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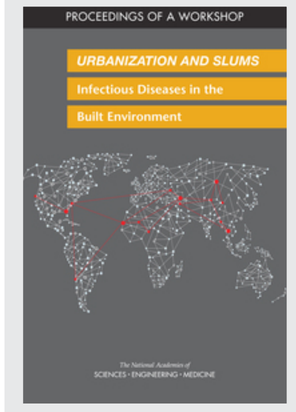

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Urbanization and Slums: Infectious Diseases in the Built Environment: Proceedings of a Workshop (2018)

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Bridging Drivers and Interventions to Scale Up Successful Practices

The final session of the workshop focused on bridging drivers and interventions to scale up successful practices in urban and slum health. The session was moderated by Mary Wilson, clinical professor of epidemiology and biostatistics at the University of California, San Francisco. During the session, the workshop organizers requested that forum members, speakers, and attendees break into three groups to explore three different assigned themes related to the promotion of health in urban environments. Each group was moderated by a workshop speaker or a member of the Forum on Microbial Threats.

Participants in group 1 were asked to consider integrated strategies that promote health and health equity on the national and local levels in low-income urban settings. This group was moderated by Jason Corburn, director of the Institute of Urban and Regional Development and professor of public health and of city and regional planning at the University of California, Berkeley. In group 2, participants were charged with discussing scaling up successful practices from research to practice in local communities. Group 2 was moderated by Thomas Scott, distinguished professor of entomology and nematology at the University of California, Davis. Participants in group 3 focused on the business case for investing in health-promoting urban environments and the link to the Sustainable Development Goals (SDGs). This group was moderated by Christopher Dye, director of strategy, policy, and information at the Office of the Director-General, World Health Organization (WHO).

This chapter summarizes potential priorities for research and action that emerged from the breakout groups and reflections on possible next

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steps by some workshop participants during the final synthesis discussion of the workshop. The ideas from each group should not be construed as collective conclusions or recommendations, and do not necessarily represent the views of all workshop participants, the Forum members, or the National Academies.

PROMOTING HEALTH AND HEALTH EQUITY IN LOW-INCOME URBAN SETTINGS

Jason Corburn, director of the Institute of Urban and Regional Development and professor of public health and of city and regional planning at the University of California, Berkeley, reported for the group that focused on integrated strategies that promote health and health equity in low-income urban settings. He said that individuals in the group framed their discussion along five areas related to urban health equity:

1. Community engagement
2. Building a local workforce
3. Gathering data
4. Moving research into policy
5. Prioritizing slum health in existing institutions

Community Engagement

According to Corburn, the group discussed the value of working toward a rich and robust definition of what community means, which may not be adequately captured by local or international institutional definitions. He said that community members are valuable experts, idea generators, and investigators who could contribute in meaningful ways to health promotion efforts throughout the process, not just after the fact, as they are the ones who often understand the community's problems as well as its needs. Through this ongoing engagement, the interventions and solutions may be more tailored, equitable, accessible, and context specific.

The group discussed models from other disciplines that may offer useful examples of community engagement, such as community-based participatory research in sociology and anthropology, said Corburn. He added that meaningful engagement with the urban poor could be bolstered by efforts to explicitly recognize and openly discuss structural drivers, including racism and spatial segregation, which contribute to health inequities, such as lack of access to health and other essential services. He said the group also discussed the strategy of engaging with place-based characteristics that influence people's opportunities, such as social, cultural, and environmental issues.

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Building a Local Workforce

Corburn reported that the group explored ways that community engagement strategies can build a local workforce. He suggested that there is an opportunity for the urban poor to benefit economically through community engagement and through the research and practice of slum upgrading if researchers are intentional about building local capacity and leadership. He explained that this model of both science and action with long-term engagement has the potential to create employment opportunities, which could be beneficial for organizations that are already active on the ground or for groups that are already disenfranchised from the economy (such as the youth). He said the group also discussed the role of community health workers and how to create a trajectory for community health workers to better integrate into the professional health worker pipeline. Corburn suggested that efforts toward building a local workforce could play a part in local-level economic development to address issues such as urban poverty.

Gathering Data

Participants spoke about the need for more data on slums as well as better, disaggregated data, said Corburn. Individuals in the group examined the possibility of developing an urban, slum-specific national data system. The data could be collected through the census, he said, or through urban slum surveillance providing longitudinal data, as was seen in examples from India and Kenya in workshop presentations. This information could uncover the realities of slum health and be leveraged to create more accountability and urgency by decision makers to act and improve slum conditions. As some governments take responsibility for certain large slums but not always for other slums and informal settlements, Corburn said the group discussed broadening the definition of slums to be more inclusive of unlisted slums in India, for example, perhaps through the mandate of WHO or another international organization. He noted that WHO has pushed for urban air pollution data across thousands of cities, for example, and wondered whether something similar might be achieved through local support and local capacity building around urban and slum health issues. Corburn suggested that longitudinal data could be helpful for tracking what is happening in slums. He noted that the one constant in cities and slums is change, suggesting that change could be seen as an opportunity to track and measure what is happening in places around the world as well as who is benefiting and who is not by using "natural experiments."

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Moving Research into Policy

The fourth point discussed by the group, said Corburn, was how to bridge the gap between research and existing institutional decision making and policy. He said that individuals in the group pointed out that researchers in the medical and biomedical fields may not clearly understand that policies in cities can act as opportunities or barriers to health improvements. To that end, he said that participants in the group suggested training researchers to better understand those opportunities and barriers and helping them build the skills to engage with policy makers on nonhealth issues, such as transportation, housing, and economic development. The group also discussed, according to Corburn, whether WHO or other international organizations could use their influence to take on a greater role in slum health by developing an urban and slum health program.

Prioritizing Slum Health in Existing Institutions

The final point considered by his group, said Corburn, was potential opportunities available within existing institutions to incorporate work on urban and slum health. For example, the group discussed that academic institutions might refocus training around urban and slum health, because few global health programs offer explicit training in this field in a holistic, interdisciplinary, and organized fashion, he said. Similarly, according to Corburn, the group discussed whether sponsors and funders might consider rerouting funding and resources based on real areas of need as identified through community outreach and improved data. It can be difficult to obtain funding for work on the types of urban and slum health activities discussed during the workshop, he said, because funding tends to be more narrowly focused on specific diseases or exposure. Developing new means of engagement with the different foundations might help to address this, he added. Participants in the group generated a list of disciplines that could be part of an interdisciplinary approach to urban and slum health to bring a range of perspectives into research, practice, and pedagogy. This list includes anthropology, medicine, epidemiology, public health, sociology, economics, civil and environmental engineering, urban planning, geography, microbiology, data science, demography, modeling, policy making, education and knowledge translation, law, ethics, media and communication, and community mobilization.

Jonna Mazet, executive director of the One Health Institute at the University of California, Davis, underscored the issue of institutional encouragement to help sponsors and governments to be more cognizant that this type of One Health or interdisciplinary approach requires support. As Corburn mentioned earlier, Mazet emphasized that financing still tends to

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go toward single diseases and issues, which has the effect of accidentally discouraging interdisciplinary participation, especially around community engagement. She suggested that this might be addressed by encouraging—or even requiring—funding proposals to include this type of interdisciplinary approach.

SCALING UP SUCCESSFUL PRACTICES: LEARNING FROM LOCAL COMMUNITIES

Thomas Scott, distinguished professor of entomology and nematology at the University of California, Davis, reported for the group tasked with exploring opportunities to scale up successful practices by learning from local communities. The group framed their discussion using four questions:

1. What are the key components for successfully scaling up public programs in local and/or urban environments?
2. How can and should public health scale-up be integrated with other development programs?
3. How do we create a translational pathway from basic science to operational research to health policy, implementation, and impact in low-income urban settings?
4. Does one size fit all, or do we have to tailor intervention scale-up to each city?

Scaling Up Public Health Programs in Local Urban Environments

Scott said the group deliberated about potential components for successfully scaling up public health programs in local urban environments. Sustainability was seen as an important component to many members of the group, which could be reinforced if the intervention contributes not only to its intended purpose but also to other positive community outcomes, explained Scott. For example, as illustrated in the workshop presentation earlier in the day (see Chapter 5) by Eva Harris, professor of infectious disease and vaccinology and director of the Center for Global Public Health at the University of California, Berkeley, a group of youth involved in eliminating mosquito larvae in Nicaragua also applied their combined capacity to address community violence, so a short-term intervention transitioned to fill a long-term community need. Community participation and sufficient coverage to achieve desired outcomes were also discussed as valuable factors with respect to scaling up programs, he said. In the context of outcomes, he added, individual group members suggested setting measurable, meaningful outcomes that are not limited to public health, as well as work-

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ing toward consensus on goals across sectors involved in urban structure and functional development.

Scott said that other components of successful scale-up were highlighted by the group, including creating an implementation plan, involving multidisciplinary expertise, adapting to the local culture and circumstances, and promoting equity with a long-term view. He also noted that, while there have been successful public health programs that could be scaled up, they were often driven by charismatic individuals, and when such individuals leave, the programs dissolve. To avoid this, Scott reported, the group discussed the potential value of establishing an institutional home to ensure continuity and having key champions train and counsel successors moving into these leadership roles.

Scaling Up and Integrating Public Health with Other Development Programs

Regarding the potential to scale up and integrate public health with other development programs, Scott said, the group discussed the aim of reaching consensus across sectors involved with the structure and function of urban environments. The group examined the potential need to identify and engage leaders who have the will and power to implement these programs, while being cognizant of political and private interests that might help or hinder program scale-up and implementation. The group also discussed developing a plan for scale-up and integration that encompasses management, governance, finance, and leadership. Scott said the group explored the issue of large infrastructural improvements versus disease-specific responses, with the assumption that both long- and short-term solutions are needed. Group members also discussed how ensuring security in the community can be a motivating factor to implement these solutions, he said, as well as the value of coordination among partners and increasing cross-talk and awareness about the benefits of urban development.

Creating a Translational Pathway from Science to Policy

The group considered strategies for creating a translational pathway from basic science to operational research to health policy implementation, said Scott, with a focus on the potential effect of that pathway in low-income urban settings. Participants in the group highlighted the potential role of using a science-driven, evidence-based approach to inform policy, he said, and discussed the types of studies in urban development that would lead to improving public health as well as the role of policy beyond implementation and monitoring. He noted that the translational pathway is not necessarily sequential; that is, policy can be developed concurrently with

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operational science and implementation. According to Scott, individuals in the group spoke about the benefit of a pipeline for multidisciplinary development, because the current disease-specific approach can be fragmented. The group discussed that institutional support for investing in core sites, such as urban slums, could serve as an incubator for developing an evidence base, said Scott. That base could be bolstered, he said, by integrating data from sites that already have infrastructure in place.

Tailoring Location-Specific Intervention Scale-Up

According to Scott, the group addressed the topic of tailoring the scale-up of interventions for specific cities because one size does not fit all. Participants in the group highlighted the potential usefulness of having a framework for the method and protocol for design and implementation of an intervention, while leaving flexibility for each community to fill in the details that fit their needs and goals, explained Scott. He also noted that the group discussed the value for implementation science to support this type of large-scale change, which could include translatable protocols, a cohort of young professionals with appropriate training and expertise, and sustainable partnerships and collaborations. Scott noted that there are lessons to be learned from existing successful public health efforts, including HIV in Africa, polio eradication, and climate change communication. The group discussed that these lessons could be examined at workshops among multidisciplinary stakeholders to stimulate dialogue and spur an exchange of ideas that has not been facilitated to the fullest extent.

BUILDING THE BUSINESS CASE FOR INVESTING IN HEALTH-PROMOTING URBAN ENVIRONMENTS

The third group examined how to build a business case for investing in health-promoting urban environments. Christopher Dye, director of strategy, policy, and information at the Office of the Director-General, WHO, reported that the group's discussion covered five areas:

1. Conceptualizing a business case for investing in health
2. Inclusion of key players
3. Potential links to the SDGs
4. Distinctiveness of urban environments
5. Potential case studies and evidence base

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Conceptualizing a Business Case for Investing in Health

Dye explained that, in this context, building a business case requires defining how to evaluate returns on investment in urban and slum health. He added that the notion of return on investment, for example, is more broadly conceived than it might be in the private sector. Based on the group's discussion, it is not simply about financial investment, he said, but also about social and political investments that cannot always be precisely quantified. The group also discussed that the purpose and audience are important to consider when making each business case, reported Dye. He noted that the outputs of the business case can extend beyond health and well-being to factors that are critical to other stakeholders, such as peace, security, employment, and education. Additionally, some members of the group recognized that even a business case that is strictly financial in terms of its inputs and outputs warrants comprehensive micro- and macro-level economic analyses to evaluate the return on investment beyond those financial terms, said Dye. For example, investments in health can make people more capable for employment or education.

Inclusion of Key Players

The group considered questions about who is developing the business case and for whom, according to Dye. Many of the group members discussed that the community should be fully active in developing the business case, reported Dye, because it is their health that is at stake. The group discussed the possibility of providing the community with veto power on proposed investments from the public or private sector, he said. Other players involved in the business case, Dye added, may include the government; industry; nongovernmental organizations, such as faith-based organizations; and large- and small-scale funders and investors, including local entrepreneurs. The group considered that the research design and evaluation expertise of the academic community can also play a role in developing the business case, said Dye.

Potential Links to the Sustainable Development Goals

The potential contribution of the SDGs to developing a business case was also examined, said Dye. He suggested that the SDG framework could be helpful in that it lays out the potential interactions among its goals and the possibilities for bringing other players into developing the business case. He cautioned that, although the SDGs call for long-term investment in health, the case for actually making those investments will need to be built more specifically and more persuasively while keeping the context and audi-

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ence in mind. Dye also noted that, in the group's discussion on multisectoral action, many participants recognized that health may not play a dominant role within the broader realm of investment in urban development.

Distinctiveness of Urban Environments

The group discussed the characteristics that make urban environments distinct from other types of environments that may make this business case unique, Dye said. He remarked that by 2050 the majority of the world's population will live in urban areas; he predicted that the people living in towns and cities will influence what happens at the country level. He noted that urban areas tend to be highly active economically with large entrepreneurial communities. The group also discussed that people live at relatively high density, he added, which has implications for the provision of services and infrastructure, some of which could be positive—for example, the volume of people in slums can be an asset for selling increased economies of scale in the water sector. Participants in the group considered that the business case for health in an urban environment might have special features that would not apply in less densely populated rural environments, noted Dye. Urban environments are also characterized by rapid change that gives rise to potential benefits and challenges, including those related to inequities, he said.

Potential Case Studies and Evidence Base

The group explored how amassing a broad range of case studies could be helpful in building an empirical evidence base for establishing best practices, said Dye. This could be used to make the business case for investing in urban and slum health as part of development, he added. Dye referred to the United Nations Human Settlements Programme's (UN-Habitat's) database mentioned in his presentation (see Chapter 2) that includes about 5,000 case studies on developments in the urban environment as a valuable resource. The SDGs can stimulate multisectoral actions, Dye remarked, which have the potential to bring people together through shared finances, combined expertise, and other advantages as well. However, he noted that the health outcomes of multisectoral actions can be hard to discern and measure. He suggested building a better evidence base around the effectiveness of different types of multisectoral actions.

SYNTHESIS AND GENERAL DISCUSSION

The discussion opened with addressing potential ways to build a strong business case that would encourage investments in urban and slum health.

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Lonnie King, professor and dean emeritus at The Ohio State University College of Veterinary Medicine, remarked that several years prior, the push toward advancing and adopting corporate social responsibilities in corporations had used language about business cases; he suggested more effectively exploiting that type of language when talking about social responsibility in urban and slum health. Peter Daszak, president of EcoHealth Alliance, noted that in cities where the rich are living and working in such close proximity to the disenfranchised and poor, health represents a connection between them (through disease vectors and transmission) that they might not otherwise have. He suggested leveraging this connection to pitch business cases that will make sense to politicians and decision makers. Daszak also suggested another pitch point for potential business cases: leveraging the connection that wealthier people have with their domestic workers by highlighting the macroeconomic benefit of improving the health of those who are contributing to the country's economy. Albert Ko, professor and chair of the Department of Epidemiology of Microbial Diseases at the Yale School of Public Health, commented that, while the geographical distance may be short between the rich and the poor, there is a great degree of social distance and marginalization. He suggested that the most compelling externality in health is probably violence, but those externalities and root drivers are still poorly understood. Daszak replied that, nonetheless, talking to powerful people in countries where the wealthy are juxtaposed against extreme poverty may drive those in power to do something. Daszak called for acknowledging and confronting policy makers with the relationship between city design and inequities around health care and violence mitigation.

Kent Kester, vice president and head of translational science and biomarkers at Sanofi Pasteur, raised the issue of how to assess the value and generalizability of interventions against the transmission of microbial threats in slums. He suggested harmonizing potential interventions with operational and implementation research components to assess the practical value of proposed interventions. Corburn agreed about the value of fleshing out implementation and evaluation sciences. Scott suggested that measurements should not be limited to public health outcomes. As an example, he questioned whether randomized controlled trials should be considered the gold standard for assessing effectiveness aimed at improving the infrastructure of modern megacities.

Dye said that building an evidence base requires characterizing the quality of the evidence, which can range from anecdotal evidence to randomized controlled trial results. He noted that people who champion randomized control trials around implementation research are probably in the minority, however, and that judgments are most commonly made by people on the ground to make sense of the underlying causes for a pro-

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gram's success or failure. The classification of different levels of evidence is also part of creating a body of relevant case studies, he added, by evaluating a given case study's validity and generalizability. Dye said that some case study databases already exist from UN-Habitat and WHO, for example, although the studies are not all health specific. For guidance about systems for evaluating evidence, Dye suggested looking at WHO's formal classification scheme for developing guidelines for good clinical research practice or the Cochrane systematic reviews, among others. He also suggested collaborating to devise a system for handling more informal types of evidence.

Eric Mintz, team lead for global epidemiology in the Waterborne Diseases Prevention Branch of the U.S. Centers for Disease Control and Prevention, commented that the Global Task Force on Cholera Control released the publication *Ending Cholera—A Global Roadmap to 2030*[1] in October 2017. He suggested that it could be leveraged to improve health in slums and informal settlements in cities, because it proposes to bring large-scale, long-term infrastructure solutions together with the delivery of short-term cholera vaccines in areas that have high incidence or high transmission rates of cholera (which are not necessarily the same spots). Mintz noted that cholera rates are increasing in cities in sub-Saharan Africa because of the growth of informal settlements and periurban areas, where people are vulnerable to waterborne diseases. He added that the road map has identified hot spots in places like Kibera in Nairobi, Kenya, and other large slums and informal settlements where a large cholera epidemic is a potential threat.

David Nabarro, advisor for health and sustainability at 4SD, described his multipart hypothesis of what he defined as a new narrative on how best to contribute to better health of poor urban residents, not only in developing countries but around the world, which is different from the way urban work has conventionally been carried out. The first element, he suggested, is readiness to refashion interventions from the viewpoint of the user and from the viewpoints of the different sectors involved. The second element, he said, is to reform implementation with community ownership and leadership at the center, with statutory bodies facilitating and sometimes nudging when needed to achieve progress. The third element, he continued, is to renew engagement in this work so that instead of slum health being seen as primarily the role of the governments or municipalities, the approach incorporates a range of both private and public actors, such as small-scale entrepreneurs, larger businesses, civil society, faith groups, and scientists. The fourth element, he suggested, is to review financing to focus on leveraging small amounts of resources within local communities to effect change. Nabarro explained that this narrative of building around

[1] *Ending Cholera—A Global Roadmap to 2030* is available at www.who.int/cholera/publications/global-roadmap/en (accessed February 10, 2018).

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community leadership, horizontal action, and multistakeholder engagement has implications for aspects ranging from the skill mix required from the workforce to development of the business case for investment. He asked the workshop participants if the elements he described are indeed part of a new narrative that is worth pursuing, or if an alternative route should be considered.

Dye responded that it may be the beginnings of a new narrative, although it is not yet sufficiently formed to be considered a new way of doing business in development. He cautioned against taking that step too quickly, which may lead to past mistakes, such as the sudden decision to support structural adjustment influenced by major funding agencies. He further warned that a jump toward a general model of development both in urban areas and more widely should be justified by the evidence. He remarked that it is useful to consider Nabarro's proposed narrative as a hypothesis to be tested for broader generalizability, alongside other ideas at various stages of development. Scott commented that the narrative described by Nabarro may be worth pursuing, but it is unclear how to best proceed with such an approach. Rather than starting from scratch, Scott suggested bringing together important players in the field with a diverse set of expertise and conducting a systematic review of existing data.

Corburn agreed with Nabarro's premises, while emphasizing the need to take a more accelerated approach. Corburn explained that the proposed narrative is not necessarily new, as a corpus of literature exists from community development and participatory practice, for example, which demonstrates the positive effects of this type of framework. To move toward the framework proposed by Nabarro, Corburn suggested that taking an aggressive approach would be better than a slow one because the current crisis of health and inequities in cities demands significant attention. Corburn articulated the "need to build the evidence base by doing, not by just studying," arguing that the evidence base needs to be built quickly through action, such as pilot programs, coupled with evaluating and tracking multiple effects.

Harris remarked that there is evidence to support the approach of "learning by doing" and pushing forward to try bringing some of those approaches to scale, despite the challenges inherent in scaling up and scaling out. She agreed with Corburn that the narrative described by Nabarro is not necessarily a new one, but she noted that it is getting more traction in an increasing number of arenas. Scott cautioned that methods for "learning by doing" need to be done carefully, such as choosing the type of evidence base, to avoid wasting resources and generating unintended consequences for already vulnerable populations. Harris clarified that she is not advocating for "learning by doing" at a global scale, but rather gaining lessons

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from a pilot stage that may serve as the principles for the next phase. She suggested that certain principles need to be followed, but communities benefit from learning what works at their own level. In that sense, she said, it is possible to have a strong, rigorous methodology that is not one size fits all. Harris added that when there is an evidence base available—from a randomized controlled trial, for example—trying to scale it up beyond the level of a study is an important next step. Scott responded that there is a balance to strike between addressing urgent needs quickly and making informed decisions based on an appropriate evidence base, even though randomized controlled trials are expensive and time consuming.

Dye remarked that the discussion had been focused on top-down initiatives and noted the importance of other types of initiatives that self-propagate within communities and spread quickly. He described the example of M-Pesa, a platform that allows users to make payments using mobile phones. He said that mobile money was unsuccessfully launched by telephone companies in South Africa, but when it spread to Kenya, where bank branches are scarce, people quickly adopted it, reaching community members who they had not imagined were interested in using this platform (Suri and Jack, 2016). He cited this as an example of the general phenomenon of good ideas spreading through communities on their own, without being driven by external panels of experts making decisions about evidence quality. These types of self-propagating innovations could be further examined, Dye suggested.

King observed that communities in poor, rural settings are clever and often have been able to survive and sustain themselves over time through creative means and wondered if there is any work around possibilities for engaging with communities through entrepreneurship to reduce poverty and improve health. Scott responded that it could be a good opportunity to take an existing proof of concept and then implement it with sufficient scale, time, and space to achieve the public health outcome being sought.

Jay Siegel, retired chief biotechnology officer and head of scientific strategy and policy for Johnson & Johnson, raised the issue of big data. He remarked that the city of Chicago has modeled multiple factors, such as the outbreak of foodborne illnesses in relation to the proximity of restaurants and exposed garbage, which increased the efficiency of rodent control efforts (NASEM, 2016). Given the amount of data that he presumes is being collected at various community and health department levels, he asked if there are opportunities to learn more about what works by analyzing data that have already been collected. Corburn replied that there is both inequity and opportunity in big data. He explained that a wealth of data available from various sources have not yet been analyzed in ways that relate those interventions to health or health determinants. He added that ample opportunities exist to increase the available data that are specific

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both to populations and to places that are either unrecognized, understudied, or not typically captured by government data.

Alex Ezeh, former executive director of the African Population and Health Research Center in Kenya, suggested encouraging countries to identify urban clusters and slums in the 2020 census. He noted that much work in slums is focused on big cities and mega-slums rather than in smaller towns that are becoming slums in their entirety because of a lack of urban planning and provision of services. He predicted that this type of decentralization will pose a challenge going forward because smaller slum dynamics are different from slums in big cities. Ko added that trends in urbanization in developing countries show that much of the growth is in midsize cities rather than megacities and noted that midsize cities experience quantitatively and qualitatively different problems than megacities.

Ko also raised the issues of equity in the interventions chosen among all other options to implement and equity in the implementation of those interventions. In other words, he said, it is the issue of "poor solutions for poor people." He questioned why people in slums are often provided with inferior solutions masked to be innovative when there are, in fact, evidence-based solutions that should be implemented, as sometimes is the case with water, sanitation, and hygiene interventions. Emily Gurley, associate scientist in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health, replied that asking the most marginalized people to do the most for safe water—to treat it at the household level—is an inequity. She said that the root cause of the issue is poor governance that does not support these vulnerable populations, because infrastructure ultimately depends on governance and large projects rather than short-term emergency solutions.

Corburn described Medellín, Colombia, as an example of positive urban transformation—it went from being the most violent city in the world in the early 1990s to no longer placing in the top 100 cities in terms of gun homicides. He explained that this was not achieved through aggressive policing or occupation, but through a complex process of deep investment in infrastructure and public spaces. Corburn attributed the success in Medellín to a combination of innovation in leadership, planning for transformation, and strong community engagement. They also used a strategy called participatory budgeting that allowed residents to prioritize certain aspects, he added, as well as the innovative use of existing technology, such as ski lifts and escalators for public transportation.

Corburn said that another strategy employed with significant health impact was called the "ethics of aesthetics," placing beautiful buildings, museums, and libraries in the poorest neighborhoods. He suggested that there are lessons to be learned from the equity of the interventions that transformed Medellín. Espinal suggested building upon existing best prac-

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tices from places like Medellín and from *favelas* in Brazil that have been completely modernized in terms of security and continuing to highlight the importance of health in all policies. Nabarro emphasized that the people collectively involved in setting the standards for health must avoid cheap and substandard solutions for poor people's ill health, if only for the reason that poor people often have much less room than rich people to maneuver if things go wrong. He suggested that the designs of interventions for poor communities are usually based on less robust and resilient approaches than the interventions designed for rich communities.

David Relman, professor of medicine at Stanford University, asked whether there are strategies for homogenizing the urban landscape in slums (other than reducing density) that might address the problem of disease transmission. Corburn replied that, if by homogenizing Relman is referring to living standards and conditions, then there has been evidence of bad planning as the result of trying to homogenize. He said that the city of Brasilia in Brazil was well planned by modern standards, but the workers who migrated to build the city created their own informal settlement on the periphery, which became the interesting part of the city. People on the edges of city planning tend to talk about how planning relates to health and disease, he added, but most people tend to like cities because they are dynamic, fun, social places with opportunities for different types of expression. Corburn expressed concern about the term *homogenization* because the richness of urbanization is its diversity. He suggested that intersectoral efforts should aim to balance efforts to address disease and exposure scenarios while simultaneously maintaining the diversity, richness, beauty, and cultures that make cities healthy at their core.

Ezeh reiterated that, in many cases, the health solutions brought to bear for poor, vulnerable populations are poor policies that end up damaging more than healing. The necessary solutions and interventions are often simple and affordable, he added, but they require working jointly with the communities. His biggest concern is "the best being the enemy of the good," he said. While it would be ideal to wait until the most scientifically proven intervention can be implemented, he explained, a basic intervention available today could also be implemented. Ezeh emphasized that if communities were listened to and collaborated with using the resources currently available, it would make a significant difference in the lives of many people living in slums today.

CLOSING REMARKS

To close the workshop, James Hughes, professor of medicine and public health at the Emory University Rollins School of Public Health, outlined

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a set of needs that were suggested throughout the workshop and which resonated from his perspective:

- Continued emphasis on the relevance of the SDGs;
- Strengthening the evidence base;
- Including health in all policies;
- Engaging communities, local experts, and policy makers in planning;
- Promoting the empowerment of women;
- Placing emphasis on collaboration across disciplines and sectors, in line with the One Health approach;
- Promoting equity;
- Moving beyond disease-specific solutions; and
- Thinking broadly about return on investment in health.

Relman reflected on the framing of issues during this workshop and noted that there seemed to be more consideration of the intersection of theory and reality, of the "end game," and of taking action and measuring effects than in previous forum workshops. He underscored Ezeh's remark about preventing the perfect from being an enemy of the good and encouraged the group to continue working on improved measures and interventions, while continuing to implement available and effective interventions. Relman suggested focusing on the science of implementation for known interventions, while also exploring other aspects of basic science, such as microbiology and molecular biology and engineering, which might contribute to decision making. Relman concluded by emphasizing the importance of striking a balance in both considerations of more experimental studies such as those that may help better understand ecological dispersal across slum environmental circumstances and the urgency of scaling up demonstrable interventions as presented throughout the workshop.

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