#ISEE2021

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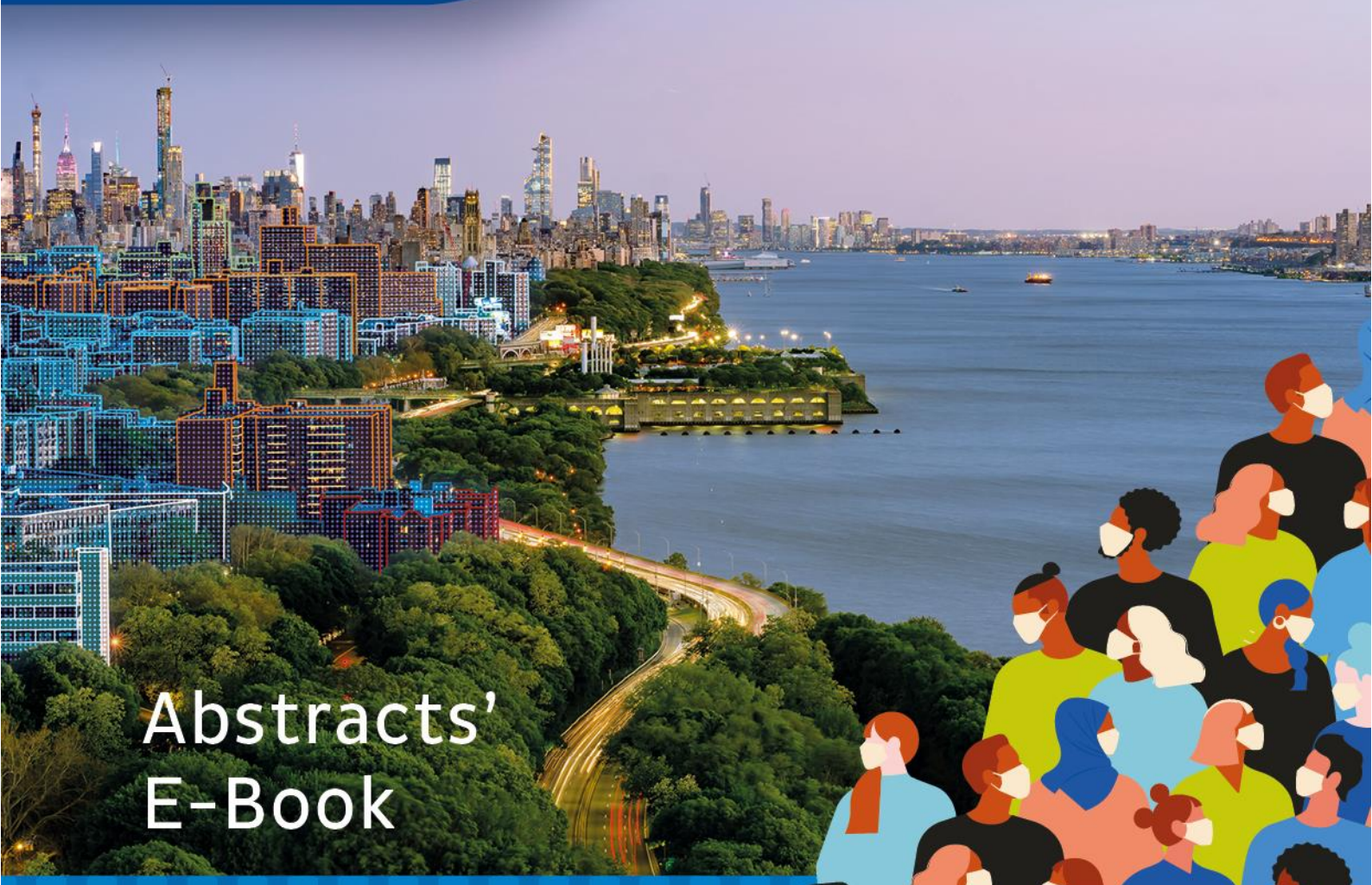

Abstracts' E-Book

Local Academic Host:
Columbia University
Mailman School of Public
Health, New York, US

ABSTRACT E-BOOK

August 24, 2021 / 07:30 - 08:30 / Statue of Liberty Hall (Hall 1)
LIGHTNING TALKS 5
Epidemiology of PFAS or Heavy Metals
Chairs: Tony Fletcher, United Kingdom & Temitope Ayodeji Laniyan, Nigeria

O-LT-042
Chemical exposures » Heavy metals

Association between cadmium and genotoxicity and oxidative stress risk biomarkers in a population of Northern Italy

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BACKGROUND AND AIM: Cadmium is a toxic heavy metal exerting several adverse effects in humans, especially for kidney, bone, liver, and cardiovascular system. In particular, genotoxic effects may occur through several epigenetic mechanisms, but a direct genotoxicity has been suggested. 8-oxo-7,8-dihydro-2'deoxyguanosine (8-oxodG) is an oxidized derivative of deoxyguanosine, largely used as biomarker of oxidative stress in urine. In this study, we aimed to assess cadmium levels in a population in Northern Italy, in order to evaluate the correlation between cadmium exposure with different haematological and biochemical parameters, as well as the relationship with 8-oxodG levels.
METHODS: We recruited healthy and non-smoking subjects living in the Reggio Emilia province in the period 2017-2019 at the Transfusion Medicine Unit of Santa Maria Nuova Hospital, AUSL-IRCCS of Reggio Emilia, Northern Italy. Urinary cadmium and 8-oxodG, and fasting blood haematological and biochemical parameters were assessed.
RESULTS: We eventually recruited 140 participants (mean age 47.4 years). Mean urinary cadmium and 8-oxodG levels were 0.25 µg/L (range: 0.01–1.33 µg/L) and 3.68 µg/g creatinine respectively. All haematological and biochemical parameters were in the normal range. We found a positive association of cadmium concentrations with alanine aminotransferase, total cholesterol, triglyceride, and TSH levels, while a negative one was observed with glycaemia, HDL levels. In addition, we found a strong positive correlation between urinary cadmium and 8-oxodG.

ABSTRACT E-BOOK

CONCLUSIONS: Our study suggests that cadmium exposure is associated with detrimental effects on some haematological and biochemical parameters even at very low levels, generally considered safe for the general population. The positive association between urinary cadmium levels and oxidative stress, as assessed through 8-oxodG levels, highlights the potential role of this heavy metal in causing direct genotoxic effects.
We acknowledge the collaboration of Transfusion Medicine Unit-Reggio Emilia Hospital personnel, AVIS-Section of Reggio Emilia staff and volunteers, and all blood donors who participated to this study.

Keywords: Biomarkers of exposure, Chemical exposures, Environmental epidemiology, Exposures, Heavy metals, Toxicology