Mobilising urban knowledge in an infodemic: urban observatories, sustainable development and the COVID-19 crisis

Michele Acuto[1], Ariana Dickey[2], Stephanie Butcher[3] & Carla-Leanne Washborune[4]

[1]University of Melbourne, michele.acuto@unimelb.edu.au; [2]University of Melbourne, a.dickey@unimelb.edu.au; [3]University of Melbourne, stephanie.butcher@unimelb.edu.au; [4]University College London, c.washbourne@ucl.ac.uk.

Abstract: Along with disastrous health and economic implications, COVID-19 has also been an epidemic of misinformation and rumours – an 'infodemic'. The desire for robust, evidence-based policymaking in this time of disruption has been at the heart of the multilateral response to the crisis, not least in terms of supporting a continuing agenda for global sustainable development. The role of boundary-spanning knowledge institutions in this context could be pivotal, not least in cities, where much of the pandemic has struck. 'Urban observatories' have emerged as an example of such institutions; harbouring great potential to produce and share knowledge supporting sustainable and equitable processes of recovery. Building on four 'live' case studies during the crisis of institutions based in Johannesburg, Karachi, Freetown and Bangalore, our research note aims to capture the role of these institutions, and what it means to span knowledge boundaries in the current crisis. We do so with an eye towards a better understanding of their knowledge mobilisation practices in contributing towards sustainable urban development. We highlight that the crisis offers a key window for urban observatories to play a progressive and effective role for sustainable and inclusive development. However, we also underline continuing challenges in these boundary knowledge dynamics: including issues of institutional trust, inequality of voices, collective memory, and the balance between normative and advisory roles for observatories.

Manuscript length: 9,323 words (total)

Omitted references:

Authors 2016 - Acuto, M., & Parnell, S. (2016). Leave no city behind. *Science*, *352*(6288), 873.

Authors 2018c - Acuto, M. (2018). Global science for city policy. Science, 359(6372), 165-166.

Authors 2019b - Acuto, M., Steenmans, K., Iwaszuk, E., & Ortega-Garza, L. (2019). Informing urban governance? Boundary-spanning organisations and the ecosystem of urban data. *Area*, *51*(1), 94-103.

Authors 2020 - Acuto, M., Larcom, S., Keil, R., Ghojeh, M., Lindsay, T., Camponeschi, C., & Parnell, S. (2020). Seeing COVID-19 through an urban lens. *Nature Sustainability*, 3(10), 1-2.

Authors 2018b - Robin, E., & Acuto, M. (2018). Global urban policy and the geopolitics of urban data. *Political Geography*, *66*, 76-87.

Authors 2019a - Washbourne, C. L., Culwick, C., Acuto, M., Blackstock, J. J., & Moore, R. (2019). Mobilising knowledge for urban governance: the case of the Gauteng City-region observatory. *Urban Research & Practice*, online first 1-23, available at: https://doi.org/10.1080/17535069.2019.1651899

Mobilising urban knowledge in an infodemic: urban observatories, sustainable development and the COVID-19 crisis

Abstract: Along with disastrous health and economic implications, COVID-19 has also been an epidemic of misinformation and rumours – an 'infodemic'. The desire for robust, evidence-based policymaking in this time of disruption has been at the heart of the multilateral response to the crisis, not least in terms of supporting a continuing agenda for global sustainable development. The role of boundary-spanning knowledge institutions in this context could be pivotal, not least in cities, where much of the pandemic has struck. 'Urban observatories' have emerged as an example of such institutions; harbouring great potential to produce and share knowledge supporting sustainable and equitable processes of recovery. Building on four 'live' case studies during the crisis of institutions based in Johannesburg, Karachi, Freetown and Bangalore, our research note aims to capture the role of these institutions, and what it means to span knowledge boundaries in the current crisis. We do so with an eye towards a better understanding of their knowledge mobilisation practices in contributing towards sustainable urban development. We highlight that the crisis offers a key window for urban observatories to play a progressive and effective role for sustainable and inclusive development. However, we also underline continuing challenges in these boundary knowledge dynamics: including issues of institutional trust, inequality of voices, collective memory, and the balance between normative and advisory roles for observatories.

Introduction

Early in the pandemic outbreak, on the 2nd of February 2020, the World Health Organisation warned that the health emergency of COVID-19 was being compounded by "a massive 'infodemic'" – an epidemic of misinformation and rumours about the coronavirus, with tangible implications for collective efforts to tackle the crisis (Zarocostas, 2020). This was echoed by the United Nations Secretary General later in April, stressing that "this is a time for science and solidarity" with the launch of a UN Communications Response Initiative to "flood the Internet

with facts and science while countering the growing scourge of misinformation" on COVID-19.[1] WHO attributed these risks to "an overabundance of information—some accurate and some not—that makes it hard for people to find trustworthy sources and reliable guidance when they need it."[2] A special 'myth-busters' team and advice service has been set up tackle spreading misinformation, such as that COVID-19 is transmitted through houseflies, 5G radio and mobile networks, or that hot and mild climates are at lower risk of contagion. Whether it has been in the shape of the ever-present Johns Hopkins University geolocated atlas of cases, countless op-eds, articles and reports in the media, or the endless COVID-19-filled chatter on social media, the coronavirus crisis has undoubtedly been deeply entrenched in the circulation of information—with much of this focused in and about how cities have responded to the pandemic. The capacity to rely on tangible, scientific and actionable information, in particular, has been critical for those working across various scales of governance from local to national to make decisions on lockdowns, 'social distancing' measures, and short and medium-term economic planning in a time of sizeable downturn. Equally, evidence has taken a prime spot in the conversation over the future of the United Nations sustainable development agenda when the pandemic has seemingly, according to some, set back global aspirations "by decades"[3] at the very least (Nature 2020; Sachs, Schmidt-Traub and Lafortune 2020).

A rising discourse has already poignantly outlined the challenges of this infodemic for effective urban governance, as major sustainable urban development questions – from density and transport management to urban inequality and poverty – come to the fore in both Global North and South. Numerous public commentaries, from the *Guardian* in the UK to the World Economic Forum, but also increasingly academic outlets like *Nature*, have argued for the centrality of cities in the crisis (Lee et al. 2020; Bai et al. 2020; Authors 2020) and their imprint on the future of sustainable development in the post-COVID 'normal'. This is no novelty: the pandemic unravelled at a historical juncture that has seen the clear rise of a 'global urban agenda' in multilateral policy (Parnell 2016; Cociña et al. 2019), as intertwined with questions of

[1] Antonio Guterres "This is a time for science and solidarity" UN Secretary General press release, 14 April 2020: https://www.un.org/en/un-coronavirus-communications-team/time-science-and-solidarity
[2] WHO Novel Coronavirus (2019-nCov) Sit. Rep – 13, 2 February 2020: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200202-sitrep-13-ncov-v3.pdf?sfvrsn=195f4010_6
[3] UN Department of Social and Economic Affairs, "UN report finds COVID-19 is reversing decades of progress on poverty, healthcare and education" 7 July 2020, New York: https://www.un.org/development/desa/en/news/sustainable/sustainable-development-goals-report-2020.html

global sustainability ranging from the role of cities in climate change, to matters of urban equality, and more (Engström et al. 2020). At the end of the last decade, urban areas and local governments received an increasing focus as critical sites for the global governance of sustainability, in response to an array of interconnected environmental and socio-economic challenges (Caprotti et al., 2017). This attention is perhaps best represented by the numerous multilateral agreements for sustainable development emerging in the 2010s, including the *2030 Agenda for Sustainable Development* and the *New Urban Agenda*, which have increasingly put cities and urban issues centre stage. In turn, cities themselves have been busily driving a global sustainable development agenda through advocacy, policy mobility and networking, when COVID-19 hit. The crisis did not hamper this attention: at the outset of the pandemic major city networks like C40 Cities, a gathering 96 of the world's largest metropolises, sprang into action— linking environmental questions to the COVID-19 recovery, and making knowledge exchange between and about cities a bedrock of this discussion. Interestingly, questions of urban inequality and inclusive recovery have taken an even clearer role in this link between sustainability and the pandemic response. This has gone hand-in-hand with academic and practitioner calls for cities to develop the capacity to generate, mobilize and access comprehensive knowledge about their environments, and to support policymaking and societal action (McPhearson, et al., 2016; Authors 2018a). Crucially, attention to the need for new organisations that are designed to 'bridge' and navigate this 'knowledge transition zone' between research and decision-making (e.g. Perry & May, 2010) had been a feature of pre-pandemic global efforts at sustainable (urban) development. These discussions have taken a stronger hold in the wake of the recognition of the impact of the 'infodemic' on recovery and longer-term sustainable development. Effective and inclusive knowledge mobilisation at the city level becomes, as commentaries recently put it, an essential "enabling condition of post-pandemic city government" when it comes to addressing sustainable and inclusive development (Parnell 2020).

This is where our research note comes in. Although the salience of these boundary-spanning knowledge-intensive organisations and processes is now acknowledged, there is currently only limited systematic reflection on the institutions that operate in this space (Hordijk & Baud 2006; Authors 2018b, Authors 2019a). We suggest that paying attention to the actions and operations of such institutions, in the midst of the pandemic (and infodemic) is an urgent matter. To do so,

we focus here on a particular type of urban knowledge institutions. These are 'urban observatories': boundary-spanning institutions focused on producing urban knowledge about one or more urban settlements, and performing an explicit monitoring capacity through a regular record of a range of urban issues. Our goal here is to capture the operations of these observatories against the backdrop of the COVID-19 crisis. We reflect on how urban observatories have been working across a number of different Global South contexts, focusing particularly on questions of sustainable development. We do this through four case studies: the Gauteng City Region Observatory (GCRO) in Johannesburg, the Indian Institute for Human Settlements (IIHS) in Bangalore, Sierra Leone Urban Research Centre (SLURC) in Freetown, and the Karachi Urban Lab in Pakistan (KUL). We seek to capture how these observatories have mobilised urban knowledge within an unprecedented time of disruption, and how this has intersected with questions of inclusive sustainable development. We discuss initial learnings from these four cases, but also by setting these into the context of a larger internationally comparative study on the role and challenges of urban observatories, which we had been completing as the crisis struck.[4] This wider, context-setting evidence is being gathered by the University of [anonymised] and University [anonymised] in collaboration with United Nations UN-Habitat Global Urban Observatory (GUO) program, to offer more systematic insights as to the role of 32 of these boundary-spanning institutions in urban governance, including the four case studies presented here. Our research note seeks to offer a more in-depth view, aiming to capture qualitatively the 'voice' of urban observatories at this time.[5] The cases were created through the development of desktop case studies drawing on available academic and grey literature, coupled with semi-structured interviews and two focus group (both conducted remotely in August 2020) with a total of thirteen representatives of the four cases. The case development took place during the crisis, but draws upon other experiences captured in the broader study which similarly relied on a desk research and interview-focused case study approach taking place before the outbreak of COVID-19, with an additional two interviews

---

[4] Intentionally, the study coupled institutions that explicitly define themselves as 'observatories', like the Manila Urban Observatory and entities that perform observatory-like functions like the Afghanistan Research and Evaluation Unit (AREU).

[5] All quotes in this research note are verbatim from these working group sessions unless otherwise cited. They are identified with a tilde (~) asterisk throughout the text. Following the online working groups, researchers then transcribed the interviews and performed an iterative content analysis of the transcripts (all interviews and focus group quotes transcribed by [anonymised], October 2020).

included explicitly in this paper. We begin this research note with a reflection on the challenges posed by conducting urban research and providing advice in a context of crisis; we then move to the issue of addressing knowledge and governance gaps; discuss the role of observatories in reframing narratives, and then offer a reflection on the issue of bridging different kinds of knowledge, and the role of observatories in knowledge translation. Whilst still preliminary, and indeed provided as 'near-live' research in the midst of an ongoing and unravelling crisis, especially in much of the Global South, our investigation aims to stress the importance of urban knowledge institutions in the urban governance of crisis, raising a series of preliminary consideration on the role of knowledge mobilisation in urban-policymaking for sustainable and equitable outcomes in the short and longer term, with a particular eye to Southern cities.

Deploying urban information and advice

Certainly, urban observatories are not the only type of organisation bridging urban knowledge between diverse institutions in cities. Yet they present an interesting if not unique confluence of information on urbanisation, presenting an important window into how we 'know' about our cities, and how knowledge can be mobilised to shape them. They are also an institutionalised form much more common than their limited appearance in urban studies literature and urban policy parlance might suggest. By a latest formal count, as of 2018, there were over 187 of these types of institutions registered internationally as part of UN-Habitat's Global Urban Observatory (GUO) Network. Broadly, urban observatories serve to collect, analyse, and present urban data. Many do so explicitly for decision-makers in cities who can then mobilise this information towards policy and planning. The positioning of observatories is therefore an important element as to how they might be situated in the urban governance of a crisis like COVID-19, and significant in the type of information that they produce and mobilise.

This, for instance, is the case for the Gauteng City-Region Observatory (GCRO). GCRO is a Johannesburg, South Africa-based observatory focused on the Gauteng City-Region, the economic heart of the country within which Johannesburg and Pretoria (Tshwane) are located. It was established in 2008 as a partnership between the University of Johannesburg (UJ), the University of the Witwatersrand (Wits), which provide in-kind support to the observatory, and the Gauteng Provincial Government (GPG), from which it receives its core grant. Organised local government in Gauteng is connected through the South African Local Government

Association (SALGA-Gauteng) and is represented on the GCRO Board. GCRO was designed explicitly as an observatory, with an advisory role built into its founding vision. Hence, GCRO was perhaps more destined than other knowledge institutions to take a central place in the city and region's decision-making processes around the COVID-19 crisis, including work done on request from the Office of the Premier for the Province of Gauteng and the National Government.

Indeed, the crisis brought GCRO into a distinct crisis advisory role. At the time of this project's focus groups (August 2020), more than half of GCRO's staff of 19 had been involved in the response work. Throughout the pandemic, GCRO has provided a continuing flow of support and advice to multiple levels of government, mostly through its data visualisation and analytics capacity. GCRO has managed to quickly mobilize spatial information because of its capacity to present spatially disaggregated social and environmental risk factors which are, or could become, critical for the crisis at hand. This approach underlines the importance of continuous baselining as to the state of a city: much of the responsive work by GCRO relied on pre-existing datasets gathered for its "quality of life" survey, now in its 10th year of operation (Authors 2019a), through which GCRO has been able to interpret the evolving situation in Gauteng in terms of COVID vulnerabilities. This has allowed GCRO, for instance, to quantify risk factors pertaining to maintaining social distancing or ensuring in-crisis hygiene, drawing on existing data on household crowding or shared sanitation. However, this information also extends to broader social and health vulnerability factors exacerbated by broader environmental factors, like access to food, electronic communication, health care, or reliance on public transport. Equally, when regularly tracked, this enables authorities to combine these factors with pre-existing health conditions (e.g. the incidence of asthma, heart disease, or diabetes) which can lead to more appropriate policy interventions. In turn, and centrally for our discussion, this baselining approach could ensure some degree of resilience of these data systems to the 'next' crisis, be that a similar pandemic, a very different natural disaster, or an unexpected major infrastructural fault, allowing for the transferability of evidence between contexts. In order to understand variations from the 'norm', a clear sense of the norm itself is required and often needed, as the case of Johannesburg and countless other cities struck by COVID-19 prove.

This is of course something that has been a feature of other platform-based observatories designed explicitly to keep the pulse of specific urban areas. It is evidenced, for instance, in the

Global North case of the Newcastle Urban Observatory, an example that further validates GCRO's experience that established, trust-based relationships between observatories and public authorities is key to prompting a quick adoption of the observatory's COVID-19 urban research by key public stakeholders (James et al., 2020). Importantly, the case of GCRO tells us that pre-existing urban research processes and information can be effectively drawn upon and repackaged to address an unexpected crisis. Essential in this context are two key elements: the availability of baseline information as to the state of a city, and readiness for that knowledge to be translatable into both policy-ready and public-graspable information by staff skilled with data analytics and with the "mechanics of government" which enables a high degree of responsiveness~. The GCRO has long played an important role in taking the 'pulse' of a 12 million-strong urban area and, as the COVID-crisis began to hit the South African metropolis in March 2020, it was able to quickly muster accessible and evidence-based information as to the overall situation—learning not just *from* a crisis but providing crucial learning *in* crisis. Converting this into useable knowledge products has also been key. Such analyses have since been published quickly and effectively as a simple 'supplement' to GCRO's regular "Map of the Month" instalment.[6] GCRO has compiled multiple interactive visualisations and special reports that show vulnerability and risk to COVID-19 throughout this particularly populous region of South Africa. An initial "Map of the Month" was quickly produced in March as the crisis began to unfold using baseline data that had already been collected and synthesised through past Maps of the Month and Quality of Life Surveys. The longitudinal and continuing data collected by GCRO enabled the observatory to assemble and present snapshots of the pandemic in a way that highlights how COVID-19 might affect the region's population. GCRO maps have also enabled better understanding of the outbreak's possible effects at different scales. As a result of regular data gathering, monitor and in several cases institutionalized reporting activities, observatories like GCRO can often offer considerable amounts of localized data readily accessible that can be mobilized quickly to address new pressing issues like that of COVID-19. Here observatories can become quite readily information springboards for other institutions to act fast in communicating tangible and systematic evidence as to the situation at hand.

---

[6] Mapping vulnerability to COVID-19 in Gauteng" Supplement to *Map of the Month*, 20 March 2020, available at: https://gcro.ac.za/outputs/map-of-the-month/detail/mapping-vulnerability-to-covid-19/

It is precisely because of the "deep, strong data" already collected by GCRO that they are able to contribute key insights for decision-makers – both proactively and in response to specific decision-makers' queries and needs – rather than relying on "shaky" data from elsewhere˜. In fact, over the past few months in the context of the crisis, GCRO has begun producing a new output, called "data insights," which are "presentation-style documents intended to be policy-facing"˜ for the purpose of providing data, particularly spatial, to elicit quick responses from decision-makers. This demonstrates the complementary role GCRO plays to government in providing high-quality research for decision-making. Another example is that in addition to the Provincial and National government, increasingly, local municipalities and metropolitan governments have also sought the expertise of GCRO staff to fill in capacity gaps, particularly related to spatial analysis. However, in the context of the crisis, these demands have expanded to issues outside observatory specialists' skillsets on which they are not necessarily in a position to consult – perhaps hinting at a widening gap in state capacities. For the GCRO, this responsiveness to multiple levels of government resulted in more than half of the staff working on the COVID response. A direct result of these shifting relationships with government are developments in the "social technology"˜ of the GCRO in their newfound position as an intermediary organisation. While not established to be such, this role as an intermediary has evolved over time and has accelerated with the pandemic. Staff members have been thrust into the "micropolitics of data," of data accuracy, and of data availability, suddenly navigating through a "very delicate and sensitive political landscape"˜. And yet GCRO's careful consideration in managing its relationship with government across all levels has a relatively solid trust in the observatory and likely one that is to reverberate after the crisis.

Intervening into urban knowledge and governance gaps

The Indian Institute for Human Settlements (IIHS) is a research and teaching institution based in Bangalore, working primarily in and on Indian cities, but also with a vast variety of international engagements in urban research and teaching. For the purpose of this research note, IIHS is recognised as not 'just' an observatory, but rather more correctly is a wider urban knowledge institution which performs, amongst other roles (such as professional training and academic education), 'observatory-like functions'. From this perspective the example of IIHS both offers an insight into the role of observatory activities within a wider urban knowledge terrain, as well

as an illustrative case of how urban observatories in the Global South have been stepping into not only knowledge gaps but also possibly into urban governance vacuums. The work of IIHS lies not just in data gathering and mobilisation, but also in its vision to be 'on the ground' experimenting and working with communities and government at all levels (national, state, and city) across urban India. It is this vision which positioned the Institute to face complex challenges from the start of the crisis. At the outset of the pandemic, over six million people in Delhi were left with no access to the state-provided food support system, including, for example, migrants without state-established identities. In response, IIHS set up emergency food provision across the city, beginning with hot meals and eventually working with government and other agencies to establish a longer-term system that provides cooking supplies for people to prepare at home. This instance marks "the first step at a universal entitlement for food security" ~ that has been a topic of discussion for 14 years, but has now taken its first steps towards becoming a reality. Fundamental to this example is IIHS's coordinating capacity and ability to design and scale innovative new systems, by integrating existing knowledge of Delhi to the emerging priorities within new circumstances. Also crucial to the success of the Delhi experiment in social protection and other IIHS-led interventions, including the set-up of specialised isolation facilities, was IIHS staff's deep grounding in spatiality, which enabled them to establish emergency response systems that the state itself did not have the capacity to do~. Throughout the crisis, the Institute has also worked extensively with government. In Tamil Nadu, for example, building on IIHS' 5-year long engagement with the state government on urban sanitation, IIHS secured personal protective equipment (PPE) kits for at-risk sanitation workers, provided food rations, and created enterprise-based livelihood support programmes for the urban poor. IIHS also authored a high-level report for the Finance Commission of India on the potential of urbanisation to accelerate post-COVID economic recovery, signalling its commitment to strategic advisory support across levels of government. From the perspective of the IIHS case, the role of observatories in a crisis like COVID-19 is thus three-fold. First is their ability to bring together skilled individuals to set up a continuous dialogue that serves as a sort of "collective memory," thus providing a space for both analysis and reflection on "where things were, where they might be going, and how new imaginaries can be contested" ~. Second is their capacity to innovate and develop new methods and approaches while conducting evidence-based action research, to attend to the crisis unfolding in real time. And finally, third is their role as a strategic

partner providing critical support to government, where state data and knowledge capacity is weak.

This latter function echoes GCRO's relationship with the Premiership of Gauteng, which in turn speaks to the potential for the relationship of scientific advice to government to feed back into capacities for academic exchange. Although initially in agreement with the provincial government to embargo research findings before release, the Premier now encourages GCRO to publish openly – a development that the observatory credits to the tone of voice used in their analysis, opting for "modulated analysis" ~ instead of critique. As a result, their analysis is "credible, trusted, accepted, and asked for again and again" ~. By working across all levels of government and by carefully navigating those relationships to encourage collaboration between them, GCRO networks knowledge that would otherwise remain siloed in their respective government spheres. The human aspect of data analytics is thus immediately apparent, demonstrating that having data itself does not necessarily yield understanding, but rather the work of skilled analysts who can curate information, develop appropriate knowledge products and navigate complex relationships results in tangible impact. The cases of GCRO, bridging provincial government with university research, and IIHS, a standalone educational, capacity-building, and research institution, raises the issue of positionality of these institutions in Global South cities with contexts where urban governance may be splintered, or shaped by significant gaps. The boundary role of observatories has tangible implications as to their place in the structures and institutions of urban governance. Even in relatively resource constrained Southern contexts, research-based universities typically possess the expertise needed to generate the specialised outputs associated with urban observatories.

The attempt to bridge academic knowledge and decision-making for sustainable urban development should not be blind to often important gaps that exist in urban governance when it comes to community engagement and the valuable contribution of local knowledge – a space for observatory work that is less commonly acknowledged in the literature. Here our third case study, that of the Sierra Leone Urban Research Centre (SLURC), based in Freetown, the capital of Sierra Leone, is a fitting example. SLURC is a research centre established collaboratively in 2016 between the Bartlett Development Planning Unit at University College London and the

Institute of Geography and Development Studies at Njala University. The centre conducts research, holds training and workshops, and is primarily focused on "capacity building, knowledge management, and policy influencing." SLURC's primary aim is to improve the well-being of urban dwellers, and has done so from its outset with a particular emphasis on informal settlements – a fitting case to capture knowledge translation beyond academia-policy relations. SLURC is an example of a community-engaged institution that has worked for four years primarily on urban informality in response to Freetown's particular urban context. SLURC has sought to provide technical guidance and research-based evidence which is closely aligned with the capacities and realities of residents living informal settlements. At the outset of the pandemic, SLURC quickly produced a publicly available policy brief drawing lessons from the 2014 Ebola outbreak to apply to COVID-19. From this point of view, the case of SLURC also highlights the important historical memory function of urban observatories. Freetown and Sierra Leone had borne witness to one of the most devastating epidemic outbreaks of the last two decades, with an explicit program of learning from the Ebola crisis which, in itself, was also building on years of a devastating decade-long civil war throughout the 1990s. It does not come to a surprise, then, that SLURC has been taking a very explicit role in support of the livelihoods of informal settlement inhabitants in the wake of the crisis, and that it has done so with a well-established appreciation of contexts of urban crisis. These insights and structures imbued Freetown with a level of resilience in the face of the COVID-19 pandemic, reducing the potentially huge negative impacts on the social and environmental structures of the city.

Yet these 'lessons learned' also highlight the role of observatories in not just capturing (or monitoring) inequalities, but also giving voice to these living in these marginalised conditions whose lives are often most rapidly and significantly affected by crises. SLURC's briefing work at the outset of the crisis focused on stressing the blatant health inequalities in Sub-Saharan Africa and foregrounding the social and environmental conditions in informal settlements that cause residents to face disproportionately higher rates of infection. In doing so, SLURC opened a wider discussion about differential (in)access to essential urban services, such as sanitation, health care, and water, within the city, and the need for responses tailored specifically to the conditions in informal settlements, in which social distancing, for example, is rarely a viable course of action. In addition to the policy brief, SLURC has worked closely with city authorities

in their preparation of a COVID-19 action plan, particularly focusing on crafting a "robust, effective, and socially just" response that addresses the "diversity and realities of informal settlements, which may not correspond to the 'one size fits all' solutions city authorities normally prioritise"~. Through robust and collaborative engagement with informal settlement residents in Freetown, SLURC has therefore been able to bring these grounded community-level reflections to inform city decisions. SLURC thus contributes valuable insight across government levels by advocating that COVID-19 is not just a health issue, but in fact a complex reality, with compounding and interconnected physical environment, socio-economic and identity factors contributing to the vulnerability of communities to the virus.

Reframing (urban) narratives

The role of observatories in reframing narratives about the city during the COVID-19 pandemic is perhaps best represented by the case of the Karachi Urban Lab (KUL). KUL was founded in 2018 and is housed in the Department of Social Sciences and Liberal Arts at the Institute of Business Administration Karachi, Pakistan. KUL seeks to foster connections between research, teaching, public policy dialogue, and advocacy, and to promote sustainable urban-rural development with a particular focus on "issues of social justice and equity in delivery of infrastructure services and housing"*[7]. Importantly, the Lab is "committed to ensuring that the communities that are the subjects of study are always involved in [KUL's] projects as stakeholders through co-production of knowledge." The Lab shares its findings with stakeholders and is careful to highlight how the communities they work with have also supported the analysis, asking: "What do you think about this data? Where are we wrong about this? Where are we right about this? How do you think we can take this forward? How can you use it?"* While some community members were initially hesitant to engage with KUL, feeling consultation fatigue after having been contacted repeatedly by groups such as other NGOs, government representatives, and multilateral donors, they have ended up inviting the Lab back after seeing the quality of its outputs. As such, through these processes, and with patience and time, KUL has developed "relationships of trust"* with their regular interlocutors. Yet this is not just a story of trust-building, as for instance already flagged by our GCRO case study. Additionally, the case of

---

[7] quotes highlighted with an asterisk (*) in this paragraph are from a separate interview with Karachi Urban Lab representatives on 12 February 2020, transcribed by [anonymised], February 2020.

KUL brings into play the challenge of reframing narratives and perceptions about urban realities and processes – an issue that becomes more and more pertinent during the 'infodemic' of misinformation. For KUL, part of this critical process of reframing traditional urban knowledge about the city has been engaging closely with the local Urdu media as a mechanism for sharing research findings and agendas directly with communities. This means of dissemination allows their "writing to reach a much wider audience"[*], moving beyond the more traditional English - oriented academia in Pakistan. As such, KUL is highly active in "getting their voices out"[*] through media campaigns, both print and social. This is a stance that involves, as in the case of SLURC, substantial co-production of knowledge rather than just a top-down re-definition of the dominant, and potentially skewed, urban narratives.

This work to reframe traditional urban narratives, however, brings forth an ethical challenge faced by the observatory regarding whether its research activities and outputs will endanger its stakeholders. Thus, KUL must balance embedding itself within the communities with which it works without creating damage or upsetting the local order. These ethical research dilemmas came to the fore again amidst the COVID-19 crisis. In fact, research emerging from the Karachi Urban Lab is already challenging state-led narratives about Pakistan's handling of the crisis. A recent article published in the Wall Street Journal dubbed Pakistan a "bright spot" (Shah 2020) and reported that the country has successfully controlled the virus – a remarkable feat when compared to neighbouring India and to Brazil, which has a similarly sized population. The reality on the ground captured by Karachi Urban Lab, however, tells a less uplifting story of state disorganisation, with residents of informal settlements unable to access food rations, health centres, or welfare checks, and "deliberate and very strategic"[~] state-led obfuscation of data in order to "give it the leverage to do whatever it wishes and wants"[~]. In this context, Karachi Urban Lab plays an important role in challenging the prevailing state narratives and gathering and analysing much-needed data.

Translating multiple urban knowledge(s)

Several observatories used collaborative approaches to knowledge production, which has broadened the kinds of actors and expertise which are seen as valuable in informing the COVID-19 response specifically, and urban planning and policy more generally. For these observatories, this manifested in participatory and collaborative research, which seeks to engage 'local', 'lived',

or 'experiential' knowledge—alongside more traditional 'expert' forms of knowledge— as key to addressing complex sustainability challenges in urban areas (Rydin, 2006; Swilling, 2014; Watson, 2014). Such 'knowledge co-production' processes have unsettled the idea of knowledge as unidirectional, highlighting the uneven politics through which certain voices or forms of research, are granted great legitimacy and credibility to inform policy and practice (Apsan Frediani, Cociña, Acuto, 2019).

Observatories such as SLURC, KUL, and IIHS engage in participatory action-research, which has extended through the COVID-19 crisis, working closely with vulnerable communities to draw from their 'lived' experience, and to collaboratively produce research which responds to these realities. On the one hand, the logic of engaging in knowledge co-production has been articulated as a mechanism to obtain deeper and better sources of information—particularly in areas with high levels of urban informality, and attendant data gaps. In cities of the Global South, for instance, working closely with informal communities has deepened the understand of how social distancing or hygiene challenges can be managed in high-density contexts with limited access to water and sanitation facilities, or in recognizing and addressing the multidimensionality of risk factors (Wilkinson, 2020). Moreover, beyond the value of engaging vulnerable groups to inform better policy and planning outcomes, embedding research within low-income or informal communities was also articulated an important act of, as SLURC colleagues' flag, "recognizing people living in informal places" ~. That is, engaging deeply with marginalized or excluded groups in the city was seen as foundation to encouraging a recovery that, in the words of KUL, was "socially just" ~ and from which, as IIHS tells us, "new imaginaries" ~ for more equitable cities can built.

The work of these observatories offered two key lessons for how knowledge co-production can both address the 'infodemic', but also help chart pathways towards more sustainable and socially just futures. Firstly, these observatories articulated a strong mandate to build the research and advocacy capacities of marginalized or vulnerable residents. For SLURC this has entailed many years of working with local communities to support them to "understand the places where they live, but also how to take actions to respond to some of the situations that they find themselves in." Working with community residents as "co-researchers", this process of "mutually producing knowledge"~ has been a fundamental approach to support informal settlement residents to advocate for just responses, in a context where the priorities of informal areas may be overlooked in

traditional governmental responses. SLURC has established durable structures, such as 'City Learning Platforms' and 'Community Learning Platforms', in which diverse urban groups are brought together to discuss different issues facing informal settlement communities (City Learning Platform, 2019). As a direct result of this capacity and trusted relationship, SLURC was able to continue working remotely with these communities and through these structures, when field activities were suspended in response to COVID-19. Working collaboratively has also been enabled through the relationship SLURC has built with the Freetown City Council (FCC), which has meant that the institute is more readily able to 'translate' the knowledge and experiences of the residents it works with to policymakers. In this case, one of the key roles of SLURC as an 'observatory' has been in supporting the research undertaken by and with communities, and to connect these community-level structures and leaders with ongoing responses led by local authorities.

Likewise, KUL has an explicit focus on 'co-producing' knowledge and embedding projects predominantly within low-income working-class informal settlements spread across Karachi. In doing so, they have used their positioning with the university to "create a platform for discussions for academic-practitioner exchanges, both locally and globally"~. As in the case of SLURC, this legacy of deep engagement and action-research with these communities has allowed for continued dialogue with these communities even as the 'field' was closed in March, due to social distancing measures. These relationships have enabled the sharing of stories about the impacts of COVID-19, and "women and men's abilities to circulate within their neighbourhoods, and their abilities to access certain corridors of power."~ In doing so, both SLURC and KUL demonstrate the value of collaborative efforts at building knowledge—bringing these often-invisible spaces to bear on urban decision-making, and playing a powerful advocacy role for vulnerable groups in the city.

Secondly, these observatories have played a key role in positioning the experience of COVID-19 within the wider framework of inequality. That is, it is well-acknowledged that the crisis has revealed and deepened existing inequalities globally. As such, the value offered by these institutions was not only in responding to the information gaps linked with the health crisis, but also in highlighting and engaging with the much longer-term environmental and social legacies which have produced inequality over time. Part of this story lies in the work that these

observatories have done in charting the differential impacts of the crisis across diverse identities in the city, whether linked with gender, (dis)ability, or migration or tenure status. For KUL, for instance, this has meant "putting the question of gender the forefront in all of our work"~, as household dynamics and inequities have been exacerbated under lockdown. Likewise, SLURC has focused a strand of research particularly on residents with disabilities, and has likewise identified emerging issues such as how water scarcity has exacerbated gender-based violence. In India, IIHS's work in responding to the particular challenges faced by migrant workers, linked with food security and labour precarity. In doing so, these observatories have been deeply attuned to the differential impacts of COVID-19 even within vulnerable communities, identifying the range of specific responses that might be required. For each of these observatories, the deep alignment with vulnerable communities has also meant that these institutions have moved beyond traditional research activities, to also engage in the direct provision of support—whether linked with food and nutrition, sanitation and hygiene interventions, or support against evictions.

Beyond examining and responding to the specific impacts of COVID-19 across diverse identities – these observatories have also positioned the COVID-19 crisis within the wider (unequal) urban and spatial trajectories of their cities. For instance, SLURC has been working closely with the Freetown City Council (FCC) to highlight the specific and unequal manifestations of COVID-19 faced by residents in informal settlements in the city. Crucially, SLURC has sought to reframe COVID-19: "not just as an illness, but rather as something that actually reflects the very context of inequalities within this particular time."~ This has meant producing knowledge not just on the health impacts, but also in linking the crisis with those longstanding issues faced by local communities that go "far beyond health"~, including looking at densities and open space, social protection, water and sanitation vulnerabilities, and housing conditions. In this way, SLURC has been working to open a dialogue on the ways in which health inequalities are fundamentally linked with those policy and planning legacies, which have marginalized and excluded urban poor communities in the city.

Likewise, IIHS highlighted the critical importance of not only engaging with these past legacies, but also in the value of an observatory in retaining a watchful eye on the underlying politics of the city before, during and after a crisis. Across the globe, cities have seen the combination of

increasing digital surveillance, policing, and greater state powers granted under 'state of emergencies' enacted as a mechanism to control and monitor the spread of COVID-19 (Sweeney 2020). In India, IIHS highlighted that this has manifested in key legislative and governance changes—such as the dilution of labour and environmental protections, arrests of activists, or the sale of public lands—which have been enabled under cover of the crisis. Beyond responding to the current moment, IIHS has identified the critical role of the observatories in recognizing and monitoring how these urban governance processes are enabled during the crisis, and examining: "how the terrain is shifting post-COVID-19 — and not just in light of the health question, but in light of the range of not-directly related challenges our cites are going to face"~. In the cases of SLURC, IIHS, and KUL these institutions have positioned themselves directly within the broader politics of the city, seeking to reveal and challenge those political rationalities which may not be oriented towards equitable and sustainable forms of urban transformation.

In engaging with a multiplicity of knowledge(s) on the city, observatories such as SLURC, IIHS, and KUL have played a key role in unsettling the uneven politics of knowledge production, and in advocating for the lived realities of marginalized residents to inform the COVID-19 response. Through capacity -building, producing collaborative and evidence-based research, or establishing structures and platforms of knowledge exchange, these institutions have sought not only to respond to the deep inequities extended through the crisis, but also to reorient how vulnerable communities are recognized within urban governance and decision-making. Critical to the operation of these knowledge co-production processes is the powerful boundary spanning role played by these observatories, as institutions which can 'translate' across diverse data sources and actors, produce diverse outputs for different users and in different languages, and provide a platform for the exchange of ideas from very different (and often unequal) urban stakeholders. Likewise, the commitment to producing knowledge which is grounded in the specific histories and spatialities of the city. As such, these observatories challenge how and by whom urban knowledge is produced and understood—not just in relation to COVID-19, but also in response to the much broader system of environmental, social and economic inequalities in which these cities are situated. In doing so, these observatories demonstrate key lessons for how urban knowledge can be collaboratively harnessed to chart pathways for more equitable and socially just cities, through the COVID-19 recovery process.

More boundary challenges ahead?

Amidst deep transformations and profound societal challenges, efforts toward knowledge mobilisation might easily fall behind, and not be seen as part of, perceived 'more-urgent' economic and sustainability agendas. Yet, as we have illustrated above, these debates are instead at the very heart of both global and very localized response to COVID-19 in those key urban theatres of the crisis. Centrally, when looking at our four cases, we would argue that it is critical to stress the second part of the UN Secretary General's call which we started with— for the COVID-19 response to be a time for science *and solidarity* – with a clear focus on issues of whose urban knowledge counts in charting sustainable development out of the crisis. In this sense, the cases we have presented stress the importance of institutionalising that link between knowledge and solidarity, and the value of spanning boundaries in a context of disruption.

As we have noted, over the past three decades the United Nations has both acknowledged and encouraged, where not supported directly, the establishment of urban observatories. Likewise, many academic, public and private institutions have developed their own observatory projects. Experiments similar to GCRO, IIHS, KUL or SLURC are now present across the world, whether as independent entities, located within universities, or as embedded within local government. In turn, the proactivity of the cases cited here, and the varied ways in which they have mobilised knowledge across boundaries, speaks volumes to the need to recast assumptions about 'best practices' and 'models' of urban research institutionalisation. Several of our cases have, for instance, illustrated how Northern institutions can learn from their counterparts in the South when it comes to incorporating an attention for complexity into the "ecosystem" of knowledge mobilisation, and its impacts on social and environmental resilience – as demonstrated for instance by recent work on South Africa's evidence ecosystem (Stewart et al. 2019).

Much of the work of observatories is dependent on the capacity to gather, process and mobilise knowledge – something that is increasingly intertwined with the technologies underpinning urban research. Observatories have made use of new technologies, and new use of existing technologies, in light of the pandemic. In the case of SLURC, for example, there has been a heavier reliance on mobile phones for data collection and sharing as well as platforms like Zoom for engagement. Likewise, in Pakistan, research activities have halted as a result of the pandemic, so the Karachi Urban Lab depends on video, telephone, and handwritten dispatches

directly from community contacts. Not only are there new methods, tools, and forms of engagement that emerge from the crisis, so too are there new voices not typically captured in urban conversations. For instance in India, COVID-19 has seen the rise of unions of informal workers, whose voices are now coming to the fore through their work with IIHS.

However, this observation on the adaptation of methods of knowledge mobilisation generates an emerging set of ethical dilemmas. Most clearly, reliance on these forms of communication are likely to stay, however the infrastructure to support them and methods based on them still need improvement. Issues of inequitable access to digital infrastructure—particularly in urban contexts marked by high levels of vulnerability and inadequate access to basic services and infrastructure—will be a key concern in how knowledge is generated. Likewise, new challenges have emerged in relation to the intrusiveness of sourcing data remotely from communities under duress from the pandemic. Even if voluntarily shared, researchers at the observatories nevertheless cite some hesitation about using the data gathered from their interlocutors. This was particularly the case for those observatories which engaged in collaborative research with vulnerable communities. Colleagues at KUL expressed a tension between the "interesting ways of capturing stories in real time" facilitated by contemporary technologies and the "ethical questions about how technologies enable us or disable us, and the ethics of representational issues, which in themselves are old issues" and yet "in the present context, are particularly heightened."~ Another concern pertains to the creeping expansion of digital surveillance, particularly given that COVID-19 has given governments essentially free license to control populations and rapidly acclimate them to a 'new normal'. And yet despite these concerns, there are concurrent instances of digital empowerment, for example in Delhi as flagged by IIHS colleagues, where an SMS notification from the provincial government about new digital ration cards led to over one million registrations in a matter of days. The current penchant for greater digital surveillance in a context of crisis management certainly opens up greater challenges to the way we gather information and share stories of and data about the crisis. As commentators have already voiced, the relative absence of data collection and monitoring projects in the Southern hemisphere from major COVID-19 initiatives, and the dearth of adequate regulatory frameworks in the Global South, for example in the field of privacy and data retention, might make local

authorities "fall prey to outside interventions of a dubious nature".[8] Moreover, there remain of course clear "data gaps" in data quality, availability and institutionalisation in most developing contexts. As a recent comprehensive review of research ecosystems in Low- and Middle-Income Countries carried out by the (now reformed) then-UK Department for International Development (DfID) noted, structural problems remain widespread and strike at the heart of the boundary spanning functions we discussed here. Issues such as weak linkages between higher education, research, private sector and government, the lack of adequate ICT infrastructure underpinning an organisation's research information system, and a lack of incentives to produce research, but also very limited research management capacity across LMICs (affecting for instance ability to obtain and handle research funding), remain crucial and especially poignant in a crisis context like COVID-19 (DfiD 2020).

From this perspective the value of often well-established Southern voices like GCRO, IIHS or SLURC, but also of supporting new institutional urban research hubs with some observatory functions, like the KUL, becomes even more crucial in a context of crisis like COVID-19. They emerge as institutions seeking to support sustainable and equitable urban development through the creation and leveraging of urban knowledge to guide better decisions both in 'normal' times, and in times of crisis. They play an important role in providing robust, timely and verifiable information in the face of the 'infodemic' – which in part relates to their methods, approaches and relationships that enable them to be trusted voices (even if they are not, of course, singlehandedly dismantling the infodemic). They bridge evidence-based information and sustainable development action—and particularly when engaged in collaborative research with urban poor groups—can do so in a way that is deeply steeped into questions of solidarity.
Our initial real-time observation of urban observatory activities in response to COVID-19 in the last few months raises some important notes on the value of boundary-spanning urban research both in and beyond a crisis like COVID-19. The review above stresses both the complex institutionalisation of these practices, with a wide variety of geographical scopes and institutional positionings, but also common trends as, for instance, with the aims of gathering and

---

[8] As flagged for instance, by building on the Big Data from the South initiative, in Milan, S. & Trere, E. "A widening data divide: COVID-19 and the Global South" *Open Democracy* 3 April 2020, available at https://www.opendemocracy.net/en/openmovements/widening-data-divide-covid-19-and-global-south/

disseminating knowledge, but also explicitly influencing policy. Above all, for international development, preliminary results from our study stress the presence of both well-established institutions in the Global South, which have been able to leverage their positioning effectively to advocate for evidence-based discussions, as well as the emergence of new actors and players in this space. Equally, our findings also underscore that many of these institutions have been advocating explicitly for better attention, in the time of COVID-19, to urban vulnerabilities, inequalities and marginalities as longstanding processes shaping the course of sustainable development.

Relatedly then, a set of initial learnings emerge from the four cases depicted. First, it is clear that effectively mobilising advice and information is deeply linked with the establishment of relationships of trust across urban research and governance – which has been key element of driving the effective uptake of information in the wake of sudden disruptions. Second, our cases point to the important role that these institutions play in maintaining a collective urban memory (or memories) when policy and politics, but also market forces, push for short-termism and change in cities, and how critical this role is both at a time of crisis, and in setting a clear development trajectory. In doing so, however, they also ask us to attend to the politics underpinning the work of these memories, and thein inherent spatiality (Rose-Redwood, Alderman and Azaryahu 2008), gesturing for instance to the role that boundary institutions can plan in depicting the geographies of inequality at the heart of the crisis. Third, the stories we have recounted show how observatories often play a bridging role as the knowledge 'glue' in urban governance gaps, many of which have to do with questions of inequality, marginalisation and engagement with communities that might not traditionally be able to meaningfully influence decision-making. Giving voice to these realities and concerns, and in some cases reframing exclusionary urban narratives, has been identified as a fundamental role, particularly in a context of deepening inequalities as a result of the crisis. Finally, and consequently, we have then stressed the complexity of how boundary institutions might be taking a normative stance as to their role, whilst needing in some cases to balance trust with advocacy. Of course, these are but preliminary and very much 'live' considerations as the COVID-19 crisis, and indeed its underlying infodemic, has begun to shift the world's attention towards Global South contexts. COVID-19 has provided a lens through which to view the contribution and criticality of these

kinds of institutions in ensuring positive and resilient urban trajectories on an increasingly urban planet. The way urban research institutions will step up to this reality, but also the mechanisms by which they will be supported to do so in a reality that is perhaps even more fragile than usual, will no doubt leave a clear imprint onto the future of urban observatories and boundary-spanning exchanges for the decades to come.

References

Authors references omitted (Authors 2016; 2018; 2019a; 2019b; 2020 [+147 words])

Apsan Frediani, A., Cociña, C. and Acuto, M. (2019) 'Translating knowledge for urban equality: alternative geographies for encounters between planning research and practice', KNOW Program Working Paper no.2, London: Development Planning Unit (DPU), University College London pp. 1–13.

Bai, X., Nagendra, H., Shi, P., & Liu, H. (2020). Cities: build networks and share plans to emerge stronger from COVID-19. *Nature*, 584, 517-520.

Caprotti, F., Cowley, R., Datta, A., Broto, V. C., Gao, E., Georgeson, L., & Joss, S. (2017). The New Urban Agenda: key opportunities and challenges for policy and practice. *Urban Research & Practice*, *10*(3), 367-378.

City Learning Platform (2019) 'Principles of Engagement for the City Learning Platform', *Practitioner Brief #1*. Freetown: Sierra Leone Urban Research Centre

Cociña, C., Frediani, A. A., Acuto, M., & Levy, C. (2019). Knowledge translation in global urban agendas: A history of research-practice encounters in the Habitat conferences. *World Development*, *122*, 130-141.

Connolly, C., Keil, R., & Ali, S. H. (2020). Extended urbanisation and the spatialities of infectious disease: Demographic change, infrastructure and governance. *Urban Studies*, 1-23 online first, 1-23, available at: https://doi.org/10.1177%2F0042098020910873

Engström, G., Gars, J., Jaakkola, N., Lindahl, T., Spiro, D., & van Benthem, A. A. (2020). What Policies Address Both the Coronavirus Crisis and the Climate Crisis?. *Environmental and Resource Economics*, *76*(4), 789-810.

Hordijk, M., & Baud, I. S. A. (2006). The role of research and knowledge generation in collective action and urban governance: How can researchers act as catalysts?. *Habitat International*, *30*(3), 668-689.

Lee, V. J., Ho, M., Kai, C. W., Aguilera, X., Heymann, D., & Wilder-Smith, A. (2020). Epidemic preparedness in urban settings: new challenges and opportunities. *The Lancet Infectious Diseases*, *20*(5), 527-529.

McPhearson, T., Parnell, S., Simon, D., Gaffney, O., Elmqvist, T., Bai, X., & Revi, A. (2016). Scientists must have a say in the future of cities. *Nature*, *538*(7624), 165-166.

Nature (editorial) (2020). Time to revise the Sustainable Development Goals. *Nature* 583, 331–2

O'Campo, P. (2012). Are we producing the right kind of actionable evidence for the social determinants of health?. *Journal of Urban Health*, *89*(6), 881-893.

Parnell, S. (2016). Defining a global urban development agenda. *World Development*, *78*, 529-540.

Parnell, S. (2020). The enabling conditions of post-pandemic city government. *Environment and Planning B: Urban Analytics and City Science*, *47*(7), 1143-1145.

Perry, B., & May, T. (2010). Urban knowledge exchange: devilish dichotomies and active intermediation. *International Journal of Knowledge-Based Development*, *1*(1-2), 6-24.

Rose-Redwood, R., Alderman, D., & Azaryahu, M. (2008). Collective memory and the politics of urban space: an introduction. *GeoJournal*, *73*(3), 161-164.

Rydin, Y. (2006) 'Joined-up Knowledge for the Sustainable City?', *Environment and Planning A: Economy and Space*, *38*(6), 1005–1007.

Sachs, J., Schmidt-Traub, G., & Lafortune, G. (2020). Speaking truth to power about the SDGs. *Nature*, *584*(7821), 344-344.

Shah, S. (2020) Why Youthful, Conservative Pakistan Is a Coronavirus Bright Spot. *The Wall Street* Journal, 1 August 2020, available at: https://www.wsj.com/articles/why-youthful-conservative-pakistan-is-a-coronavirus-bright-spot-11596297600

Stewart, R., Dayal, H., Langer, L., & Van Rooyen, C. (2019). The evidence ecosystem in South Africa: growing resilience and institutionalisation of evidence use. *Palgrave Communications*, *5*(1), 1-12.

Sweeney, Y. (2020). Tracking the debate on COVID-19 surveillance tools. *Nature Machine Intelligence*, *2*(6), 301-304.

Swilling, M. (2014) 'Rethinking the science–policy interface in South Africa : experiments in knowledge co-production'.

Van Kammen, J., de Savigny, D., & Sewankambo, N. (2006). Using knowledge brokering to promote evidence-based policy-making: the need for support structures. *Bulletin of the World Health Organisation*, *84*(4), 608-612.

van Meerkerk, I., & Edelenbos, J. (2018). *Boundary spanners in public management and governance: An interdisciplinary assessment*. Edward Elgar Publishing.

Watson, V. (2014) 'Co-production and collaboration in planning – The difference', *Planning Theory & Practice*, *15*(1), 62–76.

Wijsman, K. and Feagan, M. (2019) 'Rethinking knowledge systems for urban resilience: Feminist and decolonial contributions to just transformations', *Environmental Science & Policy*, *98*(1), 70–76.

Wilkinson, A. (2020) 'Local response in health emergencies: key considerations for addressing the COVID-19 pandemic in informal urban settlements', *Environment and Urbanization*, *32*(2), 503–522.

Williams, L.A. (1972). The Urban Observatory Approach: A Decade of Conceptualisation and Experimentation. *Urban Affairs Quarterly 8*(1), 5-20

Zarocostas, J. (2020). How to fight an infodemic. *The Lancet*, *395*(10225), 676.