Political Geography 66 (2018) 76–87

Contents lists available at ScienceDirect

Political Geography

journal homepage: www.elsevier.com/locate/polgeo

Global urban policy and the geopolitics of urban data

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ARTICLE INFO

Keywords:
Urban knowledge
Urban policy
Habitat III
Geopolitics
Network analysis

ABSTRACT

Cities have gained prominence in global sustainability discourses. The United Nations '2030 Agenda' highlights in at least four key agreements the need to engage local stakeholders as key partners for the implementation of global policy objectives. As a result, the rise of a 'cities agenda' has led not only to an increased role for cities in global politics but also to a reshaping of the knowledge-base underpinning international agreements and their implementation. This paper argues that the contemporary willingness to move beyond the "territorial trap" of modern geopolitics, by emphasizing cities' agency in global affairs and by calling for the production of globally comparable urban data, induces a process of reframing and rescaling existing understandings of the global. In that sense, the question of urban knowledge production – especially that of urban data creation – is an essentially geopolitical one. However, insights from critical geopolitics have been rarely used in current debates on global urban policy and urban data politics. This work, we posit, can inform current academic and policy discussions, as it invites us to explore three interrelated questions: how is the urban being written into contemporary global politics? What type of 'urban' issues are made salient/invisible in that process? Which geopolitical actors are currently dominating the production of urban knowledge globally? This paper offers to start addressing those themes, through the study of 28 global urban databases, digging into the technical as well as human components of those. In doing so, we offer a preliminary assessment of techno-political apparatus that underpins the construction of a global 'urban gaze' which in turn shapes - as much as it is maintained by - global urban policy frameworks and hegemonic forms of knowledge production.

Introduction

Cities have gained prominence in contemporary global sustainability discourses. Numerous United Nations processes and events, city-led activities and initiatives from the private and civil society sectors emphasise their importance as sites of opportunities and solutions to global challenges. The United Nations '2030 Agenda' (Parnell, 2016) highlights in at least four key agreements the need to engage local stakeholders as key partners for the implementation of global commitments: the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR, 2015), the Addis Ababa Action Agenda (AAAA, 2015), the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (2015), and the New Urban Agenda (NUA, 2016) (Birch, 2018; Klaus, 2018). The adoption of an "urban" Sustainable Development Goal (SDG11) on inclusive, safe, resilient and sustainable cities has "*framed the city in a discourse of urban opportunity for addressing a range of global problems*" (Barnett & Bridge, 2016). These UN frames have emerged in a landscape where cities themselves have been progressively active in claiming a stake in international affairs (Curtis, 2016), with growing numbers of formalized city networks now advocating an urban presence across a vast variety of policy domains (Acuto and Rayner, 2016). Building on this recognition, cities have often been portrayed as better suited and more agile than states in addressing global sustainability concerns (Johnson, 2018; Acuto, 2013). Yet, despite sweeping statements by the international community about the value of cities in achieving sustainability objectives (Bloomberg, 2015), many questions still stand about what it means, in practice, to link international policy with urban issues (Acuto, Parnell & Seto, 2018; Revi, 2017). Policy and academic observers have been discussing how local governments themselves would participate in the implementation of global commitments, pointing out their involvement would necessarily require adequate and localized data and monitoring systems (Mcphearson et al., 2016). This, they argue, would imply going beyond state-centric reporting and data collection frameworks much of the UN system is currently predicated upon (Robin, Steenmans & Acuto, 2017; Barnett & Parnell, 2016; Simon et al., 2016) to ensure it includes city-level information (Birch, 2018; Acuto, Robin & Lane, 2018).

By emphasizing the importance of producing local and city-level

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https://doi.org/10.1016/j.polgeo.2018.08.013
Received 6 July 2017; Received in revised form 19 July 2018; Accepted 17 August 2018

information, those conversations have also highlighted data creation as a prerequisite to the active participation of local governments in the geopolitics of global sustainability (Dellas, Carius, Beisheim, Parnell, & Messner, 2018). As a result, the rise of the 'cities agenda' has led not only to an increased role for cities in global politics, but also to a re-shaping of the knowledge-base underpinning global commitments and their implementation. Therefore, the repeated scholarly and policy warnings about the current lack of urban data also raise fundamental questions about what it means to 'call' the urban into global politics, in particular through knowledge production. Authors such as Barnett and Bridge (2016, p. 1187) have indicated that "*what is required is a form of analysis oriented not by a concern with how to define 'the urban', but rather by an interest in understanding how and why making sense of urban issues becomes salient in the first place.*" Along with this, there is in our view a need to understand the process through which specific ways of making sense of urban issues in turn reinforce hegemonic ways of seeing the city, and how this shapes global urban politics. As already demonstrated by others (Rokem & Boano, 2017), critical geopolitics offers a fertile ground to start unpacking such questions. This is an area that has long attended to the politics of knowledge, for instance demonstrating how geographical sciences and technologies of knowing have supported particular geopolitical discourses or interventions throughout history (Ó Tuathail, 1996). The contemporary willingness to move beyond the "territorial trap" of modern geopolitics (Agnew, 2003), by emphasizing city agency in global affairs (Oosterlynck, Beeckmans, Bassens, & Segaert, 2018), and by calling for the production of globally comparable urban data, invites a new process of reframing and rescaling our understanding of the global. In that sense, the question of urban knowledge production – especially that of urban data creation – is, we argue, an essentially geopolitical question. Yet, insights from critical geopolitics have been rarely (if at all) used in current debates on global urban policy and urban data politics. This work, we posit, can enrich current academic and policy discussions, as it invites us to explore three interrelated questions: how is the urban being written into contemporary global politics? What types of 'urban' issues are made salient/invisible in that process? Which geopolitical actors are dominating the production of urban knowledge globally?

In addressing these themes, this paper seeks to unpack how power operates and manifests in the current global urban knowledge landscape, and how it shapes the ways in which urban issues are framed – and acted upon - in global urban policy. In doing so, our investigation explores *the geopolitics of urban data* more specifically, although we contend that knowledge production goes beyond the generation of standardized data. This focus is justified by the emphasis in global (as well as local) policy and academic discourses on the need to address current 'urban data gaps' and to generate comparable urban information. In what follows, we first ground our work into scholarly research from critical urban data studies and critical geopolitics to argue that writing cities into global politics implies paying attention to the techno-political and socio-spatial architecture that underpins this process. Second, we introduce our methodological approach to the analysis of 28 global urban databases. Third, we dig into the technical as well as human components of global urban datasets to unveil the geopolitics of urban data. In doing so, we seek to decipher the power structures that support the construction of a contemporary global 'urban gaze' which in turn shapes - as much as it is maintained by - global urban policy and hegemonic forms of global urban knowledge production. Fourth, we discuss how our findings advance a research agenda on the geopolitics of urban knowledge, one that takes issue with the ways in which the global urban is being written and narrated through contemporary urban data production processes. Finally, we discuss the policy implications of the current urban momentum in global politics and the resulting call for an urban data revolution.

The 'urban gaze' in global politics

Despite the role cities are expected to play in the implementation of the 2030 Agenda, several authors have stressed that local governments come ill-prepared to keep up with the policy demands they are facing. Indeed, the need for policy relevant knowledge at the local level and the lack of integrated and readily available data about urban conditions across multiple sectors have been highlighted numerous times (e.g. Parnell, 2016, 2018; Birch, 2016; Acuto, 2018). For instance, the UN's Cape Town Global Action Plan for Sustainable Development Data (UN Statistical Commission, 2017) explicitly urged national governments to improve their data capacity and production at every government level – including city-level data - to track and monitor progress towards the implementation of these global development agendas. In early, 2017, more than 200 city leaders signed the Dubai Declaration emphasizing the importance of "*city data as the universal language*" (Bosworth, 2017). Simultaneously, the recent years have been marked by the emergence of a wide range of intitiatives aiming to produce knowledge about cities, and led by various academic, private and non-for-profit actors (e.g. Acuto, Robin et al., 2018; Acuto, 2018; Bai, Elmqvist, Frantzeskaki, & McPhearson, 2017). In particular, some institutions have embarked on the generation of globally comparable urban data – be that to support national and local governments reporting on their efforts towards meeting the SDGs (e.g. Caprotti et al., 2017; OECD, 2018), or to address (local) policy and business demands for city benchmarking and indexes (e.g. Holden, 2006; Kitchin, Lauriault & McArdle, 2015), or to increase the visibility of urban governments themselves on the global scene (e.g. Bhada & Hoornweg, 2009). This claim to a geopolitical role for the 'urban' – however poorly defined - has also been increasingly sponsored by the private and philanthropic sector, with major initiatives such as the C40 Climate Leadership Group and the Rockefeller 100 Resilient Cities leading to the production of globally comparable urban information across a variety of policy domains (e.g. Spaans & Waterhout, 2017). In many data scarce contexts, global urban data platforms, for instance the ones sponsored by UN-Habitat, have become a reservoir of expertise for local governments and local actors. Equally, media groups (e.g. the Economist Intelligence Unit) and private companies (e.g. McKinsey) are regularly producing global indexes and city rankings. Yet, the term 'data' itself is value-laden: the production of 'urban data' or 'urban analytics' solutions, often presented as a panacea in entrepreneurial 'smart cities' discourses, has coalesced interests from the private sector and governments worldwide but has also been heavily criticised for what it leaves out (i.e. everyday experience of the city) (McFarlane & Söderström, 2017), the types of interests it serves (Neirotti, De Marco, Cagliano, Mangano, & Scorrano, 2014; Söderström, Paasche, & Klauser, 2014; Townsend, 2013; Vanolo, 2014) and the issues it raises in relation to privacy and surveillance (Kitchin, Coletta, & McArdle, 2017; 2015; Schindler & Marvin, 2018). Similarly, the focus on the production of large scale, standardized, comparable quantitative urban data for the monitoring of the NUA and SDG11 have dominated global conversations with few critical insights about who produces that information, its selective effects in terms of what types of urban realities are made visible through knowledge production, and how such knowledge can be used, and by whom (Robinson and Parnell, 2017). This is not to undermine the value of creating collective standards for data production, as comparison beyond national borders can also help localities design better policies through mutual learning (Keiner & Kim, 2007). However, the limitations of standardized and commensurable urban metrics also need to be accounted for, and the process of inclusion/exclusion that underpin their production needs to be acknowledged. Authors like Robinson and Parnell (2017, p. 15) usefully remind us that the NUA and SDG agenda require:

> "first to harness and synthesize knowledge; second to acknowledge the limits of commensurability in assembling data on different processes; and third to protect against geographical exclusion in the

event of data gaps, and to avoid gross generalizations that erase urban specificities."

This body of work has shown that existing urban knowledge structures remain poorly representative of the experience of those affected by rapid urban transformations, for instance community groups and vulnerable populations - in cities of the Global South but not only. Some researchers have even taken a more proactive approach, exploring, through action-research, how multi-stakeholders partnerships including universities, local governments and communities could facilitate the local implementation and monitoring of SDG11 (Patel, Greyling, Parnell, & Pirie, 2015; 2017). In relation to this debate, the work of authors like Kitchin (2014) or Luque-Ayala and Marvin (2015; 2016) and Marvin and Luque-Ayala (2017) is particularly insightful as it shows that discussions of the politics of urban data require us to explore the human and non human components of urban data architectures. In that sense, experts, knowledge users, scientific tools, knowledge infrastructures and epistemic approaches to the urban need to be studied in conjunction to unveil how power operates through those. Indeed, as stressed by Andrejevic (2013, 26 cited in Kitchin, 2014) "*all data provide oligoptic views of the world, not panoptic ones: views from certain vantage points, using particular tools, rather than an all seeing, infallible god's eye views*." In a similar vein, other authors have insisted on the importance of producing qualitative accounts of urban transformations to inform the design of an inclusive and holistic global urban knowledge architecture (Robin et al., 2017) and of 'localising' global targets such as the SDGs, through partnerships with local actors, to make them relevant to local conditions (Simon et al., 2016). This is a focus which, brought in conversation with earlier work on critical geopolitics, can help understand the relationship between contemporary global urban policy and urban data politics, for it relates to the formation of new geopolitical imaginaries centred around cities. In that sense, the emergence of a "global urban agenda" (Parnell, 2016) demands a rewriting of the global in light of urban questions, and this process of geographical narration and delimitation is imbued with inevitably geopolitical challenges (Rokem & Boano, 2017).

Seminal research in critical geopolitics has highlighted the relationship between the exercise of power, at a global scale, and the production of knowledge about the world. In a foucauldian fashion, such work stresses "*the entwining of governmentality and geographical knowledge in the writing of global space*" (Ó Tuathail, 1996, p. 19). Hegemonic views of space - as "*a set of dominant understandings and [related] practices*" (Agnew, 2003, p. 10) – are supported by a set of scientific tools, professions and discourses that shape actors' perceptions and actions. Hegemonic ways of knowing are themselves disseminated through and supported by multi-scalar "*interpretative communities*" (Ó Tuathail, 1996, p. 60) including system of experts involved in the production of geographical knowledge (Gregory, 1978) as well as other actors (public or private) using that knowledge in their exercise of power. In that sense, power operates through the ability of particular institutions to produce "truth" about the world and to maintain the dominance of particular ways of knowing the world (e.g Davis, Kingsbury, & Merry, 2012). Postcolonial scholars have long highlighted the relationship between European modernity, the colonial project and the imposition of particular "*classification of the world founded on a macro-narrative and on a specific concept and principles of knowledge*" in their critical assessment of the geopolitics of knowledge (Mignolo & Tlostanova, 2006, p. 205, see also; Grosfoguel, 2002; Mignolo, 2007; 2009; Escobar, 2007). Existing work on the politics of urban knowledge – and urban data specifically - has highlighted some of those issues – yet, it has rarely looked at those through a geopolitical lens, and at multiple scales (with the exception of Schindler & Marvin, 2018 discussing the implications of urban data standardization as a "universal logic of urban control", although they do not reflect on the geopolitical implications of standardization per se). Equally, critical geopolitical studies have rarely paid attention to the ways in which the emergence of cities as global actors (Lopez de Sousa, 2016), and of urbanization as a topic of concern in global policy, affect how "*the world is actively spatialized, divided up, labelled, sorted out into a hierarchy of places of greater or lesser 'importance'*" (Agnew, 2003, p. 3). Yet, both research agenda provide a fertile ground to start uncovering the geopolitics of urban knowledge at a time where cities are given prominence in global affairs.

In what follows, we define the geopolitics of urban knowledge as the process through which the urban is being written into global policy through knowledge production, and in particular through the production of globally comparable urban data. This working definition invites us to unveil how the generation of global urban data frames the city as an object of global politics, and how it simultaneously supports the spatialization of global urban policy at various scales of governance. The 'urban gaze' that emerges from current global urban data production efforts induces inherently selective ways of seeing the urban which often provide very few insights on the complexity and diversity of urban trajectories worldwide. In that sense, thinking about the geopolitical framing of global urban policy implies asking what types of urban realities are made visible through knowledge production, why do they matter, and for whom? Answering these questions requires considering the human and non-human components of the global urban data architecture, and in doing so, demands us to unveil the material and technical elements of contemporary geopolitics (Dittmer, 2014). Indeed, the production of a geopolitical urban gaze occurs through the identification and classification of essentially 'urban' topics deemed worthy of investigation; through the creation, selection, use of particular data collection instruments and analytical techniques; through the dissemination of these data through particular platforms, institutions and to particular publics (Latour, 2005). This geopolitical assemblage connects macro efforts of knowing the urban universally, to micro processes of data collection, analysis and use in particular locations. In what follows, we take this agenda forward through the study of 28 global urban databases.

Methods

As cities are increasingly called to action to solve global challenges, some observers have indicated that evidence-based urban strategies should build on already existing urban databases (e.g Acuto, 2018). However, little is known about the current global urban data architecture, its geographical and topical coverage, the type of data currently available, the types of institutions that are driving the production of global urban data (and their linkages with the global policy arena), or the types of representations of urban phenomena those create. As a result, looking into the current global urban data landscape, we argue, constitutes a relevant entry point to unveil the geopolitics of urban knowledge.

Our research reviews 28 existing global urban data initiatives.[1] Our selection criteria for defining what counts as a global urban database were straightforward, as we focused on databases that are international in scope, collecting information about cities across countries with

[1] Urban Data Initiatives included in the study: 100 Resilient Cities; Ambient Urban Air Pollution database; C40 Open Data portal; Cities 100; City Prosperity Index; City Statistics; European Cities Data Tool; European Urban Health Indicator System; Global Observatory on Local Democracy and Decentralisation; Global Rural-Urban Mapping Project; Global Cities of the Future; How Cities are Governed; Inclusive Cities Observatory; International Observatory on Participatory Democracy (OIDP); Knowledge Centre on Cities and Climate Change (K4C); Platform for Urban Management and Analysis; Shack/SDI Know Your City; The Atlas of Urban Expansion; The Global Human Settlement Layer; Urban Data; Urban Health Index; Urban Lex; Urban Observatory; World Bank Urban Development Indicators; World Cities Culture Forum; World Council on City Data; World database of large urban areas, 1950–2050; World Urban Database.

comparative endeavor (i.e. in a standardized fashion), and freely accessible. Our study was carried out between May 2016 and February, 2017, it was then updated in November, 2017. Our sample includes initiatives collecting different types of data: GIS data, urban indicators and statistical information, survey data and qualitative urban data (predominantly city-level case studies or city documentation). Each database was reviewed to include information about the type of data it collects (GIS, composite indicators, statistical information, case studies, documentation, survey data); the number and geography of cities it covers; the focus of the information produced and its relevance to key policy sectors of urban intervention; and the type of institutions involved in data production. Our analysis reviewed for each data initiative names of founders, partner organizations, funders (a more extensive exploration of the governance structures of these databases is available in Robin et al., 2017). We explored those actors' involvement in political arena where global urban policies are discussed and enacted, in particular global discussions and decision making platforms focusing SDG11 and the NUA.[2] We used network mapping to assess the prominence of specific actors in driving the international sustainable urbanization agenda and the production of urban data at a global scale. By looking at those different aspects of the global urban data architecture in the next sections, we hope to show that studying the geopolitics of urban knowledge implies paying attention to the content of existing urban knowledge bases (i.e. geographical and thematic coverage); it implies looking into dominant modes of knowing the urban (i.e. methods used to look at cities); and to identify the sites of global urban knowledge production (i.e. institutions) and how those relate to global policy arena.

As almost every day brings the news of organizations releasing a new global urban database, we contend our study is far from exhaustive, but it offers useful preliminary insights into the current global urban data landscape and its geopolitical implications. This is further corroborated by the fact that our results were presented to 30 experts involved in global discussions on urban knowledge and the 2030 Agenda at a two-day workshop (September 2016) in the run up to the Habitat III conference.[3] Feedback from the participants were used to validate our findings and to integrate new insights and data initiatives to the study (a qualitative account of this engagement with participants can be found in Robin et al., 2017). Additional insights were gathered through informal meetings with key stakeholders (data producers, policy makers and civil society groups) at the Habitat III conference (Quito, October, 2016) and the 8th World Urban Forum (Kuala Lumpur, February 2018). By linking particular data projects to the Habitat III process, we wish to provide an example of how "*attention to both specific sites and events*" (Dittmer, 2014, p. 386) can shed light on the process of writing the urban into contemporary geopolitics.

The geopolitics of urban data

The Western gaze as a starting (view)point?

Geographical unbalances in development, policy and knowledge are no novelty to urban research, yet it remains important to acknowledge and appreciate how these might affect the evidence base on which global urban policy agendas are shaped and implemented. If 21% of the world's urban population will be living in African cities in 2050,[4] this part of the world is still largely overlooked by existing global urban databases (Fig. 1). Not surprisingly, European cities dominate the number of cases that are currently covered in global urban databases (42% of data collected across all databases). Our sample included four data initiatives that focus on specifically one world region: with the exception of a pan-Asia case, three of these focus on European cities. Even if we were to remove these initiatives from the sample, European cities are still the most widely covered (36% of data collected across all databases), but the gap with Asian cities coverage narrows, as 34% of the information collected across all databases focuses on the latter. This presents an obvious imbalance on global coverage of present and projected urban population, as European urban dwellers only account for 14% of the global total, and both Africa and Asia are well underrepresented respective to their current and projected urbanization levels.

Our findings tend to highlight the important role regional coordinating bodies play in driving the production of comparable urban information. In Europe, in fact, the function of the European Union as a producer of urban data has been unequivocal. The EU has supported the collection of city-level information across Member States, as shown by the very large pool of demographic, socio-economic, environmental data available on Eurostat's City Statistics portal (923 cities from all sizes and from across Europe). EU-driven efforts to support the harmonization of urban data production now also spans beyond the boundaries of Europe. For example, the European Commission's Joint Research Centre (JRC) has been collaborating with the Group on Earth Observation since 2014 to create the Global Human Settlement Layer,[5] which was officially launched at the Habitat III conference in Quito. This open access online tool combines satellite imagery with socio economic data to produce GIS information, as well urban indicators that will help monitor the implementation of SDG11 and other SDGs.

African cities are still largely overlooked by global urban databases, partly due to capacity issues, as the technical and human resources needed to collect, process and analyze urban data is often lacking in municipal departments. But NGO-led initiatives that combine community-generated data and technological advances offer examples where reliable and relevant urban information is generated from the bottom up – at a very large scale - and where the process of data production also acts as a catalyst for community empowerment and development. The Know Your City initiative, led by Shack Dwellers International (SDI) and the Santa Fe Institute, provides slum dwellers with technical support to map their informal settlements and assess existing needs related to infrastructure provision. SDI has been particularly vocal in advocating globally for the recognition of urban dwellers living in informal settlements as key actors in the design and implementation of inclusive and sustainable urban transitions (Patel, Baptist, & d'Cruz, 2012). The generation of comparable data about informal settlements at a global scale was instrumental in those efforts.

The geographical skew of global urban databases goes beyond the lack of representation of specific world regions. Indeed, the type of city

[2] The coalition platforms included in the analysis are: The World Urban Campaign (WUC); The General Assembly of Partners (GAP); The Coalition for Urban Transitions; The Urban SDG initiative; Future of Place; The Global Taskforce of Local and Regional Governments; The Habitat III Journalism Project was also integrated in the analysis as a platform for discussion/outreach rather than governance platform per se.

[3] List of organizations involved in the science-policy interface workshop held at in September 2016, London: Cities Alliance; International Council for Science (ICSU); University of Cape Town, African Centre for Cities; University of Pennsylvania, Penn Institute for Urban Research; Adelphi; LSE Cities; Shack Dwellers International (SDI); University College London, Development Planning Unit; University College London, City Leadership Lab; Communitas Coalition; Guangzhou Institute for Urban Innovation; C40 Climate Leadership Group; Sustainable Development Solutions Network (SDSN); Future Earth; Mistra Urban Futures; United Nations University International Institute for Global Health; Huairou Commission; Prince of Wales International Sustainability Unit; University of Oxford.

[4] The these were the UN predictions at the time this study was conducted, but a recent report by the European Commission using a distinct methodology argues that in fact the pace of urbanization is much faster than predicted by the UN, and this threshold might have already been reached (Distra, 2018).

[5] This can be found at: http://ghslsys.jrc.ec.europa.eu/.

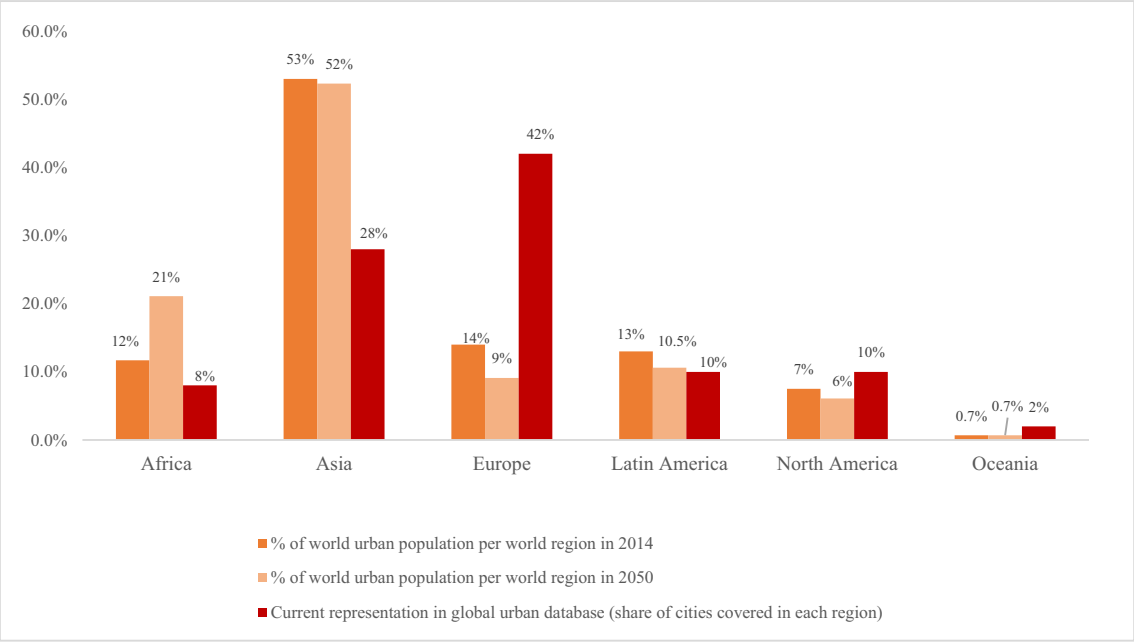

Fig. 1. Urban population per region compared to representation in sampled data initiatives, based on UNDESA World Urbanization Prospects, 2014 - note that these urbanisation trends were updated in May 2018, after the analysis for this study was finalised.

that is mostly covered in global urban datasets is also poorly representative of global urban trends. Half of the world's urban population already lives in settlements that have less than 500,000 inhabitants, and only one urban dweller in eight lives in megacities. According to numerous estimates, it is medium-sized cities that will experience the fastest, sharpest growth in the coming years (UCLG, 2016). Yet, large metropolises are extensively and predominantly covered in existing global urban databases and other international city rankings and indexes. The collection of data on small and medium-size cities is further complicated by obvious definitional matters that affect the urban data landscape we looked at, as even just the term 'city' cannot be easily defined (Brenner & Schmid, 2014). Our research reveals that the lack of clear definition of what counts as urban or metropolitan for instance has implications on what gets measured, what counts as a city and how urban issues are framed.

These issues raise obvious concerns about what types of urban settlements (mostly big metropolises) and urban geographies (predominantly Euro-centric) are made visible in global urban databases, and inform global understandings of urban challenges and opportunities. Equally, the diverging nomenclatures used to define what counts as 'urban' have led to contested appreciations of the scale and scope of urbanization patterns, with recent studies contending that urbanization might actually be happening much faster than what UN estimates predict (Distra, 2018). This in turn requires to start questioning how the global urban gaze is framed by the use of particular modes of knowing the urban.

Modes of knowing the global urban

Scientific tools and techniques offer selective representations of the world (Foucault, 1977), and the dominant use of particular instruments in the production of urban knowledge reinforces the hegemony of inherently partial ways of seeing the urban. In turn, methodological approaches and techniques used for data collection shape the ways in which data users make sense of urban phenomenon (Robin, 2018); they also determine who is able to participate in knowledge production efforts (i.e. the use of specific methods and tools require different skill-sets). For instance, research on the politics of mapping has shown that decisions about what is deemed worthy of being on a map often results in the exclusion of specific issues, populations, and spaces from the evidence base that underlies urban policy (Dodge, Kitchin, & and Perkins, 2011; Wainwright & Bryan, 2009). By mapping and counting, different actors (the state, community groups, planners, consultants) make society visible to itself, redefining the boundaries of a city by making visible some of its invisible parts. But mapping is only one among many methods deployed to make sense of cities, all of which are imbued with their own politics. As no single methodology would be able to capture the complexity of urban processes, it is key to critically assess the biases inherent to existing ways of knowing the urban (Robinson and Parnell, 2017; Barnett & Parnell, 2016).

Looking across all databases, the main type of information available appears to be quantitative 'urban indicators' in 18 datasets, with 9 gathering spatial (GIS) data and 6 producing city case studies. Only 3 of the observed databases also provide open access to city documentation,[6] whilst only 2 initiatives present city level information using survey data (Fig. 2). Some urban databases are mixing different methodologies: for instance, Eurostat's City Statistics database includes survey data on perceived quality of life across European Cities as well as key statistical information on economic growth, educational achievement, or employment rates.

As mentioned previously, much emphasis is currently being placed on the need to produce quantitative metrics – for instance composite indicators – in order to track cities' progress towards the implementation of SDGs and the NUA. Our analysis reveals that a large number of international urban data initiatives indeed focus on the production of such information. These indicators are based on varied methodologies, some of them focus on single issues (e.g. GDP/Capita, population growth, CO2 emissions, poverty levels, housing provision) whilst others intend to produce a holistic view of various policy objectives through composite indexes (such as the UN Habitat led City Prosperity Index). City indicators and indexes – whether produced by the public or private sectors - induce specific ways of seeing the urban and specific ways of

[6] City Documentation refers to open access policy documents municipalities to facilitate knowledge exchange, these include for instance planning regulations, spatial plans, economic development strategies, sustainable urban development strategies, municipal finance laws, policy reports and evaluations of specific programs.

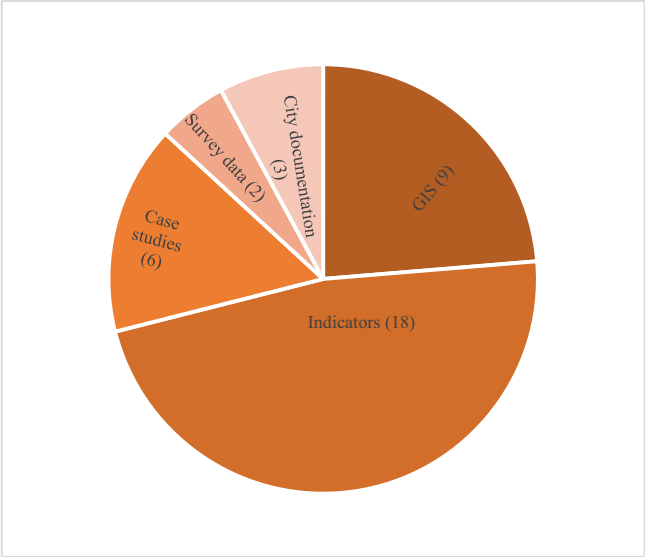

Fig. 2. Number of databases covering each type of data.

framing urban problems in that regard (e.g. Holden, 2006; Innes & Booher, 2000; Klopp & Petretta, 2017; Rydin, 2007). It can also push policy makers to focus their efforts on policy issues for which progress can be easily tracked quantitatively (e.g Liverman, 2018). A large number of private actors have been involved in the production of such metrics, explicitly focusing on the production of urban data that supports global competition between places for investments, business location, attraction of the global creative class, or tourists, amongst others.[7] As global international competition between cities increasingly shapes urban strategies, the extent to which these metrics frame urban issues in a way that resonates with objectives of sustainability, inclusivity and poverty reduction, as stated by the SDGs and the NUA, is debatable. Such quantitative information might prove useful as they provide a synthetic and comparable numerical appreciation of specific policy issues as well as of progress towards policy objectives, but they also lack the depth and contextual information that qualitative analysis offers to understand why and how interventions succeed or fail, for instance.

As already mentioned, different modes of knowing the urban require different skills and capabilities. This influences actors' ability to create and use urban information, it also dictates what can/cannot be seen in a given dataset (Kitchin et al., 2015). Dynamics of exclusion infuse the production of urban data, especially when it relies on highly technical methodologies or advanced technological systems for data collection (e.g Kitchin, 2014). From a geopolitical standpoint, this obviously influences who can or cannot take part in the production of data deemed relevant to inform the design, implementation and monitoring of global urban policy frameworks such as the SDGs and the NUA, both locally and globally. At the same time, technological developments can help overcome these issues: for instance, existing work on the use of satellite imagery and machine learning to map poverty and informal settlements across urban areas worldwide has highlighted the benefits of such data for cities that lack even the most basic spatial information (Lilford, Taiwo, & de Albuquerque, 2018; Xie, Jean, Burke, Lobell, & Ermon, 2015, for a critique, see also Luque-Alaya and Neves Maya, 2018). These technologies also contribute to reframing the 'urban' in relation to its physical and material footprint, as opposed to focusing on a city's administrative boundaries. In that sense, geospatial imagery contributes to creating a more global understanding of urban processes, going beyond the focus on administrative entities ('the city') to highlight urbanization patterns and their effects on earthly material, physical and spatial transformations (Agyemang, Amedzro, & Silva, 2017). These technologies can also contribute to reframing territorial boundaries beyond nation states, for instance by highlighting the environmental impact of urban expansion processes on the world's biodiversity (Seto, Güneralp, & Hutyra, 2012). In that sense, data collection tools do play a role in reframing traditional geopolitical writing by introducing new scales and visual representations of urbanization patterns (and their impacts) in global politics. Simultaneously, at a micro scale, such information can help the localization of global urban policy objectives in data scarce contexts, pending the data produced is relevant to the challenges faced by municipalities and other local actors. Indeed, challenges in the unbalance of available data extend beyond the types of methods and tools used to make sense of urban phenomena: understanding what types of urban (policy) issues are made salient through data production efforts is key in grasping the framing effects of global urban datasets.

Framing effects

The 'urban gaze' in contemporary global urban policy emerges from the ways in which urban issues and challenges are framed both in international agreements on cities and in global urban databases, in their attempt to produce universal and comparable urban knowledge. Taken together, those attempts at framing the urban question in relation to areas of policy interventions further contribute to making selected aspects of the urban manageable and controllable through data-informed interventions. In reviewing the objectives stated in the NUA and SDG11, we found that the urban question is framed around 17 policy sectors[8] in global urban policy (Fig. 3). We then explored the thematic content of each 28 databases to understand how closely they aligned to those policy areas, and to identify gaps between the current global urban data architecture and the policy challenges highlighted in international agreements on cities.

Information on spatial planning (ranging from technical information on the shape of built areas, to documentation on planning regulations) is the most covered across all databases (17.3% of all data produced); followed by transportation (11.6%) and governance, legislation and regulation (11.3%). Urban issues across all 28 databases therefore seem to be predominantly framed around challenges posed by rapid urban expansion, transport infrastructure provision, and the governance arrangements that are needed to manage such urban physical transformations. Climate change, resilience and adaptation issues are mostly known through qualitative information, even though the lack of robust spatial information on urban risk exposure – especially in informal settlements - has been highlighted as a key issue for urban disaster risk reduction strategies (Osuteye, Johnson, & Brown, 2017). The databases under review only provide limited information about education (2%), and research/innovation (1%), showing perhaps a limited reflexion on (interest in?) the role of higher education institutions and research bodies in addressing some of the challenges posed by the global emergence of an "urban society" (Addie, 2017). Additional under-scrutinized areas include those of ICT provision (0.6%) and Participation and Local Democracy (3.6%), which are likely to be central to infrastructural and human rights matters embedded in the SDGs and the NUA, even though the later does not explicitly mentions a

[7] These fall outside of the scope of this study. For instance, Jones Lang Lasalle and the Business of Cities have produced a detailed review of 380 city indexes in the past two years. See: http://www.jll.com/Research/jll-business-of-cities-report.pdf.

[8] For the purpose of this review, policy sectors were narrowly defined, but some data produced in one category overlaps with other policy domains and can also be used to inform integrated urban strategies (for instance, information on land use, urban sprawl, transportation modes are all relevant to issues related to sustainability and resilience).

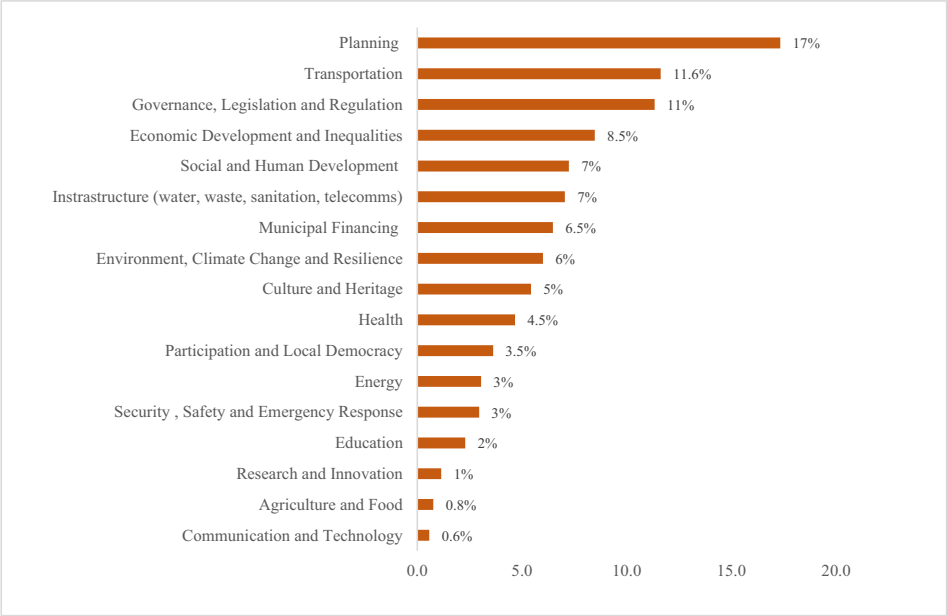

Fig. 3. Share of data produced per policy area.

universal right to the city (a theme which has however been advocated for by civil society groups and academic institutions in their engagement with the NUA process, see for instance Parnell, 2016). Questions of rural/urban linkages, especially in relation to food security in urban areas are also underexplored despite being one of the key challenges to urban sustainability – and urban living – in the coming years (e.g Romero-Lankao, McPhearson, & Davidson, 2017).

Unpacking how the geopolitical urban gaze frames the urban also necessitates looking at the relationship between objects of knowledge (i.e. focus on particular themes or areas) and modes of knowing. So, do global urban databases 'know' different aspects of the city differently? Data at hand suggest so (Fig. 4). This question is a particularly important one as methodological constraints might explain why some urban challenges escape the geopolitical urban gaze. Indeed, as explained earlier, methodological and analytical choices influence what can or cannot be made visible through knowledge production. The willingness to make particular urban issues universally comparable comes with its own limitations, for it contributes to using methodological approaches that reduce urban challenges to a set of quantifiable - and therefore easily comparable - metrics.

Initiatives focusing on collecting or creating urban indicators cover all 17 policy areas, highlighting the prevalence of quantitative metrics as a privileged mode of knowing every aspect of the urban. Transportation is widely covered in datasets collecting urban indicators and statistical information, followed by planning, infrastructure and culture and heritage. Qualitative datasets, collected either through case studies or the compilation of policy documents, perhaps unsurprisingly, cover themes such as 'governance, legislation and regulation', followed by 'planning' (mostly planning regulations and examples of best practices in planning interventions, which also relates to UN Habitat efforts to incentivise planning reforms in the Global South, in African countries in particular, Duminy et al., 2014), 'participation and local democracy', 'environment, climate change and resilience', and 'social and human development'. GIS data initiatives cover 10 policy sectors, and, as may be expected, focus mostly on data related to spatial planning, with about half of the spatial data collected directly relevant to planning policy, followed by transportation and social and human development, as well as health. Getting the right mix of quantitative, spatial and qualitative data across a wide range of urban challenges is essential. For one thing, recognizing the diversity of methodological and analytical approaches applicable to a particular urban issue might contribute to allowing a more diverse pool of institutions and actors to participate in urban knowledge production – as the range of skills necessary to participate in data production (and data use) is broadened. In addition, it also contributes to making the urban gaze more plural and cognizant of the partial understanding of urban phenomenon single methodologies offer.

Whilst national and local data initiatives are excluded from our analysis, national and local governments across the world are undoubtedly pivotal to broadening the global urban gaze and to address its blind spots. For instance, if information about urban health is poorly provided by the global urban databases under review (below 5%), national initiatives such as the Big Cities Health project in the United States can fill this gap. Nonetheless, addressing the blind spots of the global urban gaze is not just a matter of linking databases at different scales. Indeed, the standardization for data collection and curation, across geographies and scales of governance, has been heavily promoted by international institutions such as UN-Habitat or the World Bank. Such views contend that international, regional, national and local data projects can complement and support each other in building relevant and useful urban knowledge through the development of shared standards and data curation frameworks to allow information to be shared and used effectively across policy domains and scales of intervention. In that regard, the politics of standardization is a crucial aspect of the geopolitics of urban data. Organizations such as the World Council on City Data for instance developed ISO Standards[9] for the collection of data in order to allow local governments worldwide to generate city level information that is standardized and comparable. Those standards are often developed in ways that are poorly integrative of non-technocratic expertise (Schindler & Marvin, 2018). However, technological advances also represent opportunities to generate robust urban information from the bottom-up, in a way that empowers citizens and communities on the ground (Osuteye et al., 2017; Townsend, 2015), and which simultaneously provides information that allow comparison and learning (which does not mean replication), and that can guide (and advocate for) policy interventions. Therefore, moving beyond the techniques and content of global urban datasets to look at whose 'way of seeing' is currently framing how the urban is being

[9] ISO 37120: Sustainable development of communities – Indicators for city services and quality of life.

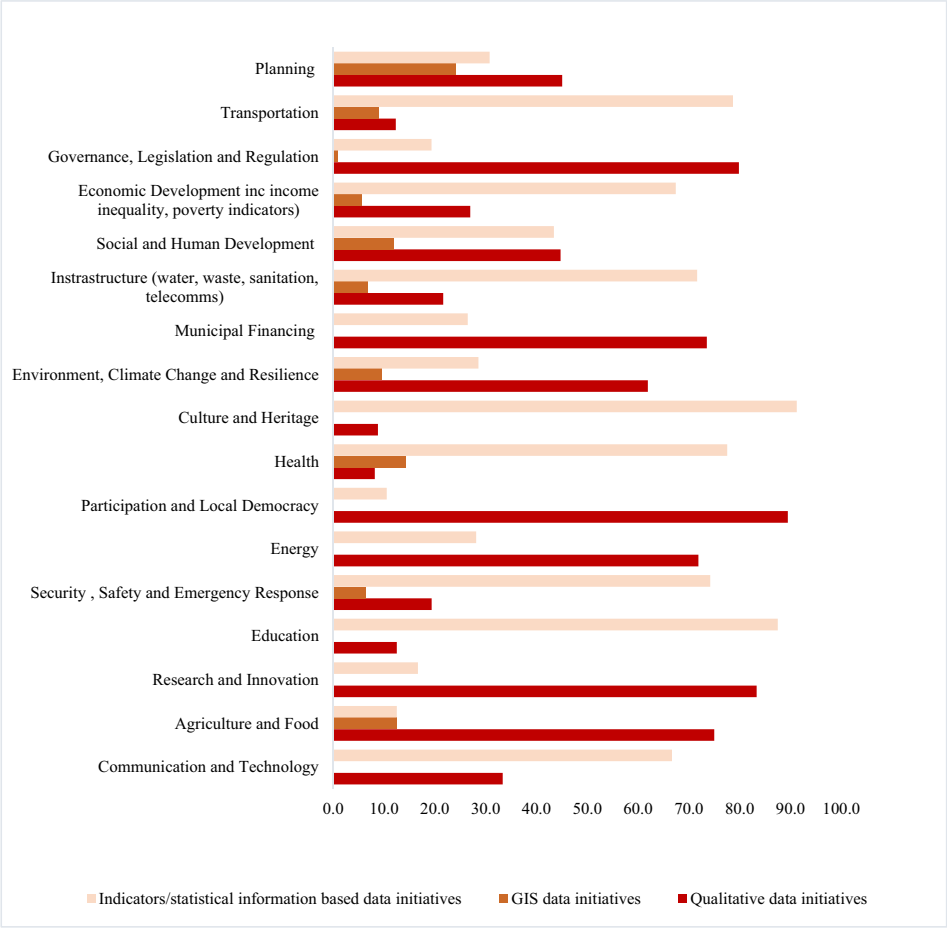

Fig. 4. Type of data produced per policy sector.

written into global politics is essential.

Shaping the geopolitical urban gaze

Knowledge of and about the urban comes from very varied sources – from citizens to government, including the private sector, international agencies, and grassroots organizations (Robin et al., 2017; Patel et al., 2015; Rydin, 2006). Therefore, unpacking the power structures that underpin the production of urban data for global urban policy also demands identifying whose voices are dominant – and whose voices are being marginalized - in that process. As our review suggests, experiences from non-Western cities are under-represented in global urban databases and looking at the type of institutions involved in global urban data production, and the extent to which they connect to global urban policy processes, might in part explain why that is the case. Our research mapped the various organizations active in global discussion and decision making platforms on SDG11 and the NUA (e.g. World Urban Campaign, General Assembly of Partners for the Habitat III conference; Habitat III Policy Units; the Campaign for an Urban SDG, or the Habitat III Journalism Project). The research focused on the platforms officially recognized as part of the Habitat III process and hence legitimized as relevant information sources in the design of the global agenda for sustainable urbanization. In order to assess the prominence of particular data producing institutions in the formulation of global urban policy, we used network analysis to map the links (edges) between data producing organizations (and their partners) (nodes) and the Habitat III structures when they existed.[10] This approach allowed us to map the network of geopolitical actors involved in global urban policy as well as urban data production (within the limits of our sample of data initiatives). The resulting network map (Fig. 5) is composed of 419 organizations; 204 of which are involved in the global urban data initiatives under review (either as lead organizations or partners of the initiatives). The bigger the node, the more connected. Each node in the network has been assigned a specific area of expertise (when explicitly referred to on the institution's website), which is reflected in the color coding for each node (green when the initiative focuses on sustainability, resilience and climate change issues; blue for health; brown for governance and participation; dark green for culture; orange when the focus is on planning and GIS data; purple when the focus is multi-sectorial).

Which geopolitical insights emerge from this network? The majority of organizations represented on the map are private sector organizations and higher education institutions (both 17% of actors present in the network); think tank/non academic research organizations and civil society groups/non governmental organizations both account for 15% of the network; followed by multilateral organizations (8%); professional networks (7.5%); city networks (5.5%). Other actors are less well represented; these include: the media (2.3%); individual local governments (outside of city networks) (2%). However, the number of organizations of each type tells us very little about their role in shaping urban data geopolitics and global urban policy. What matters is the degree to which different institutions are involved in both data

[10] Connections between actors were coded looking at the different actors (*footnote continued*) cited as partners on the data initiatives website and on the different policy forums cited above.

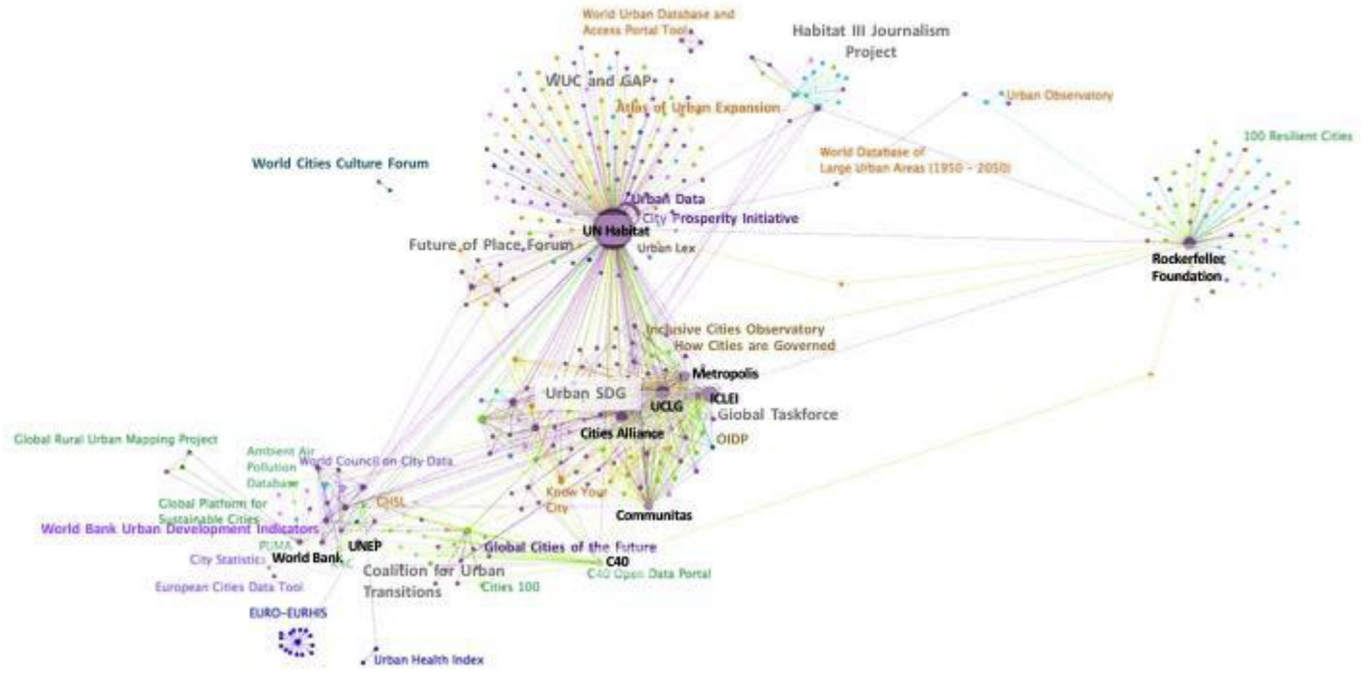

Fig. 5. The geopolitical landscape of urban data production and global urban policy.

production efforts (be that through funding or active participation) and in global urban policy platforms. For instance, numerous data initiatives, located towards the bottom of the network map, are poorly connected to global urban policy-making arena. Besides, they appear disconnected from the Habitat III journalism project, which might prevent the knowledge they produce to be disseminated across urban policy and discussion circles. UN Habitat and the Rockefeller Foundation are both connected to a large pool of expertise. Looking at key nodes in the network can also help identify which data producing institutions are holding together, and connecting, what appears to be a rather fragmented urban data/policy landscape. International organizations such as UN-Habitat and the World Bank unsurprisingly act as bridges between different data initiatives and policy arena, through funding. As a result, the data projects they fund often directly link to their policy priorities. This network map also reveals the organizational fragmentation of UN-led efforts to generate urban information (Birch, 2016; Parnell, 2016). UNEP and the World Bank are actually much more inserted within evidence production networks (towards the bottom left side of the map) than UN-Habitat. Local government coalitions/city networks (ICLEI, UCLG, C40), although less numerous in the network, appear to be particularly well connected in this map: they link data platforms to decision making platforms (e.g. GAP and WUC) or advocacy coalitions (e.g. Urban SDG campaign). These organizations play a pivotal role in building bridges between local governments, civil society groups, evidence producers and official UN decision making structures. UCLG supports four data initiatives that have been used to inform the Habitat III process, and has for quite some time now been a critical link between local governments and the UN system more generally, for instance through its leadership role in the UN Advisory Committee on Local Authorities or in the SDGs monitoring process. C40 has also been driving discussions and policy interventions around issues of cities and climate change for over a decade, mobilizing (just like Rockefeller 100 Resilient Cities more recently) sizeable interests, funding and data gathering towards making a case for the powers and capacity of cities in global climate action (Johnson, 2018). City-networks can therefore be seen as key geopolitical actors in the production of urban data as well as in the framing of global urban policy.

Some private organizations are equally active in shaping the geopolitics of urban data, through their involvement in different urban data projects. Their support takes the form of technical and operational support for data collection. ESRi for instance, a GIS and data analytics software company, is involved in the Urban Observatory, the World Database on Large Urban areas and the 100 Resilient Cities Initiatives. From a geopolitical standpoint, the emphasis put on the need to generate large scale, comparable, standardized datasets to inform global urban policy implementation contributes to reinforce the position of private companies which can sell technical expertise and analytical capabilities to governments, or other actors involved in city-making.

Philanthropic organizations do invest heavily in the production of global urban datasets. The Rockefeller Foundation has pooled together a wide number of not-for-profit, private and public partners in the 100 Resilient Cities initiative. This shows the essential role of foundations in supporting partnerships between civil society organizations and the private sector to inform municipalities in different policy areas, in that case urban resilience. Ax:Johnson funded the Future of Place Forum in the run up to the Habitat III conference, bringing together researchers, practitioners, policy-makers and activists to formulate recommendations to be included in the NUA; Bloomberg Philanthropies supports the Coalition for Urban Transitions platform. Rockefeller, Ford and McArthur Foundation also supported the Habitat III journalism project. The Ford Foundation was providing financial support to Communitas which has been active in fostering discussions around the localization of SDGs and a strong advocate for the development of an urban SDG; the Bill and Melinda Gates Foundation has provided financial support to the Know Your City Initiative in partnership with SDI, Cities Alliance and the Santa Fe Institute. Philanthropic actors are pivotal in the geopolitics of urban knowledge, as they fund the production of research on urban issues as well as direct interventions to address those. This generally points at the growing clout of the private donor world in the landscape of urban geopolitics (Kelly & McGoey, 2018), and of urban knowledge creation more specifically, raising important questions of legitimacy, inclusion and “philanthrocapitalism” (McGoey, 2015).

Writing the urban into global policy

Knowledge production is shaping contemporary geopolitical

imaginations on the challenges and opportunities arising from an "urban planet" (Elmqvist et al., 2018). Engaging in the "*examination of the geographical assumptions, designations and understandings that enter into the making of world politics*" (Agnew, 2003, p. 5) appears essential at a time where the urban is being written into global politics. As this paper initially posited, revealing the geopolitics of urban knowledge implies looking at a set of interrelated questions asking who produces urban knowledge and how, and what type of knowledge is generated as a result. In doing so, this research aimed to spark theoretical and empirical discussions on the ways in which the 'urban question' is currently being written into global politics. Such an endeavor, we argue, implies exploring the material, socio-spatial and political processes that underpin the production of a global urban gaze, a gaze which in turn frames how the urban is seen and acted upon through a set of global urban policy frameworks, and their localization. The material architecture that shapes the geopolitics of urban knowledge rests on a set of techno-scientific and methodological approaches to 'capturing' the essence of the urban, an essence which can subsequently be turned into object of policy intervention, an object that can be managed and controlled (Schindler & Marvin, 2018). As we have seen, an extreme reliance on indicators and statistical information to extract the many different qualities of the city contributes to turning complex urban systems into globally – or rather, universally - comparable objects. This is in line with the emphasis of global urban policy frameworks that put targets, monitoring and reporting at the heart of the 2030 Agenda for Sustainable Development, notably through the SDGs (Liverman, 2018). The socio-spatial architecture of the urban gaze also reveals its fundamental incompleteness, for it is, in its present form, poorly representative of the urban realities experienced in the *New Urban Worlds* (Simone & Pieterse, 2018) of Asia and Africa. This is obvious not only when looking at the content of existing global urban datasets, but also when one looks at the type of institutions that are currently driving the production of urban data: international organizations, anglo-american philanthropic organizations, Northern based research institutes and private companies. Within this, analytical and technical capacities to produce large scale, comparable urban data are often held by institutions where investments in such capacities (human and material) are the largest. Equally, the drive towards the standardization of urban data to create a 'universal language' is led by northern based institutions, which in turn raises questions as to whose viewpoint is performed by those universal standards. The complex intermesh of technical, social, spatial and political process that shapes how the urban comes to be known and framed in policy terms however is far from static. This research exposed the current representational bias of global urban datasets, but also recognises that such bias is non-static, as is the urban gaze. Given the relatively limited information on urban realities worldwide, these realities are constantly being challenged, redefined and revisited with urban data initiatives rapidly burgeoning at the regional, national and local scales. The geopolitics of urban knowledge therefore, far from being immutable, is currently being written, including from non-Western location. For instance, the Gauteng City Region Observatory in Johannesburg has been producing knowledge that is locally relevant on issues such as informality, racial inequalities and green infrastructure (Wray & Van Olst, 2012). In Colombia, the network Como Vamos brings together civil society organizations and the private sector to produce and disseminate information on transparency, accountability and democracy in 15 major cities across the country. In that sense, what we see emerging today is the potential for "*pluriversality, and not universality*" in urban knowledge production (Mignolo & Tlostanova, 2006, p. 210). The next and concluding section explores these points, discussing more practical policy issues that arise from an urban gaze in the making.

Conclusion

As the 'urban question' has gained prominence in the 2030 Agenda for Sustainable Development – specially in the NUA and SDG11 - the production of urban data and the establishment of urban knowledge-policy linkages has been strongly advocated for by civil society groups, academics, policy makers and businesses (Bai et al., 2017; Acuto, Parnell et al., 2018; Elmqvist et al., 2018). Yet, as this paper suggests, engaging in a systematic and critical analysis of the power dynamics at play in the production of global urban data is essential to unpack the ways in which specific types of urban geographies and urban issues are made salient in global conversations about "our" urban future (Marcuse, 2015). This approach allowed us to reveal the precarious architecture and the imbalanced scientific basis upon which the current global urban data landscape is based, be that in its content, in the tools it uses, or in its governance and funding structures. In addition, policy areas that will require critical urban interventions such as health, food security and emergency responses (especially in the wake of urban disasters) are still poorly covered in worldwide databases. The extent to which those issues can or will be incorporated in urban data production efforts will also be shaped by the power structures that underlie the funding and design of current research on cities. Foundations and philanthropic organizations are currently playing an active, if not leading role in the global production of urban data, and they have been shown to shape – not unproblematically - global research agenda in a number of development areas (e.g. global health, HIV research, climate change, etc) (McGoey, 2015; Sridhar, 2012). From a policy standpoint, this requires swift and collective action to achieve the promises of the post-2015 sustainable development agenda, especially SDG11 and the NUA. Within this very complex landscape, the regionalization of urban data collection efforts as well as partnerships between local authorities, academia and civil society groups offer inspiring avenues for the generation of urban information that reflects the current state of urbanization processes in different geographical areas and that address existing gaps in knowledge production, whilst also reflecting differing urbanization patterns and challenging all encompassing, universalizing attempts to reduce urban realities to a set of quantifiable metrics. Indeed, whilst the NUA and, particularly SDG11 (Parnell, 2018), have contributed to make the urban question visible in global policy, what is needed for their intentions to trigger sustainable and just urban futures is the production of a differentiated "*geographical imagination that takes places seriously as the settings for human life and tries to understand world politics in terms of its impacts on the material welfare and identities of people in different places*" (Agnew, 2003, p. 129). Here it is not just a matter of generating (and funding) more knowledge: rather it is about developing a more balanced and context sensitive urban knowledge base that is effectively connected to action in distinct locations.

Conflicts of interest

The authors have no conflict of interests to declare.

Acknowledgements

Part of this research received support from the UK Engineering and Physical Sciences Research Council (EP/M507970/1) and this paper is part of a broader investigation into the role of urban science in the implementation of the New Urban Agenda, which benefitted from the invaluable research support of Katrien Steenmans. We would like to extend our thanks to those who participated in the *Global Urban Knowledge and the New Urban Agenda* workshop (University College London, September 2016) for their engagement with the preliminary findings of this research. Special thanks also go to Jenny McArthur for ongoing and thought-provoking office discussions on the politics of quantification in urban policy-making. Finally, we are endeavoured to the journal editor and three anonymous referees for their useful and constructive comments on previous versions of this manuscript. We remain, of course, solely responsible for the views expressed in this article.

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