

The Prevention System and Insurance Coverage in the Context of the IV Industrial Revolution

edited by
Pietro Manzella, Michele Tiraboschi



Progetto di ricerca

La presente pubblicazione è stata realizzata nell'ambito del progetto di ricerca "Il Testo Unico di salute e sicurezza sul lavoro e la tutela assicurativa alla prova della IV rivoluzione industriale" (BRIC 2018 - ID 08 – CUP E96C18002110003), cofinanziato dall'Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro (INAIL) nell'ambito della linea di finanziamento BRIC e commissionato al Centro Studi Internazionali e Comparati DEAL dell'Università degli Studi di Modena e Reggio Emilia con partner Fondazione ADAPT. Il progetto si è svolto tra aprile 2019 e aprile 2021

Comitato scientifico

Nicole Maggi Germain, Lourdes Mella Méndez, Malcolm Sargeant (†), Willem Tousjin, Patrizia Tullini

Responsabile scientifico

Michele Tiraboschi

Coordinatore delle attività di ricerca confluite nel presente volume

Pietro Manzella

Gruppo di lavoro

Ilaria Armaroli, Eliana Bellezza, Giada Benincasa, Paolo Bertuletti, Federica Capponi, Lilli Viviana Casano, Vincenzo Cangemi, Michele Cibin, Matteo Colombo, Maria Teresa Cortese, Emanuele Dagnino, Cristina Gasparri, Cecilia Leccardi, Giuseppe Manzella, Pietro Manzella, Emmanuele Massagli, Antonella Mauro, Stefania Negri, Francesco Nespoli, Giovanni Pigliararmi, Lorenzo Maria Pelusi (†), Diletta Porcheddu, Lavinia Serrani, Francesco Seghezzi, Silvia Spattini, Irene Tagliabue, Michele Tiraboschi, Tomaso Tiraboschi

ISBN 978-88-31940-65-8

Copyright © ADAPT University Press, 2021

ADAPT University Press nasce con l'obiettivo di comunicare e diffondere oltre i confini della Università i risultati della ricerca e la progettualità di ADAPT, l'Associazione per gli studi sul lavoro fondata nel 2000 da Marco Biagi (www.adapt.it). In questo senso ADAPT University Press opera alla stregua di una piattaforma aperta e indipendente di confronto e progettazione sui temi del lavoro e delle relazioni industriali sia in chiave di raccolta di finanziamenti per borse di studio e contratti di ricerca sia per sviluppare e condividere nuove idee attraverso studi e analisi che contribuiscano a costruire il futuro del lavoro attraverso una migliore e più costante collaborazione tra Università, imprese, professionisti, operatori del mercato del lavoro e parti sociali

I volumi ADAPT University Press che non sono diffusi in modalità openaccess sono acquistabili online sul sito di www.amazon.it o attraverso il sito www.bollettinoadapt.it

Per maggiori informazioni potete scrivere al seguente indirizzo di posta elettronica: aup@adapt.it

Per essere informato sulle ultime pubblicazioni di ADAPT University Press seguici su Twitter [@ADAPT_Press](https://twitter.com/ADAPT_Press)

The Prevention System and Insurance Coverage in the Context of the IV Industrial Revolution

edited by
Pietro Manzella, Michele Tiraboschi

In Memory of
Malcolm Sargeant, a beloved colleague and friend,
and **Lorenzo Maria Pelusi**, an outstanding young scholar,
who loved Occupational Health and Safety and developed
an expertise in this difficult subject that only few people have

TABLE OF CONTENTS

<i>Preface</i> by Edoardo Gambacciani, Sergio Iavicoli	XVII
<i>Research Overview</i> by Michele Tiraboschi.....	XIX

Part I.

AN OVERVIEW

Chapter I.

The Preventive Dimension of the IV Industrial Revolution

1. Framing the Issue.....	3
2. Fluid Forms of Employment.....	11
3. A Holistic Approach: Organizational Ergonomics and Total Worker Health.....	16
4. An Ageing Workforce	18
5. Training and Regular Skills Updating.....	20

Chapter II.
Some Unresolved Issues

1. The Concepts of ‘Health’ and ‘Health at Work’: Definitional Difficulties and the Need for New Implementation Tools	24
2. New Technological Risks in the IV Industrial Revolution ...	26
3. The IV Industrial Revolution beyond Technology: Organization, the Labour Market, Demography and the Environment	29
3.1. Emerging Risks	32
4. New Work Spaces	33
4.1. Overcoming the Distinction between the ‘Inside’ and the ‘Outside’	35
5. Working Time.....	35
6. Health and Safety Professions and Skills in the IV Industrial Revolution	36
7. A New Approach to the Changes Taking Place at Work and its Effects on Health and Safety	37

Part II.
EMERGING ISSUES

Chapter I.
Remote Work and Collective Bargaining

1. Introduction	41
2. The Legal Framework: Definitional Problems and Questions of Interpretation.....	45

3. The Role of Collective Bargaining.....	53
4. Conclusions.....	57

Chapter II.

Working Anytime, Anywhere: Regulating Working Time

1. Introduction.....	59
2. Working Time and the Regulation of <i>Lavoro Agile</i>	64
2.1. Working Time Regulation According to the Definition of <i>Lavoro Agile</i>	67
2.2. Rest Periods and the Right to Disconnect.....	70
2.3. A Possible Interpretation of the Right to Disconnect in <i>Lavoro Agile</i>	74
3. The Interpretation of the Right to Disconnect Considering Working and Non-Working Time.....	78
4. Conclusions.....	81

Chapter III.

Platform Work

1. Health and Safety Legislation: Scope of Application in the Context of the Gig Economy and Covid-19.....	85
2. Legal Proceedings Initiated by the Independent Workers' Union of Great Britain.....	87
3. Relevant Legislation and the Parties' Arguments.....	88
4. The Court's Decision.....	90

5. More than an Idea: Is It Possible to Provide Exceptions to OHS Protection when It Comes to Workers whose Activity is Organised by the Employer?	92
6. Conclusions	96

Chapter IV.

5G and New Live-Work Spaces

1. Framing the Issue.....	97
2. The Lack of Legislative Measures Governing Unexpected Technological Issues.....	99
3. 5G and Labour Law.....	101
4. 5G and the Protection System in the Context of Existing Legislation	109
5. 5G and the Protection System in the Context of Future Legislation	111
6. Conclusions.....	117

Chapter V.

Exposure to Electromagnetic Fields Generated by Cell Phones

1. Framing the Issue.....	121
2. Is This an Established Stance?	124
3. A Framework Featuring Major Shortcomings and Marked by Uncertain Connections between Science and Law	128
4. Work-Related Changes and the Risks Arising from the Use of Technology: New Challenges for Employee Protection ..	137
5. Case Law.....	140

Chapter VI.

Psychosocial Risks: Lessons from the Past

1. Are Psychosocial Risks a New Phenomenon?	141
2. Work and Social Pathologies: Learning from the Past	148
3. The IV Industrial Revolution and the Individual Dimension of Work	156
4. Psychosocial Risks and the IV Industrial Revolution	160

Part III.

SAFETY 4.0: THE NEED FOR NEW SKILLS

Chapter I.

The Prevention System and the Need for New Skills

1. Framing the Issue	167
2. A New Approach: Focusing on OHS Professionals	170
3. OHS Professionals: Some Unresolved Issues from the Relevant Literature	171
4. The Italian Case: A Preliminary Analysis	173
5. OHS Professionals: Empirical Research and Preliminary Results	179

Part IV.
**PROBLEMS AND PROSPECTS:
 A JOINT DIALOGUE**

Chapter I.
The Prevention System in the IV Industrial Revolution

El sistema de prevención en la IV Revolución Industrial: una perspectiva internacional, <i>Lourdes Mella Méndez</i>	189
Le sfide per l'ordinamento italiano, <i>Patrizia Tullini</i>	210

Chapter II.
Robotics, Digitalization and Remote Work

AI, Robotics and Digitalisation: Prospects and Risks, <i>Phoebe Moore</i>	219
Remote Work: Health and Safety in New Work Settings, <i>Jon Messenger</i>	234
Platform Work and Health and Safety Protection: Riders, Drivers and Beyond, <i>Sacha Garben</i>	242
Short Paper on the Health Effects and OHS Legislation Concerning New Ways of Work, <i>Jan Popma</i>	253

Chapter III.
Psychosocial Risks and the Right to Disconnect

La salud mental y el bienestar psicológico en los nuevos contextos laborales, <i>Cristóbal Molina Navarrete</i>	263
Psycho-Social Risks: a (New) Challenges for Healthcare Systems, <i>Iván Williams Jiménez</i>	275

Chapter IV.
Social Protection in the IV Industrial Revolution

EU Law and New Risks, <i>Grega Strban</i>	283
Accidents et maladies professionnelles dans la IV ^e Révolution Industrielle, <i>Dominique Bailleux</i>	294
Social Insurance Effectiveness to Tackle New Risks, <i>Richard Lewis</i>	308

Chapter V.
Skills for Managing New Risks

Promouvoir et réglementer le développement des compétences dans le contexte de l'Industrie 4.0, <i>Nicole Maggi-Germain</i>	315
Professionisti: sfide, sviluppi e problematiche, <i>Willem Tousijn</i>	324
Occupational Health and Safety Professionals: Skills, Professionalism and Training, <i>David Clarke</i>	328

Chapter VI.
Representation and Collective Bargaining

Occupational Safety Health and Trade Unions' Role in the Context of the IV Industrial Revolution: Strategic Litigation and Participation, <i>Aude Cefaliello</i>	335
Négocier la prévention: mesures de santé et de sécurité au niveau de l'entreprise, <i>Josepha Diringier</i>	352

Chapter VII.
In Search of Good Practices

Legislación sobre seguridad y salud laboral y protecciones de seguros frente a la IV Revolución Industrial: Perspectiva desde el ordenamiento jurídico español, <i>Manuel Luque Parra</i>	363
---	-----

Chapter VIII.
Reform Prospects of the Legal and Institutional Framework

Il Testo Unico sulla salute e sicurezza sul lavoro: spunti di riflessione (a fronte dei cambiamenti in atto) e proposte di modifica, <i>Paolo Pascucci</i>	375
Il Testo Unico su salute e sicurezza: spunti e proposte di modifica, <i>Gaetano Natullo</i>	395
Profili di salute e sicurezza: tra limiti e proposte di modifica della attuale normativa, <i>Andrea Rotella</i>	404
Medico del lavoro: una professione in evoluzione?, <i>Francesco Violante</i>	413

Part V.
WORK-RELATED CHANGES: AN OVERVIEW

Chapter I.
The IV Industrial Revolution: Technology and Processes

1. The IV Industrial Revolution: More than a Technological Phenomenon.....	429
1.1. Technical and Scientific Definitions.....	434
1.2. Looking for Broader Definition.....	437

2.	Technology and its risks	440
2.1.	Main Technological Tools.....	440
2.1.1.	Advanced Robotics.....	440
2.1.2.	Big Data and Machine Learning.....	442
2.1.3.	Augmented Reality.....	443
2.1.4.	Exoskeletons	444
2.1.5.	Additive Manufacturing/3D Printing.....	445
2.1.6.	Nanotechnology and the Nanomaterial	446
2.2.	Technology-related Risks in the IV Industrial Revolution.....	447
2.2.1.	Exposure to Dangerous Activities	448
2.2.2.	Musculoskeletal Disorders.....	449
2.2.3.	Human-Machine Interaction.....	449
2.2.4.	Psycho-Social Risks	450
2.2.5.	Cybersecurity	451
2.2.6.	Exposure to Electromagnetic Fields.....	451
3.	New Production Processes and Business Models.....	452
3.1.	Production Processes.....	452
3.2.	New Business Models.....	457

Chapter II.

The IV Industrial Revolution beyond Technology

1.	Rethinking the Notion of ‘Health’	461
2.	The New Labour Market	465

2.1.	Productive and Non-productive Work in the Context of Fordism: a Genre-Based Division.....	465
2.2.	New Demographic, Economic and Social Ecosystems	470
2.2.1.	Demographic Changes and the Impact on Work	470
2.2.2.	Women Accessing the Productive Labour Market.....	475
2.3.	The Rise of Care Work.....	484
2.4.	Emerging Risks	488
2.4.1.	Gender-Related Risks.....	488
2.4.2.	Older Workers and Risks: From Stereotypes to Chronic Diseases	494
3.	A New Organisation: New Sectors and Ways of Working...	499
3.1.	New Prospects for Work Organisation.....	501
3.2.	New Ways of Working	506
4.	New Workspaces.....	508
4.1.	The Place of Work in the IV Industrial Revolution....	508
4.2.	Co-Working Areas.....	512
4.2.1.	Benefits of Co-Working Spaces: Cooperation, Exchange and Professional Networking	514
4.2.2.	New Health and Safety Risks for Workers	517
4.3.	Are we Moving on from the Inside-Outside Distinction?	520
4.4.	Connections and Missed Links between the Right to Health and Environmental Law	525

5. New Working Times.....	532
6. Learning, Employment, Innovation in the IV Industrial Revolution.....	536
6.1. Innovation and Training Ecosystems.....	536
6.2. A New Epistemological Paradigm to Understand Innovation.....	542
6.2.1. Non-Formal and Occasional Research & Development.....	544
6.2.2. Open Production and Open Innovation.....	546
6.3. The Integration between Education and Production .	547
6.3.1. The IV Industrial Revolution: The Possible Developments of the Links between Education and Production.....	549
6.3.2. Dual and Hybrid Training: Combining Learning Contexts, Spaces and Time.....	553
6.4. New Skills, Jobs and Professions.....	555
6.4.1. Knowledge Workers.....	556
6.4.2. Emerging Professions.....	562
6.4.3. Key Competencies in a Changing World of Work.....	566

Chapter III.

Towards New Labour Markets

1. From Internal Markets to Transitional Markets: New Challenges for Workers' Health and Safety.....	571
1.1. Beyond the Distinction between Internal and External Market and Transitional Markets.....	571

1.2.	Protecting Transitional Employments	574
1.3.	Risk Management Strategies and New Forms of Safety in Transitional Markets	575
1.3.1.	Transitional Markets and Unproductive Work .	577
1.3.2.	Transitional Markets and Ecological Transi- tions	578
1.4.	Occupational Transitions and Health.....	579
2.	A Fresh Perspective on Work Changes and their Implications on Health and Safety Systems	585

Part VI.

NEW SKILLS ENSURING HEALTH AND SAFETY PROTECTION

1.	Health and Safety in the IV Industrial Revolution: Skills Challenges.....	589
1.1.	Work-related Changes and New Skills Needs con- cerning Health and Safety in the Countries Analysed.	589
1.2.	The Shortcomings in Workers' Current OHS Train- ing Systems	604
2.	OHS Professionals in England, Italy, France, Spain and the USA: An Overview	614
2.1.	Definitional Aspects/Classification	614
2.2.	Training and Requirements	624
2.3.	Skills Recognition and Certification Systems	628
3.	New Professions, Roles and Professionalization Processes .	633

PREFACE

Globalization, demographic changes, automation and technological progress (i.e. AI and robotics) provide companies with many opportunities for development and competitiveness, while rapidly transforming the way in which work is carried out.

Against this backdrop, workers' health and safety must be given priority, as technological innovation can give rise to new needs in terms of prevention. One example of this is remote work, which has become mainstream following COVID-19. This way of working was implemented to ensure both workers' safety and the continuation of economic activity.

In order to deal with these processes and the ensuing issues, institutions and the scientific community shall cooperate, sharing strategies and policies. OHS legislation should be reviewed, especially as regards prevention and insurance coverage. In this sense, a debate is currently taking place at European level to include digitalisation in European Directives. Some fundamental concepts of Framework Directive no. 89/391/EEC – i.e. 'place of work', 'work organisation' and 'employee' – are now being challenged, as they are difficult to implement in this new reality.

This volume provides a fresh perspective on work-related changes and their impact on health and safety in terms of prevention, skills needs and emerging risks. This publication is part of the research project 'Occupational Health and Safety (OHS) Legislation and Insurance Coverage in the context of the Fourth Industrial Revolution' (BRIC 2018 - ID 08 - CUP E96C18002110003) which was carried out between April 2019 and April 2021. The research was co-funded by Italy's National Institute for Insurance against Accidents at Work (INAIL) under the funding line

Bando di ricerca in collaborazione BRIC 2018. It was then commissioned to the DEAL Center for International and Comparative Studies of the University of Modena and Reggio Emilia (Italy) and saw the participation of Fondazione ADAPT as a partner.

The book is in line with INAIL's research, which has been increasingly focused on the three main elements referred to by the European Commission, i.e. AI, process automation and digitalisation, paying attention to health and safety issues.

A holistic and multidisciplinary perspective should be adopted, which considers workers' health broadly understood, as pointed out by the World Health Organisation (WHO). This will make it possible to benefit from Industry 4.0. In addition, the 'Prevention through design' approach shall be implemented, whereby risk prevention starts during the design stage.

Edoardo Gambacciani
INAIL General Director

Sergio Iavicoli
Director of INAIL's Department of Medicine,
Epidemiology, Occupational and Environmental Hygiene

RESEARCH OVERVIEW

This volume summarises the results of a research project undertaken between April 2019 and April 2021, which concerned the challenges brought about by the IV Industrial Revolution in relation to workers' risk prevention and insurance protection. The research was co-funded by Italy's National Institute for Insurance against Accidents at Work (INAIL) and involved the researchers from the Centre for International and Comparative Studies on Law, Economics, the Environment and Work (DEAL) of the University of Modena and Reggio Emilia and the School of Higher Education of the Association for International and Comparative Studies in the field of Labour Law and Industrial Relations (ADAPT).

The research focused on the stability of the legal and the institutional system of prevention and protection against work-related accidents and occupational diseases, in the context of digitalisation of production. The attempt has been to review the prevention and protection system, starting from a rethinking of such concepts as 'business' and 'work' following the pervasive use of modern technologies.

To this end, comparative analysis was adopted – which was useful to understand the rules in place in other legislations to face the challenge of the IV Industrial Revolution – together with an interdisciplinary approach, which benefitted by the contribution of disciplines other than labour law. The analytical framework developed through this methodology investigated relevant provisions, considering the relationship between people and work in new organisational and production settings.

Comparison involved France, Italy, the UK and the USA and provided a major contribution to the project, as it helped to gain an understanding of

developments in other countries. EU law was also examined and questioned, as it is still intended for companies operating in the XX century.

This research did not only investigate the new challenges concerning workers' health and safety in light of digitalisation. An attempt was also made to identify tools through which the current legal and institutional system can better respond to these challenges. In this sense, the scientific committee established for the project provided an enormous contribution. For this reason, we are extremely grateful to Nicole Maggi Germain, Lourdes Mella Méndez, Willem Tousijn, Patrizia Tullini and Malcolm Sargeant, who passed away in November 2020. As ADAPT, we would always be indebted to Malcolm and we always remember him for his wisdom and passion.

The research project started with the analysis of the current national and international literature. This review too was carried out through an interdisciplinary approach in order to appreciate work-related changes from different perspectives (e.g. technology, demography, the environment and the globalization of production processes). The new risk factors and the responses provided by legislation and collective bargaining were pointed out. Concurrently, a number of case studies and best practices were identified which illustrate the changes taking place at work and their impact on workers' health and safety. As for risk prevention, the skills needed by workers and experts were outlined, to ensure the effectiveness of rules in new working environments.

In order to achieve the objectives set down in the research project, cooperation was fundamental within the research team and was made possible thanks to an online platform (Moodle) on which documents were shared. 25 researchers and Doctoral students animated 68 threads and 1,200 posts on the platform. This 'learning community' – which was also a 'community of practice' – facilitated result comparison and analysis.

The last stage of the research project saw the participation of academics, OHS practitioners, business professionals and representatives from trade unions and employers' associations. They were involved in a number of interviews, which can be accessed at the following websites: salus.adapt.it and at www.deal.unimore.it.

A first set of interviews dealt with the prevention system in the Fourth Industrial Revolution. Prof Mella Mendez (Universidad de Santiago de Compostela, Spain) investigated the topic through an international and comparative perspective, while Prof Tullini (University of Bologna, Italy) considered the Italian system and its effectiveness to face these new challenges.

A second group of interviews focused on the link between the IV Industrial Revolution and social protection. Prof Strban (University of Ljubljana, Slovenia) discussed new risks in relation to Community legislation, while Prof Bailleux (University of Lyon III, France) provided an overview of work-related accidents and occupational diseases following the use of innovative technologies. Finally, Prof Lewis (University of Cardiff, Wales) examined the efficiency of public assistance in light of these new risks.

The next set of interviews addressed the skills needed to face new risks. Prof Maggi Germain (Université Pantheon-Sorbonne, France) dealt with skill development and promotion in the IV Industrial Revolution, while the one with Prof Tousijn (University of Turin, Italy) discussed the issues resulting from the emergence of new professions. David Clarke (Australian Institute of Health and Safety, Australia) considered training and education for OHS professionals.

The fourth set of interviews focused on robotics, digitalization and remote work. Prof Moore (University of Leicester, UK) investigated the new potentials and risks related to AI, robotics and digitalization. Jon Messenger (ILO), Prof Garben (College of Europe, Belgium) considered health and safety protection related to platform workers, while Prof Popma (Vrije Universiteit Amsterdam, the Netherlands) concentrated on the risks related to new working modes.

The fifth group of interviews was concerned with representation and collective bargaining. Aude Cefaliello (European Trade Union Institute, Belgium) discussed the role of trade unions in terms of strategic litigation and participation. Prof Dirringer (Université de Rennes, France) focused on the negotiation of preventive measures, particularly health and safety protection at the company level.

The interviews in the sixth block considered the psychosocial risks linked to the Fourth Industrial Revolution and the right to disconnect. Prof Molina Navarrete (Universidad de Jaén, Spain) examined mental health and psychological wellbeing in new work contexts, while Prof Williams Jiménez (Universidad Carlos III de Madrid, Spain) investigated psychosocial risks as a new challenge for healthcare systems.

The interview in the seventh block – which was made with Prof Luque Parra (Universitat Pompeu Fabra Barcelona, Spain) – discussed the best practices in collective bargaining related to prevention.

Finally, the eighth block addressed the possible reform of Italy's regulatory framework. In this sense, Prof Pascucci (University of Urbino Carlo Bo, Italy), Andrea Rotella (OHS consultant and trainer), Prof Natullo (University Sannio of Benevento, Italy) focused on the proposals to amend Italy's Consolidated Law on OHS. The interview with Francesco Violante (Former President of the Italian Society of Occupational Medicine) focused on the occupational doctor as an evolving profession in the light of the current transformations.

The exchange we had with experts was fundamental when drafting the Green Paper and the White Paper. Research into the literature and international comparison made it possible to identify the main problems, which were summarized in the Green Paper and shared with representatives from companies, trade unions, employers' association and academics, whom we would like to thank.

Subsequently, a White Paper was produced and some further research focusing on specific aspects, though many issues are still unresolved.

We would like to thank the research team, namely Ilaria Armaroli, Eliana Bellezza, Giada Benincasa, Paolo Bertuletti, Federica Capponi, Lilli Viviana Casano, Vincenzo Cangemi, Michele Cibirin, Matteo Colombo, Maria Teresa Cortese, Emanuele Dagnino, Cristina Gasparri, Cecilia Leccardi, Giuseppe Manzella, Pietro Manzella, Emmanuele Massagli, Antonella Mauro, Stefania Negri, Francesco Nespole, Giovanni Pigliararmi, Diletta Porcheddu, Lavinia Serrani, Francesco Seghezzi, Silvia Spattini, Irene Tagliabue, Michele Tiraboschi, and Tomaso Tiraboschi.

Lorenzo Pelusi, who passed away in August 2020, was also a member of the research group. We want to remember him for his invaluable contribution and for the dedication he put in his research. He will always have a special place in our heart.

Finally, we would like to thank Sergio Iavicoli, Director of INAIL Department of Medicine, Epidemiology and Environment for his support to this research.

Further information, publications and documents about the project are freely available at the following link: salus.adapt.it.

Michele Tiraboschi

Director of the 'DEAL' Centre for International and
Comparative Studies, University of Modena and
Reggio Emilia (Italy)

Part I.
AN OVERVIEW

Chapter I.

THE PREVENTIVE DIMENSION OF THE IV INDUSTRIAL REVOLUTION

1. Framing the Issue

The advent of technology has improved health and safety at work. One example of this is the use of robots or devices operated remotely to carry out tasks that are dangerous or are performed in confined spaces or polluted areas. Another example is the use of technology to carry out heavy and repetitive tasks in order to prevent musculoskeletal and psychological risks. Robots will conduct many more tasks in the future, in sectors like agriculture, construction, transportation and healthcare ⁽¹⁾. The European Parliament has confirmed the potential of robotics and new technologies for improving occupational safety. In this sense, it has noted that they can also “create a set of new risks owing to the increasing number of human-robot interactions at the workplace” underlining “the importance of applying strict and forward-looking rules for human-robot interactions in order to guarantee health, safety and the respect of fundamental rights at the workplace” ⁽²⁾. The Fourth Industrial Revolution has radically changed production and organization, especially in large

⁽¹⁾ See J. KAIVO-OJA, *Il futuro del lavoro: la robotica*, Documento di discussione EU-OSHA, 2015, p. 3.

⁽²⁾ European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)).

industries with a stable and unionised workforce ⁽³⁾. There are also new risks for health and safety, which must be managed by the employer. In this respect, the obligations related to prevention laid down in current legislation also concern new generation risks resulting from organisational and technological changes, which could not be imagined when these provisions were enforced. One reason for this is that the wording adopted in these regulations (art. 2087 of the Civil Code and arts. 2, § 1, letter *q*, 28, § 1, and 29, § 3, Legislative Decree No. 81/2008) includes any type of risk within the organisation in which work is carried out ⁽⁴⁾, which may harm workers' physical integrity and moral personality. The law also obliges employers to update the risk assessment procedure ⁽⁵⁾ in the event of changes to production or work organisation that are significant in the context of occupational health and safety. One challenge in this area is the training of professionals with the skills to recognize these new risks, assess and consequently identify the appropriate measures to tackle them. To this end, it is necessary to identify the risks that safety operators – including prevention technicians, who mainly

⁽³⁾ M. TIRABOSCHI, *La tutela della salute e sicurezza nei luoghi di lavoro alla prova del «Testo Unico»*, in *DRI*, 2008, No. 2, p. 383; A. BONDI, *Diritto penale e sicurezza sul lavoro, persone ed enti*, Working Paper Olympus, 2015, No. 44, p. 57, argues that “legislation on health and safety management is intended for large-sized companies, at least in the Italian context”.

⁽⁴⁾ See F. MALZANI, *Ambiente di lavoro e nuovi rischi per la salute: non solo mobbing*, in L. GUAGLIANONE, F. MALZANI (eds.), *Come cambia l'ambiente di lavoro: regole rischi, tecnologie*, Giuffrè, 2007, p. 85, who argues that the emergence of a “new concept of ‘risk’ (and ‘risk assessment’)” must also take into account “the impact on health of transversal factors, *i.e.* those arising from work organisation”.

⁽⁵⁾ This obligation is defined by case law as the ‘main aspect’ of the general organization of occupational safety (see Court of Last Resort, Criminal Division, 13 June 2014, No. 25222, in *olympus.uniurb.it*). See also A. STOLFA, *Il documento di valutazione dei rischi: dimensione organizzativa e profili civilistici*, in *Diritto della Sicurezza sul Lavoro*, 2016, No. 2, p. 2.

work in public prevention services ⁽⁶⁾ – face in contexts in which the organization opens up to the Fourth Industrial Revolution. Thanks to Industry 4.0, there is a shift from automated production to a new organisational model in which there is an interaction between industrial machinery and interconnected workers ⁽⁷⁾. In this sense, the Internet of Things helps connect machines and workers, therefore creating new forms of collaboration that reduce the time needed for each task. Innovations such as wearable technology, collaborative robotics and smart production – *i.e.* collaboration between all items in the production process – can be implemented in companies, with a significant impact on the safety of workers. It has been highlighted that many negative effects can arise for employee wellbeing: increased workloads, more organizational constraints, information overload and difficulties in striking a balance between private and professional life ⁽⁸⁾. The Internet of Things is also being used in areas such as health and safety compliance and manage-

⁽⁶⁾ This professional figure and their skills have been discussed at length by S. NERI, *I professionisti della prevenzione nel lavoro che cambia. Il tecnico della prevenzione nell'ambiente e nei luoghi di lavoro*, in *Sociologia del Lavoro*, 2018, No. 150, pp. 234 ff.

⁽⁷⁾ Cf. cfr. M. TIRABOSCHI, F. SEGHEZZI, *Il Piano nazionale Industria 4.0: una lettura lavoristica*, in *LLI*, 2016, No. 2, I., especially pp. 7 ff. See also F. SEGHEZZI, *La nuova grande trasformazione. Lavoro e persona nella quarta rivoluzione industriale*, ADAPT University Press, 2017, pp. 130 ff.; V. PERESSOTTI, *Human centered manufacturing. L'uomo al centro della fabbrica. La quarta rivoluzione industriale ha ridisegnato il ruolo delle persone che devono maturare nuove competenze per interagire con i robot. Per dare vita a un innovativo modello organizzativo ed economico*, in *Sistemi & Impresa*, 2017, No. 5, pp. 42 ff.; M. MENGHINI, S. CARAVELLA, *Race against the Machine. Gli effetti della quarta rivoluzione industriale sulle professioni e sul mercato del lavoro*, in *L'Industria*, 2018, No. 1, pp. 43 ff., where it is stressed that the tasks performed by health and safety officers face a low risk of automation.

⁽⁸⁾ See M. TRONCI, *La gestione della sicurezza nei processi industriali della smart factory e del digital manufacturing*, in *RIMP*, 2017, No. 2, p. 233.

ment, logistics and process quality ⁽⁹⁾. According to the European Agency for Safety and Health at Work, the number of devices capable of interacting with people and performing machine-to-machine communications autonomously will be 50 billion by 2020 ⁽¹⁰⁾. Thanks to this ‘digital ubiquity’ all interconnected devices and robots will communicate with each other ⁽¹¹⁾. Faced this “ubiquitous revolution” ⁽¹²⁾, even production becomes smart, so terminology like smart factory ⁽¹³⁾ and smart manufacturing will enter everyday language ⁽¹⁴⁾. This change in the organization of production activities has effects on occupational health and safety, particularly in relation to the physical risks associated with the use of technology. Man-machine interactions will give rise to ‘co-bots’, which can “carry out activities to support work, easing fatigue, conducting individual tasks, increasing precision and safety levels” ⁽¹⁵⁾. Collaborative robotics also leads machines to analyse situations, thus meeting the needs of specific production phase. This state of affairs must be preceded by an analysis of the space where both machines and the workers operate. Physical risks must be prevented, in consideration that ro-

⁽⁹⁾ See INAIL, *ICT e lavoro: nuove prospettive di analisi per la salute e la sicurezza sul lavoro*, 2016, p. 22.

⁽¹⁰⁾ See J. KAIVO-OJA, *op. cit.*, p. 2.

⁽¹¹⁾ See M. IANSITI, K.R. LAKHANI, *Digital ubiquity. How connections, sensors, and data are revolutionizing business*, in *Harvard Business Review*, 2014, November, pp. 90-99.

⁽¹²⁾ See J. KAIVO-OJA, *op. cit.*, p. 1.

⁽¹³⁾ See M. TRONCI, *op. cit.*, pp. 233 ff.; M. TRONCI, L. MERCADANTE, P. RICCIARDI, *Industria 4.0: rischi e opportunità per la tutela e la sicurezza dei lavoratori*, in INAIL, *Sfide e cambiamenti per la salute e la sicurezza sul lavoro nell'era digitale. Atti. Seminario di aggiornamento dei professionisti Contarp, Csa, Cit*, 2018, pp. 49 ff.

⁽¹⁴⁾ See T. WAGNER, C. HERRMANN, S. THIEDE, *Industry 4.0 Impacts on Lean Production Systems*, in *Procedia CIRP*, 2017, Vol. 63, pp. 125 ff.; M. TRONCI, *op. cit.*; J.R. MERCADER UGUINA, A.B. MUÑOZ RUIZ, *Robotics and Health and Safety at Work*, in *International Journal of Swarm Intelligence and Evolutionary Computation*, 2019, Vol. 8, No. 176, pp. 1 ss.

⁽¹⁵⁾ See M. COLOMBO, E. PRODI, F. SEGHEZZI, *Le competenze abilitanti per Industria 4.0. In memoria di Giorgio Usai*, ADAPT University Press, 2019, p. 7.

bots will be more and more skilled, intelligent and mobile, interacting with people within “dynamic safety zones” (16). In addition, sensors on co-bots should promote the safety of workers who are threatened by different risks. Yet it is precisely these sensors that could become dirty, be subject to failures, interference or cyberattacks (17).

These interactions bring to the fore the same complexity and dangers that characterise those work settings in which many companies operate, especially when tasks are contracted out. The risks resulting from interference deriving from different companies operating in the same production site must be assessed and reduced to a minimum by drafting the single document for the assessment of risks deriving from interferences (DUVRI), pursuant to art. 26 of Legislative Decree No. 81/2008. In a similar vein, other tools must be used to prevent the risks arising when machinery and robots are operated. Further risks might also arise when using exoskeletons. Doubts have been cast as to whether these devices can be considered as a form of personal protective equipment. Many experts in the field argue in favour of this hypothesis, as these are for protecting workers from health and safety risks, so they have a preventive function with respect to musculoskeletal disorders (18).

This function – which makes exoskeletons effective tools for reducing the risk of biomechanical overload – has led researchers to argue that employers will be required to provide this equipment to workers engaged in the manual handling of loads or tasks involving repetitive movements. If not, they might face

(16) See N. STACEY ET AL., *Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025*, EU-OSHA, 2018, p. 46.

(17) *Idem*, p. 47. For an overview of accidents related to robotics and human error, see R. BORGATO, *Robot e incidenti sul lavoro*, in *www.amblav.it*, 8 May 2017.

(18) See N. MENARDO, C. DRUETTA, *Utilizzo di esoscheletri in ambito industriale e sicurezza sul lavoro*, in *ISL*, 2019, No. 1, p. 23.

penal sanctions, in line with the principle of ensuring the highest possible safety in technological terms ⁽¹⁹⁾. It has also been pointed out that “man-machine interaction generates new risks, *e.g.* stress and anxiety related to automation and robotics, which are perceived as unfamiliar by workers”, so they must be adequately assessed when exoskeletons are used in the organization ⁽²⁰⁾. These risks associated with the use of exoskeletons also include a sense of ‘invulnerability’, due to the greater physical strength provided by the machine, which could expose them to greater risks ⁽²¹⁾. Additive manufacturing and 3D printing also give rise to chemical risks, whose detrimental nature has not been demonstrated yet, though their dangers are known. 3D printers release ultra-fine particles, so the employer has to adopt some precautionary measures, *e.g.* isolating the printer from other work areas, providing a fume extraction system, supplying information and training on these risks, and implementing health surveillance in order to monitor the health of workers involved in 3D printing ⁽²²⁾. As said, “even if there is little scientific certainty about the danger of substances, products or conduct, in-

⁽¹⁹⁾ According to this principle, the entrepreneur is obliged to bring the company’s safety system into line with the best standards of technological progress, so they must be updated about recent developments. See, *ex multis*, G. NATULLO, *La «massima sicurezza tecnologica»*, in *DPL*, 1997, No. 12, p. 815; L. MONTUSCHI, *L’incerto cammino della sicurezza del lavoro fra esigenze di tutela, onerosità e disordine normativo*, in *RGL*, 2001, No. 4, I, p. 508; S. DI STASI, *Obblighi di sicurezza, sistema “collaborativo” e principio di autoresponsabilità del prestatore di lavoro* (note on Court of Last Resort, Criminal Division, 17 June 2015, No. 36040), in *ADL*, 2015, No. 6, I, pp. 1385 ff. Yet Constitutional Court 25 July 1996, No. 312, safeguarded the “constitutional principle of the necessary determinateness of criminal law provisions”. To do so, it limited the trend which applies the criteria of the highest possible safety in technological terms, imposing the milder principle of “the generally practiced security level” in the relevant product sector or deriving from legal prescriptions.

⁽²⁰⁾ See N. MENARDO, C. DRUETTA, *op. cit.*, p. 25.

⁽²¹⁾ See N. STACEY *ET AL.*, *op. cit.*, p. 48.

⁽²²⁾ See A. ROTA, *Stampa 3D: un nuovo rischio da ignoto tecnologico?*, in *LLI*, 2015, No. 1, p. 118.

ternational conventions and European law suggest adopting the precautionary principle” (23). Moreover, and with regard to asbestos-related diseases, criminal case law has adhered to the notion of the highest possible safety in technological terms, stressing that “in terms of liability for accidents or diseases affecting workers related to entrepreneurial activities, it must be considered that the employer is under the obligation (art. 2087 of the Civil Code) to be aware of scientific knowledge and techniques to prevent these events and adapt work procedures and settings to this knowledge, regardless of specific regulatory provisions” (24). Carbon nanotubes cause concern since they represent a danger to health not only at work but for society in general. While possessing extraordinary properties for engineering developments, these nanotubes have fibrous appearance, remarkable physiological and chemical durability and an apparent biopersistence in the lung, so their impact on health can be as serious as that of asbestos (25).

The above would be sufficient to understand the complexity of the prevention system that is emerging as a result of Industry 4.0 and the need to provide special skills to manage current risks. Compounding the picture is the use of artificial intelligence in production. There exists “a difference between the risks resulting from the use of traditional machines and those originating from artificial intelligence. A robot engaged in self-learning and autonomous decision-making also because is influenced by the surrounding environment could develop unique abilities” (26). In

(23) *Idem*, p. 113.

(24) See Court of Last Resort, Criminal Division, 17 January 2012, No. 20227.

(25) See G. CASTELLET Y BALLARÀ, *Nanotubi di carbonio versus fibre di amianto: un nuovo rischio per la salute umana?*, in INAIL, *Sfide e cambiamenti per la salute e la sicurezza sul lavoro nell'era digitale. Atti. Seminario di aggiornamento dei professionisti Contarp, Csa, Cit*, cit., pp. 305 ff.

(26) V. MAIO, *Il diritto del lavoro e le nuove sfide della rivoluzione robotica*, in *ADL*, 2018, No. 6, I, p. 1430, stresses the inadequacy of current regulations, in-

other words, a robot could develop behaviours which cannot be predicted in the planning stage. Consequently, when using these robots in companies, the employer will also be required to assess these risks, those emerging from possible interferences between workers' initiatives made independently from robots, and psychological issues arising from the relational and emotional dynamics established between workers and robots. In this sense, employers will be also required to provide specific training ⁽²⁷⁾. Consequently, specialists are key to supporting the employer in risk assessment. This is so because the management should accept the decisions of the professionals in charge ⁽²⁸⁾. For this reason, professionals should go beyond adopting the traditional preventive approach.

Interference deriving from the collaboration between man and machine will have to be evaluated considering two dimensions. On the one hand, intelligent robotics might be given incorrect instructions by workers and engage in dangerous behaviour. On the other hand, workers can develop stress or other psychosocial pathologies due to a dehumanized work environment or the loss of control over their tasks ⁽²⁹⁾. Hence the concern that

cluding the Machinery Directive, which also refers to robots with artificial intelligence. Laws do not consider the degree of autonomy, and the unpredictability of these machines when regulating liability for negligent conduct of robots. Therefore, it suggests developing “mechanisms in order to distribute the causal incidence of skills self-learned by the robot and the harmfulness of the instruction given to it” by the user. See also E. PALMERINI, *Robotica e diritto: suggestioni, intersezioni, sviluppi a margine di una ricerca europea*, in RCP, 2016, No. 6, p. 1835; A. SANTOSUOSSO, C. BOSCARATO, F. CAROLEO, *Robot e diritto: una prima ricognizione*, in NGCC, 2012, No. 2, p. 511.

⁽²⁷⁾ See V. MAIO, *op. cit.*, p. 1433.

⁽²⁸⁾ See Court of Last Resort, Criminal Division, 3 June 2014, No. 38100, with comment by M. GROTTO, *Per una lettura costituzionalmente orientata dell'indelegabilità della valutazione dei rischi per la salute e la sicurezza dei lavoratori*, in Cass. Pen., 2016, No. 5, p. 2184.

⁽²⁹⁾ Technostress has been defined by C. BROD, *Techno Stress. The Human Cost of the Computer Revolution*, Addison-Wesley Publishing Company, 1984, as

technology-dominated production may affect performance and reduce autonomy, with consequences on both technology and workers ⁽³⁰⁾. In Industry 4.0, it will be necessary to assess risks that require both technical skills and cyber security skills. But, as seen, it will also be necessary to identify psychological risks related to the interaction between humans and intelligent machines, which are still a new phenomenon especially at the company level. The importance of this professional category lies in the fact that “they are risk evaluators, not calculators” ⁽³¹⁾. With reference to new risks generated by new technologies, it becomes fundamental to rely on a professional who can select the most appropriate evaluation model or develop a new one in order to include the effects of the change taking place in companies.

2. Fluid Forms of Employment

The changes the digital revolution brings about in work organization must be dealt with. Unlike Fordism, work can be performed anywhere, making it possible to overcome the top-down approach while empowering the worker, who is now given more autonomy. Performance thus acquires a fluid and more fragmented character ⁽³²⁾, and tasks can be managed remotely, with-

a “modern disease caused by one’s inability to cope or deal with information and new communication technologies in a healthy way”.

⁽³⁰⁾ ILO, *Work for a brighter future. Global Commission on the future of work*, 2019, p. 43, gives emphasis to the *human-in-command approach*, so humans rather than machines make final decisions. Cf. also F. SEGHEZZI, *op. cit.*, p. 178, who argues that “alienation and data production concerning the monitoring of one’s performance” are effective risks.

⁽³¹⁾ See G. CRENCA, *L’evoluzione della professione attuariale nella gestione dei rischi*, in INAIL, *Sfide e cambiamenti per la salute e la sicurezza sul lavoro nell’era digitale. Atti. Seminario di aggiornamento dei professionisti Contarp, Csa, Cit, cit.*, p. 19.

⁽³²⁾ Cf. P. PASCUCCI, *Note sul futuro del lavoro salubre e sicuro... e sulle norme sulla sicurezza di rider & co.*, in *Diritto della Sicurezza sul Lavoro*, 2019, No. 1, p. 39; J.

out being onsite. EU institutions have highlighted the emerging risks of working remotely, especially the European Agency for Safety and Health at Work ⁽³³⁾. One danger is to neglect the protection of workers operating in fluid contexts, to the detriment of health and safety traditionally understood and their social dimension. Even though they are permanently connected, many workers might self-isolate, so they risk losing their identity. This is so because they no longer work in a workplace in which meaningful relationships and a sense of belonging can be built. In this sense, workers' physical distance from the employer as well as from the traditional workplace might give rise to individualism and social isolation ⁽³⁴⁾. Furthermore, research has shown that people operating remotely work more hours than those at the employer's premises. Other studies have highlighted a change in time management, which in remote work tends to overlap, thus affecting one's work-life balance ⁽³⁵⁾. This new organization requires one to consider the potential damage to workers' health, *e.g.* stress ⁽³⁶⁾ and the overlap between work and

MESSENGER ET AL., *Working anytime, anywhere: The effects on the world of work*, Eurofound, ILO Research Report, 2017, pp. 21 ff.

⁽³³⁾ See EU-OSHA, *Key trends and drivers of change in information and communication technologies and work location*, 2017.

⁽³⁴⁾ See S. ZAPPALÀ, *Smart working e fattori psico-sociali*, in M. NERI (ed.), *Smart working: una prospettiva critica*, Tao Digital Library, 2017, pp. 17 ff. See also N. BLOOM, J. LIANG, J. ROBERTS, Z.J. YING, *Does Working from Home Work? Evidence from a Chinese Experiment*, in *The Quarterly Journal of Economics*, 2015, Vol. 130, No. 1, in which some economists examined a Chinese travel agency with 16,000 employees that had told some of them to work from home. Initially, the experiment seemed to benefit workers and the company. Employees worked harder and said they were happier with their jobs. Meanwhile, the company saved more than \$ 1,000 per employee in reduced office space. But when the agency implemented this policy in all the company, a feeling of loneliness was reported among staff.

⁽³⁵⁾ See J. MESSENGER ET AL., *op. cit.*, pp. 21 ff.

⁽³⁶⁾ F. MALZANI, *op. cit.*, p. 86, defines it as a "modern form of alienation". In the 2004 Framework Agreement concluded by CES, UNICE, UEAPME and CEEP, work-related stress is defined as "a state which is accompanied

family life ⁽³⁷⁾. Remote work can therefore increase work-related stress, psychosocial disorders and the likelihood of suffering accidents due to lower levels of attention ⁽³⁸⁾. Barring few exceptions ⁽³⁹⁾, until a few years ago it was still possible to see a clear separation between work and personal life. Now the blurring of this distinction undermines the foundations of health and safety legislation, which is based on the concept of ‘organisation’ and ‘opportunity to work’, up to the point of challenging the employer’s obligations in terms of health and safety. This situation also questions the need of legislation to adapt to changes to the workplace without affecting one’s freedom of economic initiative (art. 41 of the Constitution) and right to health (art. 32 of the Constitution). As for the specific risks resulting from remote work, “work performed outside traditional spaces may lead the worker to self-impose a faster work pace in order not to lose the benefit of this form of employment (*e.g.* shorter lunch breaks or no lunch breaks at all). In addition, if the worker chooses their own home as the place of work, they might ignore or underestimate morbidity events and implicitly waive the right to sick

by physical, psychological or social complaints or dysfunctions and which results from individuals feeling unable to meet the requirements or expectations placed on them”.

⁽³⁷⁾ See COMMISSIONE EUROPEA, *Documento di riflessione sulla dimensione sociale dell’Europa*, COM(2017) 206 final, 26 April 2017; M. WEISS, *Digitalizzazione: sfide e prospettive per il diritto del lavoro*, in *DRI*, 2016, No. 2, p. 659; É. GENIN, *Proposal for a Theoretical Framework for the Analysis of Time Porosity*, in *IJCLLIR*, 2016, Vol. 32, No. 3, where time porosity is examined.

⁽³⁸⁾ As for psychosocial risks, see the EU-OSHA, *Expert forecast on emerging psychosocial risks related to occupational safety and health*, 2007, where ten new psychosocial risks are identified, classified considering: new forms of employment contracts, precarious work, irregular and flexible working time, job insecurity, work intensification, ageing workers, violence and bullying.

⁽³⁹⁾ See M. PERSIANI, *Diritto della previdenza sociale*, Cedam, 2014, pp. 185-186, who argues that “for the special circumstances in which work is carried out in the countryside, private life cannot be clearly separated from professional life. Accordingly, any accident that is even partially linked to rural activities should be seen as work-related”.

leave” (40). Also, with reference to these risks, assessment must be performed as referred to in arts. 28 ff. of Legislative Decree No. 81/2008, putting forward measures to tackle them (e.g. information and training). This is so because any space can be turned into a place of work, provided that a workstation is supplied which can be accessed by the worker in the context of their activity (41). One solution to deal with this risk could be the right to disconnect, already introduced by art. 19 of Act No. 81/2017, for agile work (42). This provision has made possible for the worker to disconnect so the company cannot contact them outside working hours, without this entailing any consequences. This right should be extended to all employment relationships in which the worker is provided with tools allowing them to operate remotely. It has been observed that disconnection must be conceived as a preventive measure, in line with legislation governing the best possible safety that can be offered in technological terms. In this sense, this aspect must be considered every time workers are provided with devices so work can take place beyond normal working hours (43). As long as this provision is limited to agile work, it will be up to employers to assess whether or not there is a risk that their employees are ‘al-

(40) See F. MALZANI, *Il lavoro agile tra opportunità e nuovi rischi per il lavoratore*, in *DLM*, 2018, No. 1, p. 26.

(41) See Court of Last Resort 5 October 2017, No. 45808.

(42) By ‘agile’ work is meant work performed in the context of salaried employment, referred to in arts. 18 ff. of Act No. 81/2017, which is carried out outside the employer’s premises without constraints in terms of time and place when technology is used. Cf. M. TIRABOSCHI, *Il lavoro agile tra legge e contrattazione collettiva: la tortuosa via italiana verso la modernizzazione del diritto del lavoro*, in *DRI*, 2017, No. 4, pp. 921 ss.; see also L.M. PELUSI, *La disciplina di salute e sicurezza applicabile al lavoro agile*, *idem*, pp. 1041 ss. Workers engaged in agile work should also be given training on the risks they can face when operating away from the company.

(43) See A. DONINI, *I confini della prestazione agile: tra diritto alla disconnessione e obblighi di risultato*, in M. VERZARO (ed.), *Il lavoro agile nella disciplina legale collettiva ed individuale. Stato dell’arte e proposte interpretative di un gruppo di giovani studiosi*, Jovene, 2018, p. 129.

ways-on', thus facing increased levels of stress or burnout. If this is the case, employers, along with prevention experts and occupational doctors, should identify measures to ensure disconnection, taking into account the limits on working time imposed by Community law, as well as the exceptions provided by art. 17, § 1, of Directive 2003/88/EC of 4 November 2003, stating that "the duration of working time, due to the characteristics of the activity carried out, is not measured, predefined, or determined by the workers themselves". As for the measures promoting disconnection, it was stated that compliance with the 11 consecutive hours of daily rest would not be sufficient to ensure the right to disconnect. It is necessary to provide the times within which the worker can and cannot be contacted by the employer⁽⁴⁴⁾. From this point of view, turning off the individual devices assigned to workers or the office-based network would be the only way to prevent employers from making contact with the employee outside working hours⁽⁴⁵⁾. It has also been objected that the prohibition of contacting workers through phone or emails or the shutting down of company servers might not be sufficient. What should matter is the worker's workload, also in relation to those objectives referred to in art. 18 of Act No. 81/2017⁽⁴⁶⁾.

If the concepts of 'workplace and organisation' have evolved until becoming 'fluid', the risks that workers can face both in and outside the company should also be assessed⁽⁴⁷⁾. As work is increasingly performed outside the employer's premises, the tra-

⁽⁴⁴⁾ See C. SPINELLI, *Tempo di lavoro e di non lavoro: quali tutele per il lavoratore agile?*, in *giustiziacivile.com*, 31 August 2018, p. 8.

⁽⁴⁵⁾ See A. FENOGLIO, *Il diritto alla disconnessione del lavoratore agile*, in G. ZILIO GRANDI, M. BIASI (eds.), *Commentario breve allo Statuto del lavoro autonomo e del lavoro agile*, Cedam, 2018, pp. 558 ff.

⁽⁴⁶⁾ See E. DAGNINO, *Il diritto alla disconnessione nella legge n. 81/2017 e nell'esperienza comparata*, in *DRI*, 2017, No. 4, p. 1034.

⁽⁴⁷⁾ See G. LOY, *Al principio, sta il principio della fatalità*, in L. GUAGLIANONE, F. MALZANI (a cura di), *op. cit.*, pp. 52 ff.

ditional workplace might lose momentum, so the difference between the outside and the inside is no longer relevant ⁽⁴⁸⁾, nor is that between occupational health and safety and public health ⁽⁴⁹⁾. In this perspective, it seems “difficult to deny that the relationship between the work environment and the general environment revolves around the individual” ⁽⁵⁰⁾.

3. A Holistic Approach: Organizational Ergonomics and Total Worker Health

The protection of workers’ health and safety is evolving considering two directions: work organisations and health promotion beyond traditional risk assessment. Compliance with ergonomic principles ⁽⁵¹⁾ requires one to avoid “repetitive tasks, making it necessary for ‘those in charge of health and safety’ to review the system. This is so because this approach identifies all aspects of production, with a view of improving positive effects on workers to seek their well-being” ⁽⁵²⁾. The goal is to adapt work to people ⁽⁵³⁾ in order to create a link between legislation governing

⁽⁴⁸⁾ On the difference between external and internal environment, and the consequences on the surrounding context, see P. TOMASSETTI, *Diritto del lavoro e ambiente*, ADAPT University Press, 2018.

⁽⁴⁹⁾ Further information on this aspect can be found in the report edited by Bensadon and Barbezieux for France’s Minister of the Environment, *Articulation entre santé au travail et santé publique: une illustration au travers des maladies cardiovasculaires*, 2014, and in the thematic bibliography listed by the Centre de documentation de l’Irdes, in www.irdes.fr, section *Publications par thèmes*, entry *Santé et travail*.

⁽⁵⁰⁾ See R. DEL PUNTA, *Tutela della sicurezza sul lavoro e questione ambientale*, in *DRI*, 1999, No. 2, pp. 151-153.

⁽⁵¹⁾ Further information about ergonomics is available in G. MANTOVANI (ed.), *Ergonomia. Lavoro, sicurezza e nuove tecnologie*, Il Mulino, 2000.

⁽⁵²⁾ See G. CORBIZZI FATTORI, *Ergonomia organizzativa, dai principi all’applicazione: il modello Ergo-Omnia*, in *ISL*, 2018, No. 10, p. 523.

⁽⁵³⁾ See L. MONTUSCHI, *Diritto alla salute e organizzazione del lavoro*, Franco Angeli, 1989, pp. 49 ff.

ergonomics and prevention measures ⁽⁵⁴⁾. In this sense, ergonomics and work organization seem to relate “the work environment to people’s characteristics and needs” ⁽⁵⁵⁾. In this perspective, it seems necessary to find a new approach, so ergonomics should be considered not as a way of adapting work equipment to the individual, but as a key factor that deals with human-based work organization, thus affecting the interaction between man and the environment. Rethinking ergonomics in new places of work could mean reviewing the entire subject. It is art. 15 of Legislative Decree No. 81/2008 which establishes compliance with ergonomic principles when defining work and production methods, in order to reduce monotonous and repetitive tasks. In accordance with these ergonomic principles, it will be appropriate to place the person centre-stage, paying attention to the psychological dimension in order to adapt work organization to individual specificities. We should always consider the importance of “sub-systemic relational dynamics”, which have a significant impact on productivity and workers’ psychophysical well-being ⁽⁵⁶⁾. A poorly organised company might constitute a significant stressor that can give rise to psychosocial issues. Thus, the main measure to tackle this risk is organizational well-being, namely “the ability of an organization to establish relationships among the people who work there, thus ensuring the highest degree of physical, psychological and social well-being while optimizing performance” ⁽⁵⁷⁾. In this respect, some organisational skills are needed that go beyond the ability to analyse production processes, taking into account the psychological dimension, not only to protect mental health, but also to ensure

⁽⁵⁴⁾ See F. MALZANI, *Ambiente di lavoro e nuovi rischi per la salute: non solo mobbing*, cit., p. 84.

⁽⁵⁵⁾ See F. MALZANI, *Ambiente di lavoro e tutela della persona*, Giuffrè, 2014, p. 162.

⁽⁵⁶⁾ See G. CORBIZZI FATTORI, *op. cit.*, p. 525.

⁽⁵⁷⁾ See P. PASCUCCI, *Dieci anni di applicazione del d.lgs. n. 81/2008*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 1, pp. 2 ss.

higher business efficiency. Some practices are developing aimed at integrating occupational safety with individual wellbeing, through the promotion of healthy lifestyles even outside the workplace ⁽⁵⁸⁾. The blurring of boundaries between working and private life and the dematerialization of traditional workplaces are a consequence of new work organisations, which are reflected in the ‘Total Worker Health’ approach, which aims at safeguarding workers also beyond working hours. This makes it possible to move from risk prevention at work to overall prevention. This way, worker’s better health will also promote higher company productivity and less public spending as regards healthcare. However, it should also be noticed that using these protocols outside work might interfere with workers’ private life, since it is difficult to distinguish between an obligation and a recommendation. Specific skills will be required within the company, particularly among professionals involved in prevention, in terms of employer control. It is also important to emphasize that in implementing these new measures, professionals with skills in data protection are needed, since health promotion programs involve the processing of special data, as referred to in art. 9 of the General Data Protection Regulation, 2016/679/EU.

4. An Ageing Workforce

A final risk that is worth mentioning is the ageing of the working population, which coincides with the advent of Industry 4.0 and might give rise to a number of issues. Over the next few decades, the European union will experience a significant rise in the proportion of older workers. It is estimated that around 30% of men and women in the 50-64 years old age group require

⁽⁵⁸⁾ The Total Worker Health approach, which draws on a holistic model, includes all company measures, such as awareness campaigns aimed at promoting workers’ wellbeing through measures that can be taken in private life, *e.g.* physical activity, postural exercises, proper eating habits.

workplace adjustments for health reasons (mostly musculoskeletal and mental disorders) in order to prevent early retirement and work inability ⁽⁵⁹⁾. In addition, extended working life also entails an increased risk of developing technopathies caused by prolonged exposure to harmful substances. This phenomenon poses safety issues because older workers' skills are the least suitable to manage current progress in work organization, featuring the interconnection of man and machine. As a result, older workers will be at greater risk of injury, also due to their lack of ability to manage new technologies that will characterize production. They may not be as prepared as their younger counterparts to deal with constantly evolving technologies, either because of the training received or because of a lack of familiarity with these new devices. This risk could be prevented considering aspects like human resource management, work organization and job assignments. Older workers should receive refreshment training, providing them with necessary skills and informing them on health and safety measures concerning age-related risks (*e.g.* muscular-skeletal disorders, chronic diseases, cognitive or sensory deficits). Under art. 28 of Legislative Decree No. 81/2008, workers' age-related risks must be specifically assessed by the employer. If a worker has a disability, it would be necessary to promote "reasonable accommodations" – pursuant to Legislative Decree no. 216/2003 ⁽⁶⁰⁾ – "which promotes the health and integration of the disabled person, as well as to prevent discrimination" ⁽⁶¹⁾. As for prevention, it should be noted

⁽⁵⁹⁾ See J. ILMARINEN, *Promuovere l'invecchiamento attivo sul luogo di lavoro*, EU-OSHA, 2012, p. 1.

⁽⁶⁰⁾ *Cf.* art. 3, § 3-*bis*, Legislative Decree No. 216/2003: "in order to ensure compliance with the principle of equal treatment of people with disabilities, public and private employers are required to adopt reasonable accommodations, as defined by the United Nations Convention on the Rights of Persons with Disabilities, ratified pursuant to Act 3 March 2009, No. 18, to ensure that they are placed on an equal footing with other workers".

⁽⁶¹⁾ See A. ROSIELLO, *Tutela della salute e prevenzione delle discriminazioni legate all'età nel contesto "Impresa 4.0"*, in *ISL*, 2018, No. 6, p. 348.

that some technological solutions made available by Industry 4.0 might benefit older workers, *e.g.* wearable technology and exoskeletons, as might virtual and augmented reality. Finally, the older workforce could be safeguarded by measures concerning work organisation, *e.g.* by concluding individual agreements on agile work, reducing working hours, proposing part-time working arrangements or assigning different tasks. Given the variety of risks resulting from the ageing of the working population and the measures that can be adopted to deal with them, it is not surprising that in recent years there has been an increase in projects concerning the implementation of increasingly sought-after skills, *e.g.* those related to ageing management (43%) and diversity management (35%) (62).

5. Training and Regular Skills Updating

In the light of the above, it seems necessary to make reference to the European Agency for Safety and Health at Work, which argues that lifelong training and skill updating will be essential. This is so because in the future people may perform tasks that did not even exist before, doing so remotely. Training should change, focusing on education, knowledge exchange and change management, because workers will have to be increasingly able to assess and self-manage their need for reviewing vocational skills (63). Furthermore, and in line “with the interdisciplinary nature of health and safety at work, which is certainly not the preserve of lawyers”, even mandatory training is changing, in order

(62) See INAIL, *ICT e lavoro: nuove prospettive di analisi per la salute e la sicurezza sul lavoro*, cit., p. 16.

(63) See N. STACEY ET AL., *op. cit.*, p. 63. One example of this is the work of pickers in logistics, as they might lose their relevance in modern warehouses. This might lead to make do without those skills developed over time, while increasing work-related stress, as workers simply follow instructions, so they are not encouraged to act autonomously.

to develop soft skills. One example of this is the skills needed to work as the head of the prevention and protection service (according to art. 32 of Legislative Decree No. 81/2008, and the agreement between the state and the regions) ⁽⁶⁴⁾. As noted, the growing concern about workers' mental health ⁽⁶⁵⁾ will also require professionals who can deal with psychological aspects linked to the shift towards Industry 4.0. It is not just about developing further skills to meet the needs of the market in the future. It will be important to train professionals who are able to strike a balance between production and health protection, in order to stress "those limits that the Constitution imposes on the business activity which, according to art. 41 of the Constitution, must always be carried out in such a way as not to affect security, freedom and human dignity" ⁽⁶⁶⁾. It remains to be seen whether these new skills will supplement those possessed by prevention experts or they will pave the way for a new group of professionals. If the latter, special training courses will be organised, as well as professional associations requiring state recognition ⁽⁶⁷⁾ it seems reasonable to imagine that the first scenario will take place, though. However, given the opportunities technological innovation can offer, it cannot be ruled out that in the near future, the skills required to assess and contain the risks arising from ongoing change will be different from those needed today. This could lead to the rise of professionals who are called on to support today's prevention and safety operators, or even to replace them, due to the multitude of specialised skills possessed.

⁽⁶⁴⁾ See C. LAZZARI, *Il futuro delle professioni giuridiche nel diritto della sicurezza sul lavoro, tra tecnica e cultura*, in *Studi Urbinate di Scienze Giuridiche, Politiche ed Economiche*, 2017, No. 1-2, p. 156.

⁽⁶⁵⁾ M. TRONCI, L. MERCADANTE, P. RICCIARDI, *op. cit.*, p. 52, stress that robotics and artificial intelligence will need more attention also in relation to psycho-social risks.

⁽⁶⁶⁾ As stressed in Constitutional Court 23 March 2018, No. 58.

⁽⁶⁷⁾ See W. TOUSIJN, *Il sistema delle occupazioni sanitarie*, Il Mulino, 2000.

Chapter II. SOME UNRESOLVED ISSUES

The analysis of the literature about the Fourth Industrial Revolution provides food for thought when examined with a view of understanding the challenges that arise for those dealing with workers' health and safety. Some of these challenges will be discussed in the following paragraphs. The approach used in this research has examined the notion of the *IV Industrial Revolution* – which many associated with Industry 4.0 or the 'smart factory' – to refer to a set of technological, demographic, economic and social transformations. Scholars have not settled for evaluating technological macro-trends, but they also investigated social changes, related for example to growing social inequalities, new urbanization, scientific progress in the medical and bio-medical field, and the effects on demography. This holistic approach justifies the use of a term as disruptive and significant as 'revolution', in the light of changes that question the paradigms implemented thus far. In this sense, one might refer to research into the technological transformations and the economic and social impacts caused by the Fourth Industrial Revolution, prompted by the crisis of Fordism, which began in the 1970s. This will help to rethink some key issues, *e.g.* health and work and some new legal dimensions, along the lines of the reflections provided by Beck in relation to risk society as opposed to class society in early modernity. Contemporary society would therefore be 'reflexive', as it deals with risks which are self-generated (*e.g.* technologies, productive processes, and social, economic, political systems). In this sense, 'risk' is defined as "a systematic way of

dealing with insecurities and randomness induced and introduced by modernity itself”. For the purposes of this research, what matters is the “awareness of risk as such”, *i.e.* the fact that the “shortcomings in risk-related knowledge cannot be converted to certainties by religious or magical knowledge”. This aspect is in line with “the awareness of the limits of expert knowledge”, conceived as the impossibility of knowing everything about the consequences resulting from acts and processes. This conception of risk can be found in the literature discussing post-industrial society, which is marked by profound changes in labour relations. The technological changes produced by the Fourth Industrial Revolution take place in the post-Fordist period, challenging some long-established assumptions. In particular, the time and space dimensions featuring work are being questioned, because of technology, demographic and cultural changes that influence the structure of the labour market. These elements are not merely technological ones, but are induced by more complex transformations brought about by economic, social and cultural changes originating in different ways.

1. The Concepts of ‘Health’ and ‘Health at Work’: Definitional Difficulties and the Need for New Implementation Tools

When examining the concept of ‘health’, it is necessary to understand its application in the context of the employment relationship, and to identify the actions required by the employer and those in charge of ensuring safety. The definition provided by the World Health Organization (WHO) covers the individual dimension – one’s wellbeing – but also the collective dimension, which relates to the relationship with the environment. It is also conceived not only as a goal, but also as a tool for self-fulfilment. Health promotion therefore goes beyond the promotion of a healthy lifestyle and does not only involve health pro-

professionals, but all social, political, institutional and economic entities. The complexity of the concept of 'health' can also be seen in the workplace. Even workers' protection does not only concern work-related accidents, but a number of related factors. In attempting to ensure workers' health, some aspects which characterise the Fourth Industrial Revolution must be considered. Reference is made to the work setting and the relationship with the external environment, working time, new organizational models, new jobs and new technologies and the related risks and opportunities, the evolution of which affects the need for protection, responsibilities and legal rules. By and large, the current context is characterized by the overlap of work and family life and by technological innovations that change risks and the instruments used to prevent them. If we consider these aspects in relation to the health of people and workers, it might be necessary to provide new tools for safeguarding health at work that take into account the new needs arising from today's working modes. Furthermore, some degree of continuity should be ensured between the instruments promoting occupational health and those ensuring public health, more generally, due to the overlap of work and family life referred to before. Therefore, several questions arise, *i.e.* how to address the wide character of the concept of health in the current situation. The WHO approach might be an option, also because it might be difficult to put forward an alternative, *e.g.* narrowing down the definition might not be workable. It is true that the definition was elaborated in a different context in which the developments marking the Fourth Industrial Revolution were not predicable. Yet narrowing the concept of health, bearing in mind the new configuration of work, is not consistent with people's need for protection when it comes to health and dignity. As it seems difficult to amend the health concept – an aspect that has been also stressed by relevant research – perhaps it is possible to focus on implementation tools, promoting cooperation between different entities engaged in health protection. Another issue is the link be-

tween public and occupational health. Work and the place where it is carried out are a means and an end for the control and promotion of public health. This is because work has a universal character and is socially and economically necessary. Therefore, promoting workers' health – and thus productivity – is fundamental for societal wellbeing. An example of this is remote working, as this form of employment leads to workplace dematerialization. In this sense, effective prevention policy could limit the negative consequences on workers' health in the long term, concurrently promoting sustainability in terms of public health spending. Given its nature, work represents the focus of public health protection. In this sense, it is necessary to provide tools and strategies promoting effective communication between employers and public health authorities, in order to enhance research, prevention and intervention policies. In this regard, the implementation of this model may be easier in continental Europe, while it could be more difficult in Anglo-Saxon countries (*e.g.* the US) where the role and perception of public authorities are more controversial and might conflict with a system mostly governed by private autonomy.

2. New Technological Risks in the IV Industrial Revolution

The literature makes it clear that the first aspect to deal with is technology, after which it will be possible to consider other components. Reference is therefore made to 'enabling' technologies, such as: Internet of Things, augmented reality, 3D printing, cloud, cyber-security, 5G, exoskeletons, wearable devices, and big data. Each of these technologies works primarily in relation to the others and therefore the concept of 'risk' linked to them should be given relevance. However, it is possible to identify some macro-categories of risk that illustrate the complexity of the environmental and technical scenario when observing the

evolution of occupational diseases and attempting to define some prevention tools. Some common elements have emerged, as will be seen below. Each of them is linked to one or more elements characterizing the new production context. Here, reference is made to the technological and organisational innovations that have led to prevention or working tools, as well as new risk factors for human health, both inside and outside the company. With work that has become flexible, health-related risks have also expanded. This is not only in terms of different harmful factors, but also in consideration of the combination of workplace and general risks. Moreover, risks are now related to technologies, production processes and organizational dynamics.

Exposure to Harmful Substances

This is not entirely new, yet new technologies and production have led to new risks arising from the use of innovative materials. One example of this is the risks arising from nanotechnologies and nanomaterials. These technologies help to develop more efficient products or processes in various fields (*e.g.* a 3D printer might provide benefits in terms of versatility, work flexibility, customization, energy savings, also reducing the environmental impact of production), though the effects of the substances they release on the human body are largely unknown. The interaction with new technologies and new substances at work exposes workers to a number of health-related risks.

Musculoskeletal Disorders

The use of technology in manufacturing has innovated some tasks. Some of them have been made less physically demanding (*e.g.* exoskeletons), others more flexible in terms of space and time (using ‘wearable’ devices), benefitting organizational flexibility and the balance between work and family life. This tech-

nology also makes it possible to increase environmental safety, also when performing certain tasks. However, the use of these technologies can also lead to musculoskeletal disorders, due to a number of reasons (*e.g.* sedentary lifestyle and repetitive movements).

Human-Machine Interaction

With reference to the risks deriving from man-machine interaction, some new-generation technologies are characterized by elements (*e.g.* AI, machine learning) that give them autonomy that may be complex to manage, particularly when used by workers and in case of malfunctions. The complexity of the interaction may also derive from the little usability of technologies, which generates delays when recognizing malfunctions and putting forward measures to deal with them. Further risks concern those associated with virtual reality or exoskeletons, which for example impact on the correct perception of reality. With regard to organizational models, the interaction between man and machine is critical, in terms of possible isolation, but also when concerning the pressure connected to the use of monitoring systems for production or to the work pace imposed by the man-machine relationship.

Psychosocial Risks

Psychosocial risks are discussed extensively in the literature and in institutional studies. They arise when technologies are used in rarefied contexts, causing work-related stress, overload, sleep disorders, and anxiety. Other risk factors include the control carried out through technology when monitoring performance, the feeling of providing a limited human contribution against the efficiency and autonomy of technological tools, the need for continuous adaptation to technological progress, the lack of trans-

parency of the algorithms or the functioning of automatic decision-making. There is also a widespread theory concerning the link between unstable working conditions and this type of risk.

Cyber Security

While the data collected and processed through new technologies can improve occupational health and safety, risks can arise that are not strictly related to health conditions when these data are integrated into a wider public system. These risks concern privacy, both in terms of the discriminatory use of the information processed and as regards the dissemination of sensitive data.

Exposure to Electromagnetic Fields

This is not an emerging issue, but it is still unresolved in terms of health-related risks and occupational diseases. Exposure to electromagnetic fields could increase in intensity and duration due to technological advances (5G, medical devices, and smartphones).

3. The IV Industrial Revolution beyond Technology: Organization, the Labour Market, Demography and the Environment

The literature shows that the advent of the Fourth Industrial Revolution has challenged Fordism, favouring new work organization. A modern notion of ‘work’ also established which resulted from capitalism. The 19th century economic literature promoted an idea of work to be understood in terms of production, along the lines of other production factors, such as land and capital. From the first Industrial Revolution onwards, the notion

of work has included only value-creation activities, which were economically relevant. Productive and salaried employment had proliferated until twentieth-century industrialism, thanks to reproductive and care work, traditionally entrusted to women and excluded from market dynamics, which drew on a gender-based division of labour. A holistic understanding of the innovative impact of the IV Industrial Revolution cannot disregard the demographic transformations that have affected the size and structure of the labour market. Social phenomena – *e.g.* the ageing of the population, women’s emancipation and access to employment, the migratory flows and the change in the family structure – are enabling the transformations making up the Fourth Industrial Revolution. The ageing of the population is one of the most investigated phenomena in national and international reports. The gradual increase in the average age of workers affects not only the age composition of the workforce, but work sustainability with respect to tasks, life requirements, the onset of chronic diseases, an extended working life and the consequent pressure placed on the public healthcare system. Furthermore, the aging of the population leads to an increased demand for care services, *e.g.* caregivers, assistants, nurses and domestic workers. Among the social phenomena affecting the functioning of the labour market, relevance should be given to women’s access to formal employment, the result of the socio-economic changes and the evolution of production. Starting in the last decades of the 20th century, female participation in the European labour market has increased in industrialized countries, becoming one of the main drivers of economic and social change. The growth of female participation in non-domestic work began at different times and has continued at different rates. However, the increase in the number of jobs available to women has not been matched by an improvement in terms of quality. The position of women in the labour market is affected by occupational segregation and other issues – wage differentials, limited access to top positions, domestic and family responsibilities – which place female work-

ers at a disadvantage when compared to their male counterparts. Statistically speaking, women usually hold atypical jobs associated with high instability. More recently, women's participation in the labour market has benefitted from a new flexible form of work promoted by the IV Industrial Revolution, *i.e.* so-called agile work, with a view of providing a better work-life balance, although risks exist that have already been mentioned.

Formalizing Care Work

The demand for domestic and care work has been growing since the end of the last century, a period in which lower fertility and higher emancipation were reported among women, while longer life expectancy was recorded in general. The growing demand for care and assistance means related jobs can be formalized. Yet a paradox emerges, whereby the opportunities of women in rich countries to enter employment are the result of the work of other women who come from poorer countries. This perpetuates the risk of occupational segregation with respect to 'female' jobs, which leads most female workers to engage in care work, considered as a 'natural' activity for them. Furthermore, this activity is carried out informally, so problems emerge in terms of wage protection and regulation, and of course occupational health and safety. A further issue concerns the use of digital platforms in home care and domestic work, which entails both benefits and risks. Platforms can be used to formalise irregular work, to limit the costs when matching supply and demand for domestic services, to offer quality services, to increase the opportunities for regular employment. Yet these platforms often fail to provide effective economic and social security to their users.

3.1. Emerging Risks

Gender-Related Issues

The relevant literature identifies two approaches to women's health and safety risks in the labour market. Considerable research has examined the risks emerging from the feminization of the labour market. Furthermore, studies have been concerned with health and safety risks related to new jobs performed by female workers. In relation to women's participation in the labour market, it is stressed that a 'neutral approach' to health and safety was firstly used, ignoring gender differences, thus underestimating the level of risk for women. It was only in the 1990s that risk assessment took account of gender-related differences. A gender perspective was then used for the analysis of health and safety risks, moving beyond those related to pregnancy and breastfeeding. The second approach referred to before emphasises that little research has been conducted on the safety and health of women of all ages in paid and unpaid employment. The main frame of reference for this analysis is 'gender segregation', which supports the importance of analysing the potential risks generated by horizontal and vertical segregation. For example, the risks associated with 'female occupations' are found in domestic work, as well as in the hospitality, food and healthcare sector. When carrying out gender-based risk assessment, environmental characteristics and protective measures should also be considered, as they are often modelled upon male workers. Vertical segregation too might affect women's health and safety. The job insecurity faced by women increases their exposure to occupational hazards, illness and stress. Finally, domestic work, which is usually performed by women, is not yet taken into account by forensic medicine, nor is it regarded as a form of paid employment.

Older Workers and Risks: Stereotypes and Chronic Diseases

The ageing of the population and the consequent increase in retirement age mean that workers are faced with longer working lives, which expose them to occupational hazards and age-related problems. Studies report that work participation changes with age, due to a decline in sensory and cognitive functions, along with a deterioration of the musculoskeletal system and an increase in the incidence rate of diseases (*e.g.* cardiovascular, respiratory, hormonal and metabolic disorders). The literature has also reported a widespread incidence of chronic diseases among older workers, who will be increasingly subject to physical limitations and absenteeism. This situation not only affects older workers' tasks, but also their families and the social system, *i.e.* the sustainability of the healthcare system. There is also a cultural problem, namely the negative stereotypes linked to age, *e.g.* the belief that older workers are less motivated and productive than their younger colleagues. Consequently, the organizational changes linked to Industry 4.0 technologies and the heterogeneity of the workforce are leading to the personalization of work. In this sense, the relevant literature is starting to focus on the health of workers by also considering their psychophysical peculiarities (*e.g.* age, gender). From this point of view, the 20th century notion of health seems to have been ousted by a more innovative concept, for which new tools and regulations must be elaborated.

4. New Work Spaces

The Fourth Industrial Revolution is marking the shift from an information society to a knowledge society featuring 'ubiquitous knowledge', in which people communicate with each other, and machines communicate with people and other machines, leading to the 'Internet of Things'. While it is true that work involves a man-machine interaction which presupposes new regulations,

current changes are not only due to the new technologies introduced at work, as they focus on a new concept of a 'workplace'. If digitalization of work also concerns the workplace, this means that tasks can be carried out anywhere and at any time. Digitization and globalization have made it possible to work anywhere thanks to the regular access to the information and data necessary to perform assignments. The office is ubiquitous: it is now up to workers to draw a difference between home and the place of work, with implications on the traditional distinction between work and family life. A new idea of the 'office' emerges, which has both a physical and a virtual character and is increasingly characterized by open-plan models in which workers' knowledge is shared. Therefore, a question arises as to whether the regulations protecting the health and safety of workers, which traditionally concern workplaces, are still suitable for responding to the challenges posed by new work settings. In addition, work often takes place outside the company's premises in co-working areas. Yet co-working does not always effectively contribute to creating positive interactions, knowledge sharing and exchanges. In some cases, organization experts have demonstrated that open-space offices can significantly reduce collaboration, collective intelligence and worker satisfaction. Consequently, while physical boundaries have long played a functional role in many ways, helping people to make sense of their environment, the impact that an open-plan office has on workers could be anything but positive. These new forms of work can therefore create new situations of stress and potentially affect workers' health. In this sense, the work environment plays a strategic role, as it might improve productivity and organizational wellbeing, with a possible impact on employee absenteeism and motivation.

4.1. Overcoming the Distinction between the ‘Inside’ and the ‘Outside’

Today, the company is no longer the only place where work is performed. While it might be an overstatement to speak of the disappearance of the workplace, it is difficult to overlook the need to respond to new dimensions, by also rethinking the rules concerning a fixed workstation. In this perspective, the issue can be addressed by making mention of a “dynamic work environment”, which raises doubts about responsibilities and the role of the organization in terms of prevention obligations. It is in this context that the emergence of new jobs leads one to evaluate the opportunity to review protection taking into account the ways in which work is carried out.

5. Working Time

The literature has addressed the impact of technological and organizational transformations on working time considering many dimensions, with different relevance in terms of new risks for workers’ health and safety. For example, it has been stressed that automation should be accompanied by a reduction of working hours. Yet research has focused mainly on the relationship between automation and working time in connection with unemployment rates, thus failing to consider the improvements of working conditions. Furthermore, economic transformations and organizational models caused by globalization and customised production have been analysed in relation to the widespread use of part-time work. Equally in this case, OHS has been given a limited role, notwithstanding its relevance when it comes to the links with economic insecurity. It is when considering the ways of carrying out work within a given contractual relationship that the link between technological and organizational transformations and health and safety comes to the fore. In this context, opportunities and risks emerge when workers can operate any-

time. As for the opportunities, this flexible form of working promotes a better work-life balance. However, widespread connectivity and being ‘always on’ might further blur the boundaries between work and professional life, leading to technostress, overworking and more frequent musculoskeletal disorders. A further element, which is linked to the technological transformations underway, refers to the notion of ‘smart working’ as a managerial philosophy, to be distinguished from that of ‘agile work’, which represents its partial implementation in the Italian context. It has been highlighted how the characteristics of this managerial approach – *e.g.* working anytime and anywhere – are a mere component of a broader approach in work organization strategies. A dimension of autonomy and responsibility develops which is dealt with at a managerial level through an organisation based on projects and results. Working time is therefore one of the main aspects that health and safety legislation should consider.

6. Health and Safety Professions and Skills in the IV Industrial Revolution

In the last decades, the literature has not focused much on health and safety professionals. Research has shown that the training and the requirements needed to operate as health and safety professionals are often neglected, though there is a link between these shortcomings in the literature. One aspect that emerges is the lack of a clear and shared definition of an ‘occupational health and safety professional’. The absence of a shared perspective increases difficulties when defining the main characteristic of OHS professions, due to different professionals with different titles and training who often operate in the same environment and therefore tend to overlap and generate confusion. In addition to definitional problems, there is inconsistency between the various names used in different countries and even

within the same country, an aspect which complicates comparisons between health and safety professionals working in different contexts. The complications are mainly due to terminological and language issues, but also to different health and safety legislative frameworks adopted at a national level. The process of identifying the skills that should be updated by professionals involved in occupational safety, health and prevention is far from being complete. The reference is often a generic one and includes soft, specialized and technical skills, with a different emphasis on the need to develop an interdisciplinary approach that takes into account the complexities of each task and role. It is clear that most professionals need to have their skills updated to meet the new requirements imposed by the changes taking place in the labour market. However, there are limitations in the management of health and safety training for both professionals and workers in general. The main criticisms concern the fact that training is not related to real work contexts and they are intended as mere compliance with training obligations. So, further issues exist that need to be explored. For example, there is the question of how new professions and skills for health and safety are created, which also relates to the basic skills that must be possessed by all those referred to as 'health and safety professionals'. One should also wonder about the skills needed by workers and the learning paths and methods that will need to be developed and created to update the expertise of those who play a key role in occupational health and safety.

7. A New Approach to the Changes Taking Place at Work and its Effects on Health and Safety

In conclusion, we might dare to put forward a framework within which to place the current investigation. The starting point is to consider a labour market model that follows transitional labour markets, which identify transitions as a standard practice in the

evolution of one's career. This perspective contributes to broadening research into workers' health and safety. Safety and health should be developed moving from organizations to specific transitional markets modelled around critical transitions. A new approach to people's health and safety should consider that workers experience much more fragmented career path than in the past. This is in terms of places and times of work, which is no longer characterized by standard forms of employment.

Part II.
EMERGING ISSUES

Chapter I.

REMOTE WORK AND COLLECTIVE BARGAINING

1. Introduction

Covid-19 has given new momentum to agile working ⁽¹⁾. This way of organizing work – thanks to which tasks can be performed outside the employer’s premises through IT tools – has ensured physical distancing and the continuation of many productive activities during the lockdown. The massive use of remote work – often misleadingly referred to as ‘smart working’ in newspapers ⁽²⁾ – was therefore mostly aimed at preventing the spread of the pandemic at work ⁽³⁾. Significantly, emergency leg-

⁽¹⁾ Pursuant to art. 18, § 1, of Act No. 81/2017, remote work is a way of working agreed upon by the parties, which also agree on the relevant phases, cycles and objectives, without time and space constraints, thanks to the use of technological tools. Remote work is performed inside and outside the company. The only requirement concerns the maximum duration of the daily and weekly working time, as laid down by the law and collective bargaining.

⁽²⁾ On the definition of agile work, see § 2.

⁽³⁾ This can be assumed from the emergency legislation aimed at tackling the pandemic and from the anti-contagion protocols concluded in 2020 by the social partners. Emergency legislation is discussed by E. DAGNINO, M. MENEGOTTO, L.M. PELUSI, M. TIRABOSCHI, *Guida pratica al lavoro agile*, ADAPT University Press, 2020, pp. 81-91, while protocols are referred to in G. BENINCASA, M. TIRABOSCHI, *Covid-19: le problematiche di salute e sicurezza negli ambienti di lavoro tra protocolli condivisi e accordi aziendali*, in M. TIRABOSCHI, F. SEGHEZZI (eds.), *Welfare e lavoro nella emergenza epidemiologica. Contributo sulla*

islation gave workers who were most at risk of contagion, *e.g.* because of age or concurrent pathologies, priority when accessing this way of working (4). Nonetheless, the need to use remote work has highlighted some fundamental aspects concerning this work organization, especially in relation to health and safety. Agile work can be considered as “a tool contributing to the implementation of health regulations, promoting ‘physical, mental and social’ wellbeing, and striking a balance between ‘private and professional life’” (5). Yet some authors – also following the enactment of ordinary legislation – have argued that those working remotely could face a reduction of safety levels when compared to their colleagues operating onsite. This was so because these workers perform tasks in settings not intended for work, save for co-working areas or companies’ satellite offices (6).

These observations bear relevance when considering that suddenly some 4 million workers in Italy (7) had to work remotely on a full-time basis. In this sense, one might note that the healthcare emergency did not enable companies to immediately provide workers with tools to convert their houses to workplaces. This situation has also affected other organizational aspects, with consequences on the quality of this form of employment and health and safety. Similar considerations apply to other risks related to working remotely, namely the blurred boundaries be-

nuova questione sociale. Volume V. Le sfide per le relazioni industriali, ADAPT University Press, 2020.

(4) See E. DAGNINO, M. MENEGOTTO, L.M. PELUSI, M. TIRABOSCHI, *op. cit.*, pp. 89-90.

(5) See G. LEONE, *La tutela della salute e della sicurezza dei lavoratori agili*, in D. GAROFALO (ed.), *La nuova frontiera del lavoro: autonomo – agile – occasionale. Aggiornamento al decreto-legge 12 luglio 2018, n. 87 c.d. decreto dignità*, ADAPT University Press, 2018, p. 471.

(6) See L.M. PELUSI, *La disciplina di salute e sicurezza applicabile al lavoro agile*, in *DRI*, 2017, No. 4.

(7) These statistics were provided by MINISTERO DEL LAVORO E DELLE POLITICHE SOCIALI, ISTAT, INPS, INAIL, ANPAL, *Il mercato del lavoro 2020. Una lettura integrata*, 2021, p. 25.

tween work and family life ⁽⁸⁾, hyper-connectivity ⁽⁹⁾, stress ⁽¹⁰⁾, burnout, postural issues and visual impairments ⁽¹¹⁾, as well as isolation ⁽¹²⁾. The incidence of these risks was even more signifi-

⁽⁸⁾ See J. POPMA, *The Janus face of the 'New Ways of Work'. Rise, risks and regulation of nomadic work*, ETUI Working Paper, 2013, No. 7, pp. 5 ff.

⁽⁹⁾ See B. MORISET, *Building new places of the creative economy. The rise of the coworking spaces*, paper presented to the *2nd Geography of Innovation International Conference 2014*, Utrecht, 23-25 January 2014, p. 5, pursuant to which hyper-connection makes knowledge workers more isolated.

⁽¹⁰⁾ This is defined as “the modern form of alienation” in F. MALZANI, *Ambiente di lavoro e nuovi rischi per la salute: non solo mobbing*, in L. GUAGLIANONE, F. MALZANI (eds.), *Come cambia l'ambiente di lavoro: regole rischi, tecnologie*, Giuffrè, 2007, p. 86. In the 2004 Framework Agreement concluded by CES, UNICE, UEAPME, and CEEP, work-related stress is defined as “a state which is accompanied by physical, psychological or social complaints or dysfunctions and which results from individuals feeling unable to meet the requirements or expectations placed on them”.

⁽¹¹⁾ Ergonomic and postural issues are among the most relevant risks resulting from improperly designed workstations, as reported by L. PERETTO, A. SANDELLI, F.S. VIOLANTE, *Titolo III, Attrezzature munite di videoterminali*, in P. TULLINI (ed.), *La nuova sicurezza sul lavoro. D.lgs. 9 aprile 2008, n. 81 e successive modifiche. II. Gestione della prevenzione*, Zanichelli, 2011, p. 239. See F. MALZANI, *op. cit.*, p. 84, who discusses the risks related to ergonomics, which are linked to prevention. See also G. MANTOVANI (ed.), *Ergonomia. Lavoro, sicurezza e nuove tecnologie*, Il Mulino, 2002.

⁽¹²⁾ See F. MALZANI, *Il lavoro agile tra opportunità e nuovi rischi per il lavoratore*, in *DLM*, 2018, No. 1, p. 24. The increase of psychosocial issues following the digitalization of work is dealt with also by M. WEISS, *Digitalizzazione: sfide e prospettive per il diritto del lavoro*, in *DRI*, 2016, No. 3. As for the international literature, see J. POPMA, *op. cit.*, and J. MESSENGER ET AL., *Working anytime, anywhere: The effects on the world of work*, Eurofound, ILO Research Report, 2017. See also C. SPINUZZI, *Working alone together coworking as emergent collaborative activity*, in *Journal of Business Technology and Communication*, 2012, Vol. 26, No. 4, pp. 402 ff., where it is stressed that working anywhere might also lead to isolation and the inability to establish relations. E. BERNSTEIN ET AL., *The Implications of Working Without an Office*, in *hbr.org*, 15 July 2020, argue that remote working makes it difficult to establish relationships, both long-standing and superficial ones (this aspect is also demonstrated by M.S. Granovetter, *The Strength of Weak Ties*, in *The American Journal of Sociology*, 1973, Vol. 78, No. 6). See also S. BERINATO, *What Is an Office for?*, in *hbr.org*,

cant during the pandemic, as alternation between working from home and operating at the company was not possible ⁽¹³⁾. In considering the exceptions and simplifications introduced by emergency legislation ⁽¹⁴⁾, one has concerned health and safety. This refers to the employer's obligation to provide workers with information on the risks resulting from working remotely only electronically (art. 22, § 1, Act No. 81/2017), using a form available on the Inail website ⁽¹⁵⁾. This choice prompts some reflections with regard to the way information ensures workers' protection. Doubts can arise with respect to the protection offered

15 July 2020; L.R. BLENKE, *The role of face-to-face interactions in the success of virtual project teams*, Doctoral Dissertation in Engineering Management, Missouri University of Science and Technology, 2013; D. THOMPSON, *The Coronavirus Is Creating a Huge, Stressful Experiment in Working From Home. Even before the pandemic struck, remote work was accelerating in the U.S. But the next few months will be a very strange test of our white-collar future*, in *www.theatlantic.com*, 13 March 2020. Here, reference is made to research carried out by Google on its most productive groups, in which 'psychological security' was seen as the most important feature. The same point is made by M. MORRIS, J. NADLER, T. KURTZBERG, L. THOMPSON, *Schmooze or lose: Social friction and lubrication in e-mail negotiations*, in *Group Dynamics*, 2002, Vol. 6, No. 1. Finally, see N. BLOOM, J. LIANG, J. ROBERTS, Z.J. YING, *Does Working from Home Work? Evidence from a Chinese Experiment*, in *The Quarterly Journal of Economics*, 2015, Vol. 130, No. 1, in which some economists examined a Chinese travel agency with 16,000 employees that had told some of them to work from home. Initially, the experiment seemed to benefit workers and the company. Employees worked harder and said they were happier with their jobs. Meanwhile, the company saved more than \$ 1,000 per employee in reduced office space. But when the agency implemented this policy in the company, a feeling of loneliness was reported among staff.

⁽¹³⁾ See Art. 18, § 1, Act No. 81/2017.

⁽¹⁴⁾ An overview of emergency legislation related to agile work is provided in E. DAGNINO, M. MENEGOTTO, L.M. PELUSI, M. TIRABOSCHI, *op. cit.*, pp. 81-91.

⁽¹⁵⁾ Here reference is made to the form which can be downloaded from the Inail website: cf. INAIL, *Coronavirus: estese a tutta Italia le misure rafforzate e urgenti per il contenimento del contagio. Informativa per il lavoro agile*, in *www.inail.it*, 10 March 2020.

by an information notice, even more so where it features standardized content.

In consideration of the issues brought about by the pandemic, this study will attempt to go through the system of health and safety protection for agile workers, investigating both ordinary legislation and collective bargaining. In the first paragraph, a review of the health and safety measures laid down in legislation on agile work will be carried out, in order to find links with prevention legislation and with the health and safety regulations applicable to telework. In this sense, it might be interesting to adopt an industrial relations perspective, in order to understand how collective agreements supplement legal provisions to ensure agile workers full protection. In the second paragraph, an analysis will be made of the measures adopted for this purpose by national and company-level collective bargaining, before and during the pandemic.

2. The Legal Framework: Definitional Problems and Questions of Interpretation

In the context of remote work, prevention has been given relevance in the discussions made by Italy's Parliamentary Commission⁽¹⁶⁾ and in some research. The latter has highlighted that fewer obligations in terms of health and safety were laid down concerning agile work as compared to telework, indicating the rationale of legislation⁽¹⁷⁾ and the few rules governing this issue

⁽¹⁶⁾ See R. GUARINIELLO, *Lavoro agile e tutela della sicurezza*, in *DPL*, 2017, No. 32-33, pp. 2007-2011.

⁽¹⁷⁾ See E. COMO, R. TURI, *Smart working: ne avevamo proprio bisogno? Come cambia il telelavoro*, in *Sinistra Lavoro*, 2016, No. 32. On this aspect, see also M. TIRABOSCHI, *Il lavoro agile tra legge e contrattazione collettiva: la tortuosa via italiana verso la modernizzazione del diritto del lavoro*, in *DRI*, 2017, No. 4, p. 928. The A. argues that "it is difficult to say that Act No. 81/2017 was used by lawmakers by watering down regulations on teleworking".

(¹⁸). For this reason, legal opinion has questioned the regulatory framework, especially the links between Act No. 81/2017, the Consolidated Text on Occupational Health and Safety (Legislative Decree No. 81/2008) and the general principles of labour legislation (*e.g.* art. 2087 of the Civil Code). In order to deal with these doubts, it is necessary to provide an overview of the provisions contained in Act No. 81/2017 and to highlight their main characteristics. Specifically, art. 22 states that the employer “ensures the health and safety of the worker engaged in agile work”. It is also stressed that the employer “provides workers and their health and safety representatives with an information notice in which general and specific risks are detailed concerning the special way in which work is performed”. Furthermore, it is highlighted that agile workers are required to “cooperate in the implementation of the prevention measures laid down by the employer to cope with the risks of working remotely”. A further prevention tool referred to by Act No. 81/2017 is the employee’s right to disconnect, the specifics of which are detailed in the agreement on agile work entered into between the worker and the employer (¹⁹). Finally, health and safety regulations for agile work also include art. 18 of Act No. 81/2017, which deals with the employer’s responsibility for the safety and proper functioning of the technological tools made available to the worker. In considering the limited (²⁰) character of the health and safety provisions laid down in Act No. 81/2017, the main issue concerns the obligation to deliver information to workers (art. 22, Act No. 81/2017) in relation to the employer’s duty to ensure workers’ health and safety. In this sense, this approach is also contrasted with the interpretation denying the exhaustive nature

(¹⁸) See D. GENTILINI, G. FILOSA, *La tutela della salute e sicurezza del lavoro nello smart working. Inquadramento giuridico e sfide formative*, Working Paper ADAPT, 2020, No. 20, p. 4.

(¹⁹) On the right to disconnect, *ex multis*, see E. DAGNINO, *Il diritto alla disconnessione nella legge n. 81/2017 e nell’esperienza comparata*, in *DRI*, 2017, No. 4.

(²⁰) See L.M. PELUSI, *op. cit.*, p. 1043.

of the prevention schemes laid down in Act No. 81/2017. In examining the parliamentary discussion leading up to legislation governing agile work ⁽²¹⁾, it emerges that the original version of Act no. 2233/2016 considered information as complementary to the general obligation to provide protection ⁽²²⁾. Moreover, the interpretation according to which information provision is the only fulfilment concerning health and safety seems to clash with the principles of European Union law. According to them, protection for workers involved in flexible work arrangements should be increased ⁽²³⁾. Furthermore, it also conflicts with the minimum standards of prevention ensured by European legislation, which are mandatory pursuant to Act No. 81/2017 ⁽²⁴⁾.

Drawing on these considerations, it is now possible to examine a number of aspects concerning applicable legislation. The existence of provisions specifically devoted to remote work has been seen as an important feature of Italian law. Reference is made to art. 3, § 10, of Legislative Decree No. 81/2008, which applies to “employees who carry out remote work through computers or IT tools”. This provision also applies to ‘teleworkers’, *e.g.* those engaged in “a form of organization and/or work using information technologies within the scope of a contract or an employment relationship. This work could also be performed on the employer’s premises, though it is regularly performed out-

⁽²¹⁾ As described by R. GUARINIELLO, *op. cit.*

⁽²²⁾ See L.M. PELUSI, *op. cit.*, p. 1053, who provides further documentation to support this view, *e.g.* in Nota breve. Servizio Studi del Senato No. 156/2017 and in Circ. Inail 2 November 2017, No. 48.

⁽²³⁾ See A. DELOGU, *Obblighi di sicurezza: tutela contro gli infortuni e le malattie professionali nel lavoro agile*, in GRUPPO GIOVANI GIUSLAVORISTI SAPIENZA (GGGS) (ed.), *Il lavoro agile nella disciplina legale, collettiva ed individuale. Stato dell’arte e proposte interpretative di un gruppo di giovani studiosi*, Working Paper CSDLE “Massimo D’Antona” – Collective Volumes, 2017, No. 6, p. 117.

⁽²⁴⁾ This aspect was also referred to in M. TIRABOSCHI, *op. cit.*, p. 927.

side that”⁽²⁵⁾. For these workers, the Consolidated Text on Occupational Health and Safety provides for the application of the provisions set forth in Title VII⁽²⁶⁾, which governs work involving the use of video display equipment⁽²⁷⁾. When engaging in risk assessment pursuant to art. 28 of Legislative Decree No. 81/2008⁽²⁸⁾, the employer must pay attention to eyesight risks, postural issues and physical or mental fatigue, as well as to the ergonomic and hygienic conditions of the working environment⁽²⁹⁾. It is also envisaged⁽³⁰⁾ that remote workers are subject to health supervision⁽³¹⁾ pursuant to art. 41 of the Consolidated Text on Occupational Health and Safety. Title VII of this piece of legislation also deals with the number and duration of breaks

(25) Art. 1 of the Interconfederal Agreement 9 June 2004 on Telework, concluded by Confindustria, Cgil, Cisl and Uil. This accord implements the European Framework Agreement on Telework 16 July 2002.

(26) Some scholars argue that the application of this provision is dependent upon the number of hours workers use video display units. As stressed by G. CASIELLO, *La sicurezza e la tutela contro gli infortuni e le malattie professionali nel lavoro agile*, in G. ZILIO GRANDI, M. BIASI (eds.), *Commentario breve allo Statuto del lavoro autonomo e del lavoro agile*, 2018, p. 653, these provisions apply only to workers using IT tools for more than 20 hours per week (art. 173, § 1, letter c, Legislative Decree No. 81/2008).

(27) The choice of lawmakers to provide protection based on the way work is performed (*e.g.* through computers), focusing on the place of work only at a later stage, highlights that the worker’s residence is only one of the places where workers can operate remotely. See G. LEONE, *op. cit.*, p. 474.

(28) Pursuant to art. 2, § 1, letter *q*, of Legislative Decree No. 81/2008, ‘risk assessment’ refers to “the overall and documented assessment of all the risks for workers’ health and safety in the organization in which they operate. This procedure is aimed at identifying prevention and protection measures, putting forward measures ensuring the improvement of health and safety levels over time”.

(29) See Art. 174, Legislative Decree No. 81/2008.

(30) See Art. 176, Legislative Decree No. 81/2008.

(31) According to F. MALZANI, *Il lavoro agile tra opportunità e nuovi rischi per il lavoratore*, *cit.*, p. 24, this measure is key to “ensuring the opportunity to work anywhere [...] where peculiar risks exist characterising remote work”.

granted to remote workers ⁽³²⁾. For some scholars, this provision makes clear that workers are encouraged to cooperate in terms of health and safety, because “they escape the employer’s direct control, so they will be the only ones who can comply with health and safety regulations” ⁽³³⁾. Given the characteristics of remote work, some have argued that cooperation is higher than that required of onsite workers ⁽³⁴⁾. This aspect is also reflected in the establishment of the ‘right’ working time. The lack of hourly limits might generate risks for workers. For example, being ‘always on’, they might experience difficulties in separating work and family life ⁽³⁵⁾. Furthermore, according to art. 177 of Legislative Decree No. 81/2008, those working remotely must receive training and information regarding the health and safety measures applicable to their place of work, the way work shall be carried and the measures protecting their eyesight ⁽³⁶⁾. Besides applying to video terminals, art. 3, § 10, of Legislative Decree No. 81/2008 stipulates that, if the employer provides the employee with equipment to perform remote work, the requirements laid down in arts. 70, 71 and 73 must also be complied with. These provisions have the same content as art. 18, § 2, of Act No. 81/2017 in terms of employer responsibility with regard to the safety and functioning ⁽³⁷⁾ of working tools ⁽³⁸⁾.

⁽³²⁾ See Art. 175, Legislative Decree No. 81/2008.

⁽³³⁾ See L.M. PELUSI, *op. cit.*, p. 1052.

⁽³⁴⁾ See G. SANTORO-PASSARELLI, *Lavoro eterorganizzato, coordinato, agile e il telelavoro: un puzzle non facile da comporre in un’impresa in via di trasformazione*, Working paper CSDLE “Massimo D’Antona” – IT, 2017, n. 327, p. 14.

⁽³⁵⁾ See F. MALZANI, *Il lavoro agile tra opportunità e nuovi rischi per il lavoratore*, *cit.*, pp. 21-22.

⁽³⁶⁾ According to S. CAPONETTI, *L’obbligazione di sicurezza al tempo di Industry 4.0*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 1, p. 52, training is particularly important for remote workers, as it enables them to select their place of work and understand relevant risk factors.

⁽³⁷⁾ The employer’s obligations regarding the security and proper functioning of IT tools also include the provision of security and antivirus software, as well as their renewal. See A. PRETEROTTI, *La responsabilità del datore di lavoro*

However, not referring to the fact that workers can use their own tools – *e.g.* during the pandemic ⁽³⁹⁾ – some scholars have wondered whether they should also be responsible for the aspects stressed above concerning their tools ⁽⁴⁰⁾. Finally, art. 3, § 10, determines that the place of work where remote work is carried out can be accessed by the employer, the workers’ representatives and the relevant authorities in order to assess the implementation of health and safety regulations, as well as the need for the employer to adopt specific measures allowing the worker to meet with colleagues, in order to prevent isolation ⁽⁴¹⁾. This provision compels lawmakers to answer a question that has been given priority since the introduction of legislation on agile work – the relationship between the two forms of remote work – in

per il buon funzionamento degli strumenti assegnati al lavoratore agile, in G. ZILIO GRANDI, M. BIASI (eds.), *op. cit.*, p. 605.

⁽³⁸⁾ A. PRETEROTTI, *op. cit.*, p. 601, argues that this provision refers to the responsibility of the employee for the tools assigned by the employer *for* performing work and not only *when* performing work. So these responsibilities also concern downtime.

⁽³⁹⁾ As pointed out by E. DAGNINO, M. MENEGOTTO, L.M. PELUSI, M. TIRABOSCHI, *op. cit.*, p. 85, art. 90, § 2, of Law-Decree No. 34/2020, so-called ‘*Decreto Rilancio*’ has “confirmed an already established practice during the emergency”. Specifically, “work performed remotely can also be carried out using IT tools owned by employees if they are not provided by the employer”.

⁽⁴⁰⁾ According to L.M. PELUSI, *op. cit.*, p. 1053, “it could be inferred [...] that if remote workers use their own tools, they might be asked to ensure their own health and safety”. Conversely, A. DELOGU, *Salute, sicurezza e “nuovi” lavori: le sfide prevenzionali nella gig economy e nell’industria 4.0*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 2, p. 72, points out that a duty may be imposed on the employer to assess the functioning of the equipment used and owned by the employee.

⁽⁴¹⁾ According to G. CASIELLO, *op. cit.*, p. 656, this provision does not apply to agile workers, as they carry out part of their work onsite. The same applies in relation to the provisions on information on health and safety for remote workers provided by art. 177 of Legislative Decree No. 81/2008.

order to assess the potential overlap between applicable legislation (42).

In relation to the different interpretations provided so far, health and safety regulation supplies a further element for analysis. The fact of equating the notion of ‘agile work’ to that of ‘telework’ has received mixed reactions, also in consideration of the different elements making up these definitions (43). However, art. 3 is characterized by a more extensive scope, enabling one to harmonise these divergent views. In this sense, it is specified that the main feature these ways of working must have for this provision to apply is the degree of continuity with which work is carried out remotely. This continuity refers to “the one concerning the planning of working time (in days, weeks, months or years) performed away from the company” (44) which usually characterizes remote work. Although this approach supports the views (45) that remote work carried out on a regular basis falls within the scope of art. 3, § 10, of Legislative Decree No. 81/2008 (46), uncertainty arises with respect to the notion of ‘continuity’, thus failing to unknot the issue. As is known, Italy’s prevention system is also governed by art. 2087 of the Civil Code, according to which the employer must “safeguard the employee’s physical integrity and moral freedom”. According to many scholars, the nature of the article referred to above proves suitable for “adapting legislation to the actual case when consid-

(42) *Ex multis*, M. PERUZZI, *Sicurezza e agilità: quale tutela per lo smart worker?*, in *Diritto della Sicurezza sul Lavoro*, 2017, n. 1, pp. 2-7.

(43) M. TIRABOSCHI, *op. cit.*, p. 937, points out that, to speak of ‘telework’, the ‘regular’ nature of work is decisive, *e.g.* it should be planned identifying the days on which one can work remotely. A different view is provided by A. PRETEROTI, *op. cit.*, p. 598.

(44) See M. TIRABOSCHI, *op. cit.*, pp. 944-945.

(45) This view is shared, *ex multis*, by da G. CASIELLO, *op. cit.*, p. 651.

(46) According to some scholars welcoming this interpretation, the provision of the notice further confirms the obligation imposed on the employer by Art. 36 of the Consolidated Text on OHS. See G. LEONE, *op. cit.*, p. 486.

ering special types of work and work environments”, *i.e.* remote work ⁽⁴⁷⁾.

However, the traditional health and safety protection provided by the national prevention system refers to Fordism, in which the employer ⁽⁴⁸⁾ had full control of the work environment. Things are different with remote work, as the employer is not fully familiar with the place in which work is performed, making it difficult to conduct risk assessment, one of the elements featuring the Consolidated Text on OHS. This aspect has led many to talk of a “lack of protection” ⁽⁴⁹⁾. In order to facilitate the employer’s fulfilment of these obligations, also in relation to remote work, some research has suggested selecting a number of places in which work can take place ⁽⁵⁰⁾. The employer cannot do so unilaterally since this move would run counter to the rationale of Act No. 81/2017. Rather, identification should be the result of an agreement between employer and employee, to be concluded either at the individual or collective level. In consideration of the reflections provided above, and despite the views expressed by some research, uncertainty emerges also because no case law has been issued on these aspects. This is why collective bargaining can play a major role, in order to supplement Act No. 81/2017. In this sense, the following paragraph will examine the collective agreements concluded in the context of remote work, with special reference to workers’ health and safety.

⁽⁴⁷⁾ See S. CAPONETTI, *op. cit.*, pp. 58-59. The A. also argues that “in the case of remote work, when the employer is absent, the obligation that arises cannot be considered as purpose-based, as is the case for standard work”.

⁽⁴⁸⁾ See A. DELOGU, *Obblighi di sicurezza: tutela contro gli infortuni e le malattie professionali nel lavoro agile*, *cit.*, pp. 109-110.

⁽⁴⁹⁾ See G. LEONE, *op. cit.*, p. 475.

⁽⁵⁰⁾ See, *ex multis*, L.M. PELUSI, *op. cit.*, p. 1054. The A. stresses that this solution “affects the flexibility that characterizes this form of employment”. G. CASIELLO, *op. cit.*, p. 654, also argues that health and safety should be given priority over flexibility when it comes to remote workers.

3. The Role of Collective Bargaining

In order to understand the role of collective bargaining in regulating health and safety for remote workers, reference should be made to ADAPT's Smart Working Observatory. Since the conclusion of the first company-level agreements on remote working⁽⁵¹⁾, the observatory has focused on this way of organizing work. Health and safety clearly play a major role, especially because of the doubts that arise when interpreting certain provisions. In this sense, the observatory has examined some 200 collective agreements, both renewals of existing agreements in force between 2015 and 2021 and newly stipulated agreements entered into in 2017 and 2020⁽⁵²⁾. As for the renewals, only 11 of the 29 collective agreements governing remote work deal with health and safety issues. Most of them refer to the same terms contained in Act No. 81/2017 concerning work equipment, specifying that the company is responsible for maintenance and functioning⁽⁵³⁾. Alternatively, reference is made to working hours, stressing workers' right to disconnect⁽⁵⁴⁾. Yet some collective agreements are more specific. An example is the agreement concluded in the lending industry on 19 December 2019, which applies to executives and managers. It states that

⁽⁵¹⁾ An analysis of the collective agreements governing smart working prior to the entry into force of Act No. 81/2017, is provided in ADAPT, *La contrattazione collettiva in Italia (2015). II Rapporto ADAPT*, ADAPT University Press, 2016, pp. 275-301.

⁽⁵²⁾ An examination of the collective agreements that discusses issues other than health and safety is provided in ADAPT, *La contrattazione collettiva in Italia (2020). VII Rapporto ADAPT*, ADAPT University Press, 2021, pp. 315-396.

⁽⁵³⁾ Examples include the collective agreement concluded in the bread and food industry on 23 February 2017 and that applying to small and medium-sized companies in the food industry of 16 September 2016.

⁽⁵⁴⁾ The collective agreement concluded in the tobacco industry on 11 February 2021 determines that "at the end of their working time [...], workers may log off in order to not receive communications from the company". This will not give to disciplinary procedures.

“as for remote workers, the health and safety regulations set out in Legislative Decree 81/2008 and following amendments [...] apply, taking into account the absence of a fixed workstation”. The collective agreement applying to workers in the food industry of 31 July 2020 adopts a similar stance. Specifically, it determines that the information provided to remote workers pursuant to art. 22 of Act No. 81/2017 is intended to fulfil the health and safety obligations contained in the general provisions, which are also referred to in the agreement.

The *Linee guida per il Lavoro Agile nel settore assicurativo e di assicurazione/assistenza* (guidelines for remote work in the insurance industry) of 24 February 2021 also consider provision of information on health and safety as part of the employer’s obligation (art. 35 of the Consolidated Text on OHS) ⁽⁵⁵⁾. The collective agreement applying to staff in performing arts does not refer to Legislative Decree No. 81/2008. Furthermore, “the place and time of work [...] are decided upon by the worker as well as the ensuing health and safety issues”. Interestingly, only the collective agreement concluded in the lending sector mentioned above enables remote workers to work from a ‘company hub’, the worker’s home, a location established in collective bargaining or chosen by the worker and communicated to the company. It should be noted that some agreements require remote workers to carry out health and safety training ⁽⁵⁶⁾. Analysing the provisions of the collective agreements regulating remote work, some relevant matters are dealt with superficially. In this sense, the parties only refer to some principles that are considered relevant. It is company-level collective bargaining that concentrates on more detailed aspects. The same holds true for occupational health and safety, which is examined by most of the 162 compa-

⁽⁵⁵⁾ The same interpretation on the obligation to inform workers about health and safety issues is provided by the collective agreement concluded in the wood and furniture sector.

⁽⁵⁶⁾ See *Linee guida per il Lavoro Agile nel settore assicurativo e di assicurazione/assistenza* of 24 February 2021.

ny-level agreements expressly dedicated to remote work ⁽⁵⁷⁾. While the content of company-level collective agreements varies depending on industry, significant differences exist between them also within the same sector when it comes to health and safety. For example, in the lending sector, only few agreements establish that Legislative Decree No. 81/2008 applies to agile workers. Other agreements simply refer to the employer's obligation to inform workers of the risks related to remote work. Still others, *e.g.* the 2018 agreement concluded by UBI Banca, provide that only the general provisions relating to the use of technological equipment are applicable to this way of working. Following the 2019 renewal of the collective agreement in the lending sector and the release of the guidelines for remote work in 2021 in the same sector, company-level agreements will presumably make reference to these general provisions, thus dispelling the doubts referred to above arising from some interpretations. Legislative Decree No. 81/2008 is also referred to in a number of company-level agreements in different sectors. In the tertiary sector, the need to update Italy's risk assessment form is stressed, so as to include the risks connected to remote working (*e.g.* HP Italia 2019, Prénatal 2020). A similar provision is contained in the recent company-level agreement concluded by an important metalworking firm (Acciai Speciali Terni 2020). In several agreements, the obligation to provide health and safety training as envisaged by the Consolidated Text on OHS also applies to remote workers, depending on the way work is carried out (BMS 2019, Acea 2018, Fater 2020, Eni 2019, Mallinkrodt 2019, Tirreno Power 2019). Significantly, remote workers' training concerning health and safety at work is given priority in many company-level agreements analysed. Especially in the metalworking industry, some agreements laid down further training obligations concerning health and safety. In this sense, it is mandatory to complete training modules specifically addressing

(57) The collective agreements referred to above are just used for illustrative purposes.

remote work in order to engage in this way of working (Ducati 2019, Tenaris 2019). With regard to working hours and the right to disconnection, many agreements fail to define its “technical and organizational implementation”, as provided for by art. 19, § 1, of Act No. 81/2017 ⁽⁵⁸⁾. Other health and safety issues related to remote workers – *e.g.* isolation, prolonged exposure to video terminals and health monitoring – are given scant consideration in company-level collective bargaining. Conversely, a number of agreements ⁽⁵⁹⁾ make reference to insurance coverage against work-related accidents and occupational diseases, which are governed by art. 23 of Act No. 81/2017.

Finally, mention should also be made of the health and safety issues affecting the workplace, which have been investigated at length by labour law scholars. However, most collective agreements only determine that remote work must be carried out in ‘suitable’ settings. In many agreements in the lending sector, it is specified that these work settings can be private ones (Compass 2017, UBI Banca 2018, Findomestic 2017, Banca Sella 2017) or that working remotely from public spaces is prohibited ⁽⁶⁰⁾. Only a limited number of collective agreements indicate where remote work can take place. An example of this is the collective agreement concluded by Telecom Italy, in which it is stated that remote work can take place in ‘satellite offices’ or any business

⁽⁵⁸⁾ An exception is the collective agreement concluded by Campari in 2018, which establishes an ‘alert system’ which operates in the event of longer working hours. This is supplemented by a series of ‘warnings’ suggesting that employees should log off at the end of their regular working time.

⁽⁵⁹⁾ Examples include the following collective agreements: AON (2017), ING Bank (2020), Tim (2020), Flash Fiber (2020), Olivetti (2020), Agenzia Spaziale Italiana (2019), Capogruppo Cassa Centrale Banca-Credito Cooperativo Italiano (2020).

⁽⁶⁰⁾ Mention should also be made of the following agreements: Poste Italiane (2019), Manfrotto (2018), Engeneering (2018), Capgemini (2019), Ceetrus (2019), Thyssenkrupp (2019), Indra (2018), Mallinkrodt (2019), Eni (2019). The prohibition to work in public areas is often motivated by the need to protect confidential information.

premises other than that where work is usually carried out. According to some literature ⁽⁶¹⁾, this latter possibility might conflict with Act No. 81/2017, pursuant to which remote work must be performed “in part inside and in part outside the employer’s premises” ⁽⁶²⁾. Yet a number of agreements in the engineering sector provide for this possibility (Engeneering 2018, Acciai Speciali Terni 2020, Manfrotto 2018, Lottomatica 2017, One Company Leonardo 2020), as well as explicitly identifying the worker’s residence as the place of work (Fincantieri 2020, Hitachi 2019, Roma Servizi per la Mobilità 2019). This is not always the case, thus some agreements refer to specific clauses in the individual agreement, pursuant to art. 19 of Act No. 81/2017 (Iccrea 2017, Cassa Centrale-Credito Cooperativo 2020). Sometimes remote workers are also under the obligation to inform the employer of the place chosen to perform remote work (Alpitour 2019, Duracell 2019, Novomatic 2019), also at a later stage (Italian Exhibition Group agreement 2019).

4. Conclusions

The analysis of collective agreements has highlighted that the social partners – especially at company level – have deemed it necessary to supplement the provisions laid down in Act no. 81/2017. However, the measures put forward are heterogeneous ones, and different views have been developed regarding them. Lacking relevant case law, and without the willingness to reform Act no. 81/2017 – which has been a highly-debated provision in

⁽⁶¹⁾ See M. TIRABOSCHI, *op. cit.*, p. 944, note 86, who refers to some agreements concluded in the lending sector prior to the entry into force of Act No. 81/2017.

⁽⁶²⁾ See Art. 18, Act No. 81/2017.

political circles ⁽⁶³⁾ – collective bargaining has been tasked with harmonizing the different measures implemented.

The reference to Legislative Decree No. 81/2008 made by collective bargaining is not sufficient to address the health and safety issues linked to a way of working which disregards time and space constraints. Consequently, collective bargaining must deal with the specific needs of protection, also considering the new forms of employee participation developed in the Covid-19 emergency ⁽⁶⁴⁾.

⁽⁶³⁾ Senator Ricciardi from the 5-Star Movement has introduced Draft Law No. 1833/2020 concerning the review of legislation on remote work and the right to disconnect. The Draft Law has been submitted for consideration to the Labour Committee of Italy's Senate.

⁽⁶⁴⁾ See L. MENGHINI, *Le rappresentanze dei lavoratori per la sicurezza dall'art. 9 dello Statuto alla prevenzione del Covid-19: riaffiora una nuova "soggettività operaia"?*, in *Diritto della Sicurezza sul Lavoro*, 2021, No. 1, pp. 48 ff.

Chapter II.
**WORKING ANYTIME, ANYWHERE:
REGULATING WORKING TIME**

1. Introduction

Thanks to the use of portable technologies (*i.e.*, laptops, tablets, smartphones), to the ubiquitous availability of Internet connectivity, and to the adoption of new organizational models in companies, a broader portion of work can now be performed outside the employer's premises.

Working anytime, anywhere is now a reality for an increasing share of workers, not only in the service sector. On the one hand, these workers enjoy the flexibility conceded by the disappearance of rigid scheduling and by the possibility to work outside offices, meaning better management of both the time dedicated to work activities and the one devoted to caring duties, rest, and recreation. On the other hand, they also face the drawbacks of continuous connection to work in terms of overworking, stress, confusion of the boundaries between work and other activities: *working anytime, anywhere* could easily turn into *working every time, everywhere* ⁽¹⁾ ⁽²⁾.

⁽¹⁾ The expression paraphrases the title of a contribution, on the topic, by J.-E. RAY, *Actualité des TIC. Tout connectés, partout, tout le temps?*, in *DS*, 2015, No. 6, p. 516. The expression can be translated in *Is everyone connected, everywhere, in every moment?* See also R. KRAUSE, "Always-on": *The Collapse of the Work-Life Separation in Recent Developments, Deficits and Counter-Strategies*, in E. ALES ET AL. (eds.), *Working in Digital and Smart Organizations. Legal, Economic*

The contradictions of remote working have been made even more clear in the context of the pandemic when telework has become one of the principal means to contrast the diffusion of the Coronavirus in the workplace. In this context, on the one hand, remote working guaranteed the continuity of the work performance in safe conditions in many sectors and, at the same time, the possibility for parents to take care of children while schools have been closed. On the other hand, the shift from the office to the home-office without any preparation resulted in the increase of the above-mentioned risks, both in terms of numbers of workers potentially affected and in terms of intensity, due to the lack of needed skills among workers and managers as well as of adequate organizational procedures.

Against this multi-faceted background, what is clear is that working time is changing in its nature and that, due to the spill over effects and the porosity of time ⁽³⁾, it is becoming more and more difficult to distinguish work from the private sphere. These changes, in turn, have an impact on the regulations provided by labour law for the management of time in the employment relationship. These regulations have traditionally played a central role in structuring the employment relationship (defining the exchange at the core of the contract) and in providing adequate safeguards for workers. These changes are causing tensions between current regulations and the new reality of work, as proved by recent decisions provided by the European Court

and Organizational Perspectives on the Digitalization of Labour Relations, Springer, 2018.

(2) A complete analysis of promises and perils of *working anytime, anywhere* is contained in J. MESSENGER ET AL., *Working anytime, anywhere: The effects on the world of work*, Eurofound, ILO Research Report, 2017. See also J. POPMA, *The Janus face of the 'New Ways of Work'. Rise, risks and regulation of nomadic work*, ETUI Working Paper, 2013, No. 7.

(3) See É. GENIN, *Proposal for a Theoretical Framework for the Analysis of Time Porosity*, in *IJCLLR*, 2016, Vol. 32, No. 3.

of Justice (CJEU), such as the decision of the Case C-55/18 regarding the measurement of daily working time by employers ⁽⁴⁾.

Legislators and scholars worldwide are trying to handle the transformation of work in general and, specifically, its impact on working time ⁽⁵⁾. Looking at the European Union, while the attempts to revise the EU Working Time Directive ⁽⁶⁾ have failed ⁽⁷⁾, growing attention is being paid to the so-called right to disconnect at the national level ⁽⁸⁾ and, lately, at the supranational

⁽⁴⁾ CJEU 14 May 2019, *Federación de Servicios de Comisiones Obreras (CCOO) v. Deutsche Bank SAE*, Case C-55/18, establishing that, “in order to ensure the effectiveness of those rights provided for in Directive 2003/88 and of the fundamental right enshrined in Article 31(2) of the Charter, the Member States must require employers to set up an objective, reliable and accessible system enabling the duration of time worked each day by each worker to be measured” (§ 60).

⁽⁵⁾ For an overview of the challenges to labour law raised by digitalization with a specific reference to working time regulation see M. WEISS, *Digitalisation: challenges and perspectives for labour law*, in L. MELLA MÉNDEZ, P. NÚÑEZ-CORTÉS CONTRERAS (eds.), *Nuevas tecnologías y nuevas maneras de trabajar: estudios desde el derecho español y comparado*, Dykinson, 2017, and W. DÄUBLER, *Challenges to Labour Law*, in *Pravo*, 2016, No. 1.

⁽⁶⁾ The reference is to the Directive 2003/88/EC that, notwithstanding the mechanisms of opt-outs contained, represents a fundamental mandatory reference for European Union Member States in the field of working time regulation. See, *inter alios*, A. BOGG, *The regulation of working time in Europe*, in A. BOGG, C. COSTELLO, A.C.L. DAVIES (eds.), *Research Handbook on EU Labour Law*, Edward Elgar, 2016, pp. 267 ff. It is noteworthy that the European regulation concerning working time is adopted by the European Union according to art. 153 TFEU because of the competence regarding “the improvement in particular of the working environment to protect workers’ health and safety”.

⁽⁷⁾ See T. NOWAK, *The turbulent life of the Working Time Directive*, in *Maastricht Journal of European and Comparative Law*, 2018, Vol. 25, No. 1.

⁽⁸⁾ Notably, the right to disconnect was first promoted in the scholarly debate and, particularly, by Jean-Emmanuel Ray since 2002 (see J.-E. RAY, *Naissance et avis de décès du droit à la déconnexion: le droit à la vie privée du XXI siècle*, in *DS*, 2002, No. 11) and only in recent years been recognized by collective agreements and laws.

level. The right has been introduced – with different scopes of application – in France ⁽⁹⁾, in Italy and, lately, in Spain ⁽¹⁰⁾ and, at least in principle, in Belgium ⁽¹¹⁾, but other countries are also considering the introduction ⁽¹²⁾. Recently, the European Parliament has promoted the diffusion of the right to disconnect by approving a Resolution on the 21st of January 2021 to recommend the introduction of a European Directive on the matter ⁽¹³⁾. The actions taken at the national level seem to be, at the moment, the most incisive ones in the field, even if they do not appear to be supported by a clear reflection of the actual meaning of time in the working relationship, since limited attention is paid to the notion of working time itself ⁽¹⁴⁾. The reasoning is also true for the European Resolution that, while promoting the right to disconnect as a fundamental right (Recital h), expressly

⁽⁹⁾ In France, the right to disconnect has been introduced by art. 55 of the so-called *Loi Travail* of 2016 (*loi n° 2016-1088 du 8 août 2016 relative au travail, à la modernisation du dialogue social et à la sécurisation des parcours professionnels*).

⁽¹⁰⁾ In Spain, the right to disconnect has been introduced by art. 88 LOPD (*Ley Orgánica 3/2018, de 5 de diciembre, de Protección de Datos Personales y garantía de los derechos digitales*). Moreover, specific provisions concerning the right to disconnect have also been introduced in the context of the *Real Decreto-Ley 28/2020, de 22 de septiembre, de trabajo a distancia*.

⁽¹¹⁾ In Belgium, the disconnection and the regulation of the use of technological working tools have been introduced as subjects of concertation in the context of the Comité pour la Prévention et la Protection au Travail by arts. 15-17 of the *Loi relative au renforcement de la croissance économique et de la cohésion sociale* in 2018.

⁽¹²⁾ See O. VARGAS LLAVE, T. WEBER, *Regulations to address work-life balance in digital flexible working arrangements*, Eurofound Research Report, 2020, *passim*.

⁽¹³⁾ See the European Parliament resolution of 21 January 2021 with recommendations to the Commission on the right to disconnect (2019/2181(INL)).

⁽¹⁴⁾ An interesting exception was contained in the above-mentioned *Loi Travail* of 2016 which not only introduced the right to disconnect, but also required the Government to produce a report to be delivered to the Parliament regarding the adaptation of the legal framework concerning the notions of place, workload and time in the context of technological transformation (art. 57).

confirmed the notion of working time established in the Directive 2003/88/CE.

In Italy, the right to disconnect has been introduced by the Act No. 81/2017 that establishes the regulation of the so-called '*lavoro agile*'⁽¹⁵⁾, a form of salaried work characterized by flexibility of time and place of work and the (possible) use of technological devices. In this context, the right to disconnect is included in a peculiar regulation of working time. Although it presents some incoherencies, it offers some interesting insights to deepen the matter and detect possible ways forward for a modern reconceptualization of working time.

Therefore, building on the analysis of the regulation of *lavoro agile*, with specific reference to the dispositions regarding working time, the paper will deal with the challenges posed by *working anytime, anywhere* and with the shortcomings of traditional regulations in addressing them.

The chapter will be structured as follows: the regulation of *lavoro agile* will be briefly presented and analysed (§ 2); the insights of this analysis will be deepened with concerning the features of traditional working time regulations (§ 3); finally, some conclusions will be drawn regarding the need to re-conceptualize working time regulation in the age of digitalization.

⁽¹⁵⁾ While the notion of *lavoro agile* is often translated into English as *smart working*, in this paper a different choice has been made in order to distinguish smart working as internationally known, *i.e.* “an approach to organising work that aims to drive greater efficiency and effectiveness in achieving job outcomes through a combination of flexibility, autonomy and collaboration, in parallel with optimising tools and working environments for employees” (CIPD, *HR: Getting smart about agile working*, CIPD Research Report, 2014, pp. 3-4), from the form of work introduced in Italy to support this managerial philosophy (*lavoro agile*). Regarding the distinction between *smart working* and *lavoro agile* see also C. SPINELLI, *Tecnologie digitali e lavoro agile*, Cacciari, 2018, pp. 17 ff. A comprehensive analysis of *smart working* in managerial terms is provided by T. TORRE, D. SARTI, *Into Smart Work Practices: Which Challenges for the HR Department*, in E. ALES ET AL. (eds.), *op. cit.*

2. Working Time and the Regulation of *Lavoro Agile*

The regulation of *lavoro agile* has been introduced by the Act No. 81/2017 (§ 3) with the explicit aims of improving work-life balance and fostering the competitiveness of the companies through time and space flexibility ⁽¹⁶⁾ and for the more general-purpose to provide regulation of salaried work updated to the challenges of the Fourth Industrial Revolution ⁽¹⁷⁾.

According to art. 18 of the Act, *lavoro agile* is “a peculiar form of performing the employment relationship” – thus, it is not a specific type of contract – that is established in a separate agreement which integrates the contract of employment stipulated by the parties ⁽¹⁸⁾. This form of work is characterized by:

- the fact that work is provided in part at and in part outside of the employer’s premises: while *lavoro agile* is usually organized on a day-per-week basis (n. days of work outside the office per week), it could also be organized on different time-span (week per months; the duration of a specific project; some hours of the working day);

⁽¹⁶⁾ See art. 18, § 1, of Act No. 81/2017. In the scholarly debate, see, *inter alios*, R. CASILLO, *Competitività e conciliazione nel lavoro agile*, in RGL, 2018, No. 1, I, and F. MALZANI, *Il lavoro agile tra opportunità e nuovi rischi per il lavoratore*, in DLM, 2018, No. 1.

⁽¹⁷⁾ See M. DEL CONTE, *Premesse e prospettive del “Jobs Act”*, in DRI, 2015, No. 4. See also G. ZILIO GRANDI, M. BIASI, *Introduzione: la “coda” del Jobs Act o la “testa” del nuovo diritto del lavoro?*, in G. ZILIO GRANDI, M. BIASI (eds.), *Commentario breve allo Statuto del lavoro autonomo e del lavoro agile*, Cedam, 2018, pp. 3 ff., and M. MARTONE, *Lo smart working nell’ordinamento italiano*, in DLM, 2018, No. 2, p. 294.

⁽¹⁸⁾ According to art. 19, § 2, of Act No. 81/2017 the agreement of *lavoro agile* could be either open ended or fixed term, irrespectively of the duration of the employment contract that integrates. This agreement could potentially be applied to any kind of employment contract and employment relationship: open ended and fixed term contracts; full-time and part-time contract; apprenticeships and, even, job on call and agency-work.

- the fact that it could “also be organized into phases, working cycles and objectives and without specific bonds regarding the working time and the workplace”, but, in any case, respecting “(only) the maximum limits of daily and weekly working hours”, as established by law and collective agreements;
- the (possible) use of technological devices.

As such, *lavoro agile* could be regarded as an evolution of telework as defined by European Framework Agreement on Telework signed in 2002 ⁽¹⁹⁾ and by the relevant regulations provided by Member States and by collective agreements at national levels ⁽²⁰⁾. In this context, *lavoro agile* can be regarded as a form of remote working that must be alternating, and that could be occasional: the first feature is coherent with the definition provided by the European Framework Agreement, but it is more limited compared to that definition ⁽²¹⁾; the second feature goes beyond the traditional definition of telework since the latter expressly requires that “work, which could also be performed at

⁽¹⁹⁾ See Framework Agreement on Telework signed by UNICE/UEAPME, CEEP and ETUC, 16 July 2002.

⁽²⁰⁾ See the Comparative Labor Law Dossier, *Teleworking and Labor Conditions*, in *IUSLabor*, 2017, No. 2. It is to be noted that very important developments have interested the regulation of telework as a consequence of the pandemic crisis. While in some cases the regulations introduced specifically addressed the use of remote working during the Coronavirus emergency (see, for example, the *Convention collective de travail concernant le télétravail recommandé ou obligatoire en raison de la crise du coronavirus*, stipulated in Belgium by the social partners in date 26 January 2021), in other cases, the reform regarded the whole regulation of remote working (as it has been, for instance, in the case of Spain, with the introduction of the *Real Decreto-Ley 28/2020* mentioned above).

⁽²¹⁾ According to the definition of telework provided by art. 2 of the European Framework Agreement, telework can be either full time or alternating.

the employers' premises, is carried out away from those premises *on a regular basis*" (22).

While a regulation aimed at responding to the peculiarities of the third-generation of teleworking (23), where remote working can be occasional and performed in any place, was needed, the decision to provide a specific regulation in addition to the one of teleworking raises some doubts regarding the intentions of the legislator. Compared to the regulation of teleworking, the one of *lavoro agile* is lighter in terms of obligations and the employer's economic cost. Since there are many spaces of intersection between *lavoro agile* and teleworking, the former is eroding the use of the latter and it could be supposed that fostering remote working without reforming telework was one of the tacit aims of the new regulation (24).

Notwithstanding explicit or tacit rationales, the regulation of this flexible form of work stresses the tension between the new reality of work and working time regulation, as clearly emerges from the above-mentioned definition contained in art. 18 and from the other provision regarding working time, *i.e.*, art. 19, § 1, which regulates the role of the individual agreement in establishing rest periods and in guaranteeing disconnection.

(22) *Ibidem* (emphasis added).

(23) See J.C. MESSENGER, L. GSCHWIND, *Three generations of Telework: New ICTs and the (R)evolution from Home Office to Virtual Office*, in *New Technology, Work and Employment*, 2016, Vol. 31, No. 3.

(24) See M. TIRABOSCHI, *Tradition and Innovation in Labour Law: The Ambiguous Case of "Agile Working" in Italy*, in F. HENDRICKX, V. DE STEFANO (eds.), *Game Changers in Labour Law. Shaping the Future of Work*, Wolters Kluwer, 2018, § 2.

2.1. Working Time Regulation According to the Definition of *Lavoro Agile*

Starting from the analysis of art. 18, it could seem contradictory that the same provision emphasizes the possibility of organizing work without specific working time bonds and provides the obligation to respect maximum daily and weekly working hours. This concern is even more valid if it is considered that telework in Italy is covered by a pervasive derogatory regime ⁽²⁵⁾ that provides the non-application of the regulations – implemented according to the Directive 2003/88/EC – regarding normal working time ⁽²⁶⁾, maximum weekly working hours ⁽²⁷⁾, overwork ⁽²⁸⁾, daily rest ⁽²⁹⁾, breaks ⁽³⁰⁾ and night work ⁽³¹⁾. The above-mentioned regime is connected to the specific features of this kind of employment relationship, since, according to the derogation permitted by the Directive 2003/88/EC, it regards

⁽²⁵⁾ See art. 17, § 5, letter *d*, of the Legislative Decree No. 66/2003.

⁽²⁶⁾ Art. 3 of the Legislative Decree No. 66/2003 states that the normal weekly working time is 40 hours and that it can be derogated *in melius* by collective agreement.

⁽²⁷⁾ According to art. 4 of the Legislative Decree No. 66/2003 the maximum weekly working time is established by collective agreements but, in any case, the average duration of the weekly working time cannot exceed 48 hours calculated on a maximum time span of 4 months (with possible derogations).

⁽²⁸⁾ According to art. 5 of the Legislative Decree No. 66/2003 overwork shall be used within the limits provided by collective agreements or, absent a collective regulation, within the maximum limit of 250 hours per year.

⁽²⁹⁾ Minimum daily rest is fixed, coherently with the Directive, in 11 consecutive hours per 24-hours period (art. 7, Legislative Decree No. 66/2003).

⁽³⁰⁾ Employees are entitled to a minimum break of 10 minutes if their working time exceeds 6 hours (art. 8, Legislative Decree No. 66/2003).

⁽³¹⁾ According to art. 13 of the Legislative Decree No. 66/2003, and to article 8 of the Directive 2003/88/EC, the average length of night work cannot exceed 8 hours in a 24-hours period.

workers whose working time “is not measured and/or predetermined or can be determined by the workers themselves”⁽³²⁾.

In the case of *lavoro agile*, this derogation seemed not to be applicable since it is the law itself that, providing the obligation to respect maximum daily and weekly working time, implies also applying the regulation regarding daily rest periods and breaks. In Italy, indeed, absent a specific provision referred to maximum daily working time⁽³³⁾, this notion is defined by subtracting from 24 hours the minimum daily rest periods and the minimum daily breaks⁽³⁴⁾: this circumstance, therefore, implies the determination and the measurement of time⁽³⁵⁾. Consequently, the possibility to work without a specific working time should normally be intended as a way to enable the employee (if interested and in the terms agreed with the employer) to distribute autonomously or partly autonomously the working hours agreed in the employment contract during the working day. A different interpretation – called ‘maximalist’, in opposition to the previous ‘minimalist’ one⁽³⁶⁾ – interpreting the provision as a derogation to normal working hours and overwork, should be intended as

⁽³²⁾ See art. 17, § 1, of the Directive 2003/88/EC.

⁽³³⁾ Despite the Italian Constitution expressly states that the maximum daily working time should be regulated by the law, the Italian legal system lacks a provision introducing this limitation and, as a consequence, it could be calculated only *a contrario* referring to the minimum rest periods and the minimum breaks.

⁽³⁴⁾ The maximum daily working time calculated as explained is 12 hours and 40 minutes.

⁽³⁵⁾ See, *inter alia*, M. PERUZZI, *Sicurezza e agilità: quale tutela per lo smart worker?*, in *Diritto della Sicurezza sul Lavoro*, 2017, No. 1, G. LEONE, *La tutela della salute e della sicurezza dei lavoratori agili*, in D. GAROFALO (ed.), *La nuova frontiera del lavoro: autonomo – agile – occasionale*, ADAPT University Press, 2018, pp. 479-480, and C. SPINELLI, *Tempo di lavoro e di non lavoro: quali tutele per il lavoratore agile?*, in *giustiziacivile.com*, 31 August 2018, § 2.

⁽³⁶⁾ A. DONINI, *I confini della prestazione agile: tra diritto alla disconnessione e obblighi di risultato*, in M. VERZARO (ed.), *Il lavoro agile nella disciplina legale collettiva ed individuale. Stato dell'arte e proposte interpretative di un gruppo di giovani studiosi*, Jovene, 2018, pp. 114 ff.

contrary to the European regulation since the rationale required by the Directive in the context of the regime of derogation mentioned above seems to lack in *lavoro agile* as implemented by companies.

An intermediate interpretation has also been supported, providing that the derogation to working time regulations only applies when the work performance is organized in order to guarantee full autonomy to the worker in the management of its working time; as a contrary, the derogation cannot apply when this autonomy is limited or absent at all ⁽³⁷⁾. While the first situation, if not a scholarly hypothesis, is at the moment very rare, the second is the one usually occurring in the reality of the work performance of *lavoro agile*.

In this direction, the contradiction, as already outlined by some authors, is only apparent ⁽³⁸⁾: the legislator, even if with some systematic incoherencies in terms of the legislative technique used, decided to reaffirm the importance of those limitations in order to ensure employees' health and safety. Notwithstanding the fact that the employee herself enjoys partial autonomy regarding the distribution of working time ⁽³⁹⁾, clear limits on the duration of working time are still needed in order to prevent forms of exploitation and self-exploitation.

⁽³⁷⁾ V. LECCESE, *Lavoro agile e misurazione della durata dell'orario per finalità di tutela della salute* (comment to CJEU Case C-55/18, cit.), in *RGL*, 2020, No. 3, II, p. 441.

⁽³⁸⁾ A. FENOGLIO, *Il tempo di lavoro nella New Automation Age: un quadro in trasformazione*, in *RIDL*, 2018, No. 4, I, p. 646.

⁽³⁹⁾ Certain limitations to this autonomy are usually included in the agreement not only in compliance with the requirements of art. 19 in terms of rest periods and disconnection, but also for employers' interests since in many cases the performance of work in a certain period of the day is needed for organizational reasons (for example, if team work is required).

2.2. Rest Periods and the Right to Disconnect

The regulation of working time for *lavoro agile* provided by art. 18 is complemented by the specifications contained in art. 19 which defines, along with art. 21 ⁽⁴⁰⁾, the mandatory contents of the individual agreement of *lavoro agile*. According to art. 19, § 1, the agreement must contain the regulation regarding how work should be performed outside employers' premises also with reference to the exercise of the directive power and the use of ICTs as working tools. In addition, art. 19, § 1, expressly states that “the agreement also indicates employee's rest periods and the technical and organizational measures needed to guarantee the disconnection of the employee from technological working tools” ⁽⁴¹⁾.

As such, the *agile worker* is not only entitled to the safeguards regarding working time as regulated by the Legislative Decree n. 66/2003, but the law provides necessary tools to guarantee the respect of those rights and goes even beyond.

The specification in the context of the individual agreement of rest periods is specifically intended to avoid overlapping between working time and the private sphere. It also guarantees that both parties are conscious of the limits of the subjection of the employee to the employers' prerogatives, so that the enjoyment of rest periods can be guaranteed. In Italy, mirroring the Directive 2003/88/EC, rest periods are defined *a contrario* from the definition of working time, which corresponds to “any period which is not working time” ⁽⁴²⁾. The difference in the case of

⁽⁴⁰⁾ Art. 21 of the Act No. 81/2017 requires that the agreement of *lavoro agile* includes specific provision regulating how the employer can exercise the power of monitoring the work performance provided outside of the employer premises and which are the offences put in place by the employee in the context of the same work performance that can be sanctioned by the employer in the exercise of the disciplinary power.

⁽⁴¹⁾ See Art. 19, § 1, second period, Act No. 81/2017.

⁽⁴²⁾ See art. 1, § 2, letter *b*, of the Legislative Decree No. 66/2003.

lavoro agile is that the distribution of the working time – intended as “any period during which the worker is working, at the employer’s disposal and carrying out his activity or duties”⁽⁴³⁾ – could be partly (or totally) decided on by the employee. Therefore, the indication of precise rest hours cannot be determined. Notwithstanding, it is in the interest of both the employer and the employee to determine at least certain rest periods, in order to comply with minimum requirements, such as the minimum consecutive rest hours. In this direction, company-level collective agreements providing a common regulation for *lavoro agile* for the employees⁽⁴⁴⁾ often include a provision specifying that the work performance could be distributed in a limited time-span (for example, between 8 a.m. and 8 p.m.) in order to guarantee that employees enjoy at least the minimum consecutive rest periods and do not perform night work. The time-span is, in turn, specified in the individual agreement.

Obviously, limitations regarding the reference time-span for the work performance cannot always be included – for example, when the work activity requires a connection with places located in different time zones – and even when the provision is applied, it cannot alone protect the employees from the health-related risks deriving from connectivity and over-working. This limitation is why specific emphasis is provided in both individual and collective agreements to a statement reaffirming that *lavoro agile* does not imply any change regarding the number of hours agreed between the parties. Clearly, a statement cannot provide effective protection: not only do remote workers tend to work

⁽⁴³⁾ See art. 1, § 2, letter *a*, of the Legislative Decree No. 66/2003.

⁽⁴⁴⁾ While the regulation of *lavoro agile* contained in the Act No. 81/2017 does not expressly provide a specific role for collective agreements, it is quite common that, before stipulating individual agreements of *lavoro agile* with their employees, companies stipulate a collective agreement with workers’ representatives in the company in order to establish a common reference for the stipulation of individual agreements.

more hours than their peers at the office ⁽⁴⁵⁾, but it is also particularly difficult to distinguish between working time and the private sphere.

Against this backdrop, it is possible to understand the function of the so-called right to disconnect and why it was introduced in the law regulating *lavoro agile* ⁽⁴⁶⁾. It should be noticed that – as well as in France and Spain and coherently with the purposes outlined by its first proponent and the European Resolution as well – the right to disconnect is aimed at two different purposes: protecting employees' health and safety by guaranteeing the respect of rest periods and preserving their work-life balance and their private life ⁽⁴⁷⁾. While these purposes are expressly established in the law ⁽⁴⁸⁾ in France and Spain, a similar understanding of the right could be interpreted by analysing the legal framework of *lavoro agile* in Italy. On the one hand, the form of work itself is introduced to improve employees' work-life balance; on the other, the regulation concerning the right to disconnect is contained in the same provision where it is requested to indicate rest periods in the individual agreement.

⁽⁴⁵⁾ See J. MESSENGER *ET AL.*, *op. cit.*, p. 25.

⁽⁴⁶⁾ It should be noticed that, while a large majority of Italian scholars has intended disconnection as a right of the employee, some commentators, building on a literal interpretation, doubts of the nature of the disconnection in terms of a subjective right of the employee. See A. ALLAMPRESE, F. PASCUCCI, *La tutela della salute e della sicurezza del lavoratore agile*, in *RGL*, 2017, No. 2, I. Against this position, *inter alios*, M. LAI, *Innovazione tecnologica e riposo minimo giornaliero*, in *DRI*, 2020, No. 3, p. 678.

⁽⁴⁷⁾ Already in 2002, J.-E. RAY, *Naissance et avis de décès du droit à la déconnexion: le droit à la vie privée du XXI siècle*, *cit.*, p. 941, understood the right as a measure needed to address the risks posed by “*tele-disponibilité*” (availability via ICTs) to the health and safety of workers (with regard to the effective enjoyment of the right to rest) and to work-life balance (because of the spillover between work and personal life moments). As for the Resolution, there are continuous references to these two dimensions starting from the premises.

⁽⁴⁸⁾ See art. L2242-17 of the *Code du travail* and art. 88, § 1, LOPD.

The regulation does not provide for a definition of the right to disconnect, nor does it include specific measures to be put in place in order to reach the above-mentioned purposes, but only requires the parties of the agreement of *lavoro agile* to identify and specify which are the technical ⁽⁴⁹⁾ and organizational ⁽⁵⁰⁾ measures that they decide to apply. While the generality of the provision could be intended as a weakness in the regulation, since without a minimum common standard, the implementation of the right could vary a lot and be, in many cases, inefficient ⁽⁵¹⁾, the *ratio* of this legislative technique should be connected to the differences of work organization in different companies and sectors. Given that the right to disconnect should be applied in different contexts and to a variety of employment relationships, a common standard could have been inefficient, and the decision regarding the measures to be put in place for the implementation of the right could be better taken by actors who better know the company and the specific employment relationship.

Absent a clear definition and acknowledging the flexibility needed in terms of disconnection from technological working tools in the new world of work, it is thus fundamental to propose a possible interpretation of the right in the context of the regulation of working time in *lavoro agile*.

⁽⁴⁹⁾ Examples of technical measures are the adoption of pop-up windows, out of office messages and the server deactivation in certain period of the day.

⁽⁵⁰⁾ Organizational measures relates to mechanisms put in place in order to avoid that the employee is solicited during certain time, such as policy on the use of ICTs, guidelines regarding the contact of reference in case of unavailability of the employee, etc., but they can also refer to awareness-raising campaigns and training.

⁽⁵¹⁾ See, for example, A. FENOGLIO, *Il diritto alla disconnessione del lavoratore agile*, in G. ZILIO GRANDI, M. BIASI (eds.), *op. cit.*, p. 561.

2.3. A Possible Interpretation of the Right to Disconnect in *Lavoro Agile*

It is clear so far regarding the right to disconnect in the context of the regulation of *lavoro agile* that it is related both to rest periods and the protection of work-life balance. The first reference led some commentators to consider the right to disconnect only as a revival of the right to rest established by working time regulation and, accordingly, as something superfluous ⁽⁵²⁾.

Contrariwise, considering the notion of working time, there is no full coincidence between rest periods and disconnection from technological working tools. On the one hand, an employee could be connected with technological working tools but not working, because she is not technically at the employer's disposal or she is not carrying out her working activities or duties: this is the reason why, usually, the time of connection outside working hours does not count in terms of overwork. Moreover, it is often time spent voluntarily by the employees in order to get ahead with some work, while they are doing other activities. On the other hand, even when not connected, it is still possible to carry out job-related activities and duties.

Since there is no full match between disconnection and rests, it is important to understand which are the interrelations between the different notions provided in working time regulation (including, of course, working time). Taking into account the notion of minimum consecutive rest periods, the right to disconnect strengthens the protection of employees since, lacking the

⁽⁵²⁾ The doubts regarding the overlap of the right to disconnect and the right to rest are analyzed, *inter alios*, by M.R. VALLECILLO GÁMEZ, *El derecho a la desconexión ¿“Novedad digital” o esnobismo del “viejo” derecho al descanso?*, in *Trabajo y Seguridad Social – CEF*, 2017, No. 408, V. ZEPILLI, *Disconnessione: un'occasione mancata per il legislatore?*, in *RGL*, 2019, No. 2, I, and M. RUSSO, *Esiste il diritto alla disconnessione? Qualche spunto di riflessione alla ricerca di un equilibrio tra tecnologia, lavoro e vita privata*, in *DRI*, 2020, No. 3.

connection with the working tools and thus with the ‘virtual office’⁽⁵³⁾, it is more difficult for the employee to be at the employers’ disposal and to carry out working activities. A disconnection between 8 p.m. and 7 a.m. would be enough to guarantee that no interruption is made to enjoy 11 hours of consecutive rest. In this direction, when the features of the work activities make it possible, it would be better to understand the right to disconnect as also a duty to disconnect⁽⁵⁴⁾.

In a different direction, the right to disconnect could also be used to avoid overtime work’s performance by the employees, if strictly implemented outside the normal working time. This use would imply a huge limitation to flexibility which could damage both parties. While it could, maybe, be applied in a traditional time pattern, it seems not to be coherent with *lavoro agile* and other declination of smart working managerial philosophy.

Since the time spent ‘connected’ outside working hours, while the employee is also enjoying her non-working time, could be valuable for both parties of the contract of employment⁽⁵⁵⁾, it could be reasonable to leave a certain degree of autonomy regarding the time of connection outside agreed working hours. In

⁽⁵³⁾ A comprehensive description of the ‘virtual office’ is provided by J.C. MESSENGER, L. GSCHWIND, *op. cit.*, pp. 199-201.

⁽⁵⁴⁾ A duty to disconnect was already advocated by the report *Transformation numérique et vie au travail* (known as *Rapport Mettling*) an independent report regarding the new world of work requested by the Labour Minister to a group of researchers led by Mettling in 2015, while preparing the above-mentioned reform of the Labour Code. In the scholarly debate see, *inter alios*, C. MATHIEU, *Pas de droit à la déconnexion (du salarié) sans devoir de déconnexion (de l’employeur)*, in *Revue de Droit du Travail*, 2016, No. 10, A. ALLAMPRESE, F. PASCUCCI, *op. cit.*, p. 314, and G. CALVELLINI, M. TUFO, *Lavoro e vita privata nel lavoro digitale: il tempo come elemento distintivo*, in *Labor*, 2018, No. 4, p. 412.

⁽⁵⁵⁾ Many AA. outline that *millennials* have a different understanding of the work performance and of the relationship with their devices, which highly impacts on willingness to disconnect from them. See, *ex multis*, J.-E. RAY, *Actualité des TIC. Tout connectés, partout, tout le temps?*, *cit.*, p. 520.

this direction the measures, to guarantee the right to disconnect can help the employee manage this time of connection and put clear boundaries: the status of occupied or absent in many working platforms (*e.g.*, Skype) could serve the aim. In this context, since usually the time of connection cannot be considered working time, the traditional limitation provided by working time regulation may not apply, if not in the case a portion of work is performed (and in the case it should also be paid and accounted for the relevant limits). Notwithstanding, a limitation of this time of connection should be put in place in order to avoid the risks of the constant connectivity to work: to this purpose, the 11 hours of disconnection would not be enough. While the promises of a *connexion choisie* ⁽⁵⁶⁾ should be taken into account, limitations to the autonomy given to the employees could be a reasonable measure to address its perils.

This kind of interpretation seems to also be consistent with the second aim of the right to disconnect, since it permits only a partial and limited overlap between working and leisure time. In this context, while it primarily reaffirms the importance of a distinction between work and private life in terms of work-life balance (avoiding that the former invades the latter), it may also open the way, but in a controlled manner, to the dynamics of work-life blending promoted by management theorists ⁽⁵⁷⁾. However, while management theorists refer to blending as a way to overcome the traditional distinction between work and non-work, in this limited interpretation, the dynamics can be contextualized in a world of work that still requires that distinction: it

⁽⁵⁶⁾ See G. LOISEAU, *La déconnexion. Observations sur la régulation du travail dans le nouvel espace-temps des entreprises connectées*, in *DS*, 2017, No. 5, pp. 469-470.

⁽⁵⁷⁾ For an overview of the theory regarding work-life blending in the context of labour law studies see T. USHAKOVA, *Del work-life balance al work-career blend: apuntes para el debate*, in L. MELLA MÉNDEZ, P. NÚÑEZ-CORTÉS CONTRERAS (eds.), *op. cit.*, pp. 245 ff., and M. MILITELLO, *Il work-life blending nell'era della on-demand economy*, in *RGL*, 2019, No. 1, I, pp. 52-58.

could be regarded as a controlled and employee-managed form of time porosity.

Therefore, in this context, such an interpretation permits enjoying the flexibility of the right to disconnect, which can be put in place in terms of a mandatory disconnection, that guarantees, at least, the consecutive rest periods and the needed time free from any connection to work, and in terms of flexible disconnection, in the case the employee would retain a time span of connection after the normal working hours ⁽⁵⁸⁾.

Before deepening the interpretation in the context of the separation between working time and non-working time, it is worth noting that another function of the right to disconnect has been individuated in the praxis: while still related to the safeguard of employee's health and safety, there is a use of the right to disconnect that leaves aside working time. In some cases, the right to disconnect is also implemented as a means to contrast *infobesity* and hyper-connection during working time, since it is detrimental to the concentration of the employee that is, consequently, less productive and more stressed ⁽⁵⁹⁾. While this declination

⁽⁵⁸⁾ Again, it is worth noticing that in France few collective agreements provide two different time-span for disconnection: *haute déconnexion* (high disconnection) and *basse déconnexion* (low disconnection). While the distinction is based on the possibility to contact the employee under certain exceptional conditions, which are limited to low disconnection period, these examples demonstrate that a distinction between periods of mandatory and flexible disconnection (or, better, employee-managed connection) is possible. See E. DAGNINO, *The Right to Disconnect viewed through the Prism of Work-life Balance. The Role of Collective Bargaining: A Comparison between Italy and France*, in G. CASALE, T. TREU (eds.), *Transformations of work: challenges for the national systems of labour law and social security*, Giappichelli, 2018, p. 439.

⁽⁵⁹⁾ This happens in France where the most innovative collective agreements regarding the right to disconnect integrate the right to disconnect outside working hours (*droit à la déconnexion en dehors de temps de travail effectif*) with a right to disconnect during working hours (*droit à la déconnexion pendant les temps de travail*). See, again, E. DAGNINO, *op. cit.*, p. 441.

of the right to disconnect is very interesting and promising, the next section will focus on the one described above.

3. The Interpretation of the Right to Disconnect Considering Working and Non-Working Time

Since the rationale for the promotion of the right to disconnect is not limited to *lavoro agile* and seems to be pervasive also in traditional working patterns affected by the digitalization of work⁽⁶⁰⁾ – it is not by chance that France, Spain, and Belgium⁽⁶¹⁾ have provided a broader scope of application to the right and that Italian scholars advocate for its extension⁽⁶²⁾ – the proposed interpretation of the right should be tested with reference to the overall system of working time regulation in order to understand how it fits with the new reality of work.

In this broader context, the idea of a mandatory disconnection and of a flexible disconnection/employee-managed connection could prove to be an interesting way to address the problems related to the always-on culture for traditional employee as well. Even outside a traditional 9-to-5 working schedule employees and employers could retain an interest in connectivity and em-

⁽⁶⁰⁾ See, again, for a thorough analysis J. MESSENGER *ET AL.*, *op. cit.*, *passim*.

⁽⁶¹⁾ In France, the right to disconnect is regulated both with reference to a peculiar form of work – *forfait en jours sur l'année* – which presents a features of time flexibility comparable to those of *lavoro agile* and with reference to all the workers employed by companies where one or more trade union sections are established, generally companies employing more than 50 employees (see arts. L2242-17 and L2121-64 of the *Code du travail*). In Spain, according to art. 88 LOPD, the right to disconnect is applied to all the employees (including public employees). Finally, in Belgium the negotiation regarding disconnection is promoted in the context of companies of a certain size (the ones that has to set up an Health and Safety Committee, thus normally those over 50 employees).

⁽⁶²⁾ See, *inter alios*, G. DE SIMONE, *Lavoro digitale e subordinazione. Prime riflessioni*, in *RGL*, 2019, No. 1, I, p. 16.

ployees may suffer from strict limitations on their possibility of being connected to technological working tools. Simultaneously, they are also interested in adequate protection concerning a full disconnection during certain times in order to guarantee their rest periods and to better manage their work-life balance.

If this is true, it is necessary to identify the specific positioning of this chosen connection time in the context of a regulation that is traditionally based on a binary distinction between working time and rest periods.

In this context, the proposed interpretation of the right to disconnect can establish a period of rest preserved by the risk of spillovers. In addition, and even more relevant in systematic terms, the interpretation can serve to bring out the productive nature of moments that do not fall within the concept of working time – if not eventually and for specific and limited portions – but anyway produce a utility for the employer⁽⁶³⁾. Among this time, which is useful for the production, it can be included the time spent by the employee in (at least potential) virtual connection with co-workers and managers of the company and, more generally, with work, outside working time. This time of potential availability – which somehow recalls an on-call time that, absent regulation by the law, is regulated in Italy by collective agreements⁽⁶⁴⁾ – is a time that has an economic value for the

⁽⁶³⁾ According to V. BAVARO, *Tesi sullo statuto giuridico del tempo nel rapporto di lavoro subordinato*, in B. VENEZIANI, V. BAVARO (eds.), *Le dimensioni giuridiche dei tempi del lavoro*, Cacucci, 2009, pp. 22-23, “The time needed for production, the time that satisfies the creditor’s organizational interest, that is, the time that produces economic value and economic utility (*tempo-lavoro*), is not only the actual working time (*tempo-orario*)”.

⁽⁶⁴⁾ Notably the treatment of on-call time has been one of the most recurring issues in the CJEU case law and one of the most disputed by Member States. See, recently, CJEU 21 February 2018, *Ville de Nivelles v. Rudy Matzak*, Case C-518/15, containing references to legal precedents and, lately, the decisions in Cases C-344/19 and C-580/19 of 9 March 2021. For an overview of case law concerning on-call see also T. NOWAK, *op. cit.*

employer since it permits a better functioning of the work organization.

Considering this broader notion of ‘productive time’ (*tempo lavoro* in Bavaro’s terms) and, as a consequence, a stricter notion of rests (non-working time, *i.e.*, *tempo del non lavoro*) can lead, thanks to the implementation of the right to disconnect, to re-establish rest periods as “personal time free from the ties of production/subordination”⁽⁶⁵⁾ in accordance with the new reality of work characterized by the *laisse électronique* (electronic leash)⁽⁶⁶⁾. In the meantime, it could serve to recognize the economic value of this time of potential availability. It cannot be treated as working time nor as rest periods, so there should be room to determine the value of this time of connection in terms of a percentage of a working hour and according to the economic assessment recognized in the productive sector of reference.

Obviously, this kind of interpretation of the right to disconnect and of its role in a new system of working time regulation should be promoted by adequate legislative reform in order to be enforced. While this room for innovation can already be envisioned, it cannot be left to the parties (even if collective parties through collective agreements) to determine such an important revision concerning how time should be considered in the context of the employment relationship. As said, these (individual and collective parties) should instead be left with the concrete implementation an updated legal framework since they better know the specific features and characteristics of the sector or employment relationship.

⁽⁶⁵⁾ See V. BAVARO, *op. cit.*

⁽⁶⁶⁾ Already in 2002, C. RADÉ, *Nouvelle technologies de l’information et de la communication et nouvelles formes de subordination*, in *DS*, 2002, No. 1, p. 29, identified the constant connectivity to work due to ICTs as one of the “nouvelles formes de subordination” (new forms of subordination).

Moreover, this kind of revision cannot be efficient if it does not consider the role that should be recognized to the notion of workload. Moreover, this is especially valid in the context of *working anytime, anywhere* and with reference to work performances organized into phases, working cycles and objectives, where the measurement of the working hours proves to be particularly hard. The respect of working time limitation and rest periods cannot be effective, even when the right to disconnect is applied to the employment relationship, if the workload is not coherent with the working hours agreed in the contract of employment⁽⁶⁷⁾. In this case, no intellectual disconnection from work is possible even if a connection with co-workers and managers is not in place⁽⁶⁸⁾. For this reason, effective mechanism to determine, monitor and, eventually, revise the workload according to the working hours agreed should be put in place and they should be regarded as one of the preconditions for the implementation of the right to rest and the right to disconnect⁽⁶⁹⁾.

4. Conclusions

The paper deepened the new features of working time in the Fourth Industrial Revolution starting from the analysis of working time regulation in *lavoro agile*. Taking this form of work characterized both by spatial and time flexibility as a case study, it was possible to question how regulation can address the drawbacks of constant connectivity and how it can promote autonomy in the management of time positive for the employee. In so

⁽⁶⁷⁾ See C. MATHIEU, *op. cit.*, and L. MOREL, *Le droit à la déconnexion en droit français. La question de l'effectivité du droit au repos à l'ère du numérique*, in *LLJ*, 2017, No. 2, pp. 12-16.

⁽⁶⁸⁾ See J.-E. RAY, *Grande accélération et droit à la déconnexion*, in *DS*, 2016, No. 11, pp. 916-917.

⁽⁶⁹⁾ See L. MOREL, *op. cit.* It is by no chance that, as already said *supra*, note 11, the same law introducing the right to disconnect in France, also pays a specific attention to a reconceptualization of the notion of workload.

doing, it was acknowledged that a distinction between working and non-working time is still needed. In this direction, even if with some incoherencies, the choice of the Italian legislator to establish the application to *lavoro agile* of the limitations to working hours and the duty to respect rest periods and breaks as regulated for the standard employee should be welcomed. While it can seem to be an out-dated model if compared to incisive derogations granted by law in the case of teleworking (*supra*, § 2.1), this regulation could be made compatible with the flexibility required by the new world of work and in the meantime preserve from the perverse effects of the always-on culture. To this end, the Italian legislator, following the French example, decided to introduce the so-called right to disconnect, a right that should be intended as linked to different, though intertwined purposes: the protection of employees' health and safety and the safeguard of his private life (*supra*, § 2.2).

Against this backdrop, building on the traditional notions relevant for working time regulation, it has been possible to demonstrate that the right to disconnect is neither a duplication of the traditional right to rest and, in the meantime, nor only a prohibition to contact the employee outside agreed working hours. While it is intended to strengthen the enjoyment of the right to rest and the respect of the employee's private sphere, it does so by providing a right that should be concretely implemented by measures that better address the conditions of the sector and of the employment relationship. Not contacting the employee outside working hours would not be enough if she is bound to the project assigned because of the workload.

In this context, the analysis of the possible use of the disconnection to reach the mentioned purposes led to propose a distinction between mandatory disconnection and flexible disconnection/employee-managed connection. This distinction seems to be useful in order to establish some period in the day characterized by clear boundaries, but also to enable, according to the

wills of employees and the agreement with the employer, the creation of a moment of chosen connection (*connexion choisie*) (*supra*, § 2.3).

Moving the reasoning to the systematic level, this interpretation of the right to disconnect has been tested in the context of working time regulation also outside the specific form of work. By doing this, it was possible to individuate interesting effects of the adoption of such an interpretation to better understand the nature of time in the new world of work. Framing the time of connection to work as a useful time to the production though different from working time could serve to recognize a specific evaluation of this time both for the protection of employees' health and safety and for the economic value it produces (§ 3).

Notwithstanding the possible positive outcomes envisioned for the proposed interpretation of time in the Fourth Industrial Revolution, it has to be said that in the practice of employment and industrial relations, the problems of this pattern of evolution of working time can be difficult to see, except for few agreements stipulated in France, not by chance, the country where the right to disconnect was born. While a thorough reform of working time regulation has proved to be particularly difficult both at the European and national level, this interpretation of working time can be promoted by an adaptation of existing rules since it requires a revision and not the renounce to the distinction between time for production purposes and the one exclusively devoted to personal life.

Chapter III. PLATFORM WORK

1. Health and Safety Legislation: Scope of Application in the context of the Gig Economy and Covid-19

The Covid-19 emergency has led some of the most affected countries to deal with the shortcomings of legislation protecting essential workers, who often fall outside the scope of health and safety regulations covering salaried employees. National and international labour law scholars are aware of these shortcomings, which have become more evident when new ways of working and organisational models became mainstream thanks to technological innovation. In Italy, this issue has come to the fore in relation to riders and to some rulings that considered their working conditions. This state of affairs helped to understand the effectiveness of the protection included in the 2019 reform as regards platform workers. These decisions have granted some rights to platform workers engaged in food delivery. Now they are covered by the provisions applying to salaried employees laid down in art. 2, § 1, of Legislative Decree No. 81/2015 and also by Chapter V-*bis* of the same Legislative Decree (art. 47-*septies*)⁽¹⁾, to which explicit reference has been made⁽²⁾. Furthermore,

⁽¹⁾ On the decisions by the Court of Florence (dated 1° April 2020, which was followed by the ordinance issued by the Court of Florence on 5 May 2020, n. 886) and Bologna (14 April 2020), see M. BIASI, *La salute e la sicurezza dei riders al tempo del Covid-19*, in DRI, 2020, No. 3, C. SPINELLI, *Le nuove tutele dei riders al vaglio della giurisprudenza: prime indicazioni applicative*, in LJI, 2020, No. 1, S. CARRÀ, *Riders e dispositivi di protezione individuale: le piattaforme*

the Labour Inspectorate engaged in a campaign to assess the legitimacy of riders' working conditions. This move led four platforms (Just Eat, Foodinho (Glovo), Uber Eats Italy and Deliveroo) to review the remuneration and social security contribution status of more than 60,000 riders. Some violations concerning health and safety measures applying to these workers were also reported ⁽³⁾.

In the UK, the issue has been dealt with by case law, particularly in relation to gig workers, though here the individuals falling within the notion of a 'worker' under § 230(3)b ⁽⁴⁾ were also affected by the decisions issued subsequently, which aimed at extending some safeguards to those not engaged in salaried employment ⁽⁵⁾. The ruling of the High Court of Justice (*IWUGB vs*

devono consegnare guanti e mascherine, in *ADL*, 2020, No. 4, II, D. DRAETTA, *Il lavoro autonomo dei riders ai tempi del Covid-19*, in *RIDL*, 2020, No. 3, II. See also E. DAGNINO, *DPI e lavoro da piattaforma: i primi effetti della disciplina sui rider?*, in *Boll. ADAPT*, 2020, No. 16.

⁽²⁾ For an overview of the prevention legislation laid down in Chapter V-*bis* of Legislative Decree No. 81/2015 by Act No. 128/2020, which converted Decree-Law No. 101/2020, see, A. ROTA, *La tutela prevenzionistica dei riders nella legge n. 128/2019*, in *LLI*, 2020, No. 1, esp. pp. 73-79.

⁽³⁾ See the INL Press Release, *Ispettorato nazionale del lavoro: assicurate tutele del lavoro subordinato per 60.000 riders*, 24 February 2021, and the Press Release 24 February 2021 issued by the National Prosecutor Office at the Court of Milan.

⁽⁴⁾ § 230(3)b of the 1996 *Employment Rights Act* defines the 'limb (b) worker' as "an individual who has entered into or works under [...] any other contract, whether express or implied and (if it is express) whether oral or in writing, whereby the individual undertakes to do or perform personally any work or services for another party to the contract whose status is not by virtue of the contract that of a client or customer of any profession or business undertaking carried on by the individual".

⁽⁵⁾ See G. DAVIDOV, M. FREEDLAND, N. KOUNTOURIS, *The Subjects of Labor Law: "Employees" and Other Workers*, in M.W. FINKIN, G. MUNDLAK (eds.), *Comparative Labor Law*, Edward Elgar, 2015, and B. GRANDI, *Fatti, categorie e diritti nella definizione del lavoro dipendente tra common law e civil law*, Giappichelli, 2013.

SSWP and Others) offers some insights, highlighting Italy's gap as regards OHS. This is even more so if one considers that, despite Brexit ⁽⁶⁾, EU legislation on health and safety has played a major role, *e.g.* Directive 89/391/EEC ⁽⁷⁾.

2. Legal Proceedings Initiated by the Independent Workers' Union of Great Britain

As specified in the preamble of the decision, the Independent Workers' Union of Great Britain (IWGB) is a union representing workers in the gig economy and those performing unskilled labour (mostly immigrants) ⁽⁸⁾, who are at significant risk of Covid-19. Accordingly, the legal action initiated by the union to obtain the provision of PPE (Personal Protection Equipment), was especially welcomed by couriers and logistics workers. The IWGB legal department, which is known for having supported the review of gig workers' employment status ⁽⁹⁾, wanted to take legal action against the UK government, based on the fact that it failed to implement Framework Directive 89/391/EEC and Di-

⁽⁶⁾ See J. KENNER, *Il potenziale impatto della Brexit sul Diritto del lavoro europeo e britannico*, in *DLM*, 2017, No. 1.

⁽⁷⁾ An analysis of the relevance of the directive is provided in M. BIAGI, *Dalla nocività conflittuale alla sicurezza partecipata: relazioni industriali e ambiente di lavoro in Europa verso il 1992*, in M. BIAGI (ed.), *Tutela dell'ambiente di lavoro e direttive CEE*, Maggioli, 1991.

⁽⁸⁾ The union's website stresses that it represents those workers that traditional employee representation has neglected. In this sense, see A. TASSINARI, V. MACCARRONE, *Riders on the Storm: Workplace Solidarity among Gig Economy Couriers in Italy and the UK*, in *Work, Employment and Society*, 2020, Vol. 34, No. 1, pp. 42 ff., where this trade union is defined as *rank-and-file independent union*.

⁽⁹⁾ The case law discussing gig workers is investigated in V. PIETROGIOVANNI, *L'importanza di chiamarsi lavoratori, ossia delle Corti del Regno Unito alle (p)rese con il lavoro a chiamata sulle piattaforme*, in *LLI*, 2019, No. 1, C.

rective 89/656/EEC concerning health and safety measures ⁽¹⁰⁾. According to the trade union, the transposition of the European health and safety directives only applies to salaried employees, so it does not comply with the broader concept of a ‘worker’ adopted in the directives ⁽¹¹⁾. The UK government countered the IWGB’s complaints with two arguments. Firstly, it argues that the definition of a ‘worker’ in the directive complies with that of an ‘employee’ in British law. Secondly, it considers that – even if this notion could be extended to workers – the protection provided conforms to the minimum levels imposed by EU regulations.

3. Relevant Legislation and the Parties’ Arguments

After explaining why – despite Brexit – EU law must be considered still in force when assessing compliance with national legislation ⁽¹²⁾, the decision referred to before provides an overview of Community legislation on OHS. The starting point of the reasoning is the provisions contained in the Treaties and art. 31 of the Charter of Fundamental Rights of the European Union on fair and equitable working conditions, in order to define the notion of a ‘worker’. An analysis is also provided of the most relevant European case law, which however does not consider

⁽¹⁰⁾ This is known as *strategic litigation*, which is useful in the context of the gig economy thanks to the notion of a ‘worker’ and health and safety issues. See A. CEFALIELLO, N. COUNTOURIS, *Gig workers’ rights and their strategic litigation*, in www.socialeurope.eu, 22 December 2020.

⁽¹¹⁾ As is known – and this is also reasserted by European case law – there is no correspondence between the notion of a ‘worker’ used by the European Union and that of an ‘employee’ adopted in Member States. See G. PACELLA, *La nozione euro-unitaria di lavoratore dipendente alla prova della gig-economy: si pronuncia la Corte di Giustizia europea*, in *LLI*, 2020, No. 1, R.

⁽¹²⁾ This is being done under the 2018 European Union (Withdrawal) Act, which extends the application of the European Communities Act until the end of Brexit, which should end by 31 December 2020.

the recent ruling of the Court of Justice of the European Union (*B. v. Yodel Delivery*)⁽¹³⁾ on ‘gig workers’, not even with reference to the applicability of working time directive (Directive 2003/88/EC). Subsequently, the judgment reviewed the UK’s health and safety regulations, before examining the arguments put forward by the IWGB. They refer to the ‘purposive approach’, which is influencing labour law research – e.g. Guy Davidov⁽¹⁴⁾ – and concerns the use of the wording “‘any’ worker” rather than “employee”, the latter being found in EU Member States legislation, providing two different interpretations. A first approach delimits the scope of application to workers, as intended in national systems, while the other makes use of the term without considering national laws. In relation to this second case – which is in line with Kountouris’ views⁽¹⁵⁾ – it is argued that a wider interpretation of this terminology should be used, similar to that used in EU Treaties, though discretion is left to each member state when defining the scope of application. Yet this discretion should not result in an arbitrary choice, such as that of excluding workers. The British government responded to these arguments, pointing out that three approaches are used in Community Law when dealing with the notion of a ‘worker’. The third approach introduces a specific concept that is different from that used in Treaties and in national legislation. It refers to the concept of ‘an employee’ considering the wording ‘employed by’ and thus the employer, who is defined as “any natural or legal person who has entered into an employment relationship with the worker and has responsibility for the enterprise and/or establishment”⁽¹⁶⁾. It is also argued that the differ-

(13) See Ruling C-629/19. See G. PACELLA, *op. cit.*, and J. ADAMS-PRASSL *ET AL.*, *La Corte di Giustizia dell’Ue prende tempo? L’ordinanza Yodel e le sue (scarse) implicazioni per il lavoro tramite piattaforma*, in RGL, 2020, No. 3, II.

(14) See G. DAVIDOV, *A Purposive Approach to Labour Law*, Oxford University Press, 2016.

(15) See N. KOUNTOURIS, *The Concept of ‘Worker’ in European Labour Law: Fragmentation, Autonomy and Scope*, in *ILJ*, 2018, Vol. 47, No. 2.

(16) See Art. 3, § 1, letter *b*, of Directive 391/89/CE.

ent protection provided is not discretionary, being based on principles, reasons and objective facts. In this sense, discussions with the European Commission over the years have not led to any disputes.

4. The Court's Decision

After investigating the background scenario, the tribunal evaluated the notion of a 'worker', which is crucial for issuing the final decision. The tribunal has easily dealt with the argument that a flaw in the implementation would have been detected many years ago (this is an old directive) and the issue that the European Commission did not initiate any infringement procedures. Accordingly, the focus is on the interpretation of art. 3 of the Directive. While there exist different definitions of a 'worker' within the European Union, the tribunal took into consideration the position of the UK, according to which a specific definition is supplied. Specifically, it is the wide character of the notion that must be taken into account. It should be noted that the text is clear in excluding domestic workers and bringing together the notion of an 'employer' and that of 'company responsibility'. It is stressed that the notion of a 'worker' as laid down in art. 3 must be understood as independent from that used in domestic law. EU lawmakers specifically referred to this aspect ⁽¹⁷⁾. According to the tribunal, art. 3 must be applied in individual member states, to prevent different levels of protection with respect to health and safety. This should not be a restrictive interpretation, since the purpose of art. 1 is to improve workers' OHS. According to the tribunal, the reference to the employer's responsibility in relation to the company is not sufficient to restrict this interpretation, either, as this responsibility does not exist only in case of employees. Supporting this are the decisions of the Court of Justice of the European Union – e.g. *Lawrie-Blum*,

⁽¹⁷⁾ See arts. 8, 10, 11 and 12 of the Directive.

Allonby, Union Syndicale, Fenoll, Sindicatul Familia Constanta, Ruhrlandklinik – but also art. 31 of the Charter of Nice on fair and just working conditions. Consequently, the transposition of the directive is not effective since it has limited its scope of application to employees. Consequently, it is necessary to consider whether the safeguards for workers are sufficient to meet the minimum protection requirements laid down by the directives. According to the applicants, the provisions of arts. 5, § 1, 6, § 1, and 8, §§ 4 and 5, of Directive 89/391/EEC and art. 3 of Directive 89/656/EEC have not been implemented adequately. Conversely, the government considers the first two provisions referred to, *e.g.* “the employer is obliged to ensure workers’ OHS” and “the employer shall take the necessary measures to protect workers’ ensuring health and safety, including the prevention of occupational risks, information and training, as well as organization and the necessary means”. In so doing, it argues that they would be implemented through obligations to protect the health and safety of those who are not workers of the company, with respect to work-related risks, in general, and especially when they operate in contexts which are relevant for the company, which are included in the risk assessment laid down in secondary legislation⁽¹⁸⁾. In this sense, the tribunal pointed out that the extension of this protection to the worker should be considered sufficient to meet the levels of protection established by the directives. With regard to art. 8, §§ 4 and 5 – *i.e.* workers’ protection in case of serious and immediate danger – the UK government focuses on protected disclosure, *i.e.* the guarantees provided with respect to whistle-blowing activities that also cover the reporting of situations of danger to people’s health and the violation of legal obligations⁽¹⁹⁾. With respect to this provi-

⁽¹⁸⁾ See §§ 2, 3 and 4 of the Health and Safety at Work Act of 1974 and the Regulation 3 of the Management of Health and Safety of Work Regulations of 1999, some provisions of the Workplace Regulations of 1992, the Work Equipment Regulations of 1998 and the Carriage Regulations of 2009.

⁽¹⁹⁾ *Cf.* § 47B, Employment Rights Act of 1996.

sion, the tribunal draws on the argument of the claimant, arguing that there is no correspondence between the protection of the “individual reporting crimes or irregularities”⁽²⁰⁾ and the guarantees of art. 8. Finally, in relation to art. 3 of the Directive on Personal Protective Equipment (PPE), protection is limited to employees and that, even if some mechanisms could prevent employers from behaving differently, there is no obligation in English legislation as regards the provision of PPE to workers. Consequently, as regards the transposition into British law of art. 3 of Directive 89/656/EEC it cannot be said to be in conformity with EU law, depriving workers of their protection.

5. More than an Idea: Is It Possible to Provide Exceptions to OHS Protection when It Comes to Workers whose Activity is Organised by the Employer?

Compared to the UK, the Italian OHS legislation contained in Legislative Decree No. 81/2008 features higher levels of universalism as regards protection⁽²¹⁾, up to a point that scholars have argued that it does more than merely transposing EU laws⁽²²⁾. This is so also because protection also applies to quasi-subordinate employment – through Legislative Decree No. 276/2003⁽²³⁾ – so it is more inclusive than the framework sup-

⁽²⁰⁾ This is how ‘whistleblower’ is referred to in national legislation (*cf.* Act No. 179/2017, see S.M. CORSO, *Segnalazione di illeciti e organizzazioni di lavoro. Pubblico e privato nella disciplina del whistleblowing*, Giappichelli, 2020).

⁽²¹⁾ See P. PASCUCCI, *Dopo la legge n. 123 del 2007. Titolo I del d.lgs. 9 aprile 2008, n. 81 in materia di tutela della salute e della sicurezza nei luoghi di lavoro*, Working Paper CSDLLE “Massimo D’Antona” – II, 2008, No. 73, p. 32.

⁽²²⁾ See A. DELOGU, *La definizione di lavoratore in materia di salute e sicurezza: dall’universalità della tutela ai nuovi bisogni di tutela*, in *Diritto della Sicurezza sul Lavoro*, 2020, No. 1.

⁽²³⁾ See M. TIRABOSCHI, *Campo di applicazione e tipologie contrattuali*, in M. TIRABOSCHI, L. FANTINI (eds.), *Il Testo Unico della salute e sicurezza sul lavoro dopo*

plied by the UK. Yet besides failing to consider quasi-subordinate work ⁽²⁴⁾ ⁽²⁵⁾ – it may be interesting to look at the application of this notion of a ‘worker’ within internal legislation and its possible consequences. In this context, what matters is not only the difference in terms of protections between salaried and self-employed workers, with the latter being more exposed to risks due to their status under art. 2222 of Civil Code ⁽²⁶⁾. The characteristics of quasi-subordinate work might lead to extend the reasoning of the British Court to three forms of employment governed by art. 2, § 1, of Legislative Decree No. 81/2015. This is so because they can be equated to legislation regulating ‘limb (b) workers’, as far as protection is concerned ⁽²⁷⁾. A crucial difference is the ‘exclusive’ personal nature of limb workers’ activity as compared to the ‘predominantly’ personal nature of work governed by art. 2, § 1, of Legislative Decree No. 81/2015, as amended by Act No. 128/2020, converting Decree-Law No. 101/2020 ⁽²⁸⁾. With reference to quasi-subordinate workers, the

il correttivo (d.lgs. n. 106/2009). Commentario al decreto legislativo n. 81/2008 come modificato e integrato dal decreto legislativo n. 106/2009, Giuffrè, 2009, p. 137.

⁽²⁴⁾ *Idem*, pp. 137-138, where reference is made to “a disappointing [...] technical solution” which does not consider the transposition of Directive 91/383/EC concerning temporary workers’ health and safety.

⁽²⁵⁾ See A. DELOGU, *op. cit.*, pp. 73 ff.

⁽²⁶⁾ *Ibidem*.

⁽²⁷⁾ On this point, much debate has taken place, especially concerning the ambiguous interpretation provided in Court of Last Resort 24 January 2020, No. 1663. See *Lavoro Diritti Europa*, 2020, No. 1, and the special issue of *MGL*, 2020, concerning platform workers.

⁽²⁸⁾ See F. CAPPONI, *Lavoro tramite piattaforma digitale: prima lettura del d.l. n. 101/2019 convertito in l. n. 128/2019*, in *DRI*, 2019, No. 4, M. CORTI, A. SARTORI, *Il decreto sui «riders»*, in *RIDL*, 2020, III, *amplius*, D. GAROFALO, *La prima disciplina del lavoro su piattaforma digitale*, in *LG*, 2020, No. 1, E. ALES, *Oggetto, modalità di esecuzione e tutele del “nuovo” lavoro autonomo. Un primo commento*, in *MGL*, 2019, No. 4, A. PERULLI, *Il diritto del lavoro “oltre la subordinazione”: le collaborazioni etero-organizzate e le tutele minime per i riders autonomi*, Working Paper CSDLE “Massimo D’Antona” – IT, 2020, No. 410, C. PISANI, *Le nuove collaborazioni etero-organizzate, il lavoro tramite piattaforme digitali e gli indici*

question is not so much the provisions that, according to the Court, have not been correctly implemented in British law. Rather, what matters are the effects of the application of the wide notion of a ‘worker’ as understood by the British court with respect to the protection provided to them. It should be noted that the protection envisaged in the event of work having the characteristic of quasi-subordinate work consists in obligations aimed at safeguarding salaried employment, though they might be ontologically compatible with the former ⁽²⁹⁾. However, thanks to the exceptions provided for in art. 2, § 2, of Legislative Decree No. 81/2015, it is not possible to extend relevant legislation to this category of workers. When applying the broad notion of a ‘worker’ for the purposes of the health and safety directives adopted by the British court, doubts arise in relation to the conformity of the protection provided with respect to the minimum safeguards set by the EU law. Furthermore, the latter would affect the autonomy of the social partners when opting for derogation pursuant to art. 2, § 2, letter *a*, which has been a heavily debated subject in relation to riders and the entry into force of the collective agreement concluded by Assodelivery ⁽³⁰⁾. An agreement of this kind might not provide exceptions to the minimum protection afforded by EU law. As quasi-subordinate workers operate at the client’s workplace, this state of affairs will not produce relevant differences, as collective autonomy cannot derogate from the provision of art. 3, § 7, of Legislative Decree No. 81/2008. In this sense, derogating from the application of health and safety regulations is not legitimate, except in those

presuntivi della subordinazione, in *ADL*, 2019, No. 6, I, and M. BARBIERI, *Della subordinazione dei ciclofattorini*, in *LLI*, 2019, No. 2, I.

⁽²⁹⁾ The ontological compatibility of legislation with the terms laid down in art. 2, § 1, of Legislative Decree No. 81/2015 is contained in Court of Last Resort No. 1663/2020, cit.

⁽³⁰⁾ See F. CARINCI, *Il CCNL rider del 15 settembre 2020*, and P. TOSI, *Il contratto Assodelivery-UGL e gli “eventi” collaterali*, both in *Lavoro Diritti Europa*, 2020, No. 3, and M. LOMBARDI, *Il Ccnl tra Assodelivery e Ugl sui riders: una «storia infinita» fra questioni contrattuali e disciplina legale*, in *RGL*, 2020, No. 4, I.

cases when the minimum safeguards laid down by the directives are ensured. Similarly, when the EU notion of a ‘worker’ applies, the level of protection different from that not imposed by the directive could be seen as violating Community law. As for riders, it should be noted that a limit to derogation in negotiation (art. 2, § 2, letter *a*) is already found in Chapter V-*bis* of Legislative Decree No. 81/2015, pursuant to which exceptions can be made to minimum protection provided by Legislative Decree No. 81/2015. This is so if a comprehensive interpretation of art. 47-*septies* is provided, which considers Legislative Decree No. 81/2008 applicable to riders who are not employees. The social partners can engage in derogation only in relation to salaried work and not self-employment, also in consideration of the fact that some categories of workers are governed by special rules, *i.e.* riders ⁽³¹⁾. If one opts for a restrictive interpretation, the fact that one cannot derogate from EU legislation might lead to interpret this form of quasi-subordinate work as eligible for labour protection, moving beyond art. 2, § 1, of Legislative Decree No. 81/2015. With respect to this analysis – and in relation to the most significant difference from the UK notion of a ‘worker’ – making reference to ‘predominantly’ personal services might create a divide between the concept of ‘quasi-subordinate’ workers and that of a ‘worker’ as understood in EU legislation, for the latter concerns “services provided by a ‘person’” ⁽³²⁾. Consequently, the requirement of ‘exclusive’ personality has been considered an obstacle to the applicability of this notion ⁽³³⁾. However, the notion of ‘predominantly personal’, “includes work that is ‘exclusively’ one’s own” ⁽³⁴⁾. Therefore, if it is not possible to extend the reasoning of the British Court, option must be examined with reference to cases in which the ‘exclusive person-

⁽³¹⁾ On this compatibility, see A. ALLAMPRESE, O. BONARDI, *Salute e sicurezza del lavoro nella logistica*, in *RGL*, 2020, No. 3, pp. 446-447.

⁽³²⁾ See A. PERULLI, *op. cit.*, 43.

⁽³³⁾ See G. PACELLA, *op. cit.*, pp. 28-29.

⁽³⁴⁾ See A. PERULLI, *op. cit.*, p. 44.

ality' is established in the contract or takes place in practical terms.

6. Conclusions

The analysis of *IWUGB vs SSWP and Others* and the insights into the Italian system show health and safety legislation needs to be reviewed in order to meet new working needs. This could be done considering EU law and case law. This is a pressing issue. While legislation has regulated the situation of platform workers, other categories of workers need protection, particularly those operating in the context of the gig economy. Consequently, in order to be effective, the extension of protection based on a broader notion of a 'worker' will not be sufficient, as many new tasks today escape employer control ⁽³⁵⁾. Consequently, an extensive interpretation is the key to universal protection, though this is not the only aspect that needs attention. art. 31 of the Charter of Nice referred to in the ruling and the extensive labour law research developed around the European Pillar of Social Rights ⁽³⁶⁾, – *i.e.* the consultation on work in the platform economy recently launched by the European Commission ⁽³⁷⁾ – can promote development, making sure that the characteristics of new jobs are carefully investigated.

⁽³⁵⁾ See A. DELOGU, *op. cit.*, p. 77.

⁽³⁶⁾ In this sense, see S. GARBEN, *The European Pillar of Social Rights: An Assessment of its Meaning and Significance*, in *Cambridge Yearbook of European Legal Studies*, 2019, Vol. 21, and P. GARGIULO, *Il futuro dell'Europa sociale: contenuto, problemi e limiti del pilastro europeo dei diritti sociali*, in *La Comunità Internazionale*, 2019, No. 2.

⁽³⁷⁾ See the EC Press Release, *Tutelare chi lavora tramite le piattaforme: la Commissione avvia la prima fase di una consultazione delle parti sociali*, 24 February 2021, in *ec.europa.eu*.

Chapter IV. 5G AND NEW LIVE-WORK SPACES

1. Framing the Issue

Scholars, scientists, trade unionists and business representatives have recently debated on the advisability of adopting 5G technology to re-launch Italy's development. This move could have an impact on a number of aspects, such as remote working, public services, distance learning, and the use of digital platforms for personal needs. Much research has been conducted arguing that the introduction of 5G can improve network infrastructure ⁽¹⁾, so long as the legal procedures for measuring signal intensity are reviewed, in order to determine electromagnetic field exposure limits ⁽²⁾. However, the foregoing debate is still marked by sharp divisions. An example of this tension is the appeal launched on 13 September 2017 ⁽³⁾ by a number of scientists from all over the world explaining why they are against the introduction of 5G. According to these scholars, research shows that the increasing exposure to the electromagnetic fields generated by electrical and wireless devices developed prior to 5G is detri-

⁽¹⁾ See D. FRANCI ET AL., *An Experimental Investigation on the Impact of Duplexing and Beamforming Techniques in Field Measurements of 5G Signals*, in *Electronics*, 2020, Vol. 9, No. 2.

⁽²⁾ See D. FRANCI ET AL., *Experimental Procedure for Fifth Generation (5G) Electromagnetic Field (EMF) Measurement and Maximum Power Extrapolation for Human Exposure Assessment*, in *Environments*, 2020, Vol. 7, No. 3.

⁽³⁾ Cf. *EU 5G Appeal – Scientists warn of potential serious health effects of 5G*, in *www.jrseco.com*, 31 May 2019.

mental to living organisms. The negative effects include increased risk of cancer, stress (in particular, that related to cell phone use), harmful free radicals, genetic damage, structural and functional changes to the reproductive system, learning deficits and memory issues, neurological disorders, and negative consequences on human well-being. Furthermore, there is growing evidence that this situation might affect both plants and animals. Therefore, electromagnetic fields can only make the problem worse, giving rise to a public health issue. The appeal referred to above also proposes solutions to tackle the problem, *e.g.* the adoption of measures to temporarily halt the establishment of the 5G network until common consensus is reached by the scholarly community on the effects of this technology on citizens and on how to prevent electromagnetic fields (with the latter aspect that recalls the Resolution of the Council of Europe No. 1815 of 27 May 2011) ⁽⁴⁾. While the scientific debate is ongoing, legal scholars seem to be uninterested in this issue, as they are usually involved in the law-making process rather than promoting prevention measures. Yet this latter activity should be the focus of lawmakers, especially considering that philosophical studies have stressed that we have entered a new type of society

⁽⁴⁾ Especially with regard to the protection of children and evolving organisms at greater risk of contracting degenerative diseases, the Resolution recommends that Member States carry out awareness-raising campaigns aimed at teachers through the various Ministries (education, environment and health), parents and pupils to inform them of the specific risks of early and prolonged use of cell phones and other devices that emit microwaves. Furthermore, the Resolution recommends in general and in particular that in schools preference should be given to wired internet connections, strictly regulating the use of cell phones by pupils on school premises. Finally, the Resolution invites Member States to set preventive thresholds for levels of long-term exposure to microwaves in all indoor areas, in accordance with the precautionary principle (*cf.* art. 191, § 2, TFEU, ex art. 174 TEC), not exceeding 0.6 volts per meter, and in the medium term to reduce it to 0.2 volts per meter.

that produces wealth but also risks ⁽⁵⁾. While waiting for awareness and further reflection to develop, we will see how the law should react to technological progress (§ 4) and deal with the ensuing issues (§ 5). The analysis will be carried out from a labour law perspective (§ 3). This is so because the use of 5G constitutes the starting point for modernizing the society as a whole, so the legal dimension also plays a role, in consideration of the risks emerging from technological changes.

2. The Lack of Legislative Measures Governing Unexpected Technological Issues

Prior to assessing the links between the issue at hand and labour law, it is necessary to note that in the heated debate revolving around 5G, lawmakers did not take a clear position or they failed to regulate the phenomenon ⁽⁶⁾ outright. This is so because research into 5G is in its infancy and because uncertainty arises in relation to the way technology can improve Italy's digital infrastructure. We are therefore faced with yet another at-

⁽⁵⁾ See U. BECK, *La società del rischio. Verso una nuova modernità*, Carocci, 2013. According to Beck, unlike the industrial society of the 20th century – where wealth production dominated risk production – now this relationship is reversed. See K. SCHWAB, *La quarta rivoluzione industriale*, Franco Angeli, 2016, p. 20, according to which “the required levels of management and implementation of the changes underway are still unsatisfactory, if compared with the need to rethink our economic, social and political system to govern the fourth industrial revolution. Consequently, both nationally and internationally, the institutional infrastructure, which is essential for guiding the diffusion of innovation and mitigating possible issues, is inadequate, if not completely absent”.

⁽⁶⁾ F. GASPARI, *Radiofrequency radiation, legislative omissions and the principle of precaution*, in *Diritto Pubblico Europeo – Rassegna On-line*, 2019, No. 2, stresses that from a legal point of view, there is a risk of generating a regulatory vacuum. In those cases in which lawmakers have laid down *ad hoc* provisions, the process has been rather slow, causing discrimination between the citizens of EU member states, in a sector featuring rapid development.

tempt to promote the use of tools, the risks of which are not well defined, so it is difficult to identify the responsibilities resulting from possible damage (7). Legal research has referred to this aspect as ‘technological unknown’ (8), that is, materials whose harmfulness is suspected, though science could not determine their impact on human health and the environment.

The notion of technological unknown has received little attention among legal scholars, especially labour law experts. Scientific knowledge is usually referred to, which however is often guided by certain values and views. It is for this reason that lawmakers are repeatedly asked to intervene, in order to provide legal and political instruments to resolve certain conflicts (9). In this sense, leaving to science the determination of the threshold values relating to exposure to electromagnetic fields, without legislating on this aspect, means exposing the system to eternal uncertainty (10).

(7) In relation to these cases, some argue that there is a need to assign responsibility, even when there was an inability to fully display the effects related to a given action. So stepping up objective liability might be necessary. See H. JONAS, *Tecnica, medicina ed etica. Prassi del principio di responsabilità*, Einaudi, 1997, p. 46.

(8) See R. COSTI, *Ignoto tecnologico e rischio d'impresa*, in VV.AA., *Il rischio da ignoto tecnologico*, Giuffrè, 2001, pp. 49 ff., the A. rules out that ‘technological unknown’ refers to “unknown aspects”. Rather, reference is made to controversial and complex issues. Specifically, the uncertainty makes reference to technical and technological aspects.

(9) See R. MONTINARO, *Dubbio scientifico e responsabilità civile*, Giuffrè, 2012; N. IRTI, E. SEVERINO, *Dialogo su diritto e tecnica*, Laterza, 2001.

(10) See A. VISCOMI, *Amianto: precauzione, prevenzione e responsabilità*, in L. MONTUSCHI, G. INSOLERA (eds.), *Il rischio amianto. Questioni sulla responsabilità civile e penale*, Bononia University Press, 2006, pp. 46-47.

3. 5G and Labour Law

In a recent monograph ⁽¹¹⁾, two aspects have been taken into consideration related to technological evolution, which labour law will necessarily have to address. The first aspect concerns the positive and negative effects of technological evolution. While it has been possible to reduce some organizational risks, technological innovation gives rise to new hazards for workers' health and safety ⁽¹²⁾. The second aspect concerns the issues covered by these provisions, especially considering the disruption caused by technological development.

As noted in the report *Foresight on new and emerging occupational safety and health risks associated with digitalization by 2025*, possible sources of risk include new work equipment and business organization ⁽¹³⁾. In particular, the report points to the harmful effects on the health and safety of workers using 5G, Wi-Fi networks, contactless charges of ICT mobiles and the use of brain interfaces ⁽¹⁴⁾. Technology has contributed to improving the quality of life of those in employment, to managing the complexity of modern organizations and to overcoming risks that would have a negative impact on the labour market ⁽¹⁵⁾. However, the hybridization between working and personal tools (*e.g.* laptops and mobile phones) and the blurred boundaries between public and private spaces – which will certainly benefit from 5G ⁽¹⁶⁾ – make

⁽¹¹⁾ See E. DAGNINO, *Dalla fisica all' algoritmo: una prospettiva di analisi giuslavoristica*, ADAPT University Press, 2019.

⁽¹²⁾ *Idem*, p. 117.

⁽¹³⁾ *Idem*, p. 119.

⁽¹⁴⁾ P.M. BIANCO ET AL., *Rapporto indipendente sui campi elettromagnetici e diffusione del 5 G*, European Consumers, ISDE, 2019, also highlight the risks due to little information on the dangers resulting from instruments generating electromagnetic fields.

⁽¹⁵⁾ For example, during Covid-19, a significant number of employees could carry on working remotely and safely.

⁽¹⁶⁾ According to F. SEGHEZZI, *La nuova grande trasformazione. Lavoro e persona nella quarta rivoluzione industriale*, ADAPT University Press, 2017, p. 138, “the

it necessary to rethink how to assign responsibilities relating to the management of risks resulting from the exposure to electromagnetic fields. In other words, it is important to understand the protection granted to those affected by the production system which is moving beyond the time and space constraints of the nineteenth century in order to implement aggregate forms of businesses within local ecosystems. Here, the boundaries between the workplace and the outside context are increasingly blurred⁽¹⁷⁾, and so is the dividing line between public health and workplace safety. In this respect, reference is made to the need to “re-assign the security obligation”⁽¹⁸⁾. Specifically, the company’s physical boundaries are falling through, and this is understood as a paradigm shift in legal terms⁽¹⁹⁾. In this sense, the introduction of rules governing remote working (Act No. 81/2011) constitutes a first attempt at institutionalizing this process, while witnessing “a widening of the notions of ‘place’ and ‘workplace’” with all the consequences that this ensues⁽²⁰⁾.

introduction of modern technologies such as 5G [...] allows many physical objects to be connected together, while the use of the cloud facilitates consultation of and access to information outside the company. This is also a consequence of the way Industry 4.0 has impacted business structure and the ability to develop relationships with the outside world. Accessing information remotely could reduce time and space constraints. Furthermore, it would contribute to blurring the dividing line between the company and the outside world which contributes to our understanding of the former as an independent and absolute reality”.

⁽¹⁷⁾ On this point, see P. TOMASSETTI, *Diritto del lavoro e ambiente*, ADAPT University Press, 2018, pp. 169 ff. But also p. 10, where it is stressed that “in the shift from the factory to the surrounding area [...] everything can be defined as ‘a work environment’, because everything can be a productive and working context”.

⁽¹⁸⁾ *Idem*, p. 183.

⁽¹⁹⁾ See M. D’ANTONA, *Diritto del lavoro di fine secolo: una crisi d’identità?*, in G. GHEZZI (ed.), *Massimo D’Antona. Contrattazione, rappresentatività, conflitto. Scritti sul diritto sindacale*, Ediesse, 2000, pp. 274 ff.

⁽²⁰⁾ P. TOMASSETTI, *Diritto del lavoro e ambiente*, cit., p. 183, argues that, if the physical place in which work performance takes place loses its relevance,

On close inspection, the move away from the material dimension of the company in favour of the virtual one ⁽²¹⁾ leads one to confuse workers' interest in health and safety – which is one of the many aspects of collective interest – with that of the local community.

In this sense, reference is no longer made to a community of workers but to a “community of risk”, which does not have a well-defined legal dimension, being “extremely fluid and with moving boundaries”. For this reason, it still lacks established representation bodies that can voice its will and ensure its protection ⁽²²⁾.

Against this backdrop, previous negotiations would make it possible to experiment with unprecedented forms of ‘concertation’ aimed at representing the community as a whole in decision-making. This might take place considering all the parties involved, so collective interest would be sought considering policies of public interests, the impact of which affects production and all the people in a given area ⁽²³⁾. In this sense, trade unions could play a leading role, thanks to the experience developed in

“the risk factors are no longer limited to traditional ones, as they include other organizational elements, such as working conditions and the rules through which work and production are organized”.

⁽²¹⁾ G. GASBARRONE, *5G, cosa cambia per il mondo del lavoro*, in *www.agendadigitale.eu*, 18 May 2020.

⁽²²⁾ G. SUPPIEJ, *Il diritto dei lavoratori alla salubrità dell'ambiente di lavoro*, in VV.AA., *Studi in memoria di Marino Offeddu*, Cedam, 1988, p. 621.

⁽²³⁾ Nowadays, a trend exists whereby collective bargaining is used rather than authoritative power generating a change in the relationship between Public Administration and the other associates, who are increasingly involved in the draft and implementation of administrative decisions (see L. BALESTRA, *Il diritto dei contratti nello specchio della contemporaneità*, in *RTDPC*, 2017, No. 4, pp. 1127 ff.). For more information on concertation practices where unions are involved in decision-making other than that concerning working conditions, see G. PIGLIALARMI, *La contrattazione sociale territoriale: inquadramento giuridico del fenomeno attraverso l'analisi contrattuale*, in *DRI*, 2019, No. 2, pp. 713 ss.

negotiation and representation which goes beyond labour market issues (art. 39 of the Constitution) ⁽²⁴⁾.

The fact that the risks arising from poorly mastered technology (*e.g.*, 5G in our case) could produce consequences other than those related to one's health and safety can be seen in case law. A number of decisions provide compensation to children ⁽²⁵⁾ and housewives ⁽²⁶⁾ suffering damage resulting from activities not falling within the definition of wage labour. However, the need to supply protection to the community – which might be overwhelmed by technology use – by referring to labour law can be explained with the wish to protect not only people in employment, but all individuals whose ability to generate income is regularly challenged ⁽²⁷⁾.

We shall not forget that a working community cannot fall within defined legal statuses with given safeguards. In this sense, while we could argue that everything can be referred to as work – in the sense of a “common experience, which might have different content depending on technological development” ⁽²⁸⁾ – not all working practices have institutional rules which meet the needs of those people using their physical and mental energies ⁽²⁹⁾. For this reason, alongside the legal order governing the labour mar-

⁽²⁴⁾ Cf. A. VALLEBONA, *Lavoro e spirito*, Giuffrè, 2011, p. 62. For an overview of negotiation practices carried out by trade unions not concerned with work-related matters, see ADAPT, *La contrattazione collettiva in Italia (2017)*. *IV Rapporto ADAPT*, ADAPT University Press, 2018, pp. 93 ss., and CGIL, SPI-CGIL, FONDAZIONE DI VITTORIO, *Nono rapporto sulla contrattazione sociale territoriale*, 2018.

⁽²⁵⁾ Cf. Court of Last Resort 20 August 1977, No. 3818, in *RFI*, 1977, p. 61.

⁽²⁶⁾ Cf. Court of Last Resort 13 October 1980, No. 5484, in *RFI*, 1980, p. 84.

⁽²⁷⁾ See R. FABOZZI, *Il bene “salute” tra potere organizzativo e tutele ordinamentali*, Cacucci, 2016, p. 65.

⁽²⁸⁾ See U. PROSPERETTI, item *Lavoro (fenomeno giuridico)*, in *Enc. Dir.*, 1973, Vol. XXIII, p. 328.

⁽²⁹⁾ See M. TIRABOSCHI, *Persona e lavoro tra tutele e mercato. Per una nuova ontologia del lavoro nel discorso giuslavoristico*, ADAPT University Press, 2019.

ket set up by government and trade union rules, one should imagine the existence of emerging markets consisting of individuals who also need protection as they too are exposed to the same risks as those in employment ⁽³⁰⁾.

These trends could also lead one to revisit the function of the provisions laid down in art. 2087 of the Civil Code ⁽³¹⁾ in order to prevent that “private economic initiative takes place in a way that damages the safety, freedom and human dignity” of all those who have an interest in it ⁽³²⁾.

The concept of ‘prevention’ in health and safety (arts. 2, § 1, letter *n*, and 18, § 1, letter *q*, of Legislative Decree No. 81/2008) requires the employer to provide protection not only to workers but also to individuals not engaged in the production process ⁽³³⁾, creating a link between the inside and the outside, and thus between “workers and citizens” ⁽³⁴⁾. However, as pointed out by a leading scholar, “labour law will not save the world” since our legal system is affected by “the original sin”: “the choice of the capitalist system” referred to in art. 41 of the Constitution. In other words, the company has an inevitable destiny, *e.g.* generating income and profits. Therefore, the protection of the worker must be adapted to this need ⁽³⁵⁾. Consequently, the legislator’s attitude towards 5G and more generally, technological unknown,

⁽³⁰⁾ Thanks to the internet, new forms of employment (*e.g.* freelance work) have developed for which a system of protection is yet to be properly established.

⁽³¹⁾ Cf. M. PEDRAZZOLI (ed.), *Danno biologico e oltre. La risarcibilità dei pregiudizi alla persona del lavoratore*, Giappichelli, 1995, p. 2.

⁽³²⁾ See R. FABOZZI, *Il bene “salute” tra potere organizzativo e tutele ordinamentali*, cit., p. 48.

⁽³³⁾ See P. TOMASSETTI, *Diritto del lavoro e ambiente*, cit., pp. 172-173.

⁽³⁴⁾ See P. TULLINI, *I dilemmi del caso Ilva e i tormenti del giuslavorista*, in *Ius17*, 2012, No. 3, pp. 168-169.

⁽³⁵⁾ See the insights of Mattia Persiani, exposed during the XV Edition of the Bertinoro Seminars (Bologna), *Le fonti del diritto del lavoro attraverso la giurisprudenza*, 21-29 November 2019.

must be constructive, especially if technology is used for creating profit.

However, it should be noted that this perspective originates from the fact that labour law research has focused only on some key aspects of art. 41 of the Constitution, namely: “the acceptance of a market economy system, which is the most efficient one to achieve people’s value” ⁽³⁶⁾ to the detriment of the provision prohibiting it, as it conflicts with “social utility” (art. 41, second paragraph of the Constitution). For this reason, many have cast doubts about the economic and legal sense of this aspect ⁽³⁷⁾.

An investigation of the decisions issued by the Constitutional Court makes it possible to identify the legal dimension behind this criterion. In this respect, social utility is included in “those goods that are not only considered as such by the legislator, but which enjoy direct protection in the Constitution. They coincide with other interests or rights ensured constitutionally, for example, health, the environment and the right to work”. These rights and interests call for “a limitation of economic initiative in order to balance both elements, as pointed out in paragraph 2 of art.

⁽³⁶⁾ See R. PESSI, *Valori e “regole” costituzionali*, Aracne, 2009, p. 10. See also M. PERSIANI, *Radici storiche e nuovi scenari del diritto del lavoro*, in VV.AA., *Interessi e tecniche nella disciplina del lavoro flessibile. Atti delle Giornate di studio di diritto del lavoro. Pesaro-Urbino, 24-25 maggio 2002*, Giuffrè, 2003, pp. 629 ff.; M. PERSIANI, *Conflitto industriale e conflitto generazionale (cinquant’anni di giurisprudenza costituzionale)*, in *ADL*, 2006, No. 4-5, I, pp. 1031 ff.; M. PERSIANI, *Diritto del lavoro e autorità del punto di vista giuridico*, in *CI*, 2000, No. 3, pp. 1252 ff.; N. IRTI, *Persona e mercato*, in *RDC*, 1995, n. 3, I, pp. 291 ff.; A. BALDASSARRE, item *Iniziativa economica e privata*, in *Enc. Dir.*, 1971, Vol. XXI, pp. 589 ff.

⁽³⁷⁾ On the reasons underlying the criticisms to the wording of art. 41 of the Constitution, see L. EINAUDI, *Questo titolo terzo (breve saggio avente ad oggetto le norme economiche della Costituzione)*, in A. GIORDANO (ed.), *Luigi Einaudi. In lode del profitto e altri scritti*, IBL Libri, 2011, pp. 131 ff. The A. argues that in order to deny the effectiveness of the social utility criterion, it is sufficient to stress that it neither concerns single members of society nor corresponds to the sum of individual utilities. This is so because results cannot be measured.

41”⁽³⁸⁾. So, the criterion of social utility limits the self-referential understanding of ‘entrepreneurial freedom’, as the latter cannot be separated from the context in which it takes place. On the contrary, this requires a link with other assets that are constitutionally protected, *e.g.* health and human dignity⁽³⁹⁾. The need for the ongoing balance referred to above should not lead one to assume that social utility is a criterion for resolving the conflict between fundamental rights and principles. Rather, it serves as an interpretative tool that does not allow one to draw a separation line between the principles, summarizing them through an “integrated and systemic synthesis [...] so that applying one implies applying all competing ones”⁽⁴⁰⁾.

In these terms, technological development must be taken for granted in labour law⁽⁴¹⁾. Yet the purpose of labour law is to establish a set of safeguards supporting the people facing possible consequences. This is so because the underlying principle of labour law tells us that “what is produced, why things are produced and to whom this production is addressed”⁽⁴²⁾ are not important aspects. What matters is to build ‘safety nets’ by pursuing an ‘evolutionary process’ with the aim of responding to the ‘fatality of accidents’ generated by technological progress⁽⁴³⁾. Once again, we observe that labour law can respond effectively to technological progress without compromising its evolution, the well-being of those who work for it and, consequently, that of those who enjoy the benefits. Free economic initiative should not ignore the constraints given by the system in which it

⁽³⁸⁾ See R. NIRO, *Art. 41*, in R. BIFULCO, A. CELOTTO, M. OLIVETTI (eds.), *Commentario della Costituzione. Volume I. Artt. 1-54*, Utet, 2006, p. 855.

⁽³⁹⁾ See P. TOMASSETTI, *Diritto del lavoro e ambiente*, cit., p. 89.

⁽⁴⁰⁾ *Ibidem*.

⁽⁴¹⁾ See M. NAPOLI, *La filosofia del diritto del lavoro*, in P. TULLINI (ed.), *Il lavoro. Valore, significato, identità, regole*, Zanichelli, 2008, p. 58, according to whom “there is no work without an organizational system”.

⁽⁴²⁾ *Ibidem*.

⁽⁴³⁾ *Idem*, p. 59.

is performed, in order to allow individuals to deal with the negative effects deriving from the exploitation of certain technological resources. As said, technological change calls for the need to deal with the inadequacy of labour protection. From this point of view, the insurance protection for work-related accidents should be reviewed, as it hardly covers new forms of work, new work environments and occupational diseases that develop at a later stage and not as a direct consequence of one's activity (art. 1 of Presidential Decree No. 1124/1965). In this sense, case law has undertaken to review the causal nexus concerning these cases, as well as the notions of "employment litigation" ⁽⁴⁴⁾ and "occupational risk" ⁽⁴⁵⁾ in order to prevent a division between employee protection and legislation ⁽⁴⁶⁾.

⁽⁴⁴⁾ Recently, case law has increasingly opted to ensure protection in case of damage caused by work in a broad sense and, therefore, also in the workplace. Cf. G. CORSALINI, *Estensione della tutela Inail. Questioni controverse*, in RCP, 2016, No. 4. In spite of the need to establish a causal nexus between one's disease and work in order to be awarded compensation, the environmental risks can also be factored in. This is so because the damage might arise within the work environment or during work performed thereat, even though workers were assigned to carry out dangerous tasks (Court of Last Resort 21 November 2016, No. 23653).

⁽⁴⁵⁾ Court of Last Resort Ord. 5 March 2018, No. 5066, stating that "with regard to workers' insurance protection for occupational diseases, all physical or mental illnesses which can be attributable to work-related risks can be indemnified, whether they concern work, work organization and work methodology, as work involves the individual in all their dimensions. Therefore, this includes all diseases resulting from any work activity covered by INAIL, even when not included among the diseases or the risks listed. In this latter case, the worker must demonstrate the causal link between the task assigned and the disease they have been diagnosed with" (this is in line with Court of Last Resort 17 August 2018, No. 20774; Court of Last Resort 5 March 2019, No. 6346). On this point, see also G. MARCHI, *La nozione di malattia professionale*, in LG, 2018, No. 8-9, pp. 855 ff.

⁽⁴⁶⁾ In spite of the efforts made by case law, V. FILÌ, *Il punto sulla giurisprudenza in materia di occasione di lavoro e infortunio in itinere*, in RCP, 2019, No. 1, p. 88, stresses that faced with "new working schemes" and "novel protection needs", the system of insurance coverage as laid down in the Consolidated

4. 5G and the Protection System in the Context of Existing Legislation

While waiting for academia and lawmakers to deal with the foregoing issues, reference can be made to some legal insights which might be useful to tackle the impact of 5G on people's health. Specifically, some scholars argued that a starting point to manage today's "quick industrial development" would be to refer to the insights provided by case law as regards asbestos ⁽⁴⁷⁾. At the time, "an innovative precautionary approach" ⁽⁴⁸⁾ was implemented according to which the employer was given some degree of responsibility for not having used the necessary precaution – e.g. consulting experts – when managing the particles deriving from potentially harmful substances (e.g. VCM). In other words, case law identified the causal link – and thus responsibility – through an investigation that led to consider the occurrence of the episode as probable or merely possible. So, they prioritized factual elements, which are used to give evidence to any possible harmfulness ⁽⁴⁹⁾. Today this trend is confirmed by case law that considers the harmful nature of electromagnetic fields ⁽⁵⁰⁾. An-

Text of Occupational Health and Safety has been seriously challenged, as no adjustments have been made to deal with ongoing changes.

⁽⁴⁷⁾ See P. TULLINI, *A rischio amianto?*, in RIDL, 2007, No. 4, I, pp. 453 ff.

⁽⁴⁸⁾ See D. CASTRONOVO, *Principio di precauzione e beni legati alla sicurezza. La logica precauzionale come fattore espansivo del "penale" nella giurisprudenza della Cassazione*, in *Diritto Penale Contemporaneo*, 21 July 2011, p. 3.

⁽⁴⁹⁾ See A. PERIN, *La crisi del modello nomologico fra spiegazione e prevedibilità dell'evento nel diritto penale. Note introduttive e questioni preliminari sul fatto tipico colposo*, in RIDPP, 2014, No. 3, pp. 1376 ff.

⁽⁵⁰⁾ M. TIRABOSCHI, *Esposizione a campi elettromagnetici prodotti da telefoni cellulari, malattia professionale a eziologia multifattoriale, tutele del lavoro* (comment to the judgment of the Appeal Court of Turin 13 January 2020, No. 904, and others), in DRI, 2020, n. 2, p. 562, argues that "the tribunal fails to consider the existence a scientific law. For the purposes and within the limits of a legal assessment in terms of professional risk and damage, what matters is the

other thesis – which is accepted by a part of case law ⁽⁵¹⁾ – suggests that when there is no specific law regulating the procedures to be followed in the event of technological unknown, the entrepreneur must refer to the principles of common law. Specifically, they have to consider: the entrepreneur’s technical diligence, their knowledge of the organization that must be technologically suitable and, whereas possible, “the criteria established by law within a series of special cases” ⁽⁵²⁾. Finally, some suggest re-considering the contribution of procedural law, while waiting for lawmakers to produce “a modern and clear-cut system of definitions and compensation, in order to avoid making improper decisions” ⁽⁵³⁾. This is especially true in cases in which ‘increasingly quick’ technological development makes it difficult for science to provide sufficiently reliable answers ⁽⁵⁴⁾. In these cases – *e.g.* when no specific rules are in place to deal with the problem – the injunction system (art. 700 of the Code of Civil Procedure) allows one to handle the problem through a preventive approach, which is unrelated to that considering “compensation or sanctioning mechanisms” ⁽⁵⁵⁾.

absence of certainty and the existence of suspicions and doubts which paves the way to possible situations”.

⁽⁵¹⁾ See Court of Last Resort 2 May 2006, No. 12445, in *RFI*, 2006, p. 2738.

⁽⁵²⁾ See R. COSTI, *Ignoto tecnologico e rischio d'impresa*, cit., p. 51.

⁽⁵³⁾ See C. CONSOLO, *Il rischio da “ignoto tecnologico”: un campo arduo per la tutela cautelare (seppur solo) inibitoria*, in *VV.AA., Il rischio da ignoto tecnologico*, cit., p. 65.

⁽⁵⁴⁾ *Idem*, p. 66.

⁽⁵⁵⁾ *Idem*, p. 73. From the Author’s point of view, the lengthy time needed to hand down a decision, meanwhile some possible forms of electro smog have been prevented through a protective order, may be useful so that “the situation resolves autonomously” (p. 79), in that science takes well-defined positions, or because lawmakers decide to regulate the matter.

5. 5G and the Protection System in the Context of Future Legislation

Without considering what current legislation allows in terms of protection, there is a need for a new legal rationality that cannot be achieved through minor amendments to existing insurance coverage. Rather, the new system shall “protect those exposed to occupational risks, even when the tasks assigned fall within the traditional contractual schemes, so they are consistent with the dynamics of transitional labour markets and the different expressions of production in place in the context of the IV Industrial Revolution”⁽⁵⁶⁾. In other words, there is a need to identify a new legal rationale that strikes a balance between unavoidable technological innovation and the control of its effects in terms of health and safety. Even in this case, however, a question arises in terms of the economy and social justice, as it is necessary to define who will bear the cost of this new balance and how. We need to understand whether the government will step in because the introduction of technology is the result of collective choice, or whether the risk remains with those generating hazards (companies) which will decide to use technology, undertaking to adopt the necessary precautions according to current scientific knowledge. The risk is that case law attributes the costs of the damage caused by accidents to producers – *e.g.* to those who can sustain and deal with them (cheapest cost avoider) – arguing in favour of the causal link when substantiated by a reasoning of probability, thus backing the position of the injured party in a significant way⁽⁵⁷⁾.

⁽⁵⁶⁾ See M. TIRABOSCHI, *L'emergenza sanitaria da Covid-19 tra codici ATECO e sistemi di relazioni industriali: una questione di metodo*, in M. TIRABOSCHI, F. SEGHEZZI (eds.), *Welfare e lavoro nella emergenza epidemiologica. Contributo sulla nuova questione sociale. Volume V. Le sfide per le relazioni industriali*, ADAPT University Press, 2020.

⁽⁵⁷⁾ See G. CALABRESI, *Costo degli incidenti e responsabilità civile. Analisi economico-giuridica*, Giuffrè, 2015 (but 1975).

The search for this unity – which will also allow us to look at progress in less fatalistic terms – will not involve criminal and civil liability, which by definition concerns the next stage and that, faced with scientific uncertainty, might become a useless tool⁽⁵⁸⁾. Moreover, making use of penal sanctions would mean challenging the value of specialized legal disciplines⁽⁵⁹⁾, which were established to respond to the needs generated by capitalistic development (labour law)⁽⁶⁰⁾. To avoid this risk in an era of impressive technological development, it is necessary to rethink the traditional schemes of law, which is still based on old rationality when calculating the consequences of our actions⁽⁶¹⁾. What is needed is a preventive protection mechanism, which is also

⁽⁵⁸⁾ F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, in VV.AA., *Il rischio da ignoto tecnologico*, cit., p. 4, argues that the response of the judicial system is limited, unsatisfactory and risks creating confusion in public opinion – generating social disruption – for the following reasons. The victims of technological development rely on criminal proceedings to “fulfill their expectations of justice”. As this approach is based on accusations, this system is challenged when dealing with issues “dominated by scientific uncertainty”. So the tribunal has to acquit those facing charges, because in order to condemn someone one needs to be sure. In this context, there is a “lack of response” from the Government “making people understand the rules through which scientific uncertainty must be assessed and with respect to which lawmaking must develop”.

⁽⁵⁹⁾ Klaus Luderksen is thought to have argued that – in the event of complex issues – “civil law and administrative law gives way to criminal law” (cf. F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, cit., p. 3). In this sense, S. CHIARLONI, *Intervento*, in VV.AA., *Il rischio da ignoto tecnologico*, cit., pp. 115-116, stresses that while science and technology development calls for protection, “lawmakers shall evaluate carefully those crimes related to technological risks” since “specific charges are needed based on scientifically-proven risks”. The A. specifies that if lawmakers make regulatory intervention dependent on the precautionary principle, the penal sanction will be avoided as the ‘*in dubio pro dubio*’ approach is used, which conflicts with the principle of legal certainty marking penal law.

⁽⁶⁰⁾ See L. GAETA, *Infortunati sul lavoro e responsabilità civile. Alle origini del diritto del lavoro*, ESI, 1986.

⁽⁶¹⁾ See F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, cit., p. 3.

consistent with the constitutional principles governing labour-related matters. As has been pointed out, “the constitutional function of public intervention is not limited to removing the needs originated as an event took place. In line with art. 38 of the Constitution, the government is asked to prevent those needs for which social security is granted, especially by ensuring the right to work (art. 4 of the Constitution) and to health (art. 32 of the Constitution). Therefore, the mere provision of economic services cannot be considered sufficient to make sure the objectives above are achieved” (62). Thus, the insurance and social security system should be reviewed, in order to carry out “a more frequent adjustment of the premium rate” (63) and ensure that the injured party fully gets over from the accident, which is not always the case (64). Some attempts to innovate can be seen in the Italian insurance system against work-related accidents, as the tasks entrusted to Inail have significantly changed over time. Support does not only concern economic benefits (e.g., those awarded for temporary and permanent inability, ongoing support to survivors) but also prevention measures (consultancy, training and information, as well as investment projects in the field of safety in the workplace or research projects) and those of care and re-employment (65). Prevention initiatives should

(62) See S. GIUBBONI, G. LUDOVICO, A. ROSSI, *Infortuni sul lavoro e malattie professionali*, Cedam, 2014, pp. 23-24.

(63) See E. FERRO ET AL., *Il rischio assicurato: percorso per la revisione delle tariffe dei premi Inail*, in INAIL, *Sfide e cambiamenti per la salute e la sicurezza sul lavoro nell'era digitale. Atti. Seminario di aggiornamento dei professionisti Contarp, Csa, Cit*, 2018, p. 113.

(64) See G. CALABRESI, *Costo degli incidenti e responsabilità civile. Analisi economico-giuridica*, cit., p. 65.

(65) As pointed out by G. CORSALINI, *Estensione della tutela Inail. Questioni controverse*, cit., since 1988 Inail has been entrusted with medical-legal examinations, treatment and rehabilitative healthcare. The system complies with the constitutional principles featuring workers' broad protection, so it has a public connotation. Responsibilities have also increased following the entry into force of Legislative Decree No. 38/2000, Legislative Decree No. 81/2008, as amended by Legislative Decree No. 106/2009. See L. LA PEC-

consider enhancing health monitoring also through occupational doctors ⁽⁶⁶⁾ and other professionals who might assist in technological development (in their capacity as genuine health and safety experts) ⁽⁶⁷⁾, ensuring safe working conditions. This is so because it is at the workplace that people are more exposed to risk, being as though work is “the most evident expression of one’s personality” ⁽⁶⁸⁾. Therefore, protection must go beyond the dichotomy between salaried and self-employment ⁽⁶⁹⁾, focusing on

CERELLA, *Il testo unico dell’assicurazione contro gli infortuni sul lavoro e le malattie professionali a cinquanta anni dalla promulgazione. Il percorso evolutivo e le sue prospettive*, in *RIMP*, 2015, No. 2, I.

⁽⁶⁶⁾ Some interesting ideas could come from France, where the competent doctor plays a decisive role to tackle Covid-19, but also to promote the links between occupational safety and public health. With the increasing exposure of the population – particularly that in employment – to diseases that could compromise their ability to work and to produce income, strengthening healthcare at work helps to counter the emergence of new social inequalities. See the report of the Inspection générale des affaires sociales edited by A. BENSADON, P. BARBEZIEUXPER, *Articulation entre santé au travail et santé publique: une illustration au travers des maladies cardiovasculaires*, 2014. See also the materials collected by the Centre de documentation de l’Irdes, in www.irdes.fr, section *Publications par thèmes*, entry *Santé et travail*.

⁽⁶⁷⁾ In this sense, the analysis of other systems could help one to widen the set of skills in order to modernize the preventive management of work-related risks.

⁽⁶⁸⁾ See R. FABOZZI, *Il bene “salute” tra potere organizzativo e tutele ordinamentali*, cit., p. 42.

⁽⁶⁹⁾ As stressed by M. CINELLI, *Diritto della previdenza sociale*, Giappichelli, 2015, p. 493, “worker’s qualification is irrelevant. The reference to manual work – which for a long period of time has meant that the insurance was the preserve of workers – has for a while no longer been valid for identifying manual work, not only because manual work is not its exclusive characteristic, but above all because [...] the insurance obligation has been expressly extended to those who are not required to carry out manual work, such as supervisors of other people’s work or workers who find themselves operating in working environments where others use machinery or equipment. Moreover, this protection does not refer only to workers, but also to individuals who are exposed to risk, even though they are not into an employment relationship, such as, for example, those who volunteer. This demon-

individuals, as they continuously change employment status ⁽⁷⁰⁾. Finally, we should also consider the proposal of those who look across the pond when reviewing a system so that it can meet real needs, according to the well-known principle of precaution ⁽⁷¹⁾. The most advanced and democratically evolved countries suggest defining a two-tiered system, which is founded on cooperation between an administrative body (EPA, OSHA, NIOSH in the USA) charged with drafting prevention strategies against risks deriving from technological development, with the Courts monitoring the legal rationality of such studies and measures. A system is thus developed where “regulatory administrative activity is embedded in a control system established by ordinary judicial authority” enabling the tribunal to “overrule arbitrary decisions and those which are not based on firm evidence” ⁽⁷²⁾. According to research arguing in favour of this approach, the ad-

strates once again that it is incorrect to consider that the basis of protection is the principle of professional risk”. Risk exposure concerns: “owners and tenants of agricultural businesses; students of agricultural education school, who carry out theoretical or practical exercises (in addition to teachers); students of vocational qualification or requalification courses and school yards (in addition to instructors); family members of the employer; unemployed persons who carry out volunteering. It also concerns prisoners and those hospitalized in care facilities when they are engaged in work”.

⁽⁷⁰⁾ C. SMURAGLIA, *La tutela della salute del lavoratore tra principi costituzionali, norme vigenti e prospettive di riforma*, in *RIDL*, 1988, No. 4, I, p. 434, points out the relevance of preventive monitoring at work, “where new risks and new forms of production are emerging”.

⁽⁷¹⁾ Understood as “a major feature of the concept of sustainable development, that is, the type of development that tends to combine the needs of present generations with future generations’ quality of life”, the precautionary principle has been used to “build a new development model in which the environment and health have a central role, without conflicting with economic growth”. The objective is to “minimize risks” and “anticipate the degree of protection when there is the possibility that collective damage may result from a human activity” (F. DEGL’INNOCENTI, *Rischio d’impresa e responsabilità civile. La tutela dell’ambiente tra prevenzione e riparazione dei danni*, Firenze University Press, 2013, pp. 16-17).

⁽⁷²⁾ See F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, cit., p. 5.

vantage is twofold. There is a public response to the problem without turning to the judiciary process. Furthermore, a law-science comparison is promoted, which contributes to creating a civic culture related to technological progress, which gives rise to a new set of values ⁽⁷³⁾. As mentioned, the proposal seems to come from the attempt to pursue the well-known precautionary principle as the base for “legislative and social protection policies”. They are aimed at identifying “the modalities of undertaking economic activities according to standards which are compatible with the overall system of protection and socio-economic development” ⁽⁷⁴⁾, though the practical implementations are yet to be understood ⁽⁷⁵⁾.

⁽⁷³⁾ See F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, cit., p. 5, who speaks of a “legal construction of science” which is essential to produce “a new rationality, as requested by risk society”.

⁽⁷⁴⁾ See P. TULLINI, *A rischio amianto?*, cit., p. 457.

⁽⁷⁵⁾ As pointed out by N.A. ASHFORD, *The Legacy of the Precautionary Principle in US Law: The Rise of Cost Benefit Analysis and Risk Assessment as Undermining Factors in Health, Safety and Environmental Protection*, in N. DE SADELEER (ed.), *Implementing the Precautionary Principle. Approaches from the Nordic Countries, the EU and USA*, Routledge, 2006, p. 361, “The history of the use of the precautionary approach in US law contrasts with that in the EU. Whereas in the EU, the precautionary principle appears first in food safety and then moves slowly to develop in environmental regulations and is yet to find full expression in the regulation of occupational health and safety, in the US, it begins strongly and emphatically in worker health and safety, then in the environment, and is weakly expressed in food safety law. In fact, interpretations of what constitutes sufficient scientific evidence and how precautionary agencies should be are given their strongest expression in occupational health and safety law, which profoundly affects the development of these considerations in the environmental area”. On the critical issues resulting from the application of the precautionary principle in a number of countries, see P. TOMASSETTI, *Diritto del lavoro e ambiente*, cit., pp. 157-164.

6. Conclusions

Without claiming to be exhaustive, we can say that the promotion of a digital ecosystem whose network is enhanced through 5G constitutes an example of technological unknown that legislation must face, bearing in mind that today's tools are relatively inadequate to provide effective health protection ⁽⁷⁶⁾. Rethinking the legal schemes that protect the community is necessary because the risks resulting from technological unknown are doomed to increase in the years to come ⁽⁷⁷⁾. It should be stressed that modern societies are making great strides with complex technology. However, it might give rise to unavoidable risks that have been defined as 'normal', because they cannot be overcome ⁽⁷⁸⁾. Reaching a 'zero risk' situation – *i.e.* completely safe, economic-productive systems – means attempting to achieve a completely irrational goal, at least in legal terms. An investigation of case law from the Court of Last Resort further confirms this issue. This case law has been said to turn art. 2087 of the Civil Code into a rule promoting objective responsibility ⁽⁷⁹⁾, particularly in order to meet the need of general protection

⁽⁷⁶⁾ This point was already made by P. TULLINI, *A rischio amianto?*, cit., pp. 463-464.

⁽⁷⁷⁾ These issues are highlighted in A. ROTA, *Stampa 3D: un nuovo rischio da ignoto tecnologico?*, in *LLI*, 2015, No. 1. 3D printing can impact positively on the environment as it reduces energy consumption, but it produces detrimental substances.

⁽⁷⁸⁾ See C. PERROW, *Normal Accidents. Living with High-Risk Technologies*, Basic Books, 1984.

⁽⁷⁹⁾ Reference is made to recent case law, according to which employers should try to ensure "the best safety possible from a technological point of view" (*cf.* Court of Last Resort 30 June 2016, No. 13465). This criterion has been discussed in that some scholars consider it as the result of the precautionary principle (see M. LAI, *Il diritto della sicurezza sul lavoro tra conferme e sviluppi*, Giappichelli, 2017, p. 19). Others are of the opinion that this criterion should be set aside and specific provisions should be introduced (see A. VALLEBONA, *Istituzioni di diritto del lavoro. II. Il rapporto di lavoro*, Cedam, 2015, p. 242).

(⁸⁰) and ensure safety. Yet it is important to highlight that some recent rulings seem to establish that, while art. 2087 of the Civil Code has a dynamic nature, “it does not provide an obligation on the employer to ensure ‘zero risk’ if this is not made possible because of the characteristics of work” (⁸¹). And this is the reason why lawmakers should avoid using a sanctioning instrument to protect those affected by the use of tools, the harmfulness of which is uncertain. This means “that the political system cannot bear the burden of risk” (⁸²), thus it prefers to delegate tasks to the legal remedy, which is based on civil and criminal law (⁸³), even when adapted to the needs that arise on a case-by-case basis (⁸⁴). In a time in which “the demand for justice has become more pressing, since the progress in technology and science [...] has generated new dangers or degradation for people” (⁸⁵), the definition of a universal system of social security might prevent risks and technological dangers whose effects on health are still uncertain, as in the case of 5G. Resorting to public law (⁸⁶) to deal with technological unknown also calls for a rethinking of the funding mechanisms of the social security system, which is faced with limited public resources and a number of stringent requirements in terms of employment status (*e.g.* employee).

(⁸⁰) See P. TULLINI, *A rischio amianto?*, cit.

(⁸¹) See Court of Last Resort 15 June 2020, No. 11546, in *Boll. ADAPT*, 2020, No. 25.

(⁸²) See F. STELLA, *Il rischio da ignoto tecnologico e il mito delle discipline*, cit., p. 16.

(⁸³) See A. MANTELERO, *Il ruolo dello Stato nelle dinamiche della responsabilità civile da danni di massa*, Giappichelli, 2013, p. 220.

(⁸⁴) A. MANTELERO, *Il ruolo dello Stato nelle dinamiche della responsabilità civile da danni di massa*, cit., p. 221, stresses that case law aims at protecting all individuals against unknown technological risks. In doing so, it altered some legal principles, relieving the injured party of the burden of proof. Because of the prescriptive terms established in the case of permanent damage, awareness has been developed of the relative nature of the causal link in the scientific field and on the effects of its definition in legal terms.

(⁸⁵) See F. DEGL’INNOCENTI, *Rischio d’impresa e responsabilità civile. La tutela dell’ambiente tra prevenzione e riparazione dei danni*, cit., p. 10.

(⁸⁶) See P. TULLINI, *A rischio amianto?*, cit., p. 465.

This state of affairs would promote innovation by reducing the possible negative impact on society, financing the social security system through the ‘deep pocket’ method ⁽⁸⁷⁾, *e.g.* the provision of progressive taxes, as in the case of the tax system. Promoting labour law analysis on this aspect could contribute to revisiting the rationale of this subject – which goes beyond civil liability – as it helps individuals and production establish a new relationship with progress.

⁽⁸⁷⁾ See G. CALABRESI, *Costo degli incidenti e responsabilità civile. Analisi economico-giuridica*, cit., p. 65.

Chapter V.
**EXPOSURE TO ELECTROMAGNETIC FIELDS
GENERATED BY CELL PHONES**

1. Framing the Issue

Ruling of 13 January 2020, No. 904, issued by the Appeal Court of Turin acknowledged the existence of a causal nexus between exposure to the electromagnetic fields produced by mobile phones and the onset of an acoustic neuroma, which in legal terms was referred to as “an occupational disease not classified as originating from different factors”. The decision confirms what had been already established in the first stage of legal proceedings (Court of Ivrea 30 March 2017, No. 96). The case concerned a Telecom Italia S.p.A. employee who, for working reasons, used the phone for a prolonged period, *i.e.* from 1995 to 2010. After assessing that the disease was work-related, the Appeal Court of Turin confirmed that Inail (the Italian National Institute for Work-Related Accidents) had to pay the worker the relevant social security pension for occupational illnesses. While receiving considerable media coverage, the decision described above does not constitute a novelty. Yet it confirms an interpretation that is becoming established with respect to a relatively new working tool – *e.g.* the cell phone – the risks of which are difficult to assess in the medium and long term. The Appeal Court of Brescia (Ruling of 10 December 2009, No. 361) arrived at the same conclusions, though giving rise to a heated debate about the scientific assumptions made by court-appointed ex-

perts ⁽¹⁾. A similar case was dealt with by Court of Last Resort (Ruling 12 October 2012, No. 17438) and the Court of Florence (Ruling 24 June 2017, No. 391), which expressed the same views as those provided by the Court of Ivrea ⁽²⁾. It is necessary to clarify that the ruling lodged by the Appeal Court of Turin and its prior decisions do not establish a link between the use of a cell phone and the onset of cancer. This is so because, for the purposes of establishing the causal nexus between exposure to the electromagnetic fields produced by cell phones and the onset of an oncological pathology, the acoustic neuroma (*i.e.* the case examined by the Appeal Court of Turin) is different from that of the parotid gland (*i.e.* the case discussed by the Court of

⁽¹⁾ See S. LAGORIO, P. VECCHIA, *Una Corte italiana riconosce l'origine professionale di un neurinoma del trigemino in un utilizzatore di telefoni mobili: un esempio concreto dei complessi rapporti tra scienza e diritto*, in *La Medicina del Lavoro*, 2011, No. 2, and the reply by A.G. LEVIS ET AL., *Telefoni mobili e tumori alla testa: la sentenza della Corte d'Appello di Brescia – Sezione Lavoro – alla luce delle attuali conoscenze scientifiche e della legislazione in materia*, *idem*, 2012, No. 4.

⁽²⁾ See the comments made by D. CASALE, *La prova del nesso di causalità professionale per le tecnopatie non tabellate. A proposito della prima pronuncia che riconosce gli effetti cancerogeni dei campi elettromagnetici dei telefoni cellulari* (note on Appeal Court of Brescia 22 December 2009, No. 614), in *ADL*, 2010, No. 6, II; A. VARVARESSOS, *Riscontro epidemiologico e probabilità qualificata: nuove prospettive per l'accertamento in concreto dell'elemento causale nelle ipotesi di malattie non tabellate o ad eziologia multifattoriale*, in *Rivista Italiana di Medicina Legale*, 2013, No. 3; A. ROTA, *Sulla natura professionale del tumore contratto per overuse del cellulare in ambito lavorativo* (note on Court of Last Resort 12 October 2012, No. 17438), in *RIDL*, 2013, No. 3, II; B. BANORRI, *Danni da uso del cellulare e (ir)responsabilità del produttore?*, in *RCP*, 2013, No. 4; M. CERATO, M. ROMEO, *Inquinamento elettromagnetico*, in P. CENDON (ed.), *La prova e il quantum nel risarcimento del danno*, Utet, 2013, § 45.5; E. AL MUREDEN, *Uso del cellulare e danni alla salute: la responsabilità del produttore tra dannosità "tollerabile", principio di precauzione e nuovi obblighi informativi* (note on Court of Last Resort No. 17438/2012, cit.), in *CG*, 2013, n. 3; G. BENINCASA, *Il tribunale di Ivrea qualifica come malattia professionale il tumore causato dall'uso scorretto del cellulare*, in *Boll. ADAPT*, 2017, No. 18; C. PAOLINI, *Danni alla salute per uso abnorme del cellulare: si tratta di tecnopatia se sussiste il nesso causale della probabilità qualificata* (note on Court of Ivrea 21 April 2017), in *ADL*, 2017, No. 4-5, II.

Cremona, see § 3). Irrespective of the different views on this aspect in the relevant literature ⁽³⁾, the rulings referred to above concern particular professions and tasks, which feature excessive and prolonged use of mobile phones. Furthermore, the events took place when mobile phones were not widespread and the adaptive power of antennas was significant, although no devices were implemented to avoid contact with ears or the face (*e.g.* headphones or earphones). It is certainly useful to outline (see § 2) the most recent developments in relation to 1) the risks for workers exposed to electromagnetic fields generated by mobile phones 2) the unlisted professional diseases related to those risks 3) methods and techniques for establishing the causal nexus 4) the opportunity to grant social security benefits by Inail. However, the analysis conducted so far – which also considers case law and legal opinion – wants to highlight certain gaps (see § 3) in relation to so-called ‘technological unknown’ (see § 4), according to which legal reasoning is only used to assess damage and liability without any innovation regarding prevention for workers’ health and safety. This should go well beyond making reference to current legislation. This state of affairs raises many concerns, especially in the context of a new industrial revolution that requires legal scholars – especially labour law academics ⁽⁴⁾ – to consider health and safety protection in new working settings, also because of the use of new technology in production ⁽⁵⁾. Cell phone use is a much-debated issue and also attracts significant media coverage. However, it is just the tip of the ice-

⁽³⁾ See the diverging views expressed in R. MOCCALDI, A. POLICETTI, *Mancato riconoscimento come malattia professionale di un tumore alla parotide in esposto a campi elettromagnetici da telefoni mobili e a radiazioni ionizzanti*, in *Aggiornamenti di Radioprotezione*, 2016, No. 50, and A.G. LEVIS ET AL., *Telefoni mobili e tumori alla testa: è tempo che i dati corretti vengano messi in evidenza e valorizzati?*, in *Epidemiologia & Prevenzione*, 2011, No. 3-4.

⁽⁴⁾ See P. TULLINI, *A rischio amianto?*, in *RIDL*, 2007, n. 4, I, p. 455, in relation to asbestos.

⁽⁵⁾ See the report on *Safety and Liability Implications of Artificial Intelligence, the Internet of Things and Robotics*, 19 February 2020, COM(2020)64 final.

berg, particularly if one considers the different situations in which workers are exposed to electromagnetic fields, which are disregarded by labour law research and case law because of their complexity and uncertainty (see § 3).

2. Is This an Established Stance?

In light of these considerations, it is now possible to examine and contextualize the reasoning of the Appeal Court of Turin. Some key passages and the legal arguments implemented lead one to assume that the Court has confirmed the few decisions previously handed down on this subject in the field of labour law, which have been commented on in specialized journals. As we are dealing with ‘non-listed’ occupational diseases ⁽⁶⁾, the starting point should be the insights from medical research and the scientific debate, which have divergent views on the impact that cell phones might have on human health ⁽⁷⁾. There are many studies on radiofrequencies that rule out the causal link between the use of cell phones and the insurgence of brain tumours. While developed in a scientific context, these analyses

⁽⁶⁾ As far as occupational diseases are concerned, some ‘listed diseases’ exist in Italy, which feature a legal presumption about their work-related nature, *i.e.* they are caused by working conditions or activities. As for ‘non-listed pathologies’, it is up to the worker to demonstrate the existence of the disease, the characteristics of the work carried out that caused it and the causal nexus between the disease and the task. See S. GIUBBONI, G. LUDOVICO, A. ROSSI, *Infortuni sul lavoro e malattie professionali*, Cedam, 2014, chap. III, § 10, and also M. CERBONE, *Il giudice e l’Inail nell’applicazione delle norme sulle malattie professionali*, Working Paper Olympus, 2014, No. 34.

⁽⁷⁾ With regards to labour law research, an overview of the current debate can be found in F. GOBBA, A. MODENESE, G. ZANOTTI, *Effetti dei campi elettromagnetici nei lavoratori professionalmente esposti: le evidenze scientifiche, le decisioni della magistratura*, in S. GOLDONI ET AL. (eds.), *DBA Incontri 2017. Radiazioni ionizzanti e non ionizzanti: valutazione e protezione alla luce della nuova normativa europea*, Azienda USL di Modena, 2017, pp. 140-141 (available *open access* in *salus.adapt.it*).

are not considered reliable by the Court, due to the conflict of interest allegedly faced by their authors (*i.e.* they might act as consultants for operators or companies in the sector) or the private nature of research funds, at times provided by telephone companies. As signalled by the Appeal Court of Turin: “[it is evident that] independent experts’ investigation and conclusions are more reliable than those commissioned and supported by bodies which might have an interest in the research findings [...] Moreover, it was following a dispute filed against INAIL relating to an occupational disease (*i.e.* intracranial tumour) resulting from exposure to radiofrequencies emitted by cell phones, that the Court of Last Resort highlighted that ‘the higher reliability of these studies – which are independent because they are not co-financed – further back the conclusions accepted’ (see Court of Last Resort 2012.10.12 n. 17438)”⁽⁸⁾. Yet the absence of absolute certainty in medical research on the dangers of cell phones for people’s health does not affect the legal reasoning on employee protection, since the Court does not consider the existence of a scientific law. In order to make a proper legal assessment concerning work-related risks and damage, suspicions and doubts are taken into consideration which might pave the way for further scenarios⁽⁹⁾. This way, and in line with the precautionary principle (see § 4), the Court can formulate an overall assessment concerning the possible harmfulness of the electromagnetic waves emitted by cell phones and by other devices (see § 3). Some experiments carried out on animals and independent

⁽⁸⁾ While falling outside our scientific knowledge, the following work is useful to understand how relevant research independence and neutrality are when it comes to the effects of the electromagnetic fields on people’s health: A.G. LEVIS ET AL., *Telefoni mobili e tumori alla testa: la sentenza della Corte d’Appello di Brescia – Sezione Lavoro – alla luce delle attuali conoscenze scientifiche e della legislazione in materia*, cit., p. 313, as well as the reply by Susanna Lagorio and Paolo Vecchia.

⁽⁹⁾ See A. VISCOMI, *Amianto: precauzione, prevenzione e responsabilità*, in L. MONTUSCHI, G. INSOLERA (eds.), *Il rischio amianto. Questioni sulla responsabilità civile e penale*, Bononia University Press, 2006, p. 54.

studies – without alternative risk factors and considering certain circumstances related to age and type of exposure – seem to confirm a sufficient degree of certainty when identifying the causal link ⁽¹⁰⁾ which is used to assess the legal consequences of this state of affairs (e.g. social security benefits that result, following the outset of an occupational disease). The Court usually refers to this situation as a ‘relative risk’ – i.e. an increase in the risk factor determined by the exposure to the allegedly pathogenic element – using the expression “more likely than not” ⁽¹¹⁾. When dealing with the causal link in cases of co-causality and multi-factorial events – which represents today’s situation also because of the spread of degenerative and neoplastic diseases resulting from ever-present risk factors ⁽¹²⁾ – legal causality and the probative dimension are interconnected. In this way, “they appear to arise from the same cause, namely an investigation method which is used for specific cases where a logical reasoning cannot be applied” ⁽¹³⁾. Therefore, it is possible to consider the causal link on the basis of surveys documented by epidemiological studies related to the effects of exposure to electromagnetic fields produced by cell phones. This should be done by

⁽¹⁰⁾ See Court of Last Resort No. 17438/2012, cit., and other previous decisions on the same issue. In the literature, cf. L. ROMEO, *Nesso di causalità nelle malattie multifattoriali*, in RIMP, 2016, No. 2, I, p. 322.

⁽¹¹⁾ Cf. Court of Last Resort 27 April 2004, No. 2073, in RGL, 2005, No. 1, II, and the comment by G. SACCONI, *La prova del nesso di causalità nelle malattie multifattoriali: l'importanza del criterio epidemiologico*. For the evolution of the notion of causality with special reference to the link between individual and general causality, cf. A. FIORI, *La causalità nelle malattie professionali*, in INAIL, VI *Convegno nazionale di medicina legale previdenziale. Atti*, 2006, Vol. I, pp. 36 and 42-50, where reference is made to the assessment based on the inductive method and other criteria. Cf. also C. SFERRA, *Confronto tra malattia professionale non tabellata e malattia comune*, in RIMP, 2010, No. 2, I, pp. 479-483, and G. MANCA, *Assalti e difese ai bastioni della causalità scientifica nei contributi più recenti di dottrina e giurisprudenza*, in RCP, 2013, No. 2.

⁽¹²⁾ See A. DE MATTEIS, *La prova della malattia multifattoriale. L'equivoco continua*, in RIMP, 2014, No. 3, I, p. 583.

⁽¹³⁾ See A. VARVARESSOS, *op. cit.*, p. 1559.

taking into account the peculiarity of each case ⁽¹⁴⁾, even though medical science has not defined and shared the existence of a scientific law ⁽¹⁵⁾. The Appeal Court of Turin, which based its decision on the case law of the Court of Last Resort (*cf.*, *ex multis*, Ruling 10 April 2018, No. 8773) found that “when dealing with a ‘non-listed’ occupational disease which might arise from different factors, the work-related dimension of such disease must be proven by the worker. This can be done in terms of reasonable certainty. In other words, after ruling out the mere possibility of its work-related origins, this dimension can be established if a high degree of probability exists”. This is based on the findings supplied by the worker and the consultants appointed by the Court (*cf.* Court of Last Resort No. 17438/2012, *cit.*, and Court of Florence No. 391/2017, *cit.*), also in consideration of the duties performed by workers, the disease type and degree of exposure. As clarified by the Court of Last Resort (Ruling 24 November 2015, No. 23951), “in the event of a disease featuring multifactorial aetiology – *e.g.* cancer – the causal link between the disease and work cannot be simply presumed considering theoretically-sound hypotheses, but it must be demonstrated. This can also be done taking into account its ‘qualified probability’, which needs to be assessed considering additional aspects through which technical consultants’ assumptions might be turned into legal certainties”. Barring the possibility of the work-related nature of the disease (Court of Last Resort 10 February 2011, No. 3227), this can be done when certain elements do not justify, in terms of probability, an exclusion of the causal link between exposure to electromagnetic fields and

⁽¹⁴⁾ *Idem*, p. 1560.

⁽¹⁵⁾ See Court of Last Resort No. 9893/2000; Court of Modena No. 1430/2004; Court of Venice No. 441/2008; Court of Last Resort, Criminal Division, No. 33285/2008; Appeal Court of Milan No. 2168/2009; Court of Last Resort No. 23676/2009; Court of Last Resort, Plenary Session, No. 581/2008; Court of Last Resort No. 15991/2011; Court of Last Resort No. 3227/2011.

the onset of disease. Some degree of ‘reasonable certainty’ is sufficient to establish legal causality, granting workers disability benefits (see Court of Last Resort No. 17438/2012, cit.). On this point, “it is not about comparing the results of a study on a sample of clinical cases related to the pathology at hand. Rather, it is about considering valid – even with respect to further studies – those with evaluative variables, which are relevant and allow a logical demonstration on the basis of a simple comparison with the risk index used in the field” (16). In consideration of the views of the Court of Florence (Ruling No. 391/2017, cit.), it should also be highlighted that “the phone which is used for personal reasons – while not being the exclusive cause of the disease – would not rule out the causal link with work. This is so because case law applies the provisions contained in art. 41 of the Penal Code, according to which all events contributing to the disease are taken into account, unless this link is affected by a more relevant factor that gives rise to the disease in its own right” (see Court of Last Resort 19 June 2014, No. 13954, and Court of Last Resort 9 September 2005, No. 17959, which are also referred to by the Court of Florence).

3. A Framework Featuring Major Shortcomings and Marked by Uncertain Connections between Science and Law

The insights developed so far generate a number of legal problems. One of them is the choice to refer to a consultant who plays a major role when the Court has to consider the existence of legal causality. The fact that the Court is called upon to make a final decision about the issue – after considering scientific evi-

(16) In relation to Court of Last Resort No. 17438/2012, cit., see A. VARVARESSOS, *op. cit.*, p. 1564. See also N. COGGIOLA, *Il giudice e la statistica: attività lavorative, esposizione all'amianto ed asbestosi ovvero quando il numero di morti e malati fa la prova nel processo*, in *GI*, 2005, No. 6, pp. 1172-1176.

dence and the opinion of legal consultants from both parties – is an aspect that has received attention among legal scholars and those in charge of legal proceedings.

The recent developments in scientific knowledge and the implementation of new technologies at work which increase the risk of work-related accidents and diseases make one wonder if judges can be the ‘true gatekeepers’ of the reliability of technical knowledge and carry out scientific assessments, particularly considering their education (17). While this approach might “appear reasonable as long as the technical issues are simple and understandable even to a ‘layman’ like the judge”, today, doubts arise about the advisability of tasking someone lacking medical-scientific skills with deciding over complex issues. “How can we believe that a judge, who perhaps before the trial had never even heard of epidemiology [...], can acquire such skills enabling him to rationally settle the dispute between experts from the parties?” (18). However, issues such as 1) the validity of judges’ current selection and training process 2) the criteria for verifying the qualifications and the ‘neutrality’ of the court-appointed consultant 3) the scope for entrusting individuals with specialized skills with providing medical evaluations that are binding for the judge fall outside the objectives of this paper (19).

(17) In relation to this terminology, see L. MASERA, *Giudice e perito nel processo penale: spunti per un dibattito*, in *Epidemiologia & Prevenzione*, 2005, No. 5-6, p. 305.

(18) *Ibidem*. See also M. TARUFFO, *Le prove scientifiche nella recente esperienza statunitense*, in *RTDPC*, 1996, No. 1, and E. SALOMONE, *Sulla motivazione con riferimento alla consulenza tecnica d’ufficio*, *idem*, 2002, n. 3, p. 1026. Divergent views are expressed by B. RADOS, P. GIANNINI, *La consulenza tecnica nel processo civile*, Giuffrè, 2013, p. 41. See also M. BOVE, *Il sapere tecnico nel processo civile*, in *RDP*, 2011, No. 6.

(19) In relation to the three issues referred to above, mention should be made of the opportunity to combine a three-year university degree in medicine with a specialization in the legal field, or vice versa. See the proposal by L. ENRIQUES, *Come si forma un avvocato*, in *Lavoce.info*, 26 September 2013. See

In relation the views of the Court outlined thus far – which appear to be well established ⁽²⁰⁾ – another issue should be stressed that has received little attention among legal scholars: the lack of a national database containing all decisions, even those handed down by the Court of Last Resort. As pointed out by a source operating in the medical field ⁽²¹⁾, legal scholars’ perception of case law is affected by a communication problem. Specifically, “the media has reported only news related to decisions arguing in favour of the existence of the causal link, though frequently the Courts have handed down rulings supporting the reverse view”. An awareness of the different positions taken by the Courts might give people an overall view of the problem under consideration. In other words, “the spread of news related only to decisions arguing in favour of a causal nexus between EMF exposure and cancer gives rise to a situation similar to what in academia is called ‘publication bias’, which makes one hypothesis more likely because it seems to be the only possible one” ⁽²²⁾. Indeed, empirical research based on the fragmentary information available in medical literature ⁽²³⁾ points to the existence

also R. RIVERSO, *Dalla tutela del lavoratore alla tutela della persona. Il profilo oggettivo*, in *RIMP*, 2015, n. 3, I, esp. p. 416. The A. recalls that “art. 202 of the 1965 Consolidated Text on Health and Safety provides for training, which has never been implemented, paid by Inail for the judiciary in relation to work-related injuries”. As for the expertise of court-appointed professionals (an issue that has been pointed out by Tribunal of Como Ord. 30 November 2001), cf. R. ZANETTI, *Il sapere scientifico in tribunale*, in *Epidemiologia & Prevenzione*, 2005, No. 5-6, G. TRENTA, *Competenze e professionalità nelle consulenze d’ufficio in tribunale*, in *La Medicina del Lavoro*, 2011, No. 2, pp. 163-166, and F. GOBBA, A. MODENESE, G. ZANOTTI, *op. cit.*, esp. p. 138. The AA. criticize some rulings examined in the previous paragraph because the conclusions made by the court-appointed experts move away from the prevailing views of EU case law. As for the advisability to entrust third parties with the task of making medical evaluations, see L. MASERA, *op. cit.*, p. 306.

⁽²⁰⁾ See C. PAOLINI, *op. cit.*, p. 1285.

⁽²¹⁾ See F. GOBBA, A. MODENESE, G. ZANOTTI, *op. cit.*, p. 138.

⁽²²⁾ *Ibidem*.

⁽²³⁾ See R. MOCCALDI, A. POLICHETTI, *op. cit.*

of previous Court decisions providing different views than those emerging in labour law debate, the latter being the only ones reported in labour law research. This state of affairs is sufficient to cast doubt on the existence of a one-sided position of the Court and to bring to the fore the relevance of court-appointed experts and their adherence to some stances related to the links between the exposure to EMFs produced by cell phones and the onset of cancer, which might change depending on the sector and work performed ⁽²⁴⁾. Furthermore, the decisions of the Courts make no reference to most cancers that might be work-related, to other ‘non-listed’ occupational diseases which might be related to EMF exposure or to some behavioural problems which might affect workers’ wellbeing ⁽²⁵⁾. The medical literature ⁽²⁶⁾ has also referred to EMF ‘hypersensitivity’ ⁽²⁷⁾ that affects a limited share of the population causing different effects. The most frequent symptoms include itching and burning sensation, fatigue, tiredness, insomnia, nausea, headaches, heart palpitations, and digestive disorders. French case law has dealt with these issues, with reference to a worker exposed to EM waves emitted by an isotopic mass spectrometer. For the first time, the Administrative Court of Cergy-Pontoise, France (Ruling 17 January 2019, No. 1608265) has acknowledged that this amounted to an occupational disease. What seems to be important – especially considering the causal link between the exposure of EMFs produced by cell phones and the onset of cancer – are the rulings which do not appear in the repertoire of Italian case law, *i.e.* those handed down by the Court of Cremona and the Court of Milan.

⁽²⁴⁾ See INAIL, *Tumori professionali: analisi per comparti economici*, 2019.

⁽²⁵⁾ An overview of specialised literature is provided in F. GOBBA, A. MODENESE, G. ZANOTTI, *op. cit.*, p. 135.

⁽²⁶⁾ See M. GRECO, *Inquinamento elettromagnetico e salute fra controversie, ricerca indipendente ed associazionismo. Il caso del movimento degli elettrosensibili*, in *EtnoAntropologia*, 2016, No. 2.

⁽²⁷⁾ See WORLD HEALTH ORGANIZATION, *Campi elettromagnetici e salute pubblica. Impersensibilità ai campi magnetici*, 2005, promemoria No. 296.

The one by the Court of Cremona (Ruling 10 April 2015, No. 39) is important because it makes use of a medical methodology for recognizing the causal link, based on a consequential assessment of causality conducted through the “probability of causation” which needs established evidence, namely scientific and statistical probability ⁽²⁸⁾.

This also explains the attempt of the worker’s defense to challenge the designation of the two experts. They were known to adopt the foregoing methodology, which rejects the existence of scientific evidence supporting the causal nexus between the use of cell phones and the emergence of cancer (*i.e.* the parotid gland in this case). The lawyers’ request was turned down by the Courts (Ordinance of 28 April 2014), but this aspect further underlines the relevance of court-appointed experts and their scientific convictions. This holds particularly true if one considers the 40-page report submitted by them for this specific case ⁽²⁹⁾.

Another aspect of interest is the reference made to Ruling handed down by the Appeal Court of Brescia (No. 361/2009, *cit.*). In keeping with the readings provided by the court-appointed experts, that ruling was not considered as relevant by the Court of Cremona. Firstly because, it is a decision issued prior to the evaluation released by the International Agency for Research on Cancer (IARC) in 2011 ⁽³⁰⁾. The Agency “has classified the electromagnetic fields emitted by mobile phones as ‘possibly carcinogenic for human beings’ (Group 2B, IARC’s classification system), rather than ‘carcinogenic agents for men’ (Group 1, IARC’s classification system) or ‘likely to be carcinogenic agents’ (Group 2A of the IARC classification system)”. As is known, Group 2B includes “agents for which there is little evidence of carcinogenicity in humans and insufficient evidence of carcino-

⁽²⁸⁾ See R. MOCCALDI, A. POLICHETTI, *op. cit.*, p. 5.

⁽²⁹⁾ See in detail R. MOCCALDI, A. POLICHETTI, *op. cit.*

⁽³⁰⁾ IARC, *Non-ionizing radiation, Part 2: Radiofrequency electromagnetic fields*, 2013, p. 419 (available *open access* in *salus.adapt.it*).

genicity in experiments made on animals”⁽³¹⁾. Secondly because, “evaluating causality requires that the detrimental nature of the event be demonstrated through scientific evidence, which shall be sought more in the scientific literature than in case law”. In other words, according to the Court of Cremona “in order to argue for the existence of a causal nexus between the use of mobile phones and the tumour of the parotid gland, the scientific literature should provide consolidated evidence that the use of mobile phones might cause this tumour (*i.e.* general evaluation of the causal link and detrimental nature of the event)”. The Court of Milan (Ruling 31 July 2018, No. 959) expressed the same view on a worker operating as a project manager and then as a sales manager, who made prolonged use of a mobile phone. In this case too, reference was made to IARC’s classification system, which is regarded as “the most comprehensive and authoritative study in the scientific literature on the causal link between EMF exposure and the onset of cancer”. Also in this case, the Court first rejected the worker’s request to challenge the court-appointed expert (Ordinance of 18 July 2017) and then regarded the Ruling issued by the Court of Ivrea (No. 96/2017, *cit.*) as not relevant, which argued the contrary. The worker referred to the latter one, assuming that the causal link between exposure to EMFs generated by cell phones and the emergence of brain neoplasia was yet to be demonstrated. But the Court stated that “there was no probable connection between the two factors, irrespective of the degree of the exposure”. Consequently, the worker was not granted the allowance allocated by Inail in the event of a work-related disease. These decisions have not yet entered the labour law debate dealing with the issues discussed here. However, they are sufficient to cast doubt on the existence of a shared view in case law on this topic. Furthermore, they seem to constitute the tip of the iceberg in relation to discussions concerning risk situations generated by EMF exposure,

⁽³¹⁾ *Idem*, p. 30.

which are starting to be dealt with in Court ⁽³²⁾. The Appeal Court of Perugia (Ruling 9 January 2012, No. 473) was another landmark decision. On that occasion, the Court denied the existence of a causal link between the EMFs generated by the antenna for receiving radiofrequency signals and the cancer diagnosed to a worker previously operating in two telephone companies, who died subsequently. In the Court's view, there are no "studies demonstrating that tumours in the nasal area might originate from exposure to radiofrequencies". In the case in question "half of the cases reported in the world involve people who – for occupational reasons – have inhaled dust originated from wood and, to a lesser extent, leather. Furthermore, workers operating in the textile sector, those tasked with smelting and welding metals, and workers exposed to nickel, chromium and formaldehyde dusts are also considered at risk. On the contrary, the oncogenic nature of tobacco smoke has not been clearly demonstrated". In short, "as pointed out by the court-appointed expert, there is no scientific evidence that exposure to electromagnetic waves can cause neoplasms (*i.e.* the carcinoma to the ethmoid bone in this case) which affected the claimant's spouse, causing her death". In the same vein, mention should be made of the Court of Last Resort (Ord. 11 July 2019, No. 18701), which ruled out the link between the neoplasia diagnosed to an Enel worker and his exposure to EMFs or to oil containing PCB. Following the investigation and the report of the court-appointed expert, the Appeal Court of Reggio Calabria (Ruling 8 January 2014) had already ruled out that EMF exposure was such to cause the liver disease or the bone marrow aplasia leading to the tongue neoplasm which provoked his death. Confirming the ruling of the Appeal Court, the Court of Last Resort stated that "this Court is not required to justify the reasons for accepting the conclusions of the expert when no counter-arguments are put forward by the parties or when they are not

⁽³²⁾ See G. CAMPURRA, *Il rischio da campi elettromagnetici negli ambienti di lavoro*, Ipsosa, 2008.

specifically addressed. If the latter, the Court can recognize those conclusions as justified by the investigations carried out by the expert and the explanations contained in their report (*cf.*, *ex plurimis*, Court of Last Resort No. 1660 of 2014; No. 25862 of 2011; No. 10688 of 2008; No. 4797 of 2007; No. 26694 of 2006; No. 10668 of 2005). However, the flawed nature of the ruling based on the expert's conclusions – which is reported in the final stage of the judicial process – can only be acknowledged when deviating from the current medical notions. In this case, the source shall be indicated, as shall the omissions resulting from the further investigations according to which the medical notions referred to should be considered when formulating a proper diagnosis. Otherwise, censure constitutes mere diagnostic dissent, which translates into an inadmissible criticism to the Court's views (*cf.* *ex multis* Court of Last Resort No. 1652 of 2012; No. 569 of 2011; No. 9988 of 2009)". The Court of Last Resort confirms the arguments made by the Appeal Court of Turin: "in the event of a disease – *e.g.* cancer – which can be attributed to several factors, the causal link cannot be based on assumptions made on technical hypotheses which are theoretically possible. Rather, such link must be demonstrated in a specific way, highlighting how exposure has led to the onset of the disease (see Court of Last Resort No. 23653 of 2016). For this reason, the 'qualified probability' must be demonstrated, so that a probable assumption can translate into legal certainty (*cf.* Court of Last Resort No. 9057 of 2004 and, more recently, Court of Last Resort No. 10097 of 2015; Court of Last Resort No. 13814 of 2017)". In the summing-up, the court-appointed experts provide two opposing views to the Appeal Court of Turin and the Appeal Court of Reggio Calabria, which are key when assessing the causal link.

Two other decisions – which are yet to be published – handed down by the Court of Verona and the Court of Monza confirm the divergence between scientific and legal analysis. In these cases, the acknowledgment of the causal link between EMF expo-

sure and cancer is still based on the expert's opinion and the literature review provided by them. The case dealt with by the Court of Verona (Ruling 7 June 2017, No. 293) concerned a worker in a wastewater purification system, who performed monitoring activities in an underground room containing cables and transformers that generated low-frequency EMFs. According to the ruling, it is the expert who, following "a medical-legal investigation, [...] comes to the conclusion that a causal link exists between exposure to low frequency electromagnetic fields (non-ionizing radiations) and the onset of the disease. [...] According to the expert, it is not scientifically proven that the disease would not develop by reducing the exposure to non-ionizing radiations. However – and depending on one's clinical and working history – it is possible that the applicant contracted the disease after years of exposure. Besides being shared by the Court, the causal link leads one to assume that the relationship between the disease and the work carried out is fully proven, as in this case a minimum degree of overlapping is required (unlike a criminal investigation concerning the employer's responsibility)".

The Court of Verona is aware that the research carried out so far "does not establish a certain link, but only a possible one". Therefore, it might be the case that "exposure to non-ionizing radiations determines the onset of serious diseases". The Court concludes that "the next step implies examining the claimant's occupational exposure and clinical history. And it is the expert's report, along with documentary and statistical evidence, that helps us to understand whether the claimant's arguments can be accepted".

The Court of Monza came to the same conclusions in Ruling of 13 March 2019, No. 56. The case dealt with a ramp agent operating at the Linate and Malpensa airports who coordinated loading, unloading and refuelling operations, so he was exposed to a number of high-frequency devices (radio communication tools,

weather and satellite antennas and other equipment) and other electromagnetic waves, generated by GSM mobile phones and personal computers, among others. Following the court-appointed expert's report, which was conducted considering IARC's classification of radiofrequency electromagnetic radiations and other risk factors, the Courts established that no other main agents could be identified causing the worker's acoustic neurinoma. While acknowledging the challenge related to linking RF exposure to the onset of a tumour, the Courts accepted the expert's report, making reference to the previous decision of the Appeal Court of Brescia (Ruling No. 361/2009, cit.). In doing so, it was considered that a relation exists between the acoustic neurinoma diagnosed to the worker and his work activity. For this reason, Inail was required to grant the worker the benefits awarded in the event of an occupational disease.

4. Work-Related Changes and the Risks Arising from the Use of Technology: New Challenges for Employee Protection

The analysis carried out so far on the uncertain position of case law concerning the existence of a causal link between EMF exposure and the onset of an occupational disease are a further confirmation that Italian labour lags behind in relation to the risks arising from technological devices, which go beyond the use of mobile phones at work. With reference to new work environments, co-working spaces and remote work, no reflection has been made in the context of labour law ⁽³³⁾ concerning the impact of 5G, WiFi networks, and the use of brain interfaces ⁽³⁴⁾

⁽³³⁾ An exception is the report realized by N. STACEY *ET AL.*, *Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025*, EU-OSHA, 2018, p. 55.

⁽³⁴⁾ See the *Rapporto indipendente sui campi elettromagnetici e diffusione del 5G* of September 2019, promoted by ISDE and European Consumers, and the

on workers' health and safety. Yet there is one lesson that can be learned from the review of case law conducted in this paper: it is important to engage in a dialogue between medical research, administrative bodies and legal authorities concerning the risks arising from EMF exposure. This way, the drafting of regulatory standards and its concrete implementation on work organisation will take place as soon as possible, also in relation to medical surveillance ⁽³⁵⁾. We should rethink the legal theory of risk and the concept of 'business risk' considering the Fourth Industrial Revolution, drawing on Calabresi's approach on law and economics ⁽³⁶⁾. This is because of the increasingly intertwined relationships between the producer, the employer and worker-producer, especially in relation to the legal and contractual issues, which also concern public health. These issues go beyond producers' civil liability ⁽³⁷⁾ and pose challenges related to risk assessment and the introduction of more stringent obligations to inform about the risks connected to the use of certain technologies at work ⁽³⁸⁾. This perspective questions the traditional legal approach (*i.e.* compensation) and the relevance of the provisions contained in Directive 2013/35/EU of 26 June 2013 (recently transposed into Italian law by Legislative Decree No. 159/2016). This does not concern the standards laid down in terms of exposure limits and action levels ⁽³⁹⁾, as they are conceived and de-

Appeal for 5G Moratorium – Scientists and doctors warn of potential serious health effects of 5G of 13 September 2017.

⁽³⁵⁾ See M. BELLIA ET AL. (eds.), *Linee Guida AIRM. Sorveglianza medica dei lavoratori esposti a radiazioni ionizzanti*, Ipsoa, 2013.

⁽³⁶⁾ G. CALABRESI, *The Costs of Accidents*, Yale University Press, 1970, esp. pp. 24-26 and 301-308, where social justice is emphasised.

⁽³⁷⁾ See L. LEROUGE, *Réflexions juridiques autour du rapport «Santé au travail: vers un système simplifié pour une prévention renforcée»*, in *DS*, 2019, No. 2.

⁽³⁸⁾ See the report on *Safety and Liability Implications of Artificial Intelligence, the Internet of Things and Robotics*, cit.

⁽³⁹⁾ We do not have the necessary expertise to comment on this aspect. For more information, see A. VISCOMI, *op. cit.*, pp. 46-47. See also U. BECK, *La*

veloped with reference to traditional work contexts and risk assessment. Furthermore, it is about moving away from mere compensation resulting from dangerous activities that workers are involved in, which also feature the organizational models imposed by the Fourth Industrial Revolution. This approach is clearly outlined in our Constitution and in relevant legislation ⁽⁴⁰⁾. However, it is important to provide workers with cross-cutting skills, *i.e.* technical and vocational skills to manage new risks ⁽⁴¹⁾ while striking a balance between legal provisions and people's behaviour at work. This should take place considering innovation, technological development, and precaution when dealing with tools, the effects of which are still uncertain in relation to workers' health and safety ⁽⁴²⁾. Drawing on the past, this means applying the wealth of knowledge developed when drafting legal rules and case law related to asbestos to the risks resulting from unknown technological tools. This is so because "the unknown risks can be prevented, if the system is up and running and the employer fully complies with OHS rules using their judgment", particularly in the context of the current industrial revolution ⁽⁴³⁾.

società del rischio. Verso una nuova modernità, Carocci, 2013, pp. 84-92, where reference is made to "the scam of the maximum thresholds".

⁽⁴⁰⁾ See R. RIVERSO, *op. cit.*, p. 413, and also S. GIUBBONI, G. LUDOVICO, A. ROSSI, *op. cit.*, pp. 23-24.

⁽⁴¹⁾ See the criticisms levelled by L. BIAZZI, *La nuova direttiva di radioprotezione e il punto di vista dell'esperto qualificato nella sua applicazione in campo industriale, sanitario e di ricerca*, in S. GOLDONI ET AL. (eds.), *op. cit.*, esp. p. 26.

⁽⁴²⁾ See E. PATRIZI, *Il principio di precauzione nella società del rischio*, tesi di dottorato, Università degli Studi di Macerata, 2014, *passim* and chap. II, § 2.5 (available *open access* in salus.adapt.it).

⁽⁴³⁾ See L. MONTUSCHI, *Il rischio amianto: quale tutela? Introduzione al dialogo*, in L. MONTUSCHI, G. INSOLERA (eds.), *op. cit.*, p. 10, and P. TULLINI, *op. cit.*, p. 455.

5. Case Law ⁽⁴⁴⁾

Court of Last Resort Ord. 11 July 2019, No. 18701

Appeal Court of Turin 13 January 2020, No. 904

Court of Monza 13 March 2019, No. 56

Court of Milan 31 July 2018, No. 959

Court of Florence 24 June 2017, No. 391

Court of Verona 7 June 2017, No. 293

Court of Ivrea 30 March 2017, No. 96

Court of Cremona 10 April 2015, No. 39

Administrative Court of Cergy-Pontois (France) 17 January 2019, No. 1608265

⁽⁴⁴⁾ Available in *Boll. ADAPT*, 2020, n. 14.

Chapter VI.

PSYCHOSOCIAL RISKS: LESSONS FROM THE PAST

1. Are Psychosocial Risks a New Phenomenon?

Psychosocial risks are largely considered ⁽¹⁾ an emerging issue in the context of workers' health and safety and relevant legislation. The dangers affecting workers' psychological wellbeing and mental health are the result of new working conditions, which in turn derive from technological innovation, *e.g.* digitalisation of production, flexible organisational models and working arrangements, working time porosity, the opportunity to work remotely, the use of digital platforms and other tools enabling one to control work ⁽²⁾. According to a survey conducted by Eurofound ⁽³⁾, some 40 million workers in Europe – out of a working population of around 332 million – are affected by pathologies linked to psychosocial risks arising from “interactions between and among work environments, job contents, organizational conditions and workers' capacities, needs, culture, personal extra-job considerations that may, through perceptions and

⁽¹⁾ See I. WILLIAMS JIMÉNEZ, *Emerging psychosocial risks and their regulatory dimensions: an international perspective*, Programa de Doctorado en Derecho, Universidad Carlos III de Madrid, 2019, *passim* and p. 31, where he argues that “the world of work and how occupational safety and health will be transformed are some of the key issues that policymakers are currently focusing on and will have to focus on in the near future”.

⁽²⁾ *Idem*, p. 6. Also see *supra*, chap. I, part I, and the part V of this research.

⁽³⁾ See A. PARENT-THIRION *ET AL.*, *6th European Working Conditions Survey. Overview report*, Eurofound, 2017, p. 10.

experience, influence health, work performance and job satisfaction” (4). The relevant literature regards psychosocial risks as a relatively new phenomenon (5), which includes aspects like “job insecurity, work intensification and high demands at work, and violence, harassment, and bullying, with high exposure rates in services and for (young) women. Additionally, work-life balance may be considered a risk that appears to be specific to working women». Significantly, scholars refer to these issues as ‘a labour-related problem’ in the context of which ‘workplace psychosocial risks play a major role in many European countries” (6). At the institutional level, the EU-OSHA has stressed that “an emerging occupational safety and health risk is any occupational risk that is new or is increasing. By ‘new’ is meant that: the risk did not previously exist and is caused by new processes, new technologies, new types of workplaces, or social or organisational change; or, a long-standing issue is newly considered as a risk due to a change in social or public perception (e.g. stress, bullying); or, new scientific knowledge allows a longstanding issue to be identified as a risk” (7). The EU-OSHA has provided a preliminary classification of emerging psychosocial risks, which are ordered according to their relevance (8). The first risk relates to

(4) See ILO, *Psychosocial factors at work: Recognition and control*, Report of the Joint ILO/WHO Committee on Occupational Health, 1984, 9th Session, p. 5 (also available in *salus.adapt.it*, entry *Risks/Occupational Risks/Psycho-social Risks/Risk Assessment*).

(5) See I. WILLIAMS JIMÉNEZ, *op. cit.*, p. 18.

(6) See C.-E. TRIOMPHE, *Les RPS, révélateurs des ambiguïtés et de l'essoufflement de l'édifice social européens*, in G.G. BALANDI ET AL., *Organisational and Psychosocial Risks in Labour Law. A Comparative Analysis*, Working Paper Olympus, 2012, No. 14, p. 3.

(7) See EU-OSHA, *European Survey of Enterprises on New and Emerging Risks. Managing safety and health at work*, European Risk Observatory Report, 2010, p. 17 (also available in *salus.adapt.it*, entry *Safety, Prevention and Inclusion Technologies/Big Data/Privacy*).

(8) See EU-OSHA, *Expert forecast on emerging psychosocial risks related to occupational safety and health*, European Risk Observatory Report, 2007, No. 5, pp. 7-10 (also available in *salus.adapt.it*, entry *Risks/Occupational Risks/Psycho-social*

new forms of employment contracts and job security, which concern less employment protection due to the weakening of traditional safeguards, and the insecurity linked to the possibility of finding a new job in the future. Next comes the vulnerability of the workforce, which is provided by inadequate means of protection in the globalized labour market. Reference is also made to the new work organization models, which are evolving in order to work without having to comply with time and space constraints. Mention is also made of insecurity regarding one's employment and the aging of the workforce, together with longer working hours and higher workloads. Further risks concern outsourcing, emotional involvement in the workplace (emotional labour) and the struggle to strike a balance between work and family life. Undoubtedly, the issue is now receiving growing attention, also because the difficult working conditions imposed by Covid-19 ⁽⁹⁾. Working remotely has increased workers' exposure to specific psychosocial risks – e.g. isolation, the increasingly blurred boundary between work and family life, domestic violence, work-related stress – which add to the feeling of insecurity surrounding their jobs (*i.e.* job loss or decreased remuneration). According to the data contained in a recent report ⁽¹⁰⁾, the number of workers reporting mental health issues last year due

Risks/Risk Assessment). On the impact of psychosocial risks on workers' individual wellbeing, see EUROFOUND, EU-OSHA, *Psychosocial risks in Europe. Prevalence and strategies for prevention*, 2014 (also available in *salus.adapt.it*, entry *Risks/Occupational Risks/Psycho-social Risks/Risk Assessment*); EU-OSHA, *Calculating the cost of work-related stress and psychosocial risks*, European Risk Observatory Literature Review, 2014; D. AHRENDT ET AL., *Living, working and Covid-19*, Eurofound, 2020.

⁽⁹⁾ Cf. ILO, *Managing work-related psychosocial risks during the COVID-19 pandemic*, 2020 (also available in *salus.adapt.it*, entry *Risks/Occupational Risks/Psycho-social Risks/Risk Assessment*).

⁽¹⁰⁾ Cf. ASANA, *Anatomy of work index 2021. Overcoming disruption in a distributed world*, 2021. In October 2020, quantitative research was conducted to see how people spent their time at work, dealing with administrative and bureaucratic tasks, and their workload. The research involved 13,123 knowledge workers around the world from many companies.

to chronic stress experienced in the workplace increased from 5% to 18%. Some 70% of respondents out of a total of more than 13,000 knowledge workers argued that they had experienced burnout at least once in 2020. This was mainly due to an excessive workload or a lack of clarity about tasks and roles or hyper-connectivity. For this reason, experts concluded that the impact on mental health when adopting new working conditions to contain Covid-19 will be more significant than that on physical health. If we look at the amount of literature on the First Industrial Revolution, we see that risk factors concerning workers' wellbeing and mental health are a feature of modern industrialized societies, so they were prompted neither by technological developments nor demographic and environmental changes. Marx, Weil and Durkheim elaborated concepts like 'alienation', 'commodification' and 'abstract work' which can be used to interpret reality, not only from an economic standpoint, but in terms of societal and individual wellbeing. These are concepts that refer to a specific historical and cultural context, yet they can be used to examine contemporary society. An example is Marx's concept of 'alienation' concerning the poor working conditions in the 19th century, which can also be used to refer to the technological revolution and its main issues. The same holds true for disconnection and working time porosity. For example, in the first Industrial Revolution, Dahrendorf talked of 12-hour working days and 7-day working weeks ⁽¹¹⁾, during which the work-life balance was a foreign concept. Consequently, this paper draws on the insights of some thinkers investigating capitalism and use them to interpret those risks that are erroneously regarded as emerging ones. This way, it would also be possible to make up for the shortcomings of the current legislative system when managing psychosocial risks. As the literature and the lessons from the past suggest, the way we conceive work depends on each society and historical period. Psychosocial risks

⁽¹¹⁾ See R. DAHRENDORF, *Per un nuovo liberalismo*, Laterza, 1988, pp. 163-164.

are addressed mostly in legal terms ⁽¹²⁾. As the legal framework is regarded as the main tool for ensuring psychophysical wellbeing, the national and international literature ⁽¹³⁾ has examined the regulatory mechanisms applied to traditional risks, to see if they can also be implemented in the near future. The result was that the current provisions are not suitable for protecting the health of workers as they mostly focus on physical issues. One reason for underestimating psychosocial problems ⁽¹⁴⁾ is that they vary. While physical hazards can be easily detected, thanks to technical and safety standards governing them, psychosocial risks are more difficult to assess ⁽¹⁵⁾. Furthermore, psychosocial factors are perceived as not producing obvious and immediate health damage. In this sense, they take longer to affect individual wellbeing. If psychosocial risks were addressed from an anthropological perspective – *i.e.* the relationship between individuals and work – and not from a legal perspective, as is the case among occupational doctors and psychologists, it would be possible to envisage alternative solutions to the problem focusing on the value of work in society. This would help to overcome the economic view ⁽¹⁶⁾ affecting people's behaviour in produc-

⁽¹²⁾ Occupational safety has been the subject of European regulatory intervention, *e.g.* legally binding legislative measures for Member States (see M. PERUZZI, *The prevention of psychosocial risks in European Union law*, in G.G. BALANDI ET AL., *op. cit.*).

⁽¹³⁾ Williams Jiménez's review of the literature shows that working conditions can be improved to promote effective systems for preventing psychosocial risks, especially through social dialogue. See also L. LEROUGE, *Les risques psychosociaux, une analyse juridique comparée entre le Nord et le Sud de l'Europe*, in G.G. BALANDI ET AL., *op. cit.*, and the part V of this research.

⁽¹⁴⁾ See I. WILLIAMS JIMÉNEZ, *op. cit.*, p. 31. See also L. LEROUGE, *op. cit.*, p. 37.

⁽¹⁵⁾ See L. LEROUGE, *op. cit.*, p. 37.

⁽¹⁶⁾ See H. MARCUSE, *On the Philosophical Foundation of the Concept of Labor in Economics*, in *Telos*, 1973, No. 16. The A. pursues the philosophical re-foundation of labour going beyond the economic perspective, in order to create links between political economy and philosophy, following Marx's teachings.

tive organizations and in the labour market. In order to do so, it is necessary to review the notion of 'health' and 'work'. Medical and relevant institutions – e.g. the WHO – look at the notion of health in a more inclusive way, that of 'work' which is still linked to the First Industrial Revolution. Until 1948, the concept of 'health' had negative connotations, e.g. the absence of diseases that affect the psychophysical functioning of the person. In 1948, the WHO established, looking at health as a “state of complete physical, mental and social well-being and not merely as the absence of disease or infirmity” (17). This is a broad version of the term, which includes factors that can directly affect workers' physical and psychological integrity. The WHO's definition of health is similar to that supplied by the 1986 Ottawa Charter for Health Promotion, in which it is stated that “Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical mental and social wellbeing, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment” (18). Against this background, the assessment of physical and mental wellbeing also has a collective dimension, given that health is seen as a social issue (19). This semantic evolution takes on considerable relevance in the context of psychosocial risks, which include all those discomforts that affect the activity of workers, who are now seen as members of organisations and networks. Recent studies (20) have suggested moving on from the lexical and conceptual distinction between work-related accidents and occupational diseases. An example of this is Italy's Consolidated

(17) Constitution of the World Health Organization, 1946, p. 1.

(18) Ottawa Charter for Health Promotion, 1986, p. 1. Cf. M.C. NUSSBAUM, A. SEN (eds.), *The Quality of Life*, 1993, Oxford University Press, pp. 30-31.

(19) See L. LEROUGE, *op. cit.*, p. 55.

(20) See D. RODRIGUEZ, *Sulla necessità di superare le nozioni disgiunte di infortunio sul lavoro e di malattia professionale. Verso una concezione unitaria di malattia da lavoro*, in RIMP, 2015, No. 3, I.

Act on OHS, which has reviewed the OHS terminology adopted in 1965. This distinction ⁽²¹⁾ would generate distortions when assessing those pathologies which are covered by insurance policies, giving rise to differences when evaluating work-related accidents and occupational diseases. The wording ‘occupational illnesses or pathology’ ⁽²²⁾ has been put forward which should include both situations. The notion of ‘work’ has not evolved like that of ‘health’. This concept was developed during the industrial period and merely refers to ‘abstract work’ ⁽²³⁾, to use Marx’s words, namely economic activity exchange. The economic and social changes brought about by the Fourth Industrial Revolution challenges this paradigm of work, which draws on the economic literature. In the last decades, priority has been given to salaried employment and its distinction from self-employment. Meanwhile, new working arrangements have emerged, *e.g.* non-productive work or work that does not have market value (*e.g.* domestic work), which require one to move away from the notion of ‘productive work’ as understood in the Nineteenth and Twentieth century. The aim should be to provide work with some degree of dignity, acknowledging that it is an aspect of people’s life leading to freedom. Some studies suggest going beyond the concept of GDP and adopting that of equitable and sustainable wellbeing (BES) ⁽²⁴⁾, in order to define work as an aspect that can also meet social issues, *e.g.* those generating by psychosocial risks. With reference to psychosocial risks, the conclusion is that rather than the health and safety protection systems, it is the idea of work that is passé. Regarded as productive activity and exchange, work generates psychologi-

⁽²¹⁾ *Ibidem*. While ‘illness’ indicates a sort of biological alteration, ‘injury’ refers to an event that is unrelated to biological alterations taking place afterwards.

⁽²²⁾ *Idem*, p. 45.

⁽²³⁾ See M. TIRABOSCHI, *Persona e lavoro tra tutele e mercato. Per una nuova ontologia del lavoro*, ADAPT University Press, 2019.

⁽²⁴⁾ ISTAT, *Rapporto BES 2020. Il benessere equo e sostenibile in Italia*, 2021.

cal subordination, causing mental issues that the current regulatory systems cannot deal with, because they are modelled on the industrial period. Rather than being considered as a consequence of technological evolution and social and organizational changes, psychosocial risks should lead us to regard health in the context of physical and mental wellbeing, while work should be seen as a peculiar activity of the human being.

2. Work and Social Pathologies: Learning from the Past

While the idea of ‘health’ has been further elaborated in order to refer to the physical and psychological wellbeing of people operating in a collective dimension, the meaning of ‘work’ is still based on capitalism ⁽²⁵⁾, as it only expresses a productive dimension. While recognizing the role of many thinkers in contributing to this economic definition ⁽²⁶⁾, in the context of this paper reference will be made to the insights contained in Marx’s *Capital*. Nineteenth and twentieth century industrialism embraces the Marxist theory of value: ‘work’ and Marx’s ‘exchange value’ overlap, being the latter the amount of work needed for a specific commodity ⁽²⁷⁾. The modern conception of work attrib-

⁽²⁵⁾ A. GORZ, *Metamorfosi del lavoro. Critica della ragione economica*, Bollati-Boringhieri, 1992, p. 21. This consideration is contained in the first chapter of the text, which concerns the ‘invention of work’. The A. points out that “until [...] the eighteenth century, the word ‘work’ had referred to the activity of servants who produced both consumer goods and services necessary to life, which required ongoing work. Conversely, artisans who manufactured durable items did not ‘work’ but they ‘operated’, so they could use the ‘labour’ of other men to perform less qualified tasks” (p. 24). Arendt also makes this distinction between ‘labour’ and ‘work’ in *Vita activa*.

⁽²⁶⁾ See A. SMITH, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776), It. trad. *La ricchezza delle nazioni*, Utet, 1975, and D. RICARDO, *On the Principles of Political Economy and Taxation* (1817), It. trad. *Principi di economia politica e dell’imposta*, Utet, 1947.

⁽²⁷⁾ Marx speaks of ‘use value’ and ‘exchange value’. ‘Use value’ refers to the value the good takes on for the individual who uses it, so it depends on con-

utes to workers' 'labour power' the value of 'exchange goods', so it goes beyond workers themselves (28). Objectified, abstract human work – Marx's labour power – must be contained in a good in order to have exchange value. Because of the modern abstraction of this contractually defined exchange, work becomes an abstract item which is traded on the labour market like a commodity, thus devoid of any human and relational implications. Referring to the idea of 'exchange value' – *i.e.* without its anthropological value – the modern notion of 'work' is just an abstract idea made of a set of human activities generating economic value (29). This is done neglecting the worker's personal dimension, which can be seen in the way they carry out work and develop skills. This way, the objectification of work emerges, which results from the progressive separation between the man who works, his body and time, his ambitions and desires, which began in the Roman era and developed with modernity (30). As Marx argued, "The continuation of this relationship [that

sumption (K. MARX, *Das Kapital* (1867), It. trad *Il capitale*, Utet, 1974). On the contrary, 'exchange value' represents the degree of exchangeability of two commodities.

(28) The objectification of work draws on the conceptual distinction between 'work' and the 'body' that takes place in the early Middle Ages. The *operae* can be objectified thanks to people who distance themselves from the *operae*. The law recognizes the worker's obligatory relationship on their *operae*. See V. BAVARO, *Il tempo nel contratto di lavoro subordinato. Critica sulla de-oggettivazione del tempo-lavoro*, Cacucci, 2008, pp. 27-29.

(29) See H. MARCUSE, *op. cit.* The A. argues for the need to provide a philosophical foundation to the concept of work, stressing that "the economic concept of labour has decisively influenced the conception of the essence of labour in general - including labour outside the economic sphere" (p. 9). The economic approach to the concept of labour has affected what is to be understood as work, up to the point of recognizing as labour only economically defined activities, without considering productive activities (*e.g.* arts).

(30) *Cf.* V. BAVARO, *op. cit.* In the first chapter, *Sull'ontologia giuridica del lavoro e del suo tempo*, the A. looks at the evolution of the legal relationship between work, body and time – featuring the bound between the slave and his master – which then evolved into human labour, moving on from slavery to wage labour.

between the worker and the owner of money, or the capitalist] requires that the owner of labour power always sells it only for a certain time. Otherwise, he sells himself, so he is transformed from a free man into a slave, from someone owing goods into a commodity” (31). Selling a commodity for a limited period of time – until work is performed – is the first element helping us to distinguish between ‘slavery’ and ‘free work’. There is a correlation between the concept of work as ‘property’ and its objectification as a ‘commodity’, which is exchanged on the market. Accordingly, it is necessary to define a unit of measurement with which work can be assessed (the labour power) which is the element exchanged between the worker and the employer. Working time is another feature of capitalism and can be found in Marx’s theory of value, though today working hours can be affected by new ways of working and the use of technology. Working time has been used as a tool to calculate labour power as a defined amount which can be marketed in the context of the relationship between the parties. The labour market as understood now – which was established at the end of the nineteenth century – is based on time. In other words, the worker gives the capitalist their labour power for a certain amount of time (32). This labour power is then measured through the employment contract considering the time unit (33). Marx insists on the freedom of those owning labour power, understood as an opportunity to use their own labour force as a commodity without interference, but also as the lack of other tools for engaging in work (34). Examining Marx’s *Capital*, it was Gorz who referred

(31) See K. MARX, *op. cit.*, p. 209.

(32) The contractual theory of free labour implies a ‘certain time’ – “for a certain time” as Locke puts it – which can be pre-established and determined. Otherwise, slavery might arise, preventing man from exercising his freedom.

(33) Cf. V. BAVARO, *op. cit.*, pp. 36-39.

(34) Describing the essential conditions for the capitalist to find the labour power as a commodity on the market, Marx points out that “the possessor of money must find on the commodity market the free worker. He must be

to the “realm of freedom” beyond productive labour ⁽³⁵⁾. As stressed by Marx, “the kingdom of freedom begins where the work determined by necessity and external purposes ends. It is therefore by its nature beyond the sphere of material production [...]. Beyond it begins the development of human capabilities, which is an end in itself, the true realm of freedom” ⁽³⁶⁾. According to Marx, meaning and personal fulfilment can be achieved only in free time, as people at work experience only exploitation to the point of feeling ‘alienated’ ⁽³⁷⁾. Work is aimed at satisfying the conditions necessary for survival and sustenance of the individual and his family. Therefore, it is not conceived as an opportunity for self-realization. Coherently to the abstract idea of work, modern industrialism elaborates the Taylorist

free in the sense that he can use their power, though he has no other commodity to sell” (K. MARX, *op. cit.*, p. 209).

⁽³⁵⁾ See A. GORZ, *op. cit.*, p. 23. Gorz argues that work as an activity aimed at satisfying vital needs was considered an occupation that excluded those engaging in it (e.g. slaves) from participation in public life and from the exercise of freedom. In Greece’s *polis*, family life – within which most working and productive activities took place – was determined by the need of subsistence and reproduction. Only in the public sphere was it possible to experience freedom. Gorz argues that Marx did not ascribe to the dimension of freedom the productive activities aimed at sustaining the necessities of life. He points out the substantial difference between work in Greek *polis* (carried out at home) and in capitalist society (developed in the public sphere).

⁽³⁶⁾ See K. MARX, *Il capitale*, Einaudi, 1975, Libro III, chap. 48, p. 1102.

⁽³⁷⁾ See K. MARX, *Ökonomisch-philosophische Manuskripte aus dem Jahre 1844* (1932), It. trad. *Manoscritti economico-filosofici del 1844*, Einaudi, 2004, p. 71. The *Manuscripts* have popularised the Marxist concept of ‘alienated labour’, arising from the product of labour, the act of production and from labour itself. In relation to the second form of alienation, Marx argues that it consists “in the fact that work is external to the worker, that is, it does not belong to his being, and therefore in his work he does not affirm himself but denies himself, he feels unsatisfied” (*idem*). Contrary to what was argued by Hegel in relation to the servant/master relationship in the famous *Phenomenology of Spirit* (1807), Marx believes that the worker can feel in harmony with himself outside work, while at work he would feel “outside himself”.

model ⁽³⁸⁾ based on the technical division of production ⁽³⁹⁾ and the productive cycle, which is separated into some elementary activities carried out by specialized workers. This allows for the rationalization of physical efforts, total control over production, as well as the optimization and overall increase in efficiency. The final good is ensured by the assembly line, in the context of which the worker is nothing but a cog. The plant was then broken down and then reunified according to the techniques of production organisation ⁽⁴⁰⁾. Between the 19th and 20th century, the factory became the place where subordination ⁽⁴¹⁾ and the division of labour produced the first examples of industrial mass

⁽³⁸⁾ See F. SEGHEZZI, *La nuova grande trasformazione. Lavoro e persona nella quarta rivoluzione industriale*, ADAPT University Press, 2017, pp. 30-31.

⁽³⁹⁾ Aristotle too investigated the division of labour. However, it was Adam Smith who identified the division of labour as a tool to promote productivity in his *An Inquiry into the Nature and Causes of the Wealth of Nations*. Durkheim argued that “The division of labour is a generalized phenomenon who can be noticed by everyone. We can no longer have any illusions about the tendencies of modern industry, which is moving towards the use of powerful mechanisms, forces and capital, and consequently towards an extreme division of labour. Within the factories the separation and specialization of occupations proceed endlessly” (É. DURKHEIM, *La divisione del lavoro sociale*, Il Saggiatore, 2016, p. 67).

⁽⁴⁰⁾ See F. SEGHEZZI, *op. cit.*, p. 58.

⁽⁴¹⁾ See F. SEGHEZZI, *op. cit.*, who argues that within certain limits identified by the contract, which protects the worker from misconduct, the entrepreneur can use workers in their working time, depending on the organization of work. The contract as an instrument of subordination makes it possible to define a hierarchical system whereby the worker follows the employer’s instructions. An anthropological implication also emerges in this context. This state of affairs is both a form of protection for the worker, though the exchange with the employer constitutes an unequal exchange if Taylorism is considered. An analogy also arises with slavery: if slavery is about using another person, without this dynamic being sanctioned by an exchange and a contract. Similarly, subordination is concerned with using certain potentialities of a person, in the form of wage labour, by virtue of an agreement between two parties.

production ⁽⁴²⁾. Human work is subject to a process of modification turning it into a productive factor ⁽⁴³⁾ to which market laws apply while the salaried worker is deprived of his humanity ⁽⁴⁴⁾, bending to technology and production. It is against this backdrop that, at the start of the 1930s, Weil, worked as a metalworker with other women in French factories and experienced “work dehumanization” ⁽⁴⁵⁾. Weil’s attention is on modern slavery, which determines the condition of the worker, whereby the employer owns the factory, equipment as well as working time. In this sense, “the subordinate merely plays the role of a thing manipulated by the intelligence of others” ⁽⁴⁶⁾. This progressive annihilation ⁽⁴⁷⁾ of the working class is based on the division of labour which leads the worker to “re-nounce thought” ⁽⁴⁸⁾. From a capitalistic perspective, Fordism allowed the rationalization of the physical efforts of the workforce, ensuring total control over the progress and pace of production, at the detriment of a separation between work and its human contribution ⁽⁴⁹⁾. In addition to following instructions,

⁽⁴²⁾ *Idem*, p. 43.

⁽⁴³⁾ *Idem*, p. 35: “labour becomes a factor of production like any other, and this results in the subordination to those who govern the expertise and possess the means of production”.

⁽⁴⁴⁾ See A. GORZ, *op. cit.*

⁽⁴⁵⁾ See A. SUPLOT, *Il pensiero giuridico di Simone Weil*, in *RGL*, 2011, No. 3, I, p. 606.

⁽⁴⁶⁾ S. WEIL, *Lettre à un ingénieur* (1936), in S. WEIL, *La condition ouvrière*, It. trad. *La condizione operaia*, Edizioni di Comunità, 1980, p. 205.

⁽⁴⁷⁾ As pointed out by Weil in the *Réflexions sur les causes de la liberté et de l’oppression sociale* (1955), It. trad. *Riflessioni sulle cause della libertà e dell’oppressione sociale*, Adelphi 1983, p. 17, “Our entire civilization is based on specialization, which implies the subjugation of those who execute to those who coordinate”.

⁽⁴⁸⁾ See A. SUPLOT, *op. cit.*, p. 607.

⁽⁴⁹⁾ See F. SEGHEZZI, *L’uomo fordista tra economia e società. Appunti per una rilettura eretica di Gramsci*, in E. DAGNINO, F. NESPOLI, F. SEGHEZZI (eds.), *La nuova grande trasformazione del lavoro. Lavoro futuro: analisi e proposte dei ricercatori ADAPT*, ADAPT University Press, 2017.

the worker also risks alienation when performing a task which does not need an active approach, leading to emotional and spiritual detachment ⁽⁵⁰⁾. During Fordism, salaried workers perform a series of tasks “without being interested in them and without understanding them” ⁽⁵¹⁾. This is so because they are part of a longer and more complex process of which they fail to understand the meaning and purpose. In time, these operations become automatic, up to a point in which they are similar to mechanical activities, turning the individual into a ‘machine’ ⁽⁵²⁾. He “is no longer the living cell of a living organism [...], but only an inert mechanism started by an external component that always moves in the same direction and in the same way” ⁽⁵³⁾. What is performed is an abstract scheme that indicates automatic and repeatable movements ⁽⁵⁴⁾, without considering personality and hampering involvement. Specialization on a single task prevents the development of human faculties. When performing a task which is part of a larger process, the worker misses the value of his contribution. The alienating nature of this production emerges, as the worker does not own the final product and does not control the process. While artisan work ⁽⁵⁵⁾ reversed the relationship between material execution and decision-making au-

⁽⁵⁰⁾ See K. MARX, *Manoscritti economico-filosofici del 1844*, cit., pp. 71-72.

⁽⁵¹⁾ See É. DURKHEIM, *op. cit.*, p. 35.

⁽⁵²⁾ *Ibidem*.

⁽⁵³⁾ *Ibidem*. According to S. WEIL, *Riflessioni sulle cause della libertà e dell'oppressione sociale*, cit., p. 110, “Technological progress and mass production give workers a passive role; they perform work without conceiving the link with the final result”.

⁽⁵⁴⁾ See S. WEIL, *Riflessioni sulle cause della libertà e dell'oppressione sociale*, cit., pp. 86-87: “We are facing a paradoxical situation, *i.e.* the work method can be seen in the physical movements but cannot be conceived by the worker. Since the thought that has elaborated a method is not involved in execution, such execution can be performed by machines rather than living members. So machines know this procedure so well that they give the impression that they are the ones who think, while men are like automatons”.

⁽⁵⁵⁾ Cf. R. SENNET, *L'uomo artigiano*, Feltrinelli, 2008.

tonomy, Fordism separates these two dimensions ⁽⁵⁶⁾, with the first concerning manual labour and the second becoming a feature of intellectual work. The subordination of the salaried worker in the Fordist factory is to be understood not only in contractual terms, but also in existential terms. The machine features the “instrumental character of dependent work, in relation to the production outcome and the working tool” ⁽⁵⁷⁾. The entrepreneur governs the worker’s expertise, which is available to him as “a means for the achievement of goals” ⁽⁵⁸⁾. We can therefore understand how, in Fordism, the capitalist embodies the concept of *Beruf* ⁽⁵⁹⁾, *i.e.* as a profession ⁽⁶⁰⁾ and a vocation ⁽⁶¹⁾. While the subordinate perceives “the matter, the tool, the body, his own soul as means for manufacturing” ⁽⁶²⁾, the entrepreneur bends the instrumentality of the technique to his own will, adapting it to each purpose, according to the possibilities offered by the worker’s intellectual work. In manual labour, the relational dimension is lost, as it is limited to the assembly line.

⁽⁵⁶⁾ See G. VARDARO, *Tecnica, tecnologia e ideologia della tecnica nel diritto del lavoro*, in *PD*, 1986, No. 1. The paper looks at the historical-political links between technological evolution and labour law developments. It is precisely the modern notion of technology as a simple instrument for human need satisfaction that underpins the division of labour into 1) the notion of work as *Beruf*, 2) the notion of work as a dependent worker. The distinction between intellectual and manual work will also be found in the dichotomy between entrepreneurship and labour.

⁽⁵⁷⁾ *Idem*, p. 82.

⁽⁵⁸⁾ *Idem*, p. 80.

⁽⁵⁹⁾ The German word *Beruf* – ‘calling’ in English – can be translated both as ‘work’ and as ‘vocation’, so a religious sense emerges – that of performing a duty – which dates back to the Middle Ages. With reference to its Calvinist interpretation, the term has been investigated by Weber in his *The Protestant Ethic and the Spirit of Capitalism* (It. trad. *L’etica protestante e lo spirito del capitalismo*, Rizzoli, 2014). The salvific significance of work, which stems from understanding the profession as the result of a divine vocation, has then been developed in capitalist civilization.

⁽⁶⁰⁾ See M. WEBER, *Il lavoro intellettuale come professione*, Einaudi, 1966.

⁽⁶¹⁾ See M. WEBER, *L’etica protestante e lo spirito del capitalismo*, cit.

⁽⁶²⁾ See S. WEIL, *La condizione operaia*, cit., p. 275.

This clearly annihilates relations, being them the result of productive needs. Ultimately, industrialism has modelled a rationalized society inspired by the functioning of the factory, in which the technical function dominates the individual: the subjugation of the worker to the machine in the factory corresponds to that of the citizen to the bureaucratic apparatus⁽⁶³⁾. In this context, “work is no longer performed with the idea of being useful, but with the humiliating feeling of benefitting from a privilege granted by fate, a privilege from which many human beings are excluded”⁽⁶⁴⁾. Weil’s words are still relevant: work has been deprived of its formative and hedonistic dimension, and is no longer recognized as an opportunity for development and personal fulfilment. Therefore, it is no longer work that shapes man, but man who performs and undergoes a job. The tool to deal with this degeneration is to place the individual centre-stage, making work the expression of individual’s free thought and free action.

3. The IV Industrial Revolution and the Individual Dimension of Work

Whether understood as a technological revolution or as a phenomenon that includes radical social, cultural and economic transformations, the IV Industrial Revolution features some degree of discontinuity with the industrialist paradigm. From a

⁽⁶³⁾ See G. GAETA, *Nota* to S. WEIL, *Riflessioni sulle cause della libertà e dell’oppressione sociale*, cit., pp. 146-147. Weil develops his considerations on the distinctive feature of societies marked by oppression during the rise of German and Italian totalitarianism. On p. 119, she writes: “it seems clear that contemporary mankind tends towards a totalitarian form of social organization, to use the term that has become fashionable thanks to the National Socialists. In other words, there is a tendency towards a regime in which State power would decide”.

⁽⁶⁴⁾ See S. WEIL, *Riflessioni sulle cause della libertà e dell’oppressione sociale*, cit., p. 11.

technological point of view, the new production processes aimed at mass customization, together with the digitization of tasks and the risk of ‘dehumanization’⁽⁶⁵⁾, can help place the individual centre-stage by promoting their integrity. The individual dimension of the worker is gaining momentum, especially because of the attempt to fulfil the desire for increasingly customised products in line with the consumer’s needs. In examining the link between technology and work, the former appears as a tool for the creativity and intelligence of the latter. The same needs seem to emerge in terms of professionals. One example is the robot coordinator⁽⁶⁶⁾, who monitors the functioning of automatized components and steps in if something goes wrong. They need complementary skills, *i.e.* knowledge of the details of production processes and the management of human resources in emergency situations⁽⁶⁷⁾. In turn, the resources involved in replacing machines in these situations must possess a different adaptability from that of a worker who only performs one task. Industry 4.0 is an example of those environments in which decision-making requires experience⁽⁶⁸⁾. However, there are at least two other elements that seem to confirm the centrality of human work. Firstly, there is a need for constant contact between the company and the outside world, both in the relationship

⁽⁶⁵⁾ These risks also exist with the digitization of work. See U. HUWS, *Labor in the Global Digital Economy. The Cybertariat Comes of Age*, Monthly Review Press, 2014.

⁽⁶⁶⁾ Cf. M. LORENZ ET AL., *Man and Machine in Industry 4.0. How Will Technology Transform the Industrial Workforce Through 2025?*, Boston Consulting Group, 2015, p. 12.

⁽⁶⁷⁾ For an overview of the notion of ‘skills’ and its conceptualisation, see E. MASSAGLI, *Alternanza formativa e apprendistato in Italia e in Europa*, Studium, 2016, pp. 16-41.

⁽⁶⁸⁾ See S. PFEIFFER, A. SUPHAN, *The Labouring Capacity Index: Living Labouring Capacity and Experience as Resources on the Road to Industry 4.0*, Universität Hohenheim Working Paper, 2015, No. 2; S. PFEIFFER, *Robots, Industry 4.0 and Humans, or Why Assembly Work Is More than Routine Work*, in *Societies*, 2016, Vol. 6, No. 2.

with the consumer and with the entire supply chain. The second component concerns the full digitalisation of production processes, through the connection between physical environments via the network. This would mean that ordinary and planned tasks would no longer be necessary as they would be replaced by those of automated processes. The role of the worker therefore would be to unify his specialised and personal skills. In this way, one of the possible issues of the approach outlined above would be dealt with, *i.e.* the risk of generating a reduction in mobility due to the relevance of the expertise gained. This individual capacity would develop and adapt through the contribution of the technical skills required by each task. This vision of work seems to mark a difference from that of Fordism, when the worker was considered according to the labour power he could guarantee. Complex production systems can generate reductions in the overall workforce, though they require a different consideration of the worker's potential. However, there is no empirical evidence on the applicability of this approach in a context of total digitization. The changed relationship between man and machine, as well as that between the different factors of production (*i.e.* capital and labour) determines a rethinking of the basic categories of labour law – *e.g.* 'subordination' and 'enterprise' – and of the relationships between the contracting parties. If an increasing number of tasks can be carried out without the necessity of a place of work and working time, the modalities of control are reduced. But this would risk nullifying the benefits in terms of productivity and autonomy of an effective paradigm shift. The potential consequences introduced by the technologies affects the foundations of subordination. And this not only because "the fulfilment of work cannot be understood and legally configured as a merely individual behaviour and, therefore, attributable to worker" ⁽⁶⁹⁾, when performed in collaboration with

⁽⁶⁹⁾ See P. TULLINI, *La digitalizzazione del lavoro, la produzione intelligente e il controllo tecnologico nell'impresa*, in P. TULLINI (ed.), *Web e lavoro. Profili evolutivi e di tutela*, Giappichelli, 2017, p. 8.

‘intelligent’ technologies. The reason for this is that it is difficult to identify those who possess the means of production in a digitized context. It emerges how the function of subordination as a legitimation for control seems to fade for two reasons. The first concerns the greater autonomy and responsibility of the worker. Secondly, it would seem that subordination may prove to be a limitation to the work processes enabled by Industry 4.0. It is precisely the complexity and the role of the worker that could find obstacles in the limits imposed by Aristotle’s units. It is therefore possible to consider further elements that indicate how subjectivity can gain fresh momentum, prioritising the individual with his wealth of skills. In particular, the rethinking ⁽⁷⁰⁾ of the labour market has been given priority, whereby occupational transitions are more relevant than in the past. In a productive context that is changing, career stability faces a crisis and so does its linearity. Therefore, a group of workers emerge who seek to anticipate various stages and phases of their careers, in relation to the skills and expertise companies can provide them with. These needs would be frustrated by a welfare system that provides protections aimed at reducing transitions and ensuring long-standing work relationships. Yet it would be good to provide workers with tools in terms of skills portability ⁽⁷¹⁾. The social pact that was made in Fordism between the state and the class of workers is now being challenged in an increasingly complex market. It is important to emphasize that this does not mean a two-way relationship between these parties, which would lead to serious difficulties for workers in the individual man-

⁽⁷⁰⁾ See G. SCHMID, *Sharing Risks of Labour Market Transitions: Towards a System of Employment Insurance*, in *BJIR*, 2015, Vol. 53, No. 1, and G. SCHMID, *Full Employment in Europe. Managing Labour Market Transitions and Risks*, Edward Elgar, 2008.

⁽⁷¹⁾ Cf. HOUSE OF COMMONS, PUBLIC ADMINISTRATION SELECT COMMITTEE, *The Big Society. Seventeenth Report of Session 2010-12*, Stationery Office Limited, 2011.

agement of their own careers. Reference is made to all those who can contribute to occupational transitions.

4. Psychosocial Risks and the IV Industrial Revolution

The reasoning carried out so far has underlined the absence of an historical analysis of the issues generated by psychosocial risks. This aspect still encourages the use of a specialised approach that is not effective in operational terms. As we argue in § 2, psychosocial pathologies arise when an economic approach to work is used ⁽⁷²⁾, which today is challenged by the IV Industrial Revolution. This idea excludes from the legal and scientific discourse the person who works, *i.e.* his subjectivity and personality ⁽⁷³⁾. In this sense, an alternative approach is put forward, which better adheres to subjectivity as described in the Fourth Industrial Revolution. The aim is to promote a new idea of work, which does not only concern protection, but freedom to work ⁽⁷⁴⁾. In order to pursue this goal, it is necessary to overcome the anthropological approach featuring Fordism, which conceives the man as animated by the need to satisfy his own natural needs ⁽⁷⁵⁾, which are given priority over their other structures. On the contrary, the ‘capability’ model ⁽⁷⁶⁾ links societal

⁽⁷²⁾ See H. MARCUSE, *op. cit.*, and M. TIRABOSCHI, *op. cit.*

⁽⁷³⁾ See S. ZAMAGNI, *Libertà del lavoro e giustizia sociale*, in *Quaderni di Economia del Lavoro*, 2016, No. 105.

⁽⁷⁴⁾ *Ibidem.*

⁽⁷⁵⁾ According to H. MARCUSE, *op. cit.*, p. 11, “The modern science of labour seeks to approach the problem of labour in its full complexity. However, whenever it goes beyond the economic dimension, it undertakes this task on a natural and biological basis”.

⁽⁷⁶⁾ It was Amartya Sen who developed the notion of ‘capabilities’, understood as “a process of expanding the real freedoms that people enjoy” (A. SEN, *Lo sviluppo è libertà. Perché non c’è crescita senza democrazia*, Mondadori, 2000, p. 9). In labour law research, see B. CARUSO, *Occupabilità, formazione e «capability» nei modelli giuridici di regolazione dei mercati del lavoro*, in *DLRI*, 2007, No. 113, and R. DEL PUNTA, *Labour Law and the Capability Approach*, in

well-being and success to the substantial freedoms experienced by its members, understanding this freedom as the ability “to choose a life one gives value to” (77). Beyond the economic aspect, this approach promotes the individual dimension in relation to life and work quality. This model moves on from the concept of development intended as “a process of expanding the real freedoms that people enjoy” (78). Unlike Fordism, today’s normative question associated with work concerns the freedom of work (79). The paradigm shift promoted by the Fourth Industrial Revolution suggests that fulfilment and human happiness are no longer sought after work but while working. “Hence the urgency to elaborate a concept of ‘work’ that [...] promotes freedom (*i.e.* the freedom to choose those activities that enrich the mind and heart of those engaged)” (80). The relationship between the individual and work must be freed from its industrial conception, which has limited its dimension in terms of individual promotion (happiness and abilities). In order to understand the negative implications resulting from psychosocial risks, it is necessary to investigate work as an activity integral to the market and profit, but also as a tool for responding to urgent social needs (81). The research is concerned with a new epistemology of work as a specific human activity, which considers economic implications, while dealing with other individual interests and needs (82). The starting point could be Arendt’s *The*

IJCLLIR, 2016, Vol. 32, No. 4. *Contra*, L. MARIUCCI, *Culture e dottrine del giust-lavorismo*, in *LD*, 2016, No. 4, p. 595.

(77) See A. SEN, *op. cit.*, p. 78.

(78) *Idem*, p. 9.

(79) See S. ZAMAGNI, *op. cit.*, and G. MARI, *Diritto alla libertà del lavoro*, in *Iride*, 2002, No. 2.

(80) See S. ZAMAGNI, *op. cit.*, pp. 71-72.

(81) See M. TIRABOSCHI, *Persona e lavoro tra tutele e mercato. Per una nuova ontologia del lavoro*, *cit.*, p. 65.

(82) Cf. G. MARI, *Il grande cambiamento*, in A. CASELLATO (ed.), *Lavoro e conoscenza. Dieci anni dopo. Attualità della lectio doctoralis di Bruno Trentin a Ca' Foscari. Atti del convegno. Venezia, 6 dicembre 2012*, Firenze University Press, 2013. The

Human Condition ⁽⁸³⁾, in which it is argued that the term *vita activa* designate three fundamental human activities: labour, work and action; they are fundamental because each one corresponds to one of the basic conditions in which life on earth was given to man ⁽⁸⁴⁾. Until now, work has been represented by labour law as an activity that corresponds to the biological development of the human body ⁽⁸⁵⁾. Similarly, labour law has identified salaried work with the product of a man's hands, as distinct from the work of his body ⁽⁸⁶⁾. The industrial revolution has led these two dimensions to overlap, while work itself now refers also to services, especially if produced on an industrial scale ⁽⁸⁷⁾. There is, however, a further characterization of *vita activa*, that is, action as an activity in which man reveals himself. This is how Arendt qualifies action: "By acting and speaking men show who they are, actively revealing the uniqueness of their personal identity, and thus make their appearance in the human world. [...] This revelation of 'who' someone is, as opposed to 'what' – his qualities and abilities, his talent, which he may exhibit or keep hidden – is implicit in whatever he says or does" ⁽⁸⁸⁾. Arendt also char-

paper deals with freedom, an aspect already investigated in the same volume by B. TRENTIN, *Il lavoro e la conoscenza, Lectio Doctoralis all'Università Ca' Foscari di Venezia, 13 settembre 2002*.

⁽⁸³⁾ It. trad. *Vita activa*, Bompiani, 2017.

⁽⁸⁴⁾ *Idem*, p. 40. These three work activities and their corresponding conditions are connected with human birth and death. Arendt's proposal to distinguish between labour and work is illustrative that "every European language, ancient and modern, possesses two distinct terms for what we are inclined to regard as the same activity" (p. 106). The working activity includes all the occupations undertaken with the sole purpose of maintaining and reproducing life. On the contrary "the products ensure the permanence and durability without which a world would not be possible" (p. 116). The work of our hands, as distinguished from that of our bodies secures the means of survival that constitute his artificial world.

⁽⁸⁵⁾ See M. TIRABOSCHI, *op. cit.*, p. 75.

⁽⁸⁶⁾ *Ibidem*.

⁽⁸⁷⁾ *Ibidem*.

⁽⁸⁸⁾ See H. ARENDT, *Vita activa*, cit., pp. 197-198.

acterizes the 'action' dimension in a political sense, as an area in which it is possible to experience freedom. This idea of work could therefore help conceive it as an opportunity for self-realization. The emergence of psychosocial risks might thus be linked to the new idea of 'health' as a state of physical and mental wellbeing, originating from the consequent social and organizational changes. The challenge should be to question this new idea of work in order to respond to urgent social needs – *i.e.* those posed by psychosocial risks – and to adapt systems of health and safety protection accordingly.

Part III.

SAFETY 4.0: THE NEED FOR NEW SKILLS

Chapter I.
**THE PREVENTION SYSTEM
AND THE NEED FOR NEW SKILLS**

1. Framing the Issue

As already pointed out ⁽¹⁾, the ongoing transformation of work is concerned with the use of innovative technologies and other dynamics that will determine significant changes in organisations. Although the causal nexus between the phenomena underway is far from clear, new forms of employment can be identified as a result of emerging social needs. There also exist new organizational models that have challenged the “separation line between managers and professionals, blue-collar and white-collar workers” ⁽²⁾. ‘New jobs’ have emerged, mostly due to economic ‘tertiarization’ ⁽³⁾, which present common characteristics, *e.g.* precariousness, unstable working conditions, direct interactions with the client. While new jobs are being created, traditional ones are changing, and so are the skills needed ⁽⁴⁾. The expansion of new jobs and tasks resulting from social, econom-

⁽¹⁾ Further information is available in the previous parts of this volume.

⁽²⁾ See F. BUTERA, E. DONATI, R. CESARIA, *I lavoratori della conoscenza. Quadri, middle manager e alte professionalità tra professione e organizzazione*, Franco Angeli, 1997, p. 155.

⁽³⁾ See E. REYNERI, *Sociologia del mercato del lavoro. II. Le forme dell'occupazione*, Il Mulino, 2005; I. FELLINI, *Il terziario di consumo. Occupazione e professioni*, Carocci, 2017, pp. 17-18.

⁽⁴⁾ See E. MINARDI, *Le metamorfosi delle occupazioni e delle professioni*, in *Sociologia del Lavoro*, 2008, No. 112.

ic, cultural and political needs has accelerated the shift from traditional forms of employment to occupations in which workers' autonomy and expertise play a major role. Because of these changes, some Italian scholars ⁽⁵⁾ have outlined the obsolescence of the current prevention system, putting forward proposals for different regulations, which should promote a new health and safety culture. Some of them have highlighted the need to rethink prevention, moving from 'workplace safety' to 'workers' safety' ⁽⁶⁾ due to the changes in the way work is performed, where transitions between jobs are more frequent. In order to adopt a new health and safety system, a bottom-up participatory model has been proposed in which companies and workers become aware of the importance of all the actions that

⁽⁵⁾ See A. DELOGU, *Salute e sicurezza e "nuovi" lavori: le sfide prevenzionali nella gig economy e nell'Industria 4.0*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 2; S. NERI, *I professionisti della prevenzione nel lavoro che cambia. Il tecnico della prevenzione nell'ambiente e nei luoghi di lavoro*, in *Sociologia del Lavoro*, 2018, No. 150; M.P. CAMUSI, *Più competenze tecniche, più sicurezza del lavoro*, in *RIMP*, 2009, No. 2; P. PASCUCCI, *Note sul futuro del lavoro salubre e sicuro... e sulle norme sulla sicurezza di rider & co.*, in *Diritto della Sicurezza sul Lavoro*, 2019, No. 1; P. PASCUCCI (ed.), *Salute e Sicurezza sul lavoro. Tutele universali e nuovi strumenti regolativi a dieci anni dal d.lgs. n. 81/2008*, Franco Angeli, 2019.

⁽⁶⁾ A. DELOGU, *op. cit.*, p. 70, questions the model used to safeguard those working in the gig economy, the sharing economy or through crowd-working. He stresses the need to "move away from the concept of 'security' that focuses on the workplace, not so much because work is now performed everywhere, but because these places often lack control or are unknown by the client. So it will be essential to identify forms of protection addressing the worker rather than the workplace. More importantly, it will be necessary to lay down obligations and responsibilities with which the employer shall comply in a context clearly defining liability". P. PASCUCCI, *op. cit.*, p. 43, also puts forward a similar proposal, pointing out that the new security provisions shall consider the worker rather than the workplace. See also ADAPT, ASSOCIAZIONE AMICI DI MARCO BIAGI (eds.), *La salute della persona nelle relazioni di lavoro*, ADAPT University Press, 2019, and ADAPT, ASSOCIAZIONE AMICI DI MARCO BIAGI, *Libro bianco per un welfare della persona al tempo della Quarta rivoluzione industriale e della crisi del ceto medio*, 2017.

need to be taken ⁽⁷⁾. Faced with many non-standard forms of work, attention has been paid to aspects such as the most suitable system of protection, a new risk assessment procedure to be carried out by the employer, increased health surveillance and new training methods. The relevant literature has emphasized the need to change the current prevention system regulated by Legislative Decree No. 81/2008 in order to define new forms of protection, obligations and insurance provisions in line with new work arrangements. Some research has highlighted the need for new OHS skills, yet providing some general recommendations related to new risks which might affect workers. For example, in considering the use of new technologies, the EU-OSHA ⁽⁸⁾ has stressed the need for new skills and training. In other cases ⁽⁹⁾, scholars have focused on the importance of reviewing and expanding the roles and expertise of the professionals defined in Legislative Decree No. 81/2008 in order to manage current transformations. Based on these considerations, the research group carrying out the current project aims to provide a systematic analysis of today's OHS professionals. The research, which

⁽⁷⁾ See M.P. CAMUSI, *op. cit.*, p. 546. Here, the need is stressed to review the security system in order to enhance technical skills. The A. observes that “until now [...] safety regulations feature a ‘top-down’ approach which companies and workers might find difficult to apply and to understand. Prevention ends up being considered as the starting point for further actions, *i.e.* checks that fail to ensure safety in a plant. The ‘bottom-up’ model [...] considers the need of both companies and workers. Drawing on that, prevention and dialogue [...] are essential elements, as are those through which work is made safe”.

⁽⁸⁾ See EU-OSHA, *Foresight on new and emerging occupational safety and health risks associated with digitalization by 2025*, 2018, p. 63 (also available in *salus.adapt.it*, entry *Safety, Prevention and Inclusion Technologies/Big Data/Privacy*).

⁽⁹⁾ See P. PASCUCCI, *op. cit.*, p. 53; S. CALICCHIA ET AL., *Il ruolo del medico competente tra nuove funzioni e criticità emergenti: un'analisi qualitativa dei discorsi sulla professione*, in *Medicina del Lavoro*, 2019, No. 3; G.B. BARTOLUCCI, P. SANTANTONIO, M. CASCIANI, I. DAGAZZINI, *Ruolo e integrazione delle figure tecniche della prevenzione nella gestione aziendale*, in *Giornale Italiano di Medicina del Lavoro ed Ergonomia*, 2010, No. 4.

is further developed in the Part VI, considers two aspects. The first is that nowadays prevention relies on people's proactive approach ⁽¹⁰⁾. The second aspect is that – following the changes caused by the IV Industrial Revolution – a need arises to rethink the role of OHS practitioners, as they are still defined considering Fordism. It is therefore necessary to understand the methodology to upgrade and develop their skills. In order to respond to these questions, a comparative and interdisciplinary analysis has been carried out with a view of identifying the tools to define the skills needed by today's OHS professionals to ensure workers' protection.

2. A New Approach: Focusing on OHS Professionals

This research has employed different methodologies for identifying the current OHS professionals and the skills they need to perform their role. Initially, desk analysis has investigated the national and international literature, considering those in charge of OHS and their major shortcomings in terms of skill development. This analysis ⁽¹¹⁾ has allowed us to fill the gaps regarding the little attention paid to this professional group. Subsequently, research has focused on the identification of OHS professionals in Italy ⁽¹²⁾, using documentary analysis ⁽¹³⁾. This was done to examine the data concerning the 'professionalization' processes ⁽¹⁴⁾ developed in 'sociology of professions' and the regulatory

⁽¹⁰⁾ See S. NERI, *op. cit.*

⁽¹¹⁾ See Part VI.

⁽¹²⁾ S. NEGRI (ed.), *Competenze e nuove professionalità per la tutela della salute e sicurezza*, ADAPT University Press, 2021, Part II, Chap. I and II.

⁽¹³⁾ L. AROSIO, *L'analisi documentaria nella ricerca sociale. Metodologia e metodo dai classici a internet*, Franco Angeli, 2013, p. 15, has defined this methodology as "an approach that aims to collect information and become aware of individual and collective experiences produced by creators and users".

⁽¹⁴⁾ 'Professionalization' refers to "stages or phases undergone by all current professions before being considered as such" (S. ZAN, *Struttura e or-*

tools used to recognise and ‘institutionalise’ these new professions and their skills⁽¹⁵⁾. Finally, drawing on the results collected in the previous steps, and in order to understand the skills and expertise of OHS professionals, a survey was conducted made up of 44 questions⁽¹⁶⁾. The questionnaire was administered between December 2020 and March 2021 through a link sent out to 33 employers and professional associations. A total of 338 re-submissions were recorded from OHS professionals.

3. OHS Professionals: Some Unresolved Issues from the Relevant Literature

As mentioned above, some 150 articles, books and national and international reports were examined concerning OHS practitioners and their training, regulation, institutionalization, activities and skills. The first issue to be highlighted concerns the quality and quantity of research, which has tried to categorise the professionals operating in this field both in Italy and elsewhere, also taking into account the recent pandemic. What emerges is that little research has investigated the role of OHS professionals, all the more so because it is the literature itself⁽¹⁷⁾

ganizzazione delle professioni: una analisi critica della letteratura, in *Studi Organizzativi*, 1976, No. 2-3).

⁽¹⁵⁾ L. CASANO, *Contributo all'analisi giuridica dei mercati transizionali del lavoro*, ADAPT University Press, 2020, defines that as “qualification systems addressing professionalism”.

⁽¹⁶⁾ See S. NEGRI (ed.), *op. cit.*, Part II, Chap. III.

⁽¹⁷⁾ See A.R. HALE, G. BIANCHI, G. DUDKA, W. HAMEISTER, *Surveying the role of safety professionals: objectives, methods and early results*, in *Safety Science*, 2005, Vol. 9, No. 1, p. 3; T. REIMAN, E. PIETIKÄINEN, *The role of safety professionals in organizations – developing and testing a framework of competing safety management principles*, paper presented at the 12th International Probabilistic Safety Assessment and Management Conference – PSAM 2014, Honolulu, 22-27 June 2014; S. LEKA ET AL., *The changing landscape of OSH regulation in the UK*, IOSH Research Report, 2016, p. 89; D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *Bureaucracy*,

that highlights the need for qualitative analysis in this area. The limited number of contributions is also linked to definitional issues. In this sense, there is a lack of a shared definition about who are to be considered as OHS experts. This aspect makes it more difficult to examine aspects like OHS training and skills. Compounding the picture is the set of labels and terms used to refer to the same professionals, both between different countries⁽¹⁸⁾ and within a single country. The same problem can be found in relation to training and skills. On the one hand, there are contributions that identify the changes taking place in the world of work, without paying attention to the skills needed to strike a balance between health and safety and risks. On the other hand, some research⁽¹⁹⁾ has identified those skills that must be held by OHS experts, *e.g.* interdisciplinary and technical skills. Besides skills, another issue concerns the theoretical nature of health and safety training, which does not consider reality, being only performed to comply with legal obligations. Courses suffer from a lack of uniformity as they are organised by different bodies and organisations. This is a problem when selecting the course one wants to participate in. Because of this state of affairs, research

influence and beliefs: A literature review of the factors shaping the role of a safety professional, in *Safety Science*, 2017, vol. 98, p. 98.

⁽¹⁸⁾ See Part VI, part I.

⁽¹⁹⁾ See S. LEKA, S. KHAN, A. GRIFFITHS, *Exploring health and safety practitioners training needs in workplace health issues. Report on a study supported by IOSH development funding*, IOSH Research Report, 2008, No. 2; G.B. BARTOLUCCI, P. SANTANTONIO, M. CASCIANI, I. DAGAZZINI, *op. cit.*; S. CAROLY, *Les conditions pour mobiliser les acteurs de la prévention des TMS: construire du collectif de travail entre pairs pour développer le métier et favoriser le travail collectif pluri-professionnel. Le cas de médecins du travail*, in *Perspectives Interdisciplinaires sur le Travail et la Santé*, 2013, No. 2; E. LANEYRIE, A. LANDRY, *Prise en charge pluridisciplinaire des risques psychosociaux: un premier état des lieux auprès des médecins du travail, des inspecteurs du travail et des psychologues du travail*, *idem*, 2016, No. 1; S. COLOMBO, L.E. GOLZIO, G. BIANCHI, *The evolution of health, safety and environment related competencies in Italy: from HSE technicians, to HSE professionals and, eventually, to HSE managers*, in *Safety Science*, 2019, Vol. 118.

has stressed the need to rethink OHS training ⁽²⁰⁾. Finally, the analysis of the literature has pointed out many procedures for skill recognition and certification in OHS ⁽²¹⁾. One common feature is that a number of emerging professions in this field are looking for institutional recognition and official status.

4. The Italian Case: A Preliminary Analysis

As mentioned in the methodological note, a mapping process was conducted concerning the OHS professionals operating in Italy, in order to collect information about their professional content, recognition, as well as forms of representation to identify possible conflicts between skills and expertise ⁽²²⁾. The mapping process was conducted using two theoretical approaches. One refers to Tousijn's ⁽²³⁾ 'sociology of professions', whereby

⁽²⁰⁾ This need is stressed in all countries. See Y. KIM, J. PARK, M. PARK, *Creating a Culture of Prevention, in Occupational Safety and Health Practice, in Safety and Health at Work*, 2016, Vol. 7, No. 2; C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *Beyond Safety Training. Embedding Safety in Professional Skills*, Springer, 2018.

⁽²¹⁾ See A. HALE, H. HARVEY, *Certification of safety professionals: emerging trends of internationalization*, paper presented at the 6th International Conference of Working on Safety Network, *Towards Safety Through Advanced Solutions*, Sopot, 11-14 September 2012; A.R. HALE, D. HUDSON, P. PRYOR, *The evolution of a global, professional capability framework covering the role, contribution and status of Occupational Health and Safety (OHS) professionals: Editorial, introduction and discussion*, in *Safety Science*, 2020, Vol. 122; P. PRYOR, A.R. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, in *Safety Science*, 2019, Vol. 117.

⁽²²⁾ W. TOUSIJN, *Il concetto di professionalizzazione e la divisione del lavoro tra occupazioni*, in *Sociologia del Lavoro*, 1994, No. 53, focuses on the interaction between doctors and nurses in hospitals.

⁽²³⁾ See W. TOUSIJN, *Il sistema delle occupazioni sanitarie*, Il Mulino, 2000. The 4 stages are: a) the identification of a body of scientific or technical knowledge (shared cognitive base); b) the establishment and development of professional schools; c) the establishment and development of professional associations; d) recognition by the state.

professionalization consists of 4 events, which might lead to enter an institutionally-recognized profession. The other is concerned with the three ⁽²⁴⁾ “systems of qualification referred to professionalism” as identified by Casano ⁽²⁵⁾ in the Italian context. Because of their particularity, this analysis might not be applicable in other national contexts. Furthermore, the professionalization process proposed by Tousijn contrasts with modernity and of other ways of working which might differ from traditional professions ⁽²⁶⁾. For this reason, the scheme put forward by Casano has been used along with a modern legal analysis of ‘transitional labour markets’, through which ‘new professionals’ are investigated. The mapping process was carried out through documentary analysis – *i.e.* consulting different sources – since there is no database in Italy in which it is possible to create a uniform list of professionals operating in occupational health and safety. As it is not possible to report the work carried out in detail ⁽²⁷⁾, we will provide the main results for the benefit of all those interested in this field. The first aspect that needs stressing is that OHS professionals are not only those listed in Legislative Decree No. 81/2008 (165 OHS experts have been identified) ⁽²⁸⁾. The varied character of this professional group makes it difficult to delineate the characteristics of each profession, which is further compounded by the information asymmetry experienced by the final user. Another issue that emerged is the plurality of

⁽²⁴⁾ Industrial relations, private self-regulation with UNI standardization and the public certification of skills.

⁽²⁵⁾ See L. CASANO, *op. cit.*

⁽²⁶⁾ See L. MAESTRIPIERI, *La condizione liminale della consulenza. Racconti di lavoro tra autonomia e organizzazione*, Tesi di Dottorato, Università degli Studi di Trento, Dipartimento di Sociologia e Ricerca Sociale, 2011; L. MAESTRIPIERI, *La professionalizzazione atipica della consulenza di management: il ruolo delle associazioni e delle organizzazioni*, in *QRS*, 2017, No. 1.

⁽²⁷⁾ See S. NEGRI (ed.), *op. cit.*, Part II, Chap. II.

⁽²⁸⁾ The count could be flawed because it is not clear if in some cases we are dealing with different professions or the same title is employed to refer to the same job.

occupations featuring this group, which includes both occupational doctors and industrial hygienists. Furthermore, these specialists might be assigned different roles depending on the organization they operate in, *e.g.* workers' safety representatives. The changes taking place as a result of the IV Industrial Revolution pose questions regarding the sustainability of the system of prevention. This is so because of the separation between the roles defined in the health and safety system and the one actually performed at work could affect performance. In this sense, it will be necessary to distinguish roles in order to ensure the effectiveness of the prevention system. To identify current professions using Tousijn's approach, available training was examined, which highlighted significant differences in terms of providers, content and duration. The lack of a database collecting relevant information has led to assume that OHS training is supplied by vocational schools, training bodies operating at regional level or established by professional associations. The opportunity to choose different training schemes constitutes an advantage, though it might create discrepancies because qualifications might vary for the same job position. It would therefore be important to establish a minimum set of skills required for each position. One example of this is Italy's UNI standards and other regional requirements. However, it would be necessary to standardize the classification model at the national level to facilitate circulation and access to information. The mapping process also highlighted the role of national and company-level collective bargaining, which further specified the contents of Legislative Decree No. 81/2008, for example in relation to workers' safety representatives. In addition, collective bargaining has identified a new professional, *i.e.* the workers' representative for safety, health and the environment, who performs more tasks than those envisaged by the Consolidated Text on OHS for the worker's safety

representative (*e.g.* in terms of training, information and awareness-raising activities) ⁽²⁹⁾.

The analysis ⁽³⁰⁾ has also allowed us to note that a significant number of bodies represent OHS experts. They are:

- Associazione Nazionale Disaster Manager (Assodima);
- Associazione Insieme di Professionisti Igiene e Sicurezza (Ipis);
- Associazione Italiana Formatori e Operatori della Sicurezza sul Lavoro (Aifos);
- Associazione Italiana Formatori ed Esperti in Sicurezza sul Lavoro (Aifes);
- Associazione Nazionale Aziende e Professionisti (Anap);
- Associazione Formatori 24 (AF24);
- Associazione Tecnici Manutentori Antincendio Professionisti (Atema Pro);
- Associazione Professionale Italiana Ambiente e Sicurezza (Aias);
- Associazione Italiana Consulenti Igiene Alimentare (Aicia);
- Associazione Italiana Imprese Esperte in Sicurezza sul Lavoro e Ambiente (Aiesil);
- Associazione Italiana Professionisti della Sicurezza (Aipros);

⁽²⁹⁾ See L. CASANO, *Transizione ecologica e riqualificazione dei lavoratori: vincoli del quadro giuridico-istituzionale e prospettive evolutive nell'ottica dei mercati transizionali del lavoro*, paper presented at the seminar on-line *Trasformazioni tecnologiche, demografiche e ambientali: impatto su attori, tecniche e strumenti della regolazione del mercato del lavoro*, of 6 April 2021 (forthcoming).

⁽³⁰⁾ See the list of professional bodies managed by the Ministry of Economic Development, as laid down in art. 2, § 7, of Act No. 4/2013.

- Associazione Esperti della Prevenzione per la Tutela dell'Ambiente e della Salute (Eptas);
- Associazione Europea per la Prevenzione (Aep/Assoprevenzione);
- Associazione Italiana Esperti nel Governo dei Rischi delle Strutture Sanitarie e Sociosanitarie Pubbliche e Private (Scu-domed);
- Associazione Italiana Consulenti e Operatori della Sicurezza sul Lavoro e dei Sistemi di Gestione UNI EN ISO (Aicos);
- Unione Nazionale Sicurezza e Formazione (Unasf Conflavoro PMI);
- Unione Nazionale Italiana Professionale per la Qualità (Uniquality);
- Associazione Nazionale e Consulenti Esperti in Sicurezza nei Luoghi di Lavoro (Ances);
- Associazione Nazionale Formatori per la Sicurezza (Anfos);
- Associazione Professionisti Sicurezza e Ambiente (Asa);
- Associazione di Imprenditori e Professionisti per la Formazione Imprenditoriale e della Sicurezza sul Lavoro (Assoimprenditori);
- Associazione Professionisti (Join);
- Organismo Nazionale dei Professionisti della Sicurezza (Onaps);
- Associazione Rappresentativa Italiana Formatori ed Operatori Sicurezza sul Lavoro (Arifos);
- Associazione Italiana Software e Formazione (Aisf);
- Associazione Nazionale Consulenti e Responsabili della Sicurezza sul Lavoro (Ancors);

- Associazione Nazionale Esperti ed Addetti della Salute e Sicurezza nei Luoghi di Lavoro (Aneas).

This large number of professional associations illustrates a need for representation that is not always met by traditional trade unions. Professional associations are important in a number of ways (representation, training, skill definition, provision of certification and so on). Thus, this system of representation is highly effective, even if it is necessary to reflect on the pros and cons of multiple associations ⁽³¹⁾. In conclusion, in order to offer a summary of the main outcomes of the mapping process, five dimensions have been identified, which might contain two or three options depending on the peculiarity of each professional group:

- degree of institutional recognition (*e.g.* professions regulated by the Consolidated Act; non-regulated professions; professions regulated by UNI standards or regional regulations);
- type of professions (professions regulated in orders and registers; unregulated professional activities);
- tasks/activities/skills (overlap with other profiles);
- type of training;
- existence of a professional association.

⁽³¹⁾ On this topic, see G.P. PRANDSTRALLER, *Professioni: "terza" parte sociale*, Sapere, 2000, p. 25. He argues in favour of professional unionism which should include "a confederation of professional categories, including professional bodies and associations".

5. OHS Professionals: Empirical Research and Preliminary Results

With the aim of raising awareness on OHS professionals ⁽³²⁾ and defining training and learning objectives, we drew up a questionnaire of 6 sections and 44 questions. The questions were based on an analysis of the relevant literature, with some of them taken from the survey started by the European Network of Safety and Health Professional Organisations (ENSHPO) ⁽³³⁾, which involved several European countries. The questionnaire was administered sending the link to companies and professional associations. However, given the limited number of responses, it is not possible to make generalizations. Out of the 338 respondents, 72% were males and 28% females, confirming that OHS professions are male dominated ⁽³⁴⁾. Most respondents (99.70%) have Italian citizenship; 56.33% of them were between 45 and 59 years old, 21% were 60 and older, 13% were in the 35-44 age bracket and 9.67% were between 25 and 34. The fact that most respondents (77.33%) were 45 years and older might be due to the way the questionnaire was disseminated by companies and professional associations. It is not possible to establish whether this overrepresentation actually exists within the professional group. The most common qualification held by respondents is a secondary school diploma (high school and tech-

⁽³²⁾ Cf. J.P. KOHN, D.L. TIMMONS, M. BISESI, *Occupational health and safety professionals: who are we? What do we do?*, in *American Society of Safety Engineers*, 1991, Vol. 36, No. 1, p. 24: "When asked the question 'What do you do?' most individuals respond by providing their job title or describing their work responsibilities. As professionals in a relatively new discipline, health and safety professionals often find misconceptions when attempting to explain to the layperson their role in this field. [...] A glance at the diverse areas of competency required by the Certified Safety Professional (CSP) examination reveals a possible reason for misconception of professional responsibilities in this field".

⁽³³⁾ See A.R. HALE, G. BIANCHI, G. DUDKA, W. HAMEISTER, *op. cit.*

⁽³⁴⁾ See J.P. KOHN, D.L. TIMMONS, M. BISESI, *op. cit.*, p. 25.

nical/professional school) (29.67%); followed by a master's/specialisation degree (27.30%), a four-year degree (14.54%) and a three-year degree (10.98%). A limited share of respondents (1.48%) has a doctoral degree. If one also considers the percentages of those with a bachelor's degree or a postgraduate degree, it is evident that professions in this area require specialized/university education. In relation to occupational status, in many cases it is difficult to determine whether some professions with the same title are to be considered similar. Many respondents carry out more than one task in health and safety and this imposes a rethinking in relation to the skills needed, as well as possible analyses concerning the standard requirements for certain roles. 35.50% of respondents answered they are in charge of prevention and protection services, though at times they operate as trainers or consultants. Those in charge of prevention and protection on an exclusive basis accounted for 23.37%, while OHS trainers make up 9.47% of the total, safety and environment managers for 3.25% and the same percentage applies to workers' safety representatives. The rest of respondents works as emergency workers, employers, managers, safety and environment managers, occupational doctors, supervisors, consultants, auditors, coordinators, HSE managers, engineers, regional health and safety managers and managers for integrated safety, quality and the environment management system. Significantly, 65.98% of respondents are salaried workers, 26.92% are self-employed and 0.89% of them are quasi-subordinate workers⁽³⁵⁾. This lack of uniformity calls for the need to focus on worker's protection rather than workplace protection. As for representation, 49.55% of respondents are members of professional associations, while 50.45% are not. Aias (28.24%) and Aifos (26.47%) report the largest number of members, but many associations exist which cannot be found in the list of the Minister of Economic Development. Turning to the key results of the

⁽³⁵⁾ The missing percentages concern incomplete or incorrect questions.

survey, the questionnaire stressed the need for a skill update. Respondents regarded as important developing both specialised and cross-cutting skills. The most important management skills concern those convincing others to behave in order to achieve the objective (74.56%), assessing others' point of view (69.73%), using examples to clarify one's point of view (69.53%) and disseminating enthusiasm (63.31%). The most relevant interpersonal skills are: understanding the causes of others' attitudes and behaviours (68.25%), putting people at ease (65.88%), and understanding others' perspectives (60.53%). Fundamental operational/management skills are: identifying existing risks at work (85.71%), seeking solutions (76.33%), thinking clearly and maintaining concentration under pressure (73%), making decisions while weighing up risks (71.30%), monitoring the correct health and safety operations of co-workers (65.88%), knowing how to carry out a situational analysis by integrating data from different sources (65.58%). As far as emotional skills are concerned, more than 60% of respondents consider the following as relevant ones: keeping calm in difficult times (74.26%) and making good decisions under pressure (66.86%). A detailed analysis of these skills clearly reveals the importance of experts' relational role, as they must be aware of others' actions and thoughts. Some questions investigated respondents' self-assessment in relation to their skills. The survey indicated that they possess a number of OHS skills, *e.g.* understanding problems at work (65.98%), understanding the contents of the risk assessment document or DVR (77.81%), comparing the DVR with business practices (77.22%), expressing opinions regarding company safety policies (66.86) and identifying and managing risks (69.82%). These responses are linked to the share of participants, most of whom are workers' safety representatives. Investigating people's perception of their mastery of OHS skills, most respondents indicated that they have an average knowledge of these skills, *e.g.* community and national legal principles (58.88%), regulatory aspects of worker representation (46.15%), communication tech-

niques (52.36%) and functioning of monitoring tools (55.62%). Therefore, some considerations should be made about these professionals' skills level. They reported having an average knowledge of OHS management and legal aspects. Reportedly, respondents are well aware of the following aspects: OHS general and special legislation (56.51%), the parties involved and their obligations (69.82%), risk factor identification (68%), risk assessment (70.11%), drafting of the risk assessment document (70.12%), work environment (60%), prevention and protection measures (56.80%), OHS rules and related behaviours (65.09%), safety legislation and implementation aspects (61.83%), legislation on health, safety and the environment (60.36%) and emergency procedures (60.65%). The questionnaire also included frequency concerning a number of activities, providing respondents with 5 options for each question ⁽³⁶⁾. Considering the most-frequent activities, we can find: identifying and analysing problems (75.15%), investigating and assessing workplace risks (60%), establishing relations with parties outside the company (43.11%), discussing with employees about possible risks and safety measures (38.37%) and discussing with line managers about possible risks and safety measures (38%). Respondents also regarded a number of irrelevant activities, *e.g.* drafting company policy on insurance and compensation (76%), acting as a technical expert in lawsuits or claims (63.47%), advising the employer or employee on claims for damages or injuries (59.58%), offering first-aid training (57.49%), preparing work permits for hazardous tasks (51.80%), managing the company's firefighting team (49.40%), investigating the causes of sickness among workers (42.81%), maintaining statistics concerning sick leave (48.20%). The analysis of the questionnaires makes it clear that these professionals have different skills and are able to carry out

⁽³⁶⁾ The options included: yes, daily and monthly; yes, yearly; no, though it would be required; no, because it is not required in my role.

a number of activities ⁽³⁷⁾. The questionnaire also revealed aspects that need attention in order to improve their status and recognition. This group of professionals needs more skills than those possessed, which are not aligned to the changes taking place at work. This includes an awareness of psychosocial risks and their negative impact on work and connections between occupational health and public health, which requires cooperation between OHS experts and general practitioners. In order to ensure safer and healthier work processes, these professionals should have the ability to collaborate with other practitioners. It is also necessary to enhance interdisciplinary and technical skills in order to manage existing challenges. Training should not be provided only to comply with obligations. Rather, it should be a relevant component of work settings and OHS experts' development path. Finally, it is important to certify the skills in order to establish a national system containing all the particulars of this profession.

⁽³⁷⁾ Further information about the questionnaire is available in S. NEGRI (ed.), *op. cit.*, Part II, Chap. II.

Part IV.
**PROBLEMS AND PROSPECTS:
A JOINT DIALOGUE**

The following pages contain a summary of the interviews carried out with OHS experts, who discussed a number of aspects developed in the current research project. The aim of these interviews was to encourage debate on the results of the research among OSH specialists. All the interviews can be accessed on the YouTube channel of the DEAL Center for International and Comparative Studies of the University of Modena and Reggio Emilia (Italy).

A first set of interviews dealt with the prevention system in the Fourth Industrial Revolution. Prof Mella Mendez (Universidad de Santiago de Compostela, Spain) investigated the topic through an international and comparative perspective, while Prof Tullini (University of Bologna, Italy) considered the Italian system and its effectiveness to face these new challenges.

The second set of interviews focused on robotics, digitalization and remote work. Prof Moore (University of Leicester, UK) investigated the new potentials and risks related to AI, robotics and digitalization. Jon Messenger (ILO) examines remote work, while Prof Garben (College of Europe, Belgium) considered health and safety protection related to platform workers, while Prof Popma (Vrije Universiteit Amsterdam, the Netherlands) concentrated on the risks related to new working modes.

The interviews in the third block considered the psychosocial risks linked to the Fourth Industrial Revolution and the right to disconnect. Prof Molina Navarrete (Universidad de Jaén, Spain) examined mental health and psychological wellbeing in new work contexts, while Prof Williams Jiménez (Universidad Carlos III de Madrid, Spain) investigated psychosocial risks as a new challenge for healthcare systems.

The fourth group of interviews focused on the link between the IV Industrial Revolution and social protection. Prof Strban (University of Ljubljana, Slovenia) discussed new risks in relation to Community legislation, while Prof Bailleux (University of Lyon III, France) provided an overview of work-related accidents and occupational diseases following the use of innovative technologies. Finally, Prof Lewis (University of Cardiff, Wales) examined the efficiency of public assistance in light of these new risks.

The next set of interviews addressed the skills needed to face new risks. Prof Maggi-Germain (Université Pantheon-Sorbonne, France) dealt with skill development and promotion in the IV Industrial Revolution, while the one with Prof Tousijn (University of Turin, Italy) discussed the issues resulting from the emergence of new professions. David Clarke (Australian Institute of Health and Safety, Australia) considered training and education for OHS professionals.

The sixth group of interviews was concerned with representation and collective bargaining. Aude Cefaliello (European Trade Union Institute, Belgium) discussed the role of trade unions in terms of strategic litigation and participation. Prof Dirringer (Université de Rennes, France) focused on the negotiation of preventive measures, particularly health and safety protection at the company level.

The interview in the seventh block – which was made with Prof Luque Parra (Universitat Pompeu Fabra Barcelona, Spain) – discussed the best practices in collective bargaining related to prevention.

Finally, the eighth block addressed the possible reform of Italy's regulatory framework. In this sense, Prof Pascucci (University of Urbino Carlo Bo, Italy), Andrea Rotella (OHS consultant and trainer), Prof Natullo (University Sannio of Benevento, Italy) focused on the proposals to amend Italy's Consolidated Law on OHS. The interview with Francesco Violante (Former President of the Italian Society of Occupational Medicine) focused on the occupational doctor as an evolving profession in the light of the current transformations.

Chapter I.
**THE PREVENTION SYSTEM
IN THE IV INDUSTRIAL REVOLUTION**

**El sistema de prevención
en la IV Revolución Industrial:
una perspectiva internacional**

Lourdes Mella Méndez

La transformación tecnológica y organizativa que está afectando al mundo del trabajo ha llevado a la aparición, como también lo demuestran crónicas y debates desarrollados durante la emergencia epidemiológica, de determinadas categorías de trabajadores desprotegidos o mal protegidos desde el punto de vista de la prevención, debido a un ámbito de aplicación que todavía se ve muy afectado por la división entre trabajadores por cuenta ajena y trabajadores por cuenta propia. ¿Cuáles son, en su opinión, las perspectivas de intervención normativa para garantizar una protección adecuada también para estos trabajadores?

Ciertamente, la actual transformación tecnológica está cambiando el mundo del trabajo, especialmente las formas de trabajo. Aparecen nuevas maneras de trabajar, nuevos puestos, posibilitados por las nuevas tecnologías, como sucede con el caso paradigmático de las plataformas digitales. Aquí los

trabajadores trabajan en condiciones muy precarias, especialmente desde el punto de vista de la prevención de los riesgos laborales.

Sin duda, es un trabajo de riesgo, pues se aprecian diversos factores de riesgo, como, por ejemplo: 1) la división y fragmentación que caracteriza este tipo de trabajo de plataforma. En general, el ofrecimiento de trabajo se concreta en pequeñas tareas, específicas y de corta duración, individualmente contratadas, lo que rompe con el modelo tradicional del puesto de trabajo. Ya no se ofertan puestos de trabajo, sino tareas determinadas; no se contratan trabajadores, sino prestadores de servicios *ad hoc*. Este sistema supone una permanente lucha y tensión para obtener el trabajo.

En relación con esta última idea, otro factor de riesgo es 2) el sistema de obtención del trabajo, que resulta estresante, en cuanto *hace competir* a los trabajadores por él a través de un proceso de selección que busca la excelencia. El hecho de que *la reputación* del trabajador influya en sus condiciones laborales e, incluso, en la posibilidad de tener o no trabajo, lleva a aquel a prestar servicios en situaciones peligrosas (por ejemplo, en malas condiciones atmosféricas, o de salud). En fin, otro factor de riesgo es 3) el concreto lugar de trabajo. Así, en las *plataformas online*, aquel suele ser el propio domicilio del trabajador, pero ello no significa que sea un espacio seguro, debiendo prestarse la misma atención a este aspecto que si fuese un teletrabajador.

En el caso de los *servicios con desplazamiento físico del trabajador*, el lugar de trabajo suele ser la calle (repartidores o conductores) e, incluso, el domicilio del cliente (por ejemplo, servicios de limpieza). En el primer ejemplo, un riesgo físico muy importante a evitar son los accidentes de circulación, y, en el segundo, los de abuso personal o las situaciones de discriminación y acoso.

Frente a estos riesgos, cabe preguntarse quién protege al trabajador. Es un tema polémico e importante relacionado con

su calificación jurídica, pues esta determina su régimen jurídico y estatuto protector. Dicha calificación dependerá de las características particulares en las que se desarrolle el trabajo. No siempre claro, pues, *a priori*, se pueden hallar características típicas del trabajo autónomo y del trabajo dependiente y subordinado.

Para las plataformas, generalmente, estos prestadores de servicios son trabajadores autónomos, bien los ordinarios, bien los denominados “autónomos económicamente dependientes” (que existen en el ordenamiento español, y son una categoría intermedia entre laborales y autónomos; esto es, son autónomos con ciertos derechos laborales; Ley 20/2007, de 11 de julio, del Estatuto del trabajo autónomo), y las plataformas se consideran, a sí mismas, meras intermediarias en el mercado, no verdaderos empresarios.

En cuanto a los prestadores de servicios, se aprecia una diversidad de criterios, pero la mayoría se cree trabajador por cuenta ajena de un empresario y reclama un contrato de trabajo para quedar protegido por el Derecho del Trabajo.

En los últimos años, los investigadores han barajado *tres opciones principales* para su protección: las dos ya mencionadas (laborales o autónomos) y la última, que es una opción mixta, que apuesta por la aprobación de una normativa protectora nueva, común para todos los trabajadores (dependientes u autónomos) con un catálogo mínimo y común de derechos.

Esta opción mixta es muy interesante, y de hacerse debería tener carácter internacional. Dada la dimensión internacional de la economía de plataformas, en la que los protagonistas pueden hallarse conectados en países distintos, la aplicación de derechos nacionales, con distintos niveles de protección para trabajadores que comparten una misma situación laboral, no parece la mejor solución. Lo más idóneo es que cualquier futura regulación en la materia tenga un alcance internacional unificador.

Así las cosas, esa norma nueva unificadora podría ser una norma de la Organización Internacional del Trabajo (convenio o recomendación), o, en el ámbito europeo, lo propio es la aprobación de una Directiva específica (que podría denominarse, por ejemplo, de “condiciones laborales justas en las plataformas digitales”) que establezca una regulación general y común de carácter protector para todos los trabajadores del citado ámbito, tal y como ya ocurrió en ocasiones anteriores. En efecto, la Unión Europea ya protegió por esta vía otros supuestos de trabajo atípico, como el de a tiempo parcial (1997), el temporal (1999) o el prestado a través de las empresas de trabajo temporal (2008). Por lo tanto, una nueva regulación protectora del trabajo atípico de plataformas supondría una continuidad y adaptación a los nuevos tiempos.

Además, la Unión Europea ya mostró interés regulatorio por este tema y ya aprobó, el 2 de junio de 2016, la *Agenda Europea para la economía colaborativa* y, en junio 2017, el Parlamento Europeo aprobó una Resolución sobre una *Agenda Europea para la economía colaborativa*. Esta Resolución insta a los Estados miembros y a la Comisión, «a que, en sus respectivos ámbitos de competencia, garanticen condiciones laborales justas y una adecuada protección jurídica y social para todos los trabajadores» de esta economía, «con independencia de su estatus» (apartado 39, *in fine*).

Quizás en el futuro tengamos esa norma europea, pues, en el momento presente, la UE está realizando una 1ª fase de consultas a las partes sociales a nivel europeo sobre posibles acciones para abordar los retos del trabajo de plataformas. Dicha consulta se realiza al amparo del art. 154 Tratado de funcionamiento de la Unión Europea. Según dicho precepto, la Comisión tiene como cometido fomentar la consulta a los interlocutores sociales a nivel de la Unión y adoptar todas las disposiciones necesarias para facilitar su diálogo, velando por que ambas partes reciban un apoyo equilibrado. A tal efecto,

antes de presentar propuestas en el ámbito de la política social, la Comisión debe consultar a los interlocutores sociales sobre la posible orientación de una acción de la Unión. Si, tras dicha consulta, la Comisión estimase conveniente una acción de la Unión, volverá a consultar a los interlocutores sociales (2ª fase) sobre el contenido de la propuesta contemplada. Los interlocutores sociales remitirán a la Comisión un dictamen o, en su caso, una recomendación.

Con ocasión de las consultas, los interlocutores sociales pueden informar a la Comisión sobre su voluntad de iniciar el proceso previsto en el artículo 155 TFUE (establecimiento de relaciones convencionales, acuerdos incluidos). La duración de dicho proceso no podrá exceder de nueve meses, salvo si los interlocutores sociales afectados decidieran prolongarlo de común acuerdo con la Comisión.

ETUC: Confederación de sindicatos europeos ya ha respondido a esta consulta y dice que es necesaria una acción normativa de la UE para aclarar el tema de la calificación jurídica de estos trabajadores y poder protegerlos. Además, no ven adecuado el diálogo social para llegar a un Acuerdo Europeo en la materia (las plataformas no se consideran empresarios; dificultad para aplicar un acuerdo de naturaleza voluntaria).

Respecto de los concretos derechos que deberían formar parte de ese catálogo común y mínimo a reconocer a todos los trabajadores de plataformas, cabe pensar, por ejemplo, en los derechos individuales a: 1) ser informado adecuadamente sobre las condiciones laborales, 2) a percibir un salario mínimo, 3) a la seguridad y salud en el trabajo, 4) a la protección de datos, a la formación o protección frente al despido. 5) Asimismo, cabe plantearse posibles derechos colectivos, como los de representación, acción y negociación colectiva, e, incluso, 6) el derecho a una adecuada protección social en condiciones de igualdad.

El establecer una Garantía Laboral Universal resulta importante, pues todos los trabajadores, con independencia de su acuerdo contractual o situación laboral, deberían disfrutar de derechos fundamentales del trabajo, un salario vital adecuado (Constitución de la OIT, 1919), límites máximos respecto a las horas de trabajo y protección en relación con la seguridad y la salud en el trabajo.

Por su parte, los convenios colectivos o la legislación nacional podrían aumentar este mínimo de protección social. Esta propuesta contribuye también a que se reconozca la seguridad y la salud en el trabajo como uno de los principios y derechos fundamentales del trabajo. En fin, esta normativa común e internacional podría ser una solución ideal para proteger a los trabajadores.

De momento, esa normativa internacional común y específica se hace esperar. A nivel nacional, ¿qué hacen los Estados? En el caso español, ¿hay alguna iniciativa legislativa de interés para proteger a los trabajadores de plataformas frente a los riesgos laborales?

En España, la Sentencia del Tribunal Supremo de 25 de septiembre de 2020 (recurso casación par unificación de doctrina número de recurso: 4746/2019) se pronunció, por primera vez en unificación de doctrina en nuestro país, sobre la laboralidad de un trabajador de una plataforma digital de reparto (Glovo).

Según el TS, «desde la creación del Derecho del Trabajo hasta el momento actual, hemos asistido a una evolución del requisito de dependencia-subordinación. En la sociedad postindustrial la nota de dependencia se ha flexibilizado. Las innovaciones tecnológicas han propiciado la instauración de sistemas de control digitalizados de la prestación de servicios. La existencia de una nueva realidad productiva obliga a adaptar las notas de

dependencia y ajenidad a la realidad social del tiempo en que deben aplicarse las normas».

Partiendo de esta máxima, el Alto Tribunal analizó la relación entre la plataforma de reparto demandada y el trabajador concernido por el recurso, alcanzando la conclusión de que las facultades empresariales de dirección, organización y control de la actividad y, en tal sentido, las notas de dependencia y ajenidad pueden traducirse a la realidad de formas diferentes a las clásicas.

Con todo, podrán seguir siendo calificadas como tales, pues definen el carácter laboral de la relación, cuando la empleadora asume los riesgos de la operación y es beneficiaria de sus frutos, fija la retribución o precio, la forma de pago y las condiciones esenciales de ejecución del servicio, realiza una labor de coordinación, organización y control de la prestación y ostenta la potestad sancionadora. Todo ello, aunque sus prerrogativas se manifiesten de forma indirecta o implícita, a través de la *gestión algorítmica o de una aplicación informática*, de las condiciones de trabajo o del servicio prestado al consumidor o consumidora final.

Tras esa importante Sentencia del Tribunal Supremo, en marzo de 2021 se aprobó, en el marco del diálogo social, la denominada *Iniciativa legislativa para proteger a los trabajadores de plataforma: Acuerdo de la Mesa de Diálogo Social (Gobierno, sindicatos y patronal): Laboralización de riders y seguimiento de las plataformas digitales en el ámbito laboral*.

Los contenidos del Acuerdo, que se integrarán en un futuro *Real Decreto-Ley contra la huida del Derecho del Trabajo a través de las plataformas digitales de reparto*, son los siguientes:

1. Artículo único. Modificación del Texto Refundido de la Ley del Estatuto de los Trabajadores. Se introduce una nueva Disposición adicional vigesimotercera (23ª) en el ET con el siguiente contenido:

Disposición adicional vigesimotercera. Presunción de laboralidad en el ámbito de las plataformas digitales de reparto: ejercicio implícito o indirecto de las facultades empresariales.

Se presume incluida en el ámbito de esta ley (el Estatuto de los Trabajadores), salvo prueba en contra, la actividad de las personas que presten servicios retribuidos consistentes en el reparto o distribución de cualquier producto de consumo o mercancía a terceros, por parte de empleadoras que ejercen las facultades empresariales de organización, dirección y control de forma indirecta o implícita, a través de una plataforma digital, mediante la gestión algorítmica del servicio o de las condiciones de trabajo.

Como se aprecia, se establece una presunción *iuris tantum* de laboralidad de estos trabajadores, aunque se admite prueba en contrario por parte de la empresa (de que son autónomos). ETUC: confederación de sindicatos europeos, también ha informado a la Unión Europea que esta presunción de laboralidad es la mejor solución.

2. Artículo único. Modificación del Texto Refundido de la Ley del ET. Se *modifica* la letra f) del párrafo tercero del apartado 5 del artículo 64, que tendrá la siguiente redacción: «El comité de empresa tendrá derecho a emitir informe, con carácter previo a la ejecución por parte del empresario de las decisiones adoptadas por éste, sobre las siguientes cuestiones: f) La implantación y revisión de sistemas de organización y control del trabajo, estudios de tiempos, establecimiento de sistemas de primas e incentivos y valoración de puestos de trabajo, *incluido cuando deriven de cálculos matemáticos o algoritmos*».

Disposición adicional única. Garantías de acceso a la información algorítmica por parte de la representación de las personas trabajadoras. *Los convenios y acuerdos colectivos* determinarán, *las modalidades, contenido y periodicidad* de acceso de la representación unitaria y sindical de las personas trabajadoras a la información relativa a los *parámetros y a las reglas* en los que se

basan los algoritmos utilizados por la empresa, para la toma de las decisiones que puedan incidir directa o indirectamente en las condiciones de trabajo, el acceso o el mantenimiento del empleo, incluida la elaboración de perfiles.

Como resumen: 1) se introduce una presunción de laboralidad de estos trabajadores. A partir de ahí, se aplicará toda la normativa de prevención de riesgos laborales: Ley 31/1995, de 8 noviembre (LPRL) y su normativa de desarrollo; según el art. 14 LPRL, el empresario tiene un deber de protección integral del trabajador. 2) Se prevé el derecho a acceder a la información del algoritmo en todas las plataformas; esto es muy importante para conocer sesgos que pueden llevar a que ciertos trabajadores trabajen en franjas horarias de mayor riesgo laboral. Por ejemplo, será interesante ver cómo se compone el algoritmo de asignación de tareas cuando un determinado colectivo sufra una mayor tasa de accidentes que el resto o a una hora determinada.

Recientemente se ha aprobado una normativa específica en España para los trabajadores a distancia con contrato de trabajo, ¿cómo es la regulación de la seguridad y salud de estos trabajadores?

En este punto, de proteger a estos trabajadores frente a los riesgos laborales, se ha avanzado y la nueva regulación (RDL 28/2020, de 22 septiembre, de trabajo a distancia) hace referencia expresa a la necesidad de proteger a estos trabajadores en materia de riesgos laborales.

Cabe destacar la Sección 4ª del RDL, titulada *Derecho a la prevención de riesgos laborales*, cuyo artículo 15 se refiere a la aplicación de la normativa preventiva en el trabajo a distancia. Así se prevé que «Las personas que trabajan a distancia tienen derecho a una adecuada protección en materia de seguridad y salud en el trabajo, de conformidad con lo establecido en la Ley 31/1995, de 8 de noviembre, de Prevención de riesgos laborales, y su normativa de desarrollo».

De máximo interés, resulta el artículo 16, relativo a la *Evaluación de riesgos y planificación de la actividad preventiva*. Según dicho precepto:

1. La evaluación de riesgos y la planificación de la actividad preventiva del trabajo a distancia deberán tener en cuenta los riesgos *característicos* de esta modalidad de trabajo, poniendo especial atención en los factores psicosociales, ergonómicos y organizativos. En particular, deberá tenerse en cuenta la distribución de la jornada, los tiempos de disponibilidad y la garantía de los descansos y desconexiones durante la jornada.

La evaluación de riesgos únicamente debe alcanzar a “la zona habilitada” para la prestación de servicios, no extendiéndose al resto de zonas de la vivienda o del lugar elegido para el desarrollo del trabajo a distancia.

2. La empresa deberá obtener toda la información acerca de los riesgos a los que está expuesta la persona que trabaja a distancia mediante “*una metodología*” que ofrezca confianza respecto de sus resultados, y prever las medidas de protección que resulten más adecuadas en cada caso.

Cuando la obtención de dicha información exigiera «la visita de un experto» por parte de quien tuviera competencias en materia preventiva al lugar en el que, conforme a lo recogido en el acuerdo al que se refiere el artículo 7 RDL, se desarrolla el trabajo a distancia, deberá emitirse informe escrito que justifique dicho extremo que se entregará a la persona trabajadora y a las delegadas y delegados de prevención.

La referida visita requerirá, en cualquier caso, el permiso de la persona trabajadora, de tratarse de su domicilio o del de una tercera persona física. De no concederse dicho permiso, se acudirá a la “autoevaluación” por el propio trabajador. Así, el desarrollo de la actividad preventiva por parte de la empresa podrá efectuarse en base a la determinación de los riesgos que se

derive de la información recabada de la persona trabajadora según las instrucciones del servicio de prevención.

Por su parte, el artículo 18, se refiere a otro derecho autónomo, pero de importancia clara en materia preventiva, el “derecho a la desconexión digital”, que puede considerarse una medida de protección de la salud de los trabajadores. Las personas que trabajan a distancia, particularmente en teletrabajo, tienen derecho a la desconexión digital fuera de su horario de trabajo, en los términos establecidos en el artículo 88 de la Ley Orgánica 3/2018, de 5 de diciembre.

El deber empresarial de garantizar la desconexión conlleva: 1) *una limitación* del uso de los medios tecnológicos de comunicación empresarial y de trabajo durante *los periodos de descanso*, así como 2) *el respeto a la duración máxima de la jornada* y a cualesquiera límites y precauciones en materia de jornada que dispongan la normativa legal o convencional aplicables.

La transformación en curso plantea desafíos a los sistemas de prevención a nivel nacional, pero al mismo tiempo a los actores de la prevención a nivel empresarial. En un contexto en el que de la organización del trabajo dependen importantes aspectos de protección del trabajador (desconexión, cargas de trabajo, flexibilidad espacial-temporal), ¿cree que la negociación de ámbito empresarial podrá desempeñar un papel protagonista para garantizar unas condiciones de trabajo seguras y saludables? En caso afirmativo, ¿en qué condiciones y en qué relación con la acción de los interlocutores sociales a nivel nacional o internacional?

En materia de prevención de riesgos laborales, resulta fundamental siempre la ley, la acción normativa del legislador estatal, que tiene que crear normas y principios de obligado cumplimiento para ambas partes, especialmente para la empresa.

Hay que fijar los derechos y deberes de las partes, así como un régimen de responsabilidades.

Pero la negociación colectiva también tiene su importancia. Tradicionalmente, se considera que la negociación de sector, especialmente a nivel nacional, es más garantista y efectiva que la negociación a nivel de empresa, y ello porque, por la parte social, es negociada por unos representantes de los trabajadores especializados, como son los sindicatos. Y, seguro que es así, pues un ejemplo de ello se vio en España, en la reforma laboral de 2012, que privilegió el convenio de empresa para dar más poder al empresario.

Con todo, en esta materia de la prevención, el papel del convenio colectivo, así como de otros acuerdos colectivos de empresa, como los protocolos de empresa, pueden y deben jugar un papel clave en materia de prevención de riesgos laborales, especialmente en el contexto de la digitalización.

La clave está en la distribución de contenidos a negociar: los más amplios y comunes deben quedar a la negociación de sector nacional; y los convenios de empresa se deben ocupar de la adaptación de esas líneas generales a las particularidades de la empresa y puesto de trabajo.

Los acuerdos marco europeos son especialmente útiles para establecer directrices generales sobre una materia, como sucedió como el Acuerdo marco sobre teletrabajo 2002. Incluso cuando no son de obligado cumplimiento, sirven como una guía para orientar la negociación colectiva nacional.

En España, la negociación colectiva va a tener un claro protagonismo en el desarrollo del trabajo a distancia. El RDL 28/2020, de 22 septiembre (disposición adicional primera), prevé un amplio contenido para la negociación colectiva. Así, los convenios o acuerdos colectivos podrán establecer, en atención a la especificidad de la actividad concreta de su ámbito, 1) la identificación de los puestos de trabajo y funciones susceptibles

de ser realizados a través del trabajo a distancia, 2) las condiciones de acceso y desarrollo de la actividad laboral mediante esta modalidad, 3) la duración máxima del trabajo a distancia, y 4) cuantas otras cuestiones se consideren necesario regular, entre ellas, la de prevención de riesgos laborales.

En particular, el art. 18.2 RDL 28/2020 da entrada a los denominados “protocolos sobre desconexión digital”, o sea, los protocolos informáticos o digitales. Así, la empresa, previa audiencia de la representación legal de las personas trabajadoras, debe elaborar *una política interna*, a nivel de empresa, dirigida a personas trabajadoras, en la que definirán 1) las modalidades de ejercicio del derecho a la desconexión y 2) las acciones de formación y de sensibilización del personal sobre un uso razonable de las herramientas tecnológicas que evite el riesgo de fatiga informática.

Como se aprecia, este RDL busca un equilibrio entre el intervencionismo del legislador en las relaciones laborales de los trabajadores a distancia y el refuerzo del papel de la negociación colectiva, para lograr una regulación de las condiciones del trabajo a distancia más cercana a las diversas y cambiantes actuaciones de los sectores de actividad y de las empresas.

Frente a la “remotización” del trabajo y a la fragmentación de la vida laboral, cada vez más caracterizada por transiciones ocupacionales, un sistema de prevención fuertemente ligado a un lugar de trabajo específico suscita importantes críticas. ¿Qué medidas normativas pueden garantizar que se preste atención a la persona que trabaja, independientemente del lugar de trabajo y de su situación laboral en un momento concreto?

En primer lugar, se deben *modificar los actuales sistemas de protección social*, para crear nuevos modelos de protección *que sigan al trabajador en su trayectoria profesional*, dejando de estar vinculados a la seguridad dentro de cada organización. Sin duda, hacen falta

soluciones novedosas para proteger a los trabajadores de la nueva economía, y una de ellas puede ser la de diseñar los derechos en función de las personas y no de los puestos de trabajo.

Buenas prácticas. Ya ocurre en Francia, con la introducción de la denominada “cuenta personal de actividad” (*Compte Personnel d’Activité*), destinada a aumentar la protección social de los trabajadores, incluidos los del sector público y los autónomos, dando a cada uno de ellos la posibilidad de construir su trayectoria profesional en un mundo en continua evolución, garantizando la portabilidad de sus derechos ante un cambio de empleo o situación.

La CPA incluye 3 cuentas más específicas: 1) cuenta personal de formación (CPF); 2) cuenta profesional de prevención (C2P); y 3) cuenta de compromiso ciudadano (CEC).

La cuenta de prevención profesional (article L4163-4 y ss.) permite determinar y referenciar los factores de riesgo que soporta un trabajador más allá de ciertos niveles. Dependiendo de su exposición a estos riesgos, el empleado acumula puntos en esta cuenta. Esta exposición puede dejar huellas duraderas, identificables e irreversibles en la salud. Algunos criterios de penosidad para tener en cuenta son los ligados al ritmo de trabajo (noche, turnos) y a un entorno físico agresivo (ruido, temperatura extrema). El número total máximo de puntos a conseguir por el trabajador son 100. Dichos puntos se pueden utilizar para: formarse y acceder a puestos expuestos con menos riesgos, solicitar un trabajo a tiempo parcial sin pérdida de salario o jubilarse antes, validando trimestres de aumento en la duración de la prestación de jubilación.

En España, tenemos dos iniciativas relacionadas con la formación, incluida la formación relacionada con la prevención de riesgos laborales:

1) Cuenta-formación. Cada trabajador tiene una cuenta-formación -un registro en el que se anotan todos sus cursos- que le acompaña a lo largo de su carrera profesional para acreditar su historial formativo y orientar la oferta de cursos al incremento de su empleabilidad. No se dan recursos económicos, por lo que el sistema es deficiente.

2) Cheque formación. Se aprobó en 2015 por el Gobierno y se dirige a las personas en desempleo para invertir en su formación y reinserción laboral. El objetivo es formarse y encontrar trabajo. La ventaja es que no hay que esperar que se publiquen convocatorias de plazas para cursos subvencionados. La duración del curso podrá ser a partir de 1 hora y los centros de formación tendrán que cumplir unos requisitos de calidad y estar inscritos y/o acreditados por el SEPE de su comunidad para evitar fraudes.

Otro ejemplo de portabilidad de derecho es la denominada “mochila austriaca”, en referencia a la creación de un *fondo vitalicio*, a modo de indemnización por despido. Se trata de un sistema implantado en Austria en el año 2003, consistente en que las empresas deben aportar cada mes una determinada cantidad (1,53% del salario bruto mensual) a cuentas de ahorro individuales a nombre de las personas que trabajan en la misma. Cuando se produzca el despido del trabajador, este percibirá su indemnización de esta cuenta que estaba a su nombre.

En caso de que el trabajador cambie de empresa de manera voluntaria, el importe de dicha cuenta no se pierde, sino que le acompaña (de ahí que se denomine mochila) *durante toda su vida laboral*, siendo su nuevo empresario el que continuará realizando aportaciones a esa cuenta a su nombre.

El trabajador también podrá utilizar ese fondo para formación (incluso relativa a prevención de riesgos laborales); y, en caso de que no haya sido despedido o no haya utilizado dicho capital, podrá emplearlo para complementar su pensión de jubilación.

En segundo lugar, dada la globalización de las relaciones laborales, cuando los protagonistas de estas (trabajadores, empresarios y consumidores) se hallan en diferentes países, como sucede con las plataformas digitales de trabajo, basadas en la web que operan en numerosos países, se necesitan *foros específicos para crear y coordinar las políticas laborales a nivel internacional*, fijando unos principios generales.

Las regulaciones nacionales se 1) quedan cortas, 2) resultan contradictorias entre sí, y 3) tienen dificultad de aplicación real y efectiva, pues los protagonistas de estas relaciones laborales se pueden hallar en diferentes países y estar vinculados por diferentes jurisdicciones.

La OIT recomienda seguir el ejemplo del *Convenio sobre el trabajo marítimo de la OIT (2006)*, ya que se refiere a un sector con múltiples partes que operan en jurisdicciones diferentes. El enfoque de este Convenio podría considerarse también para las plataformas digitales de trabajo. Este convenio se diseñó de tal manera que sea aplicable en todo el mundo, fácil de entender y de actualizar, y aplicable de manera uniforme. Se establece una cultura de «conocimiento y comprensión de la obligación de cumplimiento» en cada nivel, desde los sistemas nacionales de protección hasta el sistema internacional.

Otro texto de referencia es la *Declaración tripartita de principios sobre las empresas Multinacionales y la política social de la OIT (2017)*, que ofrece a las empresas multinacionales criterios orientativos sobre política social a aplicar en el ámbito internacional y se recomienda la aplicación de códigos o prácticas incluyentes, responsables y sostenibles en el lugar de trabajo.

El diálogo y la coordinación de políticas a nivel internacional se erigen como instrumentos fundamentales para asegurar la certidumbre normativa y la aplicabilidad de las normas universales del trabajo, dada la diversidad de las respuestas de los países y las empresas de plataformas. Hay que aplicar los

principios y derechos fundamentales en el trabajo de la OIT a todos los trabajadores de plataformas, con independencia de su régimen jurídico.

La Comisión Mundial sobre el Futuro del Trabajo (2019), un órgano independiente de la OIT en su informe *Trabajar para un futuro más prometedor*, recomendó el desarrollo de un “sistema de gobernanza internacional”, que establezca ciertos derechos y protecciones básicos y exija a las plataformas y a sus clientes que los respeten.

En la Declaración del Centenario de la OIT para el Futuro del Trabajo (junio 2019), se piden políticas y medidas que permitan asegurar una protección adecuada del trabajador frente a la transformación digital del trabajo, incluido el trabajo en plataformas, a fin de promover el desarrollo inclusivo y sostenible, el empleo pleno y productivo y el trabajo decente para todos.

La OIT debería seguir impulsando el debate para conseguir el reconocimiento del derecho a la seguridad y salud laboral como derecho fundamental para todos.

Si bien la diversidad (diversity) ha entrado en el debate relativo a la gestión y en parte en el jurídico y laboral, con acciones positivas destinadas a contrarrestar los conocidos problemas de infrarrepresentación o, peor aún, de discriminación en los lugares de trabajo, el sistema de protección y prevención todavía lucha hoy para responder a exigencias de protección que difieren en función de varios factores. Entre estos, el factor género es ciertamente central. Con referencia específica al factor de género, ¿Cómo cree que puede y debe tenerse en cuenta en las reflexiones sobre la elaboración de medidas de seguridad adecuadas?

Sí, resulta fundamental tener en cuenta la perspectiva de género en la política de prevención de riesgos laborales. Las cuestiones

de género tienen su impacto en: 1) la exposición y en la prevención de los riesgos, 2) en el acceso a recursos para promover y proteger la salud física y mental (incluidas la información, la educación, la tecnología y los servicios), 3) en la severidad y frecuencia de las enfermedades, 4) en las diferentes repercusiones sociales y culturales de la salud y enfermedad, 5) en la respuesta de los servicios y sistemas de salud, y, en fin, 6) en todos los aspectos de la vida y la salud de hombres y mujeres.

Factores de riesgo para tener en cuenta en la evaluación preventiva:

1. Los trabajadores hombres y mujeres son diferentes biológicamente y los riesgos laborales inciden de manera distinta en uno y otro grupo. En concreto, las mujeres tienen mayor posibilidad de sufrir ciertos riesgos, como los de carácter psicosocial, vinculados a situaciones violentas: acoso sexual, acoso por razón de sexo (no son lo mismo; el segundo es más amplio); violencia sexista o de género en el ámbito familiar con repercusión laboral.
2. Las mujeres en el mercado laboral ocupan, mayoritariamente, puestos precarios (empleo temporal y a tiempo parcial). Como ejemplo de actividades ocupadas mayoritariamente por mujeres, cabe citar los trabajos de ayuda a domicilio, trabajos de ámbito sociosanitario, educación y similares, siempre relacionados con el cuidado y salud de las personas.
3. Diferencia real en el disfrute de condiciones de trabajo. En general, los hombres ocupan puestos indefinidos, a tiempo completo, más responsabilidad y más salarios. Por su parte, las mujeres se emplean en puestos más precarios y condiciones laborales peores (menos salario, menos formación y promoción).
4. Mayor carga de trabajo en el ámbito laboral y familiar, al menos tradicionalmente, para las mujeres. “La doble presencia” es un riesgo para la salud, que puede y debe abordarse en la actividad preventiva de la empresa mediante la evaluación de

riesgos, identificándose y valorando las posibles consecuencias del riesgo sobre la salud de la plantilla.

El legislador español establece que es necesario tener en cuenta el género en la política de prevención de la empresa. Así, la Ley Orgánica 3/2007, de 22 de marzo, para la igualdad efectiva de mujeres y hombres (Disposición adicional duodécima), modificó la Ley 31/1995, de 8 noviembre, de prevención de riesgos laborales. Según el nuevo art. 5.4 de esta última norma:

«Las Administraciones públicas promoverán la efectividad del principio de igualdad entre mujeres y hombres, considerando las variables relacionadas con el sexo tanto en los sistemas de recogida y tratamiento de datos como en el estudio e investigación generales en materia de prevención de riesgos laborales, con el objetivo de detectar y prevenir posibles situaciones en las que los daños derivados del trabajo puedan aparecer vinculados con el sexo de los trabajadores».

Propuestas de actuación y buenas prácticas:

1) Hay que generar un conocimiento fehaciente, con estudios objetivos, de la situación: realización de estudios epidemiológicos. Los riesgos psicosociales deben ser evaluados con un método eficaz (el sindicato CCOO recomienda el *método CoPsoQ Istas21*) ⁽¹⁾. Conseguir datos objetivos para analizar la situación. A partir de esos datos:

2) Hay que realizar acciones de información, sensibilización y formación de todos los agentes sociales implicados (empresarios, trabajadores, sindicatos, autoridades gubernativas). Hay que prestar especial atención a las pequeñas y medianas empresas, con menos organización sindical y una figura empresarial más poderosa. A pesar de las políticas de igualdad, muchos “estereotipos” permanecen arraigados sólidamente en el imaginario colectivo (v. gr., el lugar más seguro para las mujeres

⁽¹⁾ <http://istas.net/webistas/imagenes/video%20metodo.mp4>.

es su casa; la mujer tiene menos fuerza, por lo tanto, no puede realizar los mismos trabajos; la mujer tiene menos capacidad de mando; si hay menos mujeres en altos cargos, será porque no están cualificadas).

3) Hay que tener en cuenta las diferencias de salud entre hombres y mujeres, construidas a partir de las diferencias de género y biológicas, en las diversas fases de la actividad preventiva, con el fin de efectuar una completa protección de la salud. Hay que tener en cuenta las diferencias en la evaluación de riesgos, adopción de medidas, vigilancia de la salud individual y, en fin, en la elección de representantes.

4) Actuar a nivel legislativo de manera contundente, estableciendo sanciones administrativas cuando se incumplan las normas de género.

5) A nivel de negociación colectiva, hay que promover la negociación de más convenios y acuerdos colectivos sobre el tema de género y salud. Se debe atender a situaciones particulares de cada plantilla.

6) Implementar un protocolo de actuación o Plan de Igualdad para prevenir el acoso sexual y el acoso por razón de sexo, que son riesgos laborales importantes para las mujeres trabajadoras.

7) Emplear lenguaje no sexista en cada documento elaborado desde los servicios de salud laboral, buscando visibilizar la participación de las mujeres en el mundo del trabajo, y evitando generar y reproducir en la conciencia colectiva e individual de los y las profesionales los estereotipos mencionados.

8) Los delegados y delegadas de prevención deben fomentar la negociación colectiva de medidas para incidir en la conciliación de la vida familiar, personal y laboral, así como también en la negociación del tiempo de trabajo y su distribución, para evitar la “doble presencia” de la mujer trabajadora.

6) Elaborar “guías de prevención de riesgos laborales desde una perspectiva de género” (2).

Estas buenas prácticas pueden contribuir a mejorar, aun poco a poco, la política de prevención de riesgos desde la perspectiva de género, con resultados más justos para todos los trabajadores.

(2)Ejemplo: <https://www.ccoo.es/390d3965457dc25d5f6823fd2bfca314000054.pdf>.

Le sfide per l'ordinamento italiano

Patrizia Tullini

Nonostante l'ordinamento italiano si segnali, almeno a livello di principio, come un ordinamento particolarmente attento alle esigenze di estensione delle tutele in materia di salute e sicurezza oltre il lavoro subordinato, recenti interventi normativi così come l'emergenza epidemiologica hanno messo in evidenza come rimangano delle aree di scarsa o nulla protezione. Se per i c.d. *riders* si è deciso di predisporre un intervento di carattere speciale, quali pensa possano essere le tecniche per rispondere alle istanze di protezione che arrivano da altri lavoratori, all'interno e all'esterno dell'economia delle piattaforme, che presentano condizioni di debolezza paragonabili?

Quando si parla di estensione della tutela prevenzionistica, il discorso dovrebbe essere articolato ma, ma dovendo semplificare, mi limito a dire che l'intero sistema di salute e sicurezza sul lavoro dovrebbe – a mio avviso – essere ri-centrato.

Sinora si è proceduto con progressive estensioni ed ampliamenti del campo di applicazione della normativa di tutela, nella direzione del lavoro autonomo coordinato ed eterorganizzato e rispetto al c.d. lavoro autonomo debole (nel caso, ad es., dei *riders*).

Ma il diritto alla salute e sicurezza va ripensato come diritto della persona che lavora, e non già come diritto legato ad un determinato “luogo di lavoro”. E non è neppure in questione il tema della debolezza contrattuale (nel senso che un lavoratore debole debba essere tutelato più di un altro): la tutela della salute – come abbiamo constatato in tempo di pandemia – è una tutela di

carattere universale perché attiene alla persona che lavora e non è riferibile né al suo potere contrattuale né al luogo di lavoro.

Non c'è dubbio che il TU 2008 sia stato concepito per la protezione all'interno dei luoghi di lavoro, anche se – con forte anticipazione sui tempi – la tutela è stata ancorata all'organizzazione del lavoro: il che consente l'adattamento del TU 2008 a svariate situazioni lavorative. Ma già da tempo, la giurisprudenza (soprattutto penale) ha rilevato che deve intendersi come “luogo di lavoro” ovunque ci sia una persona che lavora (Cass. pen. 2017).

La vicenda dei riders e la diffusione del lavoro agile – situazioni in cui il lavoro è totalmente de-contestualizzato dal “luogo” in cui si svolge – indicano che dobbiamo superare l'idea di una disciplina prevenzionistica incentrata sulle cose, e invece pensare alle persone. Sinora il tema non è emerso con sufficiente chiarezza perché lo *smart working* è, in realtà, *home working* e il confinamento domiciliare non solleva particolari problemi di sicurezza per le persone. Tuttavia l'insufficienza della tutela prevenzionistica secondo la l. n. 81/2017 è stata subito – giustamente – denunciata.

Per queste ragioni mi ha molto stupito che una parte della dottrina giuslavorista, al momento dello scoppio della pandemia, abbia sostenuto che il rischio biologico-pandemico non fosse connesso al lavoro perché non originato dall'ambiente di lavoro, e quindi non fosse necessario includerlo nella valutazione aziendale dei rischi. Come se il virus – e quindi il rischio biologico – fosse in sé estraneo alla persona del lavoratore.

Nell'ordinamento italiano, l'intervento della contrattazione collettiva nella regolazione delle misure di salute e sicurezza è spesso stato visto come un intervento residuale e al più integrativo, stante la necessità di garantire standard univoci per legge. Ciononostante, le dinamiche della trasformazione tecnologica e organizzativa portano oggi, ancor più di prima, ad evidenziare la necessità di una gestio-

ne delle misure di tutela della salute e sicurezza dei lavoratori sul piano aziendale (dalla disconnessione alla determinazione dei carichi lavorativi), stante la natura organizzativa di molti dei nuovi rischi. Ritiene che, anche grazie alla nuova soggettività operaia connessa alla gestione dell'emergenza pandemica, il futuro possa riservare un ruolo da protagonista alla contrattazione aziendale? Nel caso, come ritiene si possa garantire che gli interventi a livello aziendale non siano piegati a logiche di forza contrattuale e al contempo che non si creino rilevanti squilibri nella protezione dei lavoratori tra diverse aziende in uno stesso settore?

I soggetti sindacali e la contrattazione collettiva hanno indubbiamente giocato un ruolo direi secondario nel sistema prevenzionistico. Il concetto della partecipazione (individuale e collettiva) introdotto dalla Direttiva quadro del 1989 è stato declinato in modo indubbiamente riduttivo nel TU 2008, ma probabilmente ha pesato anche un ritardo della cultura sindacale. Non intendo esprimere giudizi superficiali e affrettati, ma a me pare che una certa retorica astratta sulla cultura della sicurezza abbia toccato diversi ambienti. D'altra parte, la tutela della salute ha posto al sindacato "scelte tragiche" quando si è trovata contrapposta al diritto al lavoro: le vicende italiane sono eloquenti da questo punto di vista. Personalmente sono favorevole al mantenimento di una base normativa che stabilisca gli standard minimi, generali e uniformi, di protezione. Se vogliamo pensare ad una tutela di carattere universale, occorre ipotizzare una base unitaria e condivisa di regole di tutela di un diritto fondamentale della persona, ispirata non solo all'art. 32 Cost. ma anche all'art. 3 Cost. La contrattazione collettiva, e in generale l'intervento sindacale, dovrebbero garantire quella "specializzazione" che è necessaria per rendere concreta ed effettiva la tutela nei diversi settori produttivi e nei diversi contesti aziendali. Questo sforzo di adattamento, specializzazione e concretizzazione, viene oggi lasciato al legislatore nazionale, il che rende estremamente com-

plessa e pesante la normativa prevenzionistica, oltre che esposta al rischio dell'obsolescenza. L'evoluzione tecnologica renderà inevitabile ed urgente una specializzazione della tutela. I protocolli nazionali anti-contagio hanno messo in campo nuovi soggetti collettivi, che sono portatori di una nuova visione della salute e sicurezza sul lavoro. Si tratta di Comitati aziendali, ai quali partecipano RLS e Rappresentanti sindacali o, in alternativa, dei Comitati territoriali, ai quali si aggiungono gli organismi paritetici. Sarà molto interessante valutare la loro esperienza, pensando al futuro delle relazioni sindacali in azienda.

Ragionando sul lungo periodo, una delle principali sfide che vengono poste ai sistemi di tutela prevenzionistica riguardano la sempre più rilevante frammentazione dei percorsi lavorativi e l'esigenza di gestire una forza lavoro in costante transizione tra diverse occupazioni, ma anche tra diversi status (lavoro, studio, oneri di cura) con l'esposizione a rischi di carriere discontinue. Pensa che il diritto del lavoro potrà attrezzarsi in futuro per rispondere alle esigenze di tutela della persona del lavoratore nel corso della sua vita professionale nonostante tali transizioni? Quali dispositivi e quali misure ritiene potrebbero rivelarsi determinanti nella gestione della salute della persona che lavora? Come garantire le giuste sinergie tra il sistema di tutela della salute generale e quello di garanzia della salute e sicurezza del lavoratore?

La risposta a questa domanda sta – in parte – nelle considerazioni sinora svolte. Concepire la tutela della salute e sicurezza come legata alla persona che lavora, anziché ad un determinato luogo di lavoro o status professionale, può risultare utile – o addirittura indispensabile – di fronte a carriere lavorative discontinue e alle transizioni nella vita professionale.

Va naturalmente ampliato il concetto di “salute” e di “benessere lavorativo”, agganciandolo alla persona e alla sua formazione professionale. Quindi, intendendo la tutela della salute e sicurez-

za come parte integrante del bagaglio professionale e formativo del lavoratore: come ingrediente della professionalità.

Da questo punto di vista, il TU 2008 risulta insufficiente, anche se ciò è inevitabile perché riflette un mercato del lavoro di fine secolo scorso. All'interno del TU 2008, la formazione – ad es. – è messa in relazione alla prevenzione degli infortuni e delle malattie professionali in un determinato ambiente di lavoro (quindi, finalizzata alla protezione da un rischio presente in un determinato ambiente di lavoro), non è parte integrante dello status professionale del lav. Anche in questo caso, occorre adottare una prospettiva nuova: meno legata alle cose e più alle persone.

Oggi come in passato, la trasformazione tecnologica e organizzativa impatta il mondo del lavoro con effetti non univoci: da un lato, con nuove fondamentali potenzialità di tutela della salute e sicurezza dei lavoratori; dall'altro, facendosi portatore di nuovi rischi per la persona. Se gli effetti benefici della sostituzione nei lavori più pericolosi e le potenzialità e i rischi delle nuove complementarietà tra uomo e macchina sembrano porsi in linea di continuità con dinamiche di un passato più o meno recente, l'avvento delle tecnologie di monitoraggio paiono poter essere un importante *game changer*. Pensa che l'ordinamento italiano sia pronto per gestire al meglio l'integrazione nei contesti lavorativi dei c.d. *smart personal protective equipment*? In generale, ritiene che la *datafication* del mondo del lavoro potrà essere sfruttata come risorsa oppure si risolverà in aumentati rischi per il lavoratore, la sua riservatezza e la sua personalità?

Le tecnologie, in particolare quelle c.d. intelligenti, recano con sé una forte ambivalenza perché sono portatrici di plurime potenzialità: sono tecnologie di lavoro, di controllo, anche di sicurezza e protezione sul lavoro. Il quadro normativo nazionale è innegabilmente in ritardo (come lo è gran parte della disciplina lavoristica attuale al cospetto delle tecnologie dell'IA). Certo, se im-

maginiamo di governare la sicurezza del lavoro nell'ambito del fenomeno di digitalizzazione con la Direttiva macchine, ci troviamo in difficoltà. C'è un grande fervore di analisi e di studi, specie a livello europeo, sul tema della sicurezza nell'economia digitale (cfr. Documento dell'Agenzia europea sulla *Digitalizzazione e Salute e sicurezza sul lavoro* del 2020), ma in generale – a me pare – siamo ancora fermi alla fotografia del fenomeno e alla ricognizione dei rischi c.d. nuovi ed emergenti. Un passo avanti è stato compiuto con la risoluzione del Parlamento europeo del gennaio 2021 sul diritto alla disconnessione e con l'allegata proposta di direttiva. Il tema va studiato attentamente: nella Risoluzione ci sono molti profili di avanguardia (ad es., i destinatari della tutela sono i lavoratori ricompresi nella nozione europea che è più inclusiva di quella nazionale). Altri profili riflettono, invece, un'impostazione più tradizionale: come, ad es., il fatto di legare il diritto alla disconnessione ad un orario di lavoro prestabilito, che resta il parametro principale per misurare e valutare la prestazione lavorativa. Mi rendo conto della difficoltà di calare questo diritto nuovo nella realtà lavorativa a distanza – il problema è già emerso con la l. n. 81/2017 sul lavoro agile – ma temo che se continueremo ad utilizzare criteri tradizionali (tempo e luogo) non riusciremo a battere le tecnologie che – strutturalmente – hanno disarticolato le coordinate tempo/luogo del lavoro. Le tecnologie sono ubiquie e implicano un flusso continuo, a-temporale, di dati.

Alcuni studi hanno portato sempre di più all'evidenza l'importanza del rapporto tra tutele prevenzionistiche e territorio: in alcuni (noti) casi, i termini del conflitto tra tutela della salute e tutela dell'occupazione sono emersi come predominanti, ma nel più ampio quadro dei rischi psicosociali ci pare che al di là del conflitto, il territorio rappresenti un fattore fondamentale nella garanzia della salute e sicurezza dei lavoratori rispetto a elementi perturbanti connessi alla gestione della vita privata e lavorativa (pendolarismo; assenza di servizi alla persona; assenza di servizi per la

prima infanzia...). Andando oltre l'esigenza di garantire dei livelli minimi di servizio su tutto il territorio nazionale, pensa che la promozione di sinergie a livello territoriale tra il mondo del lavoro, le pubbliche amministrazioni e il mondo del terzo settore e della economia sociale, possa rappresentare un investimento idoneo a garantire più alti standard di tutela oppure che azioni di questo tipo prestino il fianco a esacerbare i divari territoriali?

La relazione tra il sistema normativo di salute e sicurezza e il territorio non è nuova, anche se finora è stata molto sottovalutata. Questa relazione è ribadita – sebbene un po' sotto traccia – dallo stesso TU 2008, là dove – nel definire la nozione di “prevenzione” aziendale allude (anche) al rispetto della salute della popolazione e all'integrità dell'ambiente esterno. Tra il dentro e il fuori dell'impresa non c'è separazione netta: il lavoratore è anche il cittadino; la tutela della salute all'interno del luogo di lavoro presidia anche la salute della popolazione. Ancora una volta, la perimetrazione della tutela al luogo di lavoro risulta fuorviante.

In fondo, sono proprio i casi più drammatici del Paese che dimostrano come la salute dei lavoratori e la salute della popolazione nel territorio siano strettamente connessi. L'approccio prevenzionistico “globale” previsto dal TU 2008 impone che si tenga conto del contesto di lavoro e di vita della persona: il sistema di sicurezza aziendale non va certo concepito come un'isola o una realtà auto-conclusa, avulsa dal suo territorio.

È un'ulteriore lezione che possiamo trarre dall'esperienza della pandemia. Nei protocolli anti-contagio viene instaurato un raccordo diretto tra la sorveglianza sanitaria aziendale e i servizi sanitari del territorio. Ma anche la vaccinazione nei luoghi di lavoro – prevista dal recente Protocollo nazionale per la realizzazione di piani aziendali finalizzati alla vaccinazione – può leggersi in una prospettiva di raccordo territoriale tra i servizi aziendali e quelli pubblici. L'iniziativa finalizzata alla vaccinazione diretta

delle persone, che a prescindere dalla tipologia contrattuale prestano la loro attività in favore dell'azienda (come si legge nel Protocollo), costituisce un'attività di sanità pubblica che si colloca nell'ambito del Piano strategico nazionale per la vaccinazione. È un passo avanti significativo, che può aiutarci a progettare un futuro con più salute e sicurezza per la persona che lavora.

Chapter II.
**ROBOTICS, DIGITALIZATION
AND REMOTE WORK**

**AI, Robotics and Digitalisation:
Prospects and Risks**

Phoebe Moore

The so-called Fourth Industrial Revolution is causing deep changes within the world of work with important implications also in the OSH field. Coherently with past technological transformations, some of the effects are positive (for example, in terms of reduction of the accidents at work), while others produce new risks for the workers' health and safety. As for your knowledge, which are the main features of the ongoing transformation of work as far as OSH is concerned? Which aspects are worth particular attention?

Standard understandings of occupational safety and health (OSH) have at points been limited to the sphere of the observable, where people working in tangible arenas are threatened by fire hazards, ergonomic risks, and slips, trips, and falls. But OSH is about more than just fastening your proverbial seatbelt. What is often overlooked are the intangible and tacit arenas of OSH, i.e., human cognition, mental health, wellbeing, and even the detail of ergonomics and the impact of a working space on less vis-

ible, but nevertheless ultimately corporeal dimensions, where the mind and body both face OSH risks.

So, with that in mind, to talk about the key transformations to OSH, as regards technological transformations, these days, we must think about the risks and benefits resulting from an unfathomable number of and myriad types of digital and data-driven applications being used to develop, modify, assist, and measure aspects of work in most industries, in most areas of the globe.

The emergence of automation is the most known transformation with implications for the OSH field, for example in advanced robotics, where an imperfectly programmed robot may collide with a worker on the warehouse or factory floor or carry out another unexpected activities, such as the surprising case where a robot released bear repellent on Amazon workers. ⁽¹⁾ Therefore, new questions about liability and responsibility for these kinds of accidents have already emerged.

Saying that, automation, along with being risky, can also be very positive. It can, and has, eliminated a lot of what McAfee and Brynjolfsson call ‘dull, dirty, dangerous and dear’ ⁽²⁾ work. Work on assembly lines in factories is indisputably dull, dirty and dangerous, and once a type of work is seen as being too dear for a company, it becomes increasingly of interest for automation. McAfee and Brynjolfsson report on other interesting uses of automation that clearly reduce OSH risks such as where drones replace humans in oil rig sea-based maintenance checks; remote-controlled trucks move iron ore in an Australian mine; and machines replace humans to milk cows in the Netherlands.

⁽¹⁾ S. SHAH, *Amazon workers hospitalized after warehouse robot releases bear repellent*, *Endgadget*, 6 December 2018.

⁽²⁾ A. MCAFEE, E. BRYNSJOLFSSON, *Harnessing our Digital Future: Machine, Platform, Crowd*, W.W. Norton & Company Ltd., 2017.

However, we have to ask, who decides what kinds of work are restricted to the ‘dull, dirty, dangerous’ work categories (also called DDD or the ‘three Ds’ in Asia Pacific discourses)? In 2021, we see that DDD *manual* work is not the only work that can, and is, being automated. Is it only dull and dangerous work that is being automated, or are there less tedious and higher-skilled manual tasks that robots and AI-based systems can replace; and *mental*, or better-called, cognitive or ‘knowledge’ work as well? Tasks are being replaced by AI-systems in radiology, education, public administration quite quickly. What OSH risks will this introduce?

We seem to have lost sight of an *a priori* question, i.e. ‘what work should we automate, because it is dull, dirty and dangerous?’, as companies race to experiment with the latest technologies to automate jobs, sometimes just for sake of remaining competitive and innovative, rather than with a clear set of productive and mutually beneficial goals for workers and their managers.

Today, is vital to put these and your broader questions, Emanuele, into the recent and current social and economic context within which we are working. Before the Covid-19 (C19) global pandemic, in the United Kingdom, 20% of non-key workers were able to work from home. In April 2020, in the second month of the C19 stipulated lockdown in the UK, the percentage of non-key workers in professional occupations working from home jumped to 70%. In the key worker categories, which includes professional and non-professional health care workers and transportation and manufacturing workers and employees, only 10% were able to work at home. ⁽³⁾ But working from home was not the only change occurring during the periods of lock-down for workers. Many were put on furlough The Corona Job Retention Scheme, as companies scrambled for financial survival, which offered salaries at 80 per cent paid by the gov-

⁽³⁾ ONS, *People in Work: Corona and Homeworking*, 2020.

ernment. The Scheme was used for non-keyworkers and key workers alike, but rates of furlough were lower for non-key worker professional categories, and much lower than for key worker categories. The number reached 10% for education workers (who were later classified as key workers), ⁽⁴⁾ 2% for public administration and defense workers in non-keyworker categories; and 7% for finance and insurance and 10% of health workers. On the other hand, 70% of key workers were originally furloughed due to C19 and in September 2020, 42% of manufacturing and 32% of transport and storage workers were furloughed. In sum, more non-key workers can work from home than key workers during the pandemic. Key workers are more often furloughed and therefore, their job security reduced, because there is no guarantee of job retention at the end of furlough schemes, which can itself result in deskilling, as workers spend months without training and local work support, and so on.

In that context, therefore, companies have been looking for ways to automate *management* over non-key workers' environment more than ever before. So, if we think of management as itself, knowledge work, then that is currently seeing increases in automation via algorithm, sometimes clandestine cameras within computer screens, recorded keystrokes and various forms of electronic time keeping and performance management. On the one hand, this means home workers are susceptible to increased surveillance and the related discomfort that key workers have long experienced in GPS tracking and platform management. On the other hand, it could mean that key workers' work is not likely to be automated soon because of the increase in demand for example e-commerce, work which still does not sit within the 'dear' category set out by McAfee and Brynjolfsson, despite workers facing increasingly facing insecure conditions.

⁽⁴⁾ PWC, *Corona Issues, crisis and resilience*, 2020, in <https://www.pwc.co.uk/issues/crisis-and-resilience/covid-19/coronavirus-job-retention-scheme.html>.

Definitive research identifying the significance for these work changes during the period of C19 and potentials for automation has not yet been carried out, but emerging OSH risks are clear. Alongside the challenges of relying on personal possessions in homes to meet ergonomic standards, for non-key home workers, a range of new pressures have emerged. Without the availability of physical space for meetings and potentially non-documented discussions, a huge amount of the communications aspect of work, has been digitalised. Microsoft reports that:

66% more people are creating documents that would presumably have been conversations before, and just among Exchange Online commercial and education customers, 40.6 billion more email messages were sent in February 2021 than in February 2020. ⁽⁵⁾

The roots of datafication of human dialogue start within telecommunications systems where vocal data was recorded in the 1980s in the United States and used to make links between workers' productivity and their attitudes at work. Later, electronic mail systems (e-mail) clearly had an impact on communication in both work and consumer environments.

But this level of the increase in datafication of communications is unprecedented. We have to ask, what will the impact of these current extreme shifts be for OSH? People analytics systems were already becoming increasingly common to determine people's productivity and performance, as well as to make predictions about whether a worker would leave a job or whether they will become a loyal workplace leader. Now, digitalised communications means that communications become legal documents, can be more easily surveilled and monitored, and can therefore be used for appraisals and quality assessments as well as grievances and even firing attempts (see case of *Bărbulescu V Romania*).

⁽⁵⁾ MICROSOFT, *Remote work is exhausting and we need to take action now*, 2020.

HR tech and ‘bossware’ investment has led to and will increase specific expectations for worker flexibilization, or what Andrew Pakes of Prospect Union and others are referring to as ‘blended work’. I would argue that these recent shifts reflect attempts for *tech-augmentation* of work in cognitive and knowledge labour rather than full automation or even semi-automation. In my EU-OSHA commissioned report ⁽⁶⁾ about OSH risks of AI tools and applications, I use the concept of AI-augmentation precisely; and in the book that I have just edited with Jamie Woodcock, ⁽⁷⁾ we also talk about the augmentation of the possibilities for exploitation and risks that emerge when technology is advanced in workplaces.

As for the risks, the OSH system already faced transformations during the past waves of technological changes. Do you think that changes occurring in the world of work are raising new needs for protection compared to those faced by workers during the Third Industrial Revolution? Do you think that these changes relate to the intensity of the risks or imply a qualitative transformation of them?

The tension between capital and labour is nothing new, and the relationship between labour power and machinic intervention is also not new. The intensity of risk in and of itself might not have transformed, but because all workplace changes are set in a social, economic, political context, the nature of that risk and the potentialities surrounding it, are changing fast.

The Luddites were concerned that machines would entirely replace human work and that the entire craft of spinning wool would be automated. Machines and tools of the scientific management method were perhaps the first time however that ma-

⁽⁶⁾ P. MOORE, *OSH and the Future of Work: benefits and risks of artificial intelligence tools in workplaces*, Discussion Paper, 2018, 1.

⁽⁷⁾ P. MOORE, J. WOODCOCK, *Augmented Exploitation: AI, Automation and Work*, 2021, Pluto.

chines were not seen to replace human work but rather, to measure and evaluate work, where early cameras, stethoscopes, and micro-chronometers were used to identify the ‘one best way’ for e.g. bricklaying.

The next period of work design history and theory called ‘human relations’ innovated by Elton Mayo is said to have been an attempt to respond to the techno-economism and determinism of scientific management. During that period, the human took a more prominent role, though the perception of workers was that their antagonism toward bosses was irrational, which is an interesting twist.

Fast forwarding through history, the latest transformations are now different because, as I argued in my 2019 book, ⁽⁸⁾ and other recent work, technologies are now seen to not only have the capacity to determine the value of labour and its surrounding features more intimately, but also to provide direct competition with the reliability and validity of human judgement over that process of value identification altogether.

The magical capabilities of AI, then, become central to discussions of digitalised management. What makes AI different from other uses of tech and the ‘transformations’ you are asking me about is its forecasted competence to replace humans not just at the level of manual work but of cognitive work. AI in its final, universal form, will make autonomous decisions.

Therefore, AI must have *subjectivity*. As I argued in my text ‘The Mirror for Artificial Intelligence: In Whose Reflection?’, ⁽⁹⁾ if we are going to depict the machine meaningfully and effectively as subject, we must think about our own subjectivity quite carefully

⁽⁸⁾ P. MOORE, *The Quantified Self in Precarity: Work, Technology and What Counts*, Routledge, 2019.

⁽⁹⁾ P. MOORE, *The mirror for (artificial) intelligence: In whose reflection?*, in V. DE STEFANO (ed.), *Automation, AI, and Labour Protection, Comparative Labor Law and Policy Journal Special Issue*, 2020, vol. 41, n. 1, pp. 47-67.

first. Subjectivity is assumed to be agential, where we form our identities in neoliberal capitalism as we want them. We can even pick and choose between various forms of selves, seemingly as easily as a shopper looks for skinny or full fat milk. However, Foucault writes that there are two meanings to ‘subject’, one, ‘subject to someone else by control and dependence’, and two, ‘tied to his own identity by a conscience or self-knowledge’.⁽¹⁰⁾ Therefore, subjectivity involves a power relation as well as a person’s self-understanding where our subjective position as a worker, both involves how we perceive our work, the values we bring to it, and the ways that we introspectively think about ourselves, as workers, but also involves how managers and now, machines, perceive us.

Subjectivity is inherently two-way in the human sense. This really matters, when talking about the employment relationship, which is still largely considered to occur as a binary system and where data collection is legislated for in the individual, rather than collective, sense.

However, seemingly autonomous machines are now quite clearly expected to fully enter into the employment relationship which, in turn, is likely to have significant transformations to the experience of *humans* in that relationship. I have written about this in my European Parliament report *Data subjects, digital surveillance, AI and the future of work*⁽¹¹⁾ where I argue that many aspects of a conventional employment relationship have now changed, often considered irreversibly so, in the areas of: negotiations for the right to privacy; consent and what it can mean within the employment relationship, when machinic decisions are made based on people analytics’ datafied reliability; worker and machinic autonomy; the risk of inference, where managers may make judgements about workers based on data without following due

⁽¹⁰⁾ M. FOUCAULT, *Power*, edited by J.D. FAUBION, Penguin Books, 1964.

⁽¹¹⁾ P. MOORE, *Data subjects, digital surveillance, ai and the future of work*, 2020.

diligence; the tendencies for function creep, where managers use data inappropriately in more than one processing category without workers' knowledge and under legally dubious circumstances; and very importantly, the chance for discrimination to emerge when humans are not considered leading in machine-influenced decision-making.

Talking about potentialities, exoskeletons, smart PPEs and, more generally, the use of big data seem to be the most innovative factors. What kind of role do you think they may play also considering longer working careers and an ageing workforce? What are the risks associated to their use?

So, you are asking me about innovations in big tech and where the pressure points are for specific human categories. This is a good time for me to talk about the constitution of the subject perhaps both inside of, and outside of protected characteristics, when humans encounter data and its usage. The GDPR refers to the 'data subject', which is defined within the GDPR in Article 4.1 as follows:

Article 4.1: 'personal data' means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person. ⁽¹²⁾

Subjects, as I have said already, do not exist in a vacuum and indeed, require formation. Althusser describes a 'theoretical theatre' ⁽¹³⁾ wherein a theorised person such as a policeman, calls out

⁽¹²⁾ GDPR Definitions.

⁽¹³⁾ L. ALTHUSSER, *Ideology and Ideological State Apparatuses*, La Pensée, 1970.

to another person on the street: ‘hey, you there!’, at which point the said person who is hailed, is considered a possible suspect immediately, whether or not they have done anything wrong. This process becomes a kind of interpellation of individuals as subjects, whereby their subjectivity is narrowed down to a specific identification, which Althusser talks about as features of ideological processes rather than as accidental.

The GDPR deals with two type of data subjects, the consumer, and the worker. Which is fascinating because clearly there are various factors at stake and power dynamics for these two categories. Nonetheless, there is an ideological constitution of the subject any time technology enters the employment relationship. Therefore, we should be thinking about how a ‘data subject’ is constituted by virtue of the relationship between workers, managers and data-producing calculation machines.

I think we need to be sensitised to that and to keep human agency front and centre, or what Janine Berg and Valerio de Stefano have talked about as ‘humans in command’. ⁽¹⁴⁾ The way to do that with AI in mind is to encourage more and better conversations about *human* subjectivity and how we become subjects, including the power relations inherent to workplaces and the risks that emerge when this is done without full consideration of OSH risks. What is most important about human behaviour in the workplace and what kinds of behaviours therefore, must be prioritised for mimicry in the human/machine mirror that AI apparently reveals?

Datafication is at the centre of the transformation. While, as anticipated, data may be used for the protection of health and safety, they are also used by companies to improve the productivity of their workforce (e.g. productivity

⁽¹⁴⁾ V. DE STEFANO, *Negotiating the Algorithm’: Automation, Artificial Intelligence and Labour Protection*, in *Comparative Labor Law & Policy Journal*, 2019, vol. 41, n. 1.

apps). What kind of balance should/could be reached between the interest on productivity gains and economic, social and environmental sustainability of work? Do you think that trade unions could play a relevant role, notably in terms of protection of employees' health and safety?

Apart from various corporate social responsibility mechanisms, the current model of political economic *modus operandi* is not conducive to some kind of invisible hand driving fairness and balance or prioritisation of workers' safety and health, in a supposed free market. Entering recessions in many economies and history demonstrates corporate interests are prioritised in these periods. Here, therefore, is a good place to talk about the requirements of the GDPR for agreeing how much data collection is reasonable in the workplace and then to talk about what unions and other bodies are doing in this sphere to protect workers' interests.

The European Data Protection Board (EDPB)'s 'Opinion 2/2017 on data processing at work' was published during the first year the GDPR came into force and then became applicable in May 2018, stating that:

6.4. Data processing at work must be a *proportionate* response by an employer to the risks it faces taking into account the legitimate privacy and *other interests* of workers. (Art. 29 WP 2017: 23) [italics added by author]

Within 6.4, the identification of workers' *other interests* is mentioned, but in practice, the wider interests of workers and their surrounding rights, are often overlooked. To fully inform 'proportionality', which refers to the proportional necessity for data collection at work as balanced between the employer and workers, a range of workers' rights must be taken into account. Usually, monitoring and tracking are justified with regards to an employer's stated interests, which should be justified in balance and proportion with workers' needs and interests.

Proportionality should also take full account of workers' needs and interests to fully deal with OSH risks, however, just as much as a company's or an institution's interests. Workers' needs could be for protection from techno-stress and cyberbullying; shielding from excessive and opaque worker surveillance rather than consented and transparent monitoring and tracking; and the need and right to dignity and personality. Then, when legality of the functions available is ensured, Data Controllers, by way of the Data Protection Officer (DPO), should actively and explicitly invite union and other worker representatives to be involved in activities around selecting software and hardware that may be used to monitor and track any aspect of work.

Worker representatives should also work with the DPO to negotiate and discuss activities will be tracked and monitored, to agree to and find consensus for legitimacy of these and to firmly agree on the proportionality between business need and workers' rights. If these steps are all met, then a Data Protection Impact Assessment (DPIA) should be carried out. Andrew Pakes and his team at Prospect Union has done a lot of work in this area, likewise, arguing for better commitment to Data Protection Impact Assessments, given 1 in 5 companies are now either using digital monitoring of workers, or are planning to do so in the near future. ⁽¹⁵⁾

For OSH protections in this context, worker representatives must be appropriately trained with expertise in data protection. They should work alongside DPOs to ensure legality and proportionality of devices and programmes selected for tracking workers. In this way, worker representatives, alongside the DPO, can create technical solutions to protect the rights for workers to, for example, explicitly control any device that will monitor their work and associated behaviour, providing an au-

⁽¹⁵⁾ PROSPECT UNION, *Data Protection Impact Assessments: a definitive guide*, 2021.

thentic means to opt out. Therefore, workers can decide not to consent to be tracked at all.

Fortunately, there are a number of recent legislation initiatives and social partners who are keeping themselves aware of OSH risks emerging in the imminent future. The Trades Union Congress (TUC), has recently published reports and a manifesto on *Work and the AI Revolution*.⁽¹⁶⁾ A Task Force on AI standardisation sits within the ETUC STANDardisation project populated by trade unionists interested or working on AI.

I am currently involved in the EU-OSHA Digitalisation campaign which looks specifically on safety and health issues, working on a project on advanced robotics and AI systems in workplaces. I am also an invited expert and advisor for the Centre for Data Ethics and Innovation (CDEI) work on devising an AI Barometer CDEI AI Barometer's *Advisory Panel on Recruitment and Workforce Management* and for the Chartered Institute for Personnel Development (CIPD) *responsible investment in technology project advisory group*, where we are working on the development of guidance for employers on how they can invest responsibly in new technology, with a focus on protecting or enhancing job quality while optimising business outcomes.

Some current responsible investment in OSH technologies can be seen in, for example, the introduction of location oriented wearable devices being implemented at the BBC for C19 protections, where sensors warn workers that they are standing too close to someone else and thus violating social distancing rules.⁽¹⁷⁾ Clearly this is a good move to protect workers' health. But I think the ways to protect workers' safety and health work at two levels, where, if the device may invade personal privacy in ways that do not have immediate benefit for both workers and the

⁽¹⁶⁾ TRADES UNION CONGRESS, *AI Manifesto*, 2021.

⁽¹⁷⁾ A. WEBBER, *BBC staff told to wear social distancing devices*, in *Personnel Today* 8 January 2021.

company, as stated, the ‘user’ who is the worker, who must be given real optionality to opt in and opt out. Companies must also be committed to keeping to rules about data collection, processing and storage, and even beyond that, should write codes of conduct that are adhered to. Workers should not put the worker in the position of having to chase their data and to approach their managers to enquire what data is collected about, but they should be approached by DPOs in the first instance, who should be reaching out to workers rather than setting up clandestine data collection systems which would ensure transparency and better trust relationships and lead to fewer lawsuits. Indeed, Art. 25 of the GDPR requires Data Controllers to implement data protection by design and by default and thus, there should be meaningful ways for workers to opt out.

Of further significance relevance is the fact that not all monitoring and tracking tools at work are identical, obviously. Various tools and applications have various functions, and products are developed in countries with varying data protection regulation and other laws beyond those required by the GDPR. Therefore, Data Controllers in EU member states (and elsewhere, if companies intend to do business with EU countries), must ensure that software targeted for implementation meets the standards of the GDPR, regardless of where products are designed and manufactured.

Privacy is more than an interest, it is a right, but there are a whole range of interests surrounding and entangled with aspects of privacy which are at stake and which have relevance for discussions of OSH and workers’ rights discussed and agreed in meaningful consultations with worker representative groups. For example, during the C19 period, workers have been instructed to work from home, irrespective of the suitability of the home environment for work activities. When management relied on person-to-person contact, the question arose, how would work be monitored and performance evaluated given home working?

Workers' interests then of course involve privacy, but other interests are also such as how to accommodate people with caring responsibilities' need for more time away from terminals than others during normal shifts, or the need and indeed, right to a reasonable work/life balance in general to maintain wellbeing as digitalised work seems best suited to infinitely expendable working time schedules. These, and a whole range of basic workers' interests and rights are at stake when we think about OSH and intensified monitoring and tracking of work, particularly when we recall that humans are first and foremost, autonomous subjects with a right to pursuing collective action, and machines, frankly, are not.

Remote Work: Health and Safety in New Work Settings

Jon Messenger

In your opinion how has the workplace changed with the introduction of the new technologies?

The workplace can change dramatically with the introduction of new technologies but I think in the case of remote work or, as I prefer to call it, telework – I want to be very clear about what I’m talking about, which is work performed outside the employer’s premises by means of ICT – clearly the introduction of new technologies changes the nature of the workplace, but I think in the case of telework/remote work/agile work it’s not the technology, that has changed because ideally, at least, you should be using the same technology.

I think the main difference with telework, remote work, agile work is not that you are using different technologies but that you’re working from outside the employer’s premises.

That changes the nature of the work very much particularly, since it makes it virtually impossible to manage the work with traditional management techniques: I mean, what I would call a traditional management style which has sometimes been referred to as “management by walking around” where you go from office to office, or from workstation to workstation, and you look at what employees have been doing is not actually possible with remote work unless you use electronic surveillance techniques, which I strongly advise against because it has a very corrosive effect on trust.

I’ve emphasized from the beginning (and also in our ILO teleworking guide *Teleworking during the Covid-19 pandemic and beyond: a*

practical guide) that trust is the key to making telework work for both workers and the employer as well.

You've got to absolutely trust the worker: but how can you manage a worker remotely without looking at them without electronic surveillance, or keystroke monitoring or any of that?

Well, you do it by managing by results. Technology is a dramatic change certainly, as ICTs have become more and more ubiquitous in the workplace, it has changed the nature of work dramatically, of course, also enabling much higher productivity levels, which is key for reducing working hours, but I really think that with telework or remote work the key difference is you're working remotely: you're still using ICTs, hopefully the same ICTs, that you use in the office, but you're doing it from outside the employer's premises, and that as I said, is really different.

You cannot manage workers through a traditional method, you have to manage by results: you have to be very clear about what the deliverables are, what the deliverables have to look like, when they're due etc. All these things have to be very clearly specified.

I would say effective organizations already had a results-based management system in place, prior to the pandemic: even when you're working in the physical premises of the employer you still should have a results-based management system.

It is surprising how many organizations did not have results-based management, or management by objectives prior to the pandemic, or if they did, they were not well-developed systems and they had to be improved.

I have been really pushing hard on that on every webinar and every interview and all the media work that I have done over the last year, since I started myself teleworking on a full-time basis.

I was already teleworking one day a week regularly, and ad hoc telework in addition to that, but, since last March, I have not

been in my office in a year, but it works. And the reason it works, is that is very clear what my objectives are, and how I have to deliver them.

I think the key thing about telework really isn't that the technology is different, which it shouldn't be, since it should be replicating the office environment. The key thing is you're doing it remotely: you can't manage it the same way and you can't work the same way exactly either. You really have to focus on results, you have to prioritize, (which you should have done anyway) you have to decide what the key things are that you need to do, and you have to manage your own time.

Time sovereignty is a key point: you have to be able to have flexibility when you work, so you can work at those times that are most productive for you.

Flexibility helps me with productivity but for other people, for example workers with family responsibilities, it gives them the opportunity to break up their working day into smaller segments and organize it in line with their own individual needs.

That is the key on the employer side, a management by objectives, and, on the workers side, time sovereignty so that the worker can work at those times which are the best for them.

Let us move on to the second question: which are the safety measures for workers who operate remotely, and how can we protect the health and safety of staff related to aspects that escape employer control?

There is almost always an employment relationship with telework: we're not talking about gig work, we're not talking about platform work, we're talking about a situation where there's an existing employer relationship and you're just not working at the employer's physical premises. It is very important to keep that distinction in mind, these aren't self-employed people: these are dependent employees with employers, so there is somebody

who should be considering that. There is such a thing as a virtual inspection of the workplace that can be done. I'm not an expert on that, some of my colleagues are much better qualified than me to talk about how you do that, but that's an important aspect.

I would say that the biggest issues regarding occupational health and safety were accentuated with forced telework and the lockdowns, first and foremost social isolation, which is already a big issue with teleworking in general.

I mean, the more you telework the more you have a risk of detachment from colleagues and also from the organization itself, and of course with social distancing requirements, that becomes mandatory, you have to isolate yourself. That's very difficult for human beings, because, as the anthropologists say, we're social animals, so you've got to really use mechanisms to be able to reach out and interact with other people because otherwise you're really going to have serious mental health issues.

Another key one is ergonomics: having a proper workstation, a proper set up, is hugely important because if you don't have, that you will have back, neck, leg, shoulder problems, all the classic teleworking symptoms. Ergonomic problems can develop much more rapidly working from home than they would in a typical office chair.

But there's other things too: your diet changes, your way of doing things changes, your behaviors change. You become more sedentary, and that's part of the problem.

I think teleworkers need to really take all that into consideration. I particularly point the finger at social isolation and ergonomic issues, they are the big challenges of teleworking, and they have become bigger during the pandemic.

As for question number three, which are the obligations and the responsibilities of the employer in relation to

workers operating away from the business premises? For example, is the employer obligated to check the workplace, or should workers be given more responsibilities in terms of health when working remotely?

My understanding throughout all my work on telework has been that the employers' responsibilities do not go away with telework. The nature of it is such that you cannot inspect the workplace the way you would inspect the workplace in in the physical premises.

For one thing, it would amount to almost a form of electronic surveillance if you came in physically and you had OSH inspectors physically come into the employees' home: I know you can do virtual workplace inspections, I mean, if you have a home office for example the employer can designate somebody to do a virtual inspection of your workplace just to see if there are any obvious hazards.

This is something the ILO has required for a long time: with telework there is a checklist of things you're supposed to look for as a teleworker, and you should go through and check each box to make sure that you are in compliance with these various items.

If you are in fact in compliance, you have to sign your own self-certification that you comply with all of these rules that are designed to protect you: these kinds of checklists are designed to help you know what the potential risks are when you might not realize, and then correct them before they become serious hazards that lead to um occupational accidents, injuries, and other negative outcomes.

Another problem, even before teleworking, is the additional remote working following work in the office. I think the risk is even higher when you are outside the employer's premises on a full-time basis: I did a report a few years ago, a joint ILO and Eurofound report called *Working anytime, anywhere*, and one of

the things that really emerged from that is the importance of really being able to disconnect. That has become a big issue now: the European Parliament proposed that a directive should be developed on the right to disconnect. Several countries, beginning with France but also including Belgium, Spain and Italy have specifically established a specific right to disconnect because of the great risk of blurring of boundaries between personal life and work life.

This “anytime anywhere work” could unfortunately turn into “working every time and everywhere”. This constant connectivity is a terrible risk for occupational health and safety because you never get rest: that can lead to much more profound negative OSH impacts. If you do not disconnect you that means you don’t ever turn off: even if the employer doesn’t contact you, the mere fact that you could be contacted, that you have to remain available without limitations, causes enormous stress fatigue.

Establishing very clear boundaries is the goal: they could be individualized boundaries if necessary, but having boundaries is critical, absolutely essential.

Moving on to question number four, in your opinion is current occupational health and safety legislation suitable to protect workers in these new work settings? As an alternative do you think that these provisions should be reviewed considering new working time and space?

I know the only the broad principles regarding health and safety requirements in the different legislations, I do not know all the details, so I don’t know whether change is required. I can say this much: I think it is a good idea to review existing occupational safety and health legislation, regulations, policies to see if they still are adequate in the context of teleworking and particularly during this full-time mandatory teleworking, which I hope will end with the pandemic. However, I still expect teleworking

in general will be much higher after the pandemic, I just hope it will not be mandatory and I hope it will not be full time because those features really do accentuate its negative aspects.

Telework has a very high potential to be a positive arrangement for both workers and employers if it is practiced correctly, so I would say I would recommend a review of existing occupational safety and health legislation, regulations, policies at national, sub-national, but also organizational level to see are they adequate.

It is crucial to deal with issues like labor inspection in the terms of a balancing act, so we can show on the one hand that we provide adequate OSH protections for teleworkers, but on the other hand we protect teleworkers' privacy. It is very important to protect teleworkers' privacy.

I would strongly advise to just look at what you have got, review it carefully and think about whether it is still applicable. Even for if you are reviewing an organizational policy, ask your workforce if the provisions are adequate, if there is there something missing, if there are aspects of the telework experience that have to be dealt with or that need to be better covered by the existing policy. I think that really is something that needs to be determined on a case-by-case basis.

For the last question: since people can work anytime anywhere, do you think there is still a clear distinction between occupational health and public health?

That's a tough one for somebody who is not an OSH expert. I could see where, with telework, in particular with full-time mandatory teleworking, the boundaries between workplace safety and public safety start to become blurred, but I do not think I really can say definitively whether they're the same thing.

However, I still do not think they suddenly become exactly the same, because you have issues of public health that go far be-

yond the workplace, and Covid shows that you've got issues of public health out there far beyond each person's individual home workstation.

I know Bergamo, where you live, was very heavily affected by the pandemic. We were not as heavily affected here but still Geneva was hit pretty hard, and in order to make sure for example that people can go about their daily business with a reasonable security, wearing masks is something that's mandated here, like in many European countries. We would never mandate something like that in the US because it would be considered a "restriction of individual liberties". So, there is always these trade-offs too between what is good for public health, which may be more restrictive, and individual freedoms, which might require less restriction even if it leads to more risk to public health. I guess I am kind of arguing that the boundary between occupational safety and health and public health is still there, but I think that it has gotten a lot blurrier during the Covid-19 pandemic.

Platform Work and Health and Safety Protection: Riders, Drivers and Beyond

Sacha Garben

The conditions of weakness of platform workers have been a subject of study and debate for some years now, also with specific reference to the OSH protections. As it is in the general approach to the issue, also with specific regard to health and safety aspects of the gig economy, the focus has been on limited categories of workers, namely on the workers in the food-delivery and in the transportation sector (Uber & Co). It seems, otherwise, that other workers in the platform economy have been neglected, both for in-presence services (for example, in the care sector and in domestic work) and for online services (from clickworking to professional design). Do you think that a unitary reasoning is adequate to the heterogeneous world of the platform economy? Do you think that the main issues related to platform work are common in the gig economy or that specific categorizations and differentiations should be taken into account?

Online platform work includes all labour provided through, on, or mediated by online platforms. As such, it indeed features a wide array of standard and non-standard working relationships such as (versions of) casual work, dependent self-employment, informal work, piece-work, home-work and crowd-work, in a wide range of sectors. The actual work provided can be digital or manual, in-house or outsourced, high-skilled or low-skilled, on-site or off-site, large- or small scale, permanent and temporary, all depending on the specific situation. This heterogeneity indeed means that the OSH risks are different for different types of online platform work/workers. The OSH environment and

attendant risks are very different for a bike food delivery courier and an online translator. These differences need to be taken into account in the design of specific rules and protections for the different types of online platform work.

At the same time, it can be said that by and large, all online platform work has to some extent similar characteristics and thereby poses a range of similar risks, both pre-existing and new ones, both physical and psycho-social:

Work organisation methods characteristic of online platforms:

- platform work, through competitive and rating mechanisms, encourages a rapid pace of work without breaks, which may induce accidents;
- pay not being continuous but per-assignment adds such time pressure;
- continuous real-time evaluation and rating of worker performance can become an important source of stress: workers have to be friendly, efficient and serviceable at all moments, and the worker must always be on stand-by to accept any potential upcoming jobs, which also blurs work-life boundaries.

Profile of online platform workers:

- online platform workers tend to be of younger age, which is a well-known independent risk factor for occupational injury;
- a reported lack of appropriate training for online platform workers further increases the risk of accidents;
- studies suggest that health problems may in fact be a main reason to engage in digital online platform work such as on microtask platforms, which means that online platform work can provide an alternative way for people with health impairments to carry on work and earn some income, contributing to social and labour market inclusion, but on the other hand means that many online platform workers are already in

a vulnerable position from an OSH perspective, which the work online platform work may aggravate.

Lack of common workplace:

- any physical health and safety risks could be anticipated to be worse because of the loss of the protective effect of working in a public workplace, as most of this work is transacted in private spaces (automobiles or homes) or in the general public space (traffic), which increases the risk that the work equipment does not meet ergonomic criteria and that other environmental factors are not optimized for working;
- as most of the tasks will be performed individually, separated from – and often competition with – fellow workers, this can lead to isolation by denying workers face-to-face contact with their colleagues which forms the basis of both social support and discussion of work concerns;
- the lack of a monitored workplace may also mean that a worker can develop anti-social and/or health-threatening habits as a means of coping with stress (such as dependence on alcohol or drugs) which would be spotted by the employer in a normal working situation but can escalate rapidly if nobody is aware of them.

Precariousness of atypical employment:

- online platform workers share many similarities with both temporary workers and agency workers, means that they are probably exposed to the same OSH risks, with studies consistently showing higher injury rates among workers on these non-standard arrangements;
- the fact that online platform workers will usually be denied the right to paid sick leave leads to increased illness; morbidity. Working while sick can increase the risk of injury
- finally, job insecurity, known to contribute to poor overall health among contingent workers, is salient among online platform workers: their working relationship with the online

platform can usually be ended without notice or any form of dismissal protection, and even when the relationship is active, there is no guarantee of minimum pay since this is dependent on performing an assignment;

- the application of OSH rules and employment law in general is not easy, as the involvement of online platforms in the organization and provision of (digital and manual) labour tends to complicate the classification and regulation of the responsibilities as regards the work in question. The almost inevitably triangular (or multilateral) nature of the arrangements, their often-temporary nature, the sometimes relatively high measure of autonomy of the worker in terms of working place and time, and the at times informal (citizen-to-citizen) nature of some of the activities, and the absence of a common workplace all challenge the application of the concept of the standard, permanent, binary employment relationship.
- So the answer is that there should be both a unitary response to the risks of precarious atypical employment generally and online platform work specifically, as well as more specific protections in relation to the OSH reality of each 'sub-sector' of online platform work.

Coherently with the mentioned focus, the main regulatory interventions (for example in Italy and, more recently, in Spain) aimed at the protection of a specific category of workers (i.e. riders) and, although through different techniques, they tried to extend the OSH regulation applied to employees to these workers. Do you think that the extension of the OSH regulation for employees are satisfactory of the needs of protection of these workers or there are conditions of weakness that cannot be addressed by merely extending labour law protections? I think, for example, to the precarity and the economic insecurity which directly have and impact on the health and safety of the workers. Against this background, don't you think that other interventions should be considered, aimed to address the needs

of platforms workers together with the similar needs of other precarious workers (for example, on call workers)?

I do think that the ‘silver bullet’ that addresses the largest part of the problem of precariousness of online platform work is that of labour status. As soon as online platform workers are treated, under national and EU law, as “workers” rather than “self-employed”, they will be entitled to a full range of protections relating to OSH, minimum wage, social security, dismissal protection, etc. However, it is true that this may not entitle them to a sufficient overall wage, because they may not have guaranteed working hours. On an individual level, the aspect of free choice would seem to be crucial in this respect. A study of a large sample of women with temporary jobs showed psychological distress and somatic complaints were higher among those who were involuntarily performing temporary jobs, compared with those workers who preferred temporary work. Research has shown that insufficient work is a principal concern of online platform workers, the majority of whom expressed a desire for more hours, either in crowdwork or non-crowdwork activities. Such underemployment and intermittency of work require daily or even hourly job search, with the added stress and excess working time that ensues. I am not an economist or specialist of labour market functioning and dynamics as such, but I would think that the prevalence of low-hour employment is a signalling factor about the health of the overall labour market and economy. A certain, contained, degree of such employment may be desirable to provide a measure of flexibility for workers with certain profiles (e.g. students, people looking for limited part-time activity for personal reasons, etc.), but if it grows beyond a certain proportion and is used for instance by people who already have a (near-)fulltime employment to get their overall income to a sufficient level (i.e. the ‘working poor’), or by people who would prefer to have stable full-time employment but cannot find it (see the point of individual choice above), then something is awry with the economy and labour market and there is a

risk of exploitation and precariousness. I agree that it is crucial to more generally provide sufficient protection for workers in atypical employment relationships of all kinds. As regards on-call/low-hour work, the EU Directive on predictable and transparent working conditions already goes some way to minimum protections, such as a framework of hours within which the work is to be provided, protection against dismissal and the banning of exclusivity clauses. Member States can decide to go further, for instance by banning 0-hours contracts or limiting their use to certain circumscribed situations. At the same time, we should also recognise the limits of regulatory intervention by means of labour law.

Considering the global relevance of the gig economy as well as the importance of the EU regulation in the the OSH field, which do you think may be the legal instruments to introduce effective rights for platform workers? What kind of difficulties do you envision for a legislative intervention that may implement common standard at the EU level? Which role do you think trade unions may play in this field?

The European Commission is currently planning to take action to ensure dignified working conditions and adequate social protection in platform work. In its first stage consultation of social partners, the Commission has identified a number of areas in which improvements may be needed, including (i) employment status; (ii) working conditions, including health and safety; (iii) access to adequate social protection; (iv) access to collective representation and bargaining, and (v) algorithmic management. I believe that the most crucial element is the first: the question whether the people working via online platforms are to be regarded as ‘workers/employed’ with the attendant rights under EU and national law, or instead as ‘independent contractors/self-employed’, as most other issues are directly dependent on that question of labour status. As they are often formally

contracted by the platforms as independents and have working arrangements that do not always correspond clearly to a traditional employment relationship, online platform workers have been difficult to classify in many jurisdictions. While national courts seem increasingly confident to (re-)qualify online platform workers from self-employed to employed, they may feel that under the current legal framework(s) they have to fit a square peg into either a round or a triangle-shaped hole. As such, the Commission suggests introducing a rebuttable presumption of employment. This could provide an elegant solution, that would significantly shift but not totally tilt the legal balance in favour of the increased socio-economic protection of online platform workers. It would mean that the majority of online platform workers would receive the protection that workers/employed receive under EU and national law, filtering out the false self-employed, while leaving scope for the possibility of genuinely self-employed working via platforms without imposing worker status or treatment on them. What could that look like, concretely? I have developed some tangible suggestions for the key provisions of a possible Directive on the labour status of online platform workers:

Article 1: Application of EU law to online platform workers

Online platform workers are entitled to all the rights and protections applicable to workers under EU law, unless their relationship to the platform clearly does not feature the essential characteristics of an employment relationship and they are to be regarded as self-employed in light of, in particular, their full autonomy in terms of the pricing, organisation and execution of the work in question.

Article 2: Application of national labour protections to online platform workers

1. Member States shall ensure online platform workers all the rights and protections under the relevant national law applicable to persons with an employment contract.

2. *By way of derogation to paragraph 1, Member States may decide to dis-apply the relevant provisions of national law to those online platform workers whose relationship to the platform clearly does not feature the essential characteristics of a work relationship and who are to be regarded as self-employed in light of, in particular, their full autonomy in terms of the pricing, organisation and execution of the work in question.*

In addition to a rebuttable presumption of employment, the EU measure could provide specific protection for all online platform workers – including those that are genuinely self-employed.

Article 3: Specific protections for online platform workers

Member States shall ensure that the functioning of online platforms complies with the rights and principles contained in the EU Charter of Fundamental Rights. In particular, the activities of online platforms must fully respect the fundamental principles and rights to fair and just working conditions, non-discrimination, transparency, data protection and consumer protection. This includes the design, operation and application of algorithms, for which the online platform is fully responsible.

The merit of this approach lies not just in its capacity to efficiently tackle the issue of precariousness in the online platform economy. It lies in its acknowledgement that to protect workers in what is often referred to as the ‘new’ world of work, the ‘old’ rules and existing protections are usually actually the best tools. They may need some tweaking for best results, but most importantly, it needs to be made clear that they, quite simply, apply. This no-nonsense approach rejects the omnipresent but shallow narratives of technological exceptionalism that trade on the idea that the ‘digital revolution’ has made labour codes, and other important norms, redundant. To the contrary, it has underlined their primordial importance.

On trade unions: the precarious position of online platform workers is further aggravated by the fact that the specific features of online platform work tend to hamper the collective organization of workers, and thus the defense of their rights and

interest, as well as the development of social dialogue. Most workers on online platforms do not know each other, there is a high turn-over of workers, set working patterns may be lacking, workers may not consider the work they provide for/on/via the online platform as their primary professional activity, and putting workers in direct competition with each other – through individual ratings and the competitive method of work allocation – is an operational feature of many online platforms. These factors are not conducive to the solidarity and collaboration needed for effective unionization – and the fact that they may be considered “self-employed” problematizes such unionization in legal terms. Asserting their employment status may thus be a crucial piece that helps the unionization of online platform work.

One of the main regulation for the protection of the health and safety of the workers is – as the EU-level regulation and the history of labour law makes evident – the one on working time. While the application of this regulation is still debated and depends on the specific sector of the gig economy (for example, transportation and delivery), how do you think an effective reform may be implemented to guarantee an adequate protection for the workers against the risks of overworking and self-exploitation?

Article 17 of the Working Time Directive specifies that «with due regard for the general principles of the protection of the safety and health of workers, Member States may derogate from Articles 3 to 6, 8 and 16 when, on account of the specific characteristics of the activity concerned, the duration of the working time is not measured and/or predetermined or can be determined by the workers themselves»; which basically means under that Directive those worker are only entitled to paid annual leave. This reflects a certain logic: it is different to protect people from exploitation or from, as you say, “self-exploitation”. In this respect it should again be noted that the issue of choice is crucial: if someone deliberately chooses to work more than the

limits, this likely poses less of a OSH risk than those that are forced to, and moreover – normatively, ethically it presents a different problématique. It thus ties in to the answer to question 2: the incidence of people overworking is likely to be a reflection of the overall “health” of the economy and labour market: if these excessive hours are necessary for many workers to make a decent living, then there is likely something malfunctioning in the economy, and we can imagine that some kind of regulatory intervention may be necessary (although, again, with such macro-issues it is not evident what exactly). But if excessive hours are related to individual free choices, then it would seem that this is not “self-exploitation” and regulatory intervention should arguably be limited to mitigating the risks to others (for example in traffic).

As already anticipated, the gig economy seems to be very heterogeneous in terms of services and sectors, so that some characteristics and some weaknesses are relevant for certain categories and not for others. While, in general terms, the gig economy has raised question regarding the scope of application of OSH regulation, it seems to emerge also a need of differentiation of the specific measures to be applied to the different situations. If, in some cases, the legislation is pushing for the extension of the same provisions applied to employees, in other cases this seems not to be a viable intervention. How do you think that the regulation can address the specific needs raising from the different sectors of the platform economy, considering the different level of intervention in the OSH field? What kind of role may trade unions play?

I would refer to my answer to the first question: both a unitary response to the risks of precarious atypical employment generally and online platform work specifically, as well as more specific protections in relation to the OSH reality of each ‘sub-sector’ of

online platform work seem appropriate. Especially for the latter, it would be great if this could be done by collective bargaining.

Short Paper on the Health Effects and OHS Legislation Concerning New Ways of Work

Jan Popma

What are the new risks that emerge due to the new jobs (and new ways of working) as well as the new workplaces in which work is carried out and that often overlap with the environment surrounding the company as well as with private life settings?

The notion of new ways of work is quite broad. In general, it is used in the context of ICT-enabled forms of work. This could also refer to platform work or the ‘gig economy’ (such as driving an Uber taxi or jobs in the food delivery service), or to the upcoming field of robotics – both of which bring several health and safety issues. Still, for the purpose of this interview, I would like to narrow down the notion of ‘new ways of work’ to ICT-enabled teleworking, notably ‘office work’ using a computer (or comparable media) in a home setting or shared office spaces. So all work that is not being performed at the premises of the employer. In times of Covid, it appears the private home has become the most important setting for telework, shared offices temporarily being on the way back.

The risks of new ways of work are numerous – at least on a conceptual level. The empirical data, however, is not too strong – and at least not consensual. Most empirical work reports both positive and negative effects. ⁽¹⁸⁾ Still, without going into the statistical details, I think it is important to address some of the *potential* risks here, as there are clear indications that these risks (may or do) arise.

⁽¹⁸⁾ For example A.I. TAVARES, *Telework and health effects review*, in *International Journal of Healthcare*, 2017, vol. 3, n. 2.

Clearly, the risks of poor ergonomics in office settings are well documented. This pertains both to the physical setting (desk, chair) and the frequent use of computers or other devices. Poor ergonomics may give rise to musculoskeletal diseases, ranging from back aches, repetitive strain injuries to tension headache. Also, lack of physical exertion in an office environment is a well-known risk. More likely than not, these health risk will be on the rise with a growing number of workers working from home, as not all home settings allow for optimal ergonomic work stations (the proverbial kitchen table). Also, teleworkers are inclined to work longer hours seated, without taking breaks.

New ways of work also (may) entail various forms of psychosocial risks. Direct effects may be the experience of poor connectivity or other forms of malfunctioning ICT (leading to computer related anger/anxiety). More generally speaking, workers may experience ‘techno-stress’, which is a container concept encompassing techno-invasion (frequent interruptions of work, leading to a decrease in concentration) and techno-overload (too much information). The more intense forms of techno-stress may be techno-addiction (a propensity to check e-mail or the smart phone compulsively) and information addiction. Finally, technostress may come in the shape of a feeling that you should be available for work 24/7. There appears to be a mental mode of not being able to switch off.

To be sure, these forms of technostress are not typical of new ways of work alone, but may also arise in knowledge workers working from ‘normal’ office settings. And frequent interruptions may also be caused by colleagues passing by in open office settings – a nuisance that may in fact be reduced in the seclusion of the home setting (boosting concentration). But then, on the other hand, frequent interruptions in the home setting may occur due to the presence of family members (see below, question 2). And if the feeling you should always be available extends to

the private situation and the evening, this intensifies technostress.

Even if new ways of work hold a promise of autonomy in performing ones tasks, like permitting to take breaks at will, it appears that workers tend to take *less* breaks and in some cases experience *less* autonomy due to rising expectations from the side of their employer. There are various studies indicating that a lot of employers expect their workers to be reachable outside of office hours. Also, research indicates that home-based workers and highly mobile workers are working overtime much more often than average and are making very long hours – 20-30% of them working more than 48 hours a week, compared to less than 10% of workers working at the premises of the employer.⁽¹⁹⁾

Another form of job intensification is the extension of working time. For instance, workers working from home may in fact use the time saved from not having to travel to and from to actually *work* in this period. Furthermore, new technologies make it possible to work any time, also during the evening. This may lead to work/life imbalance, but also to erosion of resting time (see below). Home-based and highly mobile workers report reduced rest periods much more than average.

A third form of job intensification is eradication of idle time. Commuting, for example, may be considered to be a ‘switch off’ from the duties of work. But when commuting to the office, new technologies (notably smart phones) make it possible to breach the private sphere of the automobile or even public transport, converting commuting time to work time. And time spent chatting to colleagues at the coffee machine in a regular office is another moment of repose that is lost when these colleagues are not around in the home setting.

⁽¹⁹⁾ EUROFOUND, *Telework and ICT-based mobile work: Flexible working in the digital age*, New forms of employment series, 2020.

Burn-out is quite complex an issue, being caused by various interacting factors – such as too high job demands (work load, time pressure), lack of autonomy, lack of social support and more. It appears that once again, new ways of work may be both beneficial and detrimental – depending on how work is being organised. The possibilities of ICT may offer greater schedule flexibility and more autonomy, but may also lead to job intensification and rising pressure on the worker to be available ‘24/7’ and always respond *asap*. It’s all a matter of how new ways of work are being organised, as well as the expectations of both the employer, colleagues and the worker herself.

Another element attributing to burn-out, is sub optimal recovery. Notably, home based workers tend to take fewer breaks and also are reporting poorer sleep quality which, in the not so long run, may have detrimental effects on (psychological) health.

A final risk that may be mentioned here, is that workers under new ways of work may be more prone to (ICT-based) supervision than ‘regular’ workers. Clearly, supervision may also be an issue on the regular shop floor level, but it appears that ICT-based surveillance is much more pervasive and may lead to a feeling of being under *constant* supervision. Recent research by a Dutch trade union found that nearly one out of eight workers are being monitored while working online – or supposed to be online. This may lead to psychosocial effects, specifically when monitoring involves monitoring the work place at home.

How does the overlapping of work time and space with that of private life, and hence the failure to strike a balance between private and work life, impact on the emergence of psycho-social risks and their implementation?

The balance between private and work life is not at risk *per se*. In fact, new ways of work may help to strike a balance. For instance, working from home may save a lot of commuting time. Also, it becomes feasible to enjoy lunch with your family mem-

bers, which may be considered ‘quality time’. The combination of work with informal care for sick family members may also be more simple to manage.

Still, it is quite clear that working from home also entails a blurring of spheres that may lead to work stress. Notably, as has been ‘evidenced’ by many clips on You-tube of workers working from home during the Covid lock-down, the presence of children at home during work hours may be rather stressful. Still, it is evidenced by recent findings from Eurofound that home based workers with children in fact experience *less* work-life balance problems. This is the only category of workers with children that report an imbalance that is lower than comparable workers without children. On the other hand (ICT enabled) highly mobile workers experience *by far* the highest level of work-life imbalance – notably because they work overtime extensively and they can be reached at all times (disturbing domestic peace and giving rise to conflicts with partners).

Clearly, this work-life imbalance may give rise to higher levels of stress. Yet, overall, neither the potentially positive nor potentially negative effects of new ways of work on work–life balance dominate. It varies from case to case and depends on the individual characteristics of the worker, the company culture and the work arrangement. ⁽²⁰⁾

What role do psychosocial risks currently play and how might they emerge in the future? Is current legislation adequate to protect these risks?

It is clear from the above that new ways of work are actually quite ambiguous a development. ⁽²¹⁾ New technologies that enable these new ways of work may help to actually safe workers a lot of time, give them control over their own work and work

⁽²⁰⁾ EUROFOUND, *Telework and ICT-based mobile work: Flexible working in the digital age*, New forms of employment series, 2020, p. 26.

⁽²¹⁾ J.R. POPMA, *The Janus Face of New Ways of Work*, ETUI, 2013.

environment, and boost productivity. On the other hand, they may give rise to new risks, specifically psycho-social risks. It is quite likely that new ways of work will become even more common in the post-Covid era, since the advantages are clear. Also, I think that most employers have found out that they do not have to have cold feet in granting workers more autonomy and trust their workers.

On the other hand, the downsides I have just summarized too may become more widespread in the future. It all depends on how new ways of work are being implemented in practice. Undoubtedly, many employers will weigh the benefits and the risks in a proper manner. But undoubtedly too, some employers may also be tempted to raise the demands on workers, keeping them on an electronic leash and putting workers' health at risk.

So, it is important to keep an eye on the fact that there is legislation in place to protect workers against the (upcoming) risks to steer the developments in the right direction.

First of all, it should be quite clear that most of the current OHS legislation does apply to new ways of work. Not only as concerns the psycho-social risks, but also the musculoskeletal risks I have mentioned and even the lay-out of the workplace. To be sure, it seems clear that the wordings of article 2 of the Workplace Directive (89/654/EEC) limit the scope of the legislation to the premises of the undertaking and/or establishment and any other place within the area of the undertaking. However, it is also clear that the minimum safety and health requirements in Directive 90/270/EEC (work with display screen equipment) fully apply – including the minimum requirements set out in the appendix concerning, a.o. work desk, office chairs, the direct work environment as well as the computer itself. So all work places, even at home, should meet the requirements for a *healthy* work place. The definition given of 'display screen workstation' makes no distinction according to the location of the workstation.

Second, even if there is no specific Directive on psychosocial risks, it is quite clear that these risks fall under the scope of Framework Directive 89/391/EEC. The notion of ‘risk’ is *not* limited to physical or chemical risks, but also spans the risk of burn-out or other forms of psychosocial risks. The European Court of Justice has been quite unequivocal in this respect. *Any* worker should be protect against *all* relevant risks, even if the worker does not work at the premises of the employer.

Third, and maybe most important concerning psychosocial risks, the Working Time Directive (2003/88/EEC) fully applies too. This means that *all* workers are entitled to 11 hours uninterrupted rest per day, 35 hours once a week. Also, excessively long working weeks (of over 48 hours) should be prevented. Some exemptions apply, the most notorious being the notion of autonomous workers, whose «duration of [...] working time is not measured and/ or predetermined or can be determined by [...] themselves». This seems to apply to workers that are working from home (or another place outside of the regular office), outside of the gaze of the employer. However, the Court of Justice has made it abundantly clear that the of ‘autonomous worker’ should be limited to workers who are *entirely* free to organise their own working time, and not workers who are only partially free to do so. As long as the employer is entitled to instruct the worker to perform specific tasks within a certain time-frame, the notion of ‘autonomy’ within the meaning of the Working Time Directive does not apply.

So it is clear that virtually all workers are, or at least should be, fully protected from the risks to their health that come with the new ways of work.

How can we protect the health and safety of workers who work anywhere, without a defined workplace and, therefore, in contexts beyond the employer’s control?

The first step to be taken, is that the employer performs a risk assessment – addressing not only the ergonomic risks of home based work places (in accordance with the annex of Directive 90/270/EEC), but also the *potential* psychosocial risks. The European Court of Justice has been quite clear that the risk assessment should address *all* relevant risks.

Also, the risk assessment should not merely be an inventory of all risks that actually *do* occur, but must in fact *anticipate* potential risks, make an estimate of the likeliness the risk *may* occur. The anticipatory nature of the risk assessment implies that the risks should be taken into consideration *before* deciding whether or not to introduce new ways of work. This may also be deduced from art. 6 (3)(c) of the Framework Directive, which states that representatives must be consulted about the «planning and introduction of new technologies [...], as regards the consequences of the choice of equipment, the working conditions and the working environment for the safety and health of workers».

After having assessed the risks, it goes without saying that the employer should take adequate measures to minimize the risks prevent or reduce these risks as far as reasonably achievable. What measures should be taken specifically, depends on the specific circumstances. But all national OHS legislations contain some general notion of a duty of care, that should be tailored to the situation in the company. The employer should also inform workers on the risks of new ways of work and the precautions the worker should take.

One of the other elements of proper OHS management is that workers are entitled to have access to health surveillance (Art. 14 of Framework Directive). Once again, this is a very general provision, but it is advised that not only musculoskeletal complaints but also signals of psychosocial overburdening be part of the surveillance protocol. In this way, health surveillance should be an early warning system for protecting workers from harm and indicating the need for swift action to reverse initial damage.

The working times regulations too contain valuable elements for curbing psychosocial overburdening. Most importantly, as indicated earlier, *all* workers are entitled to 11 hours uninterrupted rest per day, 35 hours once a week. To be sure, 11 hours of uninterrupted rest leaves ample room for work days spanning 13 hours, and work weeks of over 60 hours could be possible. But the regulations also limit the *average* working weeks to 48 hours, and the workload should be limited if the work cannot be completed within 48 hours. This applies to all kinds of work, regardless of where the work is being performed. It could even be defended that, as working from home practically implies that home is becoming a work place, *all* time that the worker is at the disposal of the employer should be considered working time (see ECJ in the cases *SIMAP*, *Jaeger*, *Dellas and Matzak*). So it is also in the interest of the employer that he makes it crystal clear that the worker should respect adequate resting times.

Is current occupational health and safety legislation adequate to protect the health and safety of workers who work that is independent of spatial and temporal dimensions?

In theory, then, the above legislative body should be adequate to protect the worker in the age of new ways of work. In practice, however, many workers do experience work stress and burn-out. So apparently, OHS is not adequate. Therefore, there is a need to be even clearer as to the protection of workers under new ways of work. Some examples do exist already.

One strategy might be an unequivocal “right to disconnect”, a right that has in some way or other been adopted into legislation in Belgium, France, Italy and Spain – even if the specifics are to be defined by sectoral or company level bargaining. In the Netherlands, a right to disconnect has been proposed in 2020, and is parliamentary process.

Even clearer would be technical means to actually make it *impossible* to access e-mail or other work related outside the agreed

'office' hours. In some larger companies, these systems have in fact been installed.

Chapter III.
**PSYCHOSOCIAL RISKS
AND THE RIGHT TO DISCONNECT**

**La salud mental y el bienestar psicológico
en los nuevos contextos laborales**

Cristóbal Molina Navarrete

¿Qué se entiende por riesgos psicosociales? ¿Existe una definición legislativa? ¿Qué pautas comunitarias e internacionales hay?

Un primer obstáculo a una gestión preventiva más eficaz de los riesgos psicosociales en los entornos de trabajo es, precisamente, la falta de suficiente consenso científico internacional en torno a los diversos conceptos implicados: “factores psicosociales”, “factores de riesgo psicosocial” y “riesgos psicosociales” propiamente ⁽¹⁾. Carecemos del mismo modo de un “catálogo”

⁽¹⁾ Por ejemplo, los términos «factores de riesgo psicosocial» (peligros psicosociales) y «riesgos psicosociales» se usan a menudo de forma indistinta. Además, el «estrés» -que es un riesgo psicosocial- a veces se tiene -erróneamente- como un factor de riesgo psicosocial. Otro ejemplo: suele considerarse la “inseguridad contractual” como un riesgo psicosocial. Pero es un “factor de riesgo psicosocial”. Un factor de riesgo (peligro) es la capacidad potencial de un agente, proceso o situación (medioambiente de trabajo, organización, prácticas laborales) para provocar consecuencias negativas para la salud en el trabajo. El «riesgo» es la relación de

o “inventario” de cuáles son los riesgos psicosociales laborales típicos o jurídicamente relevantes. El listado de enfermedades laborales asociadas a los riesgos psicosociales también es abierto (OIT, 2002-2010).

Por “factores psicosociales” en los entornos de trabajo suele entenderse todo tipo de condiciones de trabajo relativas a la organización, el contenido del trabajo, la realización de tareas, el ambiente de trabajo, las relaciones sociales y características personales susceptibles de afectar tanto al bienestar o la salud integral (física, psíquica) de las personas trabajadoras como al desarrollo de su trabajo. Si el diseño de estas condiciones es el adecuado, serán factores positivos (protección) de salud (“factores de bienestar psicosocial en los entornos de trabajo”), en cambio, si no es el adecuado, si no están equilibradas, se convertirán en factores negativos de salud (“factores de riesgo psicosocial en los entornos de trabajo”).

Ante esta carencia, no es fácil encontrar definiciones jurídicas, menos legislativas, de lo que se entiende por “riesgo psicosocial”. En cambio, sí existen definiciones legislativas nacionales (Francia, Bélgica, Suecia), comunitarias (Directiva 2006/57) internacionales (Convenio 190 OIT) de algunos riesgos, como el relativo al acoso en el trabajo (*mobbing*), o acoso sexual en el trabajo, incluso acoso discriminatorio.

No obstante, sí existen relevantes indicaciones y pautas de las organizaciones internacionales más solventes (Comisión Europea, Organización Internacional del Trabajo -OIT-, Organización Mundial de la Salud), para alcanzar una definición operativa, útil, a efectos jurídicos de los factores de riesgo psicosocial y de los riesgos psicosociales en sentido estricto. Por ejemplo, del comité mixto OIT-OMS (1984) se deriva que los riesgos psicosociales en el trabajo son:

probabilidad de que una persona sea perjudicada o experimente efectos adversos relevantes en la salud si se expone a un factor de riesgo psicosocial.

«la relación de probabilidad de sufrir un daño relevante en la salud a consecuencia de las interacciones entre trabajo, medio ambiente, satisfacción laboral y condiciones organizativas, por una parte, y las capacidades de la persona trabajadora, su cultura, necesidades y situación personal fuera del trabajo»

(2)

Esta definición inspira la reciente (Abril 2021) Norma ISO 45003 (Occupational health and safety management – *Psychological health and safety at work – Guidelines for managing psychosocial risks*): «combination of the likelihood of occurrence of exposure to work-related hazard(s) of a psychosocial nature and the severity of injury and ill-health that can be caused by these hazards».

(3)

Además de complejos, suelen tener carácter interactivo (no actúan de forma aislada), sino unos en relación con otros. No se trata de un problema individual (salud mental), aunque tenga un impacto diferente según personas y colectivos (mujeres, inmigrantes, jóvenes, etc.), sino organizativo (social)

Más importante que definirlos, es tipificarlos. La OIT (Programa SOLVE) incluye:

- 1) La rama o grupo de riesgos de estrés laboral: estrés, síndrome del quemado (burnout), tecnoestrés, “estrés de género”, etc.
- 2) La rama o grupo de violencia en el trabajo: acoso moral en el trabajo, acoso sexual en el trabajo, acoso discriminatorio (orientación sexual, inmigrantes, etc.), violencia de terceros (ej. agresiones a profesionales de la salud; atracos a estaciones de servicios, bancos, etc.), ciberacoso en el trabajo.

(2) https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_473270.pdf.

(3) <https://www.iso.org/obp/ui/es/#iso:std:iso:45003:dis:ed-1:v1:en>.

- 3) La rama de adicciones en el trabajo (no derivan exclusivamente del entorno de trabajo, sino externos – familiar, el social, el educativo, etc. –, pero el entorno laboral puede reducirlos o agravarlos)

En Europa, pese a disponer de un mismo marco normativo genérico (Directiva 391/1989/CE), las personas investigadoras, profesionales, agentes sociales, órganos de la administración y empresas de los diversos Estados siguen difiriendo notablemente en el nivel de conocimiento y concienciación sobre estos temas. De ahí la necesidad de un marco de actuación común que traduzca el conocimiento en políticas y prácticas efectivas de gestión psicosocial en el trabajo.

Una buena iniciativa de cooperación entre ciencia (Universidades) e instituciones este ámbito es PRIMA-EF– (Psychosocial Risk Management-Excellence Framework). <http://www.prima-ef.org/prima-ef-guidance-sheets.html>

Cuadro-síntesis de factores y riesgos psicosociales en los entornos laborales

Factores psicosociales	Factores de Riesgo Psicosocial	Riesgos Psicosociales	Consecuencias psicosociales negativas
Organización	Sobrecarga	Estrés laboral (burnout, fatiga digital informática, etc.)	Daños psicosociales (lesiones, enfermedades) Pérdida de productividad
Carga y ritmos	Ritmos intensos		
Tiempo de trabajo	Jornada prolongada		
Interacción vida personal/trabajo (...)	Exceso de conectividad		

Organización	Pobre comunicación		
Cultura de empresa	Vaciamiento tareas	Violencia laboral/	Daños psicosociales, violación derechos fundamentales, pérdida productividad, etc.
Relaciones sociales	Falta de control o autonomía	Acoso laboral/	
Calidad ambiente (etc.)	Estereotipos (etc.)	Acoso de género (etc.)	

¿Estamos hablando de un fenómeno nuevo? ¿Es un tema relacionado con las nuevas tecnologías? ¿Se complicará o mejorará este fenómeno en la organización del trabajo típica de la RI 4.0?

En absoluto son ahora ya riesgos nuevos. Durante mucho tiempo se les ha calificado “emergentes”. De hecho, así sigue siendo para el Observatorio de Riesgos Emergentes de la Agencia Europea de Seguridad y Salud (OSHA-EU) ⁽⁴⁾. Pero riesgos que se conocen desde hace ya casi media década, y cuyas consecuencias nocivas en la salud incluso se valoran por la OIT como enfermedades del trabajo (R194, Recomendación sobre la lista de enfermedades profesionales, 2002, revisada el año 2010), creo que deben tenerse ya como suficientemente “emergidos”, conocidos y, por lo tanto, a gestionar preventivamente de forma eficaz.

Otra cosa es, y enlazo con la segunda parte de la pregunta, que evidencien nuevas dimensiones con los procesos de transformación tecnológica y organizativa ⁽⁵⁾, a raíz de la revolución digital (“Revolución 4.0”). Aunque el llamado

⁽⁴⁾ <https://osha.europa.eu/es/emerging-risks>.

⁽⁵⁾ <https://osha.europa.eu/es/emerging-risks/developments-ict-and-digitalisation-work>.

“tecnoestrés” se conoce desde los años 90 (reacción de estrés ante la sobrecarga o la colonización tecnológica de todos los ámbitos de vida, laboral, personal, social) es manifiesto que el desarrollo de las nuevas tecnologías de la información y de la comunicación (TIC) e internet (digitalización) incide en los factores psicosociales. En el sentido de favor o protección (ej. reducción del trabajo penoso, mejora de la conciliación de tiempos de vida, más autonomía de gestión, etc.), cuanto de mayor riesgo (exceso de jornadas laborales, conectividad fuera de jornada, desequilibrios de la vida laboral-familiar). El Consejo Económico y Social Europeo (CESE) lo ha dejado claro:

«10.1. Si bien el uso cada vez más intenso de las TIC puede representar, para determinados trabajadores, una oportunidad de autonomía y una mejor conciliación entre vida profesional y vida privada [son dos factores psicosociales, como se indicó], en ciertos casos también constituye un riesgo para la salud. El aumento del número de trabajadores que sufren estrés y síndrome de desgaste profesional (burnout) es una realidad preocupante y costosa para la que el diálogo social debe encontrar solución»⁽⁶⁾

Con la aceleración de la telemática para abordar la crisis de la Covid-19, con una masiva migración de lugar de trabajo físico a los lugares de trabajo virtuales, incluso se han identificado “nuevos riesgos psicosociales” (*fatiga informática*, dentro y fuera de la jornada – España lo regula –, “síndrome Zoom”, “ciberagotamiento” – el cansancio que genera estar pendiente de la ciberseguridad, con la hiperresponsabilización de la seguridad en la gestión individual de las personas trabajadoras, etc.). En realidad, no son sino modalidades de los riesgos psicosociales precedentes derivados del desequilibrio entre lo demandado y lo controlable (estrés laboral, burnout), o de la violencia laboral (*violencia digital, ciberacoso laboral*: art. 3 Convenio 190 OIT)

⁽⁶⁾ Dictamen CESE sobre *Papel y perspectivas de los interlocutores sociales y otras organizaciones de la sociedad civil en el contexto de las nuevas formas de trabajo*, (2017/C 434/05).

En suma, *la digitalización puede ser un factor de bienestar psicosocial si sus condiciones son las adecuadas. Hoy, actúa más como factor de riesgo.*

¿Qué papel pueden desempeñar los interlocutores sociales y la negociación colectiva? Le pregunto con especial referencia al tema de la conciliación de la vida personal y laboral

Precisamente, de nuevo como advierte el CESE, el papel de la autorregulación colectiva (diálogo social y autonomía colectiva) es clave. Sobre el presupuesto doble de la «preocupante y costosa realidad del aumento del estrés laboral por el proceso de digitalización» (las TIC tienden a difuminar las fronteras entre vida profesional y vida privada – todo tiempo puede ser de trabajo, todo lugar puede ser de trabajo –), por un lado, y de la obligación del “diálogo social de hallar solución”, pone de relieve que:

«Un diálogo (social) amplio para limitar la disponibilidad permanente de los trabajadores y su formación para la utilización eficaz de las TIC son respuestas necesarias, así como nuevos derechos, como... a la desconexión» (que reconocen Francia y España, por ej., y ahora se propone una Directiva europea) (7).

En realidad, así viene sucediendo -aunque con escaso éxito, a mi juicio, como sucedió con el acuerdo de teletrabajo- desde 2004. Todos estos riesgos cuentan con una dilatada autorregulación comunitaria, a través de acuerdos marco autónomos (esto es, no reforzados por una Directiva – salvo para el caso del sector de los sanitarios respecto de los riesgos por instrumentos cortantes

(7) Punto 10.2 del citado Dictamen CESE 2017/C 434/05). Insiste en esta dirección su Dictamen CESE: *El diálogo social para la innovación en la economía digital*, (2019/C 159/01).

y punzantes) (8): estrés laboral (2004), violencia y acoso (2007), violencia y acoso de terceros (2010). Más recientemente, el acuerdo sobre digitalización (junio 2020), pendiente todavía de implementar (los otros sí lo han sido en los diversos Estados). Su ventaja como instrumento de regulación (mayor legitimación social) contrasta con su inconveniente (la débil eficacia jurídica, la falta de uniformidad -nacional, sectorial, empresarial-).

El papel de la negociación colectiva, en todo caso, es crucial porque buena parte de los factores de riesgo psicosocial se vinculan a condiciones de trabajo, a factores de organización y contenido del trabajo, competencia propia de la negociación. Entre ellos, sin duda, la regulación de los tiempos de trabajo que favorezcan la mayor conciliación corresponsable. Aunque son aún escasos los estudios que ponen en directa relación la salud y las responsabilidades familiares, las evidencias disponibles no dejan lugar a dudas.

En efecto, mientras en las mujeres sí existe relación entre el número de personas atendidas en el hogar y el deterioro de la salud, en los hombres tal relación no es significativa. Cuando las mujeres compaginan trabajo remunerado y trabajo doméstico-familiar la incidencia negativa en su salud es mayor. Esta doble jornada—y la consiguiente sobrecarga de trabajo— tienen una fuerte repercusión sobre la salud: provoca estrés, fatiga crónica, envejecimiento prematuro y trastornos psicosomáticos, así como mayores frecuencias de enfermedades relacionadas con el trabajo, y reduce el tiempo de descanso necesario para reponerse. Al mismo tiempo, supone una fuente de insatisfacción. Por lo tanto, el papel de la NC en este ámbito es determinante, aunque precisa de incentivos normativos y económicos.

(8) <https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:32010L0032&from=EN>.

Otra vez con especial referencia al tema de la conciliación de la vida personal y laboral, ¿tiene usted conocimiento de buenas prácticas?

Justamente, el CESE llama la atención sobre la importancia que la nueva Directiva (UE) 2019/1158, sobre conciliación de la vida laboral y familiar tendrá (plazo: 2 de agosto de 2022), junto al derecho de desconexión digital, debe tener para un equilibrio de tiempos de vida y de trabajo que resulten psicosocialmente saludables. A mi juicio, para la conciliación corresponsable son necesarias leyes que garanticen derechos subjetivos de adaptación razonable e incentiven la corresponsabilidad, junto a políticas de incentivo (ayudas, servicios). Ahora bien, la negociación colectiva tiene un papel significativo a la hora de la regulación del tiempo de trabajo de forma flexible, para equilibrar necesidades de conciliación con las productivas.

De hecho, en todos los países las leyes en materia promueven el papel determinante de la negociación colectiva. En este sentido, con muchos los acuerdos, también los “planes de igualdad”, negociados, sobre todo en grandes empresas, cierto, que hacen de la conciliación uno de sus objetivos fundamentales. Así, por ejemplo:

- a) Acuerdo global del Grupo Renault (*Construir el mundo del trabajo juntos*) para la mejora de la calidad de vida y de trabajo. El equilibrio entre la vida laboral y personal-familiar es central ⁽⁹⁾. Practica la recomendación de la OIT: el futuro del trabajo no está predeterminado, depende del acuerdo
- b) Acuerdo marco del Grupo Telefónica, sobre igualdad efectiva de trato, en el que, además de corregir las brechas de género, se plantean como acción fundamental favorecer la conciliación corresponsable, así como garantizar un entorno

⁽⁹⁾ <http://www.industrial-union.org/industrial-signs-quality-of-working-life-agreement-with-renault>.

laboral libre de todo tipo de acoso, también por razón de sexo ⁽¹⁰⁾.

Eurofound y Cese ofrecen diversos ejemplos en distintos países europeos ⁽¹¹⁾.

¿Cree que se necesiten cambios normativos e institucionales? ¿O es más bien una cuestión de formación y cultura empresarial y sindical? ¿Se necesitan, en su opinión, nuevas figuras profesionales en la empresa para gestionar este fenómeno?

Respecto de la cuestión del papel de la regulación normativa en la mejora de la -hoy deficiente- gestión eficaz de los riesgos psicosociales en los entornos laborales sigue existiendo una notable división de opiniones, pues mientras unos creen que sin una ley específica no se avanzará adecuadamente, otros entienden que el marco legal ya existe, lo que hay es que concienciarse de su significado y aplicarlo también en la práctica, como para el resto de los riesgos laborales. Yo siempre es sido más partidario de favorecer la formación-cultura que demandar continuamente leyes, que no aseguran la calidad reguladora ni menos su mayor eficacia. Aunque la OSHA-EU (Encuesta ESENER) evidencia que un marco normativo claro favorece la acción preventiva, no menos cierto es que la experiencia práctica confirma que una ley específica no es ni una condición necesaria (ni Irlanda ni Reino Unido las tienen y ocupan posiciones altas en el ranking ESENER) ni una condición suficiente (Portugal, Francia, Hungría la tienen y no tienen buenos índices de eficacia) para la eficacia de gestión preventiva.

Por supuesto, una buena regulación legal ayuda (Suecia, Bélgica). Ahora bien, creo que ese debate sobre la necesidad-conveniencia

⁽¹⁰⁾ https://cincodias.elpais.com/cincodias/2021/04/14/companias/1618404216_628680.html.

⁽¹¹⁾ *Addressing digital and technological change through social dialogue*, Eurofound, 2017.

de una ley específica es falso, e introduce disfunciones (las empresas creen que, en tanto no se dé, no es obligado). Como acaba de recordar el TJUE (reafirmando su doctrina aplicada para Italia hace 20 años):

«de los artículos 5, apartado 1, y 6 de la Directiva 89/391 se desprende que *los empresarios están obligados a evaluar y a prevenir* los riesgos para la seguridad y la salud de los trabajadores vinculados a su entorno laboral (véanse, en este sentido, las sentencias de 15 de noviembre de 2001, Comisión/Italia, C-49/00, apartados 12 y 13, y de 14 de junio de 2007, Comisión/Reino Unido, C-127/05, apartado 41), entre los que figuran ciertos *riesgos psicosociales, como el estrés o el agotamiento profesional*» (STJUE 9 de marzo de 2021, apartado 62)

Difícil ser más contundente. Por lo que no hace falta ninguna ley especial para vencer las actuales resistencias para hacer la obligación normativa realidad práctica. Esta obligación se extiende a todos los factores “vinculados al entorno laboral”, así como a los tiempos de disposición (conectividad) no considerados laborales.

En todo caso, conviene poner de relieve que la ratificación del Convenio 190 de la OIT, respecto de la violencia y el acoso, sí marcará un antes y un después. En estos casos sí obligará a la ley nacional tanto a definir esta tipología de riesgos como a reconocer instrumentos obligatorios de gestión psicosocial, hoy voluntarios, como los protocolos de gestión psicosocial de la violencia y el acoso en el trabajo, también por razón de sexo (en este caso ya son obligatorios) y en sus modalidades digitales.

De todos modos, hoy asistimos a una pugna entre los modelos de regulación en esta materia, por la intervención de los modelos de autorregulación de mercado, voluntarios, como el estándar ISO 45003: 2021. En línea con el Convenio 187 OIT (2006), sobre el marco promocional para la seguridad y salud en el trabajo, debe darse la bienvenida a todo instrumento que ayude a

mejorar la cultura de prevención de riesgos psicosociales. Pero nunca pueden sustituir a los mecanismos legales, ya existentes.

En este sentido, y para terminar con la última cuestión indicada, entiendo que el sistema normativo, institucional y técnico de seguridad y salud en el trabajo es suficiente, si bien comprendido y aplicado, para una protección eficaz frente a los factores y riesgos psicosociales. Los servicios de prevención especializados en este tipo de riesgos, las competencias de participación de los órganos representativos también especializados en las empresas (comités de seguridad y salud, personas delegadas de prevención; agentes de igualdad, agentes de intermediación cultural, etc.), así como las representaciones más generales (comités de empresa), son suficientes, si bien formados, para ello. Por eso, considero más eficaz y eficiente ampliar y mejorar las competencias de órganos (técnicos y representativos ya existentes), que multiplicar los instrumentos (como ya sucede en diversas experiencias: consejeros de confianza -Bélgica-, comités de convivencia laboral o comités de calidad de clima).

Psycho-Social Risks: a (New) Challenges for Healthcare Systems

Iván Williams Jiménez

What do we mean by ‘psychosocial risks’?

Terminology is still an issue in many jurisdictions. From a European perspective we are more comfortable with the term psychosocial risks or work-related psychosocial risks, in other countries they use psychological health and safety or mental health and wellbeing. This creates some level of confusion to legislators and employers. The rationale behind occupational safety and health legislative frameworks doesn't help either. Many regulatory frameworks were articulated with a clearly compensation focus rather than preventative. This means that for many years the spotlight has been placed around work-related stress, more recently on depression, anxiety and mental ill-health as outcomes, I think there's a need to shift from mental health disorders to organizational or work-related contributing factors.

The management of psychosocial risks relate to work design, organisation and social factors such as excessive work hours, poor leadership and culture in the organization, poor communication, excessive production pressure, bullying, and harassment have the potential to negatively impact workers' mental health and wellbeing. On this basis as legal scholars we've been more 'exposed' to terms such as work-related violence and harassment but we are probably less knowledgeable on other organisational factors.

Is there a legislative definition?

This is probably one of the key grey areas. The existing legislative approach is fragmented. Historically there's been a lack of political will to develop/implement new initiatives.

- We can see how some countries have a detailed definition of psychosocial hazards and risks in their OSH legislation, but we must acknowledge that even when there are laws governing they are often not meaningfully implemented and the fact that regulations exist doesn't imply enforcement and compliance.
- Many countries consider it already covered by existing laws though in practical terms protections aren't effectively implemented or enforced.
- It is expected that there will be key developments at the international & EU level in the coming months and years that will have major influence in this particular subject. This is logic if we take into consideration how the traditional concept of working conditions and workplaces are evolving. It also make sense with new realities where regulatory frameworks have to be fit for purpose in the new context of a digitalised world of work, with the booming of precarious employment or increasingly disorganised work.
- We are also seeing how regulations are becoming more relevant in issues related to work-life balance, working time and work-related stress. This is happening at a same time when the promotion of workplace wellbeing is also gaining legitimacy on the regulatory agenda (right to disconnect).

Are there EU and international guidelines and trends?

Several regulatory approaches, EU Directives (e.g. Directive 89/391/EEC the European Framework Directive on Safety and Health at Work), European Social Dialogue Agreements (e.g. Work-related stress 2004, Harassment and Violence at Work

2007). The European Commission carried out an interesting exercise in the form of an interpretative document of the implementation of the Council Directive 89/391/EEC in relation to mental health in the workplace.

From an international perspective there are other interesting developments:

- ILO core Convention on Occupational Safety and Health, 1981 (No.155) and its accompanying Recommendation (No.164) protecting workers' *physical and mental health and well-being*
- International Labour Standards - equality of opportunity and treatment, working time
- Recent Convention C190 and its accompanying Recommendation-Violence and harassment in the world of work
- UN global framework 2030 Agenda for Sustainable Development and SDGs (3 and 8);
- ISO 45003 Psychological Health and Safety in the workplace – Guidelines.

More recently we can see an increasing trend in public policy ownership and willingness to regulate in this area. These are other subtle or less noticed developments that have the potential to positively impact in EU member states:

- The EU Commission, the EU Parliament and the Council of Europe have been active in this field – The Council of Europe recently published the report *Enhancing wellbeing at work* that includes a specific remark to include the perspective of well-being at work horizontally into relevant national and Union policies and to implement effective policy interventions at Union and national level to address common challenges to well-being at work. This is quite novel as it legitimates the

mandate for national jurisdictions to tackle the work-related issue.

- Trade unions have been advocating for the need for legally binding requirements in the wider field of psychosocial risks, in the form of a dedicated Directive in the area of Psychosocial Risks in the workplace. They have also been active in calling for Directive on work-related stress. These are long-demanded initiatives that in the next few years can result in successful developments.
- The mental health and wellbeing of workers and the management of psychosocial risks by businesses are likely to constitute key areas of the next European Strategic Framework on Occupational Safety and Health for the period 2021-2027.
- EU Framework Agreement on Digitalisation for implementation at the national level.

Are we talking about a new phenomenon?

It's worth noting that as far back as 1959 the World Health Organization (WHO) noted adverse psychological impacts due to changes in work patterns or working conditions as something directly associated with decreases in physical and mental health.

European bodies like the European Health and Safety Agency have defined emerging risks as risks caused by technical innovation or by social or organisational change or the evolution of traditional risks such as burnout, mobbing, harassment, work-related violence, work-related stress to new occupational risks that didn't exist before or that become worsen due to new work processes or the effect of technology, such as, new forms of job insecurity, the increasing of work-related demands, technology-stress, new forms of violence and the blurring between personal and work life.

My very own PhD focused on the topic of emerging risks of a psychosocial nature. The study reviewed the effectiveness of

regulatory approaches to psychosocial risks with a strong focus on emerging risks in this area by examining the context and conditions for successful regulatory interventions in psychosocial risks management.

I also think that what is new is the momentum and the alignment of different initiatives on the subject of workplace mental health and wellbeing, human capital management and the focus of the SDGs on a holistic approach to wellbeing.

Is it an issue related to new technologies?

It is true that there is a ‘hype’ in the pace of transformation due to technology developments. There are many factors that contribute to this idea. On the one side the Covid-19 crises has accelerated the widespread adoption of AI and automation technologies in businesses; there’s an increasing trend of decomposition of jobs into tiny micro-tasks that can be digitally distributed (these are characteristics perpetuated by the so-called gig economy); electronic performance, online reputation, behavioural profiling of workers, algorithmic reputation scores are becoming widely adopted in some workplaces; workplace and workers monitoring and surveillance force impact of AI and automation technologies, electronic performance monitoring (EPM) and so on.

These are all novel developments that can have both a positive or negative impact in working conditions, though we need to be mindful that these changes don’t happen from one day to another. The example of autonomous vehicles is a good example of this as this technology was supposed to be ready to be implemented in our vehicles and road five years ago, and we are still far from that objective.

On that basis, we need to understand that technology is not inherently harmful, but the way it is used can be. Therefore, it is not technology itself that creates risks for the safety and health of workers, it is the way that it is implemented. That said, it is

true that legislative frameworks don't always keep pace with technological advancements. We are seeing now this on EU's new initiatives on artificial intelligence that look to foster trustworthy AI and a firm commitment to protecting the rights, safety and dignity of workers. For this reason robust evidence-base is crucial to demonstrate the case for a human in command approach to emerging technology.

From a research perspective many institutions are in the process of analysing the prevalence of new risks. The National Institute of Occupational Safety and Health (NIOSH) reviewed on a recent study the nature of work-related risks linked to stressful interaction with robots, anxiety about employment and careers, blurred work/home boundaries, fast pacing of work or work intensification.

Is it destined to worsen or to improve with the organisational and employment models in place in the Fourth Industrial Revolution?

Technological development, innovation, digitalisation is having a knock-on effect on how we understand new forms of work organisation, restructuring and unemployment. This is creating new forms of employment and labour relations, higher job demands and workload, job insecurity, unemployment or underemployment can have effects on worker's psychosocial health. For the time being the focus has been on the negative aspects as many of the conversations are driven by the media that tend to reiterate the 'robots are coming for your jobs' narrative. As scholars we are in a privileged position to shape or shift this narrative through evidence base as the EOSH project will contribute to in terms of its findings.

What role can be played by the social partners and collective bargaining? I'm asking this with particular reference to work-related stress.

Collective bargaining is probably one of the areas where developments are clearly lagging behind. There are minor progress through this route. For example in Switzerland measures to prevent psychosocial risks are an intrinsic part of collective agreements with definitions and monitoring by trade unions. The nordic countries have robust foundations on “organisational and social working environment” and the prevention of work-related stress. They also have strong labour inspectorates that support what is being mandated through collective agreements.

Employers have a key role to play by putting efforts on embedding business-wide risk mitigation processes (by incorporating these risks into corporate risk management and business operations) and by improving systems and structures, producing appropriate psychosocial risk policies and programs geared toward promoting employee mental health and wellbeing.

Are you aware of any best practices? I am asking this with particular reference to the theme of work-related stress.

- Labour inspection campaigns - Managing stress and psychosocial risks at work.
- Organisational factors: Anti-bullying Policies, Codes of Conduct, Development of organizational culture, Management training, Organizational survey, Handling procedures, Return to work programmes. Business practices that involve supporting employees who already have mental health problems.
- Businesses investing in a prevention first approach that allows workers to cope better with pressure, e.g Stress management training.

Do you think regulatory or even institutional changes are needed? Or, rather, is it a matter of company and union training and culture?

From a regulatory perspective, it is well known that higher levels of awareness go in hand with long-term or robust regulatory

frameworks. So there's still a long way to go. We need to be conscious that the current approach is not working. Historically, there's been a lack of regulations and standards for psychosocial risk management as opposed to other similar areas, so in many jurisdictions regulating psychosocial risks is a matter still in its infancy.

As previously stated there is a need for structural changes in how occupational safety and health is regulated to shift the approach from a culture of compensation towards prevention (this is laws not aimed at prevention but focussing on compensation).

Are new professionals needed in the company to handle these types of issues?

There's supporting evidence that demonstrates the lack of appropriate expertise and the lack of organisational awareness on this particular issue. It is important to highlight that psychosocial risk management should not be approached just through an health and safety or human resources perspective but from a strategic perspective both at organizational and at policy level that includes key actors and stakeholders in the debate.

Chapter IV.
**SOCIAL PROTECTION
IN THE IV INDUSTRIAL REVOLUTION**

EU Law and New Risks

Grega Strban

Is EU legislation addressing the emerging risks of the Fourth Industrial Revolution related to work environments and work patterns?

During its establishment and over the course of history, social security had to be adjusted to the ever changing societal relations in order to fulfil its function, i.e. provide (public) income security to people when social risks would materialise. Basically, it has always followed the industrial revolutions. From the first one presenting manufacturing and focusing on a more optimised form of labour performed through the use of water- and steam-powered engines and other types of machine tools. Especially important for social security were industrialisation and urbanisation, when first modern social security schemes (based on social insurance) were introduced. The second industrial revolution introduced steel and the use of electricity in factories, enabling mass production on the assembly lines. In the third one, electronic and eventually computer technology was introduced in factories, moving from analogue to digital technology and automation software. Finally, the fourth industrial revolution is

based on the interconnectivity through the Internet of Things, access to real-time data, and the introduction of cyber-physical systems, i.e. connecting physical with digital, allowing for better collaboration of people ⁽¹⁾. The response to the industrial revolution 4.0, which is changing the way work is being organised (and interactions in the society as such), has to be modernised (labour and) social security law, hence designated as social security law 4.0 ⁽²⁾.

Standard employment ⁽³⁾ is being replaced by non-standard forms of employment and new forms of self-employment. Among them are fixed-term contracts, part-time work (either temporary or on a more frequent basis, horizontal or vertical), temporary agency work, telework, traineeships and student work, as well as casual work, including on-demand work (including zero-hour contracts) and platform work (i.e. people working for digital platforms, without having a fixed workplace). Moreover, self-employment, especially involuntary, bogus, dependent, new ⁽⁴⁾ and part-time self-employment, or other country-specific

⁽¹⁾ See EPICOR, *What is Industry 4.0 – the Industrial Internet of Things (IIoT)*, 25 April 2021.

⁽²⁾ More in U. BECKER, O. CHESALINA (eds.), *Social Law 4.0, New Approaches for Ensuring and Financing Social Security in the Digital Age*, 2021.

⁽³⁾ Traditional patterns of (organising) work and mobility, which used to be considered as a norm (standard), also when shaping social security systems after the Second World War, are changing. According to ILO Convention 102 concerning minimum standards of social security of 1952, the standard beneficiary is a man with a wife and two children in a stable (full-time and permanent) employment relationship. Standard social security benefits should suffice for such a standard beneficiary. I. VUKOREPA, Y. JORENS, G. STRBAN, *Pensions in the Fluid EU Society: Challenges for (Migrant) Workers*, in N. DA COSTA CABRAL, N. CUNHA RODRIGUES (eds.), *The Future of Pension Plans in the EU Internal Market, Financial and Monetary Policy Studies*, Springer 2019, p. 326.

⁽⁴⁾ New self-employed persons may fall between the two traditional, standard categories of dependent and subordinated workers (or employees) and independent self-employed persons (entrepreneurs) also in social security law.

non-standard contracts (mini-jobs, civil law contracts, etc.) may exist. The distinction between employment and self-employment is blurred to a certain extent also in EU law ⁽⁵⁾.

Even though Member States have transferred the execution of certain sovereignty rights to a supranational organisation, such as the EU, they remain exclusively competent to determine the substance of their national social security law. They should find their own solution and shape modernised social security law, whereby they might be supported by the EU ⁽⁶⁾. National solutions are bound to be distinctive. They always reflect various historically conditioned and rather distinctive structural (e.g. educational, living and working conditions) and cultural elements (e.g. powers of social partners or civil movements) ⁽⁷⁾ and policy preferences of each Member State. Nevertheless, the courts of law might remind the legislature that the rule of law demands of them to follow the changes in social relations with its normative action ⁽⁸⁾. Hence, the law of social security is not only one of the youngest, but is also bound to be one of the most dynamic areas of law.

⁽⁵⁾ Article 48 TFEU under the chapter on the free movement of workers is referring to employed and self-employed workers. Such provision is indeed a bit odd, since self-employed persons are usually distinguished from workers and other provisions of EU law might apply to them, such as freedom of establishment and freedom to provide services in the internal market. However, this shows that workers and self-employed persons might no longer be clearly separable categories, especially in the EU social security coordination law.

⁽⁶⁾ See e.g. The European Pillar of Social Rights, Principle 12 on Social Protection, emphasising that regardless of the type and duration of their employment relationship, workers, and, under comparable conditions, the self-employed, have the right to adequate social protection.

⁽⁷⁾ J. BERGHMAN, *The Invisible Social Security*, in W. VAN OORSCHOT, H. PEETERS, K. BOOS (eds.), *Invisible Social Security Revisited, Essays in Honour of Jos Berghman*, Lannoo, 2014, p. 37.

⁽⁸⁾ E.g. Decision of the Slovenian Constitutional Court U-I-69/03, 20 October 2005, OdlUS XIV, 75.

Developments in national law have to be reflected also in the law of the European Union (EU), which should also be modernised in a more dynamic way. Not only is the EU supporting the endeavours of the Member States, it has to coordinate various social security systems that workers and other (economically active, but also inactive) persons do not lose their social security expectations or vested rights when moving within the EU. Not only work patterns are modified, also trends of mobility are changing. Patterns of mobility of (non-standard) workers have become more diverse. The traditional long-term mobility of moving from home Member State to host Member State and working there for a longer period of time has been partially replaced by mobility characterised by multiple shorter-term movements to other Member States and various restrictions due to pandemic in recent times (which opens new questions also to social security and its distinction from social compensation schemes set up for mitigating the effects of pandemics). The EU and its Member States shall follow such changes.

Are there any trends that highlight this commitment?

Indeed, there are some trends visible also in the social security field. There is a proposal to modernise Social Security Coordination Regulations, i.e. Regulations (EC) 883/2004 (basic regulation) and (EC) 987/2009 (implementing regulation). However, it takes quite some time. The revision of Social Security Coordination Regulations has been proposed by the European Commission already in December 2016, but it has not yet been passed by the EU legislator⁽⁹⁾. The proposed revision shall touch upon applicable legislation (including posting and reinforcing of cooperation between institutions), unemployment benefits (including minimum qualifying period of 1 month, increased export to a minimum of six months with possible extension to the whole

⁽⁹⁾ See <https://data.consilium.europa.eu/doc/document/ST-7698-2019-ADD-1-REV-1/en/pdf>, accessed 25 April 2021.

period of entitlement), long-term care benefits (including their definition and enumeration) and family benefits (including a distinction between family benefits intended to replace income due to child-raising and other family benefits), equality of treatment (following some CJEU cases, like C-140/12 Brey and following cases).

Moreover, a so called Electronic Exchange of Social Security information (EESSI) shall assist social security institutions across the EU to exchange information more rapidly and securely. Initially it was envisaged that it should become operational already in 2012, but first electronic documents have been shared only in January 2019 between Slovenia and Austria. With more short term movements and more virtual work, without one stable place of work, such exchange of information is essential for providing social security to mobile (also non-standard) workers.

Another initiative has been launched in order to provide cross-border social security, i.e. European Social Security Number (ESSN) and Insurance Status Verifier. They shall facilitate the identification of persons across borders for the purposes of social security coordination and ensure the quick and accurate verification of their social security insurance coverage status ⁽¹⁰⁾.

However, it seems that the commitment under the European Pillar of Social Rights has led to another pilot project of the European Commission in 2021, i.e. the one on European Social Security Pass (ESSPASS). It shall explore a digital solution to facilitate the interaction between mobile citizens and national authorities and improve the portability of social security rights across borders. Request, issuance, identification and verification processes shall be digitalised, in the first stage for A1 forms and later on for European Health Insurance Card-EHIC, pensions etc.). According to the Communication on The European Pillar

⁽¹⁰⁾ See <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1222-European-Social-SecurityNumber>, accessed 25 April 2021.

of Social Rights Action Plan from March 2021 ⁽¹¹⁾. social protection across national borders is a pre-condition of a well-functioning internal market. Existing and new forms of labour mobility facilitated by digitalisation, from generalised teleworking across borders to digital nomads working remotely across the EU, require seamless interactions between mobile workers and administrations, while reducing the risk of errors and fraud. Innovative solutions, notably digital ones, can facilitate the physical and virtual mobility of citizens, support the portability of social security rights and the cross-border verification of social security coverage by administrations, and address challenges in the identification of people for social security coordination purposes.

Another initiative based on the European Pillar of Social Rights has been taken, by passing the Recommendation on access to social protection for workers and the self-employed (2019/C 387/01). It is not legally binding, addressed to the Member States, but nevertheless bears importance, since workers and self-employed persons shall be guaranteed access to social protection. The principles of formal coverage, effective coverage, adequacy and transparency defined by the Recommendation shall apply to all workers and to the self-employed. It is mainly self-employed persons, who might lack such access under national social security law. Digital, labour intensive platforms might organise work predominately by engaging self-employed persons. The question, whether they are genuinely self-employed, economically dependent persons or even subordinated workers (according to some national courts of law), is not being tackled under the present discussion points.

⁽¹¹⁾ COM(2021) 102 final, 4 March 2021, p. 24.

In this context, what role is the role of European Social Dialogue?

It could be argued that (European) social partners possess different tools of influencing social security systems. They include informal processes, processes aiming at achieving what is supposed to be a binding result and those capable of reaching fully binding decisions. What is common to all cases is the fact that the state or the government is the subject empowering social partners in the field of social security, whether by recognising them as equal contractual or negotiation parties, or by stepping aside and allowing them to act as autonomous subjects, staying true to the notion of (functional) decentralisation and legislative self-government of social insurances.

The transfer of competence and other forms of recognition do not exculpate the State or the government from safeguarding the achieved level of social security and its further development. Many legislative acts and international and European obligations are targeted to Member States. Nevertheless, social dialogue is of key importance. Governments shall not breach the collective bargaining autonomy of social partners at the level of bipartite social dialogue, which should lead to a higher level of social protection of (non-standard) workers ⁽¹²⁾.

For instance, also in the Recommendation on access to social protection for workers and the self-employed (2019/C 387/01), social dialogue is emphasised. The Commission has undertaken a two-stage consultation of the social partners under Article 154 TFEU on a possible action addressing the challenges of access to social protection for people in all forms of employment. Moreover, social partners may be involved by the Member

⁽¹²⁾ G. STRBAN, L. MIŠIČ, *Social Partners in Social Security: Two Common Forms of Recognition and Selected Issues*, in J. PICHRT, K. KOLDINSKÁ (eds.), *Labour Law and Social Protection in a Globalized World: Changing Realities in Selected Areas of Law and Policy*, Bulletin of Comparative Labour Relations, 2018.

States in (re)designing their social security systems. This shall be done respecting the tradition of national social security schemes (e.g. in some Member States unemployment insurance might be in the competence of social partners).

More prominent role of social partners is envisaged also by the proposed Directive on adequate minimum wages in the European Union, which is not directly linked to social security. Nevertheless, it may present a good basis for decent social protection coverage across EU ⁽¹³⁾.

Are there any cases that highlight the presence of new risks in the workplace that have been brought to the attention of the Court of Justice of the European Union (CJEU)?

Indeed, there are some cases dealt by the CJEU considering new forms of work organisation and new mobility patterns. However, the CJEU still seems to be relying on the traditional rules of social security coordination, but trying to provide the best coverage of cross-border mobile workers.

The rules on determining the applicable social security legislation are based on the geographical aspect of work. This is being emphasised also by the CJEU, which mentions the location of the employed or self-employed activity as a main criterion for social security coordination (C-137/11 *Partena*). However, social security law 4.0 (following the fourth industrial revolution) is based more on digital platforms and remote (i.e. tele-) working (boosted by the Covid-19 pandemic), also from different Member States (see C-570/15 *X*, also the opinion of Advocate-General Szpunar). Geographical stability between a worker, his/her employer and a Member State is no longer guaranteed in all cases, which might complicate the coordination of national social security systems. Gainful activity from a distance may no longer be of a merely marginal and ancillary nature.

⁽¹³⁾ COM(2020) 682 final, 28 October 2020.

As a rule, social security coverage depends on the social security law of the Member State of work. Following the Petroni principle (or principle of favourability, C-24/75 *Petroni*, where the CJEU argued that workers moving in the EU should not be worse-off than those who are not moving), the CJEU reduced the exclusive and binding effect of the applicable law rules. From the *Bosmann* case (C-352/06 *Bosmann*) onwards (C-611/10 *Hudziński and Wawrzyniak*, C-382/13 *Franzen*, C-95/18 *van den Berg and Giesen*), the Court has been allowing an insured person to fall back on the social security system of the Member State of residence, in case the applicable legislation of the Member State of work does not provide certain social security benefits or when these benefits are too limited ⁽¹⁴⁾.

Contrary to its previous case law (C-41/79 *Testa*, C-302/84 *Ten Holder*, C-60/85 *Luijten*), the CJEU seems to be no longer upholding the rule on one single legislation applicable for a moving person at the same time, in order to avoid positive and negative conflicts of national laws. Deviations are allowed, at least if it is *in favorem laboratoris*. Moreover, it seems that social security systems are no longer perceived in their entirety, but rather that specific social security schemes, such as family benefits or pensions are being compared.

Nevertheless, the CJEU seems to insist on the *lex loci laboris* rule, even when it does not provide comprehensive social security coverage *ratione materiae*. In the *Franzen* case (C-382/13), the CJEU recalled that the general principle of *lex loci laboris* means that a resident of a Member State who works for several days per month on the basis of an on-call contract in the territory of another Member State, is subject to the legislation of the Member State of employment both on the days on which he performs the employed activities and on the days on which he does

⁽¹⁴⁾ G. STRBAN, *Family Benefits in the EU: Is it Still Possible to Coordinate Them?*, in *Maastricht Journal of European and Comparative Law*, 2016, vol. 23, n. 5, p. 787.

not. That should be the case, even if income was low, irregular and not leading to social security coverage. Therefore, it might be called for to condition the *lex loci laboris* rule with some minimum coverage standards in order to be applied.

With respect to the current regulatory framework, do you think that changes are necessary?

Absolutely. As Heraclitus argued, the only constant in life is change. Social relations are being modified constantly and they should be followed by modernising national and EU social security law. Physical presence at a workplace is no longer the overwhelming norm. In cross-border situations distinctive definitions of work relevant for social security are posing difficulties. Similarly as in the free movement law, maybe also in social security coordination law a more harmonised definition of a worker (or definition by only one Member State for all activities) is required.

Moreover, Member state shall provide at least minimum social security coverage in order to be competent, and maybe voluntary schemes (often offered to non-standard workers) shall be coordinated in the EU as well.

Therefore, social security coordination law, adjusted to the fourth industrial revolution, should disregard the thresholds concerning the level of income or number of working hours for mobile non-standard workers, since the adding of income or hours worked (e.g. simultaneously) in two or more Member States may de facto present genuine and effective activities, and not only marginal and ancillary ones. Moreover, the distinction between activities as a worker and as a self-employed person might be abolished and a person's entire income or duration of work should be considered in its entirety.

The link between standard (hours of and income from) work, which would lead to standard social security seem no longer to exist. Many of the mentioned forms of non-standard work or

new, more flexible forms of work organisation are associated with various elements of precariousness, entailing various forms of insecurity. This shall be avoided also by adjusting the (national and EU) social security law rules.

Accidents et maladies professionnelles dans la IV^e Révolution Industrielle

Dominique Bailleux

La caractéristique principale de la IV révolution industrielle est qu'elle affecte l'ensemble de nos activités, de nos métiers. Les technologies de l'information et de la communication sont un moyen d'améliorer notre qualité de vie grâce aux nombreuses innovations qui ont vu le jour. Certaines ont pour ambition de prévenir les risques professionnels (*détection par la vidéo de situation de dangers, équipements individuels de protection intelligents*)⁽¹⁵⁾, d'autres, à l'inverse, induisent des pathologies professionnelles.

La distinction entre accident et maladie professionnelle est-elle toujours d'actualité? Y a-t-il des tendances qui remettent en question cette distinction?

Les Français restent très attachés à leur législation sur les risques professionnels (*AT, accident de trajet et MP*). Pourtant la réparation allouée est forfaitaire, la procédure de reconnaissance complexe.

La distinction entre AT et MP relève du code de la sécurité sociale. Elle est inscrite dans la loi. Ainsi, la définition de l'accident du travail issue de l'article L. 411-1 du CSS invite à caractériser un «accident survenu par le fait ou à l'occasion du travail» et ce «quelle qu'en soit la cause». Historiquement, constituait «un accident du travail, toute lésion corporelle résultant de l'action soudaine et violente d'une cause extérieure, au temps et au lieu de travail». Les critères d'extériorité et de violence ont fini par disparaître de la définition prétorienne. Une lésion purement interne (*infarctus du myocarde, rupture d'anévrisme*) peut caractériser un accident du travail. L'accident se réduit à un événement certain

⁽¹⁵⁾ Comprenant des capteurs susceptibles d'alerter sur le rythme cardiaque, la température, le niveau d'humidité...

et identifié dans le temps et l'espace. Seul le critère de soudaineté permet de le distinguer de la maladie.

La maladie suppose une pathologie à évolution lente inscrite dans un tableau des MP. Historiquement, le rattachement de certaines pathologies à la qualification de MP étant impossible ⁽¹⁶⁾, certains auteurs, puis des juges du fond ont plaidé pour qu'il soit dit que «la pénétration dans l'organisme d'un virus, laquelle est une intrusion, une sorte d'effraction par un agent extérieur, revêt un caractère de soudaineté suffisant» pour qu'il s'agisse d'un accident du travail. La Cour de cassation a refusé ce rattachement à la qualification d'accident du travail, des affections qui – au terme d'une période d'incubation – sont le résultat d'une série d'événements à évolution lente auxquels on ne saurait assigner une origine et une date certaine ⁽¹⁷⁾.

Pour autant, le contentieux récent révèle que certaines maladies (*sclérose en plaques, dépression nerveuse réactive*) sont susceptibles d'être rattachées au risque accident du travail. Il s'agit bien souvent d'une stratégie de contournement acceptée par le juge. La Cour de cassation a alors formulé une nouvelle définition de l'accident du travail. « Constitue un accident du travail, un événement ou une série d'événements survenus à des dates certaines par le fait ou à l'occasion du travail, dont il résulte une lésion corporelle ». En l'espèce, la sclérose en plaques était présumée imputable à une vaccination réalisée dans le cadre du travail¹⁸. La solution vaut pour la dépression nerveuse soudaine survenue consécutivement à un entretien d'évaluation ⁽¹⁹⁾. Dans

⁽¹⁶⁾ En raison du système exclusif des tableaux des maladies professionnelles.

⁽¹⁷⁾ Aujourd'hui, on peut penser à la contamination par le SARS-CoV2.

⁽¹⁸⁾ Cass. soc., 2 avr. 2003, n. 00621.768, in *JurisData*, n. 2003-018497: D. 2003, p 1724, note H. Kobina Gaba; *Dr. soc.* 2003, p 673, obs. L. Millet.

⁽¹⁹⁾ Cass. 2^e civ., 1^{er} juill. 2003, n. 02-30.576, in *JurisData*, n. 2003-019704: JCP E 2004, 877, n. 14, obs. D. Asquinazi- Bailleux; D. 2004, p. 906, note M. Huyette.

ce contexte, la cervicalgie aigüe résultant d'un brusque mouvement de la tête pour visualiser la zone de stockage est un accident du travail ⁽²⁰⁾, comme la congélation d'un membre consécutivement à l'action du froid ⁽²¹⁾ ou «le coup de froid» nécessitant l'hospitalisation d'un salarié travaillant à de très basses températures ⁽²²⁾. Nombreuses lombalgies sont déclarées comme accident du travail. A l'inverse, n'est pas un accident du travail, un spasme vasculaire réfractaire survenu à la suite d'une exposition prolongée au froid ⁽²³⁾.

La synthèse de cette jurisprudence permet d'affirmer que le critère de soudaineté, propre à l'accident du travail, doit se vérifier soit dans le fait générateur certain et identifié, soit dans l'apparition de la lésion. Le caractère traumatique ⁽²⁴⁾ de la lésion est sans doute déterminant. En définitive, la distinction entre accident du travail et maladie professionnelle demeure ancrée dans notre législation même si les frontières sont devenues perméables.

Comment la législation française traite-t-elle les nouvelles pathologies générées par l'usage des nouvelles technologies? Et les partenaires sociaux?

D'emblée, on notera que les risques professionnels mécaniques ou électriques liés à l'utilisation d'un robot ne posent aucun problème. Par contre, les pathologies générées par l'usage des technologies de l'information et de la communication (TIC) sont multiples et ne sont pas spécialement répertoriées. On sait que le

⁽²⁰⁾ Cass. 2^e civ., 22 mars 2005, n. 03-16.415, in *JurisData*, n. 2005-027792.

⁽²¹⁾ Cass. soc., 17 nov., in *Bull. civ.*, 1960, IV, n. 1036.

⁽²²⁾ Cass. soc., 7 juin 1968: *Bull. civ.*, 1968, V, n. 278.

⁽²³⁾ Cass. 2^e civ., 18 oct. 2005, n. 04-30.352, in *JurisData*, n. 2005-030441: JCP S 2005, 1423, note D. Asquinazi- Bailleux.

⁽²⁴⁾ L'OMS définit le traumatisme comme un «dommage physique subi par un corps humain lorsqu'il est brutalement soumis à des quantités d'énergie (*mécanique, thermique, chimique, rayonnée*) qui dépassent le seuil de tolérance physiologique ou privé d'un ou plusieurs éléments vitaux (*oxygène, chaleur*)».

développement de la robotique tend à déshumaniser l'environnement de travail et de vie. Chacun s'accorde à reconnaître que les innovations numériques permettent de simplifier et d'alléger le travail. En période de pandémie, l'usage des TIC a permis la continuité de nombreuses activités. En contrepartie, l'usage des TIC est devenue un facteur de risques professionnels. Nombreuses pathologies peuvent être identifiées à la suite d'une hyperconnexion: troubles oculaires, dépression, burn out ou syndrome d'épuisement professionnel ⁽²⁵⁾, troubles musculo-squelettiques (TMS), stress récurrent. L'équilibre entre vie privée et vie professionnelle peut en être gravement compromis au point de compromettre la santé.

L'étude de la législation française et plus particulièrement des tableaux des maladies professionnelles établit que les technologies de la communication ne sont guère prises en compte. Ainsi, les tableaux 71 et 71 bis désignant des affections oculaires (cataractes, ptérygion) ne visent que des travaux exposant au rayonnement thermique de verre ou de métal portés à incandescence. L'emploi des TIC n'est pas envisagé. Quant aux troubles musculo-squelettiques, ils ne sont mentionnés que dans un seul tableau (tableau 98) lequel désigne exclusivement des travaux de maintenance.

Dès lors, les pathologies liées à l'usage des TIC vont relever plutôt du système complémentaire de reconnaissance. Un nouvel alinéa a été rajoutée à l'article L. 461-1 du CSS aux termes duquel les pathologies psychiques peuvent être reconnues comme maladie d'origine professionnelle, dans les conditions de la reconnaissance individuelle par un comité régional de reconnaissance des maladies professionnelles (CRRMP). Un taux d'IPP de 25 % est exigé (CSS., art. R. 461-8). Dans ce cas, le comité de re-

⁽²⁵⁾ Un rapport a été réalisé en 2017 sur commande de la Commission des Affaires sociales de l'Assemblée nationale. Il apparaît que la réalisation d'un tableau semble particulièrement ardue: près de 95 professions ont été répertoriées, établir le lien causal essentiel avec le travail.

connaissance est composé d'un praticien hospitalier spécialisé en psychiatrie.

Il est à observer que la notion de pathologie psychique n'est pas définie. Il peut donc s'agir de dépression, d'anxiété, de troubles d'adaptation. La détresse psychologique ou encore la souffrance au travail sont des zones grises mal définies sur le plan de la médecine. Néanmoins il existe des outils permettant de quantifier le stress, la détresse psychologique. Comme le soulignait, en 2016, Patrick Légéron ⁽²⁶⁾, la France est régulièrement dénoncée comme ayant une politique de santé mentale insuffisante. On dénombre 11 000 suicides par an, ce qui est bien supérieur aux morts par accident de la route. Il s'agit d'un vrai problème de santé publique.

Les pathologies psychiques relèvent exclusivement du système complémentaire de reconnaissance. Il s'agit de l'étude de dossiers cas par cas. Dans notre système, c'est le médecin-conseil qui mène une enquête de manière systématique et se déplace sur le lieu de travail. Il a la charge de déterminer le taux de gravité de la pathologie en termes d'IPP. La problématique majeure est le taux de 25 % qui ne peut normalement pas être quantifié tant que l'état de la personne n'est pas consolidé, ce qui est rare en matière de pathologies psychiques. Dès lors, la CNAM a accepté d'assouplir son système pour n'exiger un taux de 25% qu'au stade de l'instruction de la demande ⁽²⁷⁾ pour favoriser l'entrée dans le dispositif de reconnaissance. La question du taux de 25% est un obstacle majeur à la reconnaissance de maladies liées au travail. Un mouvement se fait jour pour dénoncer l'existence de ce taux ⁽²⁸⁾. Ainsi, le Pôle social du Tribunal Judiciaire de Rouen

⁽²⁶⁾ Actes de la conférence européenne organisée par EUROGIP le 24 March 2016.

⁽²⁷⁾ Cass. 2^e civ., 19 janv. 2017, n. 15-26.655, in JCP S 2017, 1062, Note CF Pradel, P. Pradel-Boureux et V. Pradel.

⁽²⁸⁾ Deux assouplissements ont été proposés. D'une part, permettre aux caisses de fixer un taux d'incapacité "prévisible" afin d'assurer le maintien

(²⁹) vient de juger que l'exigence d'un taux de 25% est un obstacle à la possibilité d'établir le lien entre le travail et la pathologie. Il s'agit d'une discrimination fondée sur la gravité de la pathologie contraire à l'article 14 CEDH (³⁰) et à l'article 1 du protocole 12, additionnel de la CEDH.

On pourrait alors préférer la création d'un tableau pour les maladies psychiques. Certains estiment que la création d'un tableau dans le cas de pathologies multifactorielles, n'est pas envisageable alors que d'autres estiment au contraire que la dérégulation du cortisol (*hormone du stress*) s'identifie et se soigne.

La question des TIC oblige à s'intéresser aux plateformes de mise en relation par voie électronique. La question intéresse plus particulièrement les plateformes de mobilité qui déterminent les caractéristiques de la prestation et en fixent le prix. La question du statut des travailleurs est en débat devant le juge qui tend à les requalifier en salariés (³¹). Pour autant, le législateur français a fait le choix de maintenir le travailleur sous un statut d'indépendant (³²) en lui procurant certains avantages du salariat. En matière de risques professionnels et dans le cadre d'une responsabilité sociale, les plateformes sont tenues, soit de souscrire

des indemnités journalières jusqu'à la consolidation effective de la maladie sans différer la reconnaissance de la maladie professionnelle. D'autre part, dans la mesure où une amélioration de l'état est probable après que le patient a été soustrait aux facteurs pathogènes qui avaient déclenché ses troubles, il est proposé que la gravité de la pathologie soit évaluée, autant que possible, au moment de la demande de reconnaissance.

(²⁹) TJ Rouen, 10 mars 2021, n. RG 20/00398.

(³⁰) convention européenne de sauvegarde des droits de l'homme et des libertés fondamentales.

(³¹) Cass. soc., 4 mars 2020, n. 19-13.316: JCP G 2020, 901, note B. Bossu; JCP S 2020, 1080, note G. Loiseau; JCP E 2020, 1282, note M. Depincé, D. Mainguy et B. Siau; Dr. soc. 2020, p 374, note PH Antonmattei; RDT 2020, p328, note L. Willocx; Dr ouvr. 2020, p. 181, note A. Jeammaud.

(³²) G. LOISEAU, *Travailleurs des plateformes: un naufrage législatif* (l. n. 2019-1428, 24 déc. 2019): JCP 2020, 1000.

un contrat collectif d'assurance couvrant les accidents du travail, soit de rembourser la cotisation payée par les travailleurs qui s'assurent individuellement (que ce soit par l'affiliation volontaire à la sécurité sociale ou par une assurance privée (C. Trav., art. L. 7342-2). Des propositions ont été faites pour améliorer leur protection sociale. Dans une société moderne, ne faut-il pas penser que les travailleurs indépendants ont droit également à une protection sociale effective et efficace? Pour l'heure, rien n'est définitivement réglé et diverses pistes sont à l'étude ⁽³³⁾.

Les partenaires sociaux ont un rôle à jouer dans l'élaboration des tableaux. Néanmoins, en 2018, le Gouvernement a confié à l'ANSES (*Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail*) une mission d'expertise préalable à l'élaboration des tableaux des MP. Il s'agit de séparer la phase d'expertise de la phase de négociation avec les partenaires sociaux, dans le cadre de la procédure de création ou de révision des tableaux de maladies professionnelles. La raison tient au fait qu'il existe un décalage entre la connaissance des effets de certains facteurs de risques et leur prise en compte par le système des tableaux des MP. Cette expertise collective et indépendante a pour finalité d'éclairer les différentes commissions qui interviennent dans l'élaboration des tableaux comme le Conseil d'orientation des conditions de travail (COCT) ⁽³⁴⁾, la Commis-

⁽³³⁾ Rapport de J-Y Frouin, remis le 1^{er} décembre 2020, intitulé *Réguler les plateformes numériques de travail*.

⁽³⁴⁾ Le Conseil d'orientation des conditions de travail (COCT) est placé auprès du ministre chargé du travail (art. L. 4641-1 du code du travail). Il comprend des commissions spécialisées au nombre de 6. Leurs thématiques sont les suivantes:

- Commission 1: Orientations transversales, questions internationales, études et recherche.
- Commission 2: Prévention des risques pour la santé au travail (risques physiques, chimiques et biologiques).
- Commission 3: Équipements et lieux de travail.
- Commission 4: Pathologies professionnelles.

sion Spécialisée n.4 (CS4) ⁽³⁵⁾ pour le régime général, la Commission supérieure des maladies professionnelles en agriculture (COSMAP). Il est souvent dénoncé une sous-déclaration des maladies professionnelles.

Les partenaires sociaux ont un rôle décisif plus particulièrement en matière de prévention ⁽³⁶⁾... En droit français, les questions de sécurité et de santé au travail relèvent plutôt du droit du travail. Le législateur incite à la négociation collective. Ainsi, la loi n. 2016 – 1088 du 8 août 2016 relative à la modernisation du travail – dite loi travail – a intégré un véritable droit à la déconnexion dans le code du travail. C'est l'article L. 2242-17 qui impose une négociation annuelle sur les modalités de plein exercice par le salarié de son droit à la déconnexion et la mise en place dans l'entreprise de dispositifs de régulation de l'utilisation des outils numériques. A défaut d'accord, l'employeur élabore une charte après avis du CSE qui doit notamment sensibiliser les cadres à un usage raisonnable des outils numériques. Plus généralement, la négociation doit porter sur la qualité de vie au travail.

Les entreprises utilisent de nouvelles technologies, sans être pleinement conscientes des dommages que celles-ci peuvent causer aux travailleurs. Comment la jurisprudence traite-t-elle ces dommages? L'employeur est-il toujours

- Commission 5: Acteurs de la prévention en entreprise (CHSCT, services de santé au travail).

- Commission 6: Questions relatives aux activités agricoles

⁽³⁵⁾ Au sein du COCT, pour le régime général, la commission spécialisée n. 4 (CS4) est compétente sur les questions relatives à la connaissance de l'origine professionnelle des maladies et à l'articulation entre la réparation et la prévention des maladies professionnelles. Pour le régime agricole, la COSMAP assure ces missions.

⁽³⁶⁾ L'institut national de recherche et de sécurité pour la prévention des risques professionnel (INRS). Ce dernier est géré paritairement par des organisations syndicales et patronales.

responsable même s'il n'avait pas pu prévoir l'accident causé par la technologie?

L'emploi des TIC interroge aussi lorsque le travailleur en fait un usage abusif pendant le temps de travail. Cet usage exacerbé peut devenir un facteur de risques professionnels. Ainsi, l'usage du téléphone portable lorsque le salarié est à un poste de travail dangereux ou à un poste de précision (*mécanique de précision avec usage de composants fragiles et couteux, par ex*) entraîne un manque de concentration et donc favorise un risque d'accident. L'addiction au téléphone portable est bien réel auprès des jeunes travailleurs. Même s'il existe un règlement intérieur qui encadre ces pratiques, l'usage du téléphone pendant le temps de travail est le souci du chef d'entreprise. C'est devenu un fait de société qui ne trouve pas sa solution dans le droit disciplinaire et la sanction. L'emploi des TIC qui font courir des risques aux travailleurs trouve sa réponse soit dans le droit à la santé (obligation de soumettre le salarié addict au médecin du travail) soit dans l'obligation d'assurer la sécurité des travailleurs.

Le sujet se déplace alors sur la question de la prévention et de la réparation au travers la violation de l'obligation de sécurité. Sur le fondement de l'article L. 4121-1, l'employeur prend les mesures nécessaires pour assurer la sécurité et protéger la santé physique et mentale des travailleurs. Il engage sa responsabilité vis-à-vis de ses salariés— indépendamment de l'existence d'un risque professionnel. Initialement, cette obligation était dite de *résultat*. Mais, depuis un arrêt en date du 25 novembre 2015 ⁽³⁷⁾, la Chambre sociale retient que ne méconnaît pas son obligation de sécurité, «l'employeur qui justifie avoir pris toutes les mesures prévues par les articles L. 4121-1 et L. 4121-2 du code du travail». Elle permet donc à l'employeur d'échapper à sa responsa-

⁽³⁷⁾ Soc. 25 nov. 2015, n. 14-24.444, D. 2015. 2507; *ibid.* 2016. 144, *chron.* P. Flores, S. Mariette, E. Wurtz et N. Sabotier; *ibid.* 807, *obs.* P. Lokiec et J. Porta; *Dr. soc.* 2016. 457, *étude* P.-H. Antonmattei; *RJS* 2/2016, p. 99, *obs.* Gardin.

bilité en démontrant qu'il a pris les mesures nécessaires pour préserver la santé de ses salariés.

En présence d'un risque professionnel, le juge va caractériser la faute inexcusable de l'employeur à partir de la violation de l'obligation de sécurité. Ainsi, «de manquement à l'obligation légale de sécurité et de protection de la santé à laquelle l'employeur est tenu envers le travailleur a le caractère d'une faute inexcusable lorsque l'employeur avait ou aurait dû avoir conscience du danger auquel était soumis le travailleur et qu'il n'a pas pris les mesures nécessaires pour l'en préserver»⁽³⁸⁾. Avec ces arrêts, le fondement contractuel de l'obligation de sécurité disparaît au profit d'un fondement légal. La Cour s'appuie sur les articles L. 4121-1 et L. 4121-2 du Code du travail qui énumèrent les obligations en matière de prévention des risques. Il n'est pas nécessaire qu'au moment de l'accident, l'employeur connaisse précisément l'existence du danger. Il suffit qu'il doive en avoir conscience. Sa faute n'a pas besoin d'être déterminante dans la réalisation du dommage mais qu'elle soit une cause nécessaire. La faute inexcusable est établie lorsque l'employeur a manqué à ses obligations de prévention et d'évaluation des risques. Cet alignement sur la position de la Chambre sociale de la Cour de cassation conduit à penser que la charge de la preuve de la faute inexcusable est désormais partagée entre les deux parties. En présence d'une faute inexcusable de l'employeur, la victime va pouvoir demander une réparation au-delà du forfait d'indemnisation prévue par le code de la sécurité sociale.

Si on applique cette jurisprudence à l'usage des TIC, la situation de l'employeur est similaire. Même s'il n'a pas pris conscience du danger, l'employeur sera coupable de ne pas avoir mis à jour le document unique d'évaluation des risques qui est obligatoire dans toutes les entreprises. Il s'agit de lister les risques qu'un

⁽³⁸⁾ Cass. 2^e civ., 8 oct. 2020, n. 18-26.677: JCP S 2020, 3070, note D. Asquinazi-Bailleux. – Cass. 2^e civ., 8 oct. 2020, n.18-25.021: JCP S 2020, 3071, note M. Keim- Bagot.

équipement, un procédé ou un produit peut causer à la santé du personnel. Autrement dit, l'employeur doit inventorier les dangers des outils qu'il utilise. Les risques doivent être recensés selon des critères propres à l'entreprise (*fréquence d'exposition, gravité par exemple*), puis classés. Ce classement permet de faciliter la planification des mesures de prévention et de protection à mettre en œuvre. Des normes ISO accompagnent les opérateurs économiques qui fabriquent, par exemple des robots. Autrement dit, la prévention des risques est introduite dès la phase de conception. En définitive, l'obligation de sécurité qui pèse sur l'employeur l'oblige d'une part à évaluer les risques encourus par ses salariés et d'autre part, prendre des mesures efficaces d'éradication de ceux-ci ou tout au moins d'atténuation de ceux-ci.

Comment la dématérialisation du lieu de travail impacte-t-elle sur les hypothèses d'accidents?

La dématérialisation du lieu de travail renvoie essentiellement à la situation du télétravailleur. C'est curieusement dans le code du travail qu'est envisagé la situation d'accident du travail. L'article L. 1222-10 du C. Trav. dispose que «l'accident survenu sur le lieu où est exercé le télétravail pendant l'exercice de l'activité professionnelle du télétravailleur est présumé être un accident du travail au sens de l'article L. 411-1 du Code de la sécurité sociale». Ce texte n'a pas encore donné lieu à un contentieux alors même que sa rédaction suscite des interrogations.

Pour rappel, l'accident du travail est celui survenu « au temps et au lieu de travail »⁽³⁹⁾. Cette affirmation caractérise la présomption d'imputabilité qui est une présomption de causalité entre le fait accidentel et le travail. Elle trouve son fondement dans le critère d'autorité requis pour caractériser le contrat de travail. Ce critère permet de distinguer l'accident du travail de l'accident de

⁽³⁹⁾ Cass. civ., 27 déc. 1911: Sirey 1911, 1, p. 383. - Cass. ass. plén., 28 juin 1962: JurisData n. 1962-096006; JCP G 1962, II, 12822, concl. R. Lindon.

trajet ou encore de l'accident de droit commun. Ainsi, le malaise dont a été victime un salarié dans les locaux des services de la médecine du travail est bien un accident du travail ⁽⁴⁰⁾. En revanche, le salarié d'astreinte à son domicile n'est pas dans un lien de subordination et peut vaquer librement à ses occupations personnelles, sans qu'une analogie soit possible avec le salarié en mission ⁽⁴¹⁾. À l'inverse, le salarié d'astreinte dans un logement imposé par son employeur est victime d'un accident du travail ⁽⁴²⁾.

Par analogie avec cette jurisprudence, il est permis de penser que si le lieu où est exercé le télétravail est un lieu de coworking, ce lieu sera assimilé à un espace de l'entreprise (lieu qu'elle loue). Il est alors logique que l'accident soit qualifié d'accident du travail s'il survient au temps normal de travail. Plus délicate est la question du domicile car le salarié est supposé assurer la sécurité dans son domicile. L'article L. 1222-9 du C.Trav. invite à vérifier qu'au moment de l'accident, le salarié était dans l'exercice de son activité professionnelle. Est-ce à dire qu'il ne peut se faire un thé, préparer son repas? La question reste posée car au sein de l'entreprise, lors d'un déplacement vers la machine à café, le salarié est couvert. La protection pour accident du travail dépasse largement l'exécution stricte de la prestation de travail. Pour les télétravailleurs, l'avenir nous dira si le juge retient une interprétation stricte du texte qui coïncide avec sa lettre ou préfère s'attacher à son esprit.

Quel rôle la négociation collective peut-elle jouer dans la définition des nouvelles pathologies du travail? Existe-t-il des cas dans lesquels la négociation collective introduit des systèmes d'indemnisation supplémentaires pour compenser le préjudice subi par le travailleur?

⁽⁴⁰⁾ Cass. 2e civ., 6 juill. 2017, n. 16-20.119.

⁽⁴¹⁾ Cass. soc., 2 avr. 2003, n. 01-20.765: JurisData n. 2003-018495; JCP E 2003, 1746, obs. G. Vachet.

⁽⁴²⁾ Cass. 2e civ., 2 nov. 2004, n. 02-31.098: JurisData n. 2004-025447.

En droit français, le droit à la négociation collective des salariés concerne l'ensemble de leurs conditions d'emploi, la formation professionnelle et leurs garanties sociales (C. Trav. art. L. 2221-1).

Autrement dit, la question des risques professionnels et de leur qualification ne relève pas du champ de la négociation collective. Il en va différemment de la protection sociale complémentaire d'entreprise qui peut être mise en place par convention collective, par référendum ou encore par décision unilatérale. D'ailleurs, le législateur conduit une politique d'incitation pour que les entreprises mettent en place une couverture complémentaire de prévoyance ou de retraite supplémentaire. Les cotisations patronales à un régime de garanties collectives et obligatoires sont exonérées de cotisations sociales dans la limite de certains seuils (relativement élevés). Par contre, les conditions de l'exonération sont très strictes. L'incitation est passée également par l'obligation depuis le 1^{er} janvier 2016, de procurer à tous les salariés de toutes les entreprises, une couverture complémentaire «frais de santé». Certains parlent alors d'une sécurité sociale professionnelle ou une sécurité sociale bis.

En matière de risques professionnels, les contrats collectifs offrent des compléments de rente AT/MP, améliorent la prise en charge de l'incapacité de travail en complétant les Indemnités journalières servies par la sécurité sociale. Enfin, certains contrats prévoient une rente de conjoint ou d'orphelin. Les contrats peuvent parfaitement définir les termes d'incapacité, d'invalidité. En revanche, ils ne définissent pas les pathologies prises en charge, sachant qu'ils ne peuvent écarter de leur garantie une pathologie ou une affection prise en charge par l'assurance maladie.

La négociation de ces contrats collectifs de prévoyance se fait également au niveau de la branche. Dès lors, s'est développé une problématique autour de la désignation de l'organisme assureur. Aujourd'hui, seule la recommandation d'un organisme est pos-

sible sous réserve que le contrat conclu présente un degré élevé de solidarité (par la prise en charge de cotisations pour certains salariés ou anciens salariés, par une politique de prestations d'actions sociales). La solidarité est un pilier essentiel attendu d'un régime de protection sociale.

En conclusion, le chemin à parcourir est encore long pour que les pathologies liées aux nouvelles technologies soient correctement prises en compte et réparées.

Social Insurance Effectiveness to Tackle New Risks

Richard Lewis

The below responses reflect the practical working of the legal system: what lawyers and claimants experience can be more important than studying only what judges say. The economics and sociology of law are crucial in its understanding. In over 45 years of teaching and research, I have been much influenced by P.S. Atiyah's *Accidents, Compensation and the Law*. Injured people would be better compensated according to the degree of the disability they suffer instead of focusing on how and where they were injured. A unified system of social insurance should reflect this. To a large extent such a system was put in place in New Zealand almost fifty years ago following the report of the Woodhouse commission. In effect, in constructing a more comprehensive scheme not only were personal injury claims in tort abolished but also the special scheme of compensation for industrial injury was removed. These reforms reflected the view of the International Labour Organisation that the distinction between work and other accidents is increasingly anomalous and traditional practice is the main obstacle to change. This approach very much affects the responses to the somewhat narrow focus of the below questions ⁽⁴³⁾.

⁽⁴³⁾ For further detail and references see, in particular, the following selected publications: R. LEWIS, *Compensation For Industrial Injury*, 1987, which includes *Compensation For Industrial Disease*, in *J Social Welfare Law*, 1983, 10-21; R. LEWIS, *Employers' Liability and Workers' Compensation: England and Wales*, in a book edited by G. WAGNER (2012), *The statistics were update*, in R. Lewis, *Industrial Injuries Compensation: Tort and Social Security Compared*, in *Industrial Law Journal*, 2017, 445-476; R. LEWIS, A. MORRIS, *Tort Law Culture: Image and Reality*, in *Journal of Law & Society*, 2012, vol. 39, pp. 562-592, or *Journal of European Tort Law*, 2012, vol. 3, pp. 1-35.

Do you think public social insurance systems funded by employers and employees are still efficient?

(Since 1973 the industrial injuries scheme (II Scheme) has been wholly funded by taxpayers alone). The answer here depends on the meaning of 'efficient.' There are at least two interpretations, the first simple and the second more complex and depending on the objectives set for a compensation scheme. Does 'efficient' mean: *Either* (a) cost effective (for example, are the costs of administration acceptable and are claims determined in reasonable time?); *Or* (b) is there a wider meaning dependent upon the aims set (For example, does the scheme delivers fairly to all those intended or in need? Does it help to prevent injury?).

a) Narrow Meaning – The answer to whether the II Scheme is cost effective is undoubtedly yes – especially if it is compared with claims for civil liability in tort.

The administrative cost of the II Scheme is only 2% of the benefits it pays out. This extraordinarily low figure reflects the fact that pensions remain in payment for as long as there is disability and so may last a lifetime. There is very little cost in continuing to pay these historic pensions. By contrast, for new claims alone the figure is much higher – perhaps 20%. However, even this figure seems very reasonable in comparison to the astronomical costs of litigating at common law: tort administrative costs are 85% of the damages distributed. This means that for each £1 in damages received by a tort claimant, another 85p is spent in insurance costs and legal fees. II Scheme claims are also paid more quickly. They are usually resolved within a few months of the claim being made whereas if a civil case goes to court it takes on average 3 to 5 years. (However, only 1% of cases go before a judge; almost all are settled out of court in 1 to 2 years).

There are many reasons for the greater efficiency of the II Scheme. The administration is by civil servants and tribunals where expensive lawyers are generally absent and private insur-

ers do not operate. Claims are usually adjudicated on the basis of the paperwork alone and hearings are unusual. Claimants are not required to prove fault. By contrast, in tort wrongdoing is the basis of the claim. This uncertain standard can be difficult to apply. In addition, the II Scheme benefits are much easier to assess: they depend upon a fixed objective scale relating to a percentage table of anatomical disability. In contrast, tort in theory attempts a subjective assessment to return the claimant as far as possible to the position before the accident. Although in practice this individualised approach to compensation is considerably diminished, it inevitably involves greater cost.

Although cheaper to run, the II Scheme cannot match the payments made by tort in cases of serious injury. The maximum benefit amounts to only a third of average earnings. Although the value of such a pension can be substantial if capitalised over a lifetime, it remains low compared to tort damages. This is because the II Scheme makes no payment specifically for financial loss. This means, for example, that lost earnings or medical costs cannot be claimed; only the disability itself is compensated, not any resulting monetary loss. Nothing is awarded for care costs because of the existence of a free National Health Service. In contrast, tort not only pays for lost earnings in full but it also ignores the Health Service and provides compensation for future private medical care irrespective of whether this is actually used by the claimant. Many would not consider that 'efficient.'

The II Scheme compensates only by awarding a monthly pension whereas in tort almost always lump sums are used. Tort offers this once-and-for-all method of payment and it inevitably involves additional expense and delay in more serious cases but is very 'efficient' in disposing of the mass of small claims which, on average are only for about £ 5,000.

b) Wider Meaning – Neither the II Scheme nor the law of tort can be considered as 'efficient' in compensating all those injured by accident, let alone disease. Nor do they provide full com-

pensation to those who gain access to the system or reduce the incidence of injury.

Even in relation to work injuries it has been estimated that, for a variety of reasons, only one in ten workers make a claim in tort. However, there are four times as many claimants in tort compared to the II Scheme. One reason for this is that II Scheme benefits do not compensate for financial loss. However, in practice, the vast majority of claims both under the II Scheme and tort are concerned with minor injuries. They both focus unduly on non-pecuniary loss, which comprises two-thirds of all damages paid in tort. The coverage of both schemes is limited. For example, as discussed below diseases are under-represented. In addition, under the II Scheme no payment can be claimed by the self-employed or by those who are injured when travelling to or from work. The time and resources spent in determining whether or not an injury is work connected is not 'efficient' and inevitably produces many anomalies and much injustice.

There is no deterrence which might lead to a reduction of injury in the II Scheme because payments are not made by employers. Similarly, the existence of liability insurance to cover tort liability has been said to have little effect on reducing injury. Although some may view this as 'inefficient,' others would consider the deterrent function better achieved by a combination of the criminal law and regulatory measures by a fully funded Health and Safety Executive, as in New Zealand.

In light of new and emerging risks, is it necessary to re-think the workings of social insurance?

Yes – there is a need to reform social insurance. As argued above, what has been termed the 'industrial preference' should be removed. Instead compensation should be paid according to the degree of injury suffered, its effects on the claimant and what are the claimant's reasonable needs. The 'industrial preference' will become increasingly harder to defend if compensation

is progressively extended to new injuries and diseases which are commonly found in the population at large. These are discussed further in question 3 below. Similarly, if commuting accidents are included in the scheme or if it is extended to encompass the self-employed the special preference will be further diluted and increasingly difficult to defend. The increase in artificial self-employment contracts in the 'gig' economy (as shown in the recent UBER litigation) will add to these pressures.

Is the distinction between work-related accident occupational disease still relevant for recognising the benefits provided by public insurance systems?

Yes – Under the II Scheme benefit can only be claimed if either an accident is suffered or a 'prescribed disease.' Diseases must appear of a specified legislative list as being a risk of the claimant's particular employment. This list system is very restrictive and has been very slow to change. It recognises only the 'tip of the iceberg' of occupational ill health. In particular, the system almost entirely fails to compensate for the many cancers which, although endemic in the population at large, also have industrial causes. This is because proving the work connection in law can be impossible unless the disease is listed for the precise occupation and this is often narrowly described. Other disabilities which are barely covered include musculoskeletal disorders and mental injuries, including stress. The latter reflects the undue emphasis in the Scheme on anatomical impairment and physical injuries only.

In recent years there has been much greater recognition of some diseases such as occupational deafness and asbestos related illnesses. This has led to a growth in claim numbers for disease so that they now exceed those for accidents. Disease claims have been more successful partly because, unlike many accidents, their effects can be long lasting and they are less likely to be excluded as being below the minimum threshold for a claim. However, it was the tort system that produced compensation for

certain respiratory diseases of miners and for vibration white finger. Following litigation a special state scheme of compensation was set up in 1999 which compensated 760,000 people before it closed. Although the tort system requires proof of fault, today it compensates three times more disease claims than the II Scheme. This is a further indication of the limited scope of the social insurance scheme.

Can a compensation system exclusively based on the employer's civil liability be considered more efficient?

No certainly not - This has been largely dealt with above in the answer to question 1. In the UK there is no 'employer privilege' which prevents claims being made both in tort and under the II Scheme. The tort system is extremely expensive, slow and compensates only a minority of all accident victims let alone all those suffering from disease and disablement. For those seriously injured tort fails in its objective to return them to the position they were in before their injury; many are substantially undercompensated. By contrast those who suffer minor injury comprise the great majority of claimants and their losses are frequently overcompensated. Their damages are paid at a disproportionate administrative cost which usually exceeds the compensation paid to the claimant. Overall, two thirds of total damages awarded are for pain and suffering alone and insufficient priority is given to direct financial losses.

The moral force of the fault principle cannot be maintained by the system in practice: in effect, there is little or no inquiry at all into wrongdoing where minor injury is involved. This applies to most of claims that are brought. In addition, defendants invariably go without punishment in the civil law because liability insurers meet the cost of almost all awards; any deterrent in the law is severely undermined. In short, the system is far from what it purports to be. Our JLS review in 2012 concluded: «Tort in practice is limited in its scope, partial in its application and very dependent upon existing systems of welfare and insurance ad-

ministration [...] [It] produces arbitrary results that bear only a limited relationship to the portrayal of justice contained in the traditional tort textbook». It is clearly not an “efficient” system.

Do you think that regulatory changes are necessary to ensure workers’ proper insurance protection in the Fourth Industrial Revolution?

Yes – as discussed above, changes are needed no matter whether you take a narrow view of the framework for the questions posed or whether you place them in a wider context which looks to more comprehensive reform of social insurance. Provision for workers can only be understood as part of the broader welfare environment.

Chapter V.
SKILLS FOR MANAGING NEW RISKS

**Promouvoir et régler
le développement des compétences
dans le contexte de l'Industrie 4.0**

Nicole Maggi-Germain

Les transformations du travail liées à la quatrième révolution industrielle ont un fort impact sur les parcours professionnels et les compétences demandées aux travailleurs. Quels sont les plus grands défis pour la réglementation du travail dans ce domaine?

Il me paraît essentiel de souligner, à titre préliminaire, le contexte dans lequel s'inscrit ce qui est identifié comme la quatrième révolution industrielle. Notre environnement, qu'il soit de travail ou personnel, utilise massivement les techniques numériques, contribuant progressivement à en modifier le quotidien, en particulier par la charge mentale psychique qu'elles font peser sur le salarié. Cet environnement numérique mobilise de nouvelles références, d'autres mondes sémantiques. L'économie digitale, l'économie numérique, l'économie de l'information, l'économie de la connaissance, l'industrie 4.0 constituent autant de références destinées à formaliser ces transitions et à les inscrire dans un processus qui les rende acceptables par tous. Elles mettent en scène et placent sur le devant de la scène politique et sociale des

évolutions présentées à la fois comme inéluctables et sources de progrès. Plus prosaïquement, de nouveaux marchés se créent, destinés à accompagner les entreprises et les groupes dans leur transition numérique comme autant de «futurisation du présent» (1). Il n'y a pourtant, dans cette mise en scène terminologique, ni loi ni science mais des choix humains portés par une idéologie destinée à façonner une certaine représentation de la Société. Car contrairement à l'organisme vivant, la technique, «suppose l'ingéniosité du mécanicien. [...]. Le tout est rigoureusement la somme des parties. L'effet est dépendant de l'ordre des causes» (2). Loin de s'imposer à nous comme une science objective qui se développerait de manière linéaire, l'expansion de la technique numérique repose sur un choix de Société dont le travail – qu'il s'agisse des conditions de travail ou du rapport au travail qu'elle contribue à façonner – constitue le point d'orgue. Dans un tel cadre, le rôle et la place accordés au droit, en tant que «conservatoire de valeurs», selon l'expression de Jacques Caillosse, sont d'autant plus importants que la norme technique, facilement adaptable à son contexte, empiète sur les terres du droit. En présence d'une technologie émergente et en constante évolution du fait de la succession des apports scientifiques, le risque existe de voir le terrain occupé par les seuls techniciens. Le Droit céderait alors devant la rationalité technique tirée du savoir scientifique. Cette tension est perceptible dans la place accordée à la normalisation qui échappe au Droit, à moins que les normes en question aient été rendues obligatoires par leur intégration dans un acte juridique (3). S'ouvre ainsi un marché des normes, adoptées en dehors de tout processus démocratique dès lors que leur élaboration relève du lobbying – le financement de l'ISO provient des

(1) M. ROBITAILLE, *Le transhumanisme comme idéologie technoprophétique*, in FUTURIBLES, janvier 2011, n. 370, p. 57-70, 59.

(2) G. CANGUILHEM (1945-1950), *La connaissance de la vie*, Hachette, 1952, p. 149.

(3) Par exemple dans un contrat d'entreprise (Cour de cassation chambre civile 3, 23 mai 2012, n. de pourvoi: 11-13011 Publié au bulletin.

cotisations des groupes et entreprises qui en sont membres – et de la capacité des «parties prenantes» à peser, notamment grâce aux experts, dans un processus basé sur le consensus. Le risque existe aussi d’assécher un débat limité aux conditions de mise sur le marché de produits dépendants de technologies évolutives (4).

Le système juridique français est souvent cité comme un exemple positif en référence à l’évolution du cadre législatif dans le domaine de la formation des travailleurs. Quels outils, introduits par les réformes les plus récentes, vont dans le sens de protéger les travailleurs contre les nouveaux risques et de les accompagner dans les transitions professionnelles et biographiques de plus en plus fréquentes auxquelles ils sont confrontés?

Si le système de formation professionnelle continue mis en place en 1970 n’a pas permis de supprimer les inégalités d’accès (les cadres hommes appartenant à de grandes entreprises accèdent beaucoup plus souvent à des actions de formation). Il a cependant profondément évolué, tant dans sa philosophie que s’agissant des dispositifs mis en place. L’objectif de promotion sociale a ainsi progressivement cédé le pas à l’adaptation aux besoins de l’économie. Cette évolution s’est traduite par la disparition du congé individuel de formation (CIF), financé par les fonds paritaires issus des cotisations prélevées sur la masse salariale des entreprises, auquel a succédé le compte personnel de formation (CPF). La philosophie des deux dispositifs diffère fondamentalement. Le CIF constituait un droit de tirage sur des formations qualifiantes. Il rendait ainsi possible une reconversion professionnelle choisie par le salarié. Le CPF s’inscrit dans la logique des droits attachés à la personne, ouverts quel que soit

(4) N. MAGGI-GERMAIN, 7. *robotique et intelligence artificielle. Réflexions sur quelques enjeux juridiques et anthropologiques*, in 1. *Cuarta Revolución Industrial Y Robótica*, in *Revista de Direito do Trabalho* (Brésil), n. spécial (Actes du colloque CIELO – Uruguay 2018), 2019, p. RR-7.1.

le statut d'emploi, mais fortement conditionnés dans l'usage qui peut en être fait. Autrement dit, il permet à tout travailleur d'acquérir des droits à la formation («équivalents» à 500 euro par année de travail dans la limite d'un plafond de 5.000 euro) et de les utiliser tout au long de sa vie professionnelle. Cependant, les droits acquis ne lui permettent pas de suivre une formation qualifiante. Le dispositif suppose alors d'être abondé. Autrement dit, il appartiendra à une Région, à Pôle emploi ou encore à l'employeur d'apporter le financement complémentaire. L'organisme financeur pourra, ce faisant, conditionner le financement et orienter la formation vers des besoins qu'il a précisément identifiés. Nous sommes loin du projet de promotion sociale dans lequel était partiellement ancré le système de formation professionnelle continue.

Corrélativement, les obligations pesant sur les employeurs ont également été renforcées sous l'effet de plusieurs décisions jurisprudentielles aujourd'hui inscrites dans le Code du travail qui imposent à l'employeur non seulement d'assurer l'adaptation de ses salariés à leur poste de travail, mais également de veiller au maintien de leur capacité à occuper un emploi. C'est sans doute là que se loge la spécificité du système français de sécurisation des parcours professionnels qui, contrairement au modèle de flexisécurité, ne se limite pas à construire les transitions professionnelles mais cherche d'abord à assurer le maintien du salarié dans l'emploi au sein de son entreprise. Autrement dit, le cadre juridique français écarte le modèle de «l'employabilité», qui conduit à reporter sur le salarié la charge de sa formation, au profit du modèle de «la capacité professionnelle» qui suppose de répartir l'obligation entre les différentes parties prenantes, au premier rang desquelles se trouve l'entreprise.

Le modèle français n'échappe cependant pas aux évolutions globales. Il est profondément travaillé par le postulat de la mutation permanente que supposerait la grande transformation numérique. Envisagée comme l'un des ressorts d'une innovation éri-

gée en axiome, la mobilité est devenue l'une des caractéristiques essentielles du fonctionnement socio-économique, au niveau national comme européen. La mise en récit de la grande transformation numérique se nourrit des catégories de pensée et des concepts élaborés par le management. Parmi eux, « l'agilité » occupe une place essentielle. Pensés sur le modèle des « méthodes agiles » des réseaux informatiques, c'est-à-dire adaptables en permanence, l'entreprise, voire le contrat de travail devraient être « agiles ». S'appuyant sur le développement des techniques, le discours sur la grande transformation consacre à la fois la mutation permanente et l'individualisation, manifestations de la « révolution silencieuse » qui serait conduite par les personnes elles-mêmes.

Les transformations en cours ont un fort impact sur les systèmes de prévention et de sécurité au travail. Quels sont les principaux défis en matière de formation tant pour les travailleurs que pour les acteurs clés de ces systèmes ?

L'expansion de l'utilisation des techniques numériques, en particulier le recours aux algorithmes, facilite l'introduction de nouvelles formes d'organisation du travail qui valorisent l'engagement total de la personne du travailleur tout en instituant des formes de contrôle inédites. Ce nouveau « monde digital », qui possède ses propres références, est porté par un discours managérial qui survalorise l'engagement personnel (dont la rhétorique sur les talents constitue l'une des expressions). Ce discours individualisant n'épargne pas la fonction publique, comme le montre le programme « Action publique 2022 ». Les nouveaux usages du numérique – l'évaluation des salariés ; le travail sur les plateformes numériques, par exemple - rendus possibles par la généralisation de l'utilisation des algorithmes facilitent l'émergence de nouvelles formes de domination qui passent par le contrôle des personnes en général et des travailleurs en particulier, grâce, notamment, à la géolocalisation ou encore aux « gants intelligents » équipés de capteurs qui guident et enre-

gistrent le mouvement. La technique des algorithmes peut également être utilisée dans la gestion des carrières des travailleurs. Carrefour a mis en place, avec l'entreprise Proxem, un système d'analyse des 13 000 entretiens annuels de sa population d'encadrants grâce à l'utilisation d'un algorithme. Mais s'agit-il vraiment d'une «analyse»? Le recours à la technique des algorithmes dans le cadre des entretiens d'évaluation constitue d'abord un outil de sélection des travailleurs conformément à des objectifs prédéfinis par l'entreprise en fonction d'orientations et de priorités qu'elle a définies. Sous couvert de l'apparente neutralité octroyée par l'exploitation «scientifique» de données numériques par le logiciel d'un prestataire de services extérieur, l'expérience, le nombre d'emplois occupés, etc. peuvent apparaître comme des «critères» objectivés. Ils sont cependant le fruit de choix en matière de gestion des ressources humaines. Cette technique apparemment neutre institue aussi une forme de contrôle permanent non seulement de l'activité mais également des travailleurs et de la personne. Et c'est bien à un nouvel ordre social fondé sur la transparence ⁽⁵⁾, le contrôle et la prévisibilité que nous convie la «prédiction algorithmique». L'exemple le plus emblématique est sans doute celui de l'entretien numérique HireVue qui combine l'entretien vidéo et de l'analyse «prédictive» dans le but de déceler plus rapidement les «talents» pour une évaluation avant embauche. Le logiciel est basé, notamment, sur des séries de jeux psychométriques (notions d'arithmétiques; résolution de problèmes; attention) et une vidéo (la personne se filme et répond à des questions). Le système exploite les données des milliers de candidats précédents afin de déterminer des traits caractéristiques de la personnalité (langage corporel; richesse du vocabulaire; mouvements oculaires; niveau de stress dans la voix, capacité à retenir l'information, etc.). Le système aurait l'avantage d'éviter la dé-

⁽⁵⁾ Cf. Directive sur des conditions de travail transparentes et prévisibles 2019/1152 du PE et du Conseil du 20 juin 2019, JOUE L 186/105 du 11 juillet 2019.

multiplication des entretiens d'embauche mais est surtout censé écarter, en supprimant l'humain du processus d'entretien, tous les aspects subjectifs – et donc nécessairement faillibles – tributaires du contact interpersonnel. Il s'agit, pour reprendre les termes d'une directrice des ressources humaines, de «Capter le vécu des salariés». Cela suppose de faire tomber les frontières entre la vie personnelle et la vie professionnelle, entre ce qui relève de l'activité de travail et de l'activité ludique. Le management l'a bien compris en détournant de la sphère privée les usages en vigueur dans les réseaux ⁽⁶⁾.

En enserrant les travailleurs dans des processus d'apprentissage et de renouvellement des capacités cognitives permanents, les techniques numériques surexposent la personne. Loin d'offrir aux travailleurs leur émancipation, ces formes d'organisation du travail donnent à voir différents visages de la dépendance qui s'appuient sur la recherche d'un engagement total de la personne dans les formes les plus hétéroclites de sa subjectivité qui rendent d'autant plus nécessaires la mise en place de garde-fous collectifs.

Quel rôle les acteurs des systèmes de relations industrielles peuvent-ils jouer face à ces défis?

La place de la négociation collective de branche reste fondamentale pour bâtir un système de règles qui s'imposeront à l'ensemble des entreprises d'un secteur d'activité. L'industrie 4.0. suppose d'encadrer l'usage de techniques tel que celle des algorithmes et d'en déterminer, au préalable, les finalités. De ce point de vue, le système français d'extension des conventions et accords collectifs signés au niveau interprofessionnel ou au niveau de la branche activité constitue sans aucun doute un moyen souple de le faire. En effet, ce mécanisme permet au ministre du

⁽⁶⁾ N. MAGGI-GERMAIN, *Le travail à l'ère des techniques numériques*, in V. BONNIN, L. GATTI, L. LEROUGE (dir.), *La numérisation du travail. Enjeux juridiques et sociaux en santé au travail*, 2021, p. 280.

travail d'étendre à l'ensemble des entreprises – même non signataires – entrant dans le champ d'application, l'accord signé par des organisations professionnelles d'employeurs et des organisations syndicales représentatives. Le rôle de l'État est central ; il lui est possible de refuser l'extension pour des motifs liés à l'intérêt général, notamment pour atteinte excessive à la libre concurrence ou au regard des objectifs de la politique de l'emploi (Cod. trav. art. L2261-25). Cette intervention de la puissance publique peut se révéler d'autant plus utile dans des secteurs d'activité en cours de constitution, comme celui de la robotique. Laisser aux seuls groupes et entreprises la capacité à le structurer pourrait leur permettre, à court terme, obtenir un avantage concurrentiel facilitant la captation de marchés (7).

Plus largement, la prise en charge de ces évolutions doit s'appuyer sur le paritarisme, autrement dit sur la capacité des partenaires sociaux à prendre en charge la gestion d'un système comme celui de la formation professionnelle continue et à en déterminer les orientations. Le fait que le financement de la formation professionnelle continue repose en grande partie sur les contributions prélevées sur la masse salariale des entreprises plaide pour la mise en place d'une gestion paritaire.

Certaines études soulignent que l'un des principaux problèmes de la formation en santé et sécurité est sa séparation du domaine plus général du développement professionnel des travailleurs. Au contraire, la sécurité doit être l'un des résultats de «savoir bien faire son travail». Quelle est la relation entre la sécurité et le développement professionnel aujourd'hui? Pensez-vous qu'il soit souhaitable d'intégrer la formation à la sécurité dans le domaine du développement professionnel des travailleurs? Comment cela peut-il être accompli?

(7) N. MAGGI-GERMAIN, 7. *robotique et intelligence artificielle. Réflexions sur quelques enjeux juridiques et anthropologiques*, cit.

De manière globale, la formation professionnelle continue demeure essentielle dans un contexte d'expansion de techniques numériques qui transforment le rapport au travail et, au-delà, le travail lui-même. D'abord parce qu'à un bout de la chaîne, l'automatisation croissante de certaines tâches conduit à un resserrement de l'activité de travail sur les tâches non substituables, dont on peut penser qu'elles seront valorisées dès lors que la comparaison avec la machine est impossible. Ensuite parce que l'expansion du numérique crée, à l'autre bout de la chaîne, de nouvelles formes d'emploi qui dévalorisent le travail – les «travailleurs du clic» ou encore les micro tâches répétitives générées par la plate-forme d'Amazon, «The mechanical turk», ou par la plateforme française FouleFactory à un coût défiant toute machine. Cette armée de tâcherons de l'ère du numérique ne bénéficie pas de l'application du Code du travail, pas plus qu'ils ne sont en capacité d'imposer le contenu de leurs conditions de travail dans un contrat d'entreprise. En facilitant l'acquisition de savoirs et de savoirs faire non substituables, et, ce faisant, l'accès à un statut professionnel, la formation professionnelle continue pourrait alors constituer une solution, parmi d'autres, pour lutter contre la partition du monde du travail entre les travailleurs qui se verraient appliquer un Droit du travail forgé sur l'idée de solidarité et les travailleurs entrepreneurs d'eux-mêmes ⁽⁸⁾.

Concernant plus spécifiquement la formation en santé et en sécurité, l'intégrer au développement professionnel des travailleurs risque d'entraîner corrélativement le report de l'obligation sur le travailleur. Or, la formation à la sécurité et la santé au travail ne peut pas être dissociée de l'outil de travail et, plus largement, des choix économiques qui sont réalisés par l'employeur qui conditionnent aussi les choix qu'il fait en matière d'organisation du travail et sur lesquels le travailleur n'a aucun pouvoir de décision.

⁽⁸⁾ A. EHRENBURG, *La Société du malaise*, Odile Jacob, 2010, p. 13.

Professioni: sfide, sviluppi e problematiche

Willem Tousijn

Come si è evoluto il concetto di professione nel tempo e quali sono oggi a suo parere le sfide e i problemi centrali per lo studio delle professioni?

La parola “professione” (P) ha due significati. In senso generale, significa occupazione, attività lavorativa. In senso più ristretto, indica un gruppo di occupazioni a elevata qualificazione e elevato prestigio sociale. Questo secondo significato risale alle Università medievali e rinascimentali, da cui uscivano i dottori in teologia, legge e medicina, membri dell'aristocrazia. La sociologia si è interessata a questo secondo significato a partire dagli anni Trenta del Novecento, quando la Scuola Funzionalista elaborò un concetto di P come occupazione dotata di elevate conoscenze scientifiche formali, applicate a problemi cruciali per l'equilibrio della società. A partire dagli anni Settanta, questa concezione fu criticata in quanto ideologica, volta a giustificare i privilegi dei professionisti. Una serie di contributi teorici di ispirazione weberiana pose l'accento sui fenomeni di potere delle P: controllo del mercato, controllo occupazionale, potere sui clienti, e altro. Oggi al centro dell'attenzione c'è il dibattito sui conflitti generati dall'avvento della logica manageriale e della logica consumerista nei settori, come la sanità e il diritto, in cui la logica professionale ha dominato incontrastata fino a ieri. Si tratta di studiare se lo scontro tra le diverse logiche generi un declino della logica professionale o se prevalgano forme di coesistenza tra esse.

Come nasce una professione? Il processo di professionalizzazione tipico delle professioni liberali vale anche per i nuovi gruppi professionali nascenti?

In sociologia il concetto di “processo di professionalizzazione” ha funzionato bene per spiegare l’evoluzione, nei paesi avanzati e prima della 1° guerra mondiale, di un gruppo di occupazioni tra cui spiccano medici e avvocati. Queste occupazioni hanno ottenuto il controllo del mercato e una serie di privilegi (reddito, potere e prestigio elevati). Il processo parte con l’individuazione di un prodotto/servizio (o di una serie di prodotti/servizi) ad elevato contenuto di conoscenze scientifiche, sul quale è possibile rivendicare una “giurisdizione esclusiva”. In Italia, lo Stato può sancire questa esclusività attraverso l’istituzione dell’Ordine professionale, che comporta vari meccanismi di autoregolazione. I principali sono l’albo, gli organi di autogoverno, l’esame di abilitazione, il codice deontologico. Per i gruppi professionali nascenti, il processo di professionalizzazione descritto, che possiamo definire “tradizionale” è *una* delle possibili strategie da adottare. Non tutti i gruppi nascenti la scelgono. Per esempio, psicanalisti e consulenti aziendali riescono a controllare il mercato attraverso altre strategie. Quali strategie scegliere dipende da molti fattori: natura e composizione del mercato, natura delle conoscenze, composizione del gruppo occupazionale, e altri.

Alcuni studi più o meno recenti segnalano la tendenza a una professionalizzazione di tutti, secondo lei, considerate le trasformazioni in atto nei moderni mercati del lavoro, si può parlare di una professionalizzazione di tutti?

No. Se per “professionalizzazione di tutti” intendiamo che tutti i gruppi occupazionali a elevate conoscenze debbano seguire il processo tradizionale, ho già risposto negativamente. Tra l’altro, l’istituzione di nuovi Ordini è oggetto da tempo di aspri conflitti politici tra fautori della libera concorrenza e sostenitori della tutela della qualità professionale. Se invece si intende un generico

processo di crescita delle competenze in tutte le occupazioni, mi pare che ne esistano ancora molte a bassa qualificazione e dubito molto che siano sull'orlo della scomparsa.

Quali strategie potrebbero adottare i nuovi gruppi professionali per conquistare uno spazio nel mercato del lavoro e ottenere un riconoscimento a livello sociale e istituzionale del proprio contenuto professionale?

Dipende dal gruppo occupazionale e dai suoi obiettivi, nonché dagli altri attori sulla scena. Le domande fondamentali da porsi sono le seguenti. 1) Qual è il prodotto che il gruppo occupazionale vende? 2) Quali sono le caratteristiche del gruppo occupazionale? Numerosità, composizione, eterogeneità interna, tipi di competenza 3) Quali attori sono coinvolti? Con quali obiettivi? Molto importante è il tipo di clienti: privati/pubblici, aziende/organizzazioni o individui. Il “riconoscimento” non è un obiettivo chiaro. Da parte di chi? In quale forma? Con quali contenuti? La sociologia ha individuato tre arene in cui si gioca la professionalizzazione: giuridica (Governo, Parlamento), opinione pubblica, luoghi di lavoro. Ottenere un riconoscimento in un'arena, per esempio quella legislativa, non significa ottenerlo anche nelle altre due arene. Lo Stato interviene quando c'è un interesse pubblico, un obiettivo generale, oppure quando c'è un conflitto tra interessi, e quindi compie scelte politiche.

Il mondo del lavoro è interessato a ingenti cambiamenti che coinvolgono diversi aspetti del lavoro tra cui l'insorgenza di nuovi rischi, malattie professionali e condizioni di pericolosità. Rispetto a tale questione che ruolo potrebbe giocare la professionalizzazione del lavoro nel garantire un corretto equilibrio del sistema della salute e sicurezza sul lavoro? Come connettere contenuto professionale e competenze chiave nell'ambito della salute e sicurezza?

Credo sia meglio evitare un uso generico o, peggio, ideologico della parola “professionalizzazione”. Meglio, forse, istituziona-

lizzazione, ma bisogna capire bene che cosa si vuole regolare. Occorre innanzitutto definire il campo di attività. Un buon punto di partenza è il “Sistema della salute e della sicurezza del lavoro”, così come lo avete definito nella vostra ricerca: la descrizione delle competenze mi pare puntuale e chiara. Colpisce la vastità del campo e l’eterogeneità delle competenze, ma è così anche in altri campi. Si pensi alla medicina: la professione medica ha fatto fronte all’esplosione delle conoscenze inventando il modello delle specialità, con cui mantiene la propria unità, almeno formalmente. Tuttavia, ci sono buoni motivi per ritenere che le specialità costituiscano in realtà delle professioni a se stanti, con una loro identità specifica, associazioni professionali, riviste scientifiche, attività di lobbying. I conflitti intra-professionali sono frequenti e talvolta aspri come quelli interprofessionali. Occorre poi affrontare il nodo della formazione professionale. Le professioni tradizionali “producono i produttori” in quelle che fino a ieri erano le Facoltà (Medicina, Giurisprudenza, Ingegneria, Architettura, ecc.), e quindi controllano il processo formativo e il prodotto che ne esce. Oggi le Facoltà non esistono più e i corsi di laurea si moltiplicano. Le Università sono quindi un altro attore che influenzerà il processo di regolazione del campo. Quanto alla questione dell’Ordine professionale, ho già menzionato l’aspro dibattito politico in corso da anni sull’argomento. In ogni caso, un passo preliminare (in genere) è la formazione spontanea di una associazione professionale, possibilmente unitaria, che si faccia protagonista del processo di professionalizzazione.

Occupational Health and Safety Professionals: Skills, Professionalism and Training

David Clarke

Given the complexity of definitions and terminology that characterizes health and safety professionals and the attempts by the Occupational Health and Safety Professional Capability Framework that has divided health and safety professionals into OHS professionals and OHS practitioners, what other strategies can be adopted to better identify this professional group, ensure recognition at the national level and between different countries?

The Global OHS professional capability framework (GCF) is the first time that multiple countries have come together, to seek to standardise our understanding of the range of health and safety roles, their differences at different levels, and the knowledge and skills required to do the work at each of the levels. It is a critically important International piece of work and provides a potential pathway to a more sophisticated international approach to workplace health and safety.

- First and foremost, all countries should strive to adopt the content and terminology of the GCF. This includes:
 - Promoting role descriptions in industry that follow the framework;
 - Lining terminology to the various certifications of the profession; and most importantly
 - Have governments, especially government health and safety regulatory authorities, adopt the language of the strategy, and urge business to source suitably qualified practitioners and professionals, using the skill sets contained in

the GCF as a guide.

- Governments should also look to formally regulate the use of suitably qualified, certified people by supporting certification of the profession at the different levels of work, using the GCF as a guide. OHS workers have the lives of others potentially in their hands, and the current failures of governments to use formal certification as a way of creating a higher and more consistent standard of health and safety, contributes to accidents and injuries. Under the right framework, the Generalist/specialist divide (i.e., auditors) and Industry specialisations – can be brought together.
- A clear Professional Development framework should be linked to Certification, to provide ongoing career learning and development – and this framework should be linked directly to the acquisition of knowledge and skills as described in the GCF and this CPD framework.
- Governments should support the establishment of an accepted Body of Knowledge, such as the Australian OHS Body of Knowledge which provides a source for the current evidence base for the science and practice of health and safety, and which provides guidance to the teaching of OHS in Universities. Where University level courses do not exist yet, they should be created.

Do you think that current health and safety professionals have the skills to recognize, identify and manage new risks?

Yes and No.

Currently, the skill and capability of health and safety professionals is far too variable. This is because of the lack of regulation of the profession, lack of consistent education and training, and the lack of use of the Global Capability Framework.

People come into the field and work in health and safety roles, with a diversity of backgrounds and knowledge. Although the knowledge base exists for good health and safety practice (see OHS Body of Knowledge) which if followed, provides the toolkit for identifying new and merging risks in a changing world, not enough of those who work in OHS roles have those skills. In Australia, Universities use the Body of Knowledge BUT only a small percentage of people in WHS have done those courses.

In this way, the OHS profession is still an adolescent profession – there is a lack of consistency of standards. As a result, employers cannot be fully confident that the advice they are receiving from these professionals is of the quality it should be to maximise the prevention of injury, illness, and death.

The whole idea of being a capable WHS professional includes the concept of identifying and assessing new risks. To use Covid-19 as an example: it is a biological OHS hazard and can be managed within the known science and practice of good quality precautionary based risk management. However, to use the Australian Covid-19 experience as an example – our healthcare/hospital system has poor OHS: IOHS workers are low on the management totem pole, paid less, and have less responsibilities. Doctors are put in charge of infection control and leading the management of risks linked to Covid. These people work to different practices, practicing infection control rather than health and safety risk management. Infection control works to guidelines and standards and is very weak in adapting to new and emerging risks, especially those where there are many unknowns. In the one breakout of Covid in Victoria Australia between May-October 2020, thousands of healthcare workers contracted Covid-19 as a result- hospitals continued to follow standards, but those standards did NOT protect workers. Good health and safety practice would dictate new and precautionary measures, and recognition of, for example, the risk of airborne

transmission and subsequent precautionary mitigation factors would be put into place. This did not happen. Hospital management simply continued to blame the works for poor hygiene.

What key skills should be possessed by occupational health and safety professionals, and what is the role of soft skills in performing their work?

The key knowledge and skills required for good work in OHS are well outlined in the Global Capability Framework, which our organisation's representative Pam Pryor, was a co-author, so I will not repeat that content, but refer you to the document.

Soft skills are one of the most under-developed areas for OHS workers, along with business acumen - understanding how the business functions and other key drivers which management work to. The role of OHS managers, the more senior they are in the company, is to influence organisational culture. To do this, emotional intelligence is also a high value, and combined with communications soft skills and business knowledge, enables the OHS professionals to listen and understand motivations for individuals and groups in the business, and respond to those behaviours in a way which can be heard, and understood. You cannot even begin to influence culture unless you understand why people behave the way they do. Having a positive impact on organisational culture is the greatest single challenge of? This is the big question for HSE leaders.

Today, at the more senior levels companies may use heads of Health, safety environment and quality, who have no experience in OHS. What is valued most is management capability, business acumen etc. If we want to assist the process of getting people with OHS skills rising into those roles, we must better educate them in the soft skills and general business knowledge and skills (business acumen). Also, emotional intelligence can be taught – at least partly – so should also be on the professional development menu.

Many studies point to shortcomings in the methodologies used in training courses for occupational health and safety professionals. Do you confirm this trend? What learning methodologies and training courses should be used for these professionals?

I am not directly familiar with the general comment about those studies. However, we have issues with our training and education in Australia.

- It is a 2-tiered system: University level, and the lower-level Vocational Education and Training (VET) sector. While the GCF identifies these two tiers as relating to practitioner (VET) and professional (University) which is a good alignment, the reality in business, is that the profession is not aligned in this way throughout industry. There are many people working in OHS professional roles with limited OHS education, and who are unconscious to their own circumstances – they do not have certain key knowledge, but they are not aware of that.
- There are new developments in online automated learning, and VR learning, that we support. Online learning which identifies the trainee's knowledge and lack of knowledge, and trains according to that, could be a useful tool. The use of virtual reality provides great opportunities to have a sensory experience of issues and risks.

Do you think it is useful to certify the skills of these professionals? What other qualification systems do you think should be adopted to better define the job of these professionals?

This is critical if there is a genuine desire to improve OHS across any national system.

People who work in OHS have the lives of others in their hands. Employers have the right to be confident that the person

they are employing, directly or as an OHS consultant, is suitably qualified and capable of giving good advice. Lives, and prosecutions, are potentially at stake.

The system should certify capability consistent with the work levels in the GCF. The Australian OHS certification program had already done this, and we are willing to share this knowledge. In a relatively new program, in Australia we have now certified more than 2,000 practitioners and professionals, in accordance with the structure of the Global Capability Framework.

The concept of certification is not just about gaining that certification but keeping it. Through ongoing Professional Development under a certification framework, OHS people can be streamed into developing new skills in the areas that can most grow their capability – including soft skills.

This program should ideally not be voluntary. If government and employers are to gain confidence in the capability of the OHS profession, it stands to reason that all people working in the field should seek to be properly certified. Therefore, government regulation should accompany this system.

Thirdly, as previously stated, the creation of a Body of Knowledge (or the adoption and translation of the Australian OHS Body of Knowledge) to provide a next level of detail about the science and evidence-based practice of OHS, provides a crucial underpinning knowledge element.

Finally, Accrediting education, to ensure that education programs are applying consistent conceptual frameworks about OHS practice, is critical. In Australia, the Australian OHS Education Accreditation Board (AOHSEAB) undertakes this and is also considering applying accreditations internationally.

Summary statement.

Taking OHS to the next level, to deal with a rapidly changing

world, requires the movement from what we describe as an adolescent profession to a mature one.

The key components required for a mature profession are:

1. *A recognised Body of Knowledge* on which to base education and further training.
2. *A form of education assurance*, through accreditation of education programs to ensure consistency of learning.
3. *Consistency of role definition and knowledge and skills requirements* – already in place with the *Global Capability Framework*. However, the framework must be adopted and promoted by government.
4. *Capability Assurance in the form of certification of the profession*, consistent with the Global Capability Framework; and
5. *A framework for career learning and ongoing training and professional development* – linked to the certification framework, and the knowledge and skill requirements at each level of work as described in the Global capability framework.

With these five things in place, rapid acceleration of the quality of health and safety occurs. In Australia today, we have now established these five key elements, and are rapidly expanding their usage. We are willing to share this internationally significant knowledge, and the frameworks we work to.

Chapter VI.
**REPRESENTATION
AND COLLECTIVE BARGAINING**

**Occupational Safety Health and Trade Unions' Role
in the Context of the IV Industrial Revolution:
between Strategic Litigation and Participation**

Aude Cefaliello

The ongoing technological revolution, which is impacting both traditional sectors and new economic models (for example platform economy), seems to raise new challenges for Trade Unions in terms of OSH protections While the 4th industrial revolutions raises new risks, it also provides new opportunities for the protection of workers' health and safety. In this regard, what risks do you think trade unions should focus on? Which are the main opportunities that unions may use in their action to promote better OSH Safeguards?

It might be important to start by distinguishing between the 4th Industrial Revolution and the previous ones ⁽¹⁾. All revolutions

⁽¹⁾ 1st Industrial Revolution (end of the 18th century and beginning of the 19th): Invention of steam engine (Coal); 2nd Industrial Revolution (end of the 19th century): emergence of new source of energy (Electricity, gas and oil); 3rd Industrial Revolution (second half of the 20th century): emergence of

are due to new scientific advancements impacting the way of production. However, during the previous industrial revolutions, the main challenge was to reduce the risk created by these innovations for workers' OSH. The example of the development of the coal or the chemical industries led to significant improvement in the production process. However, the exposure of the workers to these innovations was dangerous for their health. OSH action was needed to reduce an existing risk embedded within the nature of the material.

Considering that we live in the 4th industrial revolution, it might be hard to provide an exact definition of it. Still, some characteristics can be mentioned, such as using AI and robot in various sectors, cyber and global connectivity, and the capacity to collect and process huge amounts of data beyond human capabilities (i.e., Big Data) ⁽²⁾. These new inventions do not represent a risk on their own for workers' health ⁽³⁾. In these situations, OSH action is needed to guarantee that it does not create a risk for the workers (e.g., MSDs and PSR). These risks are getting more and more prevalent, and they have a significant impact on workers' health and safety. There are existing solutions to ensure that these risks are reduced to the minimum (e.g., ergonomic workplaces, right to disconnect). Therefore, it is a matter of choice of work organization when we introduce new technologies in link with the 4th Industrial revolution.

I would like to illustrate each characteristic mentioned above with examples of how they can impact workers' health and safety.

nuclear energy (and also rise of electronics, telecommunications and computers).

⁽²⁾ F. BONCIU, *Evaluation of the impact of the 4th industrial revolution on the labor market*, in *Romanian Economic and Business Review*, 2017, vol. 12, n. 2, p. 10.

⁽³⁾ Even if we should take into consideration the risks from exposures to screens, and the potential impact of electromagnetic waves.

1. *Cyber and global connectivity: the increasing use of Teleworking*

Previous research has already underlined the potential risk linked with the new constant cyber-connectivity at work (4). Moreover, the current Covid-19 pandemic has abruptly increased the number of workers teleworking (5). This increase is due to the public and governmental measures making teleworking mandatory for all workers who can perform their work remotely. These measures have been necessary to address the risk of spreading Covid-19. However, in many companies, teleworking has been implemented sometimes overnight. Therefore, there has been no time to assess and evaluate the risks that full-time telework might represent. A recent study has reviewed the mental and physical effects of working at home (6). According to this review, the impact on health outcomes is strongly influenced by the degree of organizational support available to employees, colleague support, social connectedness (outside of work), and levels of work to family conflict. Working at home could have negative or positive impacts. It is fundamental to recognize the link between the work organization of remote work and the impact on health. Even if the current increase in teleworking is exceptional, some companies have already expressed their plan to increase teleworking after the pandemic (7). Working from home can represent an opportunity for workers to reach a better work-life balance and reduce commuting (and therefore improve the living conditions). The working organization will make the difference between being cyber-connecting having negative or pos-

(4) J. POPMA, *The janus face of the 'new ways of work. Rise, risks and regulation of nomadic work*, ETUI, 2013.

(5) https://ec.europa.eu/jrc/sites/jrcsh/files/jrc120945_policy_brief_-_covid_and_telework_final.pdf.

(6) J. OAKMAN ET AL., *A rapid review of mental and physical health effects of working at home: how do we optimise health?*, in *BMC Public Health*, 2020, vol. 20, 1825.

(7) https://www.littler.com/files/littler_european_employer_covid-19_survey_report.pdf;
See also <https://www.libertyglobal.com/wp-content/uploads/2021/03/2021-03-Liberty-Global-Deloitte-Future-of-Work-discussion-paper.pdf>, p.15.

itive impacts on workers' OSH. As we will discuss later in this note, it will be crucial for Trade Unions and health and safety representatives to be part of the discussion at the organizational level to implement teleworking in a structural way.

2. *Collection of Data and workers' OSH*

With the increase of remote work, some countries (like the US) have reported increased use of remote monitoring technologies ⁽⁸⁾. Before the pandemic, some companies also started to ask their employees to wear some sports devices to count their steps every day, to be sure that they are fit. In the context of "Return to work", some companies have introduced the possibility to wear a tracking and monitoring device that will «notify workers with a light vibration when they come in close contact to one other» ⁽⁹⁾. These examples show that almost everything can be monitor and create data at work.

The main question which will determine whether the collection of data and the use of wearable will have a positive or a negative impact on workers' health and safety is the aim and the rules around the use of these data. Indeed, if these data are used to have a better overview of the way the company or the sector is functioning, it might be used to improve the overall working conditions. Similarly, if the data allow to track the level of exposure to risk and report to a worker to this risk is reduced, it might be a good initiative. However, if these data and wearables are used to shift OSH responsibilities on the workers and these data will be used as a base for managerial decisions, then it might create a risk for the workers. For example, if these data are used to measure the individual productivity of the workers, there is a high probability that it creates stress and psychosocial

⁽⁸⁾ <https://www.sbrm.org/hr-today/news/all-things-work/pages/monitoring-remote-workers.aspx>.

⁽⁹⁾ <https://www.safetyandhealthmagazine.com/articles/21106-covid-19-tracking-wearable-device>.

risks. Once again, these wearable and the collection of data are not dangerous on their own, but they might be depending on how they are used. Therefore, it would be a matter of work organization and a role for TU and health and safety representatives to demand full transparency on how these data are processed (and providing clear rules, so workers are protected).

3. *Algorithmic management and workers' OSH*

Following the example of Big Data, the next “level” of the use of these data is algorithmic management. *Algorithmic management* can be defined as giving self-learning algorithms the responsibility to make and execute decisions affecting workers ⁽¹⁰⁾.

Often, the example which comes to mind is the situation of the on-demand platform workers. Some platforms such as Uber or Deliveroo are well known to manage their riders via an AI. In the case of Deliveroo, the algorithm called “Frank” is assigning the gig based on the location of the riders, and the data based on previous rides ⁽¹¹⁾. The use of AI has various impacts on OSH. The most obvious one has been reported by an INRS Report in 2018, stressing that the use of AI adds a layer of risks for the workers ⁽¹²⁾. Workers know that their performances are monitored and collected, and this will influence if they will get future gigs. This way of functioning provoke stress but also pushed the riders to take risks on the road. Additionally, the AI does not consider some external factors, such as the safety of the neighborhood or how busy the streets are. Thus, it can result in a gap between the instructions given by the AI and the reality. It is important to underline that the overall rationale of predicting a

⁽¹⁰⁾ See J. DUGGAN, U. SHERMAN, R. CARBERY, A. MCDONNELL, *Algorithmic management and app-work in the gig economy: A research agenda for employment relations and HRM*, *Human Resource Management Journal*, 2020, vol. 30, n. 1, pp.114-132.

⁽¹¹⁾ <https://www.businessinsider.com/deliveroo-uses-frank-algorithm-to-cut-delivery-times-by-20-2017-7?IR=T>.

⁽¹²⁾ <https://en.inrs.fr/news/platformisation-2027.html>.

certain behavior or taking future managerial decisions based on previous data is not limited to the on-demand gig-economy. An increasing number of companies start to use AI or algorithmic management tools for HR (Human Resources or Human Relations) purposes. Suppose we combined this way of functioning with the data that can be collected (as explained before). In that case, we might end up in situations where data about the health of the workers can lead to managerial decisions having a negative impact on his career. Similarly, being constantly monitor and knowing the potential impact on the work allocated might create PSR. These impacts on health can be managed while using AI if the conditions of utilization are clearly limited and transparent. As for the previous risk, it is a matter of work organization and involvement of workers' representatives (or TU) to guarantee that the workers' interests will be taken into consideration and the risks that these technologies represent are prevented.

Coherently with the Janus Face of the transformation outlined, since it provides for more risks but also new opportunities in terms of protection, we think that unions should use two different approaches: a defensive approach, even though the promotion of litigations, and a proactive and participative approach, in order to agree specific measures to exploits the potentialities of the new technologies to protect the workers.

Do you think that a proactive approach, a participatory approach can also be used and how to manage these two different approaches? On the one hand the defensive one to be sure that the new technologies are not going to have a bad impact on the health and safety of the workers and on the other hand trying to exploit the potentialities of these new technologies so like Janus Face of the new technologies in OSH terms. What do you think about this?

It is right to underline that new technologies can represent an opportunity to improve workers' health and safety ⁽¹³⁾. All the examples mentioned above can have a positive aspect. New technologies can be particularly useful to address physical risks. Exoskeletons can be used to prevent musculoskeletal disorders ⁽¹⁴⁾. Such technologies should be implemented whenever possible at the workplace.

According to the Framework Directive 89/391/EEC, the employer has a duty to ensure the safety and health of workers in every aspect related to work. Within the context of his responsibilities, the employer shall take the measures necessary for the safety and health protection of workers. The employer implements the preventive measures on the basis of the general principle of prevention that includes the adaptation to technical progress ⁽¹⁵⁾. Additionally, the preventive measures and the working and production methods implemented by the employer must ensure that the planning and introduction of new technologies are the subject of consultation (as referred at article 11 of the Dir. 89/391/EEC) with the workers and/or their representatives, as regards the consequences of the choice of equipment, the working conditions and the working environment for the safety and health of workers ⁽¹⁶⁾.

Therefore, new technologies should be considered as a way to prevent risks and be the object of consultation with health and safety representatives. As for the preventive approach, the workers and their representatives have the right to make proposals on all questions relating to safety and health at work ⁽¹⁷⁾.

⁽¹³⁾ <https://www.safetyandhealthmagazine.com/articles/21108-trends-in-instruments-lone-worker-devices>.

⁽¹⁴⁾ <https://osha.europa.eu/en/publications/impact-using-exoskeletons-occupational-safety-and-health/view>.

⁽¹⁵⁾ Article 6(2)(e) Directive 89/391/EEC.

⁽¹⁶⁾ Article 6(3)(c) Directive 89/391/EEC.

⁽¹⁷⁾ Article 11(1) Directive 89/391/EEC.

Workers' representatives have the right to ask the employer to take appropriate measures and to submit proposals to mitigate hazards for workers ⁽¹⁸⁾.

Thus, there should be some opportunities and possibilities for the health and safety representatives (and for the workers) to be proactive and making suggestions to use technology to improve workers' OSH.

However, whether the initiatives come from the employers or from the health and safety representatives, the introduction of new technologies should be discussed and the risk evaluated. The aim and the way the technology will be used is crucial to determine the impact on workers' health, even if it is initially designed to improve workers' OSH.

For example, a company has developed a device that uses augmented reality to help firefighters see through smoke. The lens produces an outline of objects inside the helmet, allowing firefighters to see what is in front of them, including people ⁽¹⁹⁾. As such, this seems to be technology that can significantly improve workers' health and safety. However, these helmets have cameras recording everything – i.e., creation of data or monitoring on workers' performance. In this situation, it is imperative agree with the workers' representatives on how this technology, and particularly the data or recording produced, will be used in the future (which might lead to PSR). Once again, as such, this technology does not create a risk – all the contrary. Still, it has to be defined and discussed with the workers and their representatives.

What do you think are the main area of intervention for trade unions and how they can deal with these also in terms of skills and the competencies? How can they under-

⁽¹⁸⁾ Article 11(3) Directive 89/391/EEC.

⁽¹⁹⁾ <https://www.bbc.com/news/av/technology-43811273>.

stand which are the new risks? Workers representatives are not researchers, so it's not so easy for them to understand the new risks.

There are two provisions that are relevant for the training of workers' representatives and access to knowledge on these questions. First, workers' representatives with a specific role in protecting the safety and health of workers shall be entitled to appropriate training ⁽²⁰⁾. Second, employers must provide workers' representatives with specific responsibility for the safety and health of workers with the necessary means to enable such representatives to exercise their rights and functions ⁽²¹⁾.

I would argue that training on new risk and the 4th industrial revolutions, but also asking external expertise on specific risks, fall within the scope of these provisions. Therefore, there are two ways to gain knowledge in that field.

- "Vertical Learning": Asking external experts to report and inform them of the risk of new technologies on workers' health and safety. It could also be attending events on specific topics to learn about OSH and the 4th Industrial revolution.
- "Horizontal Learning": a phenomenon of "cross-fertilization" and learning from each other. At the occasion of events (workshop, conference) to learn how other health and safety representatives or trade unions are dealing with similar risks, but in other countries or sectors. It is also the idea of sharing "best practices".

What do you think should be the role of litigation in terms of the protection of health and safety? Sometimes discussing is not possible. Sometimes you also have employer denying their responsibilities. What do you think are the

⁽²⁰⁾ Article 12(3) Directive 89/391/EEC.

⁽²¹⁾ Article 11(5) Directive 89/391/EEC.

main area of intervention when we have to use this kind of defensive approach?

From my perspective, there are two kinds of litigation regarding OSH and the 4th industrial revolution – from a legal perspective.

1. Enforcing the content of existing rights applied to risks raising from 4th Industrial revolution

As previously underlined, an increasing number of companies are using new technologies such as AI at the workplace. We have also underlined the existing legal framework applying in OSH. Thus, one avenue for litigation is to enforce the general principles of prevention and the participation of workers' representatives when a new technology is introduced at the workplace. Previous jurisprudence at the national level provides an example of workers' representatives enforcing their right to be consulted in the context of OSH prevention ⁽²²⁾. Even if the situation was about the prevention against the risk of Covid-19; in the ruling, there is a reference to the fact that PSR should have been assessed and prevented. Considering that in the warehouse, the workers are following the instructions given on their phones, the effect of this decision can be to guarantee the consultation of the workers' representatives for the use of such software in the way work is organized. The main idea here is to stress that existing rights could and should be enforced and applied to risks connected to new technologies.

2. Enlarging the scope of existing rights applied to new forms of work raising from 4th Industrial revolution

As previously mentioned, algorithmic management is currently used by platforms hiring “on-demand workers”. Beyond the problem of the impact of this technology on workers' OSH, there is a legal problem linked to their employment status. The business model of some platforms relies on hiring self-employed

(22) Court of Appeal of Versailles, the 24th of April 2020 – Amazon.

workers. However, self-employed are excluded from the scope of the framework directives (and usually national OSH legislation). Therefore, one avenue of litigation is to recognize the on-demand gig-workers as workers (see definition art 3 of the Framework Directive). Once they are recognized as falling within the scope of the directives, the principles of prevention and the provisions mentioned above would apply.

The IWGB provides a great example of litigation illustrating this idea. Here the litigation followed two steps. First, in November 2020, IWGB won a judicial review claim against the UK Government (IWUGB v SSWP and Others) – effectively establishing that the UK Government failed to implement articles 8(4) and 8(5) of Directive 89/391/EEC and article 3 of Directive 89/656/EC (on personal protective equipment). The direct effect of this ruling has been to ensure that limb(b) workers have access to PPE and can safely withdraw from work in case of serious and immediate danger without fearing any less favorable treatment. What was interesting was the concepts discussed to come up to this judgement. Secondly, in February 2021, the Supreme Court ruled that Uber drivers should be recognized as limb(b) workers and not self-employed ⁽²³⁾. If we combined these two decisions, it would mean that, in theory, directive 89/391/EEC applies to Uber drivers, and Uber should assess and prevent the risks that its drivers are facing (physically and mentally). We will need to wait to see if these decisions will change the way the platform is functioning and if it can effectively improve workers' OSH; but, it provides a concrete example of TU actions to improve OSH in the context of the 4th industrial revolution.

As for the participative approach, it should be outlined that OSH regulations in many Member States increasingly rely on Trade Unions and workers' representatives for the im-

⁽²³⁾ *Uber BV v Aslam* [2021] UKSC 5 (*'Uber (SC)'*).

plementation of the rights established. This can be illustrated by the right to disconnect as it is regulated in France and Spain, and indirectly in Italy. This trend seems to be connected to the organizational dimension of certain number of risks faced by workers in the digitalized world of work. Against this background, is it possible to guarantee adequate protection for the workers notwithstanding the many factors that may have impact the possibility to negotiate the measures to be implemented? How sectoral and enterprise level agreements interact to guarantee effective safeguards for the workers?

The question of guaranteeing adequate protection of workers in the context of the 4th Industrial Revolution covers two aspects.

1. Interaction between legislative framework and collective agreements

Considering the overall decline of Trade Unions' representation and the coverage of collective bargaining in Europe, it is important to stress the importance of having a legislative framework providing a level-playing field of rights. It is particularly important to provide individual rights for the workers to enforce it before the courts even if there are no Trade Unions at the workplace (or if any collective agreement covers them). The right to disconnect could follow the model of the working time regulation. In France, there is a law setting general rules. These rules can be adapted to the need of the sector or the company by collective agreement. I would argue that this articulation between the law and collective agreement might be an incentive for social partners to have a collective agreement on that topic. We could also see it has a pyramidal level of organizing such right linked with the work organization (e.g., right to disconnect). By default, the law would apply regardless of the sectors or the size of the company. Then, if there is an agreement at the sectorial level, it would apply to all the companies within this sector. Finally, the workplaces that are meeting the legal threshold to have workers' representatives could bargain their own

agreement. The law could also define what could be bargained and to what extent. It would provide a good balance between safety for all workers and the flexibility which might be needed (and it would be possible only with the agreement of the workers' representatives).

2. Effective enforcement of the rules by Labour Inspectorates

However, it is not because a right exists in the law or in a collective agreement that it is applied and respected. Thus, "guaranteeing adequate protection" is linked with the question of effective enforcement. How do you enforce and guarantee the application of rights that exist in theory? Administrative enforcement should be a guarantee to provide adequate protection. If there is a breach or inadequate prevention, workers and health and safety representatives are entitled to appeal to the authority responsible for safety and health protection at work ⁽²⁴⁾. On the other side, Labour Inspectorate should be able to inspect a workplace at their own initiative ⁽²⁵⁾. Therefore, in theory, Labour Inspectorates should be able to guarantee the rights of workers. However, the reality is slightly different.

First of all, the 4th industrial revolutions contributed to the ongoing shift of regulation from a prescriptive approach with technical standards to a process-based approach focused on improving health and safety management. It requires more time to assess the management organization and the interactions with the workers. This modern setting places the LI in situations where they have to assess and determine the nature and extent of legal responsibilities and recommend suitable preventive strategies. This is the concept of "risk management" where the entire environment needs to be examined – it is in line with the broader conception and scope of OSH as covering all the working conditions. All of this requires more time and so more re-

⁽²⁴⁾ Article 11(6) Directive 89/391/EEC.

⁽²⁵⁾ ILO Convention n.81, article 12.

sources – and necessitates measures in opposition to risk-based inspection. Unfortunately, the risk-based approach is privileged to prioritize the workplace that will be inspected. Therefore, all the “low-risk” sectors where new technologies will be implemented will not be proactively visited by labour inspections.

Considering all these factors, one way to guarantee the protection of the workers is to recognized individual rights to the workers, which can be organized collectively. Thus, it would be possible to organize it at the sectoral and company level if there is the appropriate workers’ representative structure. If it is not the case, it will still allow workers to individually enforce their right before a court.

According to many institution (including EU-OSHA), one of the main potentialities brought by the Fourth Industrial Revolution for the protection for workers is the sue of data and big data. Do you agree that the right to co-decide the introduction of technologies in the company should be extended and strengthen in the field of OSH? Notwithstanding the possibility to introduce reform in this field, do you think that union and workers’ representatives are ready to act in the interest of the workers by exploiting the negotiation of data processing in the workplace?

The extension of OSH field to the collection of data and the introduction of new technology is interconnected with the bigger question of the aim and the purpose of these data. As explained previously, the identification of how the data are going to be used will determine if it represents a risk for the workers – in particular PSR, but not only. I would argue that most aspects of the work organization impact workers’ health and safety. These risks should be assessed by the employer. Additionally, the employer should consult the workers’ representative when a new technology is introduced at the workplace. Therefore, there is no doubt that there is some space and opportunities to discuss these issues from an OSH perspective. I would also argue that

the Trade Union should take this space at the discussion table. There is little doubt that digitalization and the use of new technology are going to enter the workplace; the challenge is to ensure that Trade Unions and workers' interests are part of the narrative. If the TU refuses to discuss these issues, they are going to be adopted and implemented without their consent.

During the interview, the Italian case of Amazon that had an obligation to negotiate the introduction of new technology with the Trade Unions has been discussed. The Trade Unions refused to negotiate. The attempt to negotiate took place in a conflictual industrial relation with the employer. In my opinion, even in a conflictual relationship Trade Union should participate in the negotiation, even if it is to express their disapproval officially. It would send a clear signal that they try to participate, and the workers' interests have not been taken into consideration. It might be a stronger message than leaving the negotiation. Of course, it would be necessary to discuss with the Trade Unions involved in this situation to understand their rationale and aim. One hypothesis is that it might have been a way for them to block and stop the introduction of the technology.

I would also advocate for Trade Unions and health and safety representatives to enforce their rights to be heard and consulted on these issues, to "fight" for a seat at the table. If it is their right, they should not be afraid to go to court to ask the enforcement of the right to be consulted in cases where the employer does not do it voluntarily. Some Trade Unions or workers' representatives might defend the idea that litigating can negatively impact social dialogue. First, it might be due to cultural considerations; and even in countries where social dialogue is fundamental, litigation to enforce the right to be part of the discussion should be seen as a complementary way. If TU goes to the courts, it means that there has been a breach of the OSH obligation and/or workers' consultation; the court might be the last resort to be heard.

Discussion and collective agreement will always be needed on this topic. Even if, in the future, further laws are adopted to frame the use of some technology (such as AI), it will be necessary to discuss it to implement it at the workplace. Once again, it is important to take the narrative back on these issues. It is important to stress that being part of negotiations does not mean reaching an agreement; it means participating in the discussion. Some Trade Unions could make a political use of “official” opposition to the introduction of new technology during negotiations.

Do you think that the action in the field of OSH and in the amelioration of workers wellbeing may be a relevant action to counteract the process of de-unionization?

There are two aspects to the question: workers’ expectations and the Trade Union’s priorities. Regarding the workers’ expectations, it would be necessary to determine the factors incentivizing workers to join a Trade Unions. Traditionally, topics prioritized by Trade Unions are the employment status (including the protection in case of dismissal), the wage (including also pension benefits), and working time. This can be illustrated by the recent case law all over Europe on the question of the on-demand platform workers; they often fight for the recognition of the working time regulation and application of minimum wages. Thus, OSH did not seem to be the main driver to join a union.

However, the pandemic has shown the importance of the OSH rules, particularly in providing Personal Protective Equipment and applying the right to withdraw from the workplace in case of serious and imminent danger. Maybe, the pandemic has highlighted the “benefit” of a good guarantee of OSH. There will be forthcoming discussions on implementing structural (partial) telework in companies; maybe workers will be interested in better working conditions leading to better OSH. The ILO has a broad definition of occupational health: «indicates not merely the absence of disease or infirmity; it also includes the physical and

mental elements affecting health which are directly related to safety and hygiene at work» (26). One can hope that consideration around well-being might gain importance for the workers and might be an incentivization to join a Trade Union.

The workers' interest in joining a Trade Union for OSH reasons will also heavily depend on the place that Trade Unions give to OSH. I would argue that by placing the worker at the center of the work organization, there is a possibility to have a broad conception of OSH. It could be a way to create a space to consider workers' voices on the introduction of new technology or new working organization based on technology (such as teleworking). Trade Union could also see OSH as a way to create a link with the workers, to ask them about their perspectives on work and what they would like their work and working conditions to be. I believe that there are already some (even if not perfect) legal framework which would legitimize such an understanding of OSH. However, the way it translates in practice will depend on Trade Unions' choices.

(26) Article 3(e) ILO Convention n.155.

Négocier la prévention: mesures de santé et de sécurité au niveau de l'entreprise

Josepha Dirringer

Quelles sont selon vous les raisons de cette nouvelle centralité de l'entreprise en matière de santé?

La centralité nouvelle de la négociation collective d'entreprise en matière de santé s'explique pour trois raisons. D'abord, elle s'inscrit dans le mouvement général qui tend en France, depuis la loi de 2004, à privilégier la négociation collective d'entreprise (ou de groupe) sur la négociation collective de branche, mouvement qui n'a eu de cesse de se confirmer. Ensuite, elle s'explique par l'idée, fondée en partie, que les déterminants de la santé des salariés doivent être définis au niveau de l'entreprise, sur les lieux de travail. Enfin et dans le prolongement des deux premières raisons, on observe une volonté des pouvoirs publics de promouvoir une approche systémique et organisationnelle de la négociation d'entreprise, construite autour de l'idée de bien-être au travail

La centralité nouvelle de la négociation collective d'entreprise s'observe tout particulièrement cette dernière décennie au cours de laquelle, dans les dernières réformes intervenues en droit du travail, la loi a renvoyé aux interlocuteurs sociaux le soin de négocier et de conclure des accords collectifs d'entreprise en matière de santé. Nous citerons ici les trois principales habilitations.

Premièrement, à la suite d'un accord national interprofessionnel conclu en juin 2013 sur la qualité de vie au travail, la loi du 17 août 2015 a institué une obligation de négocier périodiquement sur le thème de l'égalité professionnelle et la qualité de vie au travail (QVT). Dans ce cadre, la négociation d'entreprise peut porter sur la prévention de la santé. Ainsi, la loi prévoit que la

négociation porte sur le droit à la déconnexion ou encore sur la conciliation entre vie professionnelle et vie personnelle. Il s'agit d'un cadre général de négociation qui oblige désormais périodiquement à ce qu'employeur et syndicats représentatifs négocient sur ce thème. Comme l'a montré notamment F. Héas (2019), certaines entreprises se limitent à conclure un accord « basique » de manière à remplir leur obligation mais débouchant sur des accords qui sont en définitive assez pauvres. D'autres décident à cette occasion de conclure des accords « organisationnels » intégrant les déterminants de santé et des conditions de travail dans l'organisation générale de l'entreprise, voire de manière plus ambitieuse encore des accords instaurant une politique globale en matière de santé, misant sur la dimension préventive et englobant les aspects de santé mentale (RPS, harcèlement, charge de travail, etc.) en lien avec la stratégie de l'entreprise. Allant encore plus, certains accords vont jusqu'à prétendre conférer à leur accord QVT une dimension sanitaire cherchant à encadrer les comportements des salariés y compris en dehors du travail (« accords comportementalistes »).

Deuxièmement, et de manière plus spécifique, depuis 2013, la loi a rendu obligatoire la mise en place d'une couverture complémentaire des frais de santé. La loi privilégie la voie conventionnelle, mais l'employeur peut aussi le décider de manière unilatérale. L'accord instituant une couverture complémentaire de frais de santé peut prendre place dans l'accord global conclu sur la QVT. Il peut prévoir que l'organisme assureur chargé du remboursement des frais de santé fournisse en outre des services de prévention tels que des services de télémédecine, des coaches de santé, etc.

Enfin, à la suite de l'ordonnance n. 2017-1389, et à compter du 1^{er} janvier 2019, les interlocuteurs sociaux sont invités à négocier, non plus des « accords de pénibilité », mais des « accords en faveur de la prévention des risques professionnels ». Plus qu'une invitation, il s'agit bien d'une obligation de négocier en faveur de

la prévention des risques professionnels. Cette obligation ne concerne que certaines entreprises, soit qu'elles emploient une part significative de salariés exposés à des risques professionnels (min 25 %) ou soit que la *sinistralité* au titre des accidents du travail et des maladies professionnelles y atteigne un certain seuil. Il s'agit d'une négociation collective administrée dont le contenu est largement encadré par la loi. L'enjeu de cet accord est en effet d'ouvrir des droits aux salariés exposés à certains risques professionnels, notamment dans le cadre de leur compte professionnel de prévention. Là encore, cet accord peut intégrer un accord global sur la QVT et certains accords décident de faire de cette partie de l'accord un élément de leur stratégie globale en matière de santé au travail.

A ce cadre général, il convient également d'ajouter la négociation collective d'entreprise qui a lieu dans le cadre des restructurations et qui traite de la prévention des risques psychosociaux. De plus en plus, les accords organisationnels conclus à cette occasion intègrent des mesures de prévention des risques psychosociaux. Ce n'est pas une obligation légale que d'intégrer un tel plan au sein des accords. Cependant, tout y invite. D'un côté, la jurisprudence oblige désormais l'employeur à mettre en place des mesures de prévention des RPS en cas de restructurations et de l'autre la loi incite fortement à ce que les restructurations fassent l'objet d'une négociation collective. Par suite, tout concourt à ce que des plans de prévention soient inscrits dans les accords ayant pour objet les suppressions ou les transformations d'emploi.

Selon vous, quelles sont les principales caractéristiques liées à cette évolution ? Quelle interaction peut se développer entre la négociation collective et le rôle des représentants au niveau de l'entreprise?

Avant toute chose, il est important de rappeler que la prévention de la santé relève toujours de la responsabilité de l'employeur au titre de son obligation de sécurité. Juridiquement c'est donc à lui

qu'il incombe d'intervenir dans le cadre de son pouvoir de décision unilatérale. Par conséquent l'essor de la négociation collective en matière de santé conduit à un nouveau rapport entre les normes internes à l'entreprise.

Les accords d'entreprise ne se substituent pas à l'intervention de l'employeur et au rôle des représentants élus des salariés chargés de contrôler le respect des règles en matière de santé et de sécurité au travail. Ces accords constituent le cadre dans lequel l'employeur exerce son pouvoir de direction. Il l'encadre. Il lui donne aussi une plus grande légitimité. Autrement dit, l'essor de la négociation collective d'entreprise en matière de santé permet à l'entreprise de devenir progressivement un espace légitime d'élaboration des politiques de santé au travail.

Cela n'est pas en effet sans conséquence sur les missions des représentants des salariés qui siègent au sein du comité social et économique (CSE) dont la mission est en autre chose de promouvoir la santé, la sécurité et l'amélioration des conditions de travail dans l'entreprise ⁽²⁷⁾. Il ne s'agit plus seulement pour eux d'être informés et consultés sur la manière dont l'employeur respecte son obligation de sécurité et met en œuvre les principes généraux de prévention dans l'entreprise. Il leur incombe aussi de veiller au respect d'engagements contenus dans les accords d'entreprise de même que leur travail au quotidien est utile aux négociations collectives qui doivent intervenir notamment à l'occasion de la négociation en matière de QVT. De manière optimiste, il est donc possible de parier sur la complémentarité des missions des représentants syndicaux et des représentants élus. Cela passe notamment par le déploiement d'informations partagées, que concrétise la mise en place de la base de données économiques et sociales. Cette base de données a été rendue obligatoire et est accessible aussi bien par les représentants élus que

⁽²⁷⁾ Depuis les ordonnances de 2017, le CSE a remplacé le comité d'entreprise et le comité d'hygiène, de sécurité et des conditions de travail.

par les délégués syndicaux qui négocient les accords. Allant encore plus loin, certains accords sur le dialogue social ou sur la QVT décident de créer des plateformes d'échanges sur le thème particulier de la santé des salariés. Cependant, de manière moins optimiste, on peut craindre qu'une concurrence s'instaure entre les deux canaux de représentation. La légitimité accrue de l'action patronale, qui se fonde sur une norme négociée avec les syndicats, peut en réalité fragiliser le pouvoir de contrôle des représentants élus. Ces derniers peuvent rencontrer des difficultés à mettre en cause des décisions qui résultent de l'application d'un accord signé par les syndicats représentatifs. Par ailleurs, on peut douter que cette synergie procédurale qui transparait de la loi advienne dans la réalité. En effet, les conditions d'exercice des missions des représentants élus ont été dégradées depuis les ordonnances de 2017. Pour rappel, le comité social et économique a remplacé l'institution du comité d'entreprise, des délégués du personnel et celle du comité d'hygiène de sécurité et des conditions de travail. L'institution de représentation dédiée aux questions de santé au travail a disparu faisant craindre que les questions relatives à la santé ne soient parfois reléguées au second plan par rapport aux questions économiques et sociales. De même, la disparition des délégués du personnel est particulièrement regrettable car il n'existe plus obligatoirement de représentants qui soient désignés au plus proche des salariés et de leurs conditions de travail. Il devient désormais plus difficile aux membres du CSE de recueillir les réclamations individuelles et collectives des salariés. Ce risque est d'autant plus à craindre que la réforme a également conduit à une diminution du nombre de représentants, de leurs heures de délégation et a élargi les cadres de représentation contribuant à éloigner un peu plus les salariés de leurs représentants. Au final on est face à un paradoxe : plus le dialogue social dans l'entreprise en matière de santé s'institutionnalise, plus le lien de représentation entre représentants et salariés semble devenir fragile rendant difficile la capacité des représentants des salariés à protéger la santé des salariés.

Il est une autre évolution qui accompagne l'essor de l'entreprise comme espace d'élaboration des politiques de santé. Comme je l'ai évoqué, à la suite de la loi de 2013, nombre d'entreprises ont conclu avec des organismes assureurs des contrats collectifs afin d'offrir une couverture des frais de santé aux salariés. Or, il apparaît que dans le cadre de ces contrats, certains assureurs proposent désormais aux entreprises de prendre en charge leur politique de santé en mettant à leur disposition des logiciels de traitement des données qui intègrent les obligations légales en matière de santé et de sécurité. Au cours de la crise sanitaire que nous connaissons, le ministère du travail a également mis à disposition des entreprises un logiciel qui permet de générer le protocole sanitaire à mettre en place dans leur entreprise à partir d'un questionnaire. Ainsi, la propension de l'entreprise à externaliser certaines de ses activités se conjugue avec le déploiement de l'outil numérique. Là encore, un regard optimiste jugera que le traitement de données, la programmation automatisée des obligations de l'employeur en matière de prévention, la gestion de l'absentéisme, etc. contribuera à rendre plus efficace et plus sûre la gestion de la santé par les entreprises. À l'inverse, on peut craindre les effets d'une externalisation qui peut aller de pair avec une déresponsabilisation des acteurs de l'entreprise. Pour ma part, je doute que l'employeur reste conscient des risques et des mesures de prévention qu'il doit mettre en place quand il n'aura plus qu'à remplir un questionnaire et à appliquer un plan de prévention clé en main proposé par un logiciel qui a traité les réponses au questionnaire. On est loin des obligations résultant des principes généraux de prévention en termes d'évaluation des risques et d'appréciation des conditions de travail.

Le rôle de la négociation de la branche professionnelle?

La santé relève aussi de la négociation collective de branche. Cependant, ce n'est pas le niveau de négociation privilégié par le législateur. Elle est souvent dépréciée par rapport à la négocia-

tion d'entreprise, cet échelon étant perçu comme moins pertinent pour saisir les problématiques de santé.

De plus, depuis les ordonnances de 2017, ce niveau de négociation a été fortement fragilisé par rapport à la négociation collective d'entreprise. En effet, les accords de branche n'ont plus vocation à prévaloir sur les accords d'entreprise. Ils ne s'appliquent que de manière supplétive. Et lorsqu'ils ont vocation à prévaloir, leur application peut être écartée dès lors que l'accord d'entreprise contient des garanties jugées équivalentes.

Cette dépréciation de la négociation collective de branche est regrettable, en particulier dans la perspective de protéger le droit à la santé. Assurément, la négociation de branche présente plusieurs avantages sur la négociation d'entreprise.

D'abord, elle permet que tous les salariés exerçant les mêmes métiers disposent des mêmes droits en termes de prévention de leur santé. Cette égalité ne peut être garantie à travers la négociation d'entreprise qui conduit nécessairement à une disparité des protections et des droits.

Cela apparaît notamment lorsque l'on étudie la négociation en faveur de la prévention des risques professionnels qui peut aussi faire l'objet d'un accord de branche. Cependant, cet accord n'a pas vocation à prévaloir sur l'accord d'entreprise. Ainsi, d'une entreprise à l'autre, et à risque égal, un salarié ne bénéficiera pas des mêmes mesures de protection ni des mêmes droits sociaux. En particulier, selon l'entreprise et selon l'accord qui s'appliquera, le compte professionnel de prévention de chaque salarié ne sera pas abondé de la même manière. Par conséquent, les salariés ne bénéficieront pas des mêmes droits à formation, du même financement d'un passage à temps partiel ou du même financement d'un départ anticipé à la retraite qui sont les droits financés par ce compte.

Cette disparité existe en particulier entre les salariés des petites entreprises et ceux des grandes entreprises.

Ensuite, la branche professionnelle est un échelon pertinent pour garantir l'équilibre des négociations avec les organismes assureurs avec qui sont négociées les garanties collectives complémentaires en matière de santé. En effet, en France, depuis la loi de 2013, l'employeur a l'obligation de prévoir une couverture des frais de santé pour l'ensemble des salariés. Cette assurance complémentaire peut être négociée par chaque entreprise, mais certaines branches professionnelles ont fait le choix de recommander certains organismes assureurs. Ce faisant, ils ont négocié au niveau de la branche le montant de la cotisation, ainsi que certaines prestations offertes aux salariés de la branche. Les recherches que nous avons menées sur cette question montrent que l'encouragement de la négociation collective d'entreprise fragilise particulièrement les petites et moyennes entreprises qui ne sont pas en mesure de faire le poids face aux assureurs ou groupes mutualistes qui les assurent, là où les grandes entreprises, qui sont généralement des groupes de sociétés, bénéficient d'un rapport de force plus favorable.

Il nous semble que cette fragilité des petites entreprises aurait pu être limitée si le choix avait été fait de privilégier la négociation collective de branche plutôt que la négociation d'entreprise.

La gestion au niveau de l'entreprise de questions aussi importantes nécessite des compétences élevées pour les différents acteurs au niveau de l'entreprise, ainsi que la capacité de faire synthèse des différents intérêts des parties. Pensez-vous que les syndicats et les représentants des entreprises sont prêts à relever ce défi? Quelle interaction est possible avec les professionnels de la santé et de la sécurité? Comment favoriser des synergies vertueuses au sein des entreprises?

Côté syndicats, il est certainement que les secteurs chargés des questions de santé et ceux chargés du dialogue social coordonnent mieux leur action. Souvent ces secteurs sont distincts de sorte que les secteurs investis sur les questions de négociation

collective n'ont pas suffisamment à l'esprit les questions relatives à la santé et à la protection sociale des salariés tandis que le secteur santé des syndicats n'a pas toujours pris la mesure de la place de la négociation collective et notamment la négociation collective d'entreprise.

Côté représentants des salariés dans l'entreprise, il est certain que les questions de santé nécessitent d'être formés à la fois sur le cadre juridique et sur les questions de santé (ergonomie, gestion des risques, mesures de prévention, etc.), d'être informés et consultés régulièrement. Tout ceci est prévu par le droit du travail. En réalité ce qui manque terriblement aux représentants des salariés c'est le temps et le temps passé auprès des salariés et sur les lieux de travail. Or de ce point de vue, la réforme de 2017 a très fortement dégradé les conditions d'exercice des représentants des salariés dont le nombre a été réduit, de même que le nombre d'heures de délégation confié à chacun, alors que parallèlement le périmètre de leur action a été étendu. De même, les expertises en matière de santé auxquelles peuvent recourir les représentants des salariés (en cas de changement important des conditions de travail et en cas de risque grave) sont rendues plus difficiles, l'expert devant désormais réaliser sa mission dans un délai très contraint. En somme, le droit à l'information et à la consultation des travailleurs, en particulier en matière de santé, a perdu en effectivité au regard de la réalité des moyens dont disposent les représentants des salariés. On retrouve le paradoxe précédemment évoqué. Jamais, la santé n'a été aussi promue par la loi comme objet de dialogue social, jamais non plus les représentants des salariés n'ont été aussi contraints dans la manière d'exercer leurs prérogatives dans le domaine de la santé.

Côté médecine du travail, il en va de même. Le nombre de médecins du travail par rapport au nombre de salariés est en nombre beaucoup trop insuffisant de sorte que ces derniers sont absorbés par le traitement des salariés en arrêt maladie dont il faut définir l'aptitude ou l'inaptitude à occuper leur emploi. Il

m'a été donné l'occasion de constater leur ignorance de ce qu'étaient les accords en faveur de la prévention des risques professionnels. Ils en ignoraient tout et cela semblait tellement loin de leur pratique. De même, le temps leur manque pour participer comme ils le souhaiteraient – et devraient – aux réunions du comité social et économique afin de participer pleinement à la prévention des risques professionnels. Cela vaut aussi pour les inspecteurs du travail qui ont aussi un rôle important à jouer en matière de santé et de sécurité pour accompagner les entreprises à respecter leurs obligations.

À mon sens, il ne saurait y avoir de synergies vertueuses sans un investissement humain d'ampleur et qui soient à la hauteur des enjeux humains et financiers liés à la santé-travail. Malheureusement ce n'est pas vrai le sens vers lequel nous allons actuellement.

Chapter VII.
IN SEARCH OF GOOD PRACTICES

**Legislación sobre seguridad y salud laboral y
protecciones de seguros
frente a la IV Revolución Industrial:
Perspectiva desde el ordenamiento jurídico español**

Manuel Luque Parra

Contexto de análisis

Cualquier análisis sobre la existencia de buenas prácticas en materia de seguridad laboral, en general, y relativas a la IV Revolución Industrial en particular (en adelante, IV RI), incluidas en los convenios colectivos aplicables a las relaciones laborales en el ordenamiento jurídico español ha de partir de una doble realidad y una conclusión clara. La doble realidad es que (1) más del 90% de las empresas españolas son micro-empresas o empresas de muy escasa dimensión ⁽¹⁾ y, a su vez, (2) más del 80% de los trabajadores que prestan servicios en una empresa española están “cubiertos” por un convenio colectivo ⁽²⁾.

Constatada la doble realidad antedicha, es claro que el nivel de negociación más habitual en España es el de los convenios

⁽¹⁾ <https://cutt.ly/jbpijsbL> (28/04/2021).

⁽²⁾ <https://cutt.ly/Qbpi7fZ> (28/04/2021).

colectivos sectoriales, que funcionan – en muchas ocasiones y sobre todo los convenios colectivos sectoriales provinciales – como convenio de empresa para aquella gran mayoría de entidades de escasa dimensión de plantilla. Y si el espacio de la negociación colectiva sectorial es fundamental para las empresas de dimensión reducida, en las grandes empresas – sobre todo, si están internacionalizadas – es habitual que las buenas prácticas en la materia de prevención de riesgos laborales se regule a modo de *estándares internacionales* aplicables a todo centro de trabajo de dicha empresa o en cualquier empresa del grupo de empresas transnacional al que pertenezca la sociedad radicada en España. Por tanto, es habitual que las mejores prácticas en materia de seguridad y salud laboral en dichas empresas no se encuentran reguladas convencionalmente, sino en los referidos estándares internacionales o transnacionales.

Junto a lo anterior, en mi opinión no es posible realizar una aproximación correcta a buenas prácticas de los convenios colectivos en materia de seguridad y salud laboral sin señalar que el modelo regulatorio estatal sobre la materia es muy, por así calificarlo, “incisivo”. En el sentido de que en los últimos años se han aprobado normas de enorme calado en materia de seguridad y salud laboral que aún están siendo asumidas por la negociación colectiva vigente; entre otros, registro diario de la jornada de trabajo (RDL 8/2019), desconexión digital (art. 88 de la LOPDGDD) o, entre otros, trabajo a distancia-teletrabajo (en adelante, TAD) (RDL 28/2020).

De conformidad con todo ello, el análisis de las cuestiones que se me han planteado desde ADAPT es resuelto en los apartados que se suceden desde la perspectiva de los convenios colectivos sectoriales vigentes en España, siguiendo los resultados que alcancé, junto con la Pra Anna Ginès en la monografía *La*

prevención de riesgos laborales en la negociación colectiva sectorial: buenas prácticas (2019) ⁽³⁾.

¿Cuáles son hasta la fecha las buenas prácticas más acreditadas en los convenios colectivos para gestionar mejor la prevención de los riesgos relacionados con el trabajo?

De los convenios colectivos analizados en el estudio referido en el apartado anterior, extrajimos tres claras conclusiones desde la perspectiva de “buenas prácticas”.

La primera, que la mayoría de los convenios colectivos vigentes incorporan un apartado regulatorio expreso en materia de prevención de riesgos laborales. Una cuestión no menor y que debemos destacar pues nos indica, cuando menos desde una perspectiva cuantitativa, que la seguridad y salud en el trabajo es una “materia presente” en la mesa de negociación colectiva y con “interés regulatorio compartido” tanto desde el banco social, como desde el empresarial.

La segunda, que gran parte de dichas regulaciones son meras inclusiones en el redactado del convenio colectivo de las previsiones legales, sin hacer ningún tipo de mejora o matización aplicativa. Seguramente para muchos lectores, este carácter meramente descriptivo, de puro “compliance” o de repetición de obligaciones legales básicas sin que el convenio colectivo aporte nada nuevo es un aspecto a “no destacar” como “buena práctica”. Pues bien, no comparto dicha apreciación; considero que para muchos trabajadores el acceso – el puro acceso - a las normas legales o reglamentarias es algo utópico, mucho más la comprensión de lo que regulan. Por el contrario, es inhabitual que los trabajadores no dispongan y manejen el convenio colectivo sectorial o empresarial que se les aplica. Siendo así, la “labor pedagógica” que hacen los convenios colectivos

⁽³⁾ Monografía de acceso gratuito.

“seleccionando” aquellos aspectos de la normativa legal y reglamentaria en materia de seguridad y salud laboral que puedan resultar más relevantes en su ámbito de aplicación debe calificarse, o al menos así lo hago yo, como una “buena práctica negocial”.

La tercera, la existencia de un número reducido de “buenas prácticas” que desde un punto de vista cualitativo han de resaltarse por regular de manera interesante (=más allá de lo previsto en las normas legales/reglamentarias) muchos aspectos relativos a la seguridad y salud laboral. Un número de convenios que, aunque sea reducido en número, no impide que resaltemos que hay buenas prácticas negociales en casi todos los temas más relevantes en materia de seguridad y salud laboral. Siendo así, lo único que cabe es animar a que dichas buenas prácticas sean conocidas ⁽⁴⁾ para poder ser replicadas, matizadas o no, ampliadas o no, en otros convenios colectivos.

Dada la brevedad exigida para la realización de esta aportación, a continuación se destacan de manera sintética dichas buenas prácticas, destacando los motivos que nos han llevado a seleccionarlas, remitiendo al lector a la monografía antedicha para ver ejemplos de redactados.

Actividad preventiva integrada y no segregada

El artículo 16 de la Ley de prevención de riesgos laborales española (en adelante, LPRL) – en la lógica ordenada por la Directiva Marco 89/391/CEE, exige que el plan de prevención de riesgos laborales (evaluación y planificación) incluya toda la estructura organizativa de la empresa, disponiéndose las responsabilidades que en todos los niveles jerárquicos se asumen en materia preventiva.

⁽⁴⁾ Como hicimos in extenso en el estudio referenciado en la nota a pié de página anterior.

Desde mi experiencia personal, considero que en muchas empresas españolas la prevención de riesgos laborales aún se percibe como un ámbito de gestión profesionalizado al margen (=segregado) del proceso productivo, en lugar de considerar que sólo es posible establecer entornos seguros de riesgos laborales si la prevención está enraizada en todos los niveles jerárquicos y todos los trabajadores y responsables de equipo son conscientes de que la prevención “es cosa de todos”.

Desde esta perspectiva hay que valorar cláusulas que inciden en transmitir esta percepción de la prevención, (1) incluyendo en el redactado del convenio el compromiso de las partes de integrar la prevención en todas las esferas de la política de la empresa (Cco estatal de artes gráficas), (2) identificando cuáles son los riesgos laborales más relevantes asociados al proceso productivo respecto del que se aplica el convenio colectivo en cuestión (XXI Cco estatal para las industrias extractivas).

Junto con lo anterior, ya es posible identificar ejemplos claros de cláusulas convencionales en las que se postula la necesidad de, como se dispone en la Estrategia Española y en la Europea de Seguridad y Salud laboral, una “relectura de la PrI” en términos de género (XIX Cco estatal de la industria química).

Formación real y no formal (=información) en materia de prevención de riesgos laborales

Desde mi experiencia personal en el ámbito de la seguridad y salud laboral de casi 30 años, puedo afirmar que la mayor parte de accidentes de trabajo que se producen en la producción industrial de las empresas españolas se producen bien por una insuficiente formación del trabajador – recién incorporado o con equipos/condiciones de trabajo nuevos – con relación a los riesgos de trabajo relativos a su puesto de trabajo; bien por una mala praxis profesional (imprudencia simple/profesional, no temeraria) de trabajadores con gran experiencia en el puesto de

trabajo que desarrollan, que denota una incorrecta labor de vigilancia del responsable de equipo.

En este contexto es claro que deben destacarse aquellas regulaciones convencionales que concretan en el ámbito de aplicación del convenio colectivo el deber de formación en prevención de riesgos laborales legalizado en el art. 19 LPRL, (1) especificando cuál, cómo y cuándo es el concreto plan de formación que en materia de prevención de riesgos laborales han de recibir los trabajadores (VI Cco estatal de ferralla); (2) concretando acciones de formación muy singulares con relación a riesgos concretos y prevalentes en el sector en que se aplica el convenio colectivo en cuestión (IV Cco estatal del ciclo del agua); o refiriendo la periodicidad con la que dicha formación ha de actualizarse (Cco estatal de la industria salinera).

Vigilancia de la salud y gestión “preventiva y no solo reactiva/disciplinaria” de las situaciones de toxicomanía y embriaguez habitual como

El artículo 54 del Estatuto de los Trabajadores español tipifica como causa de despido disciplinario «la embriaguez habitual o toxicomanía si repercuten negativamente en el trabajo», siendo numerosos los autores que, desde hace años, consideramos que técnica y sanitariamente estas situaciones deberían abordarse desde la perspectiva preventiva y no sólo desde la disciplinaria.

En este contexto y dado que en determinados ámbitos dichos hábitos sociales no son menores, valoramos de manera muy importante aquellas cláusulas convencionales que prevén, lo que cabría denominar como un protocolo de deshabitación respecto de los trabajadores que puedan estar inmersos en un proceso de drogodependencia o de embriaguez habitual que pueda suponer un peligro no solo para su salud, sino también para la de terceros (compañeros y/o clientes) (Cco estatal para empresas y trabajadores de transporte de enfermos y accidentados en ambulancia). En dichos casos, el poder

sancionador es sólo la ultima ratio en caso de que el trabajador no logre superar dicho proceso de deshabitación que no pocas veces se gestiona con la ayuda de la sanidad pública (Cco estatal de perfumería y afines).

Desmonetización de la PRL

Casi la totalidad de convenios colectivos que podían consultarse en España hace tan solo 5 o 10 años incluían en su régimen salarial complementos que retribuían condiciones de trabajo peligrosas, insalubres o penosas (complemento salarial).

Sin haber desaparecido esta, en mi terminología, cierta “monetización” del riesgo laboral y de la PRL, empezamos a identificar cláusulas convencionales que de manera directa incentivan a que se adopten las medidas preventivas necesarias para que dichos “riesgos” desaparezcan o su gravedad disminuya, previendo que – entonces – deberá procederse a suprimir o minorar el “plus de retribución asociado” (Cco estatal de pastas, papel y cartón).

Siendo así, la prevención adquiere una dimensión de “verdadera inversión”, alejándonos de postulados más vinculados a la primera revolución industrial (pagar por el riesgo laboral) que a la cuarta en la que estamos (prevenir el riesgo laboral y gestionarlo para que desaparezca o se minore).

Desconexión digital

Finalmente, y muy vinculadas a la IV RI objeto de análisis, empiezan a proliferar cláusulas que concretan el derecho que a la desconexión digital se reconoce a los trabajadores en el reciente art. 88 de la LO3/2018, de Protección de Datos personales y garantía de los derechos digitales, en el sentido de – a modo de ejemplo - reconocer el derecho de las personas trabajadoras a no atender a los dispositivos digitales fuera de su jornada laboral salvo situaciones, que se suelen detallar, de urgencia organizativa (Cco estatal para las Cajas y Entidades de ahorro)

¿Se trata de buenas prácticas relacionadas con el tipo de trabajo y las características del sector productivo o son transversales y comunes a todos los tipos de procesamiento?

Las buenas prácticas reseñadas, bajo nuestro prisma, puede afirmarse que – como ha podido constatarse por los convenios colectivos citados, a modo de ejemplo, en el anterior apartado – no son transversales, sino que están normalmente vinculadas al sector industrial (producción) y al subsector de servicios desarrollado bien por empresas tecnológicas, bien por las entidades financieras. Consideramos que el primero (industrial), por ser el más sensible a los riesgos de seguridad en el trabajo e higiene industrial; mientras que los segundos (subsector de servicios tecnológico y financieros) debido a que su gran tecnificación, enraizada a la IV RI, suelen tener una presencia prevalente con relación a las previsiones en materia de desconexión digital.

¿Son eficaces las buenas prácticas codificadas por la negociación colectiva para la prevención de riesgos laborales?

No conozco ningún estudio “de campo” cuantitativo y cualitativo que haya analizado un aspecto tan relevante como la eficacia de las buenas prácticas descritas en los apartados precedentes.

Nuevamente, mi experiencia personal me lleva a poder afirmar que las grandes corporaciones (precisamente aquellas cuyas buenas prácticas suelen estar estandarizadas, por tener dimensión transnacional, y pocas veces incorporadas al redactado de un convenio colectivo) sí tienen evidencias de que la prevención es una inversión y no un gasto.

Tanto es así, que cuando he impartido formación in house en PRL en grandes Corporaciones (Gamesa, Siemens, Celsa, Cementos Molins, etc.) ha sido habitual que se me haya

transmitido una “misma afirmación”: «hemos constatado que por cada euro invertido en prevención de riesgos laborales hemos obtenido un retorno cercano a dos euros». Entendiendo dicho retorno en mejoras en los índices de siniestralidad, absentismo, responsabilidades asociadas a eventuales incumplimientos normativos al tender a ser de menor incidencia...

¿Qué impacto podría tener la IV Revolución Industrial en esas buenas prácticas?

En mi opinión, el impacto que considero puede tener la IV RI en la generación de “buenas prácticas” en los convenios colectivos cabe asociarlo a una triple dimensión.

La primera directamente relacionada bien con la aparición de “nuevos riesgos laborales”, bien con el deber de afrontar la “amplificación o potenciación” de riesgos ahora existentes de manera no prevalente.

En efecto, desde la perspectiva de la seguridad en el trabajo y de la higiene industrial es claro que riesgos asociados, a modo de ejemplo, (1) a la utilización de plásticos y derivados vinculados a la impresión en 3-D y 4-D (acetona, poliácido láctico), ...; o a la generalización de los campos electromagnéticos (radiaciones, ...), deberían generar buenas prácticas negociales específicas sobre la correcta delimitación de los puestos/lugares de trabajo más expuestos a dichos riesgos, a la vez de perfeccionar las prácticas relativas a la formación y gestión del adecuado control de los mismos.

Desde la perspectiva organizacional, es claro que la IV RI en términos de generalización del Internet de las cosas, así como de un modo de prestar servicios radicalmente diferente al que hemos conocido hasta el momento (salvo la etapa Covid-19) como es el teletrabajo requerirán que los convenios colectivos aborden de manera muy seria la configuración de prácticas negociales relativas, fundamentalmente, al (1) control del tiempo

de trabajo, para evitar jornadas excesivas, y (2) en materia de desconexión digital.

La segunda perspectiva que asocio a la “IV RI y buenas prácticas negociales” es la que he venido a denominar “humanismo tecnológico” ⁽⁵⁾, esto es, la tecnología y, más en concreto, la tecnología en cuenta «gobernanza basada en algoritmos, aún sin forma política, empieza a insinuarse» y, además, no tiene límites. En este contexto, considero indispensable reflexionar sobre una serie de valores necesarios – rehúyo de calificarlos como mínimos - de convivencia entre nosotros y la tecnología. Es ente este sentido que me refiero al término *humanismo tecnológico*.

No se trata de luchar contra la tecnología, ni tan siquiera – diría – de *poner al ser humano en el centro del debate*, sino de establecer unas *reglas éticas del juego* que permitan la convivencia, la interacción positiva e incluyente entre persona y tecnología. Se trata de que nadie quede excluido, a la vez de que nadie sea tecnológicamente *absorbido* o *disuelto* como entidad personal diferenciada de otras por el hecho de desarrollarse como ciudadano y como profesional en entornos digitales.

Es en este contexto que considero que la negociación colectiva y su resultado más perfecto: el convenio colectivo, debería aprovechar el espacio que, fundamentalmente, le viene reconocido expresamente por los arts. 87 a 91 de la LOPDGDD y los arts. 20 a 22 del reciente RDL 28/2020, de trabajo a distancia, además de los compromisos adquiridos en el plan España Digital 2025: dignidad, intimidad, desconexión digital, formación, desconexión, ... Sin olvidar que en la misma línea va el apartado XVII de la aún proyectada Carta de Derechos Digitales. Ni tampoco, que el Comité de Empleo del Parlamento Europeo acaba de aprobar el Informe de Iniciativa Legislativa que propone a la Comisión Europea legislar una Directiva sobre

⁽⁵⁾ M. LUQUE PARRA, *Humanismo, Carta de Derechos Digitales y relación laboral*, in *Inslabor*, 2020, n. 3, p. 1-3.

el derecho a la desconexión, que deberá ser valorado a principios de año por la Comisión.

En este punto, debe tenerse en cuenta que, en dicha Carta, en su redacción actual, se incorporan dos novedades que considero debe ser resaltadas. En primer lugar, se enuncia el derecho del trabajador a que se garanticen «condiciones de trabajo digno en los entornos digitales». Un derecho básico, al que – la doctrina, la negociación colectiva, los órganos judiciales, etc. – tendremos que ir dotando de contenido en los términos de humanismo tecnológico referido.

En segundo lugar, una precisa y muy relevante nueva competencia de la representación legal de los trabajadores con relación a la incidencia que, usando la terminología de Lassalle, la *gobernanza basada en algoritmos* puede tener en la relación laboral: «4. Sin perjuicio del derecho a no ser objeto de una decisión basada únicamente en procesos de decisión automatizada, salvo en los supuestos previstos por la ley, «se informará a los representantes de los trabajadores y las personas directamente afectadas sobre el uso de la analítica de datos o sistemas de inteligencia artificial en la gestión, monitorización y procesos de toma de decisión en materia de recursos humanos y relaciones laborales. Este deber de información alcanzará como mínimo al conocimiento de los datos que se utilizan para alimentar los algoritmos, su lógica de funcionamiento y a la evaluación de los resultados».

En suma, en la traslación del citado humanismo tecnológico al ámbito de las relaciones laborales seguimos utilizando, y creo que debemos seguir haciéndolo, una aproximación individual – tuitiva del trabajador (dignidad, intimidad, desconexión, ...) – y colectiva – con un claro reconocimiento del papel de la negociación colectiva en resolución del binomio planteado: *control invisible v. control oculto*. En dicho debate, la creación de buenas prácticas negociales es o debería ser “innegociable”.

Para finalizar, decía que el impacto que considero puede tener la IV RI en la generación de “buenas prácticas” en los convenios colectivos cabe asociarlo a una triple dimensión. Y la tercera que me queda por mencionar es la clara incidencia que tiene la IV RI en la gestión eficiente de la seguridad y salud laboral. Sin lugar a dudas, el big data en sí mismo ya se está convirtiendo en el “mejor aliado” para analizar de manera eficiente la multitud de variables que pueden derivarse del día a día de las empresas para poder adoptar políticas preventivas cuya eficiencia real sea medible. La capacidad de la negociación colectiva para generar buenas prácticas en esta tercera dimensión es, como en las demás, muy relevante.

¿Existe algún sistema contractual que muestre elementos de innovación en el ámbito de las buenas prácticas?

Como he comentado en el tercer apartado de este artículo, los sistemas contractuales que de manera más clara están reflejando gran parte de las buenas prácticas señaladas son aquellos que se desarrollan bien en el sector industrial (producción), bien en el subsector de servicios desarrollado bien por empresas tecnológicas, bien por las entidades financieras.

De manera transversal, el hecho de que hace muy pocos meses se haya regulado en España el teletrabajo (RDL 28/2020) con una singular previsión normativa a que las empresas, con base en la negociación colectiva, adopten medidas preventivas dirigidas a prevenir los riesgos directamente asociados a dicha modalidad de prestación de servicios ⁽⁶⁾ considero que generará en poco tiempo una batería de experiencias negociales y de buenas prácticas que deberemos analizar en estudios similares al presente.

⁽⁶⁾ M. LUQUE PARRA, A. GINÈS I FABRELLAS, *Teletrabajo y prevención de riesgos laborales*, CEOE-Fundación para la Prevención de Riesgos Laborales, 2016.

Chapter VIII.
**REFORM PROSPECTS OF THE LEGAL
AND INSTITUTIONAL FRAMEWORK**

**Il Testo Unico sulla salute e sicurezza sul lavoro:
spunti di riflessione (a fronte dei cambiamenti in atto)
e proposte di modifica**

Paolo Pascucci

I fenomeni di frammentazione organizzativa, fortemente connessi ai processi di trasformazione tecnologica e organizzativa della IV rivoluzione industriale, tanto con riferimento alle modalità di ingaggio dei lavoratori, quanto con riferimento a processi di esternalizzazione, codatorialità e multidatorialità, creano delle tensioni nell'individuazione del datore di lavoro ai fini della predisposizione delle tutele prevenzionistiche, ma anche rispetto all'ambito applicativo delle tutele del Testo Unico (si pensi all'esclusione del lavoro parasubordinato svolto da luogo diverso da quello del committente. Dinanzi a questi processi – e al netto della ispirazione universalistica del Testo Unico – crede che sia necessario un intervento di ridefinizione delle nozioni di datore di lavoro e lavoratore e degli ambiti applicativi delle discipline prevenzionistiche? Se sì, in quale direzione?

Innanzitutto, grazie dell'invito a confrontarmi con voi su queste tematiche particolarmente attuali e non solo per la presenza della

emergenza sanitaria dovuta alla pandemia da Covid-19. Infatti, il tema delle metamorfosi dei sistemi organizzativi e produttivi e il loro impatto sulla disciplina della salute e sicurezza sul lavoro era ben avvertito anche prima che esplodesse la pandemia.

In realtà, il d.lgs. n. 81/2008 è stato concepito con una vocazione tendenzialmente universalistica. La l. delega n. 123/2007 da cui è promanato preconizzava infatti una disciplina che, al di là dell'unificazione normativa delle tante regole vigenti in materia – e a tale proposito sappiamo che il d.lgs. n. 81/2008 non è un vero e proprio testo unico in quanto, sebbene all'interno del suo titolo I siano contenuti tutti i principi generali della materia, esistono tuttavia altre discipline “limitrofe” e preesistenti che peraltro attendono ancora di essere coordinate con i principi generali del d.lgs. n. 81/2008 (pesca, porti, ferrovie) – puntava a predisporre una tutela di salute e sicurezza per tutti coloro che operano a diverso titolo nelle varie organizzazioni produttive.

Questa vocazione è stata soddisfatta fino ad un certo punto giacché, da un lato, abbiamo una definizione di “lavoratore” avanzatissima e per certi versi autosufficiente – il soggetto che, a prescindere dalla tipologia contrattuale con cui esegue la prestazione, presta quest'ultima nell'ambito dell'organizzazione di un datore di lavoro privato pubblico (art. 2, lett. *a*) – poiché ad essa si possono ricondurre tutte le varie fattispecie lavorative senza tema di escluderne alcuna. Una definizione universalistica che, per inciso, potrebbe essere in qualche modo valorizzata anche dal diritto del lavoro generale sol che si pensi alla questione della imputazione (datoriale) delle prestazioni di lavoro nelle catene degli appalti e dei subappalti e, più in generale, nelle esternalizzazioni.

Tuttavia, da un altro lato, questa definizione universalistica deve fare i conti con la declinazione molto parcellizzata e dettagliata delle tutele che l'art. 3 opera in ragione delle diverse tipologie contrattuali (in particolare, quelle flessibili), di cui l'esempio più macroscopico e per certi versi anche più discutibile è proprio

quello del lavoro parasubordinato: infatti, al di là dei mutamenti intervenuti dopo il 2008 – in particolare la soppressione (forse non adeguatamente meditata) del lavoro a progetto e l'introduzione del concetto di collaborazione etero-organizzata (d.lgs. n. 81/2015) – non c'è dubbio che, rispetto al lavoro parasubordinato, il d.lgs. n. 81/2008 tradisce quella vocazione universalistica nel momento in cui riconosce l'applicazione della tutela nei confronti del lavoratore parasubordinato solo ove questi svolga la sua attività nei luoghi di lavoro del committente. E qui, a ben guardare, in questo riferimento testuale ai “luoghi” emerge forse uno dei primi anacronismi del d.lgs. n. 81/2008, che rischia di non tener conto dei profondi cambiamenti dell'organizzazione del lavoro: industria 4.0, processi di digitalizzazione, delocalizzazione delle attività lavorative. D'altronde, lo stesso anacronismo emerge anche nella stessa rubrica generale del d.lgs. n. 81/2008 in cui si parla di «tutela della salute e sicurezza nei luoghi di lavoro», emergendo il retaggio di una tradizione per certi versi gloriosa, ma che sicuramente non tiene conto delle più recenti evoluzioni.

E, allora, il fatto che da un lato si riconosca che “lavoratore” ai fini del d.lgs. n. 81/2008 è chiunque svolga una prestazione a prescindere dalla tipologia contrattuale nell'ambito di un organizzazione datoriale, ma, che dall'altro lato, lo si neghi qualora il lavoratore parasubordinato non svolga l'attività nel luogo del committente evidenzia un problema piuttosto serio, che dimostra come l'irrilevanza del tipo contrattuale non sia poi del tutto vera: anzi, è proprio il fatto che si tratta di un lavoratore parasubordinato a mettere in dubbio il suo diritto alla tutela, non dovendosi trascurare come gran parte delle collaborazioni parasubordinate prescindano sempre più da un luogo fisso. Qui, ovviamente, il discorso dovrebbe ampliarsi, non dovendosi trascurare il problema dell'effettività della tutela. Infatti, al di là della propria dimensione pubblicistica (evidentissima anche per la presenza delle sanzioni penali e amministrative), la disciplina di salute e sicurezza sul lavoro si avvale necessariamente degli

“strumenti” del contratto di lavoro (potere direttivo, di controllo e disciplinare), ponendosi allora il problema dell'utilizzazione di tali strumenti nelle ipotesi di assenza della subordinazione. Un problema risolto a monte nel caso delle collaborazioni etero-organizzate in virtù dell'applicazione della disciplina del lavoro subordinato *ex art.* 2 del d.lgs. n. 81/2015, ma che conserva la sua attualità nelle altre ipotesi di parasubordinazione. In ogni caso, al di là dell'ipotesi specifica della parasubordinazione, la questione del “luogo di lavoro” costituisce uno dei punti più critici dell'attualità delle previsioni del d.lgs. n. 81/2008, ma su questo tornerò più avanti.

Non si deve tuttavia dimenticare che, accanto a questioni come quella poc'anzi evocata, legata alle metamorfosi del mercato del lavoro e dei sistemi produttivi, ne esistono anche altre riconducibili ad aspetti più “tradizionali” e relative a “sacche” di lavoro di modesta rilevanza dal punto di vista professionale, ma di enorme importanza dal punto di vista sociale, che sono tuttora escluse dall'applicazione del d.lgs. n. 81/2008. Il riferimento è al lavoro domestico che proprio negli ultimi anni ha registrato un *boom* straordinario dovuto alle crescenti esigenze di cura che emergono soprattutto a causa dell'invecchiamento della popolazione. Se è vero che l'esclusione del lavoro domestico è di per sé legittimato dalla direttiva quadro europea n. 391/1989, è vero pure che quest'ultima costituisce pur sempre una disciplina inderogabile *in peius*, ben potendo quindi gli Stati membri dell'UE innalzare l'asticella della tutela. Anche alla luce di quanto avvenuto con la pandemia e al di là della specialità della figura datoriale nel lavoro domestico, non è più pensabile che esso sia ancora assoggettato solamente ad alcune discipline minimalistiche degli anni Cinquanta anche perché i rischi presenti nell'attività domestica non sono né pochi né trascurabili.

Occorre quindi rivedere la scelta “conservativa” fatta all'epoca dal d.lgs. n. 81/2008, così come, per altro verso, si potrebbero rivedere alcune previsioni delle discipline speciali che oggi si in-

trecciano tra il d.lgs. n. 81/2008 e il d.lgs. n. 81/2015 in relazione ai contratti di lavoro flessibile: penso ad esempio alla somministrazione che potrebbe meritare qualche adattamento specialmente per quanto attiene alla ripartizione degli obblighi formativi (v. oltre).

In realtà, non ci si dovrebbe limitare a considerare la figura del lavoratore, ma occorrerebbe riflettere più attentamente anche su quella del datore di lavoro per la sicurezza.

Ad esempio, nel d.lgs. n. 81/2008 non c'è alcuna specifica menzione di tale figura per quanto concerne le società di capitali, qui facendosi ricorso alla consolidata elaborazione giurisprudenziale secondo cui la posizione di garanzia datoriale si ripartisce equamente su tutti i membri del consiglio di amministrazione salvi i casi in cui il consiglio abbia individuato (con una delega di gestione e non di funzioni) in capo ad uno dei propri membri la prevalente posizione di garanzia datoriale e fermo restando in tal caso l'obbligo di tutti gli altri membri del consiglio di amministrazione di vigilare sull'operato di costui. Dato che ormai la dimensione giuridica delle imprese italiane è prevalentemente societaria, c'è da chiedersi come mai ancora possiamo permetterci di avere una definizione di datore di lavoro che non tenga conto anche di questo aspetto. E se è vero che in tal caso sopperisce la disciplina giurisprudenziale, è vero pure che questa può scontare il naturale soggettivismo giudiziario che potrebbe incrinare quella certezza del diritto di cui c'è particolarmente bisogno proprio in materia di sicurezza sul lavoro. Si potrebbe quindi trarre insegnamento dalla vicenda della delega di funzioni che, dopo esser stata per tanti anni governata solo dall'elaborazione giurisprudenziale, ha trovato positiva soluzione mediante la legificazione degli orientamenti giurisprudenziali da parte dell'art. 16 del d.lgs. n. 81/2008, emergendo così una disciplina molto più certa e stabile. Si potrebbe dunque integrare l'art. 2, lett. *b*, del d.lgs. n. 81/2008 con qualche parola che possa aiutare a capire meglio chi sia al datore di lavoro anche nelle società di capitali. Così

come non dovremmo trascurare le difficoltà che l'individuazione della posizione di garanzia datoriale pone nelle pubbliche amministrazioni, giacché la definizione del secondo periodo dell'art. 2, lett. *b*, del d.lgs. n. 81/2008 – in base alla quale il datore di lavoro è individuato dall'organo di vertice nel dirigente che abbia poteri di gestione, decisionali e di spesa – deve fare i conti nella pratica con una situazione nella quale la disponibilità delle risorse economiche – a causa delle modalità di gestione dei bilanci nelle pubbliche amministrazioni – non sempre risulta chiara ed effettiva, come del resto emerge anche dai riscontri del contenzioso in materia. Concludendo sul punto, direi che la definizione di lavoratore andrebbe preservata perché ha una portata che travalica i tempi, potendosi semmai prevedere qualche precisazione *a latere* che colmi le lacune e che affini alcuni aspetti specifici (ad esempio, sulle equiparazioni). Quanto al datore di lavoro, oltre a riflettere sulla sua definizione negli ambiti societari così come su alcuni profili dei poteri datoriali nelle pubbliche amministrazioni, si potrebbe valutare se non sia opportuna un'esplicita precisazione per quanto riguarda la figura datoriale nelle aziende ospedaliere pubbliche nelle quali, com'è noto, gli atti aziendali identificano il datore di lavoro per la sicurezza con l'organo di vertice, vale a dire il direttore generale, derogando a quanto prevede il d.lgs. n. 81/2008 in merito alla distinzione tra organo di vertice e dirigente/datore di lavoro. Una distinzione dalla quale, nel caso delle aziende ospedaliere, si potrebbe effettivamente prescindere in ragione della struttura aziendalistica delle stesse che, al di là della loro natura giuridica pubblicistica, tende ad avvicinarle sul piano gestionale alle imprese private. Riportando l'attenzione sull'inadeguatezza di una disciplina ancora incentrata sul luogo di lavoro (quella che altrove ho definito “disciplina fordista”) occorre considerare che, al di là della richiamata questione della parasubordinazione, il problema del “luogo” emergerà sempre più in ragione della progressiva digitalizzazione e di quella presumibile esplosione delle varie forme di lavoro a distanza anche dopo l'auspicabile fine della pandemia. Senza dimenticare, per inciso,

che nella disciplina della sicurezza sul lavoro, il “luogo” rileva discutibilmente anche in relazione agli appalti (art. 26), là dove appunto si prevede l’applicazione delle relative regole purché il committente abbia la disponibilità giuridica dei luoghi. Riflettere sulla questione dell’evanescenza del luogo di lavoro non significa beninteso che non esistano più problemi di salute e sicurezza nei tradizionali luoghi di lavoro, non dovendosi tra l’altro dimenticare come la giurisprudenza riconduca nell’ambito della tutela della salute e sicurezza sul lavoro anche la situazione di coloro che, pur non essendo lavoratori, si trovino legittimamente nel luogo di lavoro.

Per altro verso, il tema del “luogo” si interseca anche con un altro aspetto, evidenziato in alcune recenti ricerche (Tomassetti, Buoso), vale a dire se la disciplina della sicurezza sul lavoro riguardi solo il “luogo fisico” dell’organizzazione produttiva o non debba in qualche modo intrecciarsi con il “luogo esteso” che lo circonda, cioè l’ambiente circostante, qui emergendo l’esigenza di un dialogo tra tutela dell’ambiente di lavoro e tutela dell’ambiente, dovendosi valorizzare gli spunti che emergono nel Manifesto di Treu, Caruso e Del Punta sul diritto del lavoro sostenibile.

I processi di trasformazione del mondo del lavoro impattano anche sull’azione delle rappresentanze dei lavoratori in ambito prevenzionistico, soprattutto a fronte dei processi di smaterializzazione e remotizzazione del lavoro. Ritieni che la disciplina del TU sia adeguata a garantire i necessari spazi di intervento dei rappresentanti con riferimento ai nuovi rischi? Si può immaginare un intervento di riforma volto ad agevolare l’intervento delle stesse su alcune delle tematiche – organizzative – più rilevanti a fini prevenzionistici?

Nel nostro paese il tema della rappresentanza per la sicurezza è stato interpretato assecondando la nostra tradizione sindacale, con i rappresentanti dei lavoratori per la sicurezza che, special-

mente nelle imprese di maggiori dimensioni, operano nell'ambito delle rappresentanze aziendali (RSU). Il che, per certi versi, potrebbe anche innescare rischi di contrattualizzazione dei temi della sicurezza, così come, per altro verso, evidenzia la necessità di una specializzazione sempre più forte dei RLS: una specializzazione che, a ben guardare, diverrà sempre più necessaria anche a fronte della dispersione dei "rappresentati" nei tanti luoghi o al di fuori dei luoghi tradizionali di lavoro. E allora verrebbe da lanciare una provocazione, valutando se l'esperienza avviata in relazione alla pandemia con i protocolli anti-Covid-19, che ha coinvolto le rappresentanze sindacali generali, non possa in qualche modo fornire qualche insegnamento per il futuro. È vero che, nel caso della pandemia, tutto ciò si è giustificato in considerazione della natura ubiquitaria del virus e del fatto che il rischio non riguardava solo lo specifico contesto aziendale, ma tutta la popolazione. Ma varrebbe comunque la pena verificare se da tale esperienza non possano emergere spunti interessanti tenendo conto delle non poche difficoltà dei rappresentanti per la sicurezza aziendali di tutelare tutta una serie di soggetti già difficilmente rappresentabili e anche difficilmente contattabili proprio per la loro crescente delocalizzazione. Quanto meno bisognerebbe valutare se non sia il caso di trarre spunto da questo straordinario coinvolgimento delle organizzazioni sindacali sui temi della sicurezza sul lavoro per sensibilizzarle maggiormente anche per quanto concerne la gestione della rappresentanza per la sicurezza territoriale (RLST) che oggi sconta non poche criticità

A fronte di un lavoro sempre più fluido, svolto in molteplici luoghi non sempre determinati e spesso fuori dalla disponibilità giuridica del datore di lavoro e rispetto a rischi sempre più connessi ad aspetti del lavoro relativi all'organizzazione e alla commistione tra esperienza di lavoro ed esperienza di vita, in che modo gli strumenti prevenzionistici previsti dalla attuale normativa, come la valutazione dei rischi che si basa su coordinate spazio-

temporali ben determinate, possono o devono adeguarsi al nuovo contesto? È necessario individuare un nuovo concetto (e una nuova definizione) di valutazione dei rischi, ad esempio, per presidiare adeguatamente i nuovi contesti di lavoro o quella attualmente presente nella sezione II, capo III, titolo I del TU può dirsi ancora attuale?

Per quanto riguarda la valutazione dei rischi io credo che si debba “stressare”, ancor di più di quanto non sia stato fatto finora, il concetto di “organizzazione”. Un concetto polimorfo perché, da un lato, viene in gioco l’organizzazione del lavoro che è la fonte dei rischi o, talvolta, l’occasione per l’emersione dei rischi: si pensi proprio alla pandemia in atto, con un virus che se è un rischio biologico specifico e professionale nelle aziende come quelle sanitarie, nelle altre è piuttosto un rischio generico che si aggrava in ragione della sua presenza nell’organizzazione di lavoro. Ovviamente non dobbiamo parlare di organizzazione solo in termini reificati pensando soltanto all’insieme dei macchinari, delle strutture, dei luoghi fisici e quant’altro; certo l’organizzazione è anche tutto questo, ma prima ancora è l’insieme delle regole che presiedono al progetto produttivo del datore di lavoro. Non a caso la definizione di valutazione dei rischi è quella di valutazione globale e documentata di tutti i rischi per la salute e sicurezza dei lavoratori presenti nell’ambito dell’organizzazione in cui essi prestano la propria attività (art. 2, lett. *g*, del d.lgs. n. 81/2008): una definizione esattamente simmetrica a quella di lavoratore e a quella di datore di lavoro. Quindi l’organizzazione esiste anche là dove non c’è luogo; l’organizzazione esiste in quanto ci sia l’insieme di regole che presiedono a come si svolge la prestazione. Pertanto, se c’è l’organizzazione, ancorché più sfumata e più dematerializzata, non può non esserci la valutazione dei rischi, il che significa che la definizione di quest’ultima accolta nel d.lgs. n. 81/2008 non va toccata perché è anch’essa una definizione assolutamente all’altezza e adeguata a rispondere a quelle che sono le esigenze che l’oggi e il futuro ci pongono. Ovviamente, riflettere sul con-

retto di organizzazione non significa aver risolto tutti i problemi perché una cosa è valutare i rischi che sono presenti in un'organizzazione ben definita, materializzata e localizzata, ben altra è valutare i rischi là dove non c'è un confine fisico: basti pensare al tema dei *rider* rispetto al quale l'applicazione del d.lgs. n. 81/2008 comporta la necessità di comprendere come possa farsi un'adeguata valutazione dei rischi, tenendo conto che gli ambiti in cui i *rider* operano non sono nella disponibilità del datore di lavoro o del committente. Nondimeno si dovrà adeguare la valutazione dei rischi più che al luogo in sé, sul quale non si può incidere, semmai alle concrete modalità mediante le quali si svolge la prestazione. Questo è un passaggio importante che evoca anche un altro aspetto non sempre adeguatamente indagato: la valutazione dei rischi non è un adempimento che va effettuato ad "organizzazione data", come se si potesse organizzare la propria azienda come meglio si crede *ex art.* 41 Cost. dopo di che si valutano i rischi. Ciò, a ben guardare, cozza contro il principio cardine della direttiva quadro europea n. 391/1989 che antepone l'uomo e la persona al lavoro sancendo il principio della prevenzione primaria, peraltro richiamato anche nell'art. 15 del d.lgs. n. 81/2008, il quale, tra le misure generali di tutela, annovera l'eliminazione dei rischi alla fonte. La verità è che la valutazione dei rischi dovrebbe essere in qualche modo coeva e funzionale alla creazione dell'organizzazione: non a caso gli scienziati dell'organizzazione parlano di una valutazione che entra nell'analisi del processo di lavoro perché è in quel momento che, operando le scelte strategiche della propria organizzazione, l'imprenditore può scongiurare radicalmente i rischi a monte. Lo conferma una norma apparentemente marginale, ma invece di grande significato, come l'art. 28, comma 3-*bis*, del d.lgs. n. 81/2008 secondo il quale, in caso di creazione di nuova impresa, il datore di lavoro procede immediatamente alla valutazione di rischi, fermo restando un congruo lasso di tempo (90 giorni) per l'elaborazione del relativo documento. Ciò significa, a ben guardare, che la creazione dell'organizzazione presuppone la valuta-

zione del rischio: si tratta di un aspetto fondamentale che purtroppo non è stato ancora metabolizzato e che peraltro non lede le sacrosante prerogative imprenditoriali se si legge attentamente l'art. 41 Cost. il quale riconosce la libertà di intrapresa – e quindi non solo la libertà di esercitare l'impresa, ma anche di crearla – purché essa non sia in contrasto con l'utilità sociale e purché non rechi danno alla sicurezza, alla libertà, alla dignità umana. Il che dovrebbe indurre anche a interrogarsi sul fatto se la sicurezza sia un limite esterno o non addirittura un limite interno all'intrapresa economica. La valutazione dei rischi è quindi il passaggio centrale nella costruzione di un efficace sistema di prevenzione aziendale. Essa è il *pivot* di tutto il sistema perché tutto ruota attorno ad essa: da essa discendono la sorveglianza sanitaria, la formazione, l'adozione delle misure di protezione e di prevenzione. E con essa dovranno confrontarsi anche tutti i nuovi lavori che si svolgono al di fuori dei contesti fisici e materiali. È quanto accade anche nel lavoro agile di cui alla legge n. 81/2017, perché la tutela della salute e sicurezza del lavoratore agile non si risolve soltanto nella consegna al lavoratore della informativa sui rischi, non dovendosi trascurare che si tratta pur sempre di un lavoratore subordinato. Il che non significa vincolarlo oltre misura, ma neppure che il datore di lavoro possa spogliarsi dei propri poteri/doveri in materia di salute e sicurezza mediante il patto individuale di lavoro agile: potrà certo rinunciare ad alcuni suoi poteri, ma non a quelli relativi alla sicurezza sul lavoro i quali sono funzionalizzati alla tutela di interessi superiori. Ovviamente, anche in questo caso la valutazione dei rischi sarà particolarmente complessa, ma, più che pensare ad aggiornare le norme, potrebbe essere opportuno confrontarsi con la scienza dell'organizzazione, con i teorici del *risk assessment*, per comprendere come valutare i rischi di fronte ad un lavoro così esternalizzato. Né si dovrebbe trascurare di valorizzare quella norma tanto importante quanto misconosciuta, introdotta dal d.lgs. correttivo n. 106/2009, in forza della quale la valutazione dei rischi deve tenere conto anche dei rischi legati alla tipologia

contrattuale. E, a questo proposito, i giuslavoristi dovrebbero interrogarsi sull'esatto significato di tale previsione anche perché essa ben potrebbe essere posta in correlazione con le disposizioni del d.lgs. n. 81/2015 che vietano ai datori di lavoro che non abbiano fatto la valutazione dei rischi di ricorrere a certi lavori flessibili (lavoro a termine, somministrazione, lavoro intermittente), potendosi ipotizzare che non solo l'omessa valutazione generale dei rischi precluda tali rapporti, ma anche la specifica valutazione dei rischi ad essi connessi. L'altra dimensione della organizzazione su cui vale la pena insistere è quella della organizzazione intesa non come fonte dei rischi (l'organizzazione del lavoro, qualunque forma abbia), bensì come metodo con cui applicare i precetti prevenzionistici. A questo proposito occorre sottolineare come il tema della salute e della sicurezza sul lavoro sia sempre stato dominato dal principio di effettività, come ci ricordano sempre la dottrina e la giurisprudenza penalistiche (anche se il principio di effettività è anche un principio lavoristico, come dimostrava la celebre l. n. 1369/1960). Senonché io non credo che si debba incentrare il sistema prevenzionistico sull'art. 299 del d.lgs. n. 81/2008, il quale, rubricato come *Esercizio di fatto di poteri direttivi*, riconduce le posizioni di garanzia del datore di lavoro, del dirigente e del preposto anche in capo a chi, pur privo di formale investitura, nei fatti abbia esercitato i poteri connessi a tali figure. Senza nulla togliere al significato di tale norma, che appunto ribadisce il principio di effettività, non dovremmo trascurare che essa è collocata tra le ultime disposizioni del d.lgs. n. 81/2008, quasi a simboleggiare la sua funzione di norma di chiusura del sistema, che soccorre ove non sia chiaro il reale assetto del sistema medesimo. Infatti, a ben guardare, il d.lgs. n. 81/2008 contiene tutta una serie di indicazioni molto chiare su come creare un efficace ed effettivo sistema di prevenzione aziendale, come d'altronde conferma anche l'art. 30 sui modelli di organizzazione e di gestione (su cui tornerò) a prescindere dal loro collegamento con l'esonero della responsabilità amministrativa del d.lgs. n. 231/2001. Ed è soprattutto nell'art. 28, comma

2, lett. *d*, che il legislatore, parlando del contenuto del documento di valutazione dei rischi, sottolinea come questo debba individuare le procedure per l'attuazione delle misure da realizzare, nonché i ruoli dell'organizzazione aziendale che vi debbono provvedere, a cui devono essere assegnati unicamente soggetti in possesso di adeguate competenze e poteri. Il fatto che questa norma, in buona sostanza, preveda che il datore di lavoro deve mettere nero su bianco nel documento di valutazione dei rischi "chi fa che cosa" significa che lo stesso datore deve definire un modello organizzativo chiaro e trasparente. E quand'anche quel datore non si dotasse di uno specifico modello organizzativo ai sensi dell'art. 30, che pone un onere e non un obbligo in tal senso, nei fatti un certo qual modello gli sarebbe imposto dallo stesso art. 28 là dove lo obbliga a definire chiaramente appunto l'organigramma aziendale che presiede alla salute e sicurezza. E se in tale organigramma tutte le figure del sistema (dirigenti, preposti ecc.) saranno adeguatamente collocate coerentemente ai propri poteri ed attribuzioni, non ci sarà alcun bisogno di ricorrere all'art. 299 il quale soccorrerà solo nelle ipotesi di opacità se non di oscurità del sistema. Un imprenditore che opera secondo i principi della responsabilità sociale d'impresa non ha alcun interesse ad avere un'organizzazione opaca, bensì una organizzazione trasparente, e qui riemerge, a ben guardare, il senso profondo dell'art. 30 che indica come i modelli di organizzazione e di gestione servono soprattutto a rendere tracciabili e trasparenti le procedure attraverso le quali si provvede ad adempiere i precetti prevenzionistici.

In questo nuovo contesto lavorativo, crede che il tema della formazione dei lavoratori in materia di salute e sicurezza sia da ripensare anche in vista di una maggiore consapevolezza e autonomia che i lavoratori dovrebbero avere (se adibiti a – e chiamati a scegliere i – luoghi di lavoro spesso fuori dal diretto controllo del datore di lavoro, ad esempio), anche in funzione del principio di cooperazione dei lavora-

tori sancito nell'art. 20, d.lgs. 81/2008 (e, da ultimo, nell'art. 22, comma 2, l. n. 81/2017)?

Il tema della formazione per la sicurezza costituisce molto probabilmente uno degli aspetti più critici della disciplina prevenzionistica. È fin troppo facile rilevare come tra la realtà e la definizione di formazione fornita dall'art. 2, lett. *aa*, del d.lgs. n. 81/2008 – il processo educativo attraverso il quale trasferire ai lavoratori ed agli altri soggetti del sistema di prevenzione e protezione aziendale conoscenze e procedure utili alla acquisizione di competenze per lo svolgimento in sicurezza dei rispettivi compiti in azienda e alla identificazione, alla riduzione e alla gestione dei rischi – molto spesso intercorrano anni luce. Non foss'altro, si pensi a come la verifica dell'apprendimento sia spesso evanescente o si traduca in momenti solo formalistici, laddove si tratta di un elemento assolutamente necessario per testare l'effettività della formazione, la sua sufficienza e adeguatezza come predica l'art. 37 del d.lgs. n. 81/2008, e, soprattutto, se essa sia stata in grado di incidere sugli abiti mentali e sui comportamenti, dei lavoratori, in questo consistendo il “processo educativo” evocato dalla norma citata. Eppure, a ben guardare, una formazione insufficiente o inadeguata, specie nel caso dei dirigenti e dei preposti, potrebbe incrinare la solidità delle loro posizioni di garanzia (con possibili ripercussioni sul piano delle responsabilità datoriali), le quali presuppongono che i soggetti a cui vanno ascritte rispondano *in toto* ai requisiti di legge: e non è chi non veda come, nelle definizioni di dirigente e preposto dell'art. 2, lett. *d* ed *e*, del d.lgs. n. 81/2008, si sottolinei il rilievo delle competenze professionali a cui è strettamente funzionale la specifica formazione di cui all'art. 37. D'altronde, l'approccio eccessivamente formalistico alla formazione traspare anche da alcune discutibilissime previsioni degli Accordi Stato-Regioni con cui è stata attuata la disciplina dell'art. 37 del d.lgs. n. 81/2008. Si pensi a quella sorta di compromesso con cui finora si è tentato di contemperare esigenze apparentemente inconciliabili come l'immediata produttività e la sicurezza prevedendo una dilazione

dei tempi per completare la formazione ove non sia possibile provvedere altrimenti: una previsione non solo di dubbia legittimità, ma che rivela anche come non sia stata metabolizzata l'idea che, senza la formazione – che non a caso l'art. 37, comma 4, del d.lgs. n. 81/2008 configura come prodromica all'avvio del rapporto di lavoro – non potrebbe neppure essere esigibile la prestazione di lavoro. Così come la previsione del nuovo art. 2103 c.c. sull'irrilevanza della violazione dell'obbligo formativo in caso di mutamento di mansioni ai fini della validità dell'atto datoriale non può certo riguardare la formazione per la sicurezza, imposta dall'art. 37, comma 4, del d.lgs. n. 81/2008 anche in occasione del cambiamento di mansioni. La collocazione della formazione in una fase antecedente all'effettiva esecuzione della prestazione lavorativa costituisce un serissimo problema soprattutto nei lavori flessibili, che si riflette non solo sulla ripartizione dei compiti tra agenzia fornitrice ed utilizzatore nel caso della somministrazione e più in generale nelle altre ipotesi di lavori temporanei nel settore privato, ma anche nel settore pubblico, sol che si pensi ai supplenti delle scuole o al personale precario degli ospedali. Quanto al lavoratore, non va trascurato come egli non sia solo titolare di un diritto alla formazione, bensì anche obbligato ad effettuarla. Il che evidenzia quella sua responsabilizzazione in tema di sicurezza che traspare a chiare lettere anche nell'art. 20 del d.lgs. n. 81/2008, dedicato al suo obbligo di cooperazione. Una responsabilizzazione che ovviamente tende ad accentuarsi nel momento in cui la prestazione viene eseguita in condizioni di particolare “autonomia” o al di fuori del tradizionale contesto aziendale, come accade nel lavoro agile o in tutte le occasioni in cui il lavoratore operi in altri “luoghi”. Il che, beninteso, non significa che da ciò, in caso di infortunio, scaturisca alcun automatico esonero delle responsabilità datoriali. Peraltro, non pare così peregrino che la formazione per la sicurezza dei lavoratori che accedono a lavori agili o delocalizzati debba essere “tarata” in considerazione di tali specificità, non essendo certamente sufficiente la formazione standard per i lavoratori interni.

In fondo si tratta di valorizzare e adattare nei casi di specie quel principio espresso per il lavoro interinale dalla direttiva n. 91/383/CEE del 25 giugno 1991 secondo cui i lavoratori flessibili necessitano non già di una mera equiparazione di tutela ai lavoratori standard, bensì di una tutela differenziale, anche in termini di formazione e di sorveglianza sanitaria, in ragione della loro ridotta contestualizzazione nell'organizzazione in cui operano. Dove la flessibilità, nei casi in esame, non è tanto quella tipologica (o non solo), ma quella organizzativa che si esplicita attraverso la delocalizzazione della prestazione. In questi termini, lo stesso lavoratore potrebbe e dovrebbe avere un ruolo attivo nel processo formativo, concorrendo all'identificazione di quei fabbisogni formativi – un aspetto, quest'ultimo, pressoché totalmente ignorato quando si parla di formazione per la sicurezza – che, nelle ipotesi considerate, possono essere ben diversi da quelli che emergono in relazione al lavoro “interno” all'azienda. E qui un ruolo particolarmente rilevante può e deve essere giocato dal patto individuale di lavoro agile che dovrebbe confezionare “su misura” il pacchetto di misure di tutela necessarie per quel lavoratore. Senza poter qui ampliare oltremodo il discorso, appare evidente che, ove al lavoratore agile sia stata fornita una formazione effettivamente adeguata e sufficiente nei termini di cui si è parlato, ciò non potrà non rilevare in sede di valutazione delle eventuali responsabilità in caso di infortunio, proprio per l'intima connessione che la legge ha istituito tra formazione e lavoro sicuro, ferme restando ovviamente le ulteriori valutazioni relative ad eventuali corresponsabilità datoriali e senza tuttavia trascurare che la “sostanziale autonomia” con cui il lavoratore agile normalmente opera non può non essere tenuta nella giusta considerazione. Non foss'altro, di fronte a prestazioni rese in modalità agile, certe affermazioni della giurisprudenza meritano di essere in qualche modo attualizzate. Si pensi al principio secondo cui «il datore di lavoro deve avere la cultura e la *forma mentis* del garante del bene costituzionalmente rilevante costituito dalla integrità del lavoratore, e non deve perciò limitarsi ad in-

formare i lavoratori sulle norme antinfortunistiche previste, ma deve attivarsi e controllare sino alla pedanteria, che tali norme siano assimilate dai lavoratori nella ordinaria prassi di lavoro» (Cass. pen., sez. IV, 11 agosto 2010, n. 31679).

Così come l'esecuzione della prestazione in modalità agile – come tale non sottoposta al costante controllo del datore di lavoro – dovrebbe indurre a calibrare meglio il significato dell'altro principio giurisprudenziale secondo cui il datore di lavoro è esonerato da responsabilità «solo quando il comportamento del dipendente sia abnorme» (Cass. pen., sez. IV, 13 gennaio 2004, n. 40164), essendo stato posto in essere «del tutto autonomamente e in un ambito estraneo alle mansioni affidategli – e, pertanto, al di fuori di ogni prevedibilità per il datore di lavoro – oppure rientri nelle mansioni che gli sono proprie ma sia consistito in qualcosa di radicalmente, ontologicamente, lontano dalle ipotizzabili e, quindi, prevedibili, imprudenti scelte del lavoratore nella esecuzione del lavoro» (Cass. pen., sez. IV, 23 maggio 2007, n. 25532). In altri termini, ci si potrebbe chiedere se, a fronte di prestazioni remotizzate, il concetto di “abnormità” del comportamento del lavoratore possa costituire ancora un efficace discrimine per valutare la ripartizione delle responsabilità e se il criterio di “abnormità” sia del tutto coerente con la visione di un lavoratore al quale il legislatore, confermandogli il diritto alla tutela, ha nel contempo attribuito la responsabilità attiva della propria ed altrui sicurezza (art. 20, comma 1, del d.lgs. n. 81/2008). Così come ci si dovrebbe interrogare, sempre nel caso di lavoro agile o remotizzato, sul significato dell'art. 18, comma 3-*bis*, del d.lgs. n. 81/2008, il quale prevede che, in caso di infortunio, l'esclusiva responsabilità del lavoratore sussista solo qualora la mancata attuazione degli obblighi prevenzionistici sia addebitabile unicamente a lui stesso e non sia riscontrabile un difetto di vigilanza del datore di lavoro e dei dirigenti, i quali sono tenuti a vigilare in ordine all'adempimento degli obblighi gravanti su tali soggetti. Viene infatti da chiedersi se tale obbligo datoriale di vigilanza sul comportamento del lavoratore agile non

debba essere interpretato tenendo conto sia del livello di competenza acquisita dal singolo lavoratore grazie alla formazione ricevuta, sia di quella “sostanziale autonomia” con cui è resa la prestazione. Il che, si badi bene, non significherebbe esentare il datore di lavoro dall’onere-obbligo di vigilanza, ma piuttosto ricondurre tale obbligo entro una sfera di ragionevolezza da valutare a seconda delle caratteristiche di ciascun lavoratore, della formazione da lui ricevuta e, soprattutto, di come egli abbia introiettato tale formazione. Agli evidenti problemi di praticabilità di tale obbligo di vigilanza nel caso dei lavori delocalizzati si potrebbe forse ovviare tramite strumenti che consentano al datore di lavoro di essere costantemente tenuto al corrente sull’andamento dell’esecuzione della prestazione, come, ad esempio, la periodica comunicazione/trasmisione da parte del lavoratore di riscontri, dai quali il datore di lavoro possa evincere eventuali anomalie (come i *near miss*), con ciò che ne può conseguire in merito alle sue necessarie “azioni correttive”. Strumenti che potrebbero essere utilmente considerati anche nell’ambito dei modelli di organizzazione e di gestione (di cui si parlerà oltre) e che possono rivelarsi quanto mai utili anche a questo proposito. Certo è che, nel caso dei lavori agili e da remoto, l’immagine del datore di lavoro che insegue spasmodicamente il lavoratore, attimo dopo attimo, per impedirgli di farsi male appare sempre più sfuocata rispetto ad una realtà in cui il lavoratore, almeno per quanto concerne la disciplina della sicurezza, nonostante il permanere della sua debolezza contrattuale, tende ad essere sempre meno un *capite deminutus* ed a divenire co-protagonista attivo della propria salute e sicurezza.

A fronte della dematerializzazione del concetto di “organizzazione” del lavoro, perno nell’impianto normativo del Testo Unico in materia di salute e sicurezza in quanto contestualmente fonte dei rischi per la salute e la sicurezza dei lavoratori e presupposto del sistema di prevenzione, come è possibile ritenere attuale la normativa prevenzionistica a fronte di tali mutamenti? Come e in che modo una revisio-

ne dei modelli di organizzazione e gestione potrebbe agevolare tale processo di riforma al livello normativo?

Soffermando l'attenzione specificamente sui modelli organizzativi di cui all'art. 30 del d.lgs. n. 81/2008, occorre uscire dal corto circuito secondo cui essi valgono solo ai fini del possibile esonero della responsabilità amministrativa della persona giuridica di cui al d.lgs. n. 231/2001. Infatti, al di là di questo importante ed indiscutibile effetto, non va trascurato come l'adozione e l'efficace adozione di tali modelli possa agevolare la dimostrazione – sul versante delle responsabilità individuali – di aver fatto tutto quanto necessario in relazione all'adempimento dei precetti prevenzionistici, qui potendosi ragionare dal punto di vista civilistico anche in termini di valutazione della diligenza nell'adempimento. A ben guardare, l'indiscutibile connessione tra l'adozione e l'efficace attuazione di tali modelli e la questione dell'esonero della responsabilità amministrativa della persona giuridica di cui al d.lgs. n. 231/2001 rischia di far velo alla considerazione dell'utilità più in generale dei modelli, il che emerge specialmente là dove il d.lgs. n. 231/2001 non viene in gioco in quanto inapplicabile. Mi riferisco alle pubbliche amministrazioni, sottratte com'è noto all'applicazione di tale decreto e che, nondimeno, potrebbero trarre notevoli vantaggi dall'adozione dei modelli organizzativi, specialmente in quelle ipotesi in cui la natura giuridica pubblica dell'amministrazione si affianca alla gestione aziendalistica della stessa: si pensi in particolare alle aziende ospedaliere e sanitarie. Perorare l'ingresso dei modelli organizzativi in tali contesti non significa ovviamente che anch'essi debbano ricadere sotto l'egida del d.lgs. n. 231/2001, bensì prendere finalmente atto che in realtà organizzative così complesse – le aziende ospedaliere sono, a ben guardare, le organizzazioni nelle quali si annidano pressoché tutti i tipi di rischi – non è possibile costruire un efficace sistema di prevenzione prescindendo da un adeguato modello organizzativo (le recenti vicende pandemiche lo testimoniano spietatamente). E se è vero che, a differenza delle società privatistiche, nelle pubbliche am-

ministrazioni l'adozione e l'efficace adozione dei modelli organizzativi non può essere "incentivata" dalla previsione dell'esonero della responsabilità amministrativa delle persone giuridiche di cui al d.lgs. n. 231/2001, qui inapplicabile, perché non pensare ad altri incentivi o logiche premiali per le pubbliche amministrazioni che adottino virtuosamente quei modelli, ad esempio prevedendo agevolazioni o maggiori flessibilità rispetto a certi vincoli che gravano sulle pubbliche amministrazioni (blocchi delle assunzioni, patto di stabilità ecc.). Un ulteriore spunto sul tema dei modelli organizzativi riguarda il fatto che l'art. 51 del d.lgs. n. 81/2008 prevede che gli organismi paritetici possono supportare le imprese anche mediante l'asseverazione dei modelli organizzativi. Si tratta di un aspetto scarsamente esplorato e che tuttavia merita attenzione. Infatti, al di là della distinzione tra certificazione dei sistemi di gestione e asseverazione dei modelli organizzativi – aspetti distinti tra loro per vari motivi –, mediante la procedura di asseverazione l'impresa mette a nudo la propria organizzazione e "riflette" su se stessa, come se si ponesse dinnanzi ad uno specchio, potendo così correggere le proprie disfunzioni. In verità, anche il tema della pariteticità non è stato ancora del tutto valorizzato e troppo spesso è sbrigativamente liquidato con pregiudizi ideologici, fermo restando che esso sconta, a ben guardare, le perduranti incertezze che regnano sul versante della rappresentatività delle organizzazioni sindacali che costituiscono gli organismi e che invoca a gran voce quell'intervento chiarificatore del legislatore che da tempo il nostro diritto sindacale attende.

Il Testo Unico su salute e sicurezza: spunti e proposte di modifica

Gaetano Natullo

Le trasformazioni dei modelli di organizzazione produzione e del lavoro nel nuovo millennio sono ormai ben note; così come note sono le trasformazioni che nello stesso periodo nel sono derivate con riguardo ai mercati del lavoro ed ai rapporti di lavoro. Negli ultimi anni, tali trasformazioni hanno avuto ulteriore evoluzione, da ultimo ulteriormente accentuata dalle vicende legate alla pandemia Covid-19, con l'enorme diffusione di tipologie di lavori, il lavoro agile e il lavoro tramite piattaforme digitali (*riders*), determinata come noto dall'isolamento e distanziamento sociale imposto come misura contro i rischi di contagio. Se poi si tiene conto anche dell'incremento di tipologie di attività/lavori di cura e assistenza domestica, determinata dall'aumento della popolazione anziana, si comprende come anche le ripercussioni nell'area della tutela della salute e sicurezza dei lavoratori siano inevitabili e numerose.

Ed invero, un segnale emblematico potrebbe essere quello definitorio: nel senso che oggi è forse più opportuno parlare di sicurezza “dei lavoratori” più che di sicurezza “sul lavoro”, anche a segnalare la maggior rilevanza della persona/lavoratore rispetto al luogo di lavoro, con quest'ultimo che perde di definitezza, moltiplicandosi in contesti diversi e molteplici, fino a confondersi con gli ambienti domestici e familiari.

Non c'è dubbio che tali mutamenti impongano una seria riflessione anche sulla attuale capacità della disciplina normativa (in Italia il d.lgs. n. 81/2008), a partire dalla definizione dei suoi ambiti applicativi, di tener conto dell'estrema differenziazione e frammentazione dei contesti e rapporti di lavoro.

Ciò, pur dovendo riconoscere che la disciplina del c.d. Testo Unico su salute e sicurezza risulta già notevolmente “moderna” da questo punto di vista, grazie ad una impostazione “politica” e metodologica che ha messo il fattore organizzativo al centro della strategia normativa, nella consapevolezza dell’importanza centrale del fattore organizzativo nella elaborazione ed applicazione dei modelli e sistemi di tutela della salute sui luoghi di lavoro, a partire dalla correlazione diretta, ai fini dell’applicazione delle tutele normative, tra la nozione di ambiente di lavoro ed il contesto organizzativo.

Infatti, mentre il parametro normativo utilizzato dalla legislazione tecnica degli anni Cinquanta erano «le attività alle quali siano addetti lavoratori subordinati» (si veda art. 1, d.P.R. n. 547/1955, e art. 1, d.P.R. n. 303/1956) e gli “ambienti di lavoro” (artt. 3 e 4) in cui i lavoratori subordinati svolgono quelle *attività*, con il c.d. Testo Unico del 2008 (e in parte già con il d.lgs. n. 81/2008), la nozione di “ambiente di lavoro” è cambiata, divenendo meno “fisica” e predefinita, ed invece correlata ai contesti organizzativi ⁽¹⁾. Si introduce il fattore “organizzativo” anche nella delimitazione del contesto lavorativo: nella norma sulle definizioni (art. 2, d.lgs. n. 81/2008), il legislatore definisce la “azienda”, quale «complesso della struttura organizzata dal datore di lavoro pubblico o privato». Tale percorso si completa con l’individuazione del datore di lavoro (che nella normativa degli anni Cinquanta era dato per presupposto): «soggetto che, secondo il tipo e l’assetto dell’organizzazione nel cui ambito il lavoratore presta la propria attività, ha la responsabilità dell’organizzazione stessa o dell’unità produttiva in quanto esercita i poteri decisionali e di spesa» ⁽²⁾.

⁽¹⁾ In generale e per tutti sul punto si veda F. MALZANI, *Ambiente di lavoro e tutela della persona*, Giuffrè, 2014, p. 7 ss.

⁽²⁾ Sulla figura del datore di lavoro “in sicurezza”, si veda C. LAZZARI, *Figure e poteri datoriali nel diritto della sicurezza sul lavoro*, Franco Angeli, 2015.

Dal riferimento, dunque, all'ambiente di lavoro quale contesto "fisico" in cui lavoratore (subordinato) svolge la prestazione (e per questo deve essere protetto dai rischi) si passa ad una nozione di ambiente di lavoro, presupposto e *ratio* di applicazione ed imputazione dell'obbligo di sicurezza, quale "contesto organizzativo" in cui si svolgono le (qualsiasi) prestazioni di lavoro e si esercita il potere "datoriale" (organizzativo, decisionale, gestionale e di spesa).

I fenomeni di frammentazione organizzativa, fortemente connessi ai processi di trasformazione tecnologica e organizzativa della IV rivoluzione industriale, tanto con riferimento alle modalità di ingaggio dei lavoratori, quanto con riferimento a processi di esternalizzazione, codatorialità e multidatorialità, creano delle tensioni nell'individuazione del datore di lavoro ai fini della predisposizione delle tutele prevenzionistiche, ma anche rispetto all'ambito applicativo delle tutele del Testo Unico (si pensi all'esclusione del lavoro parasubordinato svolto da luogo diverso da quello del committente. Dinanzi a questi processi – e al netto della ispirazione universalistica del Testo Unico – crede che sia necessario un intervento di ridefinizione delle nozioni di datore di lavoro e lavoratore e degli ambiti applicativi delle discipline prevenzionistiche? Se sì, in quale direzione?

Ciò detto, e riconoscendo dunque all'attuale formulazione normativa una già notevole capacità "inclusiva" rispetto ai diversi contesti e tipologie di lavoro, risulta comunque necessario ed opportuno riflettere sulla possibilità di modifiche normative.

In primo luogo, per adeguare la disciplina normativa dell'ambito soggettivo di applicazione, tenendo conto della rilevanza del fattore della "eterorganizzazione", come noto prepotentemente emerso, anche in sede legislativa, con riguardo in generale al lavoro c.d. "parasubordinato", ed in particolare alla delicata questione definitoria dei *riders*. In secondo luogo, per ricomprendere più decisamente nell'alveo delle tutele legislative quei lavori che,

come segnalato, si svolgono in contesti organizzativi non (direttamente/completamente) “organizzati” dal datore di lavoro, in quanto non in sua diretta disponibilità (caso paradigmatico quello del lavoro a distanza “domiciliare”). In questo senso andrebbe forse rivista la formulazione anche di alcune disposizioni della norma sul campo di applicazione (art. 3 d.lgs. n. 81/2008); si pensi in particolare ai commi 7 (collaborazioni), 9-10 (lavori a domicilio e a distanza). Altra riflessione andrebbe svolta con riferimento alle ipotesi di codatorialità, al fine di definire criteri certi di individuazione, al di là delle eventuali “corresponsabilità” del (unico/principale) datore di lavoro, utile per l’imputazione certa degli obblighi di sicurezza.

I processi di trasformazione del mondo del lavoro impattano anche sull’azione delle rappresentanze dei lavoratori in ambito prevenzionistico, soprattutto a fronte dei processi di smaterializzazione e remotizzazione del lavoro. Ritiene che la disciplina del TU sia adeguata a garantire i necessari spazi di intervento dei rappresentanti con riferimento ai nuovi rischi? Si può immaginare un intervento di riforma volto ad agevolare l’intervento delle stesse su alcune delle tematiche – organizzative – più rilevanti a fini prevenzionistici?

Quella delle funzioni e del ruolo delle rappresentanze dei lavoratori per la sicurezza nel complessivo assetto del sistema normativo ed applicativo della salute e sicurezza sul lavoro resta un tema delicato. Sul punto, infatti, non si può certo dire che le indagini svolte in questi anni abbiamo attestato risultati soddisfacenti, dimostrando invece una scarsa capacità di incidere effettivamente nella migliore applicazione delle tutele normative; ciò, sia sul piano della uniforme diffusione delle rappresentanze nei diversi settori, territori e aziende; sia sul piano dell’effettivo esercizio in azienda delle funzioni e prerogative previste e del riconoscimento della “fisiologia” della partecipazione dei rappresentanti dei lavoratori al sistema aziendale di prevenzione. Se ciò è

vero, e prima ancora di ragionare sull'adeguatezza della attuale disciplina normativa di fronte ai nuovi lavori ed ai nuovi rischi, occorre forse riflettere su come migliorare l'applicazione della disciplina esistente; il che potrebbe già incidere positivamente anche sulla capacità delle rappresentanze in questione di adeguare la loro azione a ricomprendere le nuove realtà ed i nuovi problemi. In questo senso, ed anche per le ulteriori segnalate finalità, occorre a mio parere certamente agire al fine di *potenziare il ruolo delle rappresentanze territoriali*, che potrebbero svolgere, in determinati contesti, una funzionale essenziale per la salvaguardia della salute dei lavoratori. De *iure condendo*, anche in ragione delle criticità sopra segnalate, andrebbe forse rivalutata la scelta, legislativa e contrattuale, di far coincidere le rappresentanze per la sicurezza con quelle "generali" (RSU/RSA). Ciò al fine di una loro effettiva "specializzazione", che dovrebbe essere di supporto e complementare alle funzioni generali di tutela dei lavoratori delle rappresentanze "generali", in primo luogo quelle negoziali. Altra possibile soluzione normativa da valutare, ai fini di una maggiore incidenza dei RLS, è quella di un raccordo più stretto di questi ultimi con gli Organismi indipendenti di vigilanza previsti dal d.lgs. n. 231/2001, la cui disciplina come noto è richiamata dal d.lgs. n. 81/2008 con riguardo ai modelli aziendali di organizzazione e gestione ed alla responsabilità amministrativa delle aziende (spec. art. 30 d.lgs. n. 81/2008).

A fronte di un lavoro sempre più fluido, svolto in molteplici luoghi non sempre determinati e spesso fuori dalla disponibilità giuridica del datore di lavoro e rispetto a rischi sempre più connessi ad aspetti del lavoro relativi all'organizzazione e alla commistione tra esperienza di lavoro ed esperienza di vita, in che modo gli strumenti prevenzionistici previsti dalla attuale normativa, come la valutazione dei rischi che si basa su coordinate spazio-temporali ben determinate, possono o devono adeguarsi al nuovo contesto? È necessario individuare un nuovo concetto (e una nuova definizione) di valutazione dei rischi, ad

esempio, per presidiare adeguatamente i nuovi contesti di lavoro o quella attualmente presente nella sezione II, capo III, titolo I del TU può dirsi ancora attuale?

Occorre in primo luogo partire dalla definizione di Valutazione dei rischi contenuta nella art. 2, lett. *g*, d.lgs. n. 81/2008: «valutazione globale e documentata di tutti i rischi per la salute e sicurezza dei lavoratori presenti nell'ambito dell'organizzazione in cui essi prestano la propria attività, finalizzata ad individuare le adeguate misure di prevenzione e di protezione e ad elaborare il programma delle misure atte a garantire il miglioramento nel tempo dei livelli di salute e sicurezza». Tale nozione potrebbe anche essere di per sé idonea ad includere i nuovi rischi, ma lo è di meno se si collega alle altre definizioni dell'art. 2 ed in particolare a quella di “datore di lavoro” e “lavoratore”, ma anche a quella ad es. di “unità produttiva”. Richiamando infatti anche quanto esplicitato più sopra, le indicazioni normative sono ancora eccessivamente concentrate sui contesti aziendali “fisici” (azienda in senso tradizionale), e troppo poco sui contesti aziendali dematerializzati (o in senso più tradizionale “esterni”), in cui la prestazione lavorativa è comunque fortemente condizionata dalle esigenze organizzative aziendali (datoriali o “paradatoriali”). Sulla scorta delle segnalate modifiche delle disposizioni sul campo di applicazione soggettivo ed oggettivo del Testo Unico, le norme sulla Valutazione dei rischi potrebbero anche risultare sufficienti, eventualmente con dei più precisi riferimenti (ivi o in altre norme del TU) ai lavori a distanza e tramite piattaforma.

In questo nuovo contesto lavorativo, crede che il tema della formazione dei lavoratori in materia di salute e sicurezza sia da ripensare anche in vista di una maggiore consapevolezza e autonomia che i lavoratori dovrebbero avere (se adibiti a – e chiamati a scegliere i – luoghi di lavoro spesso fuori dal diretto controllo del datore di lavoro, ad esempio), anche in funzione del principio di cooperazione dei lavora-

tori sancito nell'art. 20, d.lgs. n. 81/2008 (e, da ultimo, nell'art. 22, comma 2, l. n. 81/2017)?

Uno dei nodi più delicati della normativa su salute e sicurezza è rappresentato dal profilo passivo della situazione soggettiva dei lavoratori, cui si riferisce espressamente l'art. 20 T.U. Che il lavoratore, titolare del “diritto alla sicurezza del lavoro”, sia destinatario, quantomeno, di un robusto onere di cooperazione, non è più in discussione; resta invece ancora minimo il grado di incidenza, sull'obbligo datoriale e la relativa responsabilità, dell'“obbligo” del lavoratore di svolgere diligentemente ed in maniera non pericolosa la sua prestazione, nonché di attuare come prescritto le misure di prevenzione disposte dall'azienda. Ciò complica notevolmente l'applicazione delle tutele in quei casi in cui il “luogo di lavoro” non è nella disponibilità “fisica” e/o “giuridica” del “datore di lavoro” (titolare degli obblighi di sicurezza). Ovviamente, il caso del lavoro a distanza “domiciliare” ma anche quello dei *riders* sono paradigmatici. Orbene, sarebbe certamente auspicabile una maggiore specifica attenzione normativa sul punto. Certamente sarebbe utile un irrobustimento degli obblighi formativi (sia a carico delle aziende che dei lavoratori), anche con un più diretto coinvolgimento dell'ente pubblico competente in materia (INAIL): in tal senso si potrebbe valutare un ruolo diretto di Inail nella programmazione, validazione e monitoraggio delle attività formative. Quanto al profilo della cooperazione/condivisione degli obblighi, certamente occorre una riflessione, che coinvolge anche alcune necessarie modalità per salvaguardare e garantire entrambe le parti del rapporto obbligatorio: si pensi in particolare, nel caso del lavoro a distanza, al “diritto alla disconnessione”, che può diventare una efficace misura di prevenzione solo attraverso l'effettiva attuazione anche da parte del lavoratore.

A fronte della dematerializzazione del concetto di “organizzazione” del lavoro, perno nell'impianto normativo del Testo Unico in materia di salute e sicurezza in quanto con-

testualmente fonte dei rischi per la salute e la sicurezza dei lavoratori e presupposto del sistema di prevenzione, come è possibile ritenere attuale la normativa prevenzionistica a fronte di tali mutamenti? Come e in che modo una revisione dei modelli di organizzazione e gestione potrebbe agevolare tale processo di riforma al livello normativo.

La quinta questione rinvia evidentemente alla prima e più generale delle domande. Si rinvia dunque a quanto già detto circa capacità e insufficienze dell'attuale assetto normativo ad "includere" i nuovi fenomeni ed i nuovi rischi. Per quanto più specificamente riguarda i Modelli di organizzazione e gestione "per" la sicurezza del lavoro, potrebbe certamente risultare utile ipotizzare sezioni specifiche dedicate alle ipotesi di attività/lavori decentrati ed iperflessibili, fino a ricomprendere anche i casi di lavori autonomi ma con forte incidenza di modalità organizzative interconnesse con le aziende (anche se non necessariamente "eterorganizzati"). Come già detto, potrebbe essere utile anche un coinvolgimento delle rappresentanze dei lavoratori negli Organismi indipendenti di vigilanza cui compete la verifica dell'efficace attuazione dei modelli organizzativi.

In conclusione, pare opportuno un cenno ad una indicazione di tipo "trasversale", dal momento che attiene al piano delle fonti regolative. Come noto, sul punto è stato sempre considerato assolutamente residuale il ruolo della contrattazione collettiva. Sul ruolo della contrattazione collettiva in tema di salute e sicurezza sui luoghi di lavoro le perplessità sono sempre state forti (a partire dalle preoccupazioni sui rischi di "monetizzazione" della salute). Ed in effetti, sia nella legge, sia nell'esperienza applicativa, il ruolo affidato alla contrattazione collettiva, e da questa ricoperto, non risulta essere stato di primo piano. Ciò è certamente, seppure in parte, giustificato dalla comprensibile difficoltà (per non dire impossibilità) di individuare nella contrattazione collettiva una possibile fonte di definizione di standard di prevenzione, suppletiva rispetto alla legge ed alle altre norme tecniche. Di

recente, si sono avuti dei segnali di una significativa inversione di tendenza. In primo luogo, l'accordo su *Salute e sicurezza attuazione del patto della fabbrica* siglato il 12 dicembre del 2018 da Confindustria e Cgil, Cisl, Uil. Ancor più di recente in occasione della pandemia, con l'adozione del Protocollo di condivisione delle misure da adottare negli ambienti di lavoro, adottato dal Governo e dalle Parti sociali nel marzo/aprile di quest'anno ⁽³⁾. Protocollo che, e non accade spesso per i prodotti dell'autonomia collettiva, ha ricevuto espressa "validazione" legislativa ⁽⁴⁾. Questo può stimolare, anche in sede di riflessione sulla revisione del quadro normativo, una rivalutazione anche del ruolo della contrattazione collettiva: sia in sede di fonte regolativa diretta anche se delegata (si pensi ad es. al diritto alla disconnessione), sia come strumento indiretto per una effettiva applicazione delle tutele, mediante "Buone prassi" anche promosse ed incentivate legislativamente.

⁽³⁾ Protocollo condiviso di regolamentazione delle misure per il contrasto e il contenimento della diffusione del virus Covid-19 negli ambienti di lavoro, del 14 marzo 2020, aggiornato il successivo 24 aprile.

⁽⁴⁾ Ciò, in particolare con il d.l. n. 19/2020 ed il d.P.C.M. 26 aprile 2020 (art. 6, comma 2).

Profili di salute e sicurezza: tra limiti e proposte di modifica della attuale normativa

Andrea Rotella

Gli strumenti prevenzionistici previsti dal Testo Unico in materia di salute e sicurezza sul lavoro (come la valutazione dei rischi e/o la sorveglianza sanitaria) sono adeguati per prevenire nuovi rischi quali quelli psico-sociali?

La strategia prevenzionistica di derivazione europea vede nella valutazione dei rischi lo strumento cardine per la tutela della salute e della sicurezza dei lavoratori. A partire dagli anni Novanta, la valutazione dei rischi ha infatti consentito di andare oltre un concetto di prevenzione meramente precettivo, così come l'insieme delle misure per la gestione aziendale dei rischi, comprendente la sorveglianza sanitaria, la formazione, il servizio di prevenzione e protezione, ci hanno permesso di superare un'idea della prevenzione basata principalmente sull'adozione di misure di tipo tecnologico. Questa strategia, tuttavia, ma presenta il limite di continuare a proporre l'idea che gli incidenti siano il risultato di una catena di eventi (violazioni, errori, carenze, ecc.). L'idea di fondo è, tutto sommato, abbastanza intuitiva: gli incidenti sono gli effetti visibili di una qualche causa che li ha generati e, poiché conosciamo le leggi che sottendono i fenomeni, conosciamo anche le relazioni che legano tra loro causa ed effetto. L'attuale paradigma della sicurezza basato sulla valutazione dei rischi suggerisce proprio questo: attraverso l'individuazione delle cause, si possono prevedere gli effetti indesiderati e impedire che questi si manifestino con opportune azioni di prevenzione e protezione. Semplicemente, a partire dagli anni '90, si è spostata l'attenzione dai guasti di natura tecnologica ai guasti di natura organizzativa, ma l'idea di fondo è sempre quella di considerare la sicurezza in modo meccanicistico,

come una mera relazione di cause ed effetti. Purtroppo, le cose non sono così semplici e a ricordarcelo sono proprio i “grandi eventi” - come l’attuale pandemia di Covid-19 – ovvero situazioni talmente macroscopiche nelle loro conseguenze da far ritenere impossibile e ingiustificabile che tali minacce possano essere sfuggite al dominio del principio di predeterminazione. La mia opinione è che, diversamente da quanto sinora ritenuto, l’incidente non è la manifestazione della scarsa implementazione di un paradigma efficace, ma la ragionevole conseguenza di un paradigma di efficacia limitata. Ciò diventa straordinariamente vero quando trattiamo sistemi complessi (come le organizzazioni o le società) o questioni complesse (come la ricaduta dei cambiamenti sul benessere delle persone). Questo non significa che la valutazione dei rischi sia uno strumento privo di efficacia, ma che occorra piuttosto riconoscere un limite epistemico nella pretesa che sia possibile procedere alla valutazione di *tutti* i rischi, ammettendo come questo limite sia – ahimè – più basso di quanto siamo disposti a riconoscere.

Tra gli strumenti suggeriti dalla normativa che, al contrario, potrebbero aiutare moltissimo le organizzazioni a fronteggiare i rischi ve n’è uno in particolare che è stato, a mio parere, sottoutilizzato nel nostro Paese, rappresentato dalla partecipazione dei lavoratori. Questa, nelle forme suggerite dalla norma attraverso la figura del Rappresentante dei Lavoratori per la Sicurezza piuttosto che ipotizzando altre forme di coinvolgimento diretto dei lavoratori stessi, rivoluziona la concezione di una sicurezza *Top-Down*, ovvero che fluisce verso i lavoratori dopo essere stata imposta dal datore di lavoro, applicata dai dirigenti e attuata dai preposti. Un modello di sicurezza realmente partecipativo si avvantaggerebbe del contributo *Bottom-Up*, per esempio attraverso la correzione – basata sulle esperienze dei lavoratori - di tutte le inefficienze che derivano dalla definizione di procedure di sicurezza difficilmente attuabili nelle condizioni di lavoro reali, determinate dalla distanza esistente tra chi immagina il lavoro (e definisce le regole) e chi il lavoro lo esegue e quelle regole si tro-

va ad applicarle. Chi lavora, vede il rischio nella sua dimensione dinamica, vede come esso cambia mentre lo si esegue ed è costantemente costretto ad adattarsi alle nuove condizioni, a fare piccoli “aggiustamenti”, non previsti dalle procedure.

Purtroppo, come dicevo, quello della partecipazione dei lavoratori è uno strumento sottoutilizzato e lo è, per primo, proprio dai lavoratori stessi che frequentemente “delegano” al RLS il compito di “occuparsi” della loro sicurezza, piuttosto che vivere la sicurezza proattivamente lasciando che uno di loro li rappresenti. In effetti un tema molto importante che andrebbe affrontato riguarda l’elemento culturale che confonde l’assenza di incidenti con la sicurezza. Questo spinge i lavoratori (e non solo loro) a dare per scontata la sicurezza (gli incidenti hanno la caratteristica di manifestarsi raramente), abbassando la guardia, finendo col disinteressarsi ad essa in quanto la si considera un risultato definitivamente conseguito a patto di continuare ad applicare le misure di prevenzione e protezione fino a quel momento applicate ed emerse come necessarie agli esiti della valutazione dei rischi.

Al contrario la sicurezza è un elemento dinamico, poiché deriva dal controllo di rischi a loro volta dinamici, ed è il risultato emergente di un costante impegno nei confronti anche dei piccoli eventi, derivante da un’azione di consapevolezza collettiva.

La valutazione dei rischi, per come oggi è concepita e attuata, può dirsi attuale e adeguata per tutelare la salute e la sicurezza sul lavoro dei nuovi lavoratori (spesso ingaggiati con contratti di lavoro non standard) e/o di quei lavoratori che eseguono la prestazione di lavoro fuori dai locali aziendali? In che modo la normativa di riferimento dovrebbe essere adeguata ai nuovi contesti lavorativi e ai nuovi lavoratori?

Le maggiori criticità che si riscontrano nell’eseguire valutazioni dei rischi le vediamo proprio quando occorre gestire situazioni

caratterizzate da notevoli dinamicità, come nel caso di cantieri e appalti. In questi casi lo stesso ambiente circostante muta costantemente, le lavorazioni cambiano con l'avanzamento dell'opera e la valutazione complessiva è il risultato sinergico della cooperazione e del coordinamento di tutti i soggetti coinvolti. L'estrema dinamicità di questi lavori fa sì che essi risultino intrinsecamente più pericolosi di ambienti di lavoro più "statici", come dimostrano le statistiche degli infortuni. E questo nonostante l'adozione delle misure di cooperazione e coordinamento, a causa delle difficoltà per i datori di lavoro (committenti o appaltatori) di riuscire ad adattare costantemente e tempestivamente le proprie valutazioni e le misure di prevenzione e protezione a tutte le situazioni di rischio non previste.

A maggior ragione queste difficoltà si trasformano in impossibilità quando l'ambiente di lavoro nel quale si svolge la prestazione non rientra nella disponibilità giuridica del datore di lavoro. In quel caso, ammesso che si possa pervenire alla conoscibilità delle fonti di rischio presenti e conseguentemente procedere alla valutazione dei rischi, la stessa adozione delle misure di prevenzione e protezione sarebbe limitata se non inattuabile o, quantomeno, integralmente affidata alla responsabilità del lavoratore.

Un buon esempio di simili circostanze, a mio avviso, è rappresentato dall'utilizzo di mezzi di trasporto (auto, piccoli furgoni) per ragioni di lavoro. In questo caso la valutazione del rischio del datore di lavoro non può che limitarsi ad una corretta pianificazione degli spostamenti, l'acquisto di mezzi sicuri, controlli sull'abuso di alcol o la dipendenza da droghe (ove previsto) e poco altro ancora. Sembra già abbastanza, tutto sommato. E tuttavia gli infortuni mortali sul lavoro con mezzo di trasporto rappresentano da soli la metà del totale degli infortuni mortali sul lavoro. Questo risultato non è comprensibile se ci si limita ad affermare che la strada è un ambiente pericoloso. Occorre piuttosto osservare più da vicino la relazione esistente tra il lavoro e la strada, guardare come il lavoro su strada si sia modificato con

l'introduzione delle nuove tecnologie che hanno consentito di trasformare i veicoli in veri e propri uffici. Il lavoratore, durante il tragitto, non si limita a guidare ma svolge molteplici altre funzioni ad elevato impegno cognitivo – come parlare al telefono con colleghi o clienti - che distolgono la sua attenzione dalla strada. Oggi, il tempo passato alla guida viene considerato tempo improduttivo se destinato “semplicemente” al raggiungimento della destinazione. E questo è anche il percepito del lavoratore che non a caso, spesso, al di fuori dell'orario di lavoro pone in essere gli stessi atteggiamenti pericolosi alla guida del proprio veicolo che derivano da un'errata percezione del rischio.

In questi casi, dunque, non sarà la valutazione del rischio del datore di lavoro a fare la differenza, ma il possesso da parte del lavoratore di un'adeguata “cultura del rischio” ovvero di un *framing* basato su elementi razionali e di conoscenza che gli consentano di distinguere ciò che è pericoloso da ciò che non lo è, che poi altro non è se non la finalità della «formazione». Ritengo necessario precisare che nell'ipotizzare la formazione quale strumento fondamentale per la gestione di alcuni di questi rischi emergenti, non mi riferisco a come questo strumento è stato finora inquadrato nell'erogazione di corsi conformi alle previsioni degli Accordi Stato-Regioni. Al contrario occorre riappropriarsi del significato che inizialmente il legislatore ha assegnato alla formazione, ben riconoscibile nell'incipit della definizione di cui all'art. 2, comma 1, lett. *aa*, del d.lgs. n. 81/2008: «processo educativo».

Inevitabilmente, sempre più, il lavoratore in contesti del genere dovrà diventare protagonista e responsabile della propria sicurezza, a meno di non imporre l'adozione di mezzi di controllo a distanza del suo operato che, francamente, non mi auguro.

Le attuali disposizioni previste per la tutela dei lavoratori che utilizzano videoterminali (titolo VII, d.lgs. n. 81/2008) può essere considerata come attuale e idonea per tutelare la salute e la sicurezza dei lavoratori che eseguono oggi la

prestazione di lavoro a distanza oppure dovrebbe essere modificata in virtù di quella flessibilità che alcune forme di lavoro (es. lavoro agile) vorrebbero attribuire al lavoro da remoto?

La Direttiva europea dalla quale deriva l'attuale titolo VII del d.lgs. n. 81/2008 risale al 1990 e da allora non ha subito evoluzioni, né l'attuale titolo VII differisce sostanzialmente dall'iniziale recepimento nel d.lgs. n. 626/1994 della Direttiva. In verità, si è approfittato della scrittura del Testo unico per inserire qualche innovazione, come l'obbligo di fornire al lavoratore mouse e tastiera separati e almeno un supporto per lo schermo nei casi di impiego di computer portatili come postazioni fisse. Tuttavia, questa stessa modifica è un segnale dell'obsolescenza delle previsioni tecniche contenute di una Direttiva che, come si dice in questi casi, «è invecchiata male». Agli inizi degli anni Novanta i computer erano essenzialmente i terminali da installare su postazioni fisse. I laptop erano strumenti costosissimi e di limitato impiego a causa della durata pressoché nulla della batteria e delle dimensioni dello schermo (tralasciando il peso e le dimensioni che ne facevano più un “portabile” che un “portatile”) e smartphone e tablet erano ancora al di là da venire. Lo stesso World Wide Web e il protocollo HTTP non esistevano ancora.

I rischi derivanti dall'uso del videoterminale non erano completamente noti e, comunque, erano fortemente dipendenti dalla concezione dello strumento dell'epoca e dall'impiego limitato che se ne faceva. Al contrario, se oggi si mette a disposizione di un lavoratore un computer, è persino pleonastico porsi il problema se egli supererà o meno il monte di 20 ore alla settimana, una durata che invece all'epoca non era da darsi per scontata.

Per questi e altri motivi ancora, non c'è dubbio che il titolo VII sia più che inadeguato per fronteggiare i rischi derivanti dall'impiego odierno dei videoterminali. La stessa definizione di videoterminale andrebbe rivista e dovrebbero altresì essere ri-

considerati i rischi che derivano dal loro impiego, oggi limitati a quelli per gli occhi, la vista e l'apparato muscoloscheletrico.

Il principale effetto che la diffusione di questi strumenti ha portato alle nostre vite è quello che si rileva nel numero di attività che possono essere svolte senza mai doversi alzare da una scrivania. Nello specifico, è aumentato il monte ore quotidiano che alcune categorie di professioni svolgono in modalità “sedentaria”, uno stile di vita che si prolunga anche al di fuori del tempo lavorativo. Inoltre, come hanno potuto verificare in tanti durante il periodo trascorso a casa in modalità di lavoro da remoto a causa della pandemia, in queste circostanze i tempi di lavoro, spesso, si dilatano; le pause tra un'attività e l'altra, per esempio riunioni o incontri, si riducono quasi a zero perché lavorando da remoto e mediante videoconferenze si annullano persino i tempi morti necessari per spostarsi alzarsi dalla sedia, salutare i presenti e spostarsi da una sala riunioni all'altra. Sarebbe interessante in effetti sapere quanti lavoratori lavorando da casa abbiano usufruito delle pause di 15 minuti previste dalla normativa ogni 2 ore di lavoro continuativo.

A fronte della dematerializzazione del concetto di “organizzazione” del lavoro, quale ruolo assumono i modelli di organizzazione e gestione e in che modo potrebbero governare quella indeterminatezza che oggi troviamo in molti luoghi di lavoro posti spesso fuori dal diretto controllo del datore di lavoro (come la residenza, il domicilio del lavoratore o un luogo terzo)?

La prima domanda da porsi è se i modelli di organizzazione e gestione abbiano mai funzionato nel migliorare la gestione dei rischi. I dati, ufficialmente, ci dicono di sì, mostrando come le aziende certificate con modelli OHSAS 18001 o ISO 45001, abbiano visto una riduzione dei loro indici infortunistici.

Io non sono sicurissimo della solidità di queste conclusioni e, senza necessariamente mettere in discussione la dichiarata ridu-

zione del fenomeno infortunistico nelle aziende certificate, non sono pronto a scommettere che tale risultato sia da addebitarsi al modello in sé più che a un maggiore impegno nei confronti della sicurezza che sempre questi modelli portano con sé. Insomma, il beneficio potrebbe essere più il risultato di un effetto secondario del metodo che del metodo stesso.

I modelli di organizzazione e di gestione sono un ulteriore esempio della concezione *Top-Down* della sicurezza a cui accenavo nella prima parte di questo colloquio e che ben si presta a quei sistemi organizzativi che si reputa possano essere governati con una concezione scientifica del lavoro di stampo Tayloristico (chiaramente evoluta rispetto all'impostazione dei primi del '900 immaginata dallo stesso Taylor). I sostenitori di questa idea ritengono che le procedure siano il modo migliore, più efficiente e più sicuro per far funzionare il lavoro stesso. Tutto ruota attorno a procedure - che assurgono al ruolo di Totem - redatte da persone che non svolgono il lavoro in prima persona, che spieghino a chi svolge il lavoro come deve eseguirlo.

Ci sono dei vantaggi indiscutibili in questo approccio: uniformità dei comportamenti, prevedibilità delle azioni, chiara definizione del "chi fa cosa". Esse, tuttavia, hanno anche dei lati negativi che i sostenitori del metodo tendono ad ignorare. In genere le procedure non tengono conto degli imprevisti, delle urgenze, delle contingenze che il lavoratore giorno per giorno deve affrontare adottando pratiche lavorative che spesso comportano scostamenti, necessari per adattare la realtà alla teoria, o il prendere scorciatoie, per svolgere attività che nel tempo a disposizione non potrebbe portare a termine rispettando pedissequamente la procedura.

Si genera così un circolo vizioso nel quale il lavoratore verrebbe criticato per la sua rigidità laddove seguisse pedissequamente le procedure, nonostante queste durante lo svolgimento del compito manifestassero dei limiti evidenti che gli impedissero di portare a termine il lavoro nei tempi previsti. Ma se costui se ne di-

scostasse e accadesse qualcosa, verrebbe incolpato della violazione della procedura.

Ora, in verità, l'approccio tramite procedure sin qui criticato determina indubbi benefici per quelle attività caratterizzate da sequenzialità di azioni, sostanzialmente fisse e prevedibili, poco influenzabili da cause esterne che ne possano mutare lo svolgimento. Il problema è che invece questo approccio è stato esteso, anzi espressamente consigliato, ad organizzazioni complesse - proprio in ragione della loro complessità - con l'intenzione di semplificarle, generando un'illusione di controllo dell'incertezza ben lontana dal reale controllo che si possiede.

Ritengo che la strada da perseguire sia quella dell'abbandono del determinismo causale e dell'approccio esclusivamente *Top-Down*. Si tratta di accettare l'esistenza di un divario tra le procedure e la pratica lavorativa e, anziché tentare di colmare la distanza (aumentando l'illusione del controllo), impegnarsi a comprenderne le motivazioni, sviluppando nel contempo la "cultura del rischio" dei lavoratori, ovvero le capacità di adattamento degli stessi alle condizioni impreviste che si verificano quotidianamente e la loro attitudine a rispondervi con comportamenti sicuri.

Medico del lavoro: una professione in evoluzione?

Francesco Violante

La legislazione italiana in materia di salute e sicurezza sul lavoro le pare adeguata ai tempi moderni e a presidiare i “luoghi di lavoro” attuali? Che tipo di interventi e modifiche dovrebbero essere apportate all’impianto normativo di riferimento?

Premetto che la risposta alla sua domanda è un chiaro no, ma vorrei contestualizzare questo no e soprattutto accennare a quelle che possono essere ipotesi di adeguamento alla situazione attuale della legislazione in materia di salute e sicurezza del lavoro in Italia. Premetto intanto che un medico del lavoro necessariamente è una persona che ha molto a cuore gli aspetti del diritto che regolano le attività lavorative perché la medicina del lavoro è una disciplina che può essere praticata solo di pari passo alla legalità del lavoro: nel lavoro nero non esiste sicurezza, non esiste salute, non esiste nulla di quello che noi oggi consideriamo una acquisizione degli ultimi possiamo dire anche 150 anni di storia. Quindi grazie di nuovo per avermi invitato a parlare di questi temi.

Ora, perché prima ho detto che la legislazione italiana non è adeguata alla situazione attuale? Vorrei ripercorrere la strada che abbiamo alle nostre spalle per poter disegnare il nostro futuro. Da dove veniamo: nell’Italia del dopoguerra, fino alla fine degli anni Sessanta l’INAIL riconosceva ogni anno in quel decennio, in media, più di un milione di infortuni sul lavoro, di cui in media 1.800 mortali. Dove siamo oggi: gli infortuni riconosciuti dall’INAIL si sono ridotti a meno della metà e gli infortuni mortali fortunatamente si sono ridotti a meno di un terzo, ma hanno anche cambiato natura perché l’infortunio mortale oggi è di re-

gola un infortunio nel traffico cioè un incidente stradale occorso ad una persona sta lavorando e questo in qualche modo ci dice che i luoghi di lavoro italiani sono diventati molto più sicuri che in passato. Quindi la situazione è sicuramente cambiata dal punto di vista degli effetti delle condizioni di lavoro ma è cambiata anche dal punto di vista del lavoratore. Negli anni che ho ricordato l'Italia era un paese in forte sviluppo industriale: eravamo usciti dalla Seconda guerra mondiale ancora come un paese in qualche modo prevalentemente agricolo dal punto di vista dell'impiego della manodopera. In quel periodo si sviluppa tumultuosamente l'industria che poi cederà il passo dagli anni Ottanta-Novanta in avanti alla completa maturazione dell'Italia come un sistema post-industriale, in cui la manodopera impiegata nell'industria è molto inferiore dal punto di vista numerico alla manodopera impiegata nei servizi mentre i lavoratori impiegati nell'agricoltura sono, al passo con tutti gli altri paesi europei, intorno a poco più del 5 per cento.

Quindi abbiamo una situazione in cui è cambiata radicalmente la qualità del lavoro: il lavoro industriale oggi si è ridotto come numero di persone che impiega (anche se l'Italia rimane sempre la seconda manifattura europea dopo la Germania) ma gran parte del lavoro che prima era associato al concetto stesso di fatica oggi è automatizzato, con operazioni svolte da macchine o addirittura da robot. Un elemento di grandissima importanza è la qualificazione dei lavoratori: stiamo parlando di un paese in cui i due terzi della forza lavoro ordinaria hanno almeno un titolo di scuola media superiore e una buona parte è anche laureata (anche se il numero di laureati che creiamo nel nostro paese è ancora inferiore alla media europea e a quello che desidereremmo). Quindi, cosa cambia in questo contesto?

Oggi noi siamo ancora alle prese con una legislazione che in gran parte è mutuata da concetti che sono stati elaborati negli anni Cinquanta: il concetto di unicità del luogo di lavoro, quello di passività del lavoratore ed altri, soprattutto aspetti che riguar-

dano le modalità con cui il lavoro viene organizzato e reso. Improvvisamente lo scorso anno, con l'emergenza pandemica, moltissimi lavoratori italiani hanno improvvisamente scoperto che cos'era il lavoro agile, che cosa significava lavorare da casa: stiamo parlando di lavoratori impiegati essenzialmente nel settore dei servizi o, se nell'industria, essenzialmente di impiegati (ovviamente non di lavoratori addetti alla manifattura o a servizi che richiedono la presenza sul luogo di produzione). Bene, abbiamo scoperto che il lavoro può essere reso in maniera del tutto diversa da quella che immaginavamo, con un sistema legislativo che invece è ancora fermo al concetto che si entra in fabbrica o si entra in ufficio, si vive in quella realtà per un certo numero di ore e dopo si torna a casa. Abbiamo quindi necessità di modernizzare la nostra legislazione se vogliamo consolidare i buoni risultati che abbiamo raggiunto fino ad ora ma soprattutto se vogliamo affrontare gli aspetti che fino ad oggi non abbiamo affrontato.

Questi aspetti si chiamano mortalità differenziale per professioni: se vorrà magari posso commentare ancora questo problema, che è il più grosso problema di salute occupazionale dei lavoratori italiani ma di cui non si parla mai.

Come giustamente afferma, oggi ci troviamo di fronte a un confine che è sempre più labile tra quelli che sono gli spazi di lavoro e di vita privata. Come cambia la determinazione e la concezione dei rischi professionali da questo punto di vista? E ancora: come incidono questi fattori di trasformazione sulla determinazione del nesso causale per la qualificazione di una malattia come professionale?

Mi faccia commentare prima il tema del confine tra la salute occupazionale e la salute personale cioè tra gli aspetti di sanità pubblica e gli aspetti strettamente medici. Se osserviamo la salute occupazionale in modo tradizionale (cioè il numero di infortuni mortali e il numero di malattie professionali con esito mortale) ci ritroviamo con un numero che è talmente tanto piccolo da ma-

scherare in qualche modo la realtà del fenomeno della salute occupazionale. Tra gli infortuni mortali e malattie professionali con esito mortale che l'INAIL riconosce, siamo a meno di 1.000 casi all'anno. Un numero non piccolo, per carità, se pensiamo solo che in termini di infortuni mortali significa che ogni giorno qualcuno di noi esce di casa e non ritorna più alla sera: questo è un fatto drammatico, anche se ormai si tratta di poche centinaia di casi, è un numero che noi vogliamo tenda il più possibile a zero, al più presto possibile, soprattutto con riferimento agli infortuni mortali che avvengono all'interno del luogo di lavoro dove, quando si verifica un infortunio mortale, significa che la prevenzione non ha funzionato. Diverso è il discorso dell'infortunio mortale che in realtà è un incidente stradale, dove il comportamento della persona alla guida può influire al di là di quelle che sono le misure di prevenzione predisposte dal datore di lavoro. Un paese civile, come noi vogliamo essere, è un paese in cui il numero di infortuni mortali che avvengono nei luoghi di lavoro deve necessariamente tendere a zero, e lo stesso discorso vale per le malattie professionali con esito mortale. Quelle che l'INAIL riconosce ancora oggi sono per la gran parte tumori ritenuti di natura professionale, nella loro maggioranza figli dell'esposizione all'amianto che abbiamo avuto almeno fino all'inizio degli anni Ottanta: disgraziatamente, con l'amianto che produce i suoi effetti mortali a distanza di 40 - 50 anni dall'inizio dell'esposizione, questi casi ci toccheranno ancora per diversi anni (anche se fortunatamente si stanno riducendo).

Qual è allora il problema di salute occupazionale principale in Italia? Questo ci riporta ad un tema di salute pubblica e quindi ai confini tra il lavoro e la vita privata. Se osserviamo la mortalità differenziale per professioni ci rendiamo conto che in Italia ancora oggi tra i lavoratori manuali non qualificati e i lavoratori non manuali qualificati esiste un differenziale di speranza di vita di cinque anni. Questo significa che un manovale impiegato nell'edilizia vivrà probabilmente cinque anni in meno di un giudice: da che cosa deriva questo differenziale di speranza di vita?

In parte probabilmente deriva anche da esposizioni professionali, ma in gran parte deriva dal fatto che determinate attività lavorative sono associate a stili di vita che non promuovono la salute delle persone o a stili di vita che possono attivamente minare la salute delle persone come ad esempio fumare, fare uso di alcol in maniera eccessiva, e via di seguito. Questo è un problema importante conosciuto peraltro in tutti i paesi avanzati, non solo in Italia, è un problema che condividiamo con gli altri paesi, anche i più ricchi, ed è un problema che dobbiamo affrontare perché il numero di anni di vita che vengono persi dai lavoratori italiani che si trovano nella parte più bassa della classifica della speranza di vita è un numero che non si misura in migliaia, si misura in milioni all'anno e quindi da questo punto di vista è un tema che dobbiamo affrontare al più presto possibile.

Veniamo invece ora al tema delle malattie professionali: qui abbiamo bisogno di fare una completa revisione del nostro sistema di riconoscimento delle malattie professionali. Quello attuale è figlio della visione degli anni Cinquanta, quando le malattie professionali si chiamavano silicosi o intossicazioni e quindi se una persona aveva una malattia di quel genere la malattia si poteva considerare praticamente certa la connessione a una determinata attività lavorativa. Oggi le malattie professionali prevalenti, nella grande maggioranza (stando alle statistiche INAIL siamo a più del 75%) sono malattie muscolo-scheletriche in cui il lavoro può al massimo avere il ruolo di concausa ma non ha quasi mai il ruolo di singola causa efficiente. Questo comporta necessariamente un ripensamento non solo del sistema con cui l'INAIL riconosce le malattie professionali, ma anche come una malattia professionale può essere considerata a livello di giustizia civile e soprattutto come una malattia professionale concausata, in cui non sono quasi mai certo della natura esclusivamente occupazionale nella malattia venga vista dalla giustizia penale.

Abbiamo lasciato i giudici soli a confrontarsi con questo problema, quando in realtà questo problema doveva essere affronta-

to dal legislatore soprattutto per coniugare l'obiettivo di tutelare efficacemente il lavoratore con quello di evitare di intasare i tribunali con procedimenti sia civili che penali che non hanno esiti efficaci dal punto di vista della prevenzione. Sempre se guardiamo le statistiche INAIL delle malattie professionali che vengono riconosciute, un numero larghissimo di malattie si trova nella zona di cosiddetta franchigia, in cui l'INAIL non riconosce un indennizzo al lavoratore perché il danno biologico non supera il 5%. Quasi sempre questi casi, una volta che l'INAIL abbia riconosciuto la natura professionale della malattia ma non abbia indennizzato il lavoratore perché si trova al di sotto della soglia, si trasformano in un procedimento presso il tribunale civile perché il lavoratore chiede al datore di lavoro il risarcimento che non ha ottenuto dall'INAIL. Siamo proprio convinti che questo sia un sistema che va a vantaggio dei lavoratori e della comunità nel suo complesso?

Si tratta di un tema che va ripensato, ma a livello di legislatore, senza lasciare i giudici a supplire quella che è un'inerzia del legislatore nell'affrontare un problema che sicuramente è in attesa di attenzione da molti anni, perché non è da adesso che le malattie muscolo-scheletriche sono diventate le malattie professionali prevalenti.

L'ultimo decreto ministeriale che ha modificato la tabella delle malattie professionali risarcibili inserendo tra queste quasi tutte le malattie muscolo-scheletriche è del 2008: quindi questo è un problema col quale ci stiamo confrontando da oltre dieci anni. Guardando le statistiche INAIL è sicuramente tempo di affrontare questo tema con un ripensamento complessivo del modo con cui la legislazione italiana tratta le malattie professionali che hanno origine polifattoriale: sulle altre patologie dovute ad una causa specifica dal punto di vista della esposizione lavorativa non c'è bisogno di intervenire. Queste infatti sono le malattie rispetto alle quali la nostra legislazione è stata concepita.

La gestione della emergenza sanitaria causata dalla pandemia ha evidenziato come il medico competente abbia un ruolo strategico all'interno delle organizzazioni produttive e di lavoro dunque nel sistema di salute occupazionale ma anche all'esterno, nel raccordo che questa figura può cioè effettuare con le autorità sanitarie. Lei ritiene che il medico competente possa giocare un ruolo ulteriormente strategico per realizzare quelle connessioni di sistema di cui parlavamo e dunque una innovativa finzione di raccordo tra salute pubblica e salute occupazionale?

Questo è un argomento estremamente importante che ci riporta ancora una volta al tema della legislazione perché la pratica del medico del lavoro - medico competente è normata addirittura in modo minuto dalla legislazione attuale. Le faccio un esempio: la Medicina del Lavoro è l'unica specialità medica che ha una cartella clinica imposta per legge. Se legislatore definisse qual è la cartella clinica che devono usare i cardiologi, questi probabilmente si rivolgerebbero ai colleghi psichiatri per chiedere se il legislatore era presente a se stesso nel momento in cui ha preso una simile decisione. Ripeto, siamo in una situazione che è figlia di un'impostazione degli anni Cinquanta.

Qui vorrei solo sottolineare alcuni punti generali perché se no rischiamo di stare fino a sera su questi argomenti. Allora, primo punto è corretto che il medico competente si ponga come consulente globale per la tutela della salute dei lavoratori e come lei ha detto è già così in parte della delle attività economiche italiane. Sto pensando alla grande industria, la grande industria multinazionale delle aziende italiane che competono nel mondo: lì il medico competente svolge già questa funzione e svolge anche funzioni di supporto ai lavoratori in tema di scelte che riguardano la propria salute, anche al di fuori della attività lavorativa e anche perché, in generale, in queste aziende i rischi lavorativi sono stati già più che efficacemente controllati. Però dobbiamo tenere presente un aspetto rilevante che noi medici del lavoro

mutuiamo da come voi i giuslavoristi studiate le realtà lavorative. La metà circa dei lavoratori italiani è impiegata in aziende che hanno meno di 10 addetti: siamo sicuri che la legislazione italiana che è impostata, diciamo, come quegli ambiti di cui esiste una sola taglia, sia la legislazione corretta per le microimprese? Io personalmente (e la Società Italiana di Medicina del Lavoro con me) ritengo di no perché la legislazione che può funzionare per una grande impresa (dove peraltro il tema della rappresentanza dei lavoratori è normalmente molto robusto e si è abituati ad una cogestione, a una gestione collettiva degli aspetti che riguardano la salute nei luoghi lavorativi) non può essere la stessa che regola gli obblighi nelle microimprese, dove molto spesso il datore di lavoro condivide l'esperienza diretta di lavoro dei suoi dipendenti e molto spesso (sfortunatamente proprio per le dimensioni dell'impresa) non ha a disposizione tutte quelle risorse finanziarie, tecnologiche, organizzative e di *know how* di cui può disporre la grande impresa.

Da questo punto di vista le microimprese dovrebbero essere in qualche modo sostenute con una legislazione che sia ovviamente anche severa su certi aspetti che riguardano le misure di prevenzione ma che in qualche modo configuri un ruolo di supporto da parte della pubblica amministrazione che consenta a queste imprese di svolgere la loro attività presidiando il modo efficace la salute dei loro addetti, così come fa la grande impresa.

Quanto al tema dell'offerta formativa questa va sicuramente ampliata nei confronti del medico del lavoro perché c'è un punto molto importante che è l'interdisciplinarietà delle professionalità che devono confrontarsi con i temi di salute occupazionale, soprattutto quando questi temi si trovano sempre più interrelati con i temi di salute personale. Quindi anche nella abitudine alla attività interdisciplinare c'è un'occasione di formazione reciproca per tutte le figure che operano a questo livello.

Un altro degli aspetti che secondo me vanno superati, e sui quali la Società Italiana di Medicina del Lavoro è da tempo impegnata

con proposte concrete, è il modello stesso con il quale il medico del lavoro opera, perché la nostra legislazione sostanzialmente vede il medico competente come se fosse un medico di famiglia cioè si occupa da solo di tutto quello che fa parte della sua sfera di competenza. Tuttavia, la complessità dei problemi di cui ci stiamo occupando richiede spesso un impegno collettivo: ad esempio nella grande impresa normalmente di medici del lavoro ce n'è ben più d'uno e in questo modo si riescono anche a presidiare in modo adeguato le diverse aree nelle quali si deve intervenire. Va quindi ripensato il modello di attività della medicina del lavoro, salvaguardando il ruolo di consulente globale del medico del lavoro sia per il datore di lavoro sia per i lavoratori, perché bisogna sottolineare il ruolo che il medico competente ha nei confronti dell'intera comunità aziendale, non limitando il ruolo di questo professionista all'aspetto delle visite mediche e del giudizio di idoneità, aspetto senz'altro rilevante ma al quale solo non si può ridurre l'attività del medico del lavoro.

Come giudica le relazioni di intercorrono nei luoghi di lavoro tra i diversi professionisti della sicurezza? C'è comunicazione e confronto costruttivo? Ritiene necessarie competenze interdisciplinari trasversali per il medico competente in modo da relazionarsi più agilmente è con queste nuove figure professionali?

Queste nuove figure professionali sono sicuramente necessarie: faccio un esempio magari un po' banale. Pensiamo al tema degli infortuni: l'infortunio è normalmente visto a livello della comunità aziendale come un problema dell'ingegnere della sicurezza, cioè un problema essenzialmente tecnologico. È vero che un infortunio avvenuto su una macchina è collegato a qualcosa di tecnologico, ma l'infortunio trova origine anche in aspetti personali: ad esempio quell'infortunio non sarebbe accaduto se il comportamento del lavoratore o di altri fosse stato diverso.

Nei fattori che determinano un evento sicuramente c'è la tecnologia ma altrettanto sicuramente c'è l'organizzazione e c'è il

comportamento di qualcuno: ora, tutti questi aspetti a livello aziendale sono domini di figure diverse quindi il medico del lavoro ha necessità di approfondire questi aspetti per interfacciarsi in modo più efficace, ad esempio, con l'ingegnere della sicurezza per collaborare alla riduzione degli infortuni attraverso le sue competenze che sono competenze importanti dal punto di vista dello studio del comportamento (la medicina, come io dico spesso, è la regina delle scienze umane perché oggetto di interesse del medico è l'essere umano). Spesso, la riduzione degli infortuni non si può ottenere soltanto con misure tecnologiche ma bisogna coniugare i tre aspetti che citavo prima: i comportamenti, cioè le persone, l'organizzazione e la tecnologia. Il medico del lavoro sicuramente ha qualcosa da dare e qualcosa da ricevere dagli altri professionisti: per essere efficaci nella collaborazione interdisciplinare, però, bisogna comprendere anche gli schemi degli altri professionisti e quindi saper interagire con loro.

Con riferimento alle plurime attività che il medico competente è chiamato a svolgere, ritiene che i medici del lavoro oggi siano dotati di sufficienti competenze per gestire un ruolo sempre più complesso e il moltiplicarsi dei fattori rischio?

Io intanto partirei da un aspetto che avevo citato prima, quello della mortalità differenziale per professioni. L'effetto della mortalità differenziale per professioni si manifesta quando il soggetto ha lasciato l'attività lavorativa. Tempo fa, raccontavo ai miei studenti che il medico del lavoro sembra una strana persona che vede gli esseri umani nascere più o meno già adulti, dai 20 ai 30 anni, e poi li vede scomparire in più o meno buona salute dai 60 ai 65 anni. La finestra di osservazione di un medico del lavoro è molto particolare, ma noi dobbiamo occuparci dell'esperienza di salute delle persone nel loro complesso e sappiamo che essa può essere determinata da quello che è successo nella loro vita precocemente. Non occorre diventare pediatri, ma sicuramente le anamnesi che facciamo non devono essere limitate soltanto

all'inizio dell'attività lavorativa e dobbiamo assumere la responsabilità dell'attività delle persone durante la loro età adulta (quindi quando lavorano) ma soprattutto per capire che cosa succederà della loro salute quando avranno lasciato l'attività lavorativa e quindi quando le malattie che possono essere collegate agli stili di vita in alcuni contesti si manifesteranno. Questo concetto è stato anche formalizzato, ad esempio, nel concetto statunitense della *total worker health* dove è chiaramente nato anche per aspetti di carattere assicurativo (negli USA la società ha spesso a carico l'assicurazione sanitaria dei lavoratori anche dopo che hanno lasciato l'attività lavorativa e prima che queste persone magari entrino in altri schemi di carattere assicurativo).

La *total worker health* a mio parere illustra molto bene il concetto per cui io mi occupo di te durante la tua vita adulta affinché tu possa vivere in modo pieno e soddisfacente anche la tua vita post-lavorativa. Io sono il tuo medico della vita lavorativa ed essere questo significa farti stare bene durante il periodo lavorativo e fare in modo che tu possa stare bene anche dopo che l'attività lavorativa sarà terminata. Questo chiaramente richiede competenze che vanno affinate: la medicina del lavoro è una disciplina molto difficile che richiede alla persona che voglia praticarla in modo adeguato un discreto (non completo, perché non è possibile) dominio gli aspetti molto differenti tra loro che vanno dalla tecnologia all'igiene del lavoro, alla tossicologia, alla epidemiologia, agli aspetti di psicologia del lavoro e via di seguito, più buone competenze cliniche che spaziano più o meno dappertutto perché la medicina del lavoro è una specializzazione eziologica e non è una specializzazione d'organo. Quindi, ci si deve occupare delle malattie professionali siano esse problemi di carattere psicologico che problemi di tossicità per il fegato di una certa sostanza chimica: si tratta quindi di un dominio scientifico estremamente complesso che nessuno può dominare a 360 gradi, anche se un minimo di conoscenza di tutti questi diversi aspetti è necessario. È proprio questo che rende la disciplina da un lato molto interessante per la varietà degli aspetti con i quali bisogna

avere familiarità, dall'altro ovviamente particolarmente complessa e particolarmente difficile: quindi, l'impegno dal punto di vista dello studio e dell'aggiornamento del medico del lavoro è molto rilevante e spesso sottovalutato da chi non ha una visione adeguata dell'attività del medico del lavoro. Si passa molto tempo a lavorare, ma se ne deve passare altrettanto a studiare.

Ha più volte sottolineato la stretta connessione tra quella che è la salute occupazionale e la salute pubblica. È a conoscenza di buone prassi da segnalare e che tipo di prassi?

Direi che da questo punto di vista, fortunatamente, non abbiamo carenza di riconoscimenti di buoni risultati nel campo della salute occupazionale intesa nel suo senso più ampio: farò degli esempi che possono sembrare un po' fuori tema ma che secondo me non lo sono.

Ad esempio sicuramente quelle aziende che troviamo nelle classifiche dei migliori posti dove lavorare hanno implementato in maniera adeguata sia i temi della sicurezza nell'attività lavorativa sia i temi che riguardano la conciliazione tra la vita lavorativa e la vita extralavorativa nel senso di salute durante il lavoro e salute dopo il lavoro perché questo è un fatto estremamente importante per il medico del lavoro. Faccio un esempio forse banale, ma che senso ha fare tutto il possibile perché un saldatore non respiri fumi di saldatura quando poi magari quella persona fuma 20 sigarette al giorno? Non posso fare a meno di occuparmi dell'abitudine al fumo di un saldatore che devo proteggere dall'esposizione a fattori di rischio per l'apparato respiratorio: sarebbe fare un lavoro a metà.

Questo è solo un esempio della necessaria correlazione che c'è tra gli aspetti che riguardano attività lavorativa e la salute generale ma ci sono tanti altri aspetti che riguardano la salute lavorativa intesa anche come miglioramento della salute delle persone e sono aspetti che magari sono meno riconosciuti perché hanno poco a che fare con gli agenti fisici, chimici, o biologici nocivi

che possono essere presenti nell'attività lavorativa. Ad esempio, un elemento che deve essere considerato è la politica delle aziende che cercano di supportare l'occupazione femminile: in Italia abbiamo un grosso problema di partecipazione delle donne al lavoro da un lato e, lasciatemi dire, dall'altro anche di partecipazione degli anziani. Sembra che si cerchi sempre di uscire dall'attività lavorativa al più presto possibile, quando noi sappiamo dal punto di vista scientifico che un'attività lavorativa sana, protratta nel corso della vita, è legata ad un aumento della speranza di vita. Quindi abbiamo bisogno di politiche che facciano in modo che le persone possano lavorare il più a lungo possibile e che la partecipazione delle donne al lavoro venga potenziata: noi stiamo sprestando un enorme potenziale nel nostro paese, avendo la partecipazione delle donne al lavoro più bassa di quella di tutti gli altri paesi più sviluppati.

Anche il tema dell'attenzione al fatto che donne e uomini non sono identici nella loro vita normale quindi non lo sono anche come lavoratori è importante: è vero che spesso si usa il termine di "lavoratore" per indicare sia il lavoratore sia la lavoratrice: tuttavia, le aziende che mostrano la loro attenzione a questa diversità che quindi si fanno carico dei problemi dei lavoratori e dei problemi delle lavoratrici sono sicuramente esempi che dovrebbero essere seguiti in maniera molto attenta perché sono i punti di eccellenza del nostro paese e di eccellenza di quelle che chiamiamo le condizioni della vita lavorativa.

Part V.
**WORK-RELATED CHANGES:
AN OVERVIEW**

Chapter I.
**THE IV INDUSTRIAL REVOLUTION:
TECHNOLOGY AND PROCESSES**

1. The IV Industrial Revolution: More than a Technological Phenomenon

The notion of the ‘IV Industrial Revolution’ – to which many simplistically refer as ‘Industry 4.0’ or ‘Smart Company’ – should be examined against the backdrop of a wider set of technological, demographic, economic and social transformations which have been examined from different perspectives recently. Among those who have provided a holistic analysis of this paradigm, see K. SCHWAB, *The Fourth Industrial Revolution*, WEC, 2016. Besides examining technological macro-trends, he also considers some deep social changes, such as increasing social inequalities, new urbanisation phenomena – e.g. smart cities – scientific progress in the medical and biological fields, which also has demographic implications. F. SEGHEZZI, *La nuova grande trasformazione. Persona e lavoro nella quarta rivoluzione industriale*, ADAPT University Press, 2017, p. 1, points out that “one of the main limitations of Fourth Industrial Revolution research is that it only concerns the technological dimension”. In this sense, the fact that the expression ‘Industry 4.0’ has been used in many languages has led one “to think that this phenomenon was only about a new phase of good and raw materials manufacturing” (*idem*, p. 9). However, besides the doubts concerning the interpretation of the old sectoral distinction within the modern digi-

tal economy, the change we are facing might lead one to wonder “if enough differences exist to move on from those economic and social paradigms consolidated in the Fordist era, which were difficult to question in Post-Fordism” (*idem*, p. 13). In the same year, Butera takes for granted the ongoing technological transformation, stressing that its impact will be visible beyond companies. The A. poses the following question: “How will firms, companies, business networks, industrial platforms, cities, local system, organisation, work, societies look like? What about the life of people who will make use of these technologies, which might also dominate their existence?” (F. BUTERA, *Lavoro e organizzazione nella quarta rivoluzione industriale: la nuova progettazione socio-tecnica*, in *L’Industria*, 2017, No. 3, p. 291). The same views are expressed by E. RULLANI, *Lavoro in transizione: prove di Quarta Rivoluzione industriale in Italia*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *Il lavoro 4.0. La Quarta Rivoluzione industriale e le trasformazioni delle attività lavorative*, Firenze University Press, 2018, p. 425, who points out that the changes underway are not only technological ones. This is because “the pervasive nature of digitalisation in most activities (production, consumption) produces a new context, a new way of working and living [...] a new cognitive ecosystem is developing, where many bottom-up micro-changes self-organise, giving rise to a changing landscape promoting exchange and sharing. Here, autonomous spaces co-exist, along with relational mechanisms which renew links on a regular basis”.

Referring to the notion of the ‘Fourth Industrial Revolution’ also investigating the research which has tried to understand its nature. Divergent views exist, which also depend on the historical moment they were developed. Recently, a technological paradigm has been put forward, which was defined as “a coherent group of new technological systems, structural changes to the global economy in a new institutional and social context”. In this regard, a conception was developed which started from technological characteristics of a particular period and then in-

cluded other aspects. This process has an impact on “restructuring processes and changes to employment distribution, calling for the need for institutional changes to economy and labour market regulation” (G. VALENDUC, P. VENDRAMIN, *Digitalisation, between disruption and evolution*, in *Transfer*, 2017, Vol. 23, No. 2, p. 125). This industrial revolution rests on a new technological paradigm and can be investigated also through the analysis model of scientific revolutions proposed for the first time by T. KHUN, *The Structure of Scientific Revolutions*, University of Chicago Press, 1962. This model was further widened by C. PEREZ, *Structural change and assimilation of new technologies in the economic and social systems*, in *Futures*, 1983, Vol. 15, No. 5, through a new interpretation of the wave theory put forward by N.D. KONDRATIEFF, *The Long Waves in Economic Life*, in *The Review of Economic Statistics*, 1935, Vol. XVII, No. 6. According to this theory, the capitalist system comprises two integrated sub-systems: the techno-economic one and the social and institutional one. Profit and technological development are the main catalysts for innovation and social changes and result from new and more productive ways of achieving them. During the ascending phase of the wave – *i.e.* when profit and productivity increase – some benefits are visible also in socio-economic terms. Specifically “a close integration between the institutional, economic and social sphere can be seen, which generates a type of complementarity based on a technological style” (C. PEREZ, *op. cit.*, p. 360). When in the previous system productivity and profit reach their highest level, a new technological paradigm then arises. In this phase – and drawing on some considerations from classical economic theories – Schumpeter’s ‘creative destruction’ will also include socio-institutional aspects and not only economic ones, because of the complementary nature of the two subgroups (J. SCHUMPETER, *Business Cycles. A Theoretical, Historical, And Statistical Analysis of the Capitalist Process*, McGraw-Hill, 1939).

This sketchy description – which brings together the technological, socio-economic and legal-institutional dimension – is the

starting point to explain how the literature will be examined. In this sense, the technological transformations of the IV Industrial Revolution and the ensuing social and economic implications generated by them have their origins in the crisis of Fordism, which started in the 1970s. For this reason, the objective is to move on from the grey area between the end of Fordism and the start of Post-fordism in order to contribute to defining a new legal and institutional order of so-called ‘risk society’ (U. BECK, *La società del rischio. Verso una seconda modernità*, Carocci, 2013).

Looking at the way the literature has examined the IV Industrial Revolution and its impact on work calls for the need to look at the different definitions provided. This expression can be found for the first time in institutional documents – the most important of which is the *Recommendations for implementing the strategic initiative INDUSTRIE 4.0* by Kagermann, Wahlster and Helbig (Forschungsunion, Acatech, 2013) – and referred to the industrial revolution which followed the one taking place in the 1980s. From that moment on, research employed the notion of the ‘IV Industrial Revolution’, which often coincided with that of *Industrie 4.0* (or *Industry 4.0*, in English), *Smart Factory* (D. ZUEHLKE, *SmartFactory – Towards a factory-of-things*, in *Annual Reviews in Control*, 2010, Vol. 34, No. 1), *Smart Production* (Y. CHENG ET AL., *Data and knowledge mining with big data towards smart production*, in *Journal of Industrial Information Integration*, 2018, Vol. 9, pp. 1-13), *Smart Manufacturing* (A. KUSIAK, *Smart manufacturing*, in *International Journal of Production Research*, 2018, Vol. 56, No. 1-2), *Manifattura 4.0* (CENTRO STUDI ASSOLOMBARDA (ed.), *La strada verso la Manifattura 4.0. Progetto di ricerca “Focus Group Manifattura 4.0”*, Ricerca, 2016, No. 9).

The *Recommendations* referred to the IV industrial Revolution as the result of “the introduction of the Internet of Things and Services into the manufacturing environment” (H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 12). Concurrently,

while focusing on the technological dimension of these transformations, research focuses on some aspects that go beyond that, because this revolution might help to “drive solutions to both global challenges (*e.g.* resource and energy efficiency) and national challenges (*e.g.* managing demographic change)”. This is because this revolution “allows work to be organised in a way that takes demographic change and social factors into account”. It is precisely the impact of digital transformation on work which should contribute to redefining it, because “thanks to smart manufacturing resource networks, employees will be freed up from having to perform routine tasks, enabling them to focus on creative, value-added activities”. Furthermore, they “enable flexible working conditions will enable greater compatibility between their work and their personal needs” (H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 5).

A wide definition of this phenomenon is also provided by the analysis of Industry 4.0 carried out by Italy’s Lower Chamber in 2016. Here, Industry 4.0 is referred to as “an emerging industrial paradigm which will determine an industrial revolution”. It is also specified that “manufacturing plays a key role in industrial production, but it should not be considered as a number of separate phases and stages. Rather, it is an immaterial, integrated flow made it possible by digital technologies. All phases are handled and influenced by the information gathered and communicated along all the chain, from planning to utilisation and post-sale service” (*Indagine conoscitiva su “Industria 4.0”: quale modello applicare al tessuto industriale italiano. Strumenti per favorire la digitalizzazione delle filiere industriali nazionali*, Camera dei Deputati, 2016, p. 27). At first, the research interest was on the technological aspects, also as far as definitions are concerned.

1.1. Technical and Scientific Definitions

When it comes to definitions, agreement exists in the relevant literature, as they differ only in relation to the perspective adopted. Based on the findings from the literature review, M. HERMANN, T. PENTEK, B. OTTO, *Design Principles for Industrie 4.0 Scenarios: A Literature Review*, Technische Universität Dortmund Working Paper, 2015, No. 1, p. 11, Industry 4.0 is defined as follows: “a collective term for technologies and concepts of value chain organization. Within the modular structured Smart Factories of Industry 4.0, CPS monitor physical processes, create a virtual copy of the physical world and make decentralized decisions. Over the IoT, CPS communicate and cooperate with each other and humans in real time. Via the IoS, both internal and cross-organizational services are offered and utilized by participants of the value chain”. H.C. PFOHL, B. YASHI, T. KURNAZ, *The Impact of Industry 4.0 on the Supply Chain*, in W. KERSTEN, T. BLECKER, C.M. RINGLE (eds.), *Innovations and Strategies for Logistics and Supply Chains*, Epubli, 2015, p. 52, define digital manufacturing starting from the innovations it entails, that is “the sum of all disruptive innovations derived and implemented in a value chain to address the trends of digitalization, autonomization, transparency, mobility, modularization, network-collaboration and socializing of products and processes”. According to V. ROBLEK, M. MEŠKO, A. KRAPEŽ, *A Complex View of Industry 4.0*, in *SAGE Open*, 1st June 2016, p. 5, there are three aspects on which Industry 4.0 will have serious implications, namely: Digitization of production, Automation, and the link between manufacturing sites in a comprehensive supply chain. The same views can be found in F. ALMADA-LOBO, *The Industry 4.0 revolution and the future of Manufacturing Execution Systems (MES)*, in *Journal of Innovation Management*, 2015, Vol. 3, No. 4. L. BELTRAMETTI, N. GUARNACCI, N. INTINI, C. LA FORGIA, *La fabbrica connessa. La manifattura italiana (attra)verso Industria 4.0*, Guerini, 2017, p. 28, describe Industry 4.0 as an interconnected business, in which “all elements linked to manufacturing (providers, plants, distri-

bution and products themselves) are digitally connected, creating a closely integrated supply chain”. In relation to the importance of interconnection, mention should be made of A. MAGONE, T. MAZALI (eds.), *Industria 4.0. Uomini e macchine nella fabbrica digitale*, Guerini, 2016, p. 69, where relevance is given to “the cyber-physical system, a context made up of a complex network of machinery, physical goods, virtual items, calculus and memorisation devices, communication tools (video, sound and olfactory instruments), energy containers, which interact among themselves and with economic operators”. Emphasis is therefore given to the notions of the ‘Internet of Things’ (IoT) and the ‘Cyber Physical System’. The former refers to “things and objects such as RFID, sensors, actuators, mobile phones, through unique address schemes, the interacting with each other and cooperate with their neighbours smart components to achieve common goals”, L. ATZORI, A. IERA, G. MORABITO, *The Internet of Things: A Survey*, in *Computer Networks*, 2010, Vol. 54, No. 15, p. 2787. The cyber-physical setting is created thanks to the connection between items – each one with its own IP address – which communicate with one another (ACATECH (ed.), *Cyber-Physical Systems. Driving force for innovation in mobility, health, energy and production*, Springer, 2011, p. 23). This allows for a production chain where each component is not only connected to physical devices (gears, mechanical arms or others) ensuring regular production synchronisation and optimisation, thanks to constant data analysis (so-called big data). IoT can also morphed into the Internet of Services, consisting of “participants, from infrastructure to services, from business models and services themselves. The services are offered and combined through value-added services by various bidders; they are communicated to users as well as to consumers who access it through different channels”. In this sense, see P. BUXMANN, T. HESS, R. RUGGABER, *Internet of Services*, in *Business & Information Systems Engineering*, 2009, Vol. 1, No. 5. The pervasive nature of IoT in manufacturing and its possible applications are facilitated by 5G, the recent develop-

ments of which are illustrated by S. LI, L.D. XU, S. ZHAO, *5G Internet of Things: A survey*, in *Journal of Industrial Information Integration*, 2018, Vol. 10, pp. 1-9.

The different conceptualisations can be seen in the approach to technology and can be grouped under the US and the German model.

The German model was developed first and considers Cyber Physical Systems (CPS) to be truly innovation aspects, as pointed out in E. GEISBERGER, M. BROY (eds.), *Living in a networked world. Integrated research agenda Cyber-Physical Systems (agenda CPS)*, Herbert Utz, 2015, p. 23: “The CPS is the product of development and of integrated use of two of innovation fields: systems that contain software and global data networks like the Internet and distributed application systems and interactive. These are used through a powerful infrastructure that is composed of sensors, actuators and communication networks that are used by companies that operate and collaborate globally”. CPS are based on the IoT. According H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 12, “Industry 4.0 is in fact the outcome of the introduction of the Internet of Things to the production environment”.

Following a number of publications by companies released as early as 2011, the US model focuses on IoT and features a wider approach, which however makes no reference to the notion of the ‘IV Industrial Revolution’. D. EVANS, *The Internet of Things. How the Next Evolution of the Internet Is Changing Everything*, Cisco IBSG, 2011, speaks of a network of networks, connecting companies, houses, energy, transport and education, based on a new paradigm featuring networks and data. In the position paper by P.C. EVANS, M. ANNUNZIATA, *Industrial Internet: Pushing the Boundaries of Minds Machines*, GE, 2012, General Electric considers the Industrial Internet as a third wave of revolution, which follows the Industrial and the Internet Revolution.

1.2. Looking for Broader Definition

After outlining the main technological definitions related to Industry 4.0, it is now important to recall that P. BIANCHI, S. LABORY, *Industrial Policy for the Manufacturing Revolution. Perspectives on Digital Globalisation*, Edward Elgar, 2018, p. 15, stress that “the structure of the social system transforms during industrial revolutions and this inevitably changes the culture and the norms produced by a specific social system”. This is so because social systems are just “individuals who interact and these individuals entail the creation of a society which produces a language, a culture, a State and its laws” (*idem*, p. 16). Importantly, “technological change is not the only factor influencing industrial revolutions”. This aspect is evidenced by the fact that “the same technological innovations can be produced in different countries, producing different impacts” (*idem*, p. 18). This is because industrial revolutions have “complex and multidimensional origins: demographic, social, cultural and political changes combine, laying the foundations for industrial revolutions” (*idem*, p. 19). In this respect, there is a vast amount of literature about the I Industrial Revolution, e.g. E. HOBBSAWM, *Industry and Empire. The Birth of the Industrial Revolution*, New Press, 1968, pp. 12-37.

The notion of the IV Industrial Revolution should be examined against the backdrop of a wider technological, demographic, economic and social transformations dealt with from many perspectives in the last years. K. SCHWAB, *op. cit.*, has been among the first authors to consider the phenomena under scrutiny here from a holistic approach. More generally, it is the World Economic Forum (WEF), in which Schwab is very active, that starting from 2016, developed the notion of a new industrial revolution, which does not only concern technology. Schwab considers both technological macro-trends and some major social changes linked to increasing inequalities, urbanisation (e.g. smart cities) and progress in the medical and biological field. Ongoing transformations concern new business models, which challenge

current production and consumption, transport and delivery. They will also have an impact affecting the way we work and communicate, but also the way we access information, express and spend our free time. Due to its characteristics, the IV Industrial Revolution is a genuine revolution rather than “a mere consequence of the third industrial revolution”. The first aspect is “the exponential growth” with which change is taking place, which can be explained by “the heterogeneous nature of the world we are living in, which is constantly interconnected”. The second aspect is concerned with the fact that “the digital revolution is the result of different technologies” and its significant scope will produce unprecedented paradigm changes as far as the individual, economic, business and social dimension is concerned. The third one is that change will affect systems, countries, companies, sectors and the society as a whole. Criticising the political dimension of the phenomenon, S. PFEIFFER, *The Vision of “Industrie 4.0” in the Making – a Case of Future Told, Tamed and Traded*, in *NanoEthics*, 2017, Vol. 11, No. 1, p. 119, adds that “we should not lose sight of the fact that Industrie 4.0 is at best just one phenomenon among a wide range of disruptive global transformations”.

These changes cannot be examined without considering the vast amount of research investigating the crisis of Fordism and the raise of Post-Fordism in its different dimensions which will be looked at shortly. Many scholars (C. CROUCH, *Exit or Voice: Two Paradigms for European Industrial Relations after the Keynesian Welfare State*, in *European Journal of Industrial Relations*, 1995, Vol. 1, No. 1) have pointed out that the use of the suffix ‘post’ is illustrative of the failure to identify the following paradigm and the struggle to characterise a model which develops as a result of this crisis. One of the most important definitions of Post-Fordism is the one supplied by Ulrich Beck, which described the risk society as opposed to the class society developed earlier. the social production of wealth is systematically accompanied by the social production of risks. Accordingly, the problems and conflicts relat-

ing to distribution in a society of scarcity overlap with the problems and conflicts that arise from the production, definition and distribution of techno-scientifically produced risks (U. BECK, *op. cit.*, pp. 19 ff.). In this sense, the concept of risk is directly bound to the concept of reflexive modernization. Risk may be defined as a “systematic way of dealing with hazards and insecurities induced and introduced by modernization itself” (*idem*, p. 21). Giddens also considers risk to be one of the fundamental elements of late modernity (he argues against the notion of post-modernity). In the A.’s view, there is a risk specific to modernity, which results in a number of risks, such as “the globalisation risk”, that is “an increasing number of contingent events affecting anyone or at least many groups of people worldwide”, which are exemplified by the global structure of the labour market (A. GIDDENS, *Le conseguenze della modernità*, Il Mulino, 1994, p. 25). Yet one aspect that is even more interesting for the purposes of our research is “risk awareness”, that is the fact that “the lack of knowledge in risk cannot be converted into certainty by religion or magic”, together with “the awareness of the limits of expert knowledge”, viz. The impossibility to have full knowledge of the consequences of acts and processes. This conception of risk can be found in the relevant literature which – starting from A. TOURAINE, *La società post-industriale*, Il Mulino, 1970, and D. BELL, *The coming of post-industrial society*, New York Books, 1973 (the former focusing on moving on from industrialism, the latter on the acknowledgment of its predominance and mutation) – has observed the rise of post-industrial society. This society is characterised by main changes in the structure of employment relationships, in the enhancement of the role of the technical expert, and the falling through of solidity (which was replaced by liquidity, as referred to by Z. BAUMAN, *Modernità liquida*, Laterza, 2002) which characterised industrial society. This solidity has been defined by W. STREECK, *Le relazioni industriali oggi*, in R. CARAGNANO, E. MASSAGLI (eds.), *Regole, conflitto, partecipazione. Letture di diritto delle relazioni industriali*, Giuffrè, 2013, p. 45, as

“historic compromise”, so that “workers accepted private property and salaried employment, while employers had to learn to leave with an employment relationship strictly regulated, which reflected workers’ willingness for stability and security”. The technological changes introduced by the IV Industrial Revolution can be framed in the context of Post-Fordism, as examined in relevant research.

2. Technology and Its Risks

2.1. Main Technological Tools

2.1.1. Advanced Robotics

In people’s mind, robots evoke the digitalisation of processes and production. While regarded as a machine created to help the worker with physical fatigue (the word ‘robot’ means ‘slave’ in Czech), the robot was defined by the Robot Institute of America, in 1979 as “a reprogrammable, multifunctional manipulator designed to move material, parts, tools, or specialized devices through various programmed motions for the performance of a variety of task”. For this reason, it is important to identify what we mean when we talk about robotics, especially advanced robotics (Advanced Industrial Robotics – AIR) in the context of manufacturing and Industry 4.0. ISO TR/8373-2.3 defines industrial robots as follows: “manipulator with several degrees of freedom, autonomously governed, reprogrammable, and multi-purpose, which can be fixed in place or mobile for use in industrial applications”. Yet reference is made not so much to industrial robotics in general, as to more recent advanced robotics, namely “sub-field of traditional robotics, characterised by the use and development of ‘smarter’ robots which are able to operate in tougher and less structured environments, rely less on human intervention, and are capable of interacting with the outside world”. The difference between traditional and advanced

robotics is “the existence of enhanced problem-solving, mobility, resistance, sensorial, intelligence and adaptability capacities which are not generally found in mainstream robotics” (C. HINOJOSA, X. POTAU, *Advanced industrial robotics: Taking human-robot collaboration to the next level*, Eurofound, European Commission Working Paper, 2017, p. 7, following the description offered by the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, *Manufacturing: Advanced Robotics and Intelligent Automation*, 2011). The European Commission’s *ICT and Robotics Work Programme* of 2015 identifies a number of features typical of advanced robotics: adaptability, cognitive ability, configurability, decisional autonomy, dependability, flexibility, interaction capability, manipulation ability, motion capability, perception ability. Besides referring to some peculiarities of robotics in a general sense, these characteristics also concern some elements typical of Artificial Intelligence, which allows for higher cognitive autonomy and context adaptation thanks to stimulus responses (see ICF GHK, CEDEFOP, *Focus on Advanced Manufacturing*, EU Skills Panorama Analytical Highlight, 2014).

The main impact of Industry 4.0 on advanced robotics is that concerning its links with the Internet of Things, making robots an integral part of connected and digitalised production processes, and the supply chain, more generally (C. HINOJOSA, X. POTAU, *op. cit.*, p. 11). Sensors and data collected from the products allow monitoring and optimisation of production processes, along with the introduction of more flexibility in order to meet clients’ needs, both during co-planning and co-production, by mean of data elaboration and use promoting machine learning.

Workers using these robots can also provide some insights, turning them into genuine collaborative robots which are a feature of Industry 4.0. in this sense, cobots existed as early as 20 years ago and were defined as “a robotic device which manipulates objects in collaboration with a human operator” (J.E. COLGATE, W. WANNASUPHOPRASIT, M.A. PESHKIN, *Cobots: Ro-*

bots for Collaboration with Human Operators, in VV.AA., *Proceedings of the International Mechanical Engineering Congress and Exposition*, ASME, 1996, p. 433). Thanks to Artificial Intelligence and the system of connected sensors, cobots can help workers doing heavier jobs, working on single tasks, ensuring precision and increasing safety. The new potential of robotics, along with artificial intelligence, have introduced a new generation of cobots which “are very similar to traditional industrial robots (with the additional ability to work with human workers without any enclosure)” and different from first generation cobots, as the latter “did not have motors, were intrinsically passive” (cf. B.A. KADIR, O. BROBERG, C. SOUZA DA CONCEIÇÃO, *Designing Human-Robot Collaborations in Industry 4.0: Explorative Case Studies*, in D. MARJANOVIĆ ET AL. (eds.), *Design 2018. 15th International Design Conference*, 2018, p. 602).

2.1.2. Big Data and Machine Learning

The expression ‘big data’ refers to those tools which can collect a great amount of data and then analyse, process, and use them as an action tool for production processes (M. DELMASTRO, A. NICITA, *Big data. Come stanno cambiando il nostro mondo*, Il Mulino, 2019, pp. 10-15). Big data are a sort of technology which cannot be used without referring to concepts already discussed when examining advanced robotics, in that they are usually intertwined. More than technology used to collect data, it is their analysis which has become the focus of those transformations typical of the IV Industrial Revolution, namely “the utilization of business intelligence and analytics technologies. This corresponds to applying statistical and data mining techniques in organizations to produce additional business value” (M.O. GOKALP ET AL., *Big Data for Industry 4.0: A Conceptual Framework*, in VV.AA., *2016 International Conference on Computational Science and Computational Intelligence*, IEEE, 2016, p. 433). This process is

more generally identified as business intelligence, that is the ability to transform data concerning processes, products and the market in strategic information for company decision-makers, as illustrated in A. REZZANI, *Business Intelligence. Processi, metodi, utilizzo in azienda*, Apogeo, 2013. The principle on which big data analysis is based is that of Artificial Intelligence intended as the ability of machines to make decisions in consideration of the information contained in datasets about processes. This way they can elaborate the best solutions to problems. In manufacturing, the most interesting aspect of big data analytics is the one concerning machine learning, namely the ability of machine to understand actions and behaviours based on data analysis (S. SHALEV-SHWARTZ, S. BEN-DAVID, *Understanding Machine Learning. From Theory to Algorithms*, Cambridge University Press, 2014, pp. 19-22). This might impact maintenance which becomes preventive rather than predictive because of the statistics elaborated from the historical data produced. (G.A. SUSTO ET AL., *Machine Learning for Predictive Maintenance: a Multiple Classifier Approach*, in *IEEE Transactions on Industrial Informatics*, 2015, Vol. 11, No. 3). There is also an improvement in the ability to foresee consumer and market behaviours, as pointed out in S. STUBSEID, O. ARANDJELOVIC, *Machine Learning Based Prediction of Consumer Purchasing Decisions: The Evidence and Its Significance*, in VV.AA., *The Workshops of the The Thirty-Second AAAI Conference on Artificial Intelligence*, AAAI Press, 2018.

2.1.3. Augmented Reality

Augmented reality means “overlay of computer graphics on the real world” (R. SILVA, J.C. DE OLIVEIRA, G.A. GIRALDI, *Introduction to Augmented Reality*, National Laboratory for Scientific Computation, 2003, p. 1) and is part of the wider notion of mixed reality, that is a virtual context made up of real and virtual worlds (P. MILGRAM, F. KISHINO, *A taxonomy of mixed reality vis-*

ual displays, in *IEICE Transactions on Information Systems*, 1994, Vol. 77, No. 12). While virtual reality is concerned with a fully virtual environment, augmented reality enables one to include virtual representations in the real world. Its applications are manifold: from entertainment (R.T. AZUMA, *The Most Important Challenge Facing Augmented Reality*, in *Presence*, 2016, Vol. 25, No. 3) to the military and medical field. Two applications are of interest for the purpose of our study. The first is concerned with augmented reality to support maintenance, so that “the operator can access the information necessary for performing the activities directly in the working area, without the need to refer to the printed traditional manual” (R. MASONI ET AL., *Supporting remote maintenance in industry 4.0 through augmented reality*, in *Procedia Manufacturing*, 2017, Vol. 11, p. 1297). The second one refers to vocational training, as stressed by S. WEBEL ET AL., *An augmented reality training platform for assembly and maintenance skills*, in *Robotics and Autonomous Systems*, 2013, Vol. 61, No. 4.

2.1.4. Exoskeletons

Exoskeletons are part of wearable technology (J. KHAKUREL, S. POYSA, J. PORRAS, *The Use of Wearable Devices in the Workplace – A Systematic Literature Review*, in O. GAGGI ET AL. (eds.), *Smart Objects and Technologies for Social Good*, Springer, 2016, provide an overview and a more detailed analysis) and “wearable devices that can support the musculoskeletal system using various mechanical principles” (cf. M. PETERS, S. WISCHNIEWSKI, *The impact of using exoskeletons on occupational safety and health*, EU-OSHA, 2019, p. 1), reducing the muscular stress of those body parts most exposed to fatigue, e.g. the back and the shoulders.

Because of the many exoskeletons currently available, it is difficult to provide a definition that fits all, although the literature agrees that they are mechanical structures which apply on the body. Among others, they are defined as “a personal assistance

system that affects the body in a mechanical way” (M. LIEDTKE, U. GLITSCH, *Exoskelette – Verordnung für Persönliche Schutzausrüstungen*, in *Sicher ist Sicher*, 2018, No. 3).

There exist active and passive exoskeletons: the former support movement providing extra strength and increasing worker performance. The latter help distribute effort among the different parts of the body. They activated only through workers’ movements. A further benefit of passive exoskeletons is that workers can be engaged in physically demanding activity for a longer period of time, because they help one to maintain a correct posture. There are also hybrid exoskeletons. Exoskeletons can also be divided in lower-body and upper-body ones. In the first case, human effort is transferred on the ground, while in the second case, fatigue is transferred from upper to lower parts of the body. Full body exoskeletons are a combination of the previous two. Currently, this technology is mostly used in manual handling of loads and repetitive tasks, which usually wear out workers (M. PETERS, S. WISCHNIEWSKI, *op. cit.*, p. 3).

2.1.5. Additive Manufacturing/3D Printing

Additive manufacturing refers to “the process of manufacturing objects by adding material in precise locations to form an object, based on a digital 3D model” (J. VAN BARNEVELD, T. JANSSON, *Additive manufacturing: A layered revolution*, Eurofound, 2017). The difference between traditional and additive manufacturing is the in the latter case raw material is joined and not removed. This technique is used in a number of ways. In this sense, see I. GIBSON, D. ROSEN, B. STUCKER, *Additive Manufacturing Technologies. 3D Printing, Rapid Prototyping and Direct Digital Manufacturing*, Springer, 2015, which also link additive manufacturing with the dynamics of the IV Industrial Revolution. The concept is related to experiments made as early as the 1980s, as stressed by in T.

WOHLERS, T. GORNET, *History of additive manufacturing*, Wohlers Associates, 2014.

2.1.6. Nanotechnology and the Nanomaterials

Nanotechnology is the most extreme result of the so-called bottom-up approach, according to which the final product is assembled through nanofabrication (M. BASSI, I. SANTINELLO, A. BEVILACQUA, P. BASSI, *Nanotecnologie: una grande rivoluzione che parte dal piccolo*, in *Urologia*, 2013, No. 80, p. 47; D. VOLLATH, *Nanomaterials. An Introduction to Synthesis, Properties and Applications*, John Wiley & Sons, 2013, pp. 1-3).

There is no agreement about the definition of nanotechnology, although its interdisciplinary dimension is widely acknowledged in the literature and so is its disruptive effect (A. ROY, J. BHAITACHARYA, *Nanotechnology in Industrial Wastewater Treatment*, IWA Publishing, 2015, p. 5). Emphasis is given to the positive consequences of nanotechnology when used in manufacturing, medical safety and in construction (E. LINDQUIST, K.N. MOSHER-HOWE, X. LIU, *Nanotechnology What Is It Good For? (Absolutely Everything): A Problem Definition Approach*, in *Review of Policy Research*, 2010, Vol. 27, No. 3, pp. 266-267).

Due to its characteristics, nanotechnology use needs tool adaptation and enhancement (an aspect which was already pointed out by Feynman in 1959) as well as new ways of cooperation between those involved (*e.g.* businesses, academia and governments. See A. ROY, J. BHAITACHARYA, *op. cit.*, p. 7).

Yet nanotechnologies can also cause new risks for the environment and health whose seriousness is unknown, so research into responsibilities and the approach to be used is necessary (D.A. DANA (ed.), *The Nanotechnology Challenge. Creating Legal Institutions for Uncertain Risks*, Cambridge University Press, 2014, pp. 6-10).

2.2. Technology-Related Risks in the IV Industrial Revolution

The innovation of production and the technologies used in manufacturing produce two main consequences. On the one hand, some physical risks are prevented, as machines perform dangerous activities which were carried out by humans. On the other hand, new risks emerge, both from a physical and psychological point of view.

In relation to the first aspect, the use of wearable technologies, exoskeletons and assisted technology has proved to prevent a number of risks (M. JEEHEE *ET AL.*, *The Fourth Industrial Revolution and Its Impact on Occupational Health and Safety, Worker's Compensation and Labor Conditions*, in *Safety and Health at Work*, 2019, Vol. 10, No. 4, p. 403; N. STACEY *ET AL.*, *Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025*, EU-OSHA, 2018, pp. 47-48). Specifically, robotics can replace human presence in unhealthy environments, reducing repetitive movements and exposure to dangerous substances, bringing about positive consequences on workers' physical and psychological health in a number of sectors (J. KAIVO-OJA, *Il futuro del lavoro: la robotica*, Documento di discussione EU-OSHA, 2015, pp. 3-4).

As far as the new risks are concerned, the literature and the reports examined point to some categories of risks which are illustrative of the difficulty in identifying emerging occupational diseases and the new tools to tackle them.

Yet these risks shared a number of features. Each one of them is linked to one or more elements marking the new production setting, that is technological and organisational innovations characterising the development of tools used to prevent new hazards. With work becoming more flexible, the number of risks has increased considerably.

This is also because of the increasing overlapping of specific and generic risks, which are also ever-changing, as they depend on new technologies, production and organisational dynamics.

2.2.1. Exposure to Dangerous Activities

They are not new risks, yet new technologies and production techniques have given rise to new hazards resulting from the use of innovative materials. An example in this connection is the use of nanomaterials and 3D printing. These techniques enable to develop more effective processes in a number of fields (A. ROTA, *Stampa 3D: un nuovo rischio da ignoto tecnologico?*, in *LLI*, 2015, No. 1, p. 119), among which are electronics, mechanics and renewable energies (G. PAOLANTONIO, *Nanomateriali: evidenze di rischio e indirizzi per la prevenzione*, in *ISL*, 2019, No. 2, Insert, pp. III-IV, provides a summary of the applications of nanomaterials). However, the risks resulting from the use of these substances on the human body are basically unknown (N. STACEY *ET AL.*, *op. cit.*, p. 47; G. CASTELLET Y BALLARÀ, *Sistemi di controllo e protezione dei lavoratori potenzialmente esposti a nanomateriali ingegnerizzati*, in *RIMP*, 2015, No. 3, I, p. 1, p. 535; M. BASSI, I. SANTINELLO, A. BEVILACQUA, P. BASSI, *op. cit.*, p. 51; G. PAOLANTONIO, *op. cit.*, pp. VII-VIII; A. ROTA, *op. cit.*, pp. 112-113; D.A. DANA (ed.), *op. cit.*, pp. 6-10). Interaction with new technologies and new substances in the work environment make workers more exposed to health-related risks (G. CASTELLET Y BALLARÀ, *op. cit.*, p. 535; P.A. SCHULTE *ET AL.*, *Occupational safety and health criteria for responsible development of nanotechnology*, in *Journal of Nanoparticle Research*, 2014, Vol. 16, No. 1, Article No. 2153, p. 2).

2.2.2. Musculoskeletal Disorders

The use of technologies in production settings has enabled the evolution of some tasks. Some of them are less demanding, while others can be carried out remotely (thanks to the use of laptops and tablets), an aspect which also favours organisational flexibility and work-life balance (J. POPMA, *The Janus face of the New Ways of Work*. *Rise, risks and regulation of nomadic work*, ETUI Working Paper, 2013, No. 7, pp. 5-9). New technological devices also improve occupational safety (N. STACEY *ET AL.*, *op. cit.*, pp. 47-48; M. JEEHEE *ET AL.*, *op. cit.*, p. 403). Yet their use can produce musculoskeletal disorders which can originate from some specific circumstances (*e.g.* sedentariness, repetitive movements, inadequate ergonomics and stress-related issues. See EU-OSHA, *Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU*, European Risk Observatory Report, 2019, pp. 97-144; J. POPMA, *op. cit.*, pp. 18-19; N. MAGNAVITA *ET AL.*, *Environmental discomfort and musculoskeletal disorders*, in *Occupational Medicine*, 2011, Vol. 61, No. 3, p. 199; Y. ROQUELAURE, *Musculoskeletal disorders and psychosocial factors at work*, European Trade Union Institute Report, 2018, No. 142, p. 8-20; D. VAN EERD *ET AL.*, *Classification systems for upper-limb musculoskeletal disorders in workers: a review of the literature*, in *Journal of Clinical Epidemiology*, 2003, Vol. 56, No. 10, pp. 925-926; M. CANJUGA, O. HÄMMIG, G.F. BAUER, T. LÄUBLI, *Correlates of short- and long-term absence due to musculoskeletal disorders*, in *Occupational Medicine*, 2010, Vol. 60, No. 5, p. 358).

2.2.3. Human-Machine Interaction

Also in relation to the risks resulting from human-machine interaction, the situation is far from clear, especially because new-generation technologies (*e.g.* AI, machine learning) feature some levels of autonomy which might be difficult to deal with when operating them and in the event of process modification.

The complexity resulting from this interaction can also originate from the little intelligibility of machine functioning, which leads to delays in the understanding of malfunctioning and its control.

Further risks concern those related to virtual reality and exoskeletons, which impact on proper reality perception and generate stress on some parts of the body.

As of organisational models, one issue might be the isolation resulting from digital companies as well as the pressure stemming from regular monitoring systems imposed by human-machine interaction (M. PETERS, S. WISCHNIEWSKI, *op. cit.*, pp. 5-7; N. STACEY ET AL., *op. cit.*, pp. 50-52; ILO, *Safety and health at the heart of the future of work. Building on 100 years of experience*, 2019, p. 33; J. KAIVO-OJA, *op. cit.*, pp. 4-5; J. SANZ PEREDA, *Robots industriales colaborativos: una nueva forma de trabajo*, in *Seguridad y Salud en el Trabajo*, 2018, No. 95, pp. 9-10; S. HADDADIN, E. CROFT, *Physical Human-Robot Interaction*, in B. SICILIANO, O. KHATIB (eds.), *Springer Handbook of Robotics*, Springer, 2016, pp. 1835-1874; V. MAIO, *Il diritto del lavoro e le nuove sfide della rivoluzione robotica*, in *ADL*, 2018, No. 6, I, pp. 1414 ff.; M. TRONCI, *La gestione della sicurezza nei processi industriali della smart factory e del digital manufacturing*, in *RIMP*, 2017, No. 2).

2.2.4. Psycho-Social Risks

Research has particularly focused on psychosocial risks, which are linked to a number of reasons.

The first is connected with the fact that work is performed in a context which blurs the boundaries between family and personal life, which in turn might increase work-related stress, sleeping issues and anxiety. These issues might be also linked to the feeling of being controlled due to the implementation of monitoring systems and that of providing a small contribution as compared to that of technology.

Further aspects concern the need to adapt to technology innovation, some shortcomings regard the transparency of decision-making and some difficulties to concentrate. Research has also stressed the links between unstable employment and the risks referred to above (J. MESSENGER *ET AL.*, *Working anytime, anywhere: The effects on the world of work*, Eurofound, ILO Research Report, 2017, pp. 21-41; ILO, *op. cit.*, pp. 50-53; N. STACEY *ET AL.*, *op. cit.*, pp. 55-59; M. JEEHEE *ET AL.*, *op. cit.*, pp. 404-408; F. SILVAGGI, J. SÁNCHEZ PÉREZ, *La prevención de los riesgos psicosociales: una perspectiva comparada (Italia-España)*, in RLDE, 2017, No. 3, pp. 175-176; O. BONARDI, *Oltre lo stress: i nuovi rischi e la loro valutazione globale*, in LD, 2012, No. 1-2; J. POPMA, *op. cit.*, pp. 10-15).

2.2.5. Cybersecurity

While the significant amount of data collected and processed through new technologies can improve occupational health and safety, some issues might arise in relation to privacy (*e.g.* data can be used to engage in discriminatory practices) and the diffusion of sensitive information related to employees in the event of system malfunctioning (N. STACEY *ET AL.*, *op. cit.*, pp. 57-58; D.W. BATES *ET AL.*, *Big data in health care: using analytics to identify and manage high-risk and high-cost patients*, in *Health Affairs*, 2014, Vol. 33, No. 7; M. MCKEE, M. VAN SCHALKWYK, D. STUCKLER, *The second information revolution: digitalization brings opportunities and concerns for public health*, in *European Journal of Public Health*, 2019, Vol. 29, suppl. No. 3, pp. 4-5).

2.2.6. Exposure to Electromagnetic Fields

While this is not an emerging issue, its impact on occupational health and safety still needs to be dealt with. Exposure to electromagnetic fields, which is already a serious problem, might

worsen due to technological progress (5G, digital devices, smartphones. See N. STACEY *ET AL.*, *op. cit.*, p. 55; A. LEVIS *ET AL.*, *Mobile phones and head tumours. The discrepancies in cause-effect relationships in the epidemiological studies – how do they arise?*, in *Environmental Health*, 2011, Vol. 10, No. 59, pp. 10-11; S.J. GENUIS, C.T. LIPP, *Electromagnetic hypersensitivity: Fact or fiction?*, in *Science of the Total Environment*, 2012, Vol. 414, pp. 103-112).

3. New Production Processes and Business Models

3.1. Production Processes

The availability of these technologies is not sufficient to justify a paradigm change, as most of them were already in use at the beginning of the millennium, as pointed out by relevant literature.

The first aspect examined by scholars has been production digitalisation, namely “The companies’ internal processes, product components, communication channels and all other key aspects of the supply chain” (H.C. PFOHL, B. YASHI, T. KURNAZ, *op. cit.*, p. 38). The core of this innovation lies in Cyber-Physical Systems (CPS) which, by integrating physical and digital spaces, enable new process coordination forms and higher product adaptation and customisation, as well as lower costs and higher productivity (E. GEISBERGER, M. BROY (eds.), *op. cit.*, pp. 56-64). Yet CPS can truly produce a significant impact when applied to business organisation and the overall managerial approach. Its potential coordination ability concerning production processes and real-time market information, along with data related to supply chain and consumers, might impose a type of production which is “optimised through production units which are cooperative, adaptive, evolutionary and able to self-organise although pertaining to different operators” (*idem*, p. 182). Each productive sector might be affected by this integrating digitalisation process. An example of this in the automotive sector can be

found in E. ARMENGAUD, *Industry 4.0 as Digitalization over the Entire Product Lifecycle: Opportunities in the Automotive Domain*, in J. STOLFA, S. STOLFA, R. O'CONNOR, R. MESSNARZ (eds.), *Systems, Software and Services Process Improvement*, Springer, 2017. This digitalisation does not only affect the functioning of production processes, but also the conception of a business intended a single unit. In this sense, what is taking place is a “a shift away from the traditional approach, where products are developed in isolation, towards the integrated and interactive delivery of comprehensive services tailored to particular use processes and contexts. The critical success enablers are now software competence and technology. Companies that used to focus purely on mechanical and hardware systems now have to acquire systems engineering and software competence – together with all the concomitant technological and engineering competencies” (E. GEISBERGER, M. BROY (eds.), *op. cit.*, p. 171). Its added value lies in the bottom-up approach used, thus moving on from the idea of a business which is legally independent and centralised, as stressed in J.P. WULFSBERG, T. REDLICH, F.-L. BRUHNS, *Open production: scientific foundation for co-creative product realization*, in *Production Engineering*, 2011, Vol. 5, No. 2. Some examples are provided in E. GEISBERGER, M. BROY (eds.), *op. cit.*, p. 57-64, among which the following is of particular interest: “The Müller family wishes to purchase a new kitchen. An assistant helps them put together their dream kitchen online based on their preferred configuration of components, kitchen units, worktop, appliances and design, plus additional factors such as price, energy efficiency and delivery date. Once it has received authorisation from the family, the assistant uses the kitchen supplier’s production management system to perform a direct search for production facilities belonging to the manufacturers of the relevant kitchen furniture and appliances. The results of the search indicate that all the sites that produce the family’s desired kitchen furniture belong to Manufacturer A and are located in Germany, whilst all the sites that produce the worktop belong to Manufac-

turer B in eastern Europe. The results of the search also indicate that the kitchen can be delivered by the requested deadline and within the stipulated budget. The Müllers therefore go ahead and place their order using the assistant. Once the order has been placed, the kitchen supplier's production management system monitors and manages the entire process with the firms that have been subcontracted to make the individual components. Sometime after ordering their kitchen – by which time the production orders have already been placed with the suppliers of the individual components – the Müllers decide that they want to change the design of their worktop. They use the assistant to enquire about whether it is possible to change their order and if so under which terms and conditions. The assistant discovers through the production management system that the new worktop involves a different manufacturing process requiring expensive pre-treatment of the raw materials. It searches for the manufacturing sites that are best able to meet these requirements and informs the Müllers of the changes to the price and delivery date. The Müllers confirm the change to their order and Manufacturer B in eastern Europe is immediately informed of this mandatory change”.

The second aspect concerns automation, which is frequently intended only in relation to the spread of robotics (P.K. MCCLURE, “*You’re Fired*”, *Says the Robot: The Rise of Automation in the Workplace, Technophobes, and Fears of Unemployment*, in *Social Science Computer Review*, 2018, Vol. 36, No. 2), particularly the modern and collaborative form in place nowadays. Yet automation can also be implemented in terms of ‘autonomization’ (H.C. PFOHL, B. YASHI, T. KURNAZ, *op. cit.*, p. 39). This term refers to the possibility to make process components more independent in terms of decision-making, through machine learning or smart materials which can share real-time information about their properties and status. Today’s algorithms can in highly-complex systems featuring significant flows of information, human-machine interaction can be reduced to the minimum (*idem*, pp.

38-39) and improved qualitatively, also through the use of CPS. This aspect can be clarified by looking at the example provided before: “Manufacturer A has been contracted to make the furniture for the Müllers’ new kitchen. Manufacturer A has optimised its manufacturing processes to enable a single manufacturing facility to make several product lines with different product generations. The Müllers have chosen the latest-generation kitchen furniture in the product line. The relevant materials have to be processed using a specific technique. The materials communicate their specific properties to the manufacturing system and the relevant machines are automatically reconfigured as required. For example, the correct saw is selected and the material is given the correct pre-treatment. Owing to the temporary unavailability of a particular raw material, one element of the Müllers’ kitchen has to be made with an alternative material. Although the change has no impact on the quality or design of the Müllers’ kitchen, the new raw material does need to be processed using a specific technique. At the beginning of the manufacturing process, the alternative raw material communicates its properties to the manufacturing system. Since the manufacturing system has never used this particular raw material before, it consults the relevant database to find out the optimal configuration for the material’s specific properties. This configuration is then uploaded to the manufacturing system, allowing the raw material to be processed without delay so that the Müllers’ desired delivery deadline remains unaffected”.

A further innovation made it possible by technological innovation concerns mobility, that is “The dissemination of mobile devices makes communication, data sharing and generation of values possible from all over the world” (*idem*, p. 39) an aspect which was already discussed in C.L. SCHWEIGER, *Use and Deployment of Mobile Device Technology for Real-Time Transit Information. A Synthesis of Transit Practice*, TCRP Synthesis, 2011, No. 91. Mobility can also refer to the connection of different actors who have the opportunity to exchange information on a regular basis,

either through mobile connection or cost reduction, and the use of modern technologies like 5G, which enable one to connect a significant number of physical devices and the use of cloud, as illustrated by Z.M. TEMESVÁRI, D. MAROS, P. KÁDÁR, *Review of Mobile Communication and the 5G in Manufacturing*, in *Procedia Manufacturing*, 2019, Vol. 32.

The fourth aspect which is pointed out in the literature refers to modularisation. In other words, new technologies, CPS or additive manufacturing enable production system to strike a balance between consumers' needs and production costs, making it possible to develop dynamics typical of scale economies also for customised products. This flexibility would revolutionise the normal functioning of companies, because it cannot be focused on standard and vertically organised procedures, but it should be focused on "horizontal integration through value networks" (H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 31).

Thus production modularisation is not to be intended as higher coordination and integration between individual preferences and products offered, but as a means and a dynamic through which the structure of the production cycle can be changed. H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 64, provide an example of a production line in the automotive sector. Today, Manufacturing Execution Systems (MES) can coordinate vehicle production with variable components, but always in the context of a limited amount of combination, making production static and based on standard processes. This way "it is not possible to incorporate individual customer requests to include an element from another product group made by the same company". Conversely, CPS allow using "dynamic production lines", where vehicles move around independently in the assembly shop making possible to "mix and match the equipment with which vehicles are fitted", meeting consumers' needs without slowing down production.

A final aspect that needs stressing is so-called network collaboration, that is the development of horizontal integration strategies concerning production processes, which is needed due to the fact that “the depth of added-value within one factory and company generally decreases while the complexity of products and processes increase” (M. BRETTEL, N. FRIEDERICHSEN, M.A. KELLER, M. ROSENBERG, *How Virtualization, Decentralization and Network Building Change the Manufacturing Landscape: An Industry 4.0 Perspective*, in *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, 2014, Vol. 8, No. 1, p. 39). When a network is in place “risks can be balanced and combined resources can expand the range of perceivable market opportunities”. In this sense, reference is frequently made to Collaborative Manufacturing, e.g. networks involving small and medium sized companies, as stressed in H.W. LIN, S.V. NAGALINGAM, S. KUIK, T. MURATA, *Design of a Global Decision Support System for a manufacturing SME: Towards participating in Collaborative Manufacturing*, in *International Journal of Production Economics*, 2012, Vol. 136, No. 1.

All these novelties will give rise to new business models, which will be dealt with in the next paragraph.

3.2. New Business Models

Manufacturing in the XX century focused on mass production started by Ford Motor Companies, which soon disseminated in Europe and in other countries, as illustrated in B. SETTIS, *Fordismi. Storia politica della produzione di massa*, Il Mulino, 2016. This aspect can be examined in A. AMIN (ed.), *Post-Fordism. A Reader*, Blackwell, 1994, and F. SEGHEZZI, *op. cit.*, pp. 81-85. Mass production, as summarised by J.P. WOMACK, D.T. JONES, D. ROOS, *The Machine That Changed the World. The Story of Lean Production*, Harper Perennial, 1991, was based on process and product standardisation and on the application of scale economies in or-

der to reduce costs and increase remuneration, and to increase demand massively so workers buy what they produce (B. JESSOP, *Fordism and Post-Fordism: a Critical Reformulation*, in A.J. SCOTT, M.J. STORPER (eds.), *Pathways to Regionalism and Industrial Development*, Routledge, 1992). The new models which are being implemented in the IV Industrial Revolution move on from Fordism and try to overcome the standstill situation marking Post-Fordism, as pointed out in C. CROUCH, *op. cit.*

A classification of these models is provided in C. BAGNOLI, A. BRAVIN, M. MASSARO, A. VIGNOTTO, *Business Model 4.0. I modelli di business vincenti per le imprese italiane nella quarta rivoluzione industriale*, Edizioni Ca' Foscari, 2018, pp. 119-183, in which business models are considered based on business case studies and divided as *data-driven business models*, *smart factory business models*, *platform business models* and *servitization business models*, depending on how they are applied.

The analysis of the most recent literature also focuses on the ability of the business models in place in the IV Industrial Revolution to personalise products thanks to flexible technologies, as stressed in H. KAGERMANN, W. WAHLSTER, J. HELBIG, *op. cit.*, p. 22. Mass and standardised production is therefore replaced by the opportunity to engage in ongoing production and mass customisation, which was anticipated some 20 years ago by B.J. PINE, *Mass Customization. The New Frontier in Business Competition*, Franco Angeli, 1997. Unlike the arguments put forward by Pine, customisation does not only refer to having many products and services available, but to the opportunity to adapt the production processes to the customer requests, as illustrated by G. SALVENDY, *Mass Customization*, in G. SALVENDY (ed.), *Handbook of Industrial Engineering. Technology and Operations Management*, John Wiley & Sons, 2001. The relationship between producers and consumers is no longer mediated by market analyses, commercial operations and third parties, but it is now direct and epitomised by so called 'prosumers', as illustrated in A. TOFFLER, *The*

Third Wave, Bantam Books, 1970, pp. 123-140, who buy items and participates in its making.

This leads the discussion to a further innovation of business models which is identified in the service-oriented approach and concerns the production of services. Some has referred to so-called eco-systemic business models, namely “technological solutions, but involve also the intelligently coordinated innovation of products, services” (M.M. IIVARI ET AL., *Toward Ecosystemic Business Models in the Context of Industrial Internet*, in *Journal of Business Models*, 2016, Vol. 4, No. 2, p. 47). These services are usually provided through platforms or apps which companies made available so they can be “the point of entry for users and vendors of services and solutions”, like “supplementary services, enabling onboarding, management, configuration, execution, monitoring and billing”, cf. D. BAUER, D. STOCK, T. BAUERNHANSL, *Movement towards service-orientation and app-orientation in manufacturing IT*, in *Procedia CIRP*, 2017, Vol. 62, p. 202. This also challenges the distinction between productive sectors. K. DE BACKER, I. DESNOYERS-JAMES, L. MOUSSIEGT, *Manufacturing or Services – That is (not) the Question’. The Role of Manufacturing and Services in OECD Economies*, OECD Science, Technology and Industry Policy Paper, 2015, No. 19, show how digitalisation, especially the Internet of Things, allow companies to expand their market thanks for the sale of goods and services connected to services themselves, so the distinction between services and companies in manufacturing is fading. In S. GREENGARD, *The Internet of Things*, MIT Press, 2015, many examples concerning smart products are provided. Thanks to Machine to Machine (M2M) communication technology, they connect directly to the CPS of the production plant to provide data and information so many services can be provided and improved, as evidenced in H. KAGERMANN, *Chancen von Chancen von Industrie 4.0 nutzen*, in T. BAUERNHANSL, M. TEN HOMPEL, B. VOGEL-HEUSER (eds.), *Industrie 4.0 in Produktion, Automatisierung und Logistik. Anwendung Technologien Migration*, Springer, 2014. These aspects are also in-

vestigated in terms of economic impact and business competition, see M.E. PORTER, E.J. HEPPELMANN, *How smart, connected products are transforming competition*, in *Harvard Business Review*, 2014, November.

Chapter II.
**THE IV INDUSTRIAL REVOLUTION
BEYOND TECHNOLOGY**

1. Rethinking the Notion of ‘Health’

The notion of health to which reference is made, although criticisms have been levelled by scholars, is the one elaborated by the WHO in 1948, according to which health is “A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (*Constitution of the World Health Organization*, p. 1).

Even though this definition is “innovative in scope and ambition” (M. HUBER *ET AL.*, *How should we define health?*, in *The British Medical Journal*, 2011, Vol. 343, No. 7817) many voiced some criticisms in relation to the approach used by the WHO (*ibidem*; see also the editorial *What is health? The ability to adapt*, in *The Lancet*, 2009, Vol. 373, No. 9666; R. SMITH, *The end of disease and the beginning of health*, in *blogs.bmj.com/bmj*, 8 July 2008; J.S. LARSON, *The Conceptualization of Health*, in *Medical Care Research and Review*, 1999, Vol. 56, No. 2). It is the absolute dimension of the concept which has been challenged, the obsolescence of the demographic context in which the definition has been produced and the characteristics of the illnesses of that time which are now different (M. HUBER *ET AL.*, *op. cit.* On this point, R. DOLL, *Health and the environment in the 1990’s*, in *American Journal of Public Health*, 1992, Vol. 82, No. 7, pp. 933-934, underlines that “This [definition] is a fine and inspiring concept and its pursuit guaran-

tees health professionals unlimited opportunities for work in the future, but is not of much practical use”); the confusion between happiness and health and the lack of attempt to deal with some dimensional conflict making up the concept is also looked at (R. SARACCI, *The World Health Organisation Needs to Reconsider Its Definition of Health*, in *The British Medical Journal*, 1997, Vol. 314, No. 7091. An overview of the definitions of health and some possible ways to adapt them, see G. MCCARTNEY, F. POPHAM, R. MCMASTER, A. CUMBERS, *Defining health and health inequalities*, in *Public Health*, 2019, Vol. 172, pp. 22-30).

The definition provided by the WHO involves different aspects of human life. In this sense, it has been observed that health consists of many dimensions, where individual status is one component making up its characteristics, quality, contents. Specifically, four elements can be identified concerning health, namely, the environment, society, the institutional framework and the individual (J. FRENK ET AL., *Elements for a theory of the health transition*, in *Health Transition Review*, 1991, Vol. 1, No. 1, p. 24). In this classification, some further dimensions can be singled out concerning social components, which might influence human health, e.g. economic structure, science and technologies. These, along with political institutions, culture and ideology determine societal level of wellbeing and the rules for social group stratification, the access to which is determined by the occupational structure and redistributive mechanisms adopted by the government (*idem*, pp. 25-27), according to them these elements “Together, they constrain the variation of a set of proximate determinants, namely, working conditions, living conditions, lifestyles, and the health care system. The separation between working and living conditions is, of course, arbitrary. The purpose is to highlight the critical importance of work both as a direct determinant of the worker’s health status and as an indirect contributor to the health of the rest of the family. In recognition of its direct effect, working conditions are portrayed [...] as part of the immediate environment of the worker. Such an effect is due

to the occupational risks that derive from working conditions”. One’s health status consists in “the balance between exposure to disease agents and individual susceptibility resulting from a complex network of risks; this, in turn, is the product of an articulated set of social and biological determinants” which, like risk, manifest in a number of ways, shifting from good wellbeing to death (*idem*, p. 29).

The 1986 *Ottawa Charter for Health Promotion* provides further insights which contribute to defining the notion of health and understand its individual and collective dimension. Such definition argues for the involvement of public and private actors. According to the Charter “Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical mental and social wellbeing, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities” (p. 3). Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy lifestyles to wellbeing. The protection ensured to workers’ health is therefore comprehensive and does not only concern occupational accidents (the National Institute for Occupational Safety and Health (NIOSH) coined the notion of Total Worker Health, that is the set of policies, programmes and practices which supplements the protection against occupational risks with measures preventing accidents and illnesses promoting workers’ wellbeing). Thus health is not a static concept which develops in medical discourse, but it is a multidirectional notion and must be promoted by cooperation between different actors. The broad nature of this concept is also reflected in the notion of occupational health. As for workplaces, the Charter equates work with free time, stressing that “The way society organizes work should help create a healthy society. Health promotion generates living

and working conditions that are safe, stimulating, satisfying and enjoyable” (p. 2). In this sense, the role of the systematic evaluation of the impact of health in an ever-changing environment is highlighted, especially in relation to workplaces and technologies.

According to some research, the wide scope of the definition of health might affect the identification of employers’ responsibilities in relation to the obligation to ensure OHS protection, with the risk of placing an excessive burden of them, although some risks escape their control. On the relationship between workplaces and health, see R. DEL PUNTA, *Tutela della sicurezza sul lavoro e questione ambientale*, in *DRI*, 1999, No. 2, pp. 151-153. The A. argues that “it is difficult to deny that the relationship between work and general environment is a complementary one, in the sense that they both surround the individual”. In this sense, the A. goes on to state that the workplace is part of the external environment. It is like a microcosm, where people are exposed to “an uncommon concentration of potentially detrimental effects”, which are more widespread in the general environment. In both contexts, the individual plays a key role, because from a law perspective, protection should be ensured in order to protect their health from dangerous actions produced by humans. The A. aims to demonstrate that the protection of workplaces is concerned with the protection of the environment and that workplace law has been created considering workers’ health and safety and the safeguard of the workplace, more generally. F. MALZANI, *Ambiente di lavoro e tutela della persona*, Giuffrè, 2014, p. 2, examines the widening of employer responsibilities, pointing out that sometimes employers are held liable for things taking place in contexts which are their responsibility (subcontracting, teleworking) or shared by a number of people (one might think of such cases like: Eternit, Ilva, Porto Marghera). In some cases, while employers are not responsible for the incident, Inail provides insurance coverage all the same, compelling the em-

ployer to bear the costs because he is in a more favourable position economically and benefits from work performed.

M. JEEHEE *ET AL.*, *The Fourth Industrial Revolution and Its Impact on Occupational Health and Safety, Worker's Compensation and Labor Conditions*, in *Safety and Health at Work*, 2019, Vol. 10, No. 4, p. 408, suggest that the approach should be amended, moving from one focused on employer responsibilities to one in which public authorities provide a more significant contribution (WHO, *WHO Global Plan of Action on Workers' Health (2008-2017): Baseline for Implementation. Global Country Survey 2008/2009. Executive Summary and Survey Findings*, 2013, pp. 36-38; N. STACEY *ET AL.*, *Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025*, EU-OSHA, 2018, p. 67, where the need arises for a systematic redefinition of WHO strategies).

In relation to employer responsibility, a need is also voiced to broaden responsibilities in order to protect workers in non-standard work (N. STACEY *ET AL.*, *op. cit.*, pp. 61-62).

2. The New Labour Market

2.1. Productive and Non-Productive Work in the Context of Fordism: A Genre-Based Division

The modern notion of work was institutionalised during the rise of the capitalistic system. The economic literature of XIX century (particularly K. MARX, *Il capitale*, Utet, 1974; K. MARX, *Manoscritti economico-filosofici del 1844*, Einaudi, 2004, which in turn makes reference to A. SMITH, *La ricchezza delle nazioni*, Utet, 1975, and D. RICARDO, *Principi di economia politica e dell'imposta*, Utet, 1947) promoted an idea of work to be intended merely as a productive activity, so that it is assimilated to other production factor, *e.g.* land and capital. the idea of work as a productive activity developed also in labour law discourse, which did not pro-

duce work-related epistemology as opposed to the economic domain, as pointed out in M. TIRABOSCHI, *Persona e lavoro tra tutele e mercato. Per una nuova ontologia del lavoro nel discorso giuslavoristico*, ADAPT University Press, 2019, pp. 118-120. As is known, the most advanced theories on work were that of K. MARX, *Il capitale*, cit., pp. 95-105, when referring to the difference between 'exchange value' and 'use value'. Being a production factor like land and capital, work is deprived of its social and anthropological meaning and becomes an exchange item, as pointed out in M. TIRABOSCHI, *op. cit.*, p. 115. In order to be sold and meet the profit needs of capitalists, work must be treated like an economic good, which can be used to produce an exchange value. It is a form of abstract work, intended as the ability to produce economic value to be measured in terms of time, so it can be exchanged on the market with other goods having the same value. Since the I Industrial Revolution, the notion of work has included only those activities which can create value and are economically relevant. Productive and paid work proliferated thank to the presence of care and reproductive work, which are usually excluded from market dynamics, and thanks to the social division of work, which reflect the gender-based division (*idem*, p. 73).

V. PULIGNANO, *Work in deregulated labour markets: a research agenda for precariousness*, ETUI Working Paper, 2019, No. 3, p. 7, underlines that the division of work which is typical of Fordism reflects the way traditional sociology was understood, which in turn referred to Durkheim's classification of work, whereby women should engage in care and domestic work, where only men can be part of the institutional labour market.

É. DURKHEIM, *La divisione del lavoro sociale*, Edizioni di Comunità, 1962, p. 80, stresses the difference between males and females, either in biological or functional terms. While before the institution of society "women's roles are clearly distinct from males', though the two genders perform the same existence", the rise of

civilisation the distinction is clear both in relation to roles and genders. In modern society, males and females conduct different lives. While men take care of the family, women can look after the family and the house. Durkheim provides a positive assessment of the distinction between the two genders, because it fuels so called ‘conjugal solidarity’, which is among the strongest “disinterested inclinations” (*idem*, p. 79).

It is in the difference and complementarity between the two genders which lies marriage stability and modern social organisation, as the gender-based division of labour becomes norm in the name of solidarity. The individual has therefore the duty to improve the specialisation required to perform tasks, accepting to sacrifice their other faculties. According to Durkheim, female’s specialised affective functions and males’ intellectual ones take on a moral value, because they serve societal cohesion and stability.

Related to this view is the one of Parsons, especially in relation to the gender-based roles within the family and their implications in terms of social roles. Like Durkheim, Parsons argues for the gender-based division of labour within the family and the functional role of such a division during the industrialised era, which supports a male-based labour market and their social roles. According to Parsons, family roles feature “two axes of differentiation, namely a hierarchical axis of relative power and an instrumental-expressive axis” (T. PARSONS, R.F. BALES, *Famiglia e socializzazione*, Mondadori, 1974, p. 49). The first axis is concerned with generation, while the second one refers to gender. The instrumental function, which is mostly performed by the husband/father, regards the relationships of the system-family with the external environment, and aims to fulfil the conditions to maintain one’s balance and with the instrumental setting up of the desired relations towards outside objects/purposes. The expressive function, is mostly carried out by the mother/wife and concerns the aspects within the system-

family, *e.g.* maintaining relations between members, the adjustment of the models and the tensions of the units making up this system. In the A.'s view, this gender-based division of labour is effective because it reduces competition for family salary, allowing women, who are excluded from paid employment, to focus on kids' upbringing and the management of family businesses.

Most recently, this concept has been underlined in economic terms by G.S. BECKER, *A treatise on the family*, Harvard University Press, 1993. In a wide discussion on the family economics, Becker argues that the gender-based division of labour based itself on the separation of roles within the family, comparing family organisation to that of a business (*idem*, p. 51). This leads him to justify this division with profit maximisation, through the specialisation of both men and women in their activities. Following their inclination to care, women has developed an advantage in the handling of family responsibilities, allowing men to focus on market production (*idem*, pp. 37-40). Regardless of the reasons about role separation, which Becker motivates with women's natural vocation for care, the positive aspect of Becker's analysis lies in the fact that the link between domestic work and market work has been acknowledged. Males' work productivity is made possible thanks to an invisible army of females, which take care of the house and our children. The functioning of Fordist industrialism and society is clearer now, as it is "closely linked to gender segregation because implicitly focused on the distinction between work and family, man and women, work/inactivity" (M. TIRABOSCHI, *op. cit.*, p. 181).

M. TIRABOSCHI, *op. cit.*, p. 73, also further explains "the intimate connection or interdependency between reproductive and productive work", making reference to H. ARENDT, *Vita activa. La condizione umana*, Bompiani, 2017, p. 111, according to whom "What slaves leave behind them is the freedom of their masters or, using a modern expression, the potential productivity of their masters". In spite of the relevant role of women which favours

men, the first did not receive any consideration in economic terms. According to Arendt's this is due to Marx's intellectual elaboration "Marx disliked unproductive labour, a sort of labour perversion, as it was not worthy of being called labour as it does not enrich the world" (*idem*, p. 110).

This was the ideology of Fordism, nicely expressed by A. ACCORNERO, *Era il secolo del lavoro*, Il Mulino, 2000, p. 13: "salaried, productive, manufacturing work; market-based work, not care or services work; masculine, male-oriented work". According to M. TIRABOSCHI, *op. cit.*, p. 118, Fordism industrialism incorporates the abstract notion of work elaborated by Marx, leading to acknowledge as work only the activity having exchange value, *i.e.* it can be exchanged with other goods. "The labour market has coincided with the market of productive work" (*idem*, p. 199) for which care work is excluded, in that it has been regarded as unproductive for it does not produce a good sellable on the market (P. BOSI, "Care", *sviluppo umano e crescita: una conciliazione difficile*, Il Mulino, 2008, p. 640; V. PULIGNANO, *op. cit.*, pp. 7-8). If productive work is assessed in monetary terms, as it coincides with salaried work (M. TIRABOSCHI, *op. cit.*, p. 119; V. PULIGNANO, *op. cit.*, pp. 7-8), the activity which does not produce economic returns and unpaid, *i.e.* female work, is not regarded as work in a strict sense.

The IV Industrial Revolution and the disruptive effect of the technologies made available through them, challenges the Fordist paradigm, based on the gender-based division of labour and on the difference between productive and unproductive work. As pointed out by F. SEGHEZZI, *La nuova grande trasformazione. Persona e lavoro nella quarta rivoluzione industriale*, ADAPT University Press, 2017, pp. 18-19, the increase of productive process automation implies a reduction of the number of people in employment in traditional manufacturing. Concurrently, what emerges is a boost towards replacement and transformation within the labour market, through the creation of more complex

activities featuring the complementarity of man and the machine in the context of manufacturing and the emergence of new market segments that satisfy the needs of a changed socio-demographic context. The IV industrial revolution, to be intended not only in terms of technological innovation but as a new socio-economic and cultural paradigm, seems to favour the shift from “a market-oriented vision of the world to a new third-sector perspective”, as stressed in J. RIFKIN, *The End of Work. The Decline of the Global Labor Force and the Dawn of the Post-Market Era*, Putnam’s Sons, 1995, p. XVIII, and the definition of a new work organisation which is not only functional to its underlying production. The most illustrative example of the fact that the difference between productive and unproductive work is no longer tenable is the emergence of a care work market, an activity previously regarded without economic value and then performed by women on a gratuitous basis. This new market segment, like other tasks which are filling some other social needs, e.g. environmental protection, urban regeneration and the protection of cultural heritage (M. TIRABOSCHI, *op. cit.*, pp. 158-159) – poses new challenges in terms of health and safety, calling for a review of insurance legislation, so far modelled upon productive work.

2.2. New Demographic, Economic and Social Ecosystems

2.2.1. Demographic Changes and the Impact on Work

Demographic changes have been playing a major role in the transformations that contributed to changing the economic, social and cultural scenario. Population ageing, women’s emancipation, and migration flows, late parenthood, reduced birth rates and the chronic nature of some illnesses have featured countries’ economic systems beyond Fordism, favouring the IV Industrial Revolution.

The ageing of the population is one of the most investigated aspects in national and international research (ISTAT, *Indicatori demografici. Stime per l'anno 2018*, 2019; ISTAT, *Rapporto annuale 2019. La situazione del Paese*, 2019; ISTAT, *Il futuro demografico del Paese. Previsioni regionali della popolazione residente al 2065*, 2017; CENSIS, *I disabili, i più diseguali nella crescita delle disuguaglianze sociali*, in *Diario della Transizione*, 2014, No. 3; FONDAZIONE ISMU, CENSIS, *Elaborazione di un modello previsionale del fabbisogno di servizi assistenziali alla persona nel mercato del lavoro italiano con particolare riferimento al contributo della popolazione straniera. Sintesi della ricerca*, 2013; UNITED NATIONS, *World Population Ageing 2017*, 2017; WORLD HEALTH ORGANIZATION, *Global Health and Aging*, 2011). This phenomenon has been identified by R. IMPICCIATORE, *Cambiamenti demografici e mercato del lavoro*, in *RGL*, 2015, No. 2, I, p. 268, in terms of “longer longevity and persistent low levels of fertility”. Population ageing results from two factors. On the one hand, the increase of life expectancy which moved from 58 years in the 1970s to 72 years today and 77 years in 2050 (UNITED NATIONS, *World Population Prospects 2019. Highlights*, 2019, p. 29). On the other hand, the reduction of fertility rates, two aspects which changed global demography considerably (R. LEE, *The Demographic Transition: Three Centuries of Fundamental Change*, in *Journal of Economic Perspectives*, 2003, Vol. 17, No. 4, p. 168).

These two trends are already visible in Europe, where people's average age – 78 years and 83 years for men and women, respectively, will increase by a further 15 years in the next century, taking account that the number of children per female is 1.5 averagely (REFLECTION GROUP ON THE FUTURE OF THE EU 2030, *Project Europe 2030. Challenges and opportunities*, European Union, 2010, p. 23).

The result of this state of affairs is a highly-asymmetrical workforce in Europe. As the 20-54 years-old age group is shrinking, the one consisting of people aged between 55 and 69 is increasing. They are the so-called baby boomers, which were born after

the II World War who are reaching retirement age. The asymmetry is due to the fact that the increase in the number of workers aged 55 and older does not correspond to that of young people entering the labour market. Therefore, older workers become more relevant for the labour market. An ageing population means an ageing workforce, an aspect which might cause a conflict of interest between younger and older workers, as pointed out by A. SAMORODOV, *Ageing and labour markets for old worker*, ILO Employment and Training Paper, 1999, No. 33, p. 3.

Ageing of population also impacts on the reduction of people in working age and the increase of that in retirement. Population ageing also causes changes in relation to work sustainability as regards tasks, life needs, the outbreak of chronic diseases resulting from a longer working life generated from the reforms introduced by governments to deal with demographic pressures. Finally, as pointed out by R. IMPICCIATORE, *op. cit.*, p. 268, an ageing population also increases the demand for some services, *i.e.* home help, nurses, domestic workers (see also C. SARACENO, *Bisogni e responsabilità di cura: non solo una questione di genere*, *Lectio Magistralis*, Università degli Studi di Torino, 26 May 2009, p. 1).

According to 2019 statistics, life expectancy stands at 72 years old (70 for males and 75 for females) that is an 8-point increment compared to 1990 (UNITED NATIONS, *World Population Prospects 2019. Highlights*, *cit.*, p. 29).

Relatedly, fertility rates are also dropping, moving from 2.5 babies for females in 2019 to 2.2 in 2050, reaching 1.9 in 2100, according to the estimated of UNITED NATIONS, *World Population Prospects 2019. Highlights*, *cit.*, p. 32.

According to R. IMPICCIATORE, *op. cit.*, p. 271, while in pre-industrial societies, the high birth levels allowed young generations to reach adult age and higher levels of mortality allowed reaching seniority only to a limited number of individuals, now-

adays senior individuals are a constant of our society. As argued by A. ROSINA, A. DE ROSE, *Demografia*, Egea, 2014, pp. 110-111, ageing is now an irreversible phenomenon, destined to consolidate in the future, changing demography forever.

Furthermore, international and national research points out that motherhood starts later than in the past in western countries. This is also because of the emergence of so-called ‘new families’ (C. SARACENO, M. NALDINI, *Sociologia della famiglia*, Il Mulino, 2013, p. 46) namely new ways of starting families in terms of rules and values. Specifically, one-person families in Italy are on the rise, due to different reason: the end of a marriage, widow-ing, etc. Single-parent families are also increasing due to divorces, separations, and so are reconstituted families, *i.e.* those where at least one member had been married before. Migrant or mixed families are also a reality today, that is families where one of the spouses is of foreign origins (*idem*, p. 54). Finally, and increasingly “for long periods of time, families become communities made up of adults of different ages, who are given high degrees of autonomy although economic dependency exists, without a clear and legitimate authority model” (*idem*, p. 165). This model is widespread in Italy, where children tend to stay longer within the family of origins, even after reaching economic independence.

Ageing involves also the share of active individuals, which is significantly reducing. One of the indicators developed countries are looking at with concern, is, according to R. IMPICCIATORE, *op. cit.*, p. 273, the dependency ratio from the senior population, that is the relationship between the number of people aged 65 and older and potentially active population. This index tells us the degree of social and economic dependency between generations, both inside and outside the labour market. In Western countries, this ratio is some 33% – meaning that one individual in retirement age corresponds to three people in working age – while in 2050, it will be 60%.

As stressed by A. SAMORODOV, *op. cit.*, p. 4, the occupational and social implications of this state of affairs bear relevance. The cost faced by society concerning an old individual can be higher of that borne by a baby or an adolescent, leading to an increase of public spending supporting welfare systems (WHO, *World report on ageing and health*, 2015, p. 131).

C. SARACENO, *op. cit.*, p. 1 stresses that ageing, together with the consequent raise of the old population, is linked with care and those who can provide it.

The welfare model in place in Scandinavian countries, where the government plays an important role in assistance provision, is an alternative to the one in place in Mediterranean countries, which is more family-based.

The effects of ageing on population can be balanced through replacement migration (UNITED NATIONS, *Replacement Migration: Is It a Solution to Declining and Ageing Populations?*, 2001). Starting from the 1970s and increasingly over the years, many people arrived to Italy looking for a job. Because of an average age of those going to Italy lower than that of locals, migrants increase the population, also the active one. The fact that migrant women reported a higher birth rates than that of local ones contributed significantly to the increase in births.

R. IMPICCIATORE, *op. cit.*, p. 275, suggests looking at replacement migration to deal with ageing with care, as this process might have a number of limitations. First of all, the A. argues that migration flows should be higher than current ones. Furthermore once settled in the country of destination, get old and become part of the inactive population (D.A. COLEMAN, *Who's Afraid of Low Support Ratios? A UK Response to the UN Population Division Report on 'Replacement Migration'*, paper presented at the *Expert Group Meeting on Policy Responses to Population Ageing and Population Decline*, New York, 16-18 October 2000; G. DE SAN-

TIS, *Can immigration solve the aging problem in Italy? Not really*, in *Genus*, 2011, Vol. 67, No. 3) so they will also need welfare support.

Finally, migrants' fertility rate is decreasing, migration flows are not distributed evenly nationwide, as they are based in areas not necessarily affected by high levels of ageing.

As for replacement migration, this cannot be the solution to solve ongoing ageing, as pointed out in the literature on demography (F.C. BILLARIE, G. DALLA ZUANNA, *Is replacement migration actually taking place in low fertility countries?*, in *Genus*, 2011, Vol. 67, No. 3; T.J. ESPENSHADE, "Replacement Migration" from the Perspective of Equilibrium Stationary Populations, in *Population and Environment*, 2001, Vol. 22, No. 4; R. LESTHAEGHE, *Europe's Demographic Issues: Fertility, Household Formation and Replacement Migration*, in *Population Bulletin of the United Nations*, 2002, No. 44-45).

2.2.2. Women Accessing the Productive Labour Market

Women's entry into the institutional labour market is one of the social phenomenon which impacted significantly its functioning, contributing to repealing some fundamentals of Fordism and remodelling some of its aspects.

In the final years of the last century, female participation in the labour market has been increasing in industrialised countries (J. CABRITA, J. VANDERLEYDEN, I. BILETTA, B. GERSTENBERGER, *Gender equality at work*, Eurofound Research Report, 2020, p. 11) and represented the major catalyst for social and economic change at the time. By looking at the OECD data and the historical estimates for early industrialised countries (E. ORTIZ-OSPINA, S. TZVETKOVA, M. ROSER, *Women's employment*, in *ourworldindata.org*, 2018) like USA, Canada, Germany, the UK, Spain and France, it is possible to examine long-term female participation rates.

The rise in extra-domestic work began at different moments and with different paces in all countries. USA and Canada reported high rates of extra-domestic work in the 1950s, but it slowed down at the start of the XXI century. In Europe, female employment increased in the UK and France in the 1960s, while in Germany, which reported high rates of female employment in the first years of the last century (reporting a 40%-peak), this form of employment struggled in the years following the II World War. In Italy and Spain, women's integration took place later than in other European countries. In this sense female participation started to be significant in the 1970s, with this phenomenon which contributed to redefining the Italian labour market (P. VILLA, *La crescita dell'occupazione femminile: la polarizzazione tra stabilità e precarietà*, in *LD*, 2010, No. 2, p. 344). Villa goes through Italy's female employment, stressing that in the 1970s most women were inactive. By the end of the 1970s, one woman out of 3 was employed, usually until she got married or had her first child (*ibidem*, pp. 346 ff.). From 1995 to 2008, the increase in female employment had been gradual, rising the rates of female employment to more than 47%.

With the start of the economic crisis, the Italian labour market in Italy slowed down considerably. According to ISTAT, *Come cambia la vita delle donne. 2004-2014*, 2015, pp. 93-94, female employment reported a decrease equal to 47.2% in 2008 and 46.8% in 2014. In this phase of economic stagnation, female employment recorded higher levels of resilience of male employment, which reported a more significant decrease in the hardest-hit industries – construction and manufacturing – starting to increase again in 2014. The slower growth of male employment between 2004 and 2008 and its sharp decrease during the crisis, reduced the gender gap in relation to employment, though there are still marked differences, which for 2014 were calculated at 17.8% (*idem*, p. 94).

Istat data point to a significant growth as regards female employment between 2004 and 2019, which passed from 37% to 50% (+13%). The positive trend is part of a wider increase in relation to female employment which involved European countries, as pointed out in J. CABRITA, J. VANDERLEYDEN, I. BILETTA, B. GERSTENBERGER, *op. cit.*, p. 11.

However, Italy's situation is not satisfactory when compared to the objective set out by the EU for 2010 – namely 60% of female employment between 15 and 64 years old. This is true also when contrasted Italy's results with those of others where female participation has been traditionally low, *e.g.* Spain, Greece and Ireland (P. VILLA, *op. cit.*, p. 344).

As pointed out by R. REYNERI, *Il lavoro delle donne*, in C. DELL'ARINGA (ed.), *Il lavoro che cambia. Contributi tematici e raccomandazioni*, Cnel, 2009, the decision to refer to the employment rate rather than the unemployment one, represents an important paradigm shift in Europe's employment policies, which originates from the new condition of women in society. Since the 1970s, discussions about full employment concerned males only, as families at the time were based on breadwinners while females were in charge of domestic work. The changed scenario resulting from women's access to the institutional labour market and the presence of female unemployment do not allow providing a clear picture about female presence in the labour market.

Eurostat data for 2017 indicate that female employment was low while the gap with males increased. In Europe, female employment stood at 66.5% and concerned people aged between 20 and 64 years. Italy's female employment rate was 52.5%, higher than Greece 48% which ranked last in Europe, and still lower than Spain (59.6%), France (67.2%), the UK (73.1%) and Sweden (79.8%) which ranked first.

All EU countries report a share of male workers which is higher than that of female workers, with an average gap of 11.5%. Italy

is one of the countries where this gap is more pronounced (19.8%), with only Malta which fared worse (24.1%). Again, scandinavian countries ranked first.

A further aspect needs stressing in relation to Italy. Besides being lower than expected, the increase in female employment in this country presented major differences between Northern and Southern Italy, which in the last 15 years was equal to 10% and 4%, respectively.

Women's access to the labour market was certainly eased by the changes brought about by the IV Industrial Revolution. In this sense, the high female participation in the labour market was also the result of higher educational attainments among new generations (P. VILLA, *op. cit.*, p. 346; S. SCHERER, E. REYNERI, *Com'è cresciuta l'occupazione femminile in Italia: fattori strutturali e culturali a confronto*, in *SM*, 2008, No. 2, p. 185). As education among women, the most significant change was represented by higher education: OECD's data reported that in 2008 women made up 50% of individuals who received higher education.

As pointed out by R. HEATH, S. JAYACHANDRA, *The Causes and Consequences of Increased Female Education and Labor Force Participation in Developing Countries*, NBER Working Paper, 2016, No. 22766, p. 2, higher educational levels and access to extra domestic work are closely linked. Higher educational levels helped women enter the labour market, while the best employment opportunities have led women to attain higher educational levels.

According to P. VILLA, *op. cit.*, p. 346, in recent years, women have filled the gap with men, faring better than them in terms of schooling. On average, women finish school earlier and with higher grades than men. According to Istat, Italian women with a diploma are 63.8%, while men are 59.7%. Women with higher education qualifications are 22.1% and men are 16.5% (ISTAT, *Livelli di istruzione e ritorni occupazionali. Anno 2018*, 2019, p. 2). Women fare better than men because of their difficulty to access

the labour market and high-quality employment. A distinctive trait of female employment in Italy is that women with higher educational levels are overrepresented (P. VILLA, *op. cit.*, p. 351). Villa also stresses that the under-representation of educated women in the labour market is a widespread phenomenon, as they are often penalised by maternity and the difficulty to strike a balance between work and family life (*idem*, p. 348). In this sense, F. BETTIO, P. VILLA, *To What Extent does it Pay to be Better Educated? Education and the Work Market for Women in Italy*, in *South European Society and Politics*, 1999, Vol. 4, No. 2, pp. 151-152, point out that higher education contributes to mitigating the negative effects of marriage and maternity on women's career.

So the lack of education limits female employment more than maternity does. A further aspect of women's higher education levels is, according to P. VILLA, *op. cit.*, p. 347, "the emancipation from traditional cultural values and more ambitious aspirations in terms of work and lifestyles". This view is also echoed by F. BETTIO, P. VILLA, *op. cit.*, p. 158. Women's massive access to the labour market has generated a gender-based awareness for which young women's identity and self-fulfilment are also realised through their success at work and not just in the household.

Yet P. VILLA, *op. cit.*, p. 345, specifies that "the increase in the number of jobs available for women did not translate into an increase in their quality". In this sense, women at work still suffer occupational segregation, either vertically and horizontally (R. BIANCHERI, *La trasversalità dell'approccio di genere per la salute e la sicurezza del lavoro. Dalla teoria alla prassi un'interazione possibile*, in *Salute e Società*, 2014, No. 1, p. 132; A. CARDUCCI, E. CAPONI, *La prospettiva di genere nella valutazione dell'esposizione ai rischi lavorativi*, *idem*, pp. 162-164; J. CABRITA, J. VANDERLEYDEN, I. BILETTA, B. GERSTENBERGER, *op. cit.*, pp. 14-15; P. CORTES, J. PAN, *Occupation and Gender*, IZA Discussion Paper, 2017, No. 10672, pp. 3-4) as well as other disadvantages (pay gaps, difficulties when

accessing top roles, family and caring responsibilities), so women are placed at a disadvantage when compared to men.

Quality female employment is mostly hampered by “the persistence of a labour market still based on the breadwinner” (P. VILLA, *op. cit.*, p. 351). The definition of a male breadwinner was provided by Parsons in relation to 1950s US society, whereby men had to provide for their family, while women had to take care of domestic work. This is a gender division that makes the division between the public sphere (dealt with by males) and the private one (managed by females) more pronounced (see G. PASCALL, entry *Male breadwinner model*, in T. FITZPATRICK *ET AL.* (eds.), *International Encyclopedia of Social Policy*, Routledge, 2006, Vol. 3) and contributed to modelling the Fordist labour market. The gender-based division of labour, which was supported by cultural motivations, prevented women from carrying out extra-domestic and paid work, encouraging the setting up of a labour market centered on males and their needs, so unsuitable to females.

In order to understand the differences between men and women in terms of employment, it is important to appreciate that their roles cannot be overlapped in many aspects of life. This phenomenon, known as ‘gender segregation’ makes reference to “the differences in patterns of representation of women and men in labour market, public and political life, unpaid domestic work and caring, and in young women’s and men’s choice of education” (J. CABRITA, J. VANDERLEYDEN, I. BILETTA, B. GERSTENBERGER, *op. cit.*, p. 11).

Talking about gender segregation in the labour market means dealing with different aspects of female employment, examining so called ‘horizontal or sectorial segregation’ or ‘vertical or occupational segregation’, without overlooking the fact that many women are on atypical contracts and that they also bear the burden of family responsibilities.

In relation to occupational segregation, men and women are not necessarily engaged in the same sectors. Some of them are carried out mostly by women, while others are performed by men. Women are mostly engaged in the public sector (education and healthcare) and in the services sector (hospitality, food and trade). These occupations require human interaction, because women traditionally are regarded as more suitable to perform jobs involving emotional engagement. C. ALEMANI, *Le colf: ansie e desideri delle datrici di lavoro*, in *Polis*, 2004, No. 1, pp. 139-140, argues that women have introduced in the institutional labour market the element of relationality, which is typical of domestic work. This skill, while valuable, has not yet been evaluated properly in the labour market.

Vertical segregation refers to women's lower opportunities to be employed in leading roles, which are usually the preserve of men, and the higher probability of working part-time, with lower remuneration. In terms of statistics, women are usually employed through atypical contracts (part-time, fixed-term, agency work, collaborations) which are more widespread following the recent reforms of the labour market (R. PALIDDA, *Diversamente atipiche. Disuguaglianze di genere e costi della flessibilità*, in *Genesis*, 2008, No. 1-2, pp. 16-17; R. BIANCHERI, *op. cit.*, p. 133).

Young women are hired through atypical contracts, which are linked to high risks of unstable employment (G. ALTIERI, G. FERRUCCI, F. DOTA, *Donne e lavoro atipico: un incontro molto contraddittorio. 3° rapporto Osservatorio permanente sul lavoro atipico in Italia 2008*, Ires, 2008, pp. 42-43). They run the risk of losing their job and their remuneration are systematically lower than men's (L.L. SABBADINI, *Esame dei disegni di legge nn. 784-1405-1718 in tema di partecipazione delle donne alla vita economica e sociale*, Audizione Istat, Senato della Repubblica, 26 January 2010, pp. 13 ff.). The proliferation of atypical working arrangements enabled employers to engage in discriminatory practices against women who access the world of work for the first time, offering them atypical con-

tracts to save money and prevent organisational issues resulting from maternity.

Despite innovative legislation related to parental leave, there are two solutions concerning women's work-life balance. The first relates to the support offered by the family (parents, grandparents, even though they retire later than in the past) and part-time work for women.

In 2019, Istat calculated that 32.8% of women in employment was working on a part-time basis (this percentage raises to 35.1% when considering women under 34 years old) compared to 8.7% of men. In this sense, it is significant that a staggering 60% of those surveyed said that they have not chosen to move to part-time work on a voluntary basis.

More recently, female participation in the labour market might benefit from remote work, which enables one to work away from one's workplace, ideally favouring the reconciliation of work and family life and to reduce costs (E. DAGNINO, M. TIRABOSCHI, P. TOMASSETTI, C. TOURRES, *Il "lavoro agile" nella contrattazione collettiva oggi*, in E. DAGNINO, M. TIRABOSCHI (eds.), *Verso il futuro del lavoro. Analisi e spunti su lavoro agile e lavoro autonomo*, ADAPT University Press, 2016, p. 78).

This new way of organising work, which in Italy is usually referred to as 'agile working' (P. MANZELLA, F. NESPOLI, *Le parole del lavoro: agile o smart?*, in E. DAGNINO, M. TIRABOSCHI (eds.), *op. cit.*, pp. 23-24), poses questions as regards health and safety, challenging the notion of 'a place of work', on which Fordism was based.

C. GOLDIN, *A Grand Gender Convergence: Its Last Chapter*, in *The American Economic Review*, 2014, Vol. 104, No. 4, pp. 1116-1117, argues in favour of remote work, pointing out that it might help to reduce gender differences at work. M. ANGELICI, P. PROFETA, *Smart-Working: Work Flexibility Without Constraints*, CESifo Working Paper, 2020, No. 8165, pp. 28-29 share this view,

stressing that remote work will prevent gender inequalities for two reasons. Firstly, it will help to strike a balance between work and family life; secondly, it will contribute to better distributing family responsibilities.

Remote work is identified as a tool promoting female employment, although women will need to be taken care of in relation to the new health and safety issues resulting from this new way of working. They include modern risks – ergonomic and psychosocial risks, excessive workloads, absence of human interaction – and protection in contexts different from traditional workplaces (*i.e.* one's house).

The healthcare emergency originating from Covid-19 is illustrative of what has just been stated, in that household work is still unbalanced and is mostly women's responsibility, which are also in charge of looking after vulnerable people.

Much research (L. BALBO, *Crazy Quilts: rethinking the welfare state debate from a women's point of view*, in A. SHOWSTACK SASSON (ed.), *Women and the State*, Hutchinson, 1987; L. BALBO, *Tempi di vita. Studi e proposte per cambiarli*, Feltrinelli, 1991; F. BIMBI, F. PRESTINGER, *Profili sovrapposti. La doppia presenza delle donne in un'area ad economia diffusa*, Franco Angeli, 1985; D. BARAZZETTI, *Doppia presenza e lavoro di cura. Interrogativi su alcune categorie interpretative*, in *Quaderni di Sociologia*, 2006, No. 40) stresses that most female workers deal with so-called 'double presence', an expression invented by L. BALBO, *La doppia presenza*, in *Inchiesta*, 1978, No. 32, pp. 3-6, which determines higher workloads than those borne by males, increasing the possible risks they are facing. Like in other countries, in Italy the distribution of household work is still unbalanced, with women who bear the heaviest burden. C. ALEMANI, *op. cit.*, p. 140, refers to this as a "double trick. On the one hand, women are given responsibilities and tasked with activity which require time and energy. On the other hand, they struggle to fare well in the family and at work".

Furthermore the house is not yet regarded as a traditional place of work. Nor by housewives, as they perceive it as a place where they perform unpaid work, neither by women with a proper job and by home helpers. This lack of acknowledgment is one of the main reasons for the absence of a reflection concerning the health and safety of domestic workers.

2.3. The Rise of Care Work

Demographic and environmental changes, along with technological innovation, are bringing about changes in domestic and care work. C. SARACENO, *op. cit.*, p. 1, stresses that in the past, caring responsibilities were mostly performed at home, recently this issue has become “a political one. This is because domestic work affects relationships between men and women and their responsibilities, *i.e.* gender equalities”. The same arguments are made by M. TIRABOSCHI, *op. cit.*, p. 173, with the A. stressing that this activity “can no longer be left to a private relational dimension”, but should be brought to the political attention. One of the most disruptive phenomena of the IV industrial revolution is the attempt to set up a labour market specifically targeting this sector, in order to be equated to productive work.

Before providing statistical information about this form of employment, it might be sensible to deal with a terminological issue. As pointed out in ILO, *Domestic workers across the world: Global and regional statistics and the extent of legal protection*, 2013, p. 7, domestic workers are not a homogeneous group, neither in demographic terms (*e.g.* age, gender) nor in relation to the activity performed (cleaning, looking after the elderly or the children, taking kids to school, cooking, gardening, etc.). so, when defining ‘domestic workers’, reference has been made to a general formulation which attempts to highlight the commonest characteristic of this group: working in private households. In this sense, art. 1 of Domestic Workers Convention, 2011, states that “the term

‘domestic work’ means work performed in or for a household or households”.

According to the ILO’s most recent statistics, some 67 million people are engaged in domestic work. While the share of males working in this sector is significant (gardeners, drivers, butlers), domestic work is mostly performed by females, who account for 80% of the total number of workers. The demand for domestic and care work has increased in the final decades of the last century, both due to lower fertility rates, higher female emancipation (C. SARACENO, *Le politiche della famiglia in Europa: tra convergenza e diversificazione*, in *SM*, 2009, No. 1, p. 15; C. ALEMANI, *op. cit.*, p. 138), and higher interational labour mobility (W. SUEN, *Market-procured housework: The demand for domestic servants and female labor supply*, in *Labour Economics*, 1994, Vol. 1, No. 3-4, p. 2).

The fact that women were increasingly assigned jobs outside home was not followed by an even distribution of workloads as pointed out by C. ALEMANI, *op. cit.*, p. 138. Così anche R. RIZZA, M. SANSAVINI, *Donne e lavoro: rappresentazioni del femminile e conseguenze in termini di politiche di “work-life balance”*, in *Rassegna Italiana di Sociologia*, 2010, No. 1, p. 5. It is argued that workload distribution has not changed, although women have been engaged in the labour market. The same point is made by F. DOVIGO, *Strategie di sopravvivenza. Donne tra famiglia, professione e cura di sé*, Mondadori, 2007, p. 21, who argues that “while men have a family on which they can count, women have a family to look after”. The increasing demand for domestic work is also the result of longer life expectancy and the relevance of the elderly, which are among the targets of care services, as pointed out by R. SARTI, *Noi abbiamo visto tante città, abbiamo un’altra cultura. Migrazioni, identità di genere e servizio domestico in Italia. Uno sguardo di lungo periodo*, in *Polis*, 2004, No. 1, p. 19. Following the ongoing social and demographic changes, the report of the WORLD ECONOMIC FORUM, *Jobs of Tomorrow. Mapping Opportunity in the New Economy*, 2020, p. 21, states that most jobs are emerging in the so-called

care economy. The U.S. BUREAU OF LABOR STATISTICS, *Occupational Outlook Handbook. Home Health and Personal Care Aides*, 2021, estimates that healthcare operators will face an increase of 36% between 2018 and 2028, which is higher than any other profession considered.

The growing demand for care and assistance makes it possible to create a space where private services offered by families can be provided, where home helpers can have major role, as pointed out by A. COLOMBO, *Il mito del lavoro domestico: struttura e cambiamenti in Italia (1970-2003)*, in *Polis*, 2005, No. 3, p. 437.

F. CAPPONI, *L'emersione del mercato del lavoro domestico e della assistenza domiciliare: profili giuridici e contrattuali*, in *Professionalità Studi*, 2019, Vol. II, No. 6, p. 29, stresses that the need for domestic workers has established irrespective of one's social status. As highlighted by C. ALEMANI, *op. cit.*, p. 139, it is no longer a matter of social status, but a real need. The A. underlines that a paradox exists in that the opportunity offered to women of rich countries to access the labour market is possible only thanks to the work of other women from poorer areas and M. TIRABOSCHI, *op. cit.*, p. 174, who argues that the opportunity provided to women in rich countries to access the labour market is made possible to the work of other women, which are often migrants and hailing from poorer settings.

A. COLOMBO, *op. cit.*, p. 438, compares the movement of the people, mostly females, from developing to developed areas where they provide care services, to the delocalisation of other goods and services from high-intensive capital countries to high-intensive labour countries. This aspect would generate a "global value chain related to care work" consisting of two rings. The first consists of middle-class families in European countries which turn to domestic work in the private market. The second is concerned with overseas female workers engaged in domestic work, buy the same services from more vulnerable workers who are not able to leave their countries (R. SALAZAR PARREÑAS,

Servants of Globalization. Women, Migration and Domestic Work, Stanford University Press, 2001, p. 61).

Consequently, vertical perpetuation takes place again, as was the case with jobs mostly occupied by women, and leads women to take up most domestic work (C. ALEMANI, *op. cit.*, p. 141). This aspect gives rise to problems as regards these workers' remuneration and legal rights, as well as occupational health and safety. Domestic work is outsourced to women from other women, sometimes generating a feeling of guilt (*idem*, p. 139). Those engaged in this sector include local women, frequently dismissed from companies, and young mothers, who are forced to look after their family because working is not economically worthy. One difference from the past is that many migrant workers are joining this sector, as stressed by H. HARTMANN ET AL., *The Shifting Supply and Demand of Care Work: The Growing Role of People of Color and Immigrants*, Institute for Women's Policy Research, 2018, p. 6, and M. CERRI, *La "badante" e il lavoro post-fordista*, in *Economia e Società Regionale*, 2011, No. 3, p. 107. Domestic work – according to C. ALEMANI, *op. cit.*, p. 142, and R. SARTI, *Servizio domestico, migrazioni e identità di genere in Italia: uno sguardo storico*, paper presented at the Cirsde, Almaterra Seminar *La catena globale della cura*, Turin, 6 June 2004 – is the only opportunity they have, notwithstanding their qualifications obtained in their country of origins (G. COSTA, *Il lavoro non regolare di cura: quale ruolo nella costruzione di un mercato di servizi alla persona?*, in C. RANCI (ed.), *Il mercato sociale dei servizi alla persona*, Carocci, 2001, pp. 157-158). Their experience and qualifications are not recognised in our country. In the view of C. ALEMANI, *op. cit.*, p. 142, this situation is the result of the lack of an international system certifying university credits and vocational skills. So the best way to find a job, also to those who are in the country illegally, is to engage in domestic work.

Another issue that has emerged with the IV industrial revolution is the creation of digital platforms also in relation to domestic

work. recently, on-demand platforms providing domestic workers are in use in the USA, Europe and the Middle East, and they are also developing in developing countries (A. HUNT, F. MACHINGURA, *A good gig? The rise of on-demand domestic work*, ODI Working Paper, 2016, No. 7, p. 17). As stressed by A. TROJANSKY, *Platform work in the sector of long-term home care and its implications for workers' rights*, Workers' Group Research Report, European Economic and Social Committee, 2020, pp. 9-11, this phenomenon entails both risks and benefits for the labour market. On the one hand, digital platforms are useful in that they help tackle irregular employment, reduce costs and offer quality services, to organise work in a flexible way. On the other hand, these platforms fail to offer economic and social safeguards. Finally, according to A. HUNT, F. MACHINGURA, *op. cit.*, p. 23, digital platforms have given rise to the proliferation of autonomous work.

2.4. Emerging Risks

2.4.1. Gender-Related Risks

Relevant research points to two different risks when it comes to women's access to productive and reproductive work.

Some scholars focused on labour market feminisation, while others emphasize the occupational health and safety risks concerning the rise of new jobs mostly performed by female workers.

As far as the first strand is concerned, many authors (A. CARDUCCI, E. CAPONI, *op. cit.*; A. PERA ET AL., *La salute delle donne nei luoghi di lavoro: quali obiettivi per il futuro?*, in *Salute e Società*, 2014, No. 1, pp. 200-201; E. REALE, U. CARBONE, *Il genere nel lavoro. Valutare e prevenire i rischi lavorativi nella donna*, Franco Angeli, 2009; R. NUNIN, *Lavoro femminile e tutela della salute e della sicurezza: nuovi scenari per una prospettiva di genere dopo il d.lgs. n. 81/2008*, in

RDSS, 2011, No. 2; S. FERRUA, *Rapporto EU-OSHA: la prospettiva di genere nelle politiche per la salute e la sicurezza sul lavoro*, in DRI, 2015, No. 1, p. 291) point out that a 'neutral approach' was used in terms of occupational health and safety when the number of women in the labour market has increased, so the difference between female and male workers were ignored, as was the risks faced by the former. Occupational medicine did consider these differences, but only in biological terms, overlooking those factors related to socially constructed roles, that the different contexts attribute to men and women depending on cultural models.

Starting from the 1990s, the idea developed that risk assessment strategies also needed to consider the specific traits of male and female workers, in order to identify, characterise and evaluate risk exposure, as well as seriousness and danger. Therefore, recently "there arises the need to deal with risk evaluation from a global perspective, using as a paradigm the complex set of biological and socio-cultural characteristics marking 'the sex-gender system'" (A. CARDUCCI, E. CAPONI, *op. cit.*, p. 161).

The AA. considered stress the relevance of adopting a gender perspective for risk assessment in the context of occupational health and safety, as to date the focus has been mostly on breastfeeding and maternity. The research examined points to the need to provide protection to all workers in reproductive age (E. REALE, U. CARBONE, *op. cit.*, pp. 72-83). The AA. are of the opinion that this form of protection is relevant in that polluted materials generate negative effects on males and females' reproductive organs. Specifically, they might cause endocrinal disorders and delays in reproduction among women, while men's quality of sperm might be affected (*idem*, p. 83).

The second strand of research includes research like S. PAYNE, L. DOYAL, *Older women, work and health*, in *Occupational Medicine*, 2010, Vol. 60, No. 3, which emphasises the lack of interest in the occupational health and safety of women from all age in paid

and unpaid work. One limitation highlighted by Payne and Doyal is that “paid work is still often seen as a predominantly ‘male’ activity but also because much of the research on occupational health is carried out in large workplaces where men still predominate. To some extent, this gap in research follows from an assumption that women’s employment is less hazardous – that is, that segregation in the labour market is also associated with segregation in terms of the health risks of paid work and that men do ‘dangerous’ work, whereas women do not [...] The particular gap in our understanding of the health of older women workers reflects not just the absence of data on the direct effects of waged work but also a lack of understanding of the complex interaction between current and previous patterns of work and between paid and unpaid work” (*idem*, p. 173).

The main reference in this context is gender segregation, because most research underlines the relevance of examining the potential risks resulting from horizontal and vertical segregation. Women’s risks might depend on both biological and cultural factors, namely sex and gender. In relation to women’s participation in paid employment both in Europe and the USA, it has been observed that some sectors have been feminised, as female employment has increased together with the growth of some sectors, among others the tertiary one.

For example, E. REYNERI, *Sociologia del mercato del lavoro. I. Il mercato del lavoro tra famiglia e welfare*, Il Mulino, 2011, pp. 84-85, has pointed out that in Italy between 1977 and 2008, female employment grew thanks to sectors like trade, tourism, catering, public administration, healthcare, education and healthcare.

Currently, female workers operate in specific sectors. According to EUROSTAT, *Employees by sex, age and economic activity, 2019 (Activities of households as employers; Undifferentiated goods-services producing activities of private households for own use)*, a high share of female workers are employed in many countries, such as Spain (87.73%), Italy (87.86%) and France (90.33%). In the UK, em-

ployed women are 67.91%. Female workers constitute the majority also in sectors like accommodation and catering, save for France, where female workers in these sectors are almost as many as male workers (49.2%). These two sectors are female-dominated in other countries: 53.72% in Italy, 54.49% in the UK e 55.85% in Spain.

The risks related to relational ‘female occupations’ arise in home work, accommodation, food, textile, healthcare, trade and education. A gender-based risk evaluation also requires consideration of the tasks carried out, as well as environmental characteristics and protection measures. As for protection devices, they are mostly modelled upon males, so they are not suitable for females. Unlike accidents, which are more frequent among males (accidents affect women only in 32% of cases) musculoskeletal disorders are more common among female workers, as their tasks usually entail incorrect posture and sedentariness. Ergonomic risks add up to chemical ones. in the healthcare sector, nurses handle drugs, deal with detergents and disinfectants. Biological risks resulting from human-originated pathogens, women are more likely to face them as they are mostly employed in jobs entailing human interaction (healthcare, education, clerical work, call centers, teaching, home help, cleaning). Women are thus employed in more stressful, repetitive jobs. Reale and Carbone examines the data issued by the European Agency for Safety and Health at Work, where it is explained that female-dominated jobs are more at risk of dermatitis, asthma, stress and violence, infectious disease and cancer and musculoskeletal disorders.

A further source of risk is related to violence and intimidations. Male jobs are more exposed to physical violence, while female jobs are prone to threats, humiliations, intimidations and sexual harassment. Moreover, exposure to the same risks can give rise to different effects on men and women, so “in risk assessment, the different impact of the same risks on men and women due biological differences is poorly researched, also because of other

aspects, like weight, size, bone mass, muscles, metabolism. Furthermore, equipment and clothing are not suitable to women as they are mostly intended for men. This gives rise to many problems for women, but also for men with particular characteristics” (E. REALE, U. CARBONE, *op. cit.*, p. 81).

Vertical segregation might also produce risks for women’s health and safety. Women’s instability of employment increases the risk exposure, and the likelihood to contract diseases and occupational stress. Much research also stresses that analyses fail to consider those jobs where women are mostly employed, so little research has been carried out about the toxic effects or the repetitive nature of some jobs.

The little social recognition of those jobs mostly occupied by women (*e.g.* clerical work) increases women’s risk of harassment and psychological pressures (A. CARDUCCI, E. CAPONI, *op. cit.*).

Some articles in the relevant literature (E. REALE, U. CARBONE, *op. cit.*; J.H. GREENHAUS, S. PARASURAMAN, *The Allocation of Time to Work and Family Roles*, in D.L. NELSON, R.J. BURKE (eds.), *Gender, Work Stress and Health*, American Psychological Association, 2002; M. EVANDROU, K. GLASER, *Combining work and family life: the pension penalty of caring*, in *Ageing & Society*, 2003, Vol. 23, No. 5; S. PAYNE, L. DOYAL, *op. cit.*) also focused on domestic and care work in relation to possible risks concerning occupational health and safety.

E. REALE, U. CARBONE, *op. cit.*, notice that domestic work, which is usually performed by women, is not considered by legal medicine and is not examined as a profession, *i.e.* paid work. While in the public sphere there exist monitoring activities that can be adapted to women, in the domestic one this hypothesis is not viable. In domestic work, both paid and unpaid one, there is a complete lack of preventive and regular checks, which can be found in similar jobs. To this end, Reale and Carbone examines three points to promote prevention in domestic work. First of

all it is important to “recognise one’s house as a genuine workplace and that domestic work entails energy, risks and might affect one’s health status” (*idem*, p. 252). It is then necessary to “identify one’s house as a workplace, like the others, especially for women who are paid to perform this job” (*ibidem*). Finally, we need to “be aware that many disorders are a direct consequence of the type of work we perform and the risks related to them, as is the case with extra-domestic work” (*ibidem*).

S. PAYNE, L. DOYAL, *op. cit.*, p. 174, also stress the higher presence of women in the informal economy, where there is little to no health and safety protection. They also insist on the need to consider the implications for women’s health and safety in relation to their double presence in both paid and unpaid work. They argue that “this unpaid work can have an impact on both physical and mental well-being. The physical risks of caring for older dependants are similar to those experienced in paid work by nurses and care workers and include the risk of back strain from lifting someone, for example. However, the risks experienced by older women providing care for young children, including grandchildren, are less often recognized. The lifting, carrying and bending work which is part of child care can impact on the physical health of older women leading to back pain and potential musculo-skeletal damage. And with all unpaid work, there is an increased risk of poor mental health where such work is stressful, isolated and unacknowledged” (*idem*, p. 176).

J.H. GREENHAUS, S. PARASURAMAN, *op. cit.*, p. 124, have pointed out that “it is the conflict between work and family roles, rather than the time devoted to each role, that influences the amount of stress that individuals experience in their lives”, realising that stress generates when difficulties arise in the management between paid and unpaid work (*idem*, p. 125).

According to C. SARACENO, M. NALDINI, *op. cit.*, p. 175, in a few years’ time, some problems might generate in relation to care work, as families will be less and less available to look after

children and the elderly. The AA. note that “the women who were born in the first years of the 1940s and turn 60 in the first years of the 2000s gave birth to fewer kids, but one of them is still at home helping with grandsons. Half of them have at least a parent/mother-in-law over 80 who is still alive. Usually in good health and active (23% of them are still active), these ‘sandwich grandmothers’ help both their sons and grandsons and parents and parents in law”. It remains to be seen whether they can also count on this help once they get older. This is so because their daughters will still be working.

While being institutionalised, domestic work poses challenges in relation to occupational health and safety and insurance coverage. The first element to be considered is the place where work is performed, *i.e.* the client’s house. The other aspect relates to the medical and chemical substances that domestic workers often manage without adequate training. The Covid-19 healthcare emergency is illustrative of the challenges related to the promotion and protection of domestic workers’ health and safety.

2.4.2. Older Workers and Risks: From Stereotypes to Chronic Diseases

The ageing of the population is giving rise to new risks and should be considered carefully to promote people’s health and safety. According to the data issued by the AGENZIA EUROPEA PER LA SICUREZZA E LA SALUTE SUL LAVORO, *Ambienti di lavoro sani e sicuri ad ogni età. Promozione di una vita lavorativa sostenibile*, 2016, p. 4, the raising retirement age in most member States implies that many workers have to stay on at work longer, so they are more exposed to occupational risks and must adapt to an ever-changing world of work (*e.g.* through more flexible work environment). To prevent health problems, the hope is that much effort will be put to ensure healthy and safe working conditions during the whole life.

The relevant literature stresses that the ageing process affecting the working population increase the risk of facing health issues, potentially leading to high levels of absenteeism among older workers linked to serious and invalidating diseases and more occupational injuries.

According to E. ROGERS, W.J. WIATROWSKI, *Injuries, illnesses, and fatalities among older workers*, in *Monthly Labor Review*, 2005, October, p. 24, “the nature of the injury suffered by an older worker is more severe than that suffered by younger workers. Older workers who suffer a workplace injury may experience longer recovery periods than their younger counterparts. And older workers die from workplace injuries at a higher rate than do younger workers”.

Furthermore, EU-OSHA, *Workforce diversity and risk assessment: Ensuring everyone is covered*, 2009, p. 30, highlights that work participation changes with age because of a decline of physical and psychophysical abilities and an increase of the incidence of a number of diseases (cardiovascular, respiratory, musculoskeletal diseases, as well as hormonal and metabolic disorders).

According to J.O. CRAWFORD, R.A. GRAVELING, H.A. COWIE, K. DIXON, *The health safety and health promotion needs of older workers*, in *Occupational Medicine*, 2010, Vol. 60, No. 1, p. 185, the literature in the medical field points to people’s ageing in relation to changes to physical and mental abilities, which have a direct and indirect impact on their working life. Specifically, they stress that adults’ aerobic capacity in both genders decreases during working life. Their longitudinal and cross-cutting research has also indicated an increase of the body mass index (BMI), a reduction in one’s height and a weight increase, even though these aspects depend on each person (*idem*, p. 186). The relevant literature also points to declining muscular strength, which can be slowed down with regular training. It does not change until 40 years old, but it slowly declines between 40 and 65 years old (*ibidem*). The AA. have also looked into some research according to which

older people are more sensitive to health-related problems. Specifically, health tolerance decreases due to age-related changes to the cardiovascular system (*idem*, p. 188). One's ability to keep their balance reduces with age, thus it is important to consider this aspect for tasks requiring this condition.

E. ORDAZ CASTILLO, E. RONDA-PÉREZ, *Salud y condiciones de trabajo en trabajadores mayores*, in *Medicina y Seguridad del Trabajo*, 2015, No. 240, p. 316, also stress that sensorial, cognitive and organic deficits might arise with age, along with a deterioration of the musculoskeletal system (bone mass loss, osteoporosis, muscle mass loss, arthritis).

In relation to older workers, the AGENZIA EUROPEA PER LA SICUREZZA E LA SALUTE SUL LAVORO, *op. cit.*, suggests paying attention to those situations that can present higher risks, like working on a shift, work requiring significant workloads, work environments featuring sudden temperature changes. Furthermore, the difference between functional capacities increases with age, so risk assessment must consider such diversity, focusing on the relation between working needs and individual state of health (*idem*, p. 14).

A significant body of research (E. ORDAZ CASTILLO, E. RONDA-PÉREZ, *op. cit.*; S. VARVA (ed.), *Malattie croniche e lavoro. Una prima rassegna ragionata della letteratura di riferimento*, ADAPT University Press, 2014; M. TIRABOSCHI, *Le nuove frontiere dei sistemi di welfare: occupabilità, lavoro e tutele delle persone con malattie croniche*, in *DRI*, 2015, No. 3; R. BUSSE, M. BLÜMEL, D. SCHELLER-KREINSEN, A. ZENTNER, *Tackling chronic disease in Europe. Strategies, interventions and challenges*, World Health Organization, 2010; E. NOLTE, M. MCKEE (eds.), *Caring for people with chronic conditions. A health system perspective*, McGraw-Hill, 2008) focuses on the risks faced by older workers due to their age-related physical decline, stressing that older workers are more likely to suffer from chronic diseases. M. TIRABOSCHI, *Le nuove frontiere dei sistemi di welfare: occupabilità, lavoro e tutele delle persone con malattie croniche*,

cit., pp. 683-684, argues that longer working lives means that we need to live with most chronic diseases, which limit our abilities and lead to higher absenteeism.

As illustrated by S. VARVA, P. DE VITA, *Quadro definitorio in prospettiva interdisciplinare*, in S. VARVA (ed.), *op. cit.*, p. 11, 'chronic disease' means "a disease having one or more of the following characteristics: it is permanent; it leaves a residual inability; it is caused by a non-reversible pathological alteration; it calls for the patient's special recovery which might need long-term supervision, monitoring and care". As pointed out by M. TIRABOSCHI, *Le nuove frontiere dei sistemi di welfare: occupabilità, lavoro e tutele delle persone con malattie croniche*, cit., p. 682, chronic diseases include cardiovascular and respiratory diseases, musculoskeletal disorders, HIV/AIDS, multiple sclerosis, tumours, diabetes, obesity, epilepsy, depression and other mental disorders.

M. TIRABOSCHI, *Le nuove frontiere dei sistemi di welfare: occupabilità, lavoro e tutele delle persone con malattie croniche*, cit., also identifies the implications of these diseases on workers and their families, both in relation to the welfare system and the sustainability of healthcare. Equally significant is also the impact on "the dynamics of the labour market, work organisation, especially on companies called on to manage the presence or the return to work of a less productive workforce and more prone to serious work-related accidents" (*idem*, p. 689). The A. goes on to argue that "chronic diseases also have an effect on labour productivity, impacting on business and economic system productivity as well as on workers' professional development" (*ibidem*). Since in the future "the participation of workers with chronic diseases in the labour market will be unavoidable to deal with the decline of labour demand and the shortage of qualified labour" (*idem*, p. 685), Tiraboschi stresses that investment on the health and safety of the economically active population will be fundamental, using holistic programmes for the protection of workers' health. This also means training "professionals with the necessary skills

to understand and managing the issues related to the return to work and access to the labour market of workers with chronic diseases” (*ibidem*). These professionals will play an important role because they help to deal with a number of issues related to the return to work of these workers (prejudices, harassment, organisational system penalising their return, sick workers’ uncertainty).

Age-related stereotypes are a further aspect to deal with. E.S.W. NG, A. LAW, *Keeping up! Older Workers’ Adaptation in the Workplace after Age 55*, in *Canadian Journal on Aging*, 2014, Vol. 33, No. 1, p. 2, argue that “Negative stereotypes such as age-related poor health, an inflexible attitude, resistance to change, and low trainability have come to stigmatize older workers [...]. On the part of employers, these stereotypes also call into question the work motivation, engagement, and job performance of older workers”, highlighting that “older workers continue to face cultural (stereotypes, ageism) and structural barriers to work (discrimination, lack of workplace accommodation)” (*idem*, p. 12).

R.A. POSTHUMA, M.A. CAMPION, *Age Stereotypes in the Workplace: Common Stereotypes, Moderators, and Future Research Directions*, in *Journal of Management*, 2009, Vol. 35, No. 1, p. 160, have analysed much research, stressing that most stereotypes attribute negative characteristics to older workers. These stereotypes are particularly widespread in a number of sectors, *i.e.* finance, insurance, retail, and IT (*idem*, p. 173). The first stereotype is that older workers report lower work performances than their younger colleagues (*idem*, p. 165). Furthermore, a widespread assumption is that older workers are less motivated than younger ones (*idem*, p. 166). The other diffused stereotype is that older workers are more reluctant to change than their younger peers (*idem*, p. 168). For this reason, they have less development potential than young workers have and they have a lower aptitude to learning, receiving less training opportunities (*ibidem*). According to the AA., it is evident that age-related stereotypes cause older work-

ers with the same expertise as young workers to receive more negative feedback during job interviews (*idem*, p. 171).

E.S.W. NG, A. LAW, *op. cit.*, p. 10, stress that “It has been noted that older workers often perceive a heightened risk of job loss and greater feelings of job insecurity due to the changing nature of work”.

Finally, S. CARLO, *Giovani anziani e ICT: tra rischi di isolamento e opportunità di invecchiamento attivo*, in *Sociologia e Politiche Sociali*, 2014, No. 3, p. 90, argues that age-related risks should also consider the ambivalent role performed by technology. This is because, on the one hand, it can offer the opportunity for social and personal empowerment (*e.g.* contact with the family and friends), while on the other hand might lead to isolation.

E. ORDAZ CASTILLO, E. RONDA-PÉREZ, *op. cit.*, pp. 316-317, emphasise that age-related health problems might be compensated by experience and maturity, which only develop at the early stage of our life (*e.g.* strategic thinking, consideration, wisdom, life control, global perception).

3. A New Organisation: New Sectors and Ways of Working

A first set of factors relates to increasingly fragmented work. The *European Industrial Relation Dictionary* of Eurofound defines this state of affairs as resulting from “an increase in forms of work and employment which differ from the ‘standard employment relationship’ of permanent, full-time, socially secure employment”. According to G. GOSETTI, *Lavoro frammentato, rischio diffuso. Lavori e prevenzione al tempo della flessibilità*, Franco Angeli, 2012, p. 11, this fragmentation arises from “the flexibilisation process in use in the new systems producing goods and services, which compress time and space to better meet the need for capital accelerated rotation”. Some elements are identified which

mark this fragmentation, like “reorganisation of work-related spatial and time dimensions; the de-structuring of organisational processes; the link between working life and value creation; the complexity of work, which is increasingly fragmented, producing polarising effects; the implications of people at work, which affect people’s life while at work; the emergency in terms of work protection, which also relates to how to produce health and stability” (*idem*, p. 18). Digital transformation rests on a number of aspects related to work and production. The focus will be on the attempt to “overcome the spatial and time limitations as delimited by the working time and space in use in the last century” (A. CASICCIA, *I paradossi della società competitiva*, Mimesis, 2011, p. 58).

Arguably, this fragmentation concerns the entire productive process, dividing and reconstructing sectors and productions. On the one hand, one is witnessing so called servitisation (this terminology was used for the first time in S. VANDERMERWE, J. RADA, *Servitization of business: Adding value by adding services*, in *European Management Journal*, 1988, Vol. 6, No. 4) that is “The increased offering of fuller market packages or bundles of customer focused combinations of goods, services, support, self-service and knowledge in order to add value to core product offerings” (*idem*, p. 315), which to many has been in place for more than 50 years (C. KOWALKWOSKI, H. GEBAUER, B. KAMP, B. PARRY, *Servitization and deservitization: Overview, concepts and definitions*, in *Industrial Marketing Management*, 2017, Vol. 60, p. 5). In an examination performed in L. FONTAGNÉ, P. MOHNEN, G. WOLFF, *No Industry, No Future*, Note du Conseil d’Analyse Économique, 2014, No. 3, p. 3, the definition of ‘industry’ is the following one: “industry comprises economic activities that combine factors of production [...] in order to produce material goods intended for the market”, while goods are “physical objects”. This divide has given rise to a gap between definitions and business, with 1/4 of French companies that in 2017 produced only services, 1/3 mostly services and, more generally 87% of companies which sold services. Among the topics which

are more related to the digital economy is the use of data centers. As pointed out by M. CROZET, E. MILET, *The Servitization of French Manufacturing Firms*, in L. FONTAGNÉ, A. HARRISON (eds.), *The Factory-Free Economy. Outsourcing, Servitization, and the Future of Industry*, Oxford University Press, 2017, p. 111, “the most widely-known examples of services produced according to ‘industrial’ methods are those of data centres, search engines and cloud computing, all of which are energy-intensive activities, requiring high levels of fixed assets (servers farms, cooling systems, secure sites, etc.), in no way inferior to those of traditional industrial sites, and for which costs rapidly decrease. While manufacturing factories no longer have chimneys, service producers have taken over: each Google data centre includes hundreds of thousands of servers which need to be cooled”.

3.1. New Prospects for Work Organisation

In the context of the ongoing changes in the world of work, jobs, job content and workers’ skills are adapting, and so are management models, organisational aspects both outside and inside production processes and external labour markets. New organisational patterns have emerged, among others the Japanese one, so-called lean production and the business networks, which share two common aspects. “The first is the attempt to move on from the rigidities of Taylorism and Fordism to more flexible and light production, the main feature of which is being able to deal with unexpected circumstance, with increasingly lower resources [...] and to change the role of the workforce which should be more and more autonomous so as to produce so-called ‘controlled autonomy’ [...]. The second aspect is concerned with the fact that organisational systems are now governed by the market based on coordination and control criteria. The market has at least in part replaced the norms and the hierarchical supervision in the relationships between organisational

units, both in relation to each organisational function and performance control” (G.C. CERRUTI, *Lavorare al tempo del cliente nel post-fordismo. Cambiamenti degli orari di lavoro in un ipermercato*, Franco Angeli, 2010, pp. 11-12). This aspect also involves the holo-cratic paradigm theorised by B.J. ROBERTSON, *Holocracy. The New Management System for a Rapidly Changing World*, Henry Holt and Company, 2015, which is based on an organisational model in which authority and decision-making are distributed among teams which self-organise, without the need of a vertical hierarch. Centrality moves from a fixed structure to given tasks in a given moment, in order to strike a balance between changing and flexible needs and co-workers’ response.

One of the aspects modifying these processes is working time which is no longer organised by work pace and is more flexible, helping to better reconcile work and family life.

The place of work is also undergoing change, also because of the widespread diffusion of the Internet which, as pointed out by E. ARMANO, *I lavoratori della conoscenza tra informalità e ambivalenza dei networks*, in *Studi Organizzativi*, 2011, No. 2, p. 83, has created a new workspace, a ‘trans-company network’ which regularly connects the local and the global dimension, generating new ways of working and living. As pointed out by many authors, structured work organisation is less and less widespread, while other ways of working are emerging. In the words Armano, we are witnessing the creation of networks, informal social networks the size and duration of which are variable and connect different entities (knowledge workers, businesses, companies, bodies and organisation) to implement and set up specific projects. Within these networks “a porosity emerges in relation to roles, which are more fluid and interchangeable. When shifting between roles, clients can also become partners, colleagues can become competitors and workers can turn into clients as regards some projects” (*idem*, p. 87).

S. BOLOGNA, *Knowledge workers. Dall'operaio massa al freelance*, Asterios, 2017, p. 19, examines the way of working of knowledge workers, arguing that it is merely a relationship with a computer and that people are now working “in isolation, without dedicated spaces, enabling one to access a vast amount of information”. Drawing on Serres’ arguments, the A. stresses that “connectivity and replaced the community”; workers do not work side by side but they are interconnected, so it is frequently the case that they do not know each other’s face and voice but only their email address.

Besides the establishment of these networks, new organisational systems have been detected in which everything is more connected and interdependent (people/machines/technologies/societies).

G. DELLA ROCCA, *Il lavoro in digitale, il tempo e gli orari: la crisi del sistema degli orari standard*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *Il lavoro 4.0. La Quarta Rivoluzione industriale e le trasformazioni delle attività lavorative*, Firenze University Press, 2018, pp. 251-252, stresses that business digitalisation is connecting production machinery, processes and systems, units, business networks, workers and consumers, generating interdependence among them.

S. NEGRELLI, *Le trasformazioni del lavoro*, Laterza, 2013, p. 46, makes reference to working through the Internet as “a type of work favouring dialogue within one unit, department or office and other entities outside them”. In another paper written with Pacetti (S. NEGRELLI, V. PACETTI, *Tecnologie, lavoro, organizzazione nell’Industria 4.0*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 377), Negrelli reasserts relation development within workplaces featuring an increase of the connection between huge amounts of information and people.

According to F. BONSIGNORIO, *Umani e robot: possibili alternative nell’evoluzione della divisione tecnica del lavoro*, in A. CIPRIANI, A.

GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 72, the connections between the items produced and clients' orders will increase in smart companies, in order to reduce the amount of unsold products. This will only be possible if cooperation will be promoted between robots and workers, where the former will engage in repetitive and dangerous activities while the latter will be more focused on improving their cognitive abilities.

F. BUTERA, *Lavoro e organizzazione nella quarta rivoluzione industriale: la nuova progettazione socio-tecnica*, in *L'Industria*, 2017, No. 3, stresses that technology will give rise to highly-connected supply chains and new organisational forms where digital technologies allow performing automatic actions.

In another paper, F. BUTERA, G. DE MICHELIS, *Come valorizzare il lavoro nella Quarta rivoluzione industriale: Progettare insieme*, in *Astrid Rassegna*, 2019, No. 3, p. 7, consider the potential of new technologies, pointing to the creation of new jobs, professions and roles.

As signalled by C. ANTONELLI, *Introduzione. L'impresa come rete di professioni*, in C. ANTONELLI (ed.), *Le professioni per l'impresa. Caratteri distintivi, fattori di successo e testimonianze*, Franco Angeli, 2009, pp. 18 ff., the higher interconnection among entities within companies can be also seen in the shift from a business model consisting of functional areas to one featuring a combination of professions. What characterises these connections is the absence of a consistent legal and contractual framework, because employees of the company work together with the self-employed.

F. BUTERA, *op. cit.*, also makes reference to cooperation between different professionals, so those in charge of designing new organisational and technological system should work to become 'system architects' having an interdisciplinary background and design thinking. Butera goes on to emphasise that skills will be in the hands of workers and not of organisations, so they will develop a client-oriented services.

This new business model requires more creativity, autonomy, flexibility and skills on the part of workers, so they join forces to fulfil specific objectives and to contribute to the company's overall success. A. BENNATO, *Il ruolo dei team nell'industria 4.0*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 4, specifies that “the idea of a worker trained to carry out specific tasks is being replaced by the promotion of a group of workers which can exchanged previously-assigned tasks within a complex organisational system”. According to the A., “teams have now become a strategic choice when organisations face difficult and complex tasks” (p. 5) which go beyond individual workers' skills.

F. BUTERA, *op. cit.*, claims that the team has become the basic organisational unit in all creative organisations. A number of reports by Eurofound also reassert this point (M. BISELLO, E. FERNÁNDEZ-MACÍAS, M. EGGERT HANSEN, *New tasks in old jobs: Drivers of change and implications for job quality*, Eurofound Research Report, 2018; E. FERNÁNDEZ-MACÍAS ET AL., *Game changing technologies: Exploring the impact on production processes and work*, Eurofound Research Report, 2018; D. STORRIE, *The future of manufacturing in Europe*, Eurofound Research Report, 2019), stressing the importance of teamworking. A. BENNATO, *op. cit.*, p. 7, observes that “the team leader plays a fundamental role in the organisation's learning processes, collective decision-making and people development. Their attitude towards the group's failures and success, their capacity to interact with other teams and with external actors (customers, suppliers, competitors), their clarity when setting out the objectives significantly impact on performance”. Gallino also points out that there is an increasing demand for workers' flexibility along with an expansion of globalised markets, with companies which are less and less responsible (N. COSTANTINO, *Luciano Gallino e le sfide di automazione, flessibilità, precarietà*, in *Studi Organizzativi*, 2016, No. 2, p. 136). Costantino argues that Gallino defines “flexible works or occupations those asking people to adapt the organisation of their own existence in a given timeframe – during life, a year, a

month or a week – to the changing organisational needs” (*idem*, p. 135; cf. L. GALLINO, *Il lavoro non è una merce. Contro la flessibilità*, Laterza, 2007). This definition is in line with the A.’s approach, which prioritizes on the individual characteristics of this activity, *i.e.* how they are dealt with by the workers concerned.

3.2. New Ways of Working

Digital transformation gives rise to new ways of working and new organisational models. Eurofound has carried out much research on new forms of employment (see I. MANDL *ET AL.*, *New forms of employment*, Eurofound Research Report, 2015) with two work arrangements which seem to have thrived in this period: *ICT-based mobile work e strategic employee sharing*. The first working scheme – which has been named with the terminology employed by the AA. (*idem*, p. 72: “Other terms used in public discussions, policy papers and research include mobile eWork [...], mobile ICT-supported work [...] and e-nomads”) – refers to “work arrangements carried out at least partly, but regularly, outside the ‘main office’, be that the employer’s premises or a customised home office, using ICT for online connection to shared company computer systems” (*ibidem*). In this sense, “work takes place wherever and at any time it suits the work activities, task, business schedule and lifestyle of the worker, not necessarily at a specific place but also ‘on the road’” (*idem*, p. 73). ICT-based mobile work can take place in a number of ways: 1) *full mobility*, with frequent changes of location and multiple locations and involving a variety of shift-work patterns and a combination of individual and team workplaces; examples of occupations that might follow these patterns are journalists, multi-site managers, regional-global sales people and service engineers; 2) *site mobility*, with frequent changes of location but in geographically limited areas, such as hospitals, schools, offices and campuses; examples of occupations involving site mobility are researchers and con-

struction site workers; 3) *multi-location workplaces*, involving a number of fixed work locations, changing infrequently but with *ad hoc* mobility; a typical occupation is field engineer; 4) *networked workplaces*, with limited physical mobility but with the ability to work at many different locations; types of work carried out in this way include 24-hour software development (*idem*, pp. 73 ff.).

Some years ago M. VARTAINEN, *Mobile Virtual Work – Concepts, Outcomes and Challenges*, in J.H.E. ANDRIESEN, M. VARTAINEN (eds.), *Mobile Virtual Work. A New Paradigm?*, Springer, 2006, p. 14, referred to mobile virtual work as “an aspect of an activity system consisting of a subject using tools to process objects of work in a working context”. Recently, Eurofound has published a new study examining the diffusion of the phenomenon and some impacts connected to work organisation. The research points out that “ICT has facilitated new ways of organizing work by giving workers more flexibility regarding when and where work can be performed”. Yet, this has been also caused by a “more general trend towards work that is project-based and fragmented, on-demand and performance-paid” (O. VARGAS LLAVE, I. MANDL, T. WEBER, M. WILKENS, *Telework and ICT-based mobile work: Flexible working in the digital age*, Eurofound Research Report, 2020, p. 14).

The second example refers to strategic employee sharing described in I. MANDL, *New forms of employment: Developing the potential of strategic employee sharing*, Eurofound Research Report, 2016, p. 5, which occurs when “A group of employers forms a network with a separate legal entity (the ‘employer group’) that hires one or several workers to be sent on individual work assignments to the participating companies”. Consequently, the employer group becomes the formal and single employer of the workers and is responsible for: fulfilling the duties related to the employment contract as regards administrative and social obligations; coordinating the assignments of the workers in the participating companies; setting out guidelines/codes of conduct for

the cooperation of all involved parties. The individual companies are responsible for: providing the workload for the shared workers; arranging the work organisation with them and ensuring adequate working conditions, following the general principle of ‘equal pay, equal treatment’ compared to core staff; paying the employer group for the human resources provided. The structure is similar to temporary agency work, with three important differences “The sole purpose of the employer group is to administer and coordinate the assignment of the shared workers to the participating companies, with the aim of providing them with the needed human resources when required. As such, the employer group does not aim to make a profit; the participating companies have not only a client-service provider relationship with the employer group, but also commit themselves to joint and several responsibility and liability for the shared workers’ wages and social security contributions; the workers regularly rotate among the participating employers”.

4. New Workspaces

4.1. The Place of Work in the IV Industrial Revolution

The IV Industrial Revolution, which produces a number of issues in relation to some working schemes governed in Italy’s legislation (*e.g.* remote working), has had serious implications on the entire legal system, with some aspects which are still in need of proper regulation. Society too has evolved thanks to IT, digitalisation and robotics and is still doing so at a fast pace. As pointed out by M. WEISS, *Digitalizzazione: sfide e prospettive per il diritto del lavoro*, in *DRI*, 2016, No. 2, p. 651, a shift is taking place from an information society featuring “technology-based forms of employment, which results in work delocalisation and the globalisation of production processes” to a knowledge society, which is based on high-level skills and creative workers, most of whom are attracted by life in urban centers (A.C. JAMAL,

Coworking spaces in mid-sized cities: A partner in downtown economic development, in *Environment and Planning A: Economy and Space*, 2018, Vol. 50, No. 4, p. 773) and then from a knowledge society to a ubiquitous knowledge society. In this type of society (on the same concept, see P. MASKELL, A. MALMBERG, *The Competitiveness of Firms and Regions: 'Ubiquitification' and the Importance of Localized Learning*, in *European Urban and Regional Studies*, 1999, Vol. 6, No. 1; B. MORISET, *Building new places of the creative economy. The rise of the coworking spaces*, paper presented at the 2nd *Geography of Innovation International Conference 2014*, Utrecht, 23-25 January 2014, pp. 3 ff.) people communicate with one another, machines communicate with people but also with other machines, leading to so-called 'Internet of Things', as illustrated by J. KAIVO-OJA, *Il futuro del lavoro: la robotica*, Documento di discussione EU-OSHA, 2015.

"People in the knowledge society who live in places where innovation is generated have some characteristics which make them different from those who live and will be living in other societies". This is the viewpoint of S. BAGNARA, *Il lavoro nella società della conoscenza*, in L. GUAGLIANONE, F. MALZANI (eds.), *Come cambia l'ambiente di lavoro: regole rischi, tecnologie*, Giuffrè, 2007, pp. 35 ff., who also argues that knowledge workers need easy and regular access to knowledge technologies which frequently are their work environment. In this sense "the workplace and work itself are unstable [...] People operating in knowledge society have a behaviour where job flexibility and mobility emerge clearly". In this context, the technological and intellectual component of work – which has been defined 'mind-facturing work' (see Court of Last Resort 7 June 2003, No. 9168, in *RIDL*, 2004, No. 1, II, p. 41, and L. NOGLER, *Gli spazi di lavoro nelle città tra innovazioni tecnologiche e "regressioni" interpretative*, in A. OCCHINO (ed.), *Il lavoro e i suoi luoghi*, Vita e Pensiero, 2018, p. 38) – plays an important role "to the point that one of the most serious health problems for workers is the lack of movement when they are at work".

According to D. GAROFALO, *Lavoro, impresa e trasformazioni organizzative*, in VV.AA., *Frammentazione organizzativa e lavoro: rapporti individuali e collettivi. Atti delle Giornate di studio di Diritto del lavoro. Cassino, 18-19 maggio 2017*, Giuffrè, 2018, p. 171, work transformation entails a new dimension featuring man-machine interaction (or algorithm) which in turn implies “a new environment, which needs regulating and has been referred to by Floridi as ‘*the infosphere*’”. However, current changes can also be seen in the fact that concepts like working time are being challenged. This is because work digitalisation also affects the notion of working time, as stressed by M. MAGNANI, *I tempi e i luoghi del lavoro. L’uniformità non si addice al post-fordismo*, Working Paper CSDLE “Massimo D’Antona” – IT, 2019, No. 404, p. 2. According to here, in sociological terms “the essence of salaried employment was spending time in a place (the plant) in which workers made available their energies for a certain period of time”. Today, “physical working space (the so-called biosphere) is still important, though it has been transformed, but relevance should be given to the ‘infosphere’ (e.g. the cloud, social networks)”. L. NOGLER, *op. cit.*, p. 38, also points out this aspect, claiming that digitalisation has revolutionised the traditional organisation of working space: “landline telephones have almost disappeared in favour of more efficient options managed through the computer. Faxes have been ousted by PDF files which can be sent by email. Documents are no longer stored in physical archives, but ordered in digital spaces, which resemble the old offices where we used to collect them”. In the same vein, F. BUTERA, *Uffici virtuali e uffici reali*, Working Paper Fondazione Irso, 2018, argues that three places are usually associated with the notion of an office; the office/company (where staff and supervisors used to write, archive, calculate, deliver); the managerial office (that belonging to employers, managers, secretaries, where people used to communicate and hold meetings); the workshop/study (populated with researchers, professionals, artists who would study and create). “The traditional idea of an office has long been that

of a place, which was evoked in the expression ‘I go to the office’” (*idem*, p. 1). Now this image has changed due to technology, which has allowed digitalising processes (and to get rid of so-called papers) and performing the same activities everywhere and anytime, with issues in terms of work-life balance, as also stressed by J. MESSENGER *ET AL.*, *Working anytime, anywhere: The effects on the world of work*, Eurofound, ILO Research Report, 2017, p. 30. M. RICCI, *Interventi introduttivi*, in AA.VV., *op. cit.*, p. 12, also posits that “the company dematerialises, in that it is not located in a defined place. Yet this does not mean negating its localisation, organisation and its integration with the surrounding environment”. E. BORGHETTI, *Il coworking “diffuso”: l’approccio di MYSPOT verso città “workfriendly”*, presentation at the X Conferenza ESPAnet Italia, *Il Welfare e i perdenti della globalizzazione: le politiche sociali di fronte a nuove e vecchie disuguaglianze*, Forlì, 21-23 September 2017, p. 3, argues that “workers higher flexibility in relation to time and place of work enables, now and in the future, a thorough reconfiguration of workspaces. There will be a shift from a fixed workstation to interchangeable ones, also in relation to the tasks performed. Space rationalisation will also take place, so the office will no longer be associated to work only, but it will be considered a place workers’ knowledge exchange and cooperation will take place”. D. DEMARCO, *I concetti di spazio e di luogo nell’immaginario occidentale contemporaneo. Per una definizione dell’esperienza nella surmodernità*, in *Laboratorio dell’ISPF*, 2018, No. XV, Article No. 17, pp. 2-4, makes reference to the notion of ‘surmodernity’ (introduced by Marc Augé some 30 years ago) featuring ‘excess’ both in terms of space “with the shift from the ‘local’ to the ‘global’” and time. The A. goes on to posit that “in such a mobile environment, so poorly characterised by permanence, there is a need to reconstruct the links between the man and the nature to define what a place is, how it changed in our times and how it is transforming in today’s experience” (*idem*, p. 4). Drawing on Foucault, the A. argues that “while the distinctive trait of the XIX has been ‘time’ (the his-

torical time, historical thought, philosophy of history), the XX century has placed emphasis on the moment, on pure concreteness, on *hic et nunc* [...]. Today's space does not represent a clear and linear structure. It is perceived as something which is bent, like a grid, a bundle" (*idem*, p. 5). As illustrated by F. BUTERA, *Uffici virtuali e uffici reali*, cit., p. 2, "today, an organisation's main processes (planning, administering, buying, selling and managing) are cross-cutting processes which involve different functions and roles. They are no longer located in one office". Future offices linger "between virtual and real dimensions, management and innovation, individual defence and development, products and services" (*idem*, p. 6).

4.2. Co-Working Areas

Among the new ways of work pointed out by J. POPMA, *The Janus face of the 'New Ways of Work'. Rise, risks and regulation of nomadic work*, ETUI Working Paper, 2013, No. 7, pp. 5 ff., there is place- and time-independent working, which often takes place in co-working spaces.

These spaces are collective space, usually open space, intended to host both employees and self-employed workers and managed by third parties (J. MERKEL, *Coworking in the city*, in *Ephemera*, 2015, Vol. 15, No. 1).

Those using these spaces rent a workstation in an area shared with other, for a flexible period of time, as stressed by A. LEFORESTIER, *The Co-Working space concept. CINE Term project*, Indian Institute of Management, 2009, pp. 3-4.

Co-working emerged as a Post-Fordism solution (A.C. JAMAL, *op. cit.*, p. 778) and does not seem to have a precise definition (E. BORGHETTI, *op. cit.*, p. 5). Rather, J. BROWN, *Curating the "Third Place"? Coworking and the mediation of creativity*, in *Geoforum*, 2017, Vol. 82, defines it as an opaque term, coined for the first time by

Bernard de Koven, well before the creation of the first co-working space in 2005 at the Spiral Muse of San Francisco, with the aim of “working together as equals” (cf. C. FOERTSCH, R. CAGNOL, *The History Of Coworking In A Timeline*, in *www.deskmag.com*, 15 August 2013; I. CAPDEVILA, *Different inter-organizational collaboration approaches in coworking spaces in Barcelona*, in *www.ssrn.com*, 15 August 2014, p. 5 (also available in *salus.adapt.it*); C. SPINUZZI, *Working Alone Together: Coworking as Emergent Collaborative Activity*, in *Journal of Business Technology and Communication*, 2012, Vol. 26, No. 4, p. 441). Nevertheless, I. CAPDEVILA, *op. cit.*, p. 5 co-working is defined as “open-plan office environments in which they work alongside other unaffiliated professionals for a fee”. According to A. GANDINI, *The rise of coworking spaces: A literature review*, in *Ephemera*, 2015, Vol. 15, No. 1, p. 196, co-working has social and political basis and originated as a movement built around the principles of collaboration, openness, community, accessibility and sustainability. E. BORGHETTI, *op. cit.*, p. 5, defines co-working as “a physically existent platform intended to connect and stimulate diverse relationships between workers, contributing to the development of cooperative practices which improve social relations in the workers community”. In a similar vein, A. LEFORESTIER, *op. cit.*, p. 4, provides the following definition: “co-working gathers people who work independently but who share values and look for the synergies that a common space shared with talented people can bring”. Specifically, as pointed out in A.C. JAMAL, *op. cit.*, p. 778, co-working draws on the sharing economy in two ways: by sharing physical spaces or goods and by sharing intangible goods and resources. B. LANGE, *Re-scaling governance in Berlin’s creative economy*, in *Culture Unbound*, 2011, Vol. 3, No. 2, p. 202, stresses that co-working epitomises the ‘open-source idea’, being “a set of values that are being shared by a growing number of creative individuals in urban settings”.

4.2.1. Benefits of Co-Working Spaces: Cooperation, Exchange and Professional Networking

According to J. BROWN, *op. cit.*, and A. GANDINI, *op. cit.*, p. 198, the notion of co-working has evolved, as now it relates to professionally managed companies providing different kinds of services to self-employed workers and other firms. Notwithstanding this, some scholars (*cf.* I. CAPDEVILA, *op. cit.*, pp. 7 ff.; J. WATERS-LYNCH ET AL., *Coworking: A Transdisciplinary Overview*, in *www.ssrn.com*, 26 January 2016, p. 10 (also available in *salus.adapt.it*)) argue that co-working differ from other shared workspaces because of the centrality of social interactions, the idea of a ‘community’ and the basic principle of cooperation.

V. AVDIKOS, A. KALOGERESIS, *Socio-economic profile and working conditions of freelancers in co-working spaces and work collectives: evidence from the design sector in Greece*, in *Area*, 2017, Vol. 49, No. 1, p. 36, state that a new spatial distribution is generated when attempting to strike a balance between work and life which redefined the notion of ‘workspace’: workers “especially freelancers and self-employed people that work in the creative and knowledge industry, negotiate their spatio-temporal boundaries between formal workspaces, home, non-places”. According to L. NOGLER, *op. cit.*, p. 34, “organisational needs are fulfilled through design, which helps to structure physical space in the form of an open-plan office”. The A. goes on pointing out that “using the expression ‘work environment’, which draws on the German *Arbeitsumwelt* – has always been more meaningful. It is an expression indicating the set of external conditions, both material and social and cultural ones, where work is performed. At least in terms of law, this is a space where human interactions take place”.

Co-working areas are widespread in urban settings thanks to technology diffusion and changes to work organisation. As emphasized by B. MORISET, *op. cit.*, p. 1, a new workspace devel-

oped at the end of the 2000s – *i.e.* co-working spaces – which favoured exchange and support when working on specific projects. A. GANDINI, *op. cit.*, pp. 193 ff., stresses the difference between people working individually in the same space (coworking) and professionals cooperating on specific projects (co-working).

Besides the consolidation of certain ways of working (home-working, remote work), one of the reasons for the proliferation of co-working spaces is the changes in the labour market, namely a shift towards high-intensity knowledge activities and an increase in contingent employment (J. BROWN, *op. cit.*). As illustrated by B. MORISET, *op. cit.*, pp. 3 ff., co-working spaces are the result of a two-sided economic system: the knowledge economy (see W. DOLFSMA, L. SOETE, *Understanding the Dynamics of a Knowledge Economy*, Edward Elgar, 2006; W.W. POWELL, K. SNELLMAN, *The knowledge economy*, in *Annual Review of Sociology*, 2004, Vol. 30) and the digital economy (OECD, *Digital Economy Outlook 2017*, 2017). This state of affairs, together with globalisation, made it possible to work anywhere thanks to regular access to information through technological devices. The office is thus dematerialised, so the difference between one's house and office is no longer apparent, but it is the worker who is responsible for that. B. MORISET, *op. cit.*, p. 5, highlights that the social and physical boundaries of the office are not an obsolete concept. So co-working space is linked to the so-called 'third space' (I. CAPDEVILA, *Knowledge Dynamics in Localized Communities: Coworking Spaces as Microclusters*, in *www.ssrn.com*, 9 December 2013, p. 5 (also available in *salus.adapt.it*); B. MORISET, *op. cit.*, p. 6), or is identified as a "middle-ground agent" (I. CAPDEVILA, *Knowledge Dynamics in Localized Communities: Coworking Spaces as Microclusters*, *cit.*, p. 11). As pointed out in A.C. JAMAL, *op. cit.*, p. 778, by offering a 'third space' lying between a traditional workplace and a cafeteria, co-working brings together informal and formal elements in just one work setting, promoting a number of beneficial interactions (J. BROWN, *op. cit.*).

Co-working, which in A. GANDINI, *op. cit.*, pp. 194 ff., is defined as a space for meeting, sharing knowledge and collaborating spontaneously, has also given rise to a sort of aesthetical and functional acknowledgment for pleasant workplaces and great expectations concerning workers' social and economic conditions.

Research points to two different benefits: social advantages and those arising from collaboration (A. RUS, M. OREL, *Coworking: a community of work*, in *Teorija in Praksa*, 2015, Vol. 52, No. 6, pp. 1020 ss.). Some scholars argue that co-working is beneficial in relation to growing professional networks, higher visibility and reputation and more job opportunities and collaborations (C. SPINUZZI, *op. cit.*, p. 412; E. COLLEONI, A. ARVIDSSON, *La partecipazione dei giovani al mercato del lavoro: il ruolo dei co-working spaces per i giovani freelance*, in L.K.C. MANZO (ed.), *MI Generation. Il Piano di Governance delle Politiche Giovanili della Città di Milano (2013-2014)*, Comune di Milano, 2015, p. 144; A. GANDINI, *op. cit.*, p. 198). Other focus on the notion of a 'community', which seems to be the main objective of co-working, while 'collaboration' is rather one of the effects of this work arrangement (T. BUTCHER, *Coworking: locating community at work*, paper presented at the 27th Annual Australia New Zealand Academy of Management (ANZAM) Conference, Hobart, 4-6 December 2013, pp. 2 ff.; A. RUS, M. OREL, *op. cit.*, p. 1021). Workers' cooperation and interaction when engaged in co-working should also be pointed out, as they provide the opportunity to offer support and feedback on specific projects (*cf.* C. SPINUZZI, *op. cit.*, p. 408; X. PIERRE, P. BURRET, *Animateur d'espaces de coworking, un nouveau métier?*, in *Entreprendre & Innover*, 2014, No. 23, p. 25; E. COLLEONI, A. ARVIDSSON, *op. cit.*, p. 145). A.C. JAMAL, *op. cit.*, p. 779, also argues that workers like the opportunity to socialise, share ideas and set up new projects with other colleagues.

4.2.2. New Health and Safety Risks for Workers

B. MORISET, *op. cit.*, p. 8, defines co-working spaces as *accelerators of serendipity*, while J. BROWN, *op. cit.*, casts doubt on the fact that co-working contributes to positive social interactions and knowledge exchange. As stressed by R.C.D. NACAMULLI, A. LAZAZZARA (eds.), *L'ecosistema della formazione. Allargare i confini per ridisegnare lo sviluppo organizzativo*, Egea, 2019, p. 63, the notion of space is itself generic, and “when referring to organisations, inevitable involves their psychosocial use”. By making reference to learning spaces, the AA. emphasis that “one feels at ease in a space and chooses it not only for physical and sensorial characteristics – which are certainly important – but because this space enables cooperative and collaborative processes”.

Specifically, E.S. BERNSTEIN, S. TURBAN, *The impact of the ‘open’ workspace on human collaboration*, in *Philosophical Transactions of the Royal Society B*, 2018, Vol. 373, No. 1753, p. 2, argue that some organizational scholars, especially social psychologists and environmental psychologists, have shown that removing spatial boundaries can decrease collaboration and collective intelligence. Spatial boundaries have long served a functional role at multiple levels of analysis, helping people make sense of their environment by modularizing it, clarifying who is watching and who is not, who has information and who does not, who belongs and who does not, who controls what and who does not, to whom one answers and to whom one does not. T. OTTERBRING ET AL., *The relationship between office type and job satisfaction: Testing a multiple mediation model through ease of interaction and well-being*, in *Scandinavian Journal of Work, Environment & Health*, 2018, Vol. 44, No. 3, p. 332, shows that open-plan (*vs.* cellular) offices are linked to decreased ease of interaction among co-workers, decreased levels of job satisfaction, and decreased job performance and productivity. In addition, compared to cellular offices, such open-plan workspaces are linked to decreased wellbeing and satisfaction and higher level of interaction with colleagues. The

same arguments are made in J. KIM, R. DE DEAR, *Workspace satisfaction: The privacy-communication trade-off in open-plane offices*, in *Journal of Environmental Psychology*, 2013, Vol. 36, p. 18. The AA. stress that extensive research examines how the physical environment (on the distinction between physical, virtual and social environment, see M. PALVALIN, *How to Measure Impacts of Work Environment Changes on Knowledge Work Productivity? Validation and Improvement of the SmartWoW Tool*, in *Measuring Business Excellence*, 2017, Vol. 21, No. 2, p. 4) impact on the perception and behaviour of those working in offices. They stress that the workplace has changed significantly in the last decades – *i.e.* moving from workstations within the employer's premises to open-plan offices – bringing about considerable economic benefits (*e.g.* the money saved to rent working areas).

As illustrated in L. NOGLER, *op. cit.*, p. 37, today's companies need less space, as modern offices can host more workers “progress in architecture have, for example, allowed to make without pillars within floors and improved heating, ventilation and air conditioning [...]. These developments and the use of new materials, have made it possible to use workspaces in a different way”. Nevertheless, these benefits do not seem to be directly linked to improvements in communication, colleague interaction, motivation and productivity (as is usually argued), negatively impacting on privacy, distraction, acoustics quality and visibility at work (*idem*, p. 25). In this sense, C. SALTER, K. POWELL, D. BEGAULT, R. ALVARADO, *Case studies of a method for predicting speech privacy in the contemporary workplace*, CBE Summary Report, 2003, pp. 4 ff., also emphasize that noises, lack of privacy and distraction in open-plan offices increase stress, negatively affecting worker motivation and satisfaction. The relevance of the workplace for the people operating there is also illustrated in P. ROELOELOFSEN, *The impact of office environments on employee Performance: The design of the workplace as a strategy for productivity enhancement*, in *Journal of Facilities Management*, 2002, Vol. 1, No. 3, pp. 247-249, where it is argued that workspace improvement would

produce a 5 to 15% increase in productivity and organisational wellbeing, while impacting less significantly on absenteeism and motivation. Yet, while the benefits of co-working have been questioned by some research, J. BROWN, *op. cit.*, maintains that little is known of this work arrangement and its effects.

At any rate, the negative incidence that new workspaces have on workers, C. SPINUZZI, *op. cit.*, pp. 402 ff., has stressed that many workers freedom rhymes with isolation, inability to establish relations and lower cooperation and networking opportunities. As recalled by B. MORISET, *op. cit.*, p. 5, hyper-connection often leads knowledge workers to feel more isolated, a process which is worsened “by the finely grained division of labor in creative industries”. J. BROWN, *op. cit.*, underscores that workers’ individualism and social isolation might contribute to psychosocial risks. L. CALAFÀ, *Il diritto del lavoro e il rischio psico-sociale (e organizzativo) in Italia*, in *LD*, 2012, No. 2, p. 285, posits that psychosocial risks “should be given attention, especially in relation to workers’ excessive individualism and isolation, which illustrate work relevance”. The new ways of working, which are increasingly difficult to define in terms of space and time, can give rise to stress and dangers for workers’ health, as they risk “increasing the conditions leading to chronic diseases” (F. LUCIDI, *Promuovere gli spazi di salute dei lavoratori ai tempi del lavoro senza né tempo né spazio*, in *Giornale Italiano di Psicologia*, 2019, No. 1-2, p. 133). In this sense, workers’ health promotion should be redefined, not so much in traditional work settings (workplaces) but in relation to “multi-sectorial and multi-disciplinary cooperation”, so “new cultural and scientific models need testing” (*idem*, p. 134). Furthermore, research argues that new measures might be needed to promote interaction and exchanges between people operating in co-working areas. In this sense, it has been argued that many people, are just “working alone, together” (C. SPINUZZI, *op. cit.*) so they share the office without much interaction. F. BUTERA, *Uffici virtuali e uffici reali*, *cit.*, p. 6, stresses that “a risk arises to create a society like the one described by Simak in his

novel *City*. The offices of the future have to be like evolved organisations, socio-technical systems, small societies in order to protect and generate economic efficiency and life quality”.

4.3. Are We Moving on from the Inside-Outside Distinction?

The transformations affecting the workplaces are not limited to the shift between workstations and co-working areas which can host some 100 workers. The company is no longer the only place where work is performed; the notion of physical space itself is challenged, with the distinction between inside and outside which is increasingly blurred. So workplaces undergo reconfiguration, and urban spaces are also used as place of work. As pointed out by M. MAGNANI, *op. cit.*, p. 7, the organisational changes brought by technology and globalisation “break the fixed dimension of a place, places and work”. The A. stresses that “while it is an overstatement to argue that work is less related to the notion of ‘place’ and more on that of a ‘process’, that work is ubiquitous and timeless and that ‘the traditional traits of the workplace are fading’, we need to be prepared to deal with new dimensions. This means adapting the rules that still refer to the workplace as a fixed concept”. F. MALZANI, *op. cit.*, p. 2, reasserts this point, stating that it is necessary to refer to the workplace as “an ever-changing notion”. Some aspects contribute to this new conception of the workplace, namely the fact that the workplace is less relevant when identifying those who are compelled to attend it and the role of the organisation when setting down social security obligations (*idem*, pp. 25-26). E. BORGHETTI, *op. cit.*, p. 4, argues that “integrating enabling environments and remote workers becomes important, with serious consequences in terms of access to urban spaces and service hybridisation”. The result of this state of affairs is “the transformation of the way urban spaces is used, which Mitchell [...] de-

fines as *Post-sedentary space*. This phenomenon features high levels of mobility in life and at work (*Post-sedentary work*) in which technology and networks can encourage work flexibility and mobility, so workers can perform their activities in places which were not originally intended as workspaces (parks, gardens, cinemas, for examples)” (*idem*, p. 5). As pointed out by F. BUTERA, *Uffici virtuali e uffici reali*, cit., p. 2, “the office sometimes is nowhere, in that there is an office without an office. Technological tools allow one to work alone or with the rest of the world from one’s own apartment or city, in the countryside, by the river or in a shelter in the mountain, on a taxi or on the plane”.

P. PASCUCCI, *Dopo il d.lgs. 81/2008: salute e sicurezza in un decennio di riforme del diritto del lavoro*, in *RIMP*, 2018, No. 1, pp. 7-8, emphasises that the rise of new jobs, for which physical and fixed workstations are less relevant, leads one to look into the possibility to review workers’ protection considering these new forms of employment. In this sense, it is increasingly the case that “work is performed in places not intended to be workplaces only because the tasks assigned can be carried out anywhere, regardless of the fact that these places were not created to serve as workspaces”. Examining OHS legislation L. MONTUSCHI, entry *Ambiente di lavoro*, in *DDPComm*, 2000, pp. 5-6, examines the existing link between prevention at work and outside work, stating that “What matters is that both workers and the population (letter *g* of article 2) might be exposed to health-related risks, so the integrity of the external environment should be also promoted”. This provision today is laid down in letter *g* of art. 2, Legislative Decree No. 81/2008, in which prevention is defined as “the provisions or measures necessary to prevent or decrease occupational risks in line with the health of the population and the integrity of the external environment”. In this sense, the A. goes on to state that “it is the concept of prevention, which is both narrow and all-encompassing, which justifies the extraordinary extension of protection and those to whom relevant duties and obligations apply”. While the IV Industrial Revolution tends to

amplify this connection, according to P. PASCUCCHI, *op. cit.*, pp. 7-8, the link between the organisation and the place of work becomes blurred, being the first “the set of rules through which the productive project of the employer and the client is carried out, and not just a physical entity corresponding to a place”. In production contexts where the employer’s organisation concerns digital platform or ‘fluid’ settings there is a “need to lay down OHS rules suitable to the worker and not only to a given physical place”, so a shift should take place from ‘health and safety at work’ to ‘workers’ health and safety’.

G. LOY, *Al principio, sta il principio della fatalità*, in L. GUAGLIANONE, F. MALZANI (eds.), *op. cit.*, pp. 52 ff., argues that the notion of the workplace “has evolved, becoming volatile and ephemeral, like the risk factors which from the company spread in the surrounding areas”.

In the IV Industrial Revolution, the structure and the boundaries of the company as intended in Fordism are falling through. P. TOMASSETTI, *Diritto del lavoro e ambiente*, ADAPT University Press, 2018, pp. 5 ff., stresses that “it is the territory which becomes a sort of ‘open-air company’, a place in which the identity and organisational dimension of work changes profoundly: businesses, workers and consumers deal with the effect of the natural environment on the market and labour conditions. The same boundary between free time and work becomes blurred as advanced forms of collaboration takes place without limitations in terms of space and time”. The goal of ensuring healthy workplaces would overlap with that of ensuring the care for any ecosystem in which work could be performed, with the result that a convergence might take place between the internal environment (work) and the external one (the natural and open space). “From this point of view, the work environment develops along with those where production and work take place, yet sharing the idea of territory, whereby ‘physical and social spaces overlap, highlighting the set of relations existing between collectivity and

the surrounding environment, expressing the local dimension of a community'. This is the place where the people and the institutions operate – and on which the company relies to fulfil its objectives – *i.e.* the context in which social and economic links are created, assuming that legal and cultural value with which the company must necessarily deal with, somehow becoming responsible for it". The A. also adds that "the shift from the company to the territory, society becomes accessory to the market, and production permeates people's life, feeding itself with the surrounding environment: scenery, natural and human resources, social relationship and the community. The issues concerning healthy work environments move beyond traditional boundaries: everything turns into a workplace because everything is potentially a production and a working context". In the A.'s view, "there is a need to review systematically environmental issues, which is more urgent as in modern societies the distinction between the places where one works and lives is less relevant, as is that between workers' and citizens' health". "The work environment, territory and the global and economic space belong to the same ecosystem, which is made up of connections, relations, links, towards which an individual gains unitary value. This is so because the application of new technologies in each sphere of life makes it difficult to draw separation lines between in and out, material and virtual reality, far and close, private and public, subject and object". The A. goes on to argue that "the links between environmental and labour law legislation in terms of prevention are so numerous and evident that the boundaries become blurred, though no coordination exists between the two legal frameworks".

As stressed by F. MALZANI, *op. cit.*, p. 2, the notion of 'work environment' frequently relates to issues ascribable to the employer's responsibility, which are not under the control of the employer (*e.g.* outsourcing, telework) or which are shared by the collectivity. In some other cases, these issues, while not being

the employer's responsibility, are covered by Inail insurance, obliging the employer to bear the relevant costs.

In this sense, it is "difficult to deny that the relationship between the work environment and the environment in general, both in theoretical and practical terms, characterises, albeit in different terms, the individual", as pointed out by R. DEL PUNTA, *op. cit.*, pp. 151-153. Indeed, the internal environment (*i.e.* the workplace) is a part of the external one, like a microcosm in which the person is exposed to "an uncommon concentration of paternally detrimental effects", which outside are more widespread and dispersed. Against this backdrop, the individual takes on a central role as it is about ensuring them protection from risks concerning health (as defined by the WHO) resulting from human actions which are detrimental for the environment and those living therein.

The relationship between work and the environment has also been discussed by P. TOMASSETTI, *op. cit.*, pp. 36-46, who states that a distinction is usually made between these two areas, in that "some authoritative research has excluded OHS when it comes to environmental law [...] because the systemic conception of the environment clashes with the notion of work as intended in the past, which features a definite space (*i.e.* the organisation and the productive unit). Its artificial character when compared to the ecosystem in which work takes place would justify special protection as far as positive law is concerned". In western countries, labour law "contributed to attaching excessive social and cultural value to work, and to generating indifference towards the environmental implications of economic growth". In this perspective, the A. notes that "in western countries, labour law has made an attempt at protecting employment, while emerging economies attracted companies benefitting from lower costs in terms or environmental protection". Through the "the Workers' Statute, the idea developed that good business management requires bringing together production and the ex-

ternal world”. R. DEL PUNTA, *Prefazione*, in P. TOMASSETTI, *op. cit.*, pp. XV-XIX, shares the same view, because “it is also obvious that the workplace protection is a part of the wider topic of environmental protection, although one might note that since industrialisation, a great amount of risks related to detrimental factors emerged, leading lawmakers to adopt early environmental protection measures”. Nevertheless, “the connection between the protection of the work environment and that of the environment, more generally, was weak, if not existent, both in cultural and legal terms [...] the differences was that only workers and their families have another interest, *i.e.* employment, which might clash with the interests of the rest of the population. This limitation in relation to the perspective adopted was promoted by legislation, the scope of which was more delimited, by the company’s physical boundaries”. In this sense, the ongoing transformations have blurred the difference between the work environment and the surrounding one. This calls for rethinking health and safety obligations. Conversely according to G. LOY, *op. cit.*, pp. 53 ff., “the work environment as a physical parameter is included in the cause-and-effect system of the damaging event, which was already set aside by article 2087 of the Civil Code. This one compelled the employer to adopt health and safety measures non only in the place where work is performed, but when engaging in business”, thus also outside the employer’s premises.

4.4. Connections and Missed Links between the Right to Health and Environmental Law

In consideration of the scenario outlined so far, it might be worth recalling that P. PASCUCCI, *La salvaguardia dell’occupazione nel decreto “salva Ilva”. Diritto alla salute vs diritto al lavoro?*, Working Paper Olympus, 2013, No. 27, pp. 2-16, emphasises the opportunity to combine the regulation governing occupational health

and safety and environmental law, in spite of the fact that these two disciplines have always been considered separately. According to the A. “in the Italian debate, there have been attempts to use case law interpretations provided in environmental law in the labour sphere. Yet a systemic reflection of all environmental issues has not been provided so far, particularly in consideration the blurring boundaries between work and family life”. In this sense, the ‘Save-Ilva’ Decree and Ruling No. 85/2013 have been examined, pointing out that the Constitutional Court has succeeded in striking a balance between the right to health (art. 32 of the Constitution) and the right work and employment (art. 4 of the Constitution). In this sense, the notion of work has been examined by the A., which should consider compliance with rules protecting, among others, OHS. “Talking about the right to work implies a safe right to work. This is the kind of work referred to in national and international constitutional sources. This is so because work is the result of human activity and not a commodity, so people’s fundamental rights do not apply (dignity, freedom, health and safety). As a result, the right to work (*i.e.* the right to look for, find and keep employment) is the right to a legal and safe occupation, which is exactly what labour law deals with (*i.e.* the right to enter into an employment relationship)”. So, the A. argues that the employer’s only legitimate activity under art. 32 and art. 41, second paragraph, of the Italian Constitution, is the one ensuring a safe job to their workers.

In this regard, L. MONTUSCHI, *Diritto alla salute e organizzazione del lavoro*, Franco Angeli, 1989, pp. 49 ff., anticipates that art. 32 of the Constitution reinforces the employee’s demand for a healthy workplace, which should also consider amending relevant rules from the inside, without waiting for instructions outside the organisation. Otherwise, a fatalist conception spreads concerning workers’ work-related risks and their willingness to negotiate pay for a good the management of which is not under their control. As stressed by G. NATULLO, *La tutela dell’ambiente di lavoro*, Utet, 1995, pp. XI-XIII, the right to health at work is established in

art. 32 of the Italian Constitution, which “safeguards health so it also protects workers’ physical integrity”. This article has an individual and collective purpose. As for the latter “it emerges when the right to health, moves beyond physical integrity and also includes the right to a healthy environment, the protection of which is both the fundamental aspect in terms of health prevention but also the underlying criterion for human development” (M.C. CHERUBINI, entry *Diritto alla salute*, in *DDPCiv*, 1990, Vol. VI, p. 80). Equally relevant is art. 41 of Constitution “in that § 2 establishes that limits private activity if affecting social utility as well security, freedom and human dignity”. The focus is on the constitutional safeguards ensured to health in economic and social relationships. According to the A. “the provision considers this aspect more relevant than the employer’s interest when carrying out work”.

In a similar vein, F. MALZANI, *op. cit.*, pp. 17-19, makes reference to a number of rulings handed down by the Court of Last Resort (Plenary Session, No. 3476/1994, No. 5048/1988, No. 6732/2005 and also No. 9401/1995 and No. 4012/1998, pursuant to which compliance with the security obligations does not only refer to machinery and equipment, but also to the work environment and performance) and the Constitutional Court (No. 114/1977, No. 206/1974, No. 152/1969). Drawing on art. 2087 of the Civil Code, the A. argues that the healthy work environment lies between “inviolable rights and protected legal interests, because they refer to goods which are essential for the community and for living”, so the right to work is the same as the right to a healthy workplace “the protection of which can be assimilated to that concerning people’s fundamental and inviolable rights”. So, the notion of the environment is closely connected with that of health, as illustrated in arts. 32 and 2 of the Italian Constitution. Here the A. points out that “the right to a healthy environment in the constitution is limited to the natural one”. The definition of health laid down in legislation also makes reference to workers’ physical, social and mental wellbe-

ing, point out those risks which “might potentially caused damage when using or being exposed to a given factor or agent, or the combination of them” (letter s, § 1, art. 2, Legislative Decree No. 81/2008). P. TOMASSETTI, *op. cit.*, p. 79, also examines the relationship between work and the environment in constitutional terms, when analysing the link between environmental protection and workplace health and safety. In the A.’s view, since the 1970s, both legislation and case law have dealt with the environmental issue “by legally considering the notion of the environment as a unitary notion when it comes to its protection”.

Nevertheless, G.M. AMBROSO, *Ambiente e sicurezza del lavoro*, ISEDI, 1978, p. 3-6, “the complex set of rules protecting OHS is not accompanied by specific constitutional provisions”. He also adds that “the specificity of the subject leads those concerned to disregard the work environment. The plurality of interests involved causes that different constitutional provisions apply, either related to the environment or work”. In this perspective, the A. refers to art. 41 of the Constitution, stressing that “these provisions concerning health protection refer to article 32 of the Constitution, which must be interpreted along with the terms laid down in article 2, which includes the right to health”. Besides the provisions regulating work contained in arts. 1 and 3 “mention should be made to articles 4, 35 and, because of their links with article 32, also articles 37 and 38 of the Constitution”. The A. is of the opinion that an institutional framework can be set up in order to deal with health and workplace protection. “the constitutional articles referred to above should be regarded as a unitary system intended to attend to different aspects of workers’ and citizens’ right to health. The fundamental aspect of this right, which is both an individual and a collective one, is the dynamic character of the different protection schemes. While they point to the public dimension of the issue, they fail to fulfil the different needs, which emerge both in terms of the environment that at the workplace”. R. DEL PUNTA, *Tutela della sicurezza sul lavoro e questione ambientale*, *cit.*, p. 153, argues that oc-

cupational health and safety still falls within the remit of public authority, as evidenced by the presence of public bodies and penal sanctions. As stressed by G.M. AMBROSO, *op. cit.*, p. 7-8, this can be explained by the need to use provisions modelled on the Constitutions to set up “a system of rules concerning health protection both at work, and in life, more generally”. This also explains why “these rules aimed at protecting the whole set of interests, which vary significantly”. Against this background, the provisions contained in arts. 32 and 41 of the Constitution play a relevant role “as they assert the existence of a general interest towards individual health, imposing that economic enterprise does not affect people’s safety”.

However, G. NATULLO, *op. cit.*, pp. XI-XII, the art. 32 of Constitution emphasises that “both a private and a public dimension emerges in health and safety. While relevant legislation was traditionally about the relationship between citizenships and the government, the evolution of the polyvalent (*Drittwirkung*) nature of fundamental rights widened the public authority character within which the right to health was framed”. The A. goes on to stress that “the erga omnes effect of fundamental rights, which include the right to health, the compliance of which is a duty to ensure its conservation”. The A. also makes reference to case law starting from the 1960s, which confirms that “the right to health is a right existing also in relationship between private actors”. OHS and its links with the Italian Constitution are also discussed in P. TULLINI, *I dilemmi del caso Ilva e i tormenti del giuslavorista*, in *Ius17*, 2012, No. 3, pp. 163-166. Examining the ILVA case, the A. argues that the Ordinances handed down by the Tribunal of Taranto (Ord. No. 19 and 20 of 2013), focuses on the right to health and other constitutional terms, among which is employment protection, which also ensures human dignity: “no dignity exists when work is not carried out safely. Looking at constitutional norms one might note that health protection is given relevance and must be safeguarded at work, as here workers are usually willing to accept unsafe working conditions”. The

A. goes on to argue that the overlapping between production and work, on the one hand, and health and the environment, on the other hand, current legislation should indicate clearly the aspects to be safeguarded. Referring again to Ord. No. 19/2013, she maintains that “while being aware that the interests involved are relevant, one should not disregard that they cannot be perfectly equitable, generating the frustration towards an interest in relation to another. This happens unless one wants to ignore or violate the terms laid down by the Constitution” and “considering that the freedom to engage in economic enterprise provided for by article 41 of the Constitution can conflict with individual rights. This is further confirmation that health protection cannot be dismissed and a different order in relation to the priorities is not possible”.

The same views are shared by S. BUOSO, *La dimensione temporale del lavoro tra prevenzione primaria e secondaria*, in *Diritto della Sicurezza sul Lavoro*, 2017, No. 1, p. 30. Making reference to Montuschi, the A. explains that “in the context of the organisation and the individual the main aspect is that health protection must be a central point not a secondary one. We need to reassert the need to provide an organisation which is modelled upon the individual and complies with their fundamental rights, so employers’ powers are properly used, making the company efficient without marginalising the employee”. Additionally, as pointed out in G. LOY, *op. cit.*, pp. 53 ff., “while in the past those more exposed to risk were employees, now it is frequently the case that the whole population might be affected. Dangerous emissions go beyond the factory’s gates [...] so workers who receive compulsory training and information and implement measures protecting their health are more safeguarded than those unaware citizens who live near those companies where security measures are complied with”.

While adhering to the notion of the ‘risk community’, it is necessary to assign to it a number of different meanings, because this

community consists of many participants “both inside, *i.e.* the employer’s organisation, and outside, *i.e.* the link between the work setting and its surroundings” (F. MALZANI, *op. cit.*, pp. 62-63). This change should be acknowledged also by collective bargaining “the attitude of which towards this field was oscillating, although now it has to face the transnational nature of many companies and some problems concerning compliance with security standards and the exercise of representation rights”. The link between the external and the internal environment must be examined in order to ensure protection effectiveness “when production and working processes widen their detrimental effect well beyond the companies”. F. BUTERA, *Lavoro e organizzazione nella quarta rivoluzione industriale: la nuova progettazione socio-tecnica*, *cit.*, argues that trade unions have a fundamental role in the new context “moving on from having a negotiation role to one which involves participation in change focusing on environmental protection and the safeguard of workers’ quality of life (*i.e.* physical integrity, remuneration, psychological fitness, professional, social and self integrity)”. Even the employer should protect the environment in terms of CSR and business ethics. In this respect, D. GAROFALO, *op. cit.*, p. 34, points out that “CSR practices concern both the internal and the external setting, with companies which have a growing role, both in economic and political terms. In this sense, CSR no longer constitutes an obligation imposed by the government, but the employer’s voluntary choice, which increases their legitimacy towards workers and the surrounding context. The company thus ensures the wellbeing of workers, suppliers, consumers, the local community and the surrounding environment”. According to F. BUTERA, *Lavoro e organizzazione nella quarta rivoluzione industriale: la nuova progettazione socio-tecnica*, *cit.*, the challenges posed by the IV Industrial Revolution concern long-term environmental and social sustainability, because “the risks for the environment, the economy, social coexistence have never been so serious”.

5. New Working Times

Research has dealt with the impact of technological change and work organisation in relation to working time from a number of perspectives, which also include employees' health and safety.

By way of example, it has been stressed that automation might replace workers in some tasks, increasing productivity, with this aspect which should also be accompanied by a rethinking (or reduction) of working time. In spite of this state of affairs, the literature has only considered the relationship between automation and unemployment, disregarding an improvement of working conditions (A. FENOGLIO, *Il tempo di lavoro nella New Automation Age: un quadro in trasformazione*, in RIDL, 2018, No. 4, I, p. 628). Yet some wider analysis can be found where the issue of health and safety and wellbeing is dealt with in a more consistent manner (S. DE SPIEGELAERE, A. PIASNA, *The why and how of working time reduction*, ETUI, 2017, p. 26). Economic transformations have also been considered in terms of new working time arrangements and the diffusion of part-time working, somehow overlooking workers' health and safety (G. DELLA ROCCA, *op. cit., passim*).

OHS has been mostly examined in relation to the way work is performed in the light of some specific contractual schemes. Examples of this include the theoretical framework underpinning the notion of working anytime and anywhere (J. MESSENGER ET AL., *op. cit.*) and that of time- and place-independent working (see J. POPMA, *op. cit.*, p. 5). In this context, changes occurring to working time take the form of a Janus face (*idem, passim*).

Research points out that the new working time schemes present risks and opportunities, the latter being increased workers' wellbeing and work-life balance. In this respect, it has been argued that "the IV Industrial Revolution leads us to rethink the amount of time to be dedicated to work and to come up with

new organisational patterns allowing companies to increase productivity while preserving workers' work-life balance, which is a difficult objective to fulfil. As the ongoing digital revolution gives the opportunity to work anytime and anywhere, it might lead to working time which gives workers more autonomy" (A. FENOGLIO, *op. cit.*, p. 634; see also G. DELLA ROCCA, *op. cit.*, pp. 256 ff.; P. ICHINO, *Le conseguenze dell'innovazione tecnologica sul diritto del lavoro*, in *RIDL*, 2017, No. 4, I, pp. 547-548).

It is on working time flexibility that the literature has focused to define the positive aspects of working anytime. Much research has concentrated on third generation telework (see J.C. MESSENGER, L. GSCHWIND, *Three generations of Telework: New ICTs and the (R)evolution from Home Office to Virtual Office*, in *New Technology, Work and Employment*, 2016, Vol. 31, No. 3, pp. 195 ff., and the so-called virtual office) and on the fact that, through this work arrangement, better work-life balance improves workers' wellbeing (among others, J. MESSENGER *ET AL.*, *op. cit.*, p. 24, and S.K. BOELL, D. CECEZ-KECMANOVIC, J. CAMPBELL, *Telework paradoxes and practices; the importance of the nature of work*, in *New Technology, Work and Employment*, 2016, Vol. 31, No. 2, pp. 116 ff.).

On close inspection, the aspects which are widely researched in the labour law literature concern the risks of being hyper-connected and always available to work, leading to techno-stress, overworking, as well as musculoskeletal disorders (J. MESSENGER *ET AL.*, *op. cit.*, pp. 21-41; G. DELLA ROCCA, *op. cit.*, pp. 256 ff.; E. AHLERS, *Flexible and remote work in the context of digitalization and occupational health*, in *International Journal of Labour Research*, 2016, Vol. 8, No. 1-2, pp. 85 ff.).

Currently, the difference between work and family life is increasingly blurred (É. GENIN, *Proposal for a Theoretical Framework for the Analysis of Time Porosity*, in *IJCLLIR*, 2016, Vol. 32, No. 3, pp. 280 ff.; J. SOK, R. BLOMME, D. TROMP, *Positive and Negative Spillover from Work to Home: The Role of Organizational Culture and Sup-*

portive Arrangements, in *British Journal of Management*, 2014, Vol. 25, No. 3, pp. 456 ff.). On this point, see also F. LUCIDI, *op. cit.*, pp. 131-134, who adopts an interdisciplinary approach to the issue.

Labour law research has also examined the effect that organisational and technological transformation has on working time legislation and on that related to it (*e.g.* OHS) also in consideration of some new theories arguing in favour of so-called work-life blending (M. WEISS, *op. cit.*, pp. 659-660; T. USHAKOVA, *Del work-life balance al work-career blend: apuntes para el debate*, in L. MELLA MÉNDEZ, P. NÚÑEZ-CORTÉS CONTRERAS (eds.), *Nuevas tecnologías y nuevas maneras de trabajar: estudios desde el derecho español y comparado*, Dykinson, 2017) and to performance-based work (M. WEISS, *op. cit.*, pp. 659-660).

The other problem is concerned with the notion of smart working, which is different from that of ‘agile working’ as they only partially overlap (see P. MANZELLA, F. NESPOLI, *op. cit.*, pp. 23-25; A. MARTONE ET AL., *Smart working, job crafting, virtual team, empowerment*, Ipsoa, 2018, *passim*).

The international and Italian literature has dealt with this new way of working, at times in terms of working anytime anywhere, at times in terms of working time flexibility. According to the CIPD, *HR: Getting smart about agile working*, CIPD Research Report, 2014, pp. 3-4, *smart working* is “an approach to organising work that aims to drive greater efficiency and effectiveness in achieving job outcomes through a combination of flexibility, autonomy and collaboration, in parallel with optimising tools and working environments for employees”.

The elements pinpointed in this definition – *i.e.* flexibility, autonomy and cooperation, along with tool and work environment optimisation – characterise also other definitions of smart working, like the one supplied by the Smart Working Observatory set up by the Politecnico di Milano, for which “smart working is a managerial philosophy, a way to return autonomy and flexibility

to the worker, asking them to become accountable in relations to results”. For this reasons, some organisational policies must be drawn up, namely “rules and guidelines concerning working time flexibility, workplaces and the opportunity to choose and customise working tools; technologies, which might widen and digitalise the workspace, favouring communication, cooperation and the creation of a professional network; the physical layout of the work environment, which has a significant impact on work and might affect individual efficiency, effectiveness, flexibility and wellbeing; people’s behaviour and leadership, namely aspects related to workers’ culture and their idea of work as well as the approach of supervisors when exercising power” (M. CORSO, *Smart working*, in M. SACCONI, E. MASSAGLI (eds.), *Le relazioni di prossimità nel lavoro 4.0. Atti integrati e rivisti del seminario La fine del diritto pesante del lavoro nella quarta rivoluzione industriale*, ADAPT University Press, 2016, p. 15).

In a similar vein, sociological research refers to smart working as “a way to reconsider spaces, working hours and tools, in name of workers’ higher freedom and responsibility” (G. CHIARO, G. PRATI, M. ZOCCA, *Smart working: dal lavoro flessibile al lavoro agile*, in *Sociologia del Lavoro*, 2015, No. 138, p. 72).

From a managerial point of view, a diffusion has been reported of organisational models based on smart working in a number of countries (S. SARTI, T. TORRE, *Is Smart Working a Win Win Solution? First Evidence from the Field*, in T. ADDABBO, E. ALES, Y. CURZI, I. SENATORI (eds.), *Well-being at and through work*, Giappichelli, 2017, pp. 231 ff.; R. ALBANO ET AL., *DigitAgile: l’ufficio nel dispositivo mobile. Opportunità e rischi per lavoratori e aziende*, Osservatorio MU.S.I.C. Working Paper, 2017, No. 3, pp. 3 ff.), with these models also involving elements like ‘organisational discretion’ and ‘organisational autonomy’, with the former (choosing between predefined options) being more widespread than the latter (autonomy also in relation to process organisation; cf. R. ALBANO ET AL., *op. cit.*, pp. 7 ff.).

As for the organisational perspective, a distinction is usually made between the traditional notion of work-life balance and that of 'work-life management' and 'work-life blending'. While the first concept refers to the separation between family and working life, the other two argue for the interaction between them. With *work-life management*, work and family life organisation rests on flexibility, performance e commitment. Conversely, work-life blending practices are concerned with and proper overlapping between family and work (see T. USHAKOVA, *op. cit.*; M. MILITELLO, *Il work-life blending nell'era della on-demand economy*, in *RGL*, 2019, No. 1, I, pp. 53-54).

On the one hand, the blurring boundaries between work and family life lead research to consider asserting the need to reconsider between the man, work, and the market in terms of objectification (M. TIRABOSCHI, *Persona e lavoro tra tutele e mercato. Per una nuova ontologia del lavoro nel discorso giuslavoristico*, cit., pp. 110 ff.). On the other hand, a part of the literature stresses the importance of redefining the notion of a workload, which is increasingly separated from that of work duration (A. BIDET, J. PORTA, *Le travail à l'épreuve du numérique*, in *Revue de Droit du Travail*, 2016, No. 5, p. 331).

6. Learning, Employment, Innovation in the IV Industrial Revolution

6.1. Innovation and Training Ecosystems

Today it is local communities rather than companies the dimension within which resources must be organised to promote productivity, innovation and competitiveness. This is the point made by researchers of the knowledge economy, who argue that value creation and innovation processes generate at local level and not at a company level. It would be impossible to report the significant amount of research dealing with this aspect. Here,

mention could be made of R. FLORIDA, *Toward the Learning Region*, in *Futures*, 1995, Vol. 27, No. 5, p. 534, who posits that the great transformation taking place in advanced economies is not concerned with new products but with new production strategies. Specifically, this is the shift from “mass production to the knowledge economy”. Regions are better at dealing with these changes than countries are. Regions adopt the principles of knowledge creation and continuous learning; they must in effect become learning regions. Learning regions provide a series of related infrastructures which can facilitate the flow of knowledge, ideas and learning. Regions have a human infrastructure – a labour market from which firms draw knowledge workers (*idem*, p. 532).

The importance of the local dimension is reasserted also in E. MORETTI, *La nuova geografia del lavoro*, Mondadori, 2012, p. 215, where it is argued that “those places where things are physically manufactured will keep losing importance, while the cities populated by interconnected and creative workers will become the new factories of the future”.

The importance of connecting different actors to promote innovation processes is confirmed also in research on clusters (P. COOKE, *Regional Innovation Systems, Clusters, and the Knowledge Economy*, in *Industrial and Corporate Change*, 2001, Vol. 10, No. 4), which are geographical concentrations of industries, services, institutions and so forth which operate in specific sectors cooperating although being competitors (M.E. PORTER, *On competition*, Harvard Business School Press, 1998, p. 197), and industrial districts (defined “learning regions” by B. ASHEIM, *Industrial districts as ‘learning regions’: A condition for prosperity*, in *European Planning Studies*, 1996, Vol. 4, No. 4).

Yet this aspect is not completely new. Without making reference to Alfred Marshall’s work, mention should be made of Beccattini’s research on industrial districts which dates back to 40 years ago (G. DEI OTTATI, *Distretti industriali e luoghi nel pensiero di Gia-*

como Becattini: un altro modo di fare l'economista, in *Economia e Società Regionale*, 2018, No. 1, p. 9).

Today's relevance of local areas is facilitated by digital technologies, which reduce distance enabling peripheral industrial districts to access the market (M.F. FONTEFRANCESCO, *Industria 4.0, distretti industriali e conoscenza artigiana. Limiti, risorse e possibilità a per un cambio di paradigma produttivo*, in *Quaderni di Ricerca sull'Artigianato*, 2016, No. 2, pp. 185-186) and to take part in global supply chains, provided they transform their production organisation (D. MARINI, *Le metamorfosi dei distretti industriali*, in *Quaderni di Ricerca sull'Artigianato*, 2015, No. 2, p. 264). While doubts have been cast about this last argument, especially when referring to small and medium-sized enterprises (R. HARRIS ET AL., *Does Spatial Proximity Raise Firm Productivity? Evidence from British Manufacturing*, in *Cambridge Journal of Regions, Economy and Society*, 2019, Vol. 12, No. 3, p. 483), we can say that there is agreement between the correlation between companies' local aggregation, innovation and economic development (B.T. MCCANN, T.B. FOLTA, *Location Matters: Where We Have Been and Where We Might Go in Agglomeration Research*, in *Journal of Management*, 2008, Vol. 34, No. 3, p. 555, and also P. COOKE, *op. cit.*). As has been noted, this correlation is a circular one (P.-A. BALLAND, R. BOSCHMA, K. FRENKEN, *Proximity and Innovation: From Statics to Dynamics*, in *Regional Studies*, 2015, Vol. 49, No. 6, p. 910) and is not only about space, as the proximity triggering innovation has a cognitive rather than a geographical nature. In this sense, 'absorptive capacity' is needed, *i.e.* the company's specific knowledge needed to assimilate that consolidated locally (S.A. ZAHRA, G. GEORGE, *Absorptive Capacity: A Review, Reconceptualization, and Extension*, in *The Academy of Management Review*, 2002, Vol. 27, No. 2). Excessive levels of proximity are likewise detrimental, because it might hamper openness towards new ideas and opportunities. So 'cognitive distance' is necessary among companies located in the same area. (R. BOSCHMA, *Proximity and*

Innovation: A Critical Assessment, in *Regional Studies*, 2005, Vol. 39, No. 1, pp. 63-64).

At any rate, most research on industrial districts links innovation processes to tacit knowledge exchange among companies, that is the know-how contained in work processes which is developed by workers, organisations and local areas (B.-Å. LUNDVALL, B. JOHNSON, *The Learning Economy*, in *Journal of Industry Studies*, 1994, Vol. 1, No. 2, p. 30). By virtue of this exchange, which is favoured by agglomeration, a sort of 'industrial atmosphere' generates making districts innovative and competitive (A. AMIN, N. THRIFT, *Neo-Marshallian Nodes in Global Networks*, in *International Journal of Urban and Regional Research*, 1992, Vol. 16, No. 4, p. 577).

Other studies highlight the relevance of aggregate entities in university clusters and research centers: this knowledge spillover which produces innovation requires exchanges between companies and research centers (D.B. AUDRETSCH, M.P. FELDMAN, *R&D Spillovers and the Geography of Innovation and Production*, in *The American Economic Review*, 1996, Vol. 86, No. 3, pp. 638-639), giving rise to a sort of shift between tacit and explicit knowledge. This dynamic has been illustrated considering the IT sector, where cooperation between engineers (who possess explicit knowledge) and software developers (who possess tacit knowledge), produces new knowledge and learning strategies (S.D.N. COOK, J.S. BROWN, *Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing*, in *Organization Science*, 1999, Vol. 10, No. 4, p. 394). Innovative organisational models are needed to favour this cooperation, which transform production structure. In this sense, learning processes are not external to value creation processes (A. ANDREONI, *Structural learning: Embedding discoveries and the dynamics of production*, in *Structural Change and Economic Dynamics*, 2014, Vol. 29, p. 72).

However, it seems impossible that companies venture on this path alone, as processes to integrate new knowledge with company know-how are uncertain and costly (R. BOSCHMA, *op. cit.*, pp. 65-66) and social capital is necessary to promote these dynamics (M. LORENZEN, *Social Capital and Localised Learning: Proximity and Place in Technological and Institutional Dynamics*, in *Urban Studies*, 2007, Vol. 44, No. 4, p. 802). Institutions are also needed to coordinate relations between individuals and organisations, promoting knowledge transfer, mutual learning and thus innovation (C. EDQUIST, B. JOHNSON, *Institutions and organizations in systems of innovation*, in C. EDQUIST (ed.), *System of Innovation. Technologies, Institutions and Organizations*, Routledge, 1997, pp. 49-50).

As stressed by Finegold in his research on Silicon Valley, a “high-skill ecosystem” needs creating, based on some conditions: 1) a supportive host environment, a set of environmental conditions that enables young creatures to grow to maturity; 2) fuel or nourishment, to sustain the growth of life on an ongoing basis; 3) a high degree of interdependence, part of what makes this a system, and not simply a group of separate organisms sharing the same physical space is that they are mutually interdependent, *e.g.* part of a single food chain (D. FINEGOLD, *Creating self-sustaining, high-skill ecosystems*, in *Oxford Review of Economic Policy*, 1999, Vol. 15, No. 1, pp. 66-70).

The innovation ecosystem is thus a work and training ecosystem, so it needs strategic partnership which can bring together education and production (R.C.D. NACAMULLI, A. LAZAZZARA (eds.), *op. cit.*, p. 43). The AA. provide an idea of training which goes beyond individual skills but concerns a number of actors who are asked to cooperate to learn, plan and innovate. This new ecosystem does not just imply a new organisational logic and a new idea of work, but it is based on a sort of “distributed intelligence” (*idem*, p. 4) which consists of the relationship between workers. In this sense, it is the team the learning entity, along with the whole of relations established at a local level (the

‘eco’ dimension). With this new paradigm, what change is the purpose of training, which is no longer intended as gaining a predetermined set of skills, due to the fluid nature of new organisational contexts. So a shift takes place from a one-direction type of training to continuous education, that is of which is to “learn to learn” (*cf.* J.D. NOVAK, D.B. GOWIN, *Learning How to Learn*, Cambridge University Press, 1984), which also constitutes the structural dimension of work organisation (R.C.D. NACAMULLI, A. LAZAZZARA (eds.), *op. cit.*, p. 27). Consequently, the training and knowledge acquired following educational schemes become the elements on which competition arises. This knowledge must be planned and generated thanks to strategic partnerships which can bring together different languages and skills. Work and learning thus highlight their relations. It is by integrating, not by alternating or separating, planning, production, research, work, university, business, school that it is possible to learn and work to innovate. It is all about “thinking by doing” (*idem*, p. 313).

This integration requires training policies to go beyond a ‘two-stage’ functionalistic dimension: companies innovate production processes, with the training system which adapts to them. The training system is integrated with production because it helps to define emerging skills related to innovation processes (F. VONA, D. CONSOLI, *Innovation and skill dynamics: a life-cycle approach*, in *Industrial and Corporate Change*, 2015, Vol. 24, No. 6, p. 1398). It is not innovation which takes place in the production system which guides training, but it is training which makes innovation possible (P. LEWIS, *Developing Technician Skills for Innovative Industries: Theory, Evidence from the UK Life Sciences Industry, and Policy Implications*, in *BJIR*, 2020, Vol. 58, No. 3).

6.2. A New Epistemological Paradigm to Understand Innovation

The analysis provided by M. GIBBONS *ET AL.*, *The new production of knowledge. The dynamics of science and research in contemporary societies*, Sage, 1994, draws a separation line when it comes to innovation processes. Today, knowledge production is no longer a linear process ('Mode 1') but a circular and iterative one ('Mode 2'). With the first approach, the knowledge gained by research was transferred to contexts where it could be implemented. With the second approach, it is implementation itself which determines issues, communication strategies and methodologies. Consequently, scientific research, which is increasingly trans-disciplinary, cannot be conceived outside a specific implementation context, especially considering that different forms of accountability and cooperation are in place (H. NOWOTNY, P. SCOTT, M. GIBBONS, *Introduction. 'Mode 2' Revisited: The New Production of Knowledge*, in *Minerva*, 2003, Vol. 41, No. 3).

Today's theoretical models explaining innovation refers to this paradigm (M. LAZZERONI, *Oltre la terza missione? Nuove forme di relazione tra università e territorio*, in F. SALVATORI (ed.), *XXXII Congresso geografico italiano. L'apporto della geografia tra rivoluzioni e riforme. Roma, 7-10 Giugno 2017*, A.Ge.I., 2019).

The 'Triple Helix' thesis states that the university can play an enhanced role in innovation in increasingly knowledge-based societies. The focus is on the network overlay of communications and expectations that reshape the institutional arrangements among universities, industries, and governmental agencies (H. ETZKOWITZ, L. LEYDESDORFF, *The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations*, in *Research Policy*, 2000, Vol. 29, No. 2, p. 114).

The 'open innovation' paradigm states that companies should develop innovative ideas from the outside (consumers, clients, suppliers, university) and from the inside, because innovation is

a distributive process (H. CHESBROUGH, *Open Innovation: A New Paradigm for Understanding Industrial Innovation*, in H. CHESBROUGH, W. VANHAVERBEKE, J. WEST (eds.), *Open Innovation. Researching a New Paradigm*, Oxford University Press, 2006, p. 2).

Finally, some reflections concern the role of university as an innovation hub, the new role of which is to access innovation local systems to promote interaction between research, its implementation and its commercialisation prompting social and economic development (J. YOUTIE, P. SHAPIRA, *Building an innovation hub: A case study of the transformation of university roles in regional technological and economic development*, in *Research Policy*, 2008, Vol. 37, No. 8, p. 1189).

As seen, the analyses below lead us to review the notion of ‘scientific research’, which does no longer differ from R&D, which aims at innovation. In this context, some authors suggest moving on from the notion of technology transfer, which implies the separation between these two spheres (M. KITSON, *Innovation policy and place: a critical assessment*, in *Cambridge Journal of Regions, Economy and Society*, 2019, Vol. 12, No. 2, p. 301).

In other words, research cannot be intended as an activity distinct from the production, cultural, and social ecosystem in which it develops, bringing to mind the idea of academic research likened to an ‘ivory tower’ (S. SHAPIN, *The Ivory Tower: the history of a figure of speech and its cultural uses*, in *The British Journal for the History of Science*, 2012, Vol. 45, No. 1, p. 26). This is so because applied research projects would allow researchers to test their own theories (Y.S. LEE, *The Sustainability of University-Industry Research Collaboration: An Empirical Assessment*, in *The Journal of Technology Transfer*, 2000, Vol. 25, No. 2, pp. 121-122), but also because modern epistemology challenges the traditional separation between theory and its application.

This does not mean that research must focus on knowledge industrialisation, as is still argued today (F. ORAZI, *Terza missione universitaria e Industria 4.0: una nuova governance per lo sviluppo locale*, in *Quaderni di Ricerca sull'Artigianato*, 2019, No. 1, p. 136 and *passim*). We should be concerned with creating a new type of knowledge, which is not a vertical and linear process, but as a circular dynamic, where a shift from theory to practice takes place. In other words what we need is “an activity intended to identify and systematise facts, principles and methodologies, especially through experiments and hypothesis” (G. SIRILLI (ed.), *La produzione e la diffusione della conoscenza. Ricerca, innovazione e risorse umane*, Fondazione CRUI, 2010, p. 10). Without this integration, research might be affected.

6.2.1. Non-Formal and Occasional Research & Development

The fact that that application is relevant in new knowledge creation process is clear also by looking at research concerning innovation processes in the business context. The literature states that it is not enough to refer to new knowledge and codified methods provided by the scientific community to develop new products. In all sectors in which technological development depends on intense and formalised R&D, the processes known as ‘learning by doing’ and ‘learning by using’ are fundamental, although they take place occasionally in working contexts (C. FREEMAN, *The economics of technical change*, in *Cambridge Journal of Economics*, 1994, Vol. 18, No. 5). This situation arises because most know-how originates by practical experience, based on tacit knowledge, rather than codified knowledge. Furthermore, only experience can tell which innovation is more suitable (G. DOSI, R.R. NELSON, *The evolution of Technologies: An Assessment of the State-of-the-Art*, in *Eurasian Business Review*, 2013, Vol. 3, No. 1, pp. 4-5).

Furthermore, the number of patents is not the only way to assess innovation rates (C. WATANABE, Y.S. TSUJI, C. GRIFFY-BROWN, *Patent statistics: deciphering a 'real' versus a 'pseudo' proxy of innovation*, in *Technovation*, 2001, Vol. 21, No. 12). Statistics demonstrate that not all innovation strategies result in genuine inventions (R. EVANGELISTA, V. MASTROSTEFANO, *Firm size, sectors and countries as sources of variety in innovation*, in *Economics of Innovation and New Technology*, 2006, Vol. 15, No. 3). A substantial amount of innovation deals with improving existing technology through user driven learning processes. In Swiss manufacturing, most technological innovations originates from informal processes which cannot be regarded as R&D activities (S. LHUILLERY, M. BOGERS, *Measuring User Innovation: What Can a Standard Innovation Survey Tell Us?*, paper presented at the ENID, PRIME International Conference, *Indicators on Science, Technology and Innovation: History and New Perspectives*, Lugano, 15-17 November 2006, pp. 10 ff.) and from adapting technologies created by others (see R. EVANGELISTA, S. IAMMARINO, V. MASTROSTEFANO, A. SILVANI, *Looking for Regional Systems of Innovation: Evidence from the Italian Innovation Survey*, in *Regional Studies*, 2002, Vol. 36, No. 2, p. 179).

Finally, one must consider that innovating does not only mean inventing new product and systems. In line with the distinction provide by the Oslo Manual (OECD, EUROSTAT, *Oslo Manual 2018. Guidelines for Collecting, Reporting and Using Data on Innovation*, 2018, pp. 69-70), it is also important to disseminate inventions so they can transform working processes. This aspect is also illustrated by economic facts: in the USA, the productivity increase was not determined by high-tech industries, but in wholesaling (M. KITSON, *op. cit.*, p. 303).

It has also been pointed out that companies operating in the services sector, where innovation develops through incremental innovation processes rather than radical innovation processes, should codify their innovation strategies (A. OKE, *Innovation types*

and innovation management practices in service companies, in *International Journal of Operations & Production Management*, 2007, Vol. 27, No. 6, p. 582).

6.2.2. Open Production and Open Innovation

The digital technologies introduced by Industry 4.0 allow the client to customise products and services. In this sense, one might speak of “open production” (J.P. WULFSBERG, T. REDLICH, F.-L. BRUHNS, *Open production: scientific foundation for co-creative product realization*, in *Production Engineering*, 2011, Vol. 5, No. 2, p. 135), which is one of the main aspects of the smart factory (E. HOZDIĆ, *Smart Factory for Industry 4.0: A Review*, in *International Journal of Modern Manufacturing Technologies*, 2015, Vol. VII, No. 1, p. 29).

This organisational process enables one to increase productivity and reduce waste, fulfilling the principles of lean production (A. SANDERS, C. ELANGESWARAN, J. WULFSBERG, *Industry 4.0 implies lean manufacturing: Research activities in industry 4.0 function as enablers for lean manufacturing*, in *Journal of Industrial Engineering and Management*, 2016, Vol. 9, No. 3). Furthermore production can be adapted real time in order to fulfil the consumer’s expectations (M. LEE ET AL., *How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation*, in *Journal of Open Innovation: Technology, Market, and Complexity*, 2018, Vol. 4, No. 3, p. 21).

Well before the notion of the ‘smart factory’ became mainstream, economists underlined the relevance of client interaction in companies’ innovation strategies. Examining the data from the Community Innovation Survey (CIS) conducted by Eurostat on the R&D activities carried out by private companies in 13 countries, C. GRIMPE, W. SOFKA, *Search patterns and absorptive ca-*

capacity: Low- and high-technology sectors in European countries, in *Research Policy*, 2009, Vol. 38, No. 3, p. 503, have shown that companies with low and medium levels of technology maximise their profit adopting innovation strategies based on client behaviour, while client interaction must become an integral part of R&D activity also in high-tech companies, which cooperate with universities and research centres.

In companies, innovation frequently takes place through informal exchanges of tacit knowledge, which are embedded in the context they are included. In the IV Industrial Revolution, these exchanges take on an open character, engaging also bodies other than those operating in the productive process and research.

6.3. The Integration between Education and Production

The IV Industrial Revolution features changes which also involve the links between training and production. This is so because a relation exists between the introduction of new technologies and production processes and the need of new skills. This is what happened for example during the first industrial revolution, where new techniques were accompanied by new work organisation, which set aside apprenticeships in favour of standardised procedures (cf. D. JACOBY, *The Transformation of Industrial Apprenticeship in the United States*, in *The Journal of Economic History*, 1991, Vol. 51, No. 4, and H. GOSPEL, *The decline of apprenticeship training in Britain*, in *Industrial Relations Journal*, 1995, Vol. 26, No. 1). This also favoured the emergence of public and professional school (H. KANTOR, *Work, Education, and Vocational Reform: The Ideological Origins of Vocational Education, 1890-1920*, in *American Journal of Education*, 1986, Vol. 94, No. 4. In relation to the demise of apprenticeships and the rise of vocational education due to work specialisation, see R. SCHALK, *Splitting the bill. Matching schooling to Dutch labour markets, 1750-1920*, PhD thesis, Faculty of

Humanities, Utrecht University, 2015, esp. p. 81. A comparative analysis of such changes is provided in CEDEFOP, *Towards a history of vocational education and training (VET) in Europe in a comparative perspective. Proceedings of the first international conference. October 2002, Florence. Volume I*, 2004, pp. 17-27).

Work organisation and emerging technologies in the first and the second industrial revolution led to a separation between the training and the productive system, because economically useful knowledge was divided into high-level technical knowledge – intended for managerial positions – and standardised knowledge – addressing most workers (G. ZAGO, *Il lavoro fra pensiero e formazione: dalla bottega alla fabbrica*, in G. ALESSANDRINI (ed.), *Atlante di pedagogia del lavoro*, Franco Angeli, 2017, pp. 195 ff.). Combining learning and expertise was no longer necessary. Learning took place at school, university and other training centres before accessing the labour market. As for special expertise, they were needed by workers once accessing employment.

The link between education and production changed again with the third industrial revolution. Before, process standardisation was the rule (A.S. BLINDER, *Education for the Third Industrial Revolution*, CEPS Working Paper, 2008, No. 163, p. 5). Now, social and interpersonal skills gained momentum, along with those related to critical thinking and internet use, also for pedagogical and learning purposes, in order to customise teaching and widen its accessibility, particularly in the tertiary sector (*idem*, p. 10). The relation between education and production is stable, as is the paradigm through which emerging learning processes are codified thanks to the introduction of new strategies.

6.3.1. The IV Industrial Revolution: the Possible Developments of the Links between Education and Production

In line with the interpretation provided above, much research relates the IV industrial revolution to new educational needs which develop in the production system and can be developed, for which new instruments and online platforms can be used (M.A. PETERS, *Technological unemployment: Educating for the fourth industrial revolution*, in *Educational Philosophy and Theory*, 2017, Vol. 49, No. 1, pp. 4-5 and references to the concept of open education) though no change takes place in learning contexts and time. A difference exists from the previous industrial revolution – both in terms of skills needs and the role of training in society, as pointed out by Brunner. The A. argues that school should abandon the teaching approaches in place in the industrial revolution and that training should not be provided only to keep up with technological innovation (J.J. BRUNNER, *Globalization, education and the technological revolution*, in *Prospects*, 2001, Vol. 31, No. 2, p. 137). However, continuity exists as regards the links between training and production. One example of this is provided by A. BENEŠOVÁ, D. TUPA, *Requirements for Education and Qualification of People in Industry 4.0*, in *Procedia Manufacturing*, 2017, Vol. 11. In their research, it is argued that companies understand the extent to which they have implemented Industry 4.0 paradigms and translate them into a codified set of professional profiles and competence, requiring the training system to fulfil some gaps (p. 2201).

In relation to training systems, B.E. PENRASE, *The Fourth Industrial Revolution and Higher Education*, in N.W. GLEASON (ed.), *Higher Education in the Era of the Fourth Industrial Revolution*, Palgrave Macmillan, 2018, acknowledges the hybrid nature of learning in the context of the IV Industrial Revolution, with this state of affairs which will bring about the use of new learning methods, also thanks to digital tools and innovative contents.

The new learning methods are well exemplified by seamless learning (see L-H. WONG, M. MILRAD, M. SPECHT (eds.), *Seamless Learning in the Age of Mobile Connectivity*, Springer, 2015, and L.-H. WONG, C.-K. LOOI, *What seams do we remove in mobile assisted seamless learning? A critical review of the literature*, in *Computers & Education*, 2011, Vol. 57, No. 4). This expression refers to a learning approach intended to fill any seam existing between formal and informal education, promoting learning outside structured learning processes, with cooperation between learners. Through digital platforms, seamless learning wants to stress the learning dimension in all the activities carried out by people, helping them to interact and collaborate outside the classroom. While innovative, this approach does not imply integration between learning and work, though promoting an educational culture, which is no longer relying on a transfer-based and formal model.

Drawing on the arguments made by Blinder referred to above, P. PRISECARU, *Challenges of the Fourth Industrial Revolution*, in *Knowledge Horizons-Economics*, 2016, Vol. 8, No. 1, stresses the need for training to be inter-disciplinary, with the focus which must be on the qualitative dimension of learning processes, in line with the paradigms described so far for which training must be more flexible and locally oriented. T. WALLNER, G. WAGNER, *Academic Education 4.0*, in M. CARMO (ed.), *END 2016. International Conference on Education and New Developments. 12-14 June – Ljubljana, Slovenia*, World Institute for Advanced Research and Science, 2016, also calls for a rethinking of training systems in relation to content and approaches, so that a flexible mindset emerges which can deal with labour market transitions while promoting cooperation at local level.

Education provision is increasingly complex, due to the speed of changes affecting work, so new actors are needed to identify specific skills needs. This is the arguments put forward by C. DEMARTINI, L. BENUSSI, *Do Web 4.0 and Industry 4.0 Imply Education X.0?*, in *IT Professional*, 2017, Vol. 19, No. 3, who state that

providing the skills required a new planning approach is necessary, which places the learner center stage and adapts to ever-changing skills needs.

Here, training is regarded as an activity falling within the remit of training providers. Consequently, while a review of learning content, methods and objectives is encouraged, this process is triggered in work contexts.

Yet in other cases research has regarded the IV Industrial Revolution as a paradigm change, focusing on knowledge which can innovate and on the learning modalities. In this sense, new links exist between training and production, and integration between them is sought. Some research points out that it is not sufficient to bring these two domains closer, because learning must be an ongoing process which is also *fuelled by work and supported by the introduction of new methods* (see K. STACHOVÁ, J. PAPULA, Z. STACHO, L. KOHNOVÁ, *External Partnerships in Employee Education and Development as the Key to Facing Industry 4.0 Challenges*, in *Sustainability*, 2019, Vol. 11, No. 2, where integration is linked to the wider notion of sustainability).

Specifically, the Industry 4.0 paradigm calls for this integration because the enabling technologies related to it requires learners to develop work experience to operate them. So ongoing and shared learning processes are necessary, as is a rethinking of production, an example of which is the learning factory described in M. ELBESTAWI, D. CENTEA, I. SINGH, T. WANYAMA, *SEPT learning factory for Industry 4.0 Education and Applied Research*, in *Procedia Manufacturing*, 2018, Vol. 23, p. 254. Against this background, it is impossible to separate studying from experience, theory and practice. The production contexts in which work organisation is reviewed in light of this paradigm need workers and students to understand these changes and to be actively involved in them. Other authors opt for the so-called teaching factory (see D. MOURTZIS, E. VLACHOU, G. DIMITRAKOPOULOS, V. ZOGOPOULOS, *Cyber-Physical Systems and Education 4.0 – The*

Teaching Factory 4.0 Concept, in *Procedia Manufacturing*, 2018, Vol. 23), stressing the need to integrate training with production, favouring student learning which must be able to provide examples of how work is changing. While learning processes are important to supply workers with the necessary skills, it is important to combine theoretical and practical knowledge among workers and students.

M.H. KHAN, *Knowledge, skills and organizational capabilities for structural transformation*, in *Structural Change and Economic Dynamics*, 2019, Vol. 48, describes the close relation between knowledge, ability and work organisation. In order to deal with the challenges posed by the IV Industrial Revolution, it is not sufficient to focus on just one of the dimensions referred to before, it that this approach would reassert the old-fashioned assumption that work organisation could change effectively even without promoting worker knowledge and continuous investments on their skills. Furthermore, and as pointed out by the research referred to above, training calls for a combination of codified and tacit knowledge, which is also developed in non-formal settings like workplaces (*idem*, p. 48). This perspective is also adopted in E. SKOV MADSEN, A. BILBERG, D. GRUBE HANSEN, *Industry 4.0 and digitalization call for vocational skills, applied industrial engineering, and less for pure academics*, paper presented at the 5th P&OM World Conference, *Joining P&OM Forces Worldwide: Present and Future of Operations Management*, Havana, 6-10 September 2016. The complex nature of work in the IV Industrial Revolution calls for direct knowledge and the active involvement of learners in productive contexts. Rather than titles and qualifications, what matters is the set of skills developed in non-formal and informal settings. Practical and theoretical knowledge must combine, while higher education must rethink its role cooperating with production (*idem*, p. 8). Yet formal and non-formal learning shall not be opposed, as parallel development rather than full integration would take place. Rediscovering the educational value of work is not automatic, but needs circularity among the different dimen-

sions making up learning in the IV Industrial Revolution, as stressed in A. MANUTI ET AL., *Formal and informal learning in the workplace: a research review*, in *International Journal of Training and Development*, 2015, Vol. 19, No. 1.

6.3.2. Dual and Hybrid Training: Combining Learning Contexts, Spaces and Time

Based on the considerations developed above, it should be no surprise that dual and hybrid training are given new momentum, also in relation to dynamic processes integrating learning and production (see M. TIRABOSCHI, F. SEGHEZZI, *Il Piano nazionale Industria 4.0: una lettura lavoristica*, in *LLI*, 2016, No. 2, I., p. 16: “the interest towards school-work alternation, apprenticeships, higher education and dual training and the attempt to revive inter-professional funds financing lifelong learning are not coincidental and are intended to tackle unemployment by promoting professional guidance and retraining, while reflecting changes to planning, production and development”). The focus on dual training bears relevance to train young people in the context of the IV Industrial Revolution, as stressed in F. PASTORE, *New Education Models for the Workforce of the Future*, IZA Policy Paper, 2018, No. 143, p. 11, in order to challenge the paradigm according to which education and work are two different spheres.

The A. just mentioned argue that the integration between education and work should take place through education provision but also when planning new professional profiles and new learning paths implemented in hybrid contexts. This is an approach also shared by F. BUTERA, *L'evoluzione del mondo del lavoro e il ruolo della istruzione e formazione tecnica superiore*, in *Professionalità Studi*, 2017, Vol. I, No. 1. In his paper, the A. asserts that in this world of work it is impossible to come up with professional profiles based on a rigid set of tasks and duties, so it is necessary to focus on the worker's real skills and their ability to perform the

role they are assigned dynamically. In this sense, the strategic role played by the system integrating education and work, in which these two dimensions plan new learning paths and skills which promote innovation processes. The same point is made by A. MAGONE, *Tecnologia e fattore umano nella fabbrica digitale*, in *L'Industria*, 2016, No. 3, p. 423, where it is stressed that a change of paradigm should take place also in relation to educational process planning: “in the current context, the way education is planned and provided should ensure less standardised solutions, so education providers should act as consultants for workers and companies”.

Education planning changes, as do the places where education is provided (cf. I. ZITTER, A. HOEVE, *Hybrid Learning Environments. Merging Learning and Work Processes to Facilitate Knowledge Integration and Transitions*, OECD Education Working Paper, 2012, No. 81). The hybrid contexts in which learning takes place constitute an interrelation between physical and digital settings. Such interrelation does not result in alternation, but in ongoing integration. So a boundary crossing must be promoted, as defined in N. KERSH, *Rethinking the learning space at work and beyond: The achievement of agency across the boundaries of work-related spaces and environments*, in *International Review of Education*, 2015, Vol. 61, No. 6, pp. 848-849: it is important to go beyond the traditional boundaries dividing learning time, places and strategies, from its planning to its implementation, so that an ongoing exchange takes place between the elements making up the educational ecosystem.

This integration is not limited to a certain stage of one's life, but occurs everyday. It is not confined to helping young people in the transition between school and work, as it affects all transitions in their professional and private life. This view can be also found in P.-J. DITTRICH, *Reskilling for the Fourth Industrial Revolution. Formulating A European Strategy*, Jacques Delors Institut Working Paper, 2016, No. 175, p. 15, who argues in favour of reskilling aimed at developing digital expertise in order to facili-

tate workers' employability. In order for this process to take place, cooperation between education systems and companies is necessary at local level. Where not possible, the A. suggests creating coalitions, by also drawing on EC policies in this field. The same proposal is made in N. VOLLES, *Lifelong learning in the EU: changing conceptualisations, actors, and policies*, in *Studies in Higher Education*, 2016, Vol. 41, No. 2.

6.4. New Skills, Jobs and Professions

The shift from the XX century labour market to the current one, which was accelerated by globalisation (Z. BAUMAN, *Dentro la globalizzazione. Le conseguenze sulle persone*, Laterza, 2001; A. GIDDENS, *Il Mondo che cambia. Come la globalizzazione ridisegna la nostra vita*, Il Mulino, 2000; S. SASSEN, *Le città nell'economia globale*, Il Mulino, 2004), by flexible specialisation (M.J. PIORE, C.F. SABEL, *The Second Industrial Divide. Possibilities for Prosperity*, Basic Books, 1984), by the erosion of international labour markets (B. GAZIER, *Labour market institutions*, in *hal.archives-ouvertes.fr*, 2013), by the evolution of technology knowledge innovation and development processes and by the reorganisation taking place in companies, sectors and local areas (S. NEGRELLI, *op. cit.*), as well as by demographic, social, and political dynamics (R. CASTEL, *Incertezze crescenti. Lavoro, cittadinanza, individuo*, Editrice Socialmente, 2015; Z. BAUMAN, *La società dell'incertezza*, Il Mulino, 1999), has generated the transformation of work content and the rise of new professions, the demise of others and the centrality attached to the notion of skills. As pointed out by S. NEGRELLI, *op. cit.*, p. XI, this shift has brought about the emergence of “new social groups looking for recognition, causing instability, precariousness and novel forms of inequalities. New worlds of work arise where status recognition, decent working conditions and active welfare support are frequently lacking”.

Scholars from different disciplines have examined how current changes are transforming jobs, trades and professions as a response to new economic challenges and social needs.

These analyses can be grouped into two main strands. One strand of research includes scholars who developed their theories in a time in which a shift was taking place from the Fordist to Postfordist social and productive model, which also entailed cultural, organisational and social consequences. This was the context examined by a number of scholars – among whom were Negrelli, Accornero, Butera and Supiot – who anticipated reflections from academics pertaining to the second research strand, who analysed the impact that new production models based on innovative technologies – the Industry 4.0 paradigm – had on the creation or the setting-aside of new professional profiles.

Both these research strands must be considered in order to appreciate the issues resulting from long-term social and economic processes and to understand how new professions and expertise are generated in the context of the IV Industrial Revolution. While examining the evolution of work from two different perspectives, these research strands share common aspects concerning the blurring boundaries between production sectors, the shift from manual to intellectual work, the overlapping of salaried and self-employment, the increasing need for autonomy and an increasing participation and awareness of workers as regards work.

6.4.1. Knowledge Workers

Ever since the 1970s, tertiarisation has taken place in western countries, leading to an increase in the number of workers employed in the services sector and to a decrease of those operating in manufacturing and agriculture (E. REYNERI, *Sociologia del mercato del lavoro. II. Le forme dell'occupazione*, Il Mulino, 2005; I.

FELLINI, *Il terziario di consumo. Occupazione e professioni*, Carocci, 2017). According to some scholars, this was the reason behind the emergence of so-called knowledge workers, a group of workers engaged in new professions, who have also been defined with different terminology. For example, F. BUTERA, S. DI GUARDO, *Analisi e progettazione del lavoro della conoscenza: il modello della Fondazione Irso e due casi*, in *Studi Organizzativi*, 2009, No. 2, and B. SURAWSKI, *Who is a “knowledge worker” – clarifying the meaning of the term through comparison with synonymous and associated terms*, in *Management*, 2019, Vol. 23, No. 1, defined them: qualified staff, professionals, experts, creative class, second-generation autonomous workers, mental workers, information worker and white-collar workers.

The expression ‘knowledge workers’ was used for the first time by Peter Drucker (P. DRUCKER, *Management and the professional employee*, in *Harvard Business Review*, 1952, Vol. 30, No. 3; P. DRUCKER, *Landmarks of Tomorrow*, Harper & Brothers, 1957; B. SURAWSKI, *op. cit.*) to refer to those who have, use and create valuable knowledge. This expression is still used today to indicate a worker typical of modernity who produces new knowledge drawing of a combination of knowledge (F. BUTERA, S. BAGNARA, R. CESARIA, S. DI GUARDO, *Knowledge Working. Lavoro, lavoratori, società della conoscenza*, Mondadori, 2008). To do so, they make use of cognitive, relationals, communication skills. The definition of a ‘knowledge worker’ is contested (B. SURAWSKI, *op. cit.*) as different nuances of meaning can be attributed to this terminology. However some distinctive traits can be identified, which make knowledge workers different from workers operating in the XX century.

According to some research, this group of workers is also marked by widespread instability and precariousness (U. BECK, *La società del rischio. Verso una seconda modernità*, Carocci, 2013; R. CASTEL, *op. cit.*). This state of affairs is due to the ways work is performed which is no longer standardised (F. BUTERA, S. DI

GUARDO, *op. cit.*) and features “interchangeable and fluid roles” (E. ARMANO, *op. cit.*) which changes continuously depending on changing employment relationships and production and organisational needs. Furthermore, work becomes task-oriented, so pay is no longer calculated on time but on the objectives achieved (*ibidem*). This might lead to instability and economic precariousness, especially among those engaged in self-employment and collaborations.

Knowledge workers also include liminal workers (F. BUTERA, S. DI GUARDO, *op. cit.*), *i.e.* consultants, communication experts, web designers, namely new professionals which are neither registered with professional associations nor are part of professional categories, so they do not benefit from the protection offered to salaried employees (*ibidem*; E. ARMANO, *op. cit.*). Against this uncertainty, according to some authors (B.A. BECKLY, *Gaffers, Gofers, and Grisps: Role-based Coordination in Temporary Organization*, in *Organization Science*, 2006, Vol. 17, No. 1; E. ARMANO, *op. cit.*), “it is the professional community which informally recognises the skills developed by these workers and facilitates inter-organisational roles between different business settings. In other words, a professional ‘identity’ might generate which is neither laid down by law nor recognised by professional associations, which is relevant in organisational terms. From this point of view, these workers are far from performing a marginal role, as pointed out in some of the relevant literature [*cf.* A. ABBOTT, *The System of Professions. An Essay on the Division of Expert Labor*, University of Chicago Press, 1988]” (E. ARMANO, *op. cit.*, p. 92).

Among the scholars who elaborated categories within which new ways of work should be included, mention should be made of R. FLORIDA, *L’ascesa della nuova classe creativa*, Mondadori, 2003, who talks of a new creative class. According to the US Bureau of Labour Statistics, this category is further divided into two subcategories, namely ‘creative professionals’ (those holding managerial positions and operating in the financial, business, le-

gal, healthcare, sales and commercial sector) and the ‘super-creative professionals’ (who work in such sectors as biology, medicine, mathematics, education and so forth; see Florida, cited in S. NEGRELLI, *op. cit.*, p. 51).

Research agrees that knowledge workers are need to study on a regular basis, as learning for them does not end up with graduation. Lifelong learning for them is both a need and a will, because knowledge workers are the protagonists of their social and professional growth and aim at developing skills which are more in demand in the market (E. ARMANO, *op. cit.*). They are also prompted to grow because of the need for self-fulfilment, irrespective of their professional status (salaried or self-employment). In the same vein, E. RULLANI, *Lavoro in transizione: prove di Quarta Rivoluzione industriale in Italia*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 437, refers to smart workers, who manage their own time and work. Even when they decide whether to invest in their skills, it is them “who decide how to develop their skills, how to take risks and when starting to work on their own, through a startup, if they have personal ambitions in this sense”.

The authors who examined the impact of the IV Industrial Revolution in terms of job creation and destruction and the rise of new skills needs focused on the role of technology and automation, which led to findings similar to those concerning knowledge-intensive jobs. As pointed out by A. MAGONE, *op. cit.*, those investigating the impact of automation on professions, who are called ‘militant innovators’, think that technological transformations will not lead to the ‘end of work’, but to an increase of intellectual jobs linked to research, planning and innovation, while repetitive jobs will face a decrease (M. COLOMBO, E. PRODI, F. SEGHEZZI, *Le competenze abilitanti per Industria 4.0. In memoria di Giorgio Usai*, ADAPT University Press, 2019, pp. 250 ff.).

In an attempt to answer the question “What is it that computers do – or what is it that people do which computers – that appears to increase demand for educated workers?”, D.H. AUTOR, F. LEVY, R.J. MURNANE, *The Skill Content of Recent Technological Change: An Empirical Exploration*, in *The Quarterly Journal of Economics*, 2003, Vol. 118, No. 4, argue that current jobs can be divided into routine tasks, that can be readily described with programmed rules, and nonroutine tasks demanding exibility, creativity, generalized problem-solving capabilities, and complex communications. This latter set of jobs will not face the risk of being automated, but will raise demand for workers who hold a comparative advantage in nonroutine tasks, typically college-educated workers (*idem*, p. 1322).

According to E. BRYNJOLFSSON, A. MCAFEE, *The Second Machine Age. Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W.W. Norton & Company, 2014, professions which need emotional, affective, relational and creative skills will not be automated, together with those demanding problem-solving skills (M. COLOMBO, E. PRODI, F. SEGHEZZI, *op. cit.*, p. 250).

The same view was shared by M. CASTELLS, *La nascita della società in rete*, Università Bocconi Editore, 2002, p. 286 (as reported by S. NEGRELLI, *op. cit.*, pp. 67-68), who maintained that “automation implies [...] the elimination of operational, mechanical and routine work, on the one hand, and the concentration of higher-level tasks in the hands of qualified white-collar workers and professionals, on the other hand, who take decisions based on information memorised in their computers”.

E. RULLANI, *op. cit.*, p. 423, pointing out that technology is not independent from people but interconnected to them, rejects the risk of technological determinism and suggests examining new jobs, which digitalisation makes different from standard ones because they are “intelligent” and “highly differentiated” and “need workers’ temporary involvement through skills and time” (*idem*, p. 436).

P. BIANCHI, *4.0. La nuova rivoluzione industriale*, Il Mulino, 2018, p. 82, has examined the links between people and robots to understand possible implications in practical terms. The A. is of the opinion that robots do not replace people, as they perform high-precision tasks which the latter could never do. So work is increasingly divided into relational and creative tasks and low-added-value tasks which do not require complex machines.

Drawing on some past scholars, C. DEGRYSE, *Digitalisation of the economy and its impact on labour markets*, ETUI Working Paper, 2016, No. 2, p. 23, classified jobs in the digital economy as follows: 1) jobs at greatest risk of automation/digitalisation; 2) jobs at least risk of automation/digitalisation; 3) new jobs. The first group includes: office work and clerical tasks, sales and commerce, transport, logistics, and some aspects of financial services. The second group includes legal services, human resources, and some types of services (social work, hairdressing, beauty care, etc.). New jobs are further divided into jobs ‘at the top of the scale’ and those ‘at the bottom of the scale’. The first subcategory includes data analysts, data miners, and data architects, while the second consists of “digital ‘galley slaves’ (data entry or filter workers) and other ‘mechanical Turks’ working on the digital platforms e uber drivers, casual odd-jobbing (repairs, home improvement, pet care, etc.) in the ‘collaborative’ economy”.

Scholars of Industry 4.0 also agree that the division between manual and intellectual work should be set aside. Among them there is G. MARI, *Il lavoro 4.0 come atto linguistico performativo. Per una svolta linguistica nell’analisi delle trasformazioni del lavoro*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 322, who argues that work performed in the XX century was divided into intellectual and manual work because it starts with the idea of the item to be manufactured and ends with its practical realisation through manual activities. Work 4.0 causes this process to change, because a “performative linguistic act” takes place

whereby those elements which have always been separate within the intellectual/manual work dualism reunite.

This view was also supported by F. TOTARO, *Lavoro 4.0 e persona: intrecci e distinzioni*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.* The A. defines his views supporting Mari's arguments as a "friendly interaction", positing that moving beyond the division between intellectual and manual work is the way forward and that this separation represents the difference between knowledge work and work performed in Fordism.

6.4.2. Emerging Professions

Emerging jobs have been identified in the report of the WORLD ECONOMIC FORUM, *op. cit.*, where 7 professional groups were also singled out (Data and Ai, Engineering and Cloud Computing, People and Culture, Sales, Marketing and Content, Product Development, Green Economy, Care Economy).

Professional groups concern jobs in the care economy, which are devoted to people's care and health. The same view was shared by the European Commission (Communication from the Commission, *Annual Growth Survey 2012*, 23 November 2011, COM(2011)815 final; *Commission Staff Working Document on exploiting the employment potential of the personal and household services*, 18 April 2012, SWD(2012)95 final) and some national reports (*cf.* R. CICCIOMESSERE, A.M. PONZELLINI, *Le prospettive di sviluppo dei white jobs in Italia. Servizi sanitari, sociali e alla persona: i settori con il potenziale di occupazione più elevato*, Italialavoro, 2014). They pointed out an increase in the demand for this job, along with the rise of new demographic, economic, social and cultural dynamics, *e.g.* population ageing, increased female participation in the labour market, and the transformation of family models. The increase in the share of the old population has produced a rise of those in need of support and assistance because they are sick or be-

cause they are physically challenged. Yet they cannot be looked after by family members, as is used to be the case, because women participate more in the labour market. Therefore, these services must be provided on the market. The care economy, also referred to as white jobs (*ibidem*), is made up of a heterogeneous group, bringing together all those professionals dealing with “the health of people and the wellbeing of families, through social services, and the care for children, old people and the disabled” (*idem*, p. 4) from different economic sectors. They include both doctors and home help, the latter mostly operating in the undeclared economy.

Among the authors who identified emerging professional figures in this field, C. ANTONELLI, *op. cit.*, p. 19, highlights that companies’ key figures will be professionals who work with businesses on specific objectives. Some jobs originated in new organisational and productive contexts need professional recognition and skills certification. B. LODI, *La professione di temporary manager*, in C. ANTONELLI (ed.), *op. cit.*, p. 107, points out that the need for more flexibility has led to the creation of the temporary manager. This professional, and the other identified in the book (the one specialised in logistics, the marketing manager, the project manager and the management consultant) needs skills development tools and recognition strategies useful for their career development. Companies too need to have their status acknowledged, in order to engage in targeted selection processes. The shortcomings in this area are compensated by professional associations, which help promote temporary management and set up a professional network, serving as a reference for the companies which want to recruit temporary managers.

The report by M. LORENZ ET AL., *Man and Machine in Industry 4.0. How Will Technology Transform the Industrial Workforce Through 2025?*, Boston Consulting Group, 2015, p. 12, identifies two new professional profiles which will emerge in the context of Industry 4.0. One is the industrial data scientist, who is in charge

of data management and analysis in order to improve production and products. Analytical and programming skills are those needed by them. The other is the robot coordinator, who is tasked with supervising the correct functioning of machines and must intervene if malfunctioning or errors arise. They are both professionals who must be able to deal with highly complex processes.

In CENTRO STUDI ASSOLOMBARDA (ed.), *Alla ricerca delle competenze 4.0. Analisi condotta in collaborazione da Assolombarda Confindustria Milano Monza e Brianza e l'Università di Milano Bicocca-Crisp*, Ricerca, 2015, No. 3, p. 8, Assolombarda examined a database consisting of recent ads of jobs, which were not classified but faced increased demand in Lombardy: the mobile developer, the business intelligence analyst, the social media specialist/social media marketing specialist, the social network analyst.

Within the ecosystem of innovation and education referred to in the previous paragraphs, some new types of researchers are emerging through collaborations between companies and research centers. They are highly qualified workers who support companies in their innovation processes (see E.M. IMPOCO, M. TIRABOSCHI, *La ricerca ai tempi delle economie di rete e di Industry 4.0. Contratti di ricerca e lavoro di ricerca in impresa e nel settore privato*, Giuffrè, 2016). Due to the way research takes place currently, they cannot separate theory from practice. They do not produce knowledge in libraries or laboratories. As innovation is a circular process, the researcher learns also considering the context he wants to innovate. Of course technological innovation needs a set of general and systemised knowledge originating at research centres.

As observed by economists, the tacit knowledge distributed among those operating at local innovation ecosystems is not enough. It has to be fuelled by formalised knowledge in order to become “generative knowledge”, which “innovates, adapts, personalises, manages solutions and replicable products”. For all

these reasons, there is a need to create “a new group of young researchers working in both companies – participating in innovation in different sectors – and in research centers, so they are in contact with the global circuit of creativity and sciences” (E. RULLANI, *Territori in transizione. Il nuovo rapporto tra imprese e Politiche territoriali per la rinascita industriale e l'innovazione*, in R. CAPPELLIN, E. MARELLI, E. RULLANI, A. STERLACCHINI (eds.), *Crescita, investimenti e territorio: il ruolo delle politiche industriali e regionali*, Università degli Studi di Roma Tor Vergata, 2014).

To some, researchers are still “looking for their own identity” (G. SIRILLI (ed.), *op. cit.*, p. 32). This argument holds particularly true in Italy, where the social partners have rarely identified their professional profiles and laid down relevant legal clauses in collective agreements (M. TIRABOSCHI, *L'inquadramento giuridico del lavoro di ricerca in azienda e nel settore privato: problematiche attuali e prospettive future*, in *DRI*, 2016, No. 4). Furthermore, specific educational paths should be put in place to create these profiles (*i.e.* industrial PhDs) making use apprenticeship contracts to enter these programmes (see M. TIRABOSCHI, *I dottorati c.d. pratici: la prospettiva dei datori di lavoro*, in *Professionalità Studi*, 2018, Vol. I, No. 4, pp. 107 ss.). On research-based apprenticeships in the context of Industry 4.0, see M. TIRABOSCHI, *Research Work in the Industry 4.0 Era: The Italian Case*, in *EJICLS*, 2017, Vol. 6, No. 2, pp. 43 ff.).

Researchers are hybrid figures – a halfway house between scholars and planners of innovation processes – who will increasingly operate in ecosystems featuring production and innovation. They will be hired through contractual arrangements which will not establish fixed workstations and which will be regularly updated depending on projects and production contexts. The links with different innovation contexts make their career more fragmented and discontinuous. So it is up to them, using their proactivity and creativity, to make their career steadier, by also resorting to lifelong learning. One might also consider interna-

tional mobility, as the local ecosystems referred to before are just hubs connecting value production global chains.

The reflections made so far might have implications in terms of OHS which have been disregarded in the literature. For some of the emerging profiles, protection is difficult to apply (depending on the places they work, different protection measures would be implemented) and to manage (who is in charge of it? This is true if one considers that they organise their work autonomously and interact with different organisations). It seems it necessary to establish bodies operating outside the single organisations, which are certified by the ecosystems referred to before. The fragmented nature of these new professionals also poses questions in relation to their social security regime, and one should also consider the portability of contributions, particularly taking into account their high level of international mobility.

6.4.3. Key Competencies in a Changing World of Work

As said, the new labour markets prioritise skills, as pointed out in M.G. MEREU, M. FRANCESCHETTI, *Rappresentare il lavoro che cambia. Una lettura per competenze e fabbisogni*, in *Sociologia del Lavoro*, 2013, No. 129. ‘Competence’ is a multifaceted notion which, although being studied from different disciplinary domains, does not have a proper and accepted definition. It is not the purpose of this literature review to look at the definition of this notion, which can be examined by investigating the significant amount of research on this topic (D. MCCLELLAND, *Testing for Competence Rather Than for “Intelligence”*, in *American Psychologist*, 1973, Vol. 28, No. 1; D. MCCLELLAND, G. KLEMP, *The assessment of occupational competence. Final report*, National Institute of Education, 1980; L.M. SPENCER JR., S.M. SPENCER, *Competence at Work. Models for Superior Performance*, John Wiley & Sons, 1993; I.T. ROBERTSON, M. CALLINAN, D. BARTRAM (eds.), *Organizational Effectiveness. The Role of Psychology*, John Wiley & Sons, 2002, pp. 1-10; G. BERTA-

GNA, *Valutare tutti, valutare ciascuno. Una questione pedagogica*, La Scuola, 2004; G. BERTAGNA, *Pensiero manuale. La scommessa di un sistema educativo di istruzione e di formazione di pari dignità*, Rubbettino, 2006; E. MASSAGLI, *Alternanza formativa e apprendistato in Italia e in Europa*, Studium, 2016, pp. 34-35; G. SANDRONE, *La competenza: concetto ponte tra formazione e lavoro*, in *Nuova Secondaria – Ricerca*, 2017, No. 10). Here, the term is given the meaning provided by the CEDEFOP, *Terminology of European education and training policy. Second Edition. A selection of 130 key terms*, 2014, and that of the European Union laid down in the Council Recommendation of 22 May 2018 on key competences for lifelong learning: “proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. Competence is not limited to cognitive elements (involving the use of theory, concepts or tacit knowledge); it also encompasses functional aspects (involving technical skills) as well as interpersonal attributes (e.g. social or organisational skills) and ethical values”.

While providing an outline of research investigating the most in-demand skills in today’s labour market, it should be noted that a number of transformations and processes are taking place which reflect changes already implemented in work processes in the shift from Fordism to Post-Fordism and are more pronounced nowadays.

In this sense, A. ACCORNERO, *op. cit.*, p. 113, stressed that the skills required by companies were different from those possessed plant workers in the Fordism period. Now they were looking for ‘processing expertise’, through which workers were able to deal with the changing situations of new work processes.

The more recent literature also points to this aspect, as “in knowledge capitalism, work is increasingly characterised by the ‘know how to be’ rather than by the ‘know how to do’ approach” (S. NEGRELLI, *op. cit.*, p. 45). Consequently, workers are asked to have certain technical skills, to develop human capital

and creativity, to increase their relational skills, especially in terms of interpersonal contacts, mutual cooperation and teamwork (*ibidem*). Employers also need workers to be increasingly autonomous and to share responsibilities. According to Negrelli, this means moving from someone who performs a task to someone who has a role, which implies flexibility, relations, other difficulties. Negrelli stresses that autonomy and sharing of responsibilities “have become some of the most significant aspects of salaried employment, as it is with self-employment” (*idem*, p. 67). He also adds that “work autonomy and responsibilities will be increasingly important in the knowledge economy and will increase along with workers’ relational skills and social capital” (*ibidem*).

In a similar vein, E. RULLANI, *Lavoro in transizione: prove di Quarta Rivoluzione industriale in Italia*, cit., points out that changes to work organisation and the way tasks are performed because of new technologies have led the worker to organise his work settings on his own, somewhat losing those characteristics which are typical of salaried employees.

F. TOTARO, *op. cit.*, p. 477, provides a different view. While sharing the point that workers will be given more autonomy and responsibilities, he argues that “autonomy and responsibility in the context of Industry 4.0 are still in line with a binding productive standard”.

Some other scholars have stressed that the advent of the IV Industrial Revolution has led workers’ personal dimension to be given priority. In this sense, G. MARI, *op. cit.*, describes work in the context of the IV Industrial Revolution as a linguistic act thanks to which the human dimension are the focus of activity.

Workers should be placed center stage in relation to new working processes. This is because while automation will replace a number of standard replicable and activities “it cannot take place without people” (A. CIPRIANI, *La partecipazione innovativa dei la-*

voratori. Creatività e contraddizioni nel lavoro 4.0, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *op. cit.*, p. 178). For this reason, Cipriani argues that all workers, especially frontline ones, must be listened to so their work experience can be improved by implementing the man-machine relationship. By introducing machinery and new technology, the most physically demanding activities will decrease, while new psychological issues will arise, as new jobs will generate stress and work-related stress.

Scholars also agree that in the new work processes, there is a need for teamwork, also made up of specialists from different fields. M. IANSITI, K.R. LAKHANI, *Digital ubiquity. How connections, sensors, and data are revolutionizing business*, in *Harvard Business Review*, 2014, November, note that digital work becomes ubiquitous and that workers are not given strict roles and functions. They are asked to work together to improve company value and potential using mobile communication devices.

G. MARI, *op. cit.*, p. 321, stresses that “like cognitive work, work 4.0 is a necessarily cooperative activity. For this reason, sometimes it is not easy to single out individual contribution in terms of creativity and initiative”.

F. SEGHEZZI, *Lavoro e competenze nel paradigma di Industria 4.0: inquadramento teorico e prime risultanze empiriche*, in *Professionalità Studi*, 2017, Vol. I, No. 1, underlines that, besides the technical skills gained through school, soft skills also play a part, because workers will increasingly deal with flexible, and ever-changing processes. Worker involvement will go beyond the cognitive dimension, as it will include decision-making and risk-taking, *i.e.* soft skills. The fact that the skills needed are changing is frequently explained by so-called subjectifying action. This shows that the value of work activity cannot be limited to technical skills, as there are subjective elements that need considering (experience, insights, the ability to prevent events).

L. PRIFTI, M. KNIGGE, H. KIENEGGER, H. KRCDMAR, *Un modello di competenze per i lavoratori di Industria 4.0*, in *Professionalità Studi*, 2017, Vol. I, No. 1, p. 83, argue that work transformation will need workers to have many skills, so skills development is one of the main challenges to deal with ongoing changes. By means of desk research and focus groups, they lead to the conclusion that all workers will need to have high-level behavioural skills to work in the context of Industry 4.0. The most sought-after skills include: communication and relational skills (cooperation, the ability to reach a compromise) negotiation skills, emotional intelligence, project management skills, the ability to be client-oriented and to create new commercial networks. Equally important are decision-making skills and leadership, along self-organisation in order to strike a balance between work and family life.

The same conclusions are shared also by the CENTRO STUDI ASSOLOMBARDA (ed.), *op. cit.* By means of qualitative and quantitative analysis, this research identifies those soft skills needed in emerging professions and sought after by companies from 2010 to 2014. They include: teamwork, problem-solving, communication and relational skills, flexibility (in terms of mobility and working time), precision, reliability, determination and stress management. As for hard skills, they are mastery of English, IT literacy, software development.

Generally speaking, the relevant literature agrees that soft skills are increasingly important and supplement traditional technical skills. Yet they all stress that while reference is made to new risks resulting from the introduction of new technologies and the man-machine relationship, limited attention is given to skills related to OHS, which have to be possessed by workers.

Chapter III.
TOWARDS NEW LABOUR MARKETS

1. From Internal Markets to Transitional Markets: New Challenges for Workers' Health and Safety

1.1. Beyond the Distinction between Internal and External Market and Transitional Markets

The trends described so far point to the centrality of a new vision of work and labour markets, in order to understand and govern ongoing transformations. This is the approach taken by research into transitional labour market theory (TLMT), which seems to be the most reliable theoretical framework to analyse the current changes referred to above. Drawing on Günther Schmid and Peter Auer, other scholars – among other Bernard Gazier and Jerome Gautié – have worked on this framework to understand and reform labour market policies to improve the ability of the market to adapt to people's needs (G. SCHMID, B. GAZIER (eds.), *The Dynamics of Full Employment. Social Integration Through Transitional Labour Markets*, Edward Elgar, 2002, pp. 233-274). This is in line with the search for a new social model based on the need to have more job security throughout life (B. GAZIER, J. GAUTIÉ, *The "Transitional Labour Markets" Approach: Theory, History and Future Research Agenda*, in *Journal of Economic and Social Policy*, 2011, Vol. 14, No. 6, Article No. 6).

Moving on from the distinction between internal and external labour markets (see J. GAUTIÉ, *Lavoro: dai mercati interni ai mercati*

di transizione. Implicazioni sulla solidarietà, le tutele, la formazione, in *Assistenza Sociale*, 2003, No. 1-2) and the overlapping between job security and labour market protection – which dominated the 1990s’ debate about the modernisation of the labour market – this approach goes beyond European flexicurity. Here, it is important to point out that one distinctive trait of this approach is the focus on the provision of new protection, which adds up to labour market flexibilisation. The approach related to transitional labour markets deviates from this perspective, as put it by G. SCHMID, *Transitional Labour Markets, from theory to policy application. Transitional Labour Markets and Flexicurity: Managing Social Risks over the Lifecourse*, Document de travail du Centre d’Economie de la Sorbonne, 2009, No. 75, until B. GAZIER, J. GAUTIÉ, *op. cit.* The AA. promote that unity needed to govern increasingly fragmented processes, but still adopting a life-course oriented approach, which recalls Sen’s capabilities approach (A. SEN, *L’idea di giustizia*, Mondadori, 2010).

Starting from acknowledging the existence of a number of labour markets featuring specific institutions, the TLMT looks at the labour market as an open economic and social system, which regularly interacts with other social spheres and within which many professional and personal transitions take place. From this perspective, transitional labour markets are institutional elements which need promoting to encourage occupational transitions (B. GAZIER, J. GAUTIÉ, *op. cit.*). Reference is made to the 5 transitions around which transitional labour markets must be construed, promoting people transitional capabilities: the transition from education to training; the transition from unemployment to employment; the transition between different working time arrangements in the context of paid employment; the transition from unpaid care to paid productive employment; the transition from employment to pension (G. SCHMID, *Transitional labour markets: A new European employment strategy*, WZB Discussion Paper, 1998, No. FS I 98-206).

It is important to stress that the transitions referred to above do not only take place within the labour market, but also within the same company or the same profession, and they are linked with personal transitions, too. In his further studies, G. SCHMID, *Enhancing gender equality through transitional labour markets*, in *Transfer*, 2001, Vol. 7, No. 2, specifies this aspect, including those transitions related to training and retraining within the same job and those concerning the shift from self-employment to salaried employment, and viceversa. The theoretical framework of the TLMT theory is referred to in almost all the contributions mentioned so far (*idem*, p. 234). From an organisational point of view, transitional markets are a combination of paid work and other activities which are socially recognised. Income-wise, they represent a combination of the income paid by the state and other sources of living. From a social point of view, they imply acknowledging rights and opting for transitional employments (see the next paragraph) which are legally defined. In relation to taxes, public spending should finance employment rather than unemployment.

Taking these four elements as a starting point, it is easier to understand the implications of a legal interpretation of transitional labour market, particularly in relation to labour market organisation and governance. The organisation of labour market is not only intended to promote the matching between demand and supply, but the combination between paid work and socially-recognised activities. This also calls for making without the virtual boundary between contract regulation and labour market regulation and the governance of other social spheres which interact with them, thus widening the meaning of labour market organisation. Meanwhile, labour market governance is concerned with the rules and the tools to acknowledge individuals. The opportunity to combine incomes originating from different sources along with the acknowledgement of professional growth. It also means acknowledging rights (defined on a legal

basis and negotiated collectively), in order to enter so called transitional employments.

1.2. Protecting Transitional Employments

Special attention is therefore paid to so-called transitional employments, namely those activities which can be found in any transition and are different from paid productive work, although they are important and need protecting. In this respect, G. SCHMID, *Transitional labour markets: A new European employment strategy*, cit., p. 5, refers to a new type of labour policy “which supports various forms of ‘transitional employment’ such as short-time work, temporary part-time work, further training and retraining, sabbaticals, parental or career leaves”.

The concept of transitional employment discussed here should not be confused with the one analysed in the international literature concerning job-creating measures.

This labour policy was examined in the 1980s and the 1990s and aims at promoting job opportunities in the third sector for people who struggle to enter the labour market. This initiative was both praised and criticised, especially because of the questionable results (A. EVERS, M. SCHULZE-BÖING, *Social enterprises and transitional employment*, in C. BORZAGA, J. DEFOURNY (eds.), *The Emergence of Social Enterprise*, Routledge, 2001, p. 121).

In this context, a further distinction should be made between ‘transitional employment’ and ‘transitional labour markets’, with the latter which indicate specific job strategies and local-level programmes intended to increase the functioning of local markets and access to employment of those involved – *i.e.* transitional labour markets (D. FINN, *Intermediate labour markets in Britain and an international review of transitional employment programmes*, Department for Work and Pensions, 2003).

In the context of transitional labour markets, the expression ‘transitional employment’ is concerned with non-productive work. Promoting proper protection of transitional employment in the TLMT context should not be confused with the idea of promoting job opportunities for vulnerable workers, but it entails acknowledging the many activities performed during one’s life (e.g. training and care activities intended for family members) as a part of their working career, in order to turn critical transitions into opportunities (G. SCHMID, *Enhancing gender equality through transitional labour markets*, cit., p. 232), through proper conversion tools.

It is precisely the notion of transitional employment the key to understanding the scope of a broader view of the labour market, which also includes so-called ‘out-of-market activities’ (M. PACI, *Nuovi lavori, nuovo welfare. Sicurezza e libertà nella società attiva*, Il Mulino, 2005, pp. 97 ff.), pointing to a multitude of statuses between work and ‘non-work’ (M. DE COSTER, F. PICHAULT, *Traité de sociologie du travail*, De Boeck, 1998, p. 35).

G. SCHMID, *Is Full Employment Still Possible? Transitional Labour Markets as a New Strategy of Labour Market Policy*, in *Economic and Industrial Democracy*, 1995, Vol. 16, No. 3, p. 431, defines ‘transitional employment’ as those life stages where people’s activity moves away from full-time salaried employment (8 hours a day, 5 days a week, 48 weeks a year for 45 years of one’s life), while ‘transitional labour markets’ are the set of institutional mechanisms which can promote and protect stable employment.

1.3. Risk Management Strategies and New Forms of Safety in Transitional Markets

TLMT did not originate in the economic context but in the normative one. For this reason, it is particularly interesting when it comes to identify institutional solutions which can help pro-

moting new ways of organising the labour market and career development paths. The policy recommendations which can be found in the research applying this approach are developed around four principles: 1) justice understood as fairness, which makes reference to Rawls' principle, according to which inequalities are acceptable only if they produce benefits to more vulnerable groups (J. RAWLS, *Justice as Fairness. A Restatement*, Belknap Press of Harvard University Press, 2001); 2) solidarity in risk-sharing, which is based on Dworkin's idea that rights and duties must be balanced and people's acknowledgment of more responsibilities must go hand in hand with equalities of opportunities (R. DWORKIN, *Sovereign Virtue. The Theory and Practice of Equality*, Harvard University Press, 2000); 3) developing individual agency, that is providing people with the resources necessary to develop capabilities, according to Sen's views (A. SEN, *Development as Freedom*, Alfred A. Knopf, 2001); 4) transnational social cohesion, which deals with Ferrera's theories (M. FERRERA, *The Boundaries of Welfare. European Integration and the New Spatial Politics of Solidarity*, Oxford University Press, 2005) that increasing globalisation and internationalisation make it necessary to share responsibilities related to risk prevention and management beyond national boundaries (G. SCHMID, *Transitional Labour Markets, from theory to policy application. Transitional Labour Markets and Flexicurity: Managing Social Risks over the Lifecourse*, cit., p. 12). In the context of this research, the recommendations concerning the establishment of new forms of security in transitional markets are particularly relevant. On the one hand, it is important to provide protection considering specific needs and people's expectations. On the other hand, seeking solutions is regarded as a risk management strategy so adopting appropriate risk management strategies becomes fundamental, especially when they concern specific contexts: prevention, mitigation, coping with risks. The first strategy should be given priority, because it can act directly on the causes of the risks, while the other two might have a complementary function (*idem*, p. 16). So some indications are

supplied concerning the tools to be promoted and a specific regulation method: “First, the establishment of new social rights beyond employment; second, stepping stones for navigating through various risks over the life course; third, group instead of individual employability measures; and fourth – and especially promising – the establishment of learning communities through social pacts or covenants. Agreeing covenants (the most interesting element of ‘active securities’) is rather different from laying down rules and laws. Instead of enforcing institutional forms of ‘insurance’, covenants build on trust and social cohesion, that is, on forms of ‘ensurance” (G. SCHMID, *The Future of Employment Relations. Goodbye ‘Flexicurity’ – welcome back transitional labour markets?*, AIAS Working Paper, 2010, No. 10-106, p. 43). These considerations are further developed in G. SCHMID, *Sharing Risks of Labour Market Transitions: Towards a System of Employment Insurance*, in *BJIR*, 2015, Vol. 53, No. 1. Here, the A. puts forward the proposal concerning the employment insurance, which is concerned with publicly-funded job-promotion initiatives – also through forms of transitional employment – while unemployment measures would be given a marginal role and priority would be given to a universal lifelong learning insurance.

Schmid also indicates 4 criteria which must be followed for the creation of good transitional labour markets (which are specific institutional-legal assets used to govern transitions): empowerment, sustainable employment and income, flexible coordination, co-operation (G. SCHMID, *Enhancing gender equality through transitional labour markets*, cit., p. 236).

1.3.1. Transitional Markets and Unproductive Work

In order to illustrate how to implement new forms of protection based on the principles and criteria mentioned above, one might refer to Schmid’s analysis of the market built up around the transitions related to caring and family responsibilities (G.

SCHMID, *Enhancing gender equality through transitional labour markets*, cit., pp. 235 ff.). In this period, individual empowerment is achieved creating efficient infrastructure promoting sick people's care and family members' training, in order to develop their skills when attending to their relatives. Promoting economically sustainable measures is possible not by paying them remuneration, as it would be difficult to value this activity, but covering caregivers' expenses in terms of perceived work income (family time-off allowances). As for the flexible coordination criteria, it would be fulfilled by making these measures part of a flexibility programme negotiated with the employers. Finally, the cooperation criteria can be met by laying down cooperation strategies helping those involved (workers, local services, employers) and public and private services striking a balance between the time devoted to caring family members and work performed at the company. These two activities should not take place in succession, but also combined, in order to facilitate family members' care.

1.3.2. Transitional Markets and Ecological Transitions

Because of the transformations affecting the link between work and the environment, the analysis of the relevant literature concerning transitional labour markets also points to new relations between ecological transitions, work and occupational health and safety. While this relationship so far has been examined considering the impact of job-creation measures on the environment and people's health, little attention has been given to date to the impact that moving towards a sustainable economy can have on occupational transitions and so called green jobs (A. BOWEN, K. KURALBAYEVAB, E.L. TIPOEC, *Characterising green employment: The impacts of 'greening' on workforce composition*, in *Energy Economics*, 2018, Vol. 72; A. BOWEN, C. DUFFY, S. FANKHAUSER, *'Green growth' and the new Industrial Revolution*, LSE Poli-

cy Brief, 2016). This perspective has generated a number of questions in relation to health and safety and the equal access to ‘decent’ job opportunities (ILO, *Guidelines for a just transition to environmentally sustainable economies and societies for all*, 2015; ILO, *World employment social outlook 2018. Greening with jobs*, 2018).

On the one hand, it has been stressed that the growing number of jobs in the green economy is frequently characterised by organisational difficulties and little knowledge of the related health and safety issues (S. MOREIRA, L. VASCONCELOS, C. SILVA SANTOS, *Occupational health indicators: Exploring the social and decent work dimensions of green jobs in Portugal*, in *Work*, 2018, Vol 61, No. 2). So it seems that the price to pay to strike a better balance between work, environmental protection and public health can be the worsening of workers’ health and safety conditions when taking up green jobs. Some scholars also point out the risk connected to new inequalities, especially considering women and some vulnerable workers when it comes to acknowledging non-productive work, an aspect highlighted by A. ZBYSZEWSKA, *Regulating Work with People and “Nature” in Mind: Feminist Reflections*, in *CLLPJ*, 2018, Vol. 40, No. 1, and previous studies (L. RUSTICO, F. SPEROTTI, *Working conditions in “green jobs”: women in the renewable energy sector*, in *IJLR*, 2012, Vol. 4, No. 2, p. 209; L. RUSTICO, M. TIRABOSCHI, *Employment Prospects in the Green Economy: Myth and Reality*, in *IJCLLIR*, 2010, Vol. 26, No. 4, p. 369).

1.4. Occupational Transitions and Health

Some criticisms have been levelled at the TLM approach (L. BOLTANSKI, E. CHIAPELLO, *Le nouvel esprit du capitalisme*, Gallimard, 1999; C. RAMAUX, *Emploi: éloge de la stabilité. L’Etat social contre la flexicurité*, Mille et Une Nuits, 2006). In this sense, many point out that this approach neglects the relevance of people’s health while focusing exclusively on job stability. One of the risk concerns the fact that workers, especially women, are exposed to

excessive pressure during such occupational transitions. Yet these criticisms overlook the normative approach underlying the TLMT theoretical framework and the emphasis placed on the alternation between transitions and stability poles, and the links between TLMT and the ILO's reflections about protected mobility and decent work. Those arguing against TLMT also overlook the fact that this new approach is intended to promote a disruptive view of the labour market and work. In this sense, the starting point is to organise transitions and promote institutional mechanisms and tools combining transitions and stability in everyone's career through transitional employments, which have been poorly implemented so far (B. GAZIER, J. GAUTIÉ, *op. cit.*).

The same conclusions are reached by scholars researching the links between occupational trajectories, and psycho-physical health and wellbeing, which focus on the interaction between individual personality, some variables (social status, family origins) and social context when determining the scope of transitions-related risks. Starting from Marienthal's pioneering study (M. JAHODA, P.F. LAZARFELD, H. ZEISEL, *I disoccupati di Marienthal*, Edizioni Lavoro, 1986), significant research has developed in this domain. Examples include C.S. JOHNSTON, C. MAGGIORI, J. ROSSIER, *Professional Trajectories, Individual Characteristics, and Staying Satisfied and Healthy*, in *Journal of Career Development*, 2016, Vol. 43, No. 1, p. 94, who surveyed a sample of people engaged in occupational transitions (*i.e.* when unemployed or employed), confirming that personality traits are important for one's health and wellbeing and can change during occupational transitions. Yet some subjective variables and occupational aspects should be also taken into account (periods of stable employment and transitions) when investigating the links between professional trajectories, health and safety.

These conclusions have been also confirmed by the relevant literature, even in our country. Moving away from an ideological view arguing that more occupational transitions lead to a wors-

ening of life quality, this research has pointed to the need to go beyond a perspective which regards transitions as an incident – the assumed negative impact should be minimised – and to consider such transitions as a ‘normal’ situation (P.G. BRESCIANI, *E allora? Per una ecologia della transizione*, in P.G. BRESCIANI, M. FRANCHI (eds.), *Biografie in transizione. I progetti lavorativi nell’epoca della flessibilità*, Franco Angeli, 2006, p. 290).

In this sense, Bresciani refers to the notion of ‘ecology of transition’ to highlight the importance of considering the cultural and organisational conditions which might impact on transition quality and become a resource for those involved. In a similar vein, sociologists dealing with ‘mobile careers’ highlight the differentiation of career paths and the relevant risks when considering subjective variables and systems for work regulation established in specific markets (A.M. CORTESE (ed.), *Carriere mobili. Percorsi lavorativi di giovani istruiti nel mezzogiorno*, Franco Angeli, 2012).

The issue regarding the link between unstable employment and health risks is now established in the literature, as pointed out by C. ROUXEL, B. VIRELY, *Les transformations des parcours d’emploi et de travail au fil des générations*, in INSEE, *Emploi et salaires. Édition 2012*, 2012, as is the analysis about the concept of ‘precariousness’, which still relates to specific contractual schemes without considering individual variables and ad hoc measures. Research into so-called work history is more promising, as a way to identify structural precariousness in some careers and might affect people’s health. Adopting this approach A. SIRVIÖ ET AL., *Precaiousness and discontinuous work history in association with health*, in *Scandinavian Journal of Public Health*, 2012, Vol. 40, No. 4, come to the conclusion that career discontinuity is positively linked to the probability of facing mental issues determined by a subjectively perceived instability. Conversely, the data collected do not support a direct correlation between career discontinuity and certified diseases.

After clarified the relevance of such concepts as ‘career’ and ‘work history’, and the importance of considering the relationship between work and health within a systemic perspective, the added value is clear when applying the conceptual categories (*e.g.* work, labour market, transitional employment, protected mobility), the principles (*e.g.* justice understood as fairness, solidarity in risk-sharing, developing individual agency, transnational social cohesion), and the regulation criteria (empowerment, sustainable employment and income, flexible coordination, co-operation) of the TLMT when dealing with people’s health through the lens of transitional markets.

Besides the research considering the transitional market approach, some other studies in France based on the 2006 and 2010 SIP (*Santé et itinéraires professionnels*) survey have examined the links between health and occupational transitions. L. WOLFF ET AL., *Les changements dans le travail vécus au fil de la vie professionnelle, et leurs enjeux de santé. Une analyse à partir de l’enquête SIP*, Rapport de recherche CEE, 2015, No. 94, pp. 10 ff., argue that using a diachronic approach determines a major change in the analysis perspective which considers health and work, as this link is usually examined from the point of view of specific conditions, thus adopting a static perspective. This new perspective places individuals and their professional paths center stage rather than organisations and the changes affecting them. So it is possible to analyse the impact of work changes on health (and vice versa) against the specific characteristics and the stages of individual lives.

Yet focusing on individuals and the combination of activities and relations does not have to lead to individualising the relation between work and health. In this sense, A. TESTENOIRE, D. TRANCART, *Parcours professionnels, ruptures et transitions. Inégalités face aux événements de santé*, Rapport de recherche CEE, 2011, No. 65, point out the importance of conceiving both health and work in their global dimension. Defining health as the physical and psy-

chological ability to act in a routine social context (thus drawing from G. CANGUILHEM, *Le normal et le pathologique*, PUF, 1999; G. CANGUILHEM, *Écrits sur la médecine*, Seuil, 2002), what matters for them is understanding the strategies and the resources needed to promote the “action reorganisation” process when health is affected. Examining the specific impact of altered health on professional careers, the AA. confirm that the seriousness of risks and the ability to draw resources to protect from them change according to some individual variables and to individual professional trajectories (A. TESTENOIRE, D. TRANCART, *op. cit.*, p. 75).

It is not surprising that these findings originated in France, which features higher levels of innovation in relation to work regulation – e.g. the transitional market approach – which can also be found in OHS measures. This aspect is illustrated by some recent research (e.g. M.S. ARTANO, P. GRUNY, *Rapport d'information fait au nom de la commission des affaires sociales sur la santé au travail*, Présidence du Sénat, 2019, and C. LECOCQ, B. DUPUIS, H. FOREST, *Santé au travail: vers un système simplifié pour une prévention renforcée. Rapport fait à la demande du Premier ministre*, République Française, 2018) tabled to the government when laying down a set of OHS initiatives shared between the government and the social partners.

The *Rapport d'information fait au nom de la commission des affaires sociales sur la santé au travail*, *cit.*, stresses that the close relationship between work and family life and the growing impact of work on public health call for integration between the latter and OHS, so an institutional body should be establishing dealing with both these aspects. The document also highlights that major inequalities exist in terms of prevention and access to protection measures, as less qualified workers are more exposed to occupational risks, especially after so-called Uberisation. In this sense, large-sized businesses are better equipped to deal with these risks than small-sized businesses are, as the latter lack prevention

culture. According to the drafters of the document, the link between work and health is still guided by manufacturing, though the world has changed considerably. Health problems increasingly have a psychological dimension, because of new work organisation and intertwining personal and professional issues. The *Rapport* contains useful information as regards the French system, its evolution, and the proposals put forward, suggesting that higher integration is needed between all those concerned. One point which is repeatedly stressed in the document is the importance of ensuring protection to both self-employed workers and those engaged in the platform economy.

The interconnection of personal and professional issues should also be studied considering the succession of occupational transitions, *i.e.* transitional markets. So far, this aspect has been investigated considering the risk of permanent exclusion from the labour market following long-term diseases and the measures used to support workers who are more likely to face this risk. Once again, it is highlighted the need to operate locally to involve all the actors involved. In this sense, special attention is paid to the role of ANACT, which is the body promoting the improvement of working conditions – and its networks of agencies operating locally (ARACT). ANACT mostly focuses on work organisation and labour relations. Experimental initiatives are put forward at a local level, drawing on some past experiences concerning: promoting tools and instruments favouring work-life balance; supporting businesses when converting business committees and health and safety committees to social and economic committees (*Ordonnance n° 2017-1386 du 22 septembre 2017*), promoting training.

2. A Fresh Perspective on Work Changes and Their Implications on Health and Safety Systems

The policy recommendations laid down in the transitional market literature mostly concern the occupational risks resulting from human capital and income erosion due to critical events, when one has caring responsibilities or following the outset of a disability, chronic diseases or old age. While this approach has been used to examine a large number of work-related topics and traditional transitions, aspects concerning health and safety in the context of transitional markets have been largely neglected. As early as 2005, E. DE GIER, A. VAN DEN BERG (eds.), *Managing social risks through transitional labour markets*, Het Spinhuis, 2005, p. 3, highlighted that this topic was poorly researched, suggesting that a more detailed approach was needed. Subsequent studies also stress this aspect (C. BRZINSKY-FAY, *The concept of transitional labour markets: A theoretical and methodological inventory*, WZB Discussion Paper, 2010, No. SP 507), with this point which has been raised also by the most important scholars in the field of occupational transitions B. GAZIER, J. GAUTIÉ, *op. cit.*, who argue that the framework is still incomplete and need to be further expanded.

So what is needed is more cooperation between scholars of OHS and those investigating work transformations. This is so despite the fact that the changes affecting the world of work have serious consequences in terms of health and safety. As early as 2010, G. PAPADOPOULOS, P. GEORGIADOU, C. PAPAZOGLU, K. MICHALIOU, *Occupational and public health and safety in a changing work environment: An integrated approach for risk assessment and prevention*, in *Safety Science*, 2010, Vol. 48, No. 8, highlighted that OHS risks included alteration of biological rhythms, increased fatigue, and stress. The pressure resulting from workloads and the overall impact of changes to work on public health and working conditions, inequalities when accessing insurance coverage call for a reflection on an all-important aspect, namely

promoting and ensuring workers' physical and mental wellbeing and not just their skills.

For this reason, an attempt has been made here to highlight those implications stemming from the implementation of transitional labour markets models on health and safety, safeguarding workers beyond the employer's premises.

The literature review outlined here seems to confirm what has been pointed out by scholars who examined the challenges in terms of health and safety following the ongoing transformations in the world of work. Among them Y. KIM, J. PARK, M. PARK, *Creating a Culture of Prevention in Occupational Safety and Health Practice*, in *Safety and Health at Work*, 2016, Vol. 7, No. 2, point out that the expansions in the service and knowledge sectors, increases in the numbers of small businesses, nontraditional work schedules, precarious workers, worker mobility, and older-aged workers have resulted in new and emerging issues related to workers' health. This has also resulted in worrying inequalities in relation to access to protection systems against old and new risks, along with a lack of prevention culture. This calls for a review of OHS systems within companies, but also new national strategies to create and disseminate a prevention culture (*idem*, pp. 93 ff.).

Part VI.
**NEW SKILLS ENSURING HEALTH
AND SAFETY PROTECTION**

1. Health and Safety in the IV Industrial Revolution: Skills Challenges

1.1. Work-related Changes and New Skills Needs concerning Health and Safety in the Countries Analysed

The ongoing transformations in the world of work – both those concerning labour demand and supply – call for the need to examine the way workers' skills and expertise are adapting, especially in relation to those health and safety practitioners. Examining this aspect is a decisive factor. As explained by F. CARNEVALE, *La salute e la sicurezza dei lavoratori in Italia. Continuità e trasformazioni dalla Prima Rivoluzione industriale a quella digitale*, in A. CIPRIANI, A. GRAMOLATI, G. MARI (eds.), *Il lavoro 4.0. La Quarta Rivoluzione industriale e le trasformazioni delle attività lavorative*, Firenze University Press, 2018, it is pertinent to acknowledge the relevance of work organisation as a tool to implement primary prevention, which must be planned rather than taking place occasionally. This state of affairs requires a thorough understanding of all the interactions between man and machine and among people themselves, along with that of the disease. This approach would move prevention at a later stage, namely after the injurious event has taken place. This might be an attempt to go beyond the 'sop' usually provided by employers, that "medical examinations and an ergonomic chair to anyone" (*idem*, p. 124). It is therefore important to investigate all those skills which must contribute to developing a safety system which places people center-stage during current changes (A. DELOGU, *Salute e sicurezza e "nuovi" lavori: le sfide prevenzionali nella gig economy e nell'industria 4.0*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 2).

The tertiarisation of the economy is one of the major changes taking place in modern labour markets, which concerns the significant development of the service sector, giving rise to new job opportunities. These new employment opportunities in some cases differ from those available during Fordism, so new skill

needs emerged, also in relation to health and safety. The Literature available in the Anglo-Saxon countries (see A.R. HOCHSCHILD, *The Managed Heart. Commercialization of Human Feeling*, University of California Press, 1983; S.C. BOLTON, C. BOYD, *Trolley Dolly or Skilled Emotion Manager? Moving on from Hochschild's Managed Heart*, in *Work, Employment and Society*, 2003, Vol. 17, No. 2; S.C. BOLTON, M. HOULIHAN, *The (Mis)representation of Costumer Service*, *idem*, 2005, Vol. 19, No. 4; P. BROOK, *In critical defence of 'emotional labour': refuting Bolton's critique of Hochschild's concept*, *idem*, 2009, Vol. 23, No. 3; S.C. BOLTON, *Getting to the heart of the emotional labour process: a reply to Brook*, *ibidem*; P. IAGULLI, *Sulla sociologia delle emozioni di Arlie Russell Hochschild*, in *Studi di Sociologia*, 2009, No. 2; M. KORCZYNSKI, C. EVANS, *Customer abuse to service workers: an analysis of its social creation within the service economy*, in *Work, Employment and Society*, 2013, Vol. 27, No. 5) has paid attention to work in the service sector, as these jobs require direct and regular interaction with customers. This relation takes many forms and usually has both direct and indirect impacts on workers' safety. Subsequently, much research has been carried out on clients' physical and verbal attacks on service workers, in order to understand their effects on occupational health and safety. M. GIACCONE, D. DI NUNZIO, *Violence and harassment in European workplaces: Extent, impacts and policies*, Eurofound, 2015, p. 31, consider the impact of violence and harassment on workers, highlighting the link between these abuses and the rise of health-related problems, e.g. stress, depression and the lack of concentration. Further aspects concern the emergence of health problems like headache, chronic fatigue and digestion issues. Recently, the work by S. GILARDI, C. GUGLIELMETTI, F. TASSARA, *Far fronte all'aggressività dei clienti in servizi in cambiamento: i management standards proteggono il benessere degli operatori*, in *Giornale Italiano di Psicologia*, 2018, No. 2, has explored the relation between clients' aggressive interactions and the wellbeing of operators engaged in cultural promotion in Italy's public entities (i.e. librarian). The analysis has revealed that

these professionals, who suffer verbal attacks, are more likely to experience burnout though these risks are mitigated by support from colleagues and change in management practices. As pointed out by the AA. of this research “the ways organisational change is managed make a difference in relation to the prevention of risks associated to the emotional stress related to contact with clients”. Furthermore “it can be speculated that those managers who can manage change in a clear and engaging way generate a feeling of confidence and trust in the organisational context, which support workers in critical situation” (*idem*, pp. 374-375).

As stressed by P. PASCUCCI, *Note sul futuro del lavoro salubre e sicuro... e sulle norme sulla sicurezza di rider & co.*, in *Diritto della Sicurezza sul Lavoro*, 2019, No. 1, p. 42, the changes occurring in the workplace make possible for workers to carry out work from different places, so the “organisation-place of work equation is increasingly blurred”. Furthermore, new rules concerning health and safety should be implemented, “which apply irrespective of a specific place of work” (*idem*, p. 43). The same holds true for the obligations concerning information and training which, because of the changes referred to above, shall be reviewed in order to “focus on specific ways of carrying out tasks, also by simulating allowing workers to learn attitudes which are necessary in different contexts” (*idem*, p. 44). An increasing number of workers operate remotely, especially during Covid-19. In this sense, A. ROSIELLO, M. SERRA, *Smart working: disciplina, opportunità, aspetti psico-sociali*, in *ISL*, 2019, No. 4, p. 194, highlight the relevance of information, training and prevention initiatives, both on “soft skills and risks”.

Much international and national research has long focused on the risks resulting from more flexible and atypical work. A part of it (J. BENACH, M. AMABLE, C. MUNTANER, F.G. BENAVIDES, *The consequences of flexible work for health: are we looking at the right place?*, in *Journal of Epidemiology and Community Health*, 2002, Vol.

56, No. 6; EU-OSHA, *Expert forecast on emerging psychosocial risks related to occupational safety and health*, European Risk Observatory Report, 2007; D. DI NUNZIO, *Le difficili condizioni di salute e di sicurezza dei lavoratori atipici in Italia: frammentazione, atomizzazione e scarse tutele*, in *Revista Brasileira de Estudos Políticos*, 2009, No. 99-B; R. DI MONACO, S. PILUTTI, G. COSTA, *Strategie preventive per la salute: il momento critico del licenziamento*, in *Sociologia del Lavoro*, 2018, No. 150; P. PASCUCCI, *op. cit.*) has argued that atypical workers “needed higher protection than workers on stable employment, because they face worse working conditions and specific risks” (D. DI NUNZIO, *op. cit.*, p. 45). It is therefore necessary “to consider that atypical workers have a lower risk perception, so security culture should be diffused, especially within the education system and through lifelong learning” (*idem*, p. 48).

The emergence and diffusion of psychosocial risks among the workforce raises concerns about the inadequacy of training systems and health professionals’ skills ⁽¹⁾. R. JOHNSTONE, M. QUINLAN, M. MCNAMARA, *OHS inspectors and psychosocial risk fac-*

(1) For further information, see H. HOEL, S. EINARSEN, *Shortcomings of anti-bullying regulations: the case of Sweden*, in *European Journal of Work and Organizational Psychology*, 2010, Vol. 19, No. 1; K. LIPPEL, M. QUINLAN, *Regulation of psychosocial risk factors at work: an international overview*, S. MONCADA ET AL., CC.OO. (“Comisiones Obreras”) – ISTAS (Union Institute of Work, Environment and Health) *participatory action plan for a healthier work organization: A case study*, S. LEKA ET AL., *The role of policy for the management of psychosocial risks at the workplace in the European Union*, M.B. RASMUSSEN, T. HANSEN, K.T. NIELSEN, *New tools and strategies for the inspection of the psychosocial working environment: The experience of the Danish Working Environment Authority*, A. BRUHN, K. FRICK, *Why it was so difficult to develop new methods to inspect work organization and psychosocial risks in Sweden*, K. LIPPEL, M. VÉZINA, R. COX, *Protection of workers’ mental health in Québec: Do general duty clauses allow labour inspectors to do their job?*, and D. WALTERS, *Worker representation and psycho-social risks: A problematic relationship?*, all in *Safety Science*, 2011, Vol. 49, No. 4; AGENZIA EUROPEA PER LA SICUREZZA E LA SALUTE SUL LAVORO, *Il calcolo dei costi dello stress e dei rischi psicosociali nei luoghi di lavoro*, Osservatorio europeo dei rischi, Revisione della letteratura, 2014, p. 28 (available in salus.adapt.it); S. BUOSO, *Definire e qualificare il benessere organizzativo*, in *Diritto della Sicurezza sul Lavoro*, 2019, No. 1.

tors: *Evidence from Australia*, in *Safety Science*, 2011, Vol. 49, No. 4, have stressed that training concerning psychosocial risks plays a marginal role in the courses supplied to health and safety inspectors. In this respect, many bodies in Australia, among which is Worksafe Victoria, have promoted access to training on bullying and harassment at work, putting forward initiatives to improve inspectors' skills when dealing with psychosocial risks. Despite these measures, inspectors and their supervisors highlight that a series of obstacles exist in relation to the actions needed to tackle psychosocial risks, e.g. constraints concerning regulation, resources, and training also in the context of industrial relations. In France, in order to improve the effectiveness of health and safety systems as regards the identification and management of these risks, specific prevention committees have been set up (*comités de prévention soit*). E. LANEYRIE, A. LANDRY, *Prise en charge pluridisciplinaire des risques psychosociaux: un premier état des lieux auprès des médecins du travail, des inspecteurs du travail et des psychologues du travail*, in *Perspectives Interdisciplinaires sur le Travail et la Santé*, 2016, No. 1, p. 15, have explained that these bodies involve many professionals – e.g. an occupational psychologist, a nurse, an expert on ergonomics and other health and safety practitioners (e.g. engineers specialised in risk prevention), in order to promote interdisciplinarity as a tool for increasing prevention. In Spain, the focus has been on those psychosocial risks which might affect care workers looking after the elderly in specialised facilities. In this respect, M.U. RODRÍGUEZ, J.P. BILBAO, *Guía para la gestión de los riesgos psicosociales en la actividad de cuidado de personas mayores*, Instituto Nacional de Seguridad y Salud en el Trabajo, 2020, have drafted a guide where the main risk factors have been identified, as well as the consequences of being exposed to these factors for workers and organizations, along with a process to deal with it. It is precisely in this process that emphasis is given to including the management of psychosocial risks within a larger management system, by means of strategies and prevention activities involving healthcare professionals. As is evident from

this last case, the way occupational health and safety is conceived has changed recently, moving from a prevention to a more proactive approach (S. NERI, *I professionisti della prevenzione nel lavoro che cambia. Il tecnico della prevenzione nell'ambiente e nei luoghi di lavoro*, in *Sociologia del Lavoro*, 2018, No. 150), which involves all actors from the work process in different respects. This new perspective has allowed for new strategies in regards to organizational wellbeing which requires workers to develop new skills, while those concerned should also paid more attention to these aspects. E.M. PIRAS, P. ROSSI, F. MIELE, *La promozione della salute come forma di welfare aziendale: la co-costruzione di un'iniziativa di WHP tra prevenzione primaria e processi di simbolizzazione*, in *Sociologia del Lavoro*, 2018, No. 150, p. 215, stress that “in late capitalist societies, health management no longer takes place in healthcare facilities (e.g. hospitals) but in everyday life settings”. Today, healthcare and political institutions consider companies as a sort of allies, in the sense that “health promotion programmes aim at reducing health-related costs (for institutions), ensuring the workforce is healthy (for companies) and guarantee workers’ personal wellbeing (employees)” (*ibidem*). Initiatives concerning health promotion rely on “the conviction that these environments might influence workers’ physical and mental wellbeing, benefitting individual workers and all individuals, more generally” (*idem*, p. 203). These are targeted measures, which usually involve primary prevention (eating habits, physical activity, alcohol and smoking) as a way to improve workers’ overall wellbeing and prevent chronic diseases. In the US and in Europe, Workplace Health Promotion initiatives are widespread, whereas in Italy their diffusion is still limited. Besides attempting to fulfil a two-fold objective – improving workers’ living conditions and reducing absenteeism and stress – these programmes aim to extend their beneficial effects also to other individuals, e.g. workers’ family members. In the US, A.L. SCHILL, L.C. CHOSEWOOD, *Total Worker Health®: More Implications for the Occupational Health Nurse*, in *Workplace Health and Safety*, 2016, Vol.

64, No. 1, p. 4, the Total Worker Health programme is used, promoted by the National Institute for OHS, which “is defined as policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being”. “TWH recommends that, in partnership, employers and workers design safe and healthful workplaces that support all workers, regardless of individual differences in their personal health and professional career pursuits”. These programmes re-assert the relevance of occupational health nurses, as pointed out by K. CAMPBELL, C. BURNS, *Total worker Health. Implications for the Occupational Health Nurse*, in *Workplace Health and Safety*, 2015, Vol. 63, No. 7, p. 318.

Furthermore, health and safety professionals should develop new skills in regards to the changes to the way salaried workers access the labour market, an aspect stressed in the previous paragraph.

In relation to the US case, M.C. THOMPSON, J.E. WACHS, *Occupational health nursing in the United States*, in *Workplace Health and Safety*, 2012, Vol. 60, No. 3, point out the changes affecting the US workforce which might have an impact on OHS. Two aspects, which are worth mentioning, are that baby boomers stay longer in work and that female participation is on the rise, although women also deal with family responsibilities. Since the passing of the 1990 Americans with Disabilities Act, the participation of minorities has also increased and so has that of people with disabilities. The AA. underline that an education and technological gap has been reported recently, which can be seen in workers’ skills and companies’ needs. As for the UK, R. JONES, *What practitioners do. A survey of UK Registered Safety Practitioners to determine their roles and tasks*, IOSH, 2005, focuses on the employment system, stressing that some changes have affected it: higher female participation, increased outsourcing, restructuring, the presence of migrant workers and older workers, highly-

skilled young people and increased mobility. All of these aspects call for a review of health and safety practices. These trends can also be seen in Italy. A recent survey carried out by H. BAKHSHI, J.M. DOWNING, M.A. OSBORNE, P. SCHNEIDER, *Il futuro delle competenze. L'occupazione nel 2030*, Pearson, 2019, has singled out some macro-trends which affect women's participation in the labour market. The demographic evolution has made it possible for millennials to access employment, though through different paths. Women report higher levels of participation in Italy, too, although differences exist from other countries (ISTAT, *Come cambia la vita delle donne. 2004-2014*, 2015). France also reports an increase in people's average age, which has direct and indirect effects on the labour market, so global and company policies need reviewing. In 2013, the French government adopted a legal provision which governs so-called 'generational contract', preventing age discrimination (see B. BARABASCHI, *Gestire le differenze d'età nel mercato del lavoro e in impresa: il caso francese*, in *Sociologia del Lavoro*, 2014, No. 134). On close inspection, higher female participation in the labour market calls for a consideration of women's biological, social and cultural characteristics, which might expose them to different diseases and accidents that those faced by men. As pointed out previously in the Part V, much research has outlined this priority, highlighting those gender-related differences existing in the labour market in order to properly examine occupational diseases and relevant data. It seems sensible to refer to research that, while not highlighting the need of health and safety professionals to develop skills making them aware of gender-related risks, has stressed the need to raise awareness on this aspect. As for the Italian case, S. CERVIA, R. BIANCHERI, *Migliorare la salute delle donne nei luoghi di lavoro: aspetti normativi e gestione dei rischi. Una ricerca in Toscana*, in *Studi Organizzativi*, 2015, No. 1, have called for more attention to women's tendency to work on a part-time and fixed-term basis, to vertical and horizontal segregation and the fact they are more likely to face harassment at work and be paid less than males.

The AA. have also suggested considering the links between gender and occupational health and safety, considering the biological, individual and relational dimension. As for the biological factor, and based on some clinical studies carried out since the mid-1990s, the physical differences existing between males and females call for the need of different protection equipment for the latter. In relation to the individual dimension, women and men have a different approach to work-related risks. This aspect was already investigated in 1994 in the USA, where a link was reported between women's individual choices and occupational segregation in some sectors.

Finally, the relational dimension considers women and men's behaviors towards risk as dependent upon the socialization process and the relational context in which they operate. A. CARDUCCI, E. CAPONI, *La prospettiva di genere nella valutazione dell'esposizione ai rischi lavorativi*, in *Salute e Società*, 2014, No. 1, argue that there is a need to adopt a gender-based approach when examining occupational health and safety. They stress the necessity to consider the differences in risk exposure, pointing out those risks that are more common among women and examining the actual tasks performed, adapting them to each worker. On this point A. PERA ET AL., *La salute delle donne nei luoghi di lavoro: quali obiettivi per il futuro?*, in *Salute e Società*, 2014, No. 1, pp. 200-201, share the views of the EU-OSHA, positing that "it is important to introduce gender mainstreaming in organisations; promote gender in risk assessment; put forward analysis and evaluation tools to investigate gender-related risks; involve all those concerned; promote gender-based training of health and safety professionals; raise awareness about work-related stress, with special reference to gender differences and more specific issues (harassment against women)". On this point, A. NINCI, *Fattori di rischio, salute e sicurezza sul lavoro: il ruolo del CUG per la prevenzione*, in *Salute e Società*, 2014, No. 1, stresses that some improvements have been made after the introduction of Central Committees for the promotion of equal opportunities, along

with the adoption of Ethical Codes. Another change that is taking place in labour markets concerns the aging of the population, which calls for new skills among health and safety practitioners. In this respect, only few reports highlight the link between an increasingly aging population and the need to develop new skills related to occupational health and safety. In relation to workers in the 55-to-64-year-old age group and the higher incidence of chronic diseases and health issues, J. ILMARINEN, *Promuovere l'invecchiamento attivo sul luogo di lavoro*, EU-OSHA, 2012, pp. 4-5, outlines the age management practices put in place in different workplaces helping older workers to stay longer at work, stressing the need to gain new skills to deal with aging and health. Emphasis is placed on the fact that these professionals must promote cooperation with workers, employers and health and safety practitioners. M. TIRABOSCHI, *Le nuove frontiere dei sistemi di welfare: occupabilità, lavoro e tutele delle persone con malattie croniche*, in *DRI*, 2015, No. 3, p. 685, considers the higher share of older workers and the rise of those affected by chronic diseases, calling for the need to “deal with the lack of professionals who are able to understand and manage sick workers’ return to work”. These professionals will be increasingly needed as sick workers’ return to work implies moving away from prejudices and other constraints (harassment, organizational systems that affect return, workers’ psychological issues and uncertainties). In France, the new demographic trends and the introduction of the ‘generational contract’ – as pointed out by B. BARABASCHI, *op. cit.*, pp. 140 ff., prompted some companies to implement age-related strategies, involving new professionals specialised in the management of demographic management. Following these changes to the labour market, some research has explicitly referred to a set of skills that health and safety professionals must possess. Many scholars insist on the need to develop interdisciplinary skills, so that H&S professionals operate for the common good (S. LEKA, S. KHAN, A. GRIFFITHS, *Exploring health and safety practitioners training needs in workplace health issues*.

*Report on a study supported by IOSH development funding, IOSH Research Report, 2008, No. 2; G.B. BARTOLUCCI, P. SANTANTONIO, M. CASCIANI, I. DAGAZZINI, Ruolo e integrazione delle figure tecniche della prevenzione nella gestione aziendale, in Giornale Italiano di Medicina del Lavoro ed Ergonomia, 2010, No. 4; S. CAROLY, Les conditions pour mobiliser les acteurs de la prévention des TMS: construire du collectif de travail entre pairs pour développer le métier et favoriser le travail collectif pluri-professionnel. Le cas de médecins du travail, in Perspectives Interdisciplinaires sur le Travail et la Santé, 2013, No. 2; E. LANEYRIE, A. LANDRY, *op. cit.*; S. COLOMBO, L.E. GOLZIO, G. BIANCHI, The evolution of health-, safety- and environment-related competencies in Italy: From HSE technicians, to HSE professionals and, eventually, to HSE managers, in Safety Science, 2019, Vol. 118).*

This view is shared by G.B. BARTOLUCCI, P. SANTANTONIO, M. CASCIANI, I. DAGAZZINI, *op. cit.*, p. 408, who stress that “the multi-faceted nature of the issues calls for inter-disciplinary skills for both risk detection, assessment and management, as well as a new prevention protocol that must encourage health and safety professionals to cooperate on a regular basis”. As for Italy, S. COLOMBO, L.E. GOLZIO, G. BIANCHI, *op. cit.*, make a distinction between ‘safety professionals’ (engineers, experts of ergonomics and lawyers) who deal with existing risks and ‘environment professionals’ (doctors, psychologists and psychiatrists) who investigate work-related stress and wellbeing. This way, the existence of different professionals is beneficial because issues can be discussed from different standpoints, although coordination might be difficult. So, as pointed out by the AA., further collaboration is needed as well as a better understanding of those risks related to technological processes and their social and environmental consequences (*idem*, p. 730). This issue also emerges in S. LEKA, S. KHAN, A. GRIFFITHS, *op. cit.*, p. 10, where research participants were workplace health experts and IOSH members, who helped understand the role of health and safety operators in comprehending the risks associated with OHS. The participants also stressed the increasingly fundamen-

tal role played by health and safety professionals, who will need to cooperate with other figures. Most respondents argue that health and safety practitioners can deal with all aspects related to health, provided they work along with other professionals from other areas (*idem*, p. 24).

Much research has pointed out that inter-disciplinary skills must be developed to tackle the complexities in the field of health and safety. This is particularly the case for occupational doctors, who are called on to cooperate with other professionals. G.B. BARTOLUCCI, P. SANTANTONIO, M. CASCIANI, I. DAGAZZINI, *op. cit.*, p. 408 stress that they need to gain inter-disciplinary skills in order to manage the activities properly. As is the case in France (S. CAROLY, *op. cit.*; E. LANEYRIE, A. LANDRY, *op. cit.*), the AA. are of the opinion that developing regular interactions with professionals from different areas (risk detection and evaluation, prevention measures) is fundamental. As stressed by S. CAROLY, *op. cit.*, and E. LANEYRIE, A. LANDRY, *op. cit.*, doing this might be a difficult task, as those involved in health and safety sometimes lead to overlapping, inter-professional conflict and difficulties concerning other people's work and terminology.

The relevant literature highlights that health and safety professionals must also possess soft-skills. On this point S. CALICCHIA ET AL., *Il ruolo del medico competente tra nuove funzioni e criticità emergenti: un'analisi qualitativa dei discorsi sulla professione*, in *Medicina del Lavoro*, 2019, Vol. 110, No. 3, p. 216, argue that occupational doctors, as a "global advisor on workers' safety" must also have soft skills. A. PAGANO, *L'importanza delle competenze non tecniche per la sicurezza sul lavoro*, in *Prevenzione in Corso*, 2017, No. 2, p. 35, also highlights that security shall be understood as "the result of the ongoing adaptation of work to social and technical context", arguing that training in this field also needs non-technical skills. Drawing on the classification of non-technical skills made by R. FLINN, P. O'CONNOR, M. CRICHTON, *Il front-line della sicurezza. Guida alle Non Technical Skill*, Hirelia, 2011, the A. identifies sev-

en, non-technical skills including 1) situational awareness 2) decision making 3) communication 4) team work 5) leadership 6) stress management 7) fatigue management (A. PAGANO, *op. cit.*, p. 37), which must be possessed by those involved in work processes. The relevance of these skills also arises out of their observation in working contexts, as maintained by F. GUENOC, C. CHAUVIN, J.C. LE COZE, *The activities of occupational health and safety specialists in a high-risk industry*, in *Safety Science*, 2019, Vol. 112. They consider the activities carried out by *occupational health and safety specialists*, namely by “different professionals involved in the field of prevention, such as safety coordinators, prevention consultants, etc.” (*idem*, p. 71). OHS specialist interact with many interlocutors, so they cannot only possess technical and legal skills. Interpersonal skills are fundamental to understand people’s problems and the solutions to problems can be arrived at through interactions. Furthermore, the AA. pointed out that the number of topics dealt with by OHS professionals needs significant adaptation and organisational skills (*idem*, p. 79). C. KAMATÉ, H. LAROCHE, F. DANIELLOU, *Beyond Safety Training, Toward Professional Development*, in C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *Beyond Safety Training. Embedding Safety in Professional Skills*, Springer, 2018, p. 156, stress that “Professional development requires the reinforcement of transverse collaboration skills, which implies knowing enough about the work of others. However, knowing about the jobs of others definitely does not necessarily lead to harmonious relations: depending on the organizational context, it can also be used to better “trap” others. Designing training schemes together should help to establish some trust between professionals and organizations on matters related to safety”.

Another need that can be found in the literature concerns the ability to deal with increasingly complex and variable issues. J. HAYES, *Stories and Standards: The Impact of Professional Social Practices on Safety Decision Making*, in C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *op. cit.*, stresses that importance of

developing among workers and professionals so-called safety imagination, since their choices might have consequences on security. To develop safety imagination, storytelling can be used, as it generates pattern matching and mental simulation. Yet also these professionals might need to gain a number of different skills. In relation to Italy's occupational health and safety instructors, Inail and the University of Bergamo (see M. PELLICI ET AL., *La qualificazione del formatore alla salute e sicurezza sul lavoro tra idealizzazione e valutazione*, Ricerca Inail, 2016) have identified some sets of skills that need to be developed by all those involved in OHS: social and communicational skills, technical know-how and methodology. Each set includes special knowledge and capabilities, which are identified according to specific indicators. 'Social and communication skills' mean to understand people's needs and to adjust training accordingly; to establish relations; to challenge one's own skills; to promote participants' cultural exchanges. These skills are the result of "the idea that an instructor is not a single entity, as they work together with others (e.g. the employer, health and safety officers, project coordinators)" (*idem*, p. 62). Then there is the set of technical skills, which bring together craftsman-like knowledge (*idem*, p. 63) and well illustrate the fact that "an instructor must possess a number of highly-specific skills which characterise them as an expert in a given area" (*ibidem*). These skills include: knowledge of relevant legislation; knowledge of specific risks; the ability to deal with relevant documentation (e.g. the Document of Risk Evaluation, the minutes of the meeting); familiarity with the work settings from which course participants come (production processes, cultural dimension); and knowledge of roles and functions of those in charge of company- and local-level safety. The last set of skills identified by the AA. is concerned with methodology, namely: ability to understand the group's dynamics; the ability to plan and implement methodological tools in order to promote participation and learning; the ability to select the tools to facilitate the integration of theory

and practice, formal and informal learning; the ability to encourage methodological tools: the ability to innovate and to assess the impact of teaching. In the AA.'s words "the instructor's style might be equated to a knowledge crafter, along the lines of Sennett's [...] craftsmanship is not something that is learned once for all, as it needs regular care and devotion" (*idem*, p. 75). Other pieces of research, e.g. S. LEKA ET AL., *The changing landscape of OSH regulation in the UK*, IOSH Research Report, 2016, p. 68, highlight the need of health and safety professionals to make use of proper technology to convey health and safety information. Specifically, the AA. observe that new technologies (Twitter, Facebook) are changing the way people obtain information, so health and safety practitioners must also adapt to this state of affairs. A significant body of research in all national contexts has also pointed to the need to rethink training for health and safety professionals. As pointed out by the AA., this aspect is fundamental to avoid these professionals turning into a problem for the prevention system. On this point, they argue that "the role of the OSH practitioner is therefore to ensure that they are aware of the changes in the OSH landscape and engage in continual professional development" (*idem*, p. 89). In a recent contribution, R. FLIN, *Enhancing Safety Performance: Non-technical Skills and a Modicum of Chronic Unease*, in C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *op. cit.*, explores how health and safety training can be integrated into a wider professional process. First, the need to develop personal and behavioural skills, in order to become familiar with the notion of chronic unease. Furthermore, while it is important to come to terms with health and safety issues and to ensure the link between personal and technical skills, enhancing soft-skills seems more in line with the approaches focused on the idea of a community of practice, whereby the changes to the labour market makes occupational transitions more frequent. Finally, Y. KIM, J. PARK, M. PARK, *Creating a Culture of Prevention in Occupational Safety and Health Practice*, in *Safety and Health at Work*, 2016, Vol. 7, No. 2, p. 95, stress

that “the workplace level requires technological improvements, such as engineering controls, compliance with regulations, and introduction of occupational safety and health management systems, as well as managed culture change to achieve a positive safety culture. The national level requires that priority be given to workers’ health in the national agenda, and the need for a national approach to workers’ health involving the government as a whole, thus promoting a prevention culture”.

1.2. The Shortcomings in Workers’ Current OHS Training Systems

The existing literature on occupational health and safety focuses on training as a tool for preventing job-related accidents and fatalities. Much research has considered the pros and cons of the training provided, putting forward policy recommendations in order to improve its quality. Scholars have also focused the way training is supplied, together with the selection and evaluation of the methodology used in the field of occupational health and safety. This is so because significant research has investigated the effectiveness of the methodology used in improving health and safety, reducing accidents and injuries and promoting good practices among those concerned. A number of studies have also stressed that the methodology employed depends on whether learners are adults or young people. In general, and as pointed out by B. GIULLARI, *La costruzione organizzativa della sicurezza: il ruolo della formazione*, in *Sociologia del Lavoro*, 2013, No. 130, p. 174, “training and education related to OHS are increasingly relevant when promoting prevention”. In this sense, a number of bodies today offer advice and services on these aspects, although with little success. Many authors, e.g. F. BATTISTON, *Metodologia per la formazione dei videoterminalisti*, in *ISL*, 2017, No. 6, have emphasized the need to provide customized training, which is different from that supplied only to deal with legal obligations. On this

point, most research argues that it is important to develop, organized and set up training courses which are linked to work settings in which prospective workers usually operate. This is because, in order for learners to fully understand notions, a link must be created with work reality.

C. GILBERT, *Safety: A Matter for 'Professionals'?*, in C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *op. cit.*, points out that some tension exists between health and safety training and skills, which is reflected into the dichotomy between 'ordinary safety' and 'extra-ordinary safety', with the latter which is usually the preserve of experts. This conflict is the result of the contraposition between the 'inside' and the 'outside' dimension, which is concerned with the actions put in place to justify the measures adopted in order to be in keeping with relevant legislation and standards. Consequently, OHS training is overly formalized, so the activities performed are unrelated to the skills needed by workers. The A. refers to this state of affairs considering three aspects: 1) training risks being detached from real practices and the skills required of a number of OHS specialists; 2) training activities regard safety as an aspect which is not linked with routine work and only to be dealt with by specialists; 3) training are more concerned with external visibility than in internal efficacy. Accordingly, it is important to make an effort, especially in high-risk sectors and activities, to bring together training and everyday reality, linking the former in educational processes from the start. S. GHERARDI, *A Practice-Based Approach to Safety as an Emergent Competence*, in C. BIEDER, C. GILBERT, B. JOURNÉ, H. LAROCHE (eds.), *op. cit.*, examines OHS training considering "the communities of practice" (E. WENGER, *Communities of Practice. Learning, Meaning, and Identity*, Cambridge University Press, 1998), along the lines of C. GILBERT, *op. cit.*, pointing out the tacit dimension of knowledge developed in those communities, the establishment of practices in specific contexts and in everyday work. The pervasive nature of practical knowledge is there for all to see: any activity in line with this principle shall take place in

order to ensure safety in both results and social effects, especially if one considers that risks manifest as a consequence of the increasing dependence of “risk society” (U. BECK, *La società del rischio. Verso una seconda modernità*, Carocci, 2013) (2). When adopting this approach, skills are defined as an emerging organizational and cultural skill: this is the wording used by the A. to refer to the natural link between practices, work-related interactions and safety, on the one hand, and the knowledge arising between different discourses, on the other hand. In a similar vein, C. KAMATÉ, H. LAROCHE, F. DANIELLOU, *op. cit.*, argue that the consideration and the attitude towards safety must change. This is so because safety shall not be considered as an isolated problem, being it part of everyday work. Safety must become an integral part of professional development. “This clear assumption that safety is an integral aspect of professionalism raises the issue of the general perception the organization has of the link between safety and professional development” (*idem*, p. 152). The AA. point out that OHS training – which is usually carried out to comply with legal obligations and please trade unions (*idem*, p. 153) – only deal with this topic in a general way, causing a separation with reality. Scholars are of the opinion that in order to ensure a good degree of security, real work situations shall be monitored. C. VIDAL-GOMEL, *Training to safety rules use. Some reflections on a case study*, in *Safety Science*, 2017, Vol. 93, p. 138, also argues that training planning concerning occupational health and safety implies an understanding of practices developed by opera-

(2) See also H. JONAS, *Das Prinzip Verantwortung*, Insel, 1979; A. GIDDENS, *Le conseguenze della modernità. Fiducia e rischio, sicurezza e pericolo*, Il Mulino, 1994; W. PRIVITERA, *Il concetto di rischio*, in W. PRIVITERA, *Tecnica, individuo e società. Cinque lezioni sulla teoria di Ulrich Beck*, Rubbettino, 2004; U. BECK, *Che cos'è la globalizzazione. Rischi e prospettive della società planetaria*, Carocci, 2009; WORLD ECONOMIC FORUM, *The Global Risks Report 2020*, 2020; U. BECK, W. BONSS, C. LAU, *The Theory of Reflexive Modernization. Problematic, Hypotheses and Research Program*, in *Theory, Culture & Society*, 2003, Vol. 20, No. 2; P. DONATI, *Quale “modernizzazione riflessiva”? Il ruolo della riflessività del cambiamento sociale*, in *Sociologia e Politiche Sociali*, 2010, No. 1.

tors to deal with local risks and the analysis of relevant legislation. Vidal-Gomel suggests moving on from compulsory training and ‘on-the-job’ training, as training should be conceived as a tool made available to instructors to identify the characteristics of situations that might arise. F. RICCI, *Efficacia della formazione alla salute e sicurezza sul lavoro: fattori di successo e criticità*, Dottorato di ricerca in Psicologia, Università degli Studi di Parma, 2016, p. 170, notes that “training is efficient and appreciated by learners, and that learning consolidates when contents are related to everyday tasks. It is routine experience that reasserts the notions acquired”. The need to provide training that is linked to everyday contexts is also stressed by F. BATTISTON, *op. cit.*, who suggests holding training courses in specific contexts where workers operate, so extra effort is required of instructors, who will need to know these work settings.

The relevant literature stresses the need to define sound methodologies in order to provide OHS training. Scholars agree that in-person learning is more effective than online learning, especially due to the lack of interaction between learners and the instructor. Yet this view is not always shared, as some research emphasises the need to promote a more active approach when holding OHS courses, which is also an aspect highlighted by legislation, *i.e.* the State-Region agreement of 7 July 2016. According to F. RICCI, *op. cit.*, p. 33, “in-person teaching, while widespread, is not necessarily the most effective one, as it did not provide effective results in relation to knowledge enhancement, also as regards health, particularly when it comes to behaviours, beliefs and attitudes”. The A. goes on to point out that “an important aspect in this respect is that training is more effective when is not provided as a response to a legal obligation, for focusing on the prescriptive dimension is counterproductive, while it is better to regard it as an opportunity for professional growth. Safety shall be seen as a way to improve one’s skills and not as an aspect which is unrelated to everyday work. Management should focus on safety out of its interest and not only because a

legal obligation imposes us to do so” (*idem*, p. 39). F. BATTISTON, *op. cit.*, examines the potential of targeted training, raising concerns about online training. VIDAL-GOMEL, *op. cit.*, p. 141, suggests moving away from training which is legally imposed, putting forward other training activities. M.J. BURKE *ET AL.*, *Relative effectiveness of worker safety and health training methods*, in *American Journal of Public health*, 2006, Vol. 96, No. 2, p. 315, describe training strategies in this area, which include passive techniques (information dissemination), strategies where technology is used and initiatives placing learners center-stage. Classroom lessons, which are among the least engaging strategies when it comes to health and safety, are usually used to provide relevant information. Scholars stress that evidence has been given that active learning approaches are better than passive ones because notions are acquired more effectively and are properly used in everyday work, thus increasing work performance in terms of health and safety. The research mentioned before has demonstrated that engaging training initiatives are 3 times more effective than non-engaging ones in promoting knowledge and skill acquisition (*idem*, p. 320) and they also have an impact in reducing incidents (*idem*, p. 321). The AA. also point out that, while there is a tendency to provide health and safety notions online, it would be better to ensure learners’ active participation (*e.g.* through feedback and interaction) in order to increase their knowledge. Other authors stress the relevance of active learning techniques. According to F. BATTISTON, *Nuova formazione RSP e tecniche didattiche*, in *ISL*, 2016, No. 11, p. 555, “active techniques reject learners’ passive roles, as knowledge is not to be conveyed always in the same way. These techniques require active and aware participation, regardless of whether learners are children or an adult. These techniques usually contextualise the learning contexts as they are based on real environments which try to replicate the situations an individual is facing or will face. Active learning techniques feature: 1) learners’ full participation (also from a relational and emotional viewpoint); 2) regular as-

assessment of what is being taught; 3) learners' and instructors' feedback and self-evaluation; 4) situational training, *i.e.* which is related to a real situation; 5) group work, in order to develop social skills". Battiston makes reference to role-playing, games, brainstorming, storytelling and other simulations. As for gaming, it is an additional strategy which can be used when learning health and safety notions because it promotes cooperation among participants. As recalled by L. FABBRI, A. ROMANO, *Metodi per l'apprendimento trasformativo. Casi, modelli, teorie*, Carocci, 2017, chap. 6, pp. 167-218, games are part of active learning methodologies, which are intended to produce real social situations. Simulation consists of different methodologies, such as: case studies, business theatres and outdoor training. Case studies are used for solving new problems, analysing the main elements in a given context and for evaluating the success rate of a given action. Business theatres are an old-fashioned strategy used for the first time by a director of personnel of a large-sized company, who started simulated organisational situations. Like team building, business theatres facilitate team building and other skills one would not gain in their work (*i.e.* improvisation), which are fundamental in today's ever-changing labour market. Through this methodology, participants' behaviours and attitudes become manifest. The theatre of the oppressed is a methodology in which people can experience oppression and justice which can be faced by participants in their social, professional and individual life. Its intention is to raise awareness and to promote a sort of emancipated learning. Finally, outdoor training, which is experience-based, consists in a set of methodology involving participants in order to enable them to share experiences on different and unpredictable tasks. Through these activities, soft-skills are also developed – *e.g.* problem-solving, team-building and scam management skills – as long as a shared vision and the ability to manage stress. Active learning methodologies also make use of virtual reality, which is sometimes used to replicate existing risks in order to provide ad hoc training. The

potential of this tool has been highlighted by R. SACKS, A. PERLMAN, R. BARAK, *Construction safety training using immersive virtual reality*, in *Construction Management and Economics*, 2013, Vol. 31, No. 9, and M. LOOSEMORE, N. MALOUF, *Safety training and positive safety attitude formation in the Australian construction industry*, in *Safety Science*, 2019, Vol. 113. R. SACKS, A. PERLMAN, R. BARAK, *op. cit.*, p. 1005, argue poorly-engaging training in the building sector has always proved ineffective if compared to other training strategies (M.J. BURKE *ET AL.*, *op. cit.*). They also posit that virtual reality is more effective than traditional methodologies when providing OHS training. Specifically, they have demonstrated that (R. SACKS, A. PERLMAN, R. BARAK, *op. cit.*, p. 1016) virtual reality is more useful when interns are showed possible dangers without affecting their safety. Furthermore, the AA. have stressed that these way of providing OHS training help learners stay more focused than other techniques, so this strategy can be used along with other interactive ones. M. LOOSEMORE, N. MALOUF, *op. cit.*, p. 237, have stressed the importance of using new technologies because they help develop a strong emotional connection with such aspects as health, safety and prevention. Specifically, they have highlighted the need (*idem*, p. 241) of OHS training to be more reactive, flexible and interactive, in order to establish a stronger emotional connection with people and making them more aware of the importance of safety. They argue that good training related to safety is not only concerned with skills development but also with creating an emotional connection with individuals. In this sense, mention shall be made of J. HAYES, *op. cit.*, which considers workers who make decisions about health and safety not as staff but as representatives of a profession. Specifically, the A. points out that “professionalism is more than just expertise in a technical sense. Professional attitudes (or lack of them) already impact safety outcomes but companies and researches have paid this aspect of organisations very little attention. In the interests of safety, we should make this invisible work, visible” (*idem*, p. 81). Hayes ar-

gues that technical professionalism should be promoted in order to enhance safety. This is possible only by putting forward some internal strategies, *e.g.* training provided through storytelling, which enables one to develop safety imagination. These strategies are well developed within communities of practices which establish in high-risk sectors: aeronautics, nuclear centres, and the chemical industry. Research has demonstrated that listening to a story makes memories more vivid. Senior operational staff can share stories in three ways: 1) past stories are recounted, which are not necessarily tragic ones, in which the uncertain nature of technology and the need to implement regular monitoring to ensure the security of workers and the public; 2) story-based texts are given out in which experts are called on to identify with situations in the context of safety (for example, they are asked to call the family of a workers who suffered an injury); 3) stories are told about small anomalies which might cause serious consequences in terms of safety. On this aspect, Hayes refers to two types of learning: traditional and social learning.

Traditional learning features individuality, isolation, the exclusive, teacher/student relationship and a knowledge-based character. Social learning takes place in groups, is related to daily activities and is usually action-oriented. According to C. KAMATÉ, H. LAROCHE, F. DANIELLOU, *op. cit.*, p. 155, training schemes should consider the sharing of experiences and workers' stories as a privileged channel through which OHS and occupational skills should be promoted, as "the companionship and example conveyed by field managers are ingredients that largely contribute to actual professional development". Unfortunately, many lament that current organisations fail to understand that safety is developed also by means of dialogue and exchanges among colleagues. According to the AA., it would be useful to set objectives in terms of safety, involving all actors in training courses related to OHS: unions, governmental bodies, HR departments. Simulation can be used to prepare workers to deal with standards and exceptional circumstances. This tool favours a better

understanding of safety, understood as an aspect based on rules and concerning management abilities. E. SALAS, H.B. KING, M.A. ROSEN, *Improving teamwork and safety: Toward a practical systems approach, a commentary on Deneckere et al.*, in *Social Science & Medicine*, 2012, Vol. 75, No. 6, p. 987, have reasserted the importance of training programmes aimed at promoting group work in order to develop skills, attitudes and behaviours among members and succeed also in safety. According to VIDAL-GOMEL, *op. cit.*, p. 137, it is necessary to develop a 'pedagogy of situations' (P. MAYEN, *Vocational Didactics: Work, Learning, and Conceptualization*, in L. FILLIETTAZ, S. BILLETT (eds.), *Francophone Perspectives of Learning Through Work. Conceptions, Traditions and Practices*, Springer, 2015) enabling one to implement active teaching methodologies which can also prove useful in risk prevention training (P. BECKER, J. MORAWETZ, *Impacts of Health and Safety Education: Comparison of Worker Activities Before and After Training*, in *American Journal of Industrial Medicine*, 2004, Vol. 46, No. 1; M.J. BURKE ET AL., *op. cit.*; M. LABERGE, H. MACEACHEN, B. CALVET, *Why are occupational health and safety training approaches not effective? Understanding young worker learning an ergonomic lens*, in *Safety Science*, 2014, Vol. 68). In addition to it, VIDAL-GOMEL, *op. cit.*, p. 141, stresses that the role of instructors is changing. It is not only related to knowledge transfer, but they should use experience in order to make learners aware of real situations. So, they should become familiar with the whole of professional skills and have enough leeway to plan and implement this form of training. P. BECKER, J. MORAWETZ, *op. cit.*, p. 64, promote the adoption of a more engaging approach, for example by using workers as instructors. Much research (as pointed out previously in the Part V) has also stressed excessive training formalisation when it comes to occupational health and safety, emphasising the importance to review training in this area also in relation to current labour market changes. In this sense, P. PASCUCCI, *op. cit.*, p. 51, points that many organisations rely on workers' flexible collaboration, highlighting that one may

protect their health and safety at work. On this point, it is underlined that “§ 10 of the State-Regions agreement of 21 December 2011 – though temporarily during the first stage of contract implementation, provides that newly-hired staff must undergo training before or right after recruitment”. Furthermore “if it is not possible to complete training before recruitment, this training shall end within 60 days of recruitment. This might prejudice the function of training, which is intended to help workers to perform their tasks by identifying and reducing risks”. Pascucci highlights that “it is important to review the notion of training in the context of OHS, making sure that it is both a worker’s right and a element they can rely on permanently” (*idem*, p. 52). He also adds that “while it is up to the employer to provide workers with specific training, general training – which also concerns OHS – should be supplied to staff prior to entering into the employment contract or accessing the labour market. Training should thus become a condition of workers’ employment and for ensuring contract validity” (*ibidem*). Finally, he suggests providing a type of training within which businesses and educational bodies share tasks in order to develop a culture of prevention. M. LABERGE, H. MACÉACHEN, B. CALVET, *op. cit.*, share the same view. Their research conducted on Canada’s young workers revealed that they are more likely to suffer from work-related accidents than adult workers. Therefore, they put forward a strategy according to which school should provide training in order to prevent risks. In relation to new ways of working, S. CAPONETTI, *L’obbligazione di sicurezza al tempo di industry 4.0*, in *Diritto della Sicurezza sul Lavoro*, 2018, No. 1, pp. 51-52, reflects upon smart workers’ training, which should be the starting point of Industry 4.0. According to the A., Act No. 81/2017 does not promote training properly, and this might also be attributed to the different liability – both the civil and penal one – faced by those bodies which fail to deal with training obligations. Specifically, the A. argues that special training shall be provided to those workers carrying out work differently from

the way it is performed usually, by also including regular refreshment courses concerning technology and new risks.

2. OHS Professionals in England, Italy, France, Spain and the USA: an Overview

2.1. Definitional Aspects/Classification

The international literature on OHS professionals point out some shortcomings in relation to research related to these figures. A.R. HALE *ET AL.*, *Surveying the role of safety professionals: objectives, methods and early results*, in *Safety Science Monitor*, 2005, Vol. 9, No. 1, p. 3, consider the relevant literature and stress that research mostly concerns legal issues, without paying attention to the roles and tasks carried out by them. T. REIMAN, E. PIETIKÄINEN, *The role of safety professionals in organizations – developing and testing a framework of competing safety management principles*, paper presented at the *12th International Probabilistic Safety Assessment and Management Conference – PSAM 2014*, Honolulu, 22-27 June 2014, argue that in spite of the increasing relevance of OHS professionals, research has given them scant consideration. One reason for this is the heterogeneous nature of this category (due to different educational and professional backgrounds). S. LEKA *ET AL.*, *op. cit.*, p. 89, stress that most literature focuses on the opinion of professionals about what OHS is and how this area should develop. Little research considers their contribution about OHS and what OHS means at a European level. One problem is the lack of comparative work. D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *Bureaucracy, influence and beliefs: A literature review of the factors shaping the role of a safety professional*, in *Safety Science*, 2017, Vol. 98, p. 98, make clear that “the review highlights a dearth of empirical research into the practice and role of safety professionals, which may result in some ineffectiveness”. The AA. also emphasized that, after Hale’s 1995 paper, research into this area has mostly concerned OHS professionals’ tasks and

training. Yet in the last 5 years, some researchers have explored the issues referred to above considering social and organizational aspects using an ethnographic approach. In a similar vein, F. GUENNOG, C. CHAUVIN, J.C. LE COZE, *op. cit.*, p. 72, argue that “we emphasize that the current state of knowledge concerning the activities of OHS specialists is scant, and their complexity is largely underestimated [G. PEISSEL-COTTENAZ, A. GARRIGOU, *Contribution à la découverte du métier des préventeurs et à la caractérisation de leurs besoins en formation continue*, Rapport INRS, 2004, p. 13]”. They say that research only considers the work of these specialists in the event of work-related accidents, so they deal with exceptional circumstances. Furthermore, a quantitative methodology has been adopted – *e.g.* questionnaire – which does not allow one to look at the issue in detail. A.R. HALE, D. HUDSON, P. PRYOR, *The evolution of a global, professional capability framework covering the role, contribution and status of Occupational Health and Safety (OHS) professionals: Editorial, introduction and discussion*, in *Safety Science*, 2020, Vol. 122, p. 2, focus on another all-important issue – *i.e.* the fact that this problem is hardly referred to in academic papers – and the same happens in France (S. CAROLY, *op. cit.*, p. 5). E. LANEYRIE, A. LANDRY, *op. cit.*, pp. 1-2, state that little attention has been paid to cooperation between different OHS practitioners. As pointed out by the AA., no research has so far considered the collaboration between labour inspectors, occupational doctors and psychologists, although they work side by side in companies.

A further critical aspect, which affects research into this professional group, is the lack of a clear definition and who must be included into it. According to A.R. HALE *ET AL.*, *op. cit.*, p. 2, “there is no clear and agreed definition across Europe of who should be considered to be safety professionals. This means that any survey of the work that these people do suffers from a number of potential biases”. The same point is made by K.B. OLSEN, *Occupational health and safety professionals and practitioners. Current knowledge about what they do, their role in organisations, their*

strategies and their impact, Centre for Ergonomics, Occupational Safety and Health, 2020, p. 1: “many authors do not define what they discuss as OHS professionals or OHS practitioner and, if they define the group they have researched, they often give their own definition, which differs from that used by others”. The A. stresses that many definitions exist for this category of workers, depending on their task, certification process and hierarchy. K.B. OLSEN, *op. cit.*, p. 2, draws on the definition elaborated by J.-P. BRUN, C.D. LOISELLE, *The roles, functions and activities of safety practitioners: the current situation in Québec*, in *Safety Science*, 2002, Vol. 40, No. 6, P. STRAHLENDORF, *Professional Ethics*, paper presented at the *ASSE Professional Development Conference*, Las Vegas, 7-10 June 2004, and P. PRYOR, *Accredited OHS professional education: A step change for OHS capability*, in *Safety Science*, 2016, Vol. 81. For example, J.-P. BRUN, C.D. LOISELLE, *op. cit.*, p. 519, define safety practitioners as “various people who regularly conduct OHS activities within organizations. This definition applies equally to employer representatives (OHS coordinator, safety department head, etc.) and worker representatives (prevention representatives, union OHS delegate, etc.) whether or not they have recognized training from an OHS organization. Work inspectors, specialized consultants, doctors and the like are not included in the term safety practitioner as defined in this research”. K.B. OLSEN, *op. cit.*, p. 2, points out that P. STRAHLENDORF, *op. cit.*, also included external professionals who belong to groups having the same characteristics (in terms of identity, education, knowledge, autonomy). According to P. PRYOR, *op. cit.*, p. 5, a generalist OHS professional is “one who applies a multidisciplinary body of knowledge in a unique way to provide enterprises with advice on the organisational arrangements that will lead to the systemic and systematic management of OHS to prevent work-related fatality, injury, disease and ill-health”. D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *op. cit.*, p. 99, specify that “‘safety professional’ is used for roles whose primary purpose is to provide safety advice which may focus on specific hazards

(e.g. process, transportation, ergonomics, industrial hygiene), or constitute a generalist safety role to coordinate advice and support (e.g. safety management systems, culture, contractor management, emergency response). The job design, title, objective and ‘mission statement of safety professionals’ varies widely across industries and within organizations”. They go on to argue that “safety professionals’ roles are shaped by the institutions they interact with – government regulators, academic institutions, and professional bodies, as well as the features of the organizations they work within” (*idem*, p. 100). F. GUENNOG, C. CHAUVIN, J.C. LE COZE, *op. cit.*, p. 71, have elaborated a definition of ‘Occupational health and safety (OHS) specialists’, saying that they are “different professionals involved in the field of prevention, such as safety coordinators, prevention consultants, etc.”.

A. HALE, R. BOOTH, *The safety professional in the UK: Development of a key player in occupational health and safety*, in *Safety Science*, 2019, Vol. 118, p. 76, specify that ‘safety or OSH staff “is the generic term used to describe people working as generalists on a substantially full-time basis to promote and secure acceptable standards of workplace OSH (and welfare). Where a distinction is made between staff working at two levels, as either tactical or strategic staff we use the terms ‘OSH practitioner’ and ‘OSH professional’ respectively. Where we wish to distinguish between front line and supporting OSH staff, we call the latter ‘OSH specialists’” (p. 76).

In relation to Italy, S. COLOMBO, L.E. GOLZIO, G. BIANCHI, *op. cit.*, p. 725, have argued that “Health, Safety & Environment (HSE) professionals are certified specialists of different scientific disciplines that deal with the prevention of different types of risks stemming from the production of goods and services by private companies and public institutions. More specifically, the HSE professionals are certified professionals according to [...] State-Regions Agreement [...] in the sense they have to go

through an educational program at the end of which they get a certificate (after passing an exam)”.

As can be seen, the lack of a generally accepted definition makes it more difficult to understand the tasks and functions performed by these professionals, also because the emergence of new and increasingly diverse specializations, training schemes and certifications. Besides definitional problems, a number of issues exist in relation to the different terminology employed at a national level (or within the same country) to refer to these professionals, which further complicate comparative analysis, also because of different legal frameworks in the context of OHS.

In 2005, the research by R. JONES, *op. cit.*, p. 9, stressed the diversity of the functions carried out by HS professionals in the UK, as they are usually identified with different labels: health and safety officer/adviser, health and safety manager/director, inspection/enforcement officers, general OSH advice. In this respect, A.R. HALE *ET AL.*, *op. cit.*, p. 2, pointed out that “in the area of occupational health and safety and related disciplines there are a large number of professional groups who carry out tasks under different titles”.

A. GARRIGOU, G. PEISSEL-COTTENAZ, *Reflexive approach to the activity of preventionists and their training needs: Results of a French study*, in *Safety Science*, 2008, Vol. 46, No. 8, p. 1272, define “company preventionists as persons performing a recognised preventionist function in public or private enterprises (hospitals, universities, etc.), which means they are mandated by their employer. This function could be performed full time or part time”, drawing a difference from institutional preventionists, occupational physicians and members of trade unions or CHS-CT (health and safety committees). The AA. also make use of 6 categories of preventionists – 1) prevention specialist; 2) field preventionist; 3) preventionist-manager; 4) preventionist-proxy; 5) preventionist-basic coordinator; 6) unstructured preventionist – which further compound the picture. For example, in France some degree of

overlapping exists between OHS professionals' tasks. There are *préventeurs en entreprise*, whose work is also performed by *délégué à la Qualité Sécurité Environnement*, *animateur sécurité*, *animateur de prévention*, *fonctionnel de sécurité*, *responsable du service sécurité*, *technicien de prévention* and *ingénieur de sécurité*. G. GOSETTI, *Lavoro, qualità e sicurezza: la prospettiva degli operatori della prevenzione*, in *Studi Organizzativi*, 2015, No. 1, uses the word 'operators' to refer to occupational doctors, engineers, prevention officers and biologists. S. LEITÃO, B.A. GREINER, *Psychosocial, Health Promotion and Safety Culture management – Are Health and Safety Practitioners involved?*, in *Safety Science*, 2017, Vol. 91, p. 84, stress that HS practitioners are in charge of ensuring decent working conditions and promoting their wellbeing. They are usually referred to as *Health and safety Officer or Adviser* and *Health and Safety Manager or Director*, depending on their roles and responsibilities.

P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, in *Safety Science*, 2019, Vol. 117, p. 410, also make reference to terminological issues "position titles for OHS Professional and OHS Practitioner used within organisations vary across countries and also organisations. Titles for the role of OHS Professional may include: OHS Vice President; OHS Director; OHS Manager; OHS Practitioner; while titles for the vocationally trained role may include OHS Practitioner, OHS Technician, OHS Officer; OHS Coordinator. This leads to a lack of clarity and potential confusion which detracts from the professionalisation of OHS. As one of the stated objectives of the framework is to promote the recognition of OHS as a profession, it was decided to avoid titles such as 'OHS or Safety Manager' that imply that the OHS Professional has taken over, rather than is just supporting the role of line management and might have different interpretations across countries and organisations".

A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, p. 1, stress that "titles may also vary between (safety- or OHS-) 'engineer', 'officer',

‘practitioner’, ‘adviser’, ‘professional’, ‘technician’, or ‘manager’. Depending on the jurisdiction and the organisation, terminology differs especially as to the choice between ‘Occupational Health and Safety’ (OHS), ‘Occupational Safety and Health’ (OSH) and ‘Work Health and Safety’ (WHS)”. Specifically, “the very choice of title creates an expectation of where in the organisation’s hierarchy the incumbents fit and the nature of their role. Thus (OHS) ‘officers’, ‘technicians’ and ‘practitioners’ are often positioned at a lower status than ‘engineers’, ‘advisers’, ‘managers’ and ‘professionals’; while ‘engineers’ and ‘technicians’ are expected to stick to the hardware and ‘managers’ are expected to undertake management jobs. However, those with ‘manager’ in their title risk being seen as directly responsible for the execution of OHS policy rather than having a facilitating, advising and monitoring role in relation to the management of OHS by line and staff management”. Furthermore, it is problematic to make a distinction between the roles performed by OHS professionals operating in different countries.

N. FABBIO, B.J.E. WADE, B.M. TROIA, *Tecnico della prevenzione nel Regno Unito*, in *Prevenzione in Corso*, 2018, No. 3, compared Italy’s prevention officers (TdP) and their UK counterparts, who are actually three: health and safety inspector, health and safety adviser, environmental health officer (EHO). See also G. ROLLARO, G. BOSCO, *Tecnico della prevenzione all’estero*, in *Prevenzione in Corso*, 2017, No. 2.

Recently, a number of authors (A.R. HALE ET AL., *op. cit.*; P. PRYOR, A. HALE, A. HUDSON, *The OHS Professional: A Framework for Practice. Role, Knowledge and Skills*, INSHPO, 2014; INSHPO, *The Occupational Health and Safety Professional Capability Framework. A global framework for practice*, 2017) made an attempt to clarify the contours of OHS professionals, with P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, *cit.*, who stress that professional associations and

similar organisations have developed some guidelines to achieve this goal.

A first attempt to deal with these definitional issues was made by the International Social Security Association (ISSA) and the European Network of Safety & Health Professional Organizations (ENSHPO) and involved Austria, Australia, Cyprus, Finland, Germany, the UK, Italy, the Netherlands, Norway, Poland, Portugal, Singapore, Switzerland, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, France, Ireland, Spain and Sweden. The results of this analysis were summarised by A.R. HALE *ET AL.*, *op. cit.*, who argue that the objective was to understand the tasks performed by safety professionals in order to ensure comparison. In 2011, the ENSHPO started a project in order to provide a framework concerning OHS professionals' tasks, which could be used globally. This project developed and led to the conclusion of the 2017 Singapore Agreement and to drafting of the *OHS Capability Framework*, the activities of which have been summarised by P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, *cit.* In order to identify the OHS professional profile, the research group started a comparative study between different countries to define the role, functions and the skills of OHS operators and professionals. What has emerged from this research is that "the job design, title and 'mission statement of safety professionals' varies widely across industries and within organizations. Brun and Loisel [..] found more than 100 different titles [J.-P. BRUN, C.D. LOISELLE, *op. cit.*]. Hill [..] identified no common definition of practice or common terminology to explain what safety professionals do [D. HILL, *Time to transform: assessing the future of the SH&E profession*, in *Professional Safety*, 2006, Vol. 51, No. 12]. Even line managers may not understand, nor does the general population [..] [T. LAWRENCE, *The Versatile SH&E Pro*, in *Professional Safety*, 2008, Vol. 53, No. 5; T. LAWRENCE, *Championing the SH&E Professional*, *idem*, No. 11; L.H. FERGUSON, J.D. RAMSAY, *Development of a Profession. The role of education and certification in*

occupational safety becoming a profession, idem, 2010, Vol. 55, No. 10]. [...] Given these disparate objectives of safety professional roles within organisations, having a common understanding and evaluation of safety professional effectiveness remains elusive for both organisations and individuals themselves [D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *op. cit.*, p. 99)]” (*idem*, p. 405). To deal with this shortcoming, the Global OHS Capability Framework was drafted, which is useful to all those involved in OHS in terms of training and professional growth. According to this framework, there exist two categories of OHS professionals: “the *OHS Professional*, who is usually university educated (or has attained a similar level of higher education), and the *OHS Practitioner*, who is usually vocationally, educated” (INSHPO, *op. cit.*, p. 10). These two figures have different features (*idem*, p. 11). A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, p. 5, specify that OHS professionals’ skills correspond to Level 6 or 7 of the *European Qualification Framework* (EQF), while OHS practitioners’ to Level 4 or 5.

In the document provided by INSHPO, *op. cit.*, p. 12, it is specified that “the relationship of the OHS Practitioner to the OHS Professional in larger organizations is similar to that of the nurse practitioner to the general practitioner and hospital specialist in the medical profession. Like nurse practitioners working under doctors in medical practices, OHS Practitioners are generalists in the practice of OHS, liaising with and referring as appropriate to higher-level OHS Professionals, while catering on their own authority for less complex problems in familiar environments and known and proceduralised tasks”. Furthermore, it is stressed that “it is expected that OHS Practitioners and Professionals will liaise with and enlist the assistance of OHS specialists with deeper knowledge bases that may not be core to the OHS Professional or Practitioner but are important in the overall risk picture. These OHS-related specialists include, among others, ergonomists, occupational/industrial hygienists, organizational/occupational psychologists, occupational health professionals

and professionals from allied professions, such as fire protection or structural engineers/specialists. OHS Professional and Practitioners may also collaborate with experts from disciplines such as sustainability, environmental protection, emergency response, security, rehabilitation and mental health, law and insurance. OHS Professionals and Practitioners need to have sufficient understanding of each of these fields to identify the potential need for involvement of professionals in these and other disciplines” (*idem*, p. 11). Based on the Australian Qualification Framework (AQF) and the European Qualification Framework (EQF) and other qualification frameworks, the document developed three categories for both the OHS professional and the OHS practitioner. In relation to OHS practitioners, there are: 1) the OHS Officer; 2) the OHS Advisor; 3) the OHS Coordinator (*idem*, pp. 16-18); while OHS professionals are divided into: 1) graduate OHS Advisors; 2) OHS Managers; 3) General/Group Managers, OHS/Safety VP/Directors OHS/Safety (*idem*, pp. 19-21). The OHS Capability Framework also defines OHS professionals and OHS practitioners in terms of dimensions and domains and skills. P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, cit., p. 409, stress that “one key difference encountered that required extensive discussions and a preparedness by the various parties to understand and accept other perspectives was the difference in approaches to assessment for professional recognition. In North America (USA and Canada), examination is the norm while in many other countries, assessment is based on accredited qualifications supported by peer and reflective modalities such as practice reports, interviews and referees”. They hope that “the framework should not be considered an end-point or a static document but a milestone in the ongoing professionalization of OHS. The extended timeline for development reflects the evolutionary nature of the framework and the time required for the various parties to explore and be reflective about their approach and that of other groups. This evolution and reflection should not cease with the

publication of the framework and the Singapore Accord” (*idem*, p. 412).

In conclusion, we can argue that, notwithstanding the shortcomings referred to above, there are two distinct categories specialized in health and safety, namely the OHS professionals and the OHS practitioners (based on the terminology adopted by the OHS Capability Framework). There are also other professionals, who mostly focus on safety (*e.g.* engineers, experts in ergonomics) and health (*e.g.* occupational doctors and psychologists), depending on their expertise. This distinction has also been made in J. MAQUEDA BLASCO, *20 años de la Ley de Prevención de Riesgos Laborales: Avances y retos de las profesiones sanitarias*, in *Medicina y Seguridad del Trabajo*, 2016, No. 244).

2.2. Training and Requirements

Researchers from different countries point to a lack of attention as regards health and safety professionals’ training, an aspect which has been highlighted also by A. GARRIGOU, G. PEISSEL-COTTENAZ, *op. cit.*, p. 1272.

T. REIMAN, E. PIETIKÄINEN, *op. cit.*, attribute this lack of attention on behalf of research the heterogeneous nature of this group of professionals, if one considers education and training. The AA. are of the opinion that these differences make it difficult to understand the characteristics of these professionals. Compounding the picture is the fact that they have to work in complex organisations with conflicting expectations and objectives.

The different training path entered by OHS professionals, both at European and national level, further complicate things. As stressed by P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, *cit.*, p. 405, “in more than the half of countries surveyed in the INSHPO report [...]

and in the EU Safe study [...] there are no legislated educational or experience requirements for employment as an OHS advisor/coordinator/manager/consultant”. Furthermore, different courses on OHS are in place in almost all the countries surveyed, which have varying duration and scope. This lack of heterogeneity has been seen also in France by L.-M. BARNIER, P. BOUFFARTIGUE, S. GRANAUX, J.-R. PENDARIES, *Entre «culture de prévention» et contre-pouvoir: la formation en santé au travail des représentants du personnel*, in *La Revue de l’IRES*, 2020, No. 101-102. A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, highlight a lack of clarity as regards the role of OHS professionals and practitioners.

A further aspect that needs to be considered is the multitude of specialists and bodies setting OHS training standards. In some cases, this aspect is dealt with by legislation, while in other there exist professional bodies which work on these issues. A. HALE, H. HARVEY, *Certification of safety professionals: emerging trends of internationalization*, paper presented at the 6th International Conference of Working on Safety Network, *Towards Safety Through Advanced Solutions*, Sopot, 11-14 September 2012, p. 3, highlight that the EU Safe project has revealed that in 29 countries from the EU and EEA OHS professionals’ training is regulated differently. Specifically, training is legally regulated in Italy and Spain, while in the UK and France this aspect is dealt with by other organisations. K.B. OLSEN, *op. cit.*, pp. 7-8, also notes that OHS professionals’ education changes depending on the country surveyed and it is ‘surprising’ that many OHS practitioners lack higher-education degree in the OHS area.

Quantitative research carried out in different countries shows that no training requirements are needed to work as OHS professionals. D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *op. cit.*, draw on other scholars’ research (A.R. HALE, F.G. GULDENMUND, *Role and tasks of safety professionals: some results from an international survey*, paper presented at the *Safety in Action Conference*, Melbourne, 2006; A.P. SMITH, E.J.K. WADSWORTH, *Safety*

culture, advice and performance. The associations between safety culture and safety performance, health and wellbeing at an individual level, and safety culture, competent occupational safety and health advice, and safety performance at a corporate level, IOSH Research Report, 2009, No. 1) and come to the conclusion that education is not a key element in companies, especially in consideration that OHS practitioners have different level of education even though they perform the same tasks. Furthermore, starting from the analysis in A.P. SMITH, E.J.K. WADSWORTH, *op. cit.*, they observe that only 20% of professionals have a university degree and academic provision usually does not reflect the skills required of OHS professionals. A. GARRIGOU, G. PEISSEL-COTTENAZ, *op. cit.*, p. 1275, report that only 18% of French professionals operating in the field of health and safety received relevant training. A considerable body of research underlines the need to provide regular training to those in employment. In relation to the training needed to serve as an OHS practitioner and professional, the INSHPO, *op. cit.*, has established some qualification levels for both figures. *OHS practitioners* must comply with AQF4/EQF4, AQF5/EQF4, AQF6/EQF5 for Level 1, 2 and 3, respectively (*idem*, p. 18). As for OHS professionals must comply with AQF7/EQF6, AQF8/EQF6 and AQF9/EQF7 for Level 1, 2 and 3 (*idem*, p. 21). Finally, some research indicates the shortcomings of the training provided to OHS professionals. In Italy, S. CALICCHIA ET AL., *op. cit.*, p. 224, highlight that “there is a need of a context in which practices can be shared among all those involved in health and safety”. Furthermore, “progress makes doctors aware of the importance of training on a regular basis. Yet the constraints of ‘training credits’ have led to the establishment of courses and programmes in the sector. These constraints do not only refer to the number of credits needed, but also content, as doctors would like to focus on other areas of medicine. They would like to consider case studies, good practices so as to have the opportunity to exchange views with colleagues” (*idem*, p. 222). Participants in this research “have voiced the need to grow

culturally also by combining different institutional and specialised skills” (*idem*, p. 223). Always in relation to the Italian context, M. PELLICI *ET AL.*, *op. cit.*, p. 62, have pointed the existence of “a move towards a form of training focusing on people’s individual experiences”. J. SAARI, *Risk assesment and risk evaluation and the training of OHS professionals*, in *Safety Science*, 1995, Vol. 20, No. 2-3, p. 189, stresses that “OHS professionals should have a proper knowledge about the forces operative in a normal working situation, in addition to knowing the forces operative when accidents happen and diseases prevail. The professionals should, in particular, have proper theoretical knowledge as the basis of risk assessment and evaluation. The effectiveness of preventive measures should, generally speaking, be better known. The most topical need is knowing what really works and what does not. Therefore, risk assessment and evaluation are not only risk centred but also prevention centred”.

S. LEKA, S. KHAN, A. GRIFFITHS, *op. cit.*, looked at OHS practitioners’ training needs. They investigated the perspective of workplace health experts and some IOSH members concerning the OHS issues that should be dealt with in relevant training course and (*Continuous Professional Development (CPD) programmes*). According to experts, the main priorities in the field of health and safety included: 1) the aging of the workforce; 2) new risks, such as anxiety, depression and stress; 3) the separation line between professional and private life; 4) learning and physical disability; 5) harassment and bullying; 6) health promotion (obesity, diet, physical training); 7) health monitoring and feedback provided to organisations; 8) ways to involve small and medium-sized companies; 9) immigration issues; 10) musculoskeletal disorders 11) the creation of non-standard work settings; 12) management of major health-related crisis (pandemics); 13) psychological diseases (*e.g.* bipolar and schizophrenic issues); 14) sick leave and return to work; 15) work-life balance.

Finally, it should be pointed out that some research – e.g. S. CAROLY, *op. cit.* – has focused on professionals’ inability to manage their career growth. The A. stresses that it is mostly occupational doctors who face difficulties also when cooperating with other professionals in companies (*idem*, p. 5). This aspect has emerged also in a piece of research conducted in Italy on 22 occupational physicians by S. CALICCHIA ET AL., *op. cit.*, who pointed out the issues resulting from the amendments made to Legislative Decree No. 81/2008 concerning risk assessment in the event of work-related stress, particularly considering gender-based and geographical differences. Participants voiced their insecurity resulting from the fact that they do not feel skilled enough to perform their role. They say that they “would need skills they lack, so stress evaluation shall be carried out neither by the risk prevention officer nor by the occupational doctor themselves” (*idem*, p. 222). Doctors highlight that they struggle to work in a context featuring a socio-economic crisis, a changing world of work and reduced protection for workers which calls for an understanding of new risks and their interpretation against an organizational dimension (*idem*, p. 216). One important issue which emerges is the need to engage in regular OHS training also considering recent cultural, economic, social and technological changes.

2.3. Skills Recognition and Certification Systems

Different trends emerge in the relevant literature in relation to skills recognition and certification in the field of OHS, which is due to the lack of common standard and procedures. It is important to focus on skills recognition and certification in that this procedure benefits workers, companies and training bodies significantly ⁽³⁾. Previous research also indicates that profession-

⁽³⁾ See M. FRIEDMAN, *Capitalism and Freedom*, University of Chicago Press, 1962, pp. 144 ff.; F. BUTERA, E. DONATI, R. CESARIA, *I lavoratori della cono-*

al groups, in order to better define their expertise or to give them a higher degree of professionalism, increasingly implement these procedures, though voluntarily. Moving on from the debate concerning a lack of a shared definition of the concept of ‘skills’, the literature agrees on the benefits supplied by skill certification processes. P.G. BRESCIANI, *Riconoscere e certificare le competenze. Ragioni, problemi, aporie*, in P.G. BRESCIANI (ed.), *Capire la competenza*, Franco Angeli, 2012, p. 158, stresses that in today’s changing context “skills might represent ‘the single currency’ of the economic exchange” between school, training bodies, university and businesses. The A. points out that “skill recognition becomes a key goal which, if achieved, can benefit greatly all those involved in this exchange” (*ibidem*). More specifically, the positive effects are identified for each component, arguing that

scienza. Quadri, middle manager e alte professionalità tra professione e organizzazione, Franco Angeli, 1997, p. 106; C. LLOYD, *Training standards as a policy option? The regulation of the fitness industry*, in *Industrial Relations Journal*, 2005, Vol. 36, No. 5; P.G. BRESCIANI, *Riconoscere e certificare le competenze. Ragioni, problemi, aporie*, S. CONTESINI, *Il ‘progetto’ nel bilancio di competenze*, and G. DI FRANCESCO, *Il sistema integrato di certificazione e riconoscimento delle competenze per l’innovazione sociale e istituzionale*, all in P.G. BRESCIANI (ed.), *Capire la competenza. Teorie, metodi, esperienze dall’analisi alla certificazione*, Franco Angeli, 2012; M.L. LENGNICK-HALL, H. AGUINIS, *What is the value of human resource certification? A multi-level framework for research*, in *Human Resource Management Review*, 2012, Vol. 22, No. 4; T.A. KOCHAN, *The American jobs crisis and its implication for the future of employment policy: a call for a new jobs compact*, in *Industrial & Labor Relations Review*, 2013, Vol. 66, No. 2; U. BURATTI, L. CASANO, L. PETRUZZO (eds.), *Certificazione delle competenze. Prime riflessioni sul decreto legislativo 16 gennaio 2013, n. 13*, ADAPT University Press, 2013; L. TESSAROLI, *Verso la certificazione delle competenze*, in *RDSS*, 2014, No. 2; J. NOVAK, W. PARENT-JOHNSON, L.A. OWENS, P. KEUL, *National certification initiative for employment support professionals: Promoting quality integrated employment services*, in *Journal of Vocational Rehabilitation*, 2014, Vol. 40, No. 2; Y. HSU, G.B. YANCEY, *The benefits of human resource certification*, in *Emporia State Research Studies*, 2015, Vol. 50, No. 1; L. CASANO, *Il lavoro (autonomo) tra vecchie tutele e promozione della professionalità: i limiti della legge n. 81/2017 e l’attualità della legge 4/2013*, in *DRI*, 2018, No. 2; L. CASANO, *Contributo all’analisi giuridica dei mercati transizionali del lavoro*, ADAPT University Press, 2020.

“recognising and certifying skills make sense and benefit individuals, businesses, the training and education system, and society at large” (*idem*, p. 159). A. HALE, H. HARVEY, *op. cit.*, p. 3, stress the purposes of skills certification. Certification rhymes with quality, which involves both ethical standards and the service itself. Furthermore, an increasing number of professionals call for the need to certify skills in order to work in other countries even though qualifications have been obtained in the country of origins (see C. BOHALTEANU, *The Current Experience and Training of Romanian Occupational Health and Safety (OHS) Professionals*, in *Universal Journal of Management*, 2016, Vol. 4, No. 2). To start with, it is important to point out that not all jobs concerning health and safety are governed.

It is usually occupational doctors who are recognised, being it a specialisation in the medical field ⁽⁴⁾. Other professional profiles

⁽⁴⁾ For further information on occupational doctors, see L. LA PECCERELLA, *Dal medico di fabbrica al medico competente*, in *RIMP*, 2017, No. 2; A. MICCI, V. MORTARA, A. OSSICINI, *Dall'art. 33 del d.p.r. 303/1956 all'art. 38 del d.lg. 81/2008. L'evoluzione darwiniana della figura del medico competente*, *idem*, 2009, No. 1; A. SCARCELLA, *L'importanza del medico competente sul luogo di lavoro*, in *ISL*, 2019, No. 6; P. SOPRANI, *Medico competente: statuto funzionale e criticità operative*, *idem*, 2017, No. 5; C. MACALUSO, *L'assunzione dell'incarico di medico competente. Riflessioni sulle recenti precisazioni del Ministero del Welfare*, in *LPO*, 2006, No. 3; U. FONZAR, F. LARESE FILON, C. NEGRO, A.E. WUDY, *La diagnosi di malattia professionale da parte del medico competente*, in *ISL*, 2015, No. 7; A. ROSIELLO, *Stress lavoro-correlato, criteri di valutazione e ruolo del medico competente*, *idem*, 2018, No. 4; L. DORE, *Evolution de la médecine du travail*, in *DS*, 2004, No. 11; M. GOCHFELD, *Occupational Medicine Practice in the United States Since the Industrial Revolution*, in *Journal of Occupational and Environmental Medicine*, 2005, Vol. 47, No. 2; J. MAQUEDA BLASCO, *Formación en medicina del trabajo: competencia y sostenibilidad*, in *Medicina y Seguridad del Trabajo*, 2016, Special Issue; I. SÁNCHEZ-ARCILLA CONEJO, *Formación especializada en medicina del trabajo, el hecho diferencial*, *idem*, 2017, No. 249; K.N. REETOO, E.B. MCDONALD, J.M. HARRINGTON, *Competencies of occupational physicians: the customer's perspective*, HSE Books, 2004; E. WOOD, *Training of occupational medicine physicians and allied occupational safety & health professionals in the USA*, in *Sigurnost*, 2018, Vol. 60, No. 4.

are considered as emerging occupations, so they are not organised into special registers. As a result, professional associations in the field of health and safety have taken steps to define professional profiles, standards and relevant skills, in order to have these jobs recognised and certified both at social and institutional level (P. PRYOR, A. HALE, D. HUDSON, *Development of a global framework for OHS professional practice*, cit., p. 405).

A. HALE, H. HARVEY, *op. cit.*, p. 3, stress that in Anglo-Saxon countries certification has been used diffusely in relation to doctors, engineers, accountants, and so forth, though in other countries the government manages this process. OHS professionals' certification might be carried out at the central level or left to *ad hoc* entities. Certification is concerned with setting the criteria a worker must comply with in order to perform a given job. Certification standards define the degree of experience and education needed to perform a job, as well as the training one should undergo to start an occupation or to update their skills. Ethical standards are also identified, particularly in OHS jobs. In this respect, it has been stressed that "the aim of certification is to provide the guarantee that a person awarded the certificate has at least the defined level of knowledge, skill/competence and ethical probity. Every certification scheme has to struggle with two questions: how should the criteria be defined to give this guarantee? How should they be tested in practice? The answers to these questions are always compromises, because there is always a cost-benefit trade-off to be struck between the validity and desirability of the criteria and the cost and logistic complexity of assessing them" (*idem*, p. 4). A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, p. 5, also observed that in many countries some requirements are put in place in order to limit access to OHS jobs (*e.g.* licensing or registration or other forms of certification). Licensing or registration system is not yet developed among OHS professions. Examples of this system include China's Certified Safety Engineers (CSE) or Romania's and the Netherlands' safety experts. Certification provided by non-government bodies

is widely used and concerns professionals' definition of function, as well as the skills they need to perform some jobs, which should be updated on a regular basis. Skill validation and assessment can take place through different procedures (*idem*, pp. 6-7). One is the establishment of standardised tests which are arranged by certifying bodies (*e.g.* USA's Board of Certified Safety Professionals, or Canada's Board of Canadian Registered Safety Professionals). Another procedure involves assessing the academic qualifications awarded by bodies entrusted with certifying them, along with other tests and evaluations. This system was adopted by Australia in 2015 (the three-tiered system introduced by the Safety Institute of Australia, which is used for certifying the expertise of operators and OHS professionals). Another system is the one run by professional organisations, which provide what the AA. have defined an internal classification process (*idem*, p. 7). Exemplifying this is the UK's Institution of Occupational Safety and Health (IOSH), which establishes career paths for OHS professional based on qualification and experience assessment. A further certification system is the use of professional registers, which contain the name of those who meet the criteria for performing a given occupation. As argued by the AA., these registers are useful for all those who need OHS professional services (*ibidem*). In 2010, the OSH Consultants Register (OSHCR) was set up in the UK in order to offer users reliable OSHS services. This register, as pointed out by A. HALE, R. BOOTH, *op. cit.*, p. 84, contains the name of all reliable consultants in that they are members of at least one of the 11 professional associations operating in the UK (British Safety Council (BSC); British Safety Industry Federation (BSIF); British Occupational Hygiene Society (BOHS); Chartered Institute of Environmental Health (CIEH); Health and Safety Executive Northern Ireland (HSENI); International Institute of Risk and Safety Management (IIRSM); Institute of Ergonomics and Human Factors (IEHF); Institutions of Occupational Safety and Health (IOSH); National Examination Board in Occupational Safety

and Health (NEBOSH); Royal Society for the Prevention of Accidents (ROSPA); Royal Environmental Health Institute of Scotland (REHIS)).

So, professional associations play a key role in terms of service reliability and user protection. A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, p. 7, stress that, while developed, these associations play different roles depending on the country in which they have been established (*e.g.* in Romania and Spain they are only organized locally rather than nationally). Furthermore, there are also examples of associations set up with the aim of developing certification processes at the international level. A. HALE, H. HARVEY, *op. cit.*, make the example of the ENSHPO. The ENSHPO tried to define minimum standards on a voluntary basis, without attempting to replace national legislation systems dealing with this aspect. Rather the aim was to provide a common criterion to exchange good practices in terms of course provision and planning. This is an ongoing process, because much needs to be done to further improve the integration process.

3. New Professions, Roles and Professionalization Processes

The issues refer to above bring to the forefront the problem concerning the professionalization of OHS professionals, which has not been deal with extensively in the literature. First of all, it might be useful to remember that the notion of ‘professionalization process’ was elaborated in the field of Sociology of professions ⁽⁵⁾, which is concerned with studying how professional

⁽⁵⁾ For more details about the notion of a profession, see M. SANTORO, *Professione*, in *Rassegna Italiana di Sociologia*, 1999, No. 1, p. 115, who argues that “the notion of a profession is similar to the one sociology proposes to describe and explain the existence of internal differences in the world of work as regards prestige, power and income. In this sense, professions are occu-

figures are created, examining those labels used to distinguish professions from occupations. This area has evolved since the work of A.M. CARR SAUNDERS, P.A. WILSON, *The Professions*, Oxford University Press, 1933, though this literature review will not touch upon this aspect. What should be stressed here is that sociology has paid attention to “the process through which single occupations have turned into professions throughout history, meaning that take on aspects of professionalism” (W. TOUSIJN, *Il sistema delle occupazioni sanitarie*, Il Mulino, 2000, pp. 13-14). According to G. VICARELLI, *Per una analisi storico-comparata della professione medica*, in *SM*, 2010, No. 90, p. 400, the notion of ‘professionalisation’ refers “the genesis of a profession and its consolidation as such” and “its path that an occupational group follows to seek this status” (L. MAESTRIPIERI, *La professionalizzazione atipica della consulenza di management: il ruolo delle associazioni e delle organizzazioni*, in *QRS*, 2017, No. 1, p. 61). A leading scholar who has truly evaluated the existence of a professionalization path is H.L. WILENSKY, *The professionalization of Everyone?*, in *American Journal of Sociology*, 1964, Vol. 70, No. 2. He considers 5 events which must take place to complete this path: 1) starting doing the things needed on a full-time basis (*idem*, p. 142); 2) setting up a training school (*idem*, pp. 142-144); 3) establishing a professional school to meet some emerging needs (*idem*, pp. 144-145); 4) promoting political agitation to win the support of laws protecting one’s area of specialization and ethical codes (*idem*, p. 145); 5) Creation of a formal ethical code in order to a) get rid of unqualified and unscrupulous people, b) reduce international competition, c) protect customers, d) promote the ideal concept of a service (*idem*, p. 145). Many students have criticised this heuristic model, defining this process “out of touch with

pations which have been given a relevant social and cultural standing in the system of the division of labour”. See also T. PARSONS, *Professioni e libertà*, Armando, 2011; T. FAITINI, *Per una storia del concetto di professione. Traduzione teologica dell’Istituto giuridico romano della *professio census**, in *Filosofia Politica*, 2016, No. 1.

history” and “de-contextualised” (see W. TOUSIJN, *op. cit.*, pp. 14 ff.). Based on this, Tousijn has come up with a new model which consists of “4 sub-processes or components giving rise to a professionalisation process: a) identification and reaffirmation of scientific and technical knowledge; b) development of professional schools; c) development of professional associations; d) acknowledgment and protection on behalf of the state” (*idem*, p. 22). This process aims at “creating and controlling the market made up of professional services, becoming also a process featuring collective social mobility” (*idem*, p. 31). Tousijn also adds that there exist two important aspects that need considering. Firstly “professionalization processes consider three contexts [*cf.* A. ABBOTT, *The System of Professions. An Essay on the Division of Expert Labor*, University of Chicago Press, 1988]: the legal system, public opinion and workplaces. Their relevance changes for each professionalisation process. Consequently, groups and professional associations must adapt their strategies to these different contexts”. Furthermore, professionalization processes do not take place once for all, as they are ongoing (*ibidem*)⁽⁶⁾. Starting from here, G. VICARELLI, *op. cit.*, p. 399, argues that “this is the point of departure of the stages leading up to gaining professional status in the context of occupations, as well as the scientific debate on the loss of such status because of lower qualification”. Recently, this aspect has been given new momentum, in that new professions have emerged which escape traditional classifications and fall outside Wilensky’s professionalization theory, as stressed by L. MAESTRIPIERI, *op. cit.*, p. 63. The A. stresses that it is necessary to “investigate how this professionalization process is morphing into a system which defines new roles for professional associations” (*idem*, p. 62). Furthermore, it is also important to “understand how professional status is related to emerging professions in knowledge society, especially

(6) For further information, see W. TOUSIJN (ed.), *Sociologia delle professioni*, Il Mulino, 1979; W. TOUSIJN, *Dai mezzi ai fini: il nuovo professionalismo*, in G. VICARELLI (ed.), *Cura e salute. Prospettive sociologiche*, Carocci, 2013.

when they are rather different from traditional jobs” (*idem*, p. 65). What has been stated above illustrates the need to acknowledge OHS professionals. For example, D.J. PROVAN, S.W.A. DEKKER, A.J. RAE, *op. cit.*, p. 100, have argued that the ‘professionalisation’ process for OHS jobs is necessary to improve performance quality and help professionals in this sector to be recognised as such. This point was also made by A. GARRIGOU, G. PEISSEL-COTTENAZ, *op. cit.*, pp. 1285-1286, who investigated how these workers are given little training and consideration in the French context. Specifically, 98% of them stressed that establishing the professional figure of the ‘preventionist’ would help one to develop the OHS culture at work. The AA. consider the situation of OHS professionals in France and point out that only doctors benefit from a sort of recognized status (*idem*, p. 1286), while the qualification of other practitioners have not been certified by a system like the IOSH in the UK. As highlighted by A. HALE, R. BOOTH, *op. cit.*, p. 84, this body has an important role in the definition of OHS professionals’ skills and training needs. In 2003, the IOSH was awarded the Royal Charter, a document issued by the Queen which lists rights and duties for these professionals, formally recognising their role.

A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, also clarify this point, specifying that the need to certify OHS professionals’ skills is ascribable to a number of factors, *e.g.* the quality of the services provided, the increasingly complex work processes, the need to raise awareness about emerging risks. OHS professionals are ever-changing figures whose social and institutional recognition can play a relevant role. As stressed, there is much debate about to establish a specific area among the different fields health and safety is involved (*e.g.* between generalist company safety staff and consultants and OSH specialists (ergonomists, structural engineers, occupational psychologists, occupational hygienists, occupational health nurses, ergonomists)). Conflict exists also between OSH staff and trades union safety

representatives, along the lines of what has been described by W. TOUSIJN, *Il concetto di professionalizzazione e la divisione del lavoro tra occupazioni*, in *Sociologia del Lavoro*, 1994, No. 53, in relation to doctors and nurses. According to the A., inter-professional conflicts can give rise to 6 different situations: hierarchical dominance, scientific dominance, functional dominance, lack of supremacy, consultative jurisdiction and client-based differentiation (*idem*, pp. 108-110). Of course, “these possible scenarios shall not be considered as definitive ones: the balance between professions is unstable and subject to continual change generated by organized professions or outside agents” (*idem*, p. 110).

A.R. HALE, D. HUDSON, P. PRYOR, *op. cit.*, p. 8, observe that OHS professionals with special qualifications are on the rise in the UK, the USA and China, although their professional recognition is far from established, also due to a lack of awareness about their role. This state of affairs has been reported in France by S. CAROLY, *op. cit.*, p. 4, who states that three situations arise: the presence of occupational doctors – who are recognised – other professionals (occupational psychologists, ergonomists, engineers) – who have been given professional status since the 1970s – and professional nurses and healthcare assistants, who still need recognition.

progettiamo
insieme
un nuovo modo di
FARE UNIVERSITÀ

Così nasce ADAPT, per intuizione del professor Marco Biagi, quale modo nuovo di "fare Università". Ispirata alla strategia europea per la occupazione – e, in particolare, al pilastro sulla "adattabilità" di lavoratori e imprese a fronte delle sfide aperte dai moderni mercati del lavoro – ADAPT è una associazione senza fini di lucro, nata nel 2000 e con sede presso il Centro Studi DEAL dell'Ateneo di Modena e Reggio Emilia. Nel corso del 2013 ADAPT ha concorso alla nascita di Fondazione ADAPT che promuove una Scuola di alta formazione in *Transizioni occupazionali e relazioni di lavoro*.

Dal 2007 a oggi ADAPT ha promosso:

- **4** scuole di dottorato in relazioni di lavoro in collaborazione con gli atenei di Bari, Bergamo, Modena, Siena (sede di Arezzo)

- **306** borse triennali di dottorato di ricerca

Dal 2003 ha promosso:

- **126** contratti di apprendistato di alta formazione e ricerca

- **82** assegni di ricerca annuali

- **36** borse private per corsi di alta formazione

- **4** riviste, **3** collane scientifiche, **3** bollettini sui temi del lavoro

ADAPT • Associazione per gli studi internazionali e comparati sul diritto del lavoro e sulle relazioni industriali
È possibile associarsi scrivendo a segreteria@adapt.it.
I giovani interessati alla Scuola possono scrivere a fraboschi@unimore.it
Seguici su www.adapt.it • @adaptland

ADAPT
www.adapt.it

Siti e osservatori ADAPT

www.bollettinoadapt.it
@bollettinoADAPT



www.adapt.it
@adaptland

www.fareapprendistato.it
@ApprenticeADAPT



www.farecontrattazione.it
@adapt_rel_ind

www.adapt.it/adapt_law
@labour_lawyers



www.fareconciliazione.it
@ADAPTconciliare

salus.adapt.it
@ADAPT_EOSH



englishbulletin.adapt.it
@ADAPT_bulletin

www.adapt.it
@AdaptHigherEd



www.adapt.it
@ADAPT_placement

www.adapt.it
@ADAPTpeople



www.adapt.it
@ADAPT_Press

Per maggiori informazioni scrivere a redazione@adapt.it

Project financed by INAIL

Printed in April 2021 by Ancora (Milan)