



Analysing changes to the flow of public funding within local health and care systems: An adaptation of the System of Health Accounts framework to a local health system in England

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ABSTRACT

Financial flows relating to health care are routinely analysed at national and international level. They have rarely been systematically analysed at local level, despite sub-national variation due to population needs and decisions enacted by local organisations. We illustrate an adaptation of the System of Health Accounts framework to map the flow of public health and care funding within local systems, with an application for Greater Manchester (GM), an area in England which agreed a health and social care devolution deal with the central government in 2016. We analyse how financial flows changed in GM during the four years post-devolution, and whether spending was aligned with local ambitions to move towards prevention of ill-health and integration of health and social care. We find that GM decreased spending on public health by 15%, and increased spending on general practice by 0.1% in real terms. The share of total local expenditure paid to NHS Trusts for general and acute services increased from 70.3% to 71.6%, while that for community services decreased from 11.7% to 10.3%. Results suggest that GM may have experienced challenges in redirecting resources towards their goals. Mapping financial flows at a local level is a useful exercise to examine whether spending is aligned with system goals and highlight areas for further investigation.

1. Introduction

Analysing how public financial resources for health and care are generated, pooled and spent within health systems is key to understanding their performance and how it can be improved. This has been a key dimension for comparing health systems nationally and internationally [1].

Most national health and care systems are hierarchically organised, with a substantial part of their resources collected centrally by national governments and redistributed under different arrangements to local organisations [2]. Local organisations subsequently determine how resources are used to provide services in the way that best meets the needs of their populations, within the remit set by the national system's architecture and regulations. The degree of decentralisation or devolution in particular may influence the discretion that sub-national governments have over health and care policy, financing, service purchasing and

delivery [3,4].

Modern health reforms, even when national, are often implemented at a local level, or they are local reforms [5]. Local health and care organisations are therefore key actors in the design, planning, management and delivery of health-related services, including their integration [6–9]. Local organisations can also be pivotal in improving the coordination across sectors to promote health and wellbeing and provide services more effectively, efficiently and equitably [10].

Methods have been developed and refined progressively to measure systematically how much is spent, and how, in a comparable way over time and across systems. Most notably, the System of Health Accounts (SHA) proposes a framework for the systematic description of financial flows related to health and care systems, both for national and international comparisons [11,12].

The SHA framework has commonly been used to systematically analyse national health accounts over time for monitoring,

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accountability, and policy design purposes [11,13]. However, we were only able to find one academic paper that used the SHA framework to analyse changes in sub-national health accounts over a period of time, despite the potential usefulness of this for policymakers. That study was a district-level analysis of the distribution of funds at two points in time for Malawi [14]. More generally, health accounts have rarely been collected and analysed at sub-national level. There have been a few examples of data collected at regional level, particularly in countries with federal systems but rarely at the level of local health systems [15–20]. As far as we are aware there is no mapping of the flow of public funding for a whole health system, including related social care expenditure, for any local health system in Europe.

The aim of this study is to apply an adaptation of the SHA to map the flow of public health and care funding (including health, health care and social care services) for Greater Manchester, a devolved local health and care system in England. We mapped the flow of funding and analysed how it changed during the four years following a health and social care devolution deal in 2016, when the system had to define their specific policy goals [21]. With a focus on public funding, we describe and discuss changes that occurred in: revenues (resources collected or allocated from central government); pooling arrangements across sectors or services; and expenditure on health and care. We additionally compare whether the changes varied across the ten localities that comprise Greater Manchester. We show how this can be a useful exercise to understand whether the financing of a local health system is functional to support the broad goals of the system and highlight areas that may require attention.

2. Study setting

2.1. Health care and related services in England

Each year the UK Government allocates budgets to different departments including to the Department of Health and Social Care (DHSC) which is responsible for health and social care [22,23]. Planned spending for the Department of Health and Social Care in England was £150.4 billion in 2019 [24].

Most health care funding (around 87%) is transferred from the DHSC to NHS England (formerly two separate organisations named NHS England and NHS Improvement), the organisation that leads the National Health Service. During the study period, NHS England/Improvement allocated most funding to Clinical Commissioning Groups (CCGs) according to a system of need-based capitation [22]. CCGs were clinically-led organisations responsible for commissioning health and secondary care services from providers in their geographic area [25]. In April 2016, there were 209 CCGs in England [26], reducing to 191 by April 2019 [27].

Services are delivered by a variety of providers including: general practices, Trusts and Foundation Trusts, mental health care providers and community health care providers. General practices provide primary care. Trusts and Foundation Trusts are organisations that provide a range of secondary care and can be broadly categorised as providing: acute, ambulance, community, or mental health services [28]. Over time, some trusts have become larger and more complex, providing several different services [29]. As of October 2019, there were 223 Trusts in England [27].

Local authorities (LAs), led by elected local government representatives, are responsible for social care services and most public health services, alongside other locally provided public services (eg. housing, transport). To finance these services they receive funding from three main sources: council tax (tax on residential property), business rates (tax on non-domestic property), and grants from the central government [30]. Some central government grants are ring-fenced and others are not. Council tax rates are set by LAs themselves, although there are rules on how much they can be increased without holding a referendum. Business rates are set by the central government [31].

LAs have a statutory duty to fund social care for adults who meet certain means and needs tested requirements. The central government provides guidance from which LAs may deviate. LAs purchase social care from private providers and third sector providers, and provide some services themselves [32]. They also have a statutory duty to provide social care for children, which includes support for children who are disabled, protecting children from harm, and taking responsibility for looked-after children [33].

In 2013, most legal responsibilities for public health services were passed from the NHS to LAs. Since then, LAs have had responsibility for the provision of most sexual health, smoking cessation, and substance abuse services, in addition to wider health protection [34].

For several years there has been movement towards integration of health and social care and integrated local health systems [35–37]. In 2015, all CCGs were mandated to have a small pooled budget with a corresponding LA (the Better Care Fund), to encourage local integration. The two organisations jointly decide how the money is spent, sharing the risks and rewards and accountability for the outcomes [38]. Some CCG/LA pairings have since voluntarily expanded their pooled budget.

From 1st July 2022, CCGs were abolished and health care resources previously allocated to CCGs are now allocated to Integrated Care Systems (ICSs) [39]. ICSs have a larger geographic footprint (mostly merged CCG footprints) and have statutory authority. They involve a number of different institutions, including the NHS and LAs, as well as voluntary and community partners. ICSs are now responsible for commissioning both health and social care services.

2.2. Greater Manchester: a devolved local health system in England

Greater Manchester (GM) is an area in the north-west of England with a population of around 2.8 million. Life expectancy at birth in 2017–19 was slightly lower for the GM population than for the rest of England [40].

Since April 2017, the local health and care system included ten CCGs and ten LAs, with matching geographic footprints, unlike some other parts of England. We will refer to localities as the geographic footprint covered by each CCG and LA pairing.

In 2015, Greater Manchester agreed a £6bn health and social care devolution deal with the UK government. This came into action in April 2016. As part of the deal, GM organisations and NHSE agreed the establishment of a Transformation Fund worth £450m, spread over five years.

Greater Manchester Combined Authority published a plan detailing ambitions for change when the devolution deal had been agreed [21]. The plan set out the following five system changes that GM intended to implement to transform services across the local health system: (1) radical upgrade in population health prevention; (2) transforming community-based care and support; (3) standardising acute and specialist care; (4) standardising clinical support and back office services; (5) enabling better care.

For each, the plan detailed specific actions that GM would take to achieve them. Many aspects of the proposed system changes would not necessarily require a redirection of resources, however the successful implementation of the first two planned system changes are highly likely to require some redirection of resources towards preventive and out-of-hospital services, such as public health, primary care, and community services. This is strongly implied on page 38 of the plan: [21]

“Whilst a large part of the improvement in GM will come from investment in and expansion of prevention and integrated primary and community services, we want to improve the quality, consistency and efficiency of services across the region...[emphasis added]”

3. Materials and methods

3.1. The System of Health Accounts framework

The System of Health Accounts (SHA) consists of concepts and categories that accommodate a variety of modern complex arrangements to systematically describe financial flows within a health system. The SHA framework can be used to provide a comprehensive accounting of transactions of revenue-raising and resource-allocation, as well as the institutional units involved in the provision and consumption of health and care services [11].

The core of the framework stems from the precursor, National Health Accounts (NHA), and aims to analyse financial flows by three dimensions: Financing schemes, Providers and Functions. Results are typically presented as bi-dimensional tables illustrating the funding flow between specific categories of two chosen dimensions.

Financing schemes include the revenues and the arrangements (the level of pooling of funding from different revenues and the institutional agents that manage them) in place to direct resources to providers to deliver services.

Providers are distinguished between primary, whose primary activity is to provide health care services, and secondary providers, who deliver health care in addition to their main activity. Provider categories include: hospitals, residential long-term care facilities, providers of ambulatory health care, providers of ancillary services, retailers and other providers of medical goods, providers of preventive care, providers of health care system administration and financing, rest of economy, rest of the world.

Health care functions include: curative care (further disaggregated by general and specialised and inpatient or outpatient), rehabilitative care, long-term (social) care, ancillary services, medical goods, preventive care, governance and health systems finance and administrations, and other services.

Our classification is adapted to include health care and public health services, currently emphasised on their own and mostly encompassing preventive care. It is also adapted to the structure of the health care system in England and to the level of disaggregation of available data.

3.2. Data

We used a variety of data, most of which were publicly available, to gather information on the income and expenditure of the ten localities in GM for each financial year from 2016/17 to 2019/20.

To quantify CCG revenues, we used published budget allocations from NHSE [41]. We obtained the “allocation after place-based pace of change” for each of the three funding streams (core services, primary medical services, and specialised services) for each year. For CCG expenditure, we used two data sources: their annual accounts for each year [42–51] and expenditure records provided to the research team by relevant NHS organisations.

From each CCG’s annual accounts, we used records on their purchase of goods and services and overall operating expenses (section 5) to obtain a breakdown of the amount they spent on: services from Foundation Trusts and other NHS Trusts; services from general practices; prescribing costs; purchase of healthcare from non-NHS bodies; and purchase of social care. We subtracted these costs from their total operating expenditure to create an “Other” category, which includes a small share of total operating expenditure and all other expenditures (such as services from other CCGs and NHS England, premises, audit fees, general supplies and services, consultancy services).

We also used some more granular CCG expenditure data to obtain information on specific services provided by Trusts and Foundation Trusts. Trusts and Foundation Trusts provide a wide range of secondary care services such as general and acute, mental health, and community services, which are not captured by the information published in CCG annual accounts, which only report total payments to Trusts and

Foundation Trusts. The more granular expenditure data comprised all payments made in each financial year by each of the ten CCGs. We retained only payments that were identifiable as payments to Trusts or Foundation Trusts (see Supplementary Table 1). Using the criteria presented in Supplementary Table 2, we then mapped the granular expenditure items into six categories: general and acute, mental health, community services, urgent health advice telephone service, ambulance services, other expenditure.

We used a number of datasets published by the central UK government at LA level to gather information relating to LA revenues from different sources and expenditure on different services [52,53]. We used the “Revenue outturn specific and special revenue grants” (RG) dataset to quantify each local authorities’ grant income from the central government. We used council tax and business rates receipts “live tables” to quantify total revenue raised from council tax and business rates by each LA in each year. We included all rates received in the given year, irrespective of the year they relate to.

We used the “revenue outturn service expenditure summary” (RSX) dataset to quantify LA net expenditure on child and adult social care, public health, and other public services. The dataset contains net and gross expenditure for each service. Net expenditure is defined as total LA expenditure minus income received from sales, fees, charges and other income. By using net expenditure rather than gross we captured only expenditure which is government-financed, rather than any LA expenditure financed by out-of-pocket payments from service users. No mapping was required for these expenditure data as expenditure had already been mapped to functions by LAs.

We made two assumptions about LA revenues. First, we assumed the maximum permitted retention of business rates (50%) for all LAs in GM in 2016/17 [30]. We multiplied 2016/17 business rates receipts by 0.5 to quantify the business rates that the LAs retained. We made this adjustment to avoid double counting LA revenues, because the portion of business rates revenue not retained by LAs was collected by the central government and redistributed to LAs in the form of grants (which we quantified separately). From 2017/18 LAs in GM retained 100% of business rates, therefore we did not make any adjustment to business rate receipts for the other three years. Second, we approximated LA revenues allocated to public health and social care with their net expenditure on public health and social care. Most LA revenue is not ringfenced and LAs may choose to spend it on any of the services for which they are responsible (including those unrelated to social care and public health).

We used the GDP deflator at market prices published by HM Treasury in order to calculate changes over time in real terms [54].

We discussed expenditure classifications and results with representatives from CCGs and LAs in GM.

3.3. Analyses

For GM, we produced a schematic diagram showing: the funding received from different sources; the health and care expenditure by all localities (local authority and CCG pairings) in 2019/20; and the percentage change in real terms since 2016/17. We additionally calculated the percentage of total expenditure absorbed by each category in 2019/20, and the percentage points change since 2016/17.

For each locality, we calculated the percentage of revenue from different sources, and expenditure on each category in 2019/20. We analysed how both changed since 2016/17.

We calculated each CCG’s expenditure on services from Trusts by function in 2019/20, and how this changed since 2016/17.

We included the main sources of LA and CCG income, but those included are not exhaustive. For example, LAs have some smaller amounts of income from sources other than council tax, business rates and the central government. CCGs have a small running costs allowance, which we have not included, and may have other one-off income. Some providers also receive some income from Health Education England. As

a result, income and expenditure should not necessarily be expected to balance. To promote transparency and facilitate the interpretation we included a category of “excess expenditure” which captures the discrepancy between total expenditure and total income in our data. It is important to note that this may not reflect a real mismatch between revenues and expenditure, but just a mismatch due to our inability to track revenues and expenditures with complete precision in the available data.

4. Results

Total public resources available in GM to fund health and care services rose from £7.1bn in 2016/17 to £8bn in 2019/20, corresponding to an increase of 6.9% in real terms. CCG budgets rose from £4.3bn to

£4.8bn (5.7% increase in real terms) and LA budgets for public health and social care rose from £1.8bn to £2.1bn (11.8% increase in real terms).

CCG budgets from core services and primary care medical services allocations represented the majority of the total resources for health and care (59.2% in 2019/20 versus 59.8% in 2016/17). 32.9% of LA revenues were directed towards public health and social care in 2016/17, rising to 36% in 2019/20.

Expenditure for healthcare alone absorbed almost three quarters of the total resources (73.3% in 2019/20, 2 percentage points less than in 2016/17; Fig. 1), while social care absorbed 23.9% (2.8 percentage points more than in 2016/17) and public health absorbed 2.8% (0.6 percentage points less than in 2016/17).

Over half of the total expenditure was absorbed by secondary and

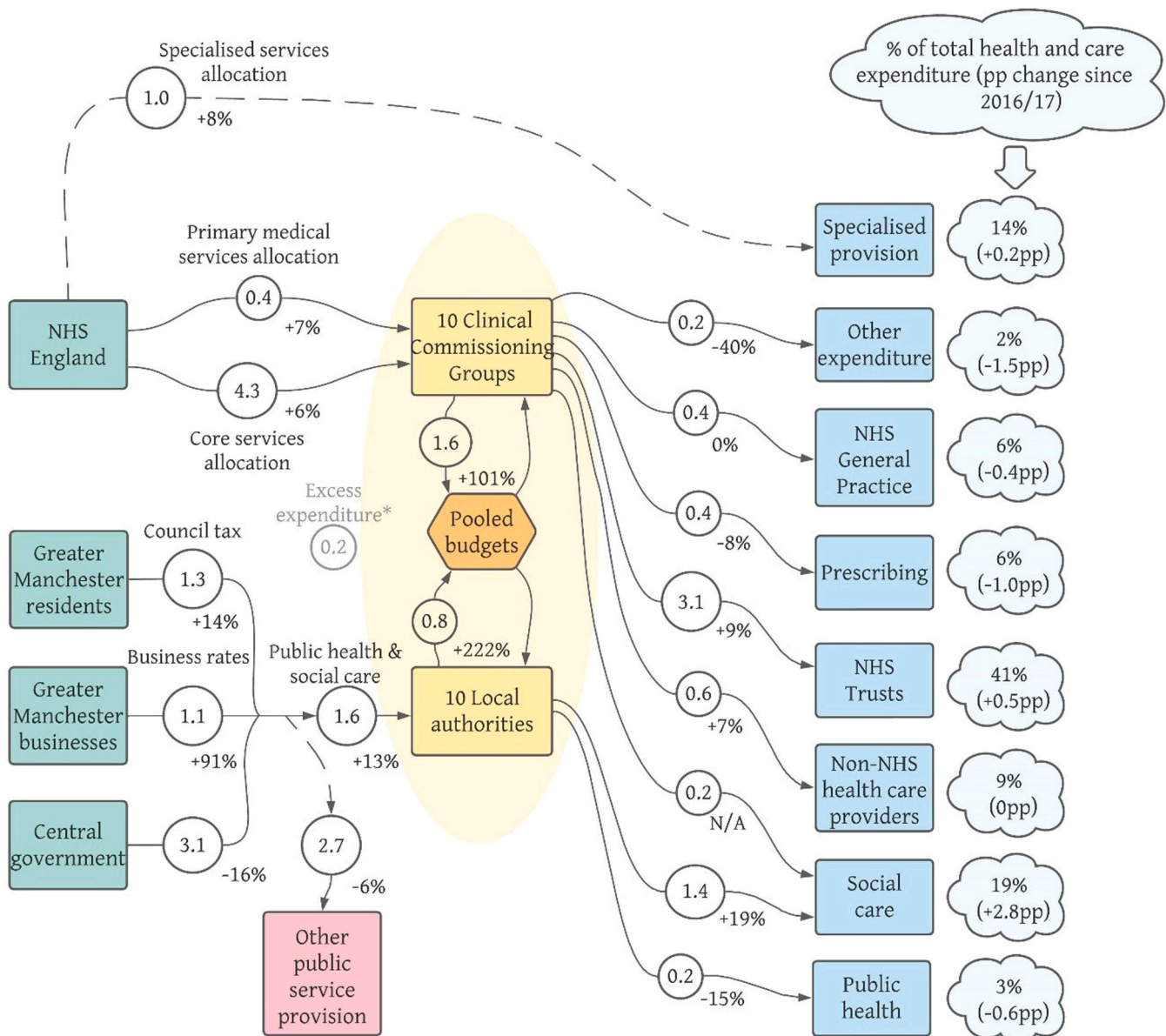


Fig. 1. The flow of funding in Greater Manchester health and care system in 2019/20 (£billions) and real terms percentage change from 2016/17
 Data sources: NHS England allocations tables; Council Tax receipts live tables; National non-domestic rates receipts live tables; Local Authority revenue outturn datasets RG, RSX; Annual accounts for ten Greater Manchester Clinical Commissioning Groups.
 *Excess expenditure is the discrepancy between total sources of financing and expenditure for health and care in the data used for this study.
 Abbreviations: pp, percentage points.
 We assume local authorities retained 50% of business rates in 2016/17, increasing to 100% from 2017/18.
 Most CCGs did not provide social care expenditure in their annual accounts in 2016/17 so we omit the percentage change for this category.

specialised care (51.9% of health and social care resources in 2019/20 compared with 51.2% in 2016/17). In 2019/20 secondary care commissioned by CCGs to NHS Trusts absorbed 41.4% of health and care expenditure (compared with 40.9% in 2016/17). Centrally commissioned specialised healthcare absorbed 13.7% (compared with 13.5% in 2016/17). Primary care and primary care prescribing absorbed 5.6% and 6.4% respectively (compared with 6.0% and 7.4% in 2016/17). Non-NHS providers, mostly community care providers, absorbed 8.6%. This percentage remained constant since 2016/17.

The amount of resources reported as pooled between the CCGs and LAs in GM increased from 19% of total health and care expenditure in 2016/17 to 44% in 2019/20. This varied between localities (Supplementary Table 3). For one locality, the percentage of their total expenditure from pooled budgets slightly decreased between 2016/17 and 2019/20, from 32% to 31%, while it increased for all other localities, with the largest increase being of 64 percentage points (from 4% to 68%).

We found similar patterns when looking at revenues and expenditure for each of the ten localities within GM. The percentage of health and social care revenue from LA financing increased for eight out of ten localities (Fig. 2). As expected, the percentage of revenue that came from the core services and primary medical services CCG allocations was quite stable over time, as they were established by NHSE/I using resource allocation formulae.

For all localities, the percentage of their budget spent on prescribing and public health decreased, and the percentage spent on social care increased during the study period (Fig. 3). Eight out of ten localities decreased the percentage spent on general practice (primary care). Most localities increased the percentage spent on services provided by Trusts, except for one locality for which expenditure on social care increased substantially.

For GM as a whole, the percentage of CCG resources paid to trusts for general and acute services increased from 70.3% to 71.6%, for community services decreased from 11.7% to 10.3%, and for mental health increased from 12% to 12.3%.

There was variation across different CCGs. For eight out of ten CCGs, the percentage of total payments to trusts for general and acute services increased (Fig. 4), while for seven out of ten CCGs the percentage for community services decreased. The percentage for mental health increased for seven CCGs and decreased for three. For all eight CCGs that recorded their expenditure on ambulance services as a distinct category, this comprised a roughly constant percentage of trust expenditure between 2016/17 and 2019/20.

5. Discussion

We illustrated the adaptation and use of the System of Health Accounts framework to map and describe the flow of health and care



Fig. 2. Health and care revenues by locality in Greater Manchester, 2016/17 and 2019/20
 *Excess expenditure is the discrepancy between total sources of financing and expenditure for health and care in the data used for this study.
 Localities ordered alphabetically: (1) Bolton, (2) Bury, (3) Manchester, (4) Oldham, (5) Rochdale, (6) Salford, (7) Stockport, (8) Tameside, (9) Trafford, (10) Wigan.
 Total includes all CCG expenditure; and local authority expenditure on social care and public health.
 Data sources: CCG annual accounts and local authority service expenditure summary (RSX).

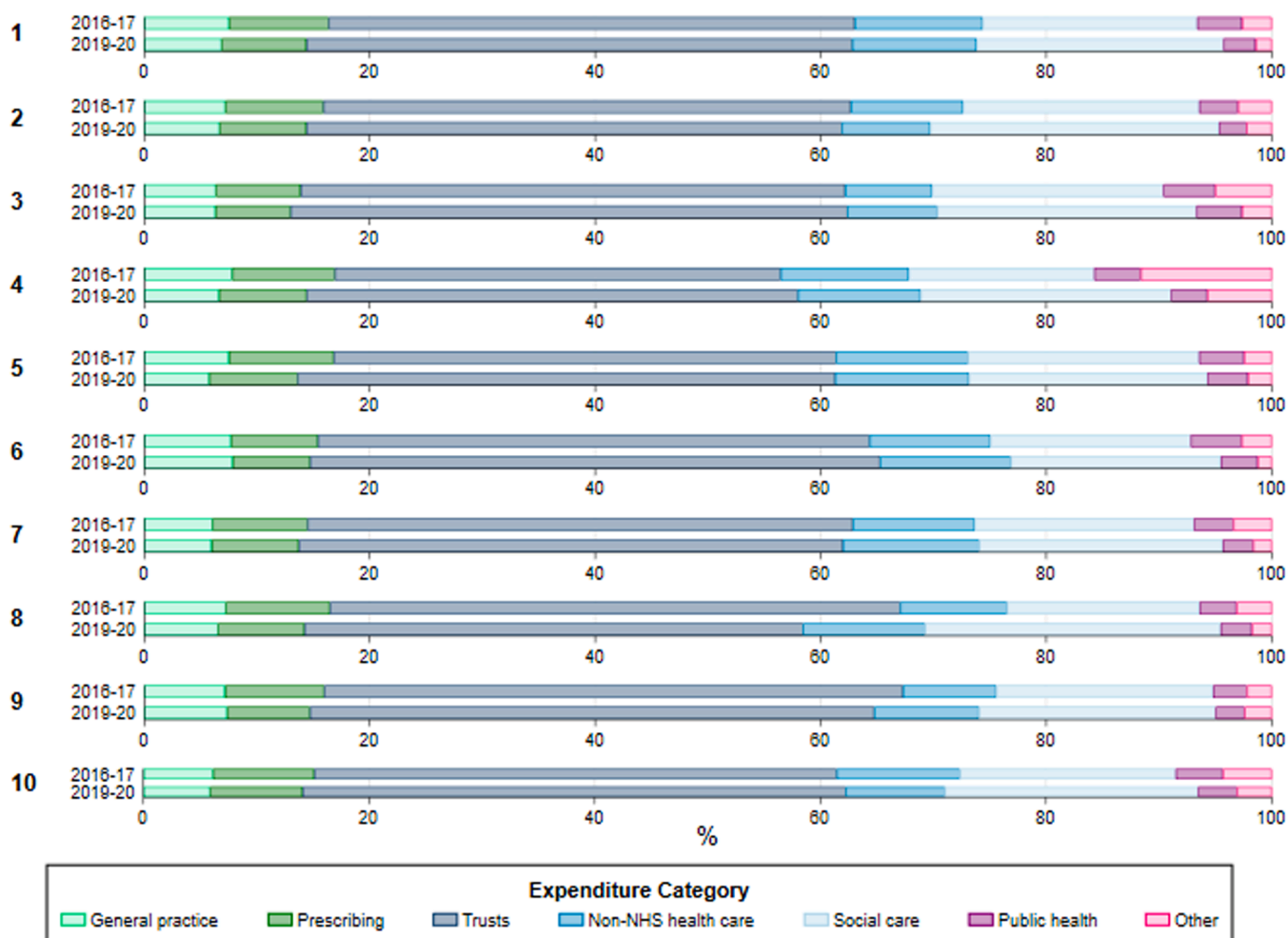


Fig. 3. Health and care expenditure by locality, 2016/17 and 2019/20
 Localities ordered alphabetically: (1) Bolton, (2) Bury, (3) Manchester, (4) Oldham, (5) Rochdale, (6) Salford, (7) Stockport, (8) Tameside, (9) Trafford, (10) Wigan. Total includes all CCG expenditure; and local authority expenditure on social care and public health. Data sources: CCG annual accounts and local authority service expenditure summary (RSX).

funding and changes over time for Greater Manchester, a devolved system in England, between 2016/17 and 2019/20. This exercise allowed us to track and examine spending against the stated policy objectives of a local health and care system; whether expenditure on prevention and community-based care increased over time.

For the whole study period of 2016/17 to 2019/20, the majority of resources for health and care (including health, health care and social care services) originated from CCG budgets, centrally allocated from NHS England. However, for most localities, in 2019/20 a greater percentage of health and care related expenditure was financed by LA revenue and less was from CCG revenue compared with 2016/17, reflecting LA’s increased expenditure on social care. There was substantial variation between localities in terms of expenditure on different services and how that changed over the study period. There was much less variation in revenue received from different sources.

For Greater Manchester as a whole, expenditure on services from Trusts, non-NHS health care providers, and social care increased in real terms during the study period. Expenditure on primary care increased slightly. Expenditure on prescribing and public health decreased in real terms. In 2019/20, a greater percentage of spending by CCGs on services from Trusts was for general and acute services, and a lower percentage was for community services.

Following devolution, Greater Manchester planned to “radically upgrade population health prevention” and “transform community-based services and support” [21]. We found that, after adjusting for

inflation, Greater Manchester decreased spending on public health by 15% which is likely to reflect cuts to centrally allocated grants [55]. However, for all of England, total expenditure on public health decreased by 12% in real terms between 2016/17 and 2019/20 [56], suggesting that cuts to public health expenditure were slightly more pronounced in Greater Manchester. Expenditure on general practice increased by only 0.1% in real terms, but this could perhaps be considered large when compared with the national change [57,58].

It should be noted that the fiscal space and redistributive powers of GM were still limited, despite agreeing a devolution deal with the central government. Indeed, some have referred to the deal as delegation rather than devolution. Financial allocations to general practice, CCGs and LAs were still centrally determined, limiting the power to raise additional resources. Additionally, there was no legal framework behind the transfer of powers, and the powers were delegated to a coalition of public bodies rather than to a statutory authority [59]. NHS hospitals were also still subject to the same national targets and quality targets, and CCGs had the same commissioning responsibilities and spending procedures as other CCGs across England [60]. Taken together these circumstances may have constrained the ability to re-direct spending toward preventive and primary care services. Moreover, population health promotion also depends on resources allocated to other public services, which we did not map in detail.

Other applications of the SHA at a sub-national level exist for Kaduna State in Nigeria [15] and Punjab State in India [16], illustrating how the

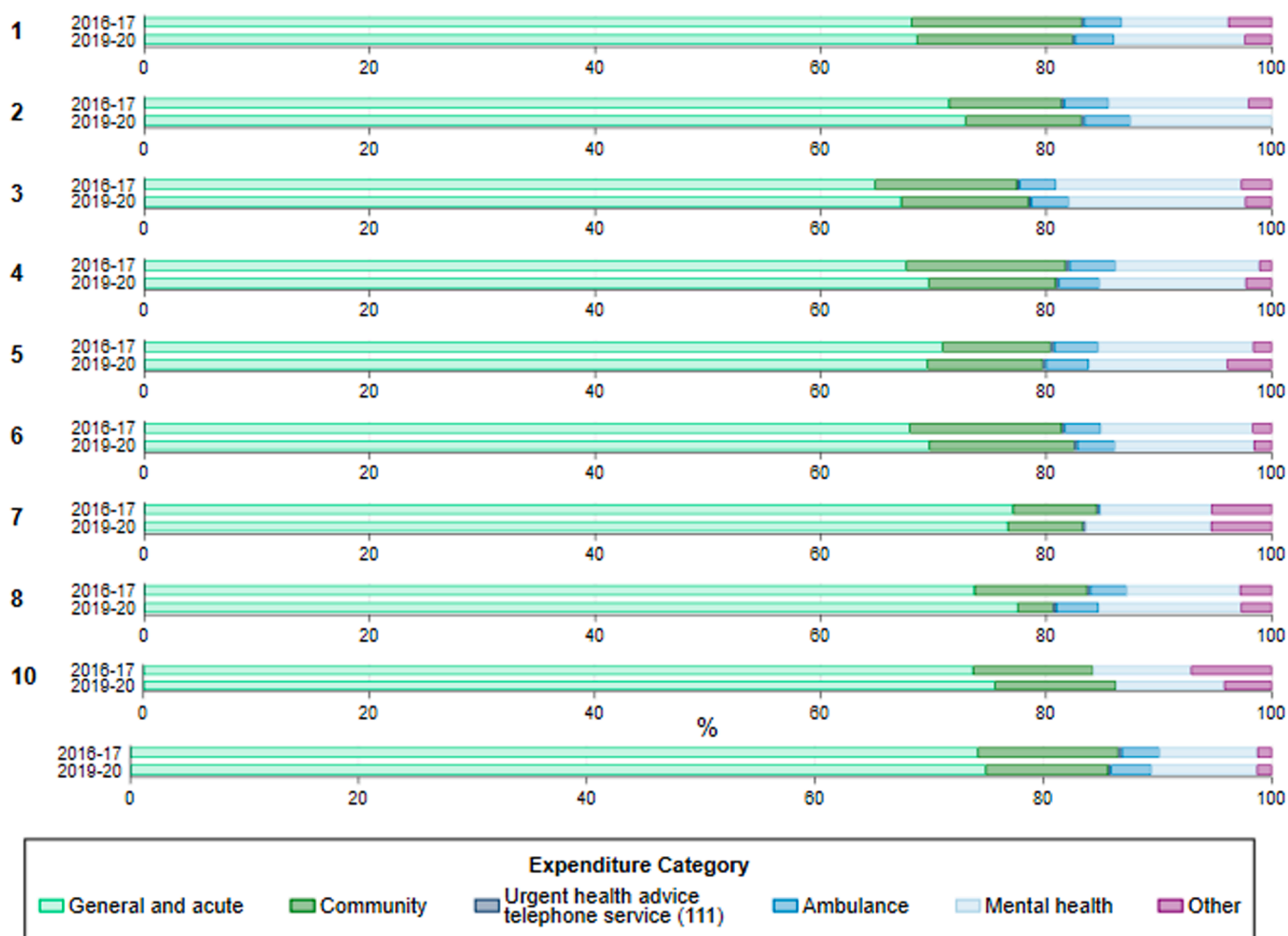


Fig. 4. CCG expenditure on services from Trusts, 2016/17 and 2019/20
 Localities ordered alphabetically: (1) Bolton, (2) Bury, (3) Manchester, (4) Oldham, (5) Rochdale, (6) Salford, (7) Stockport, (8) Tameside, (9) Trafford, (10) Wigan.
 Total includes all CCG payments categorised as trust payments.
 Data sources: CCG expenditure data.
 Two negative values have been removed: Stockport expenditure on ambulance services in 2019-20 and Bury “other” expenditure in 2019-20.

framework can be adapted to respond to policy priorities and focus in different settings. For example, a prominent focus of both of these studies was the extent to which health care expenditures were funded through risk-pooling mechanisms versus out-of-pocket payments. The former study found that out-of-pocket expenditure comprised 81% of total healthcare expenditure in Kaduna State, compared with 71.5% for all of Nigeria. The latter study found that 79% of health expenditure in Punjab State was private, and that risk-pooling mechanisms were being adopted to a lesser extent in Punjab State compared with the rest of India.

While out-of-pocket expenditure is of high interest in many settings, we analysed only public expenditure on health and care. We did not focus on out-of-pocket payments because the proportion of total health and social care expenditure that is out-of-pocket in the United Kingdom is much lower (16% of health care expenditure and 26% of long-term care expenditure in 2019) [61]. Additionally data at sub-national level are not easily available. This highlights how the framework can be adapted to the specific health system design and policy priorities.

Mapping only local government health and care financing and expenditure (and omitting private expenditure) is in some ways a more straightforward task. However, challenges still exist. Where there are different government institutions with responsibility for different overlapping populations or services, difficulties can arise in apportioning expenditure to specific localities. For example, during our study period

there were two different types of major local institution with some responsibility for health and/or care. If different institutional footprints do not match well, this may present a challenge for analysing the flow of funding for another local area in England or another country.

The categories used to record expenditure by local institutions present another potential challenge to mapping funding flows in local settings more generally. The feasibility of any analysis of local expenditure depends on which categories are used in recording expenditure, and whether expenditure information is available at the local level of interest. There may be a mismatch between how spending is reported and the information it may be more helpful to see reported. Due to the way that local expenditure is recorded in England, we were able to analyse expenditure by type of provider and by function, but data availability may not permit this in some settings. Finally, despite standardised categories, there may be substantial heterogeneity in how different sub-national units classify and report their spending.

5.1. Limitations

Most CCGs and LAs in GM had a well-matched geographic footprint, which lends itself well to considering them as a single locality. For one locality (Tameside), the footprint of the LA did not match perfectly with the CCG. Despite this, we treated it as one locality.

Tracking financial flows at the sub-national level requires detailed

data that may not always be available or collected systematically across areas and over time. In those instances, tracking may require approximations based on sensible assumptions, such as we did for LA revenues.

We were unable to draw conclusions about the impact of devolution on the flow of funding in GM, for which information on the previous period and on the rest of England would be required. Further research should seek to do this. It is also possible that there could have been changes in the flow of funding in the first year of devolution, between 2015/16 and 2016/17. Our analyses would not have detected these changes.

6. Conclusions

In many countries there is a need to consider the financial sustainability of the whole health and care system, at both national and local levels.

An adaptation of the SHA for a local health system, which uses data at the level available, can be a useful tool for examining changes in revenue financing and expenditure. This can provide insights about health service expenditure and revenue sources and where action may need to be taken to align funding flows to support policy objectives.

Our analysis suggests that after reaching a health and social care devolution agreement in 2016/17, GM may have struggled to redirect resources to achieve their goals related to population health prevention and transforming community-based care and support. Limited devolution of fiscal powers for raising revenues and re-allocating expenditure, alongside the lack of a substantial increase in total resources, may have constrained GM's ability to do so.

The change from CCGs to ICSs in England presents an opportunity to redistribute resources across areas and/or services within the new larger footprints. However, the allocation of resources to a larger geographic footprint coupled with autonomy over how those funds are spent amplify the need for monitoring and understanding patterns of expenditure and for clear criteria for allocating spending within an ICS. We have provided and illustrated an approach for doing so, which could be adapted to other settings and policy priorities.

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CRedit authorship contribution statement

Charlie Moss: Conceptualization, Data curation, Investigation, Project administration, Visualization, Formal analysis, Writing – original draft, Writing – review & editing. **Laura Anselmi:** Conceptualization, Project administration, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Marcello Morciano:** Writing – review & editing. **Luke Munford:** Writing – review & editing. **Jonathan Stokes:** Conceptualization, Writing – review & editing. **Matt Sutton:** Funding acquisition, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.healthpol.2023.104904](https://doi.org/10.1016/j.healthpol.2023.104904).

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