Toward a Research and Action Agenda on Urban Planning/Design and Health Equity in Cities in Low and Middle-Income Countries

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ABSTRACT *The importance of reestablishing the link between urban planning and public health has been recognized in recent decades; this paper focuses on the relationship between urban planning/design and health equity, especially in cities in low and middle-income countries (LMICs). The physical urban environment can be shaped through various planning and design processes including urban planning, urban design, landscape architecture, infrastructure design, architecture, and transport planning. The resultant urban environment has important impacts on the health of the people who live and work there. Urban planning and design processes can also affect health equity through shaping the extent to which the physical urban environments of different parts of cities facilitate the availability of adequate housing and basic infrastructure, equitable access to the other benefits of urban life, a safe living environment, a healthy natural environment, food security and healthy nutrition, and an urban environment conducive to outdoor physical activity. A new research and action agenda for the urban environment and health equity in LMICs should consist of four main components. We need to better understand intra-urban health inequities in LMICs; we need to better understand how changes in the built environment in LMICs affect health equity; we need to explore ways of successfully planning, designing, and implementing improved health/health equity; and we need to develop evidence-based recommendations for healthy urban planning/design in LMICs.*

KEYWORDS *Urban health, Health inequity, Urban planning, Evidence*

INTRODUCTION

This paper reviews the relationship between the physical urban environment and health equity, and proposes a research and action agenda on urban planning/design

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and health equity in cities in low and middle-income countries (LMICs). The paper draws on the work of the Urban Planning and Design working group of the Global Research Network on Urban Health Equity (GRNUHE), which was funded by the Rockefeller Foundation.

There is a growing body of work across various disciplines that recognizes the impact of the physical urban environment on human health and well-being, and thus on contributing to patterns of health inequities.[1–7] The role of the physical urban environment in contributing to intra-urban health inequities is particularly manifested in slums, where levels of disease and psychosocial stresses are invariably higher than in non-slum areas.[8–10]

The physical urban environment can be shaped through various planning and design processes: urban planning (integrated city-wide planning/spatial planning/ land use management); urban design/landscape architecture (design of public spaces); civil engineering (planning and design of infrastructure, e.g., roads and sanitation); architecture (building design); and transport planning. It is also shaped by the processes of governance (the subject of a separate paper in this issue),[11] the extent to which health equity is considered in these processes, and the extent to which disadvantaged communities are engaged to ensure that the physical urban environment meets their needs.

Through impacting the physical urban environment, urban planning and design processes can directly impact physical and mental health and social well-being and reduce health inequities in various ways. In the United States, it has been noted that "A plethora of recent evidence suggests that disparities in health … have not narrowed over time, are getting worse, and are increasingly linked to the physical and social environments that fall under the traditional domain of planning."[12(p543)]

The importance of reestablishing the link between urban planning and public health has been recognized in recent decades.[13–21] Urban planning and design processes can particularly affect health equity through shaping the extent to which the physical urban environments of different parts of cities facilitate the following:

1. Access to adequate housing and basic infrastructure (e.g., shelter, basic services such as water and sanitation, roads and electricity)
2. Equitable access to the other benefits of urban life (e.g., livelihood opportunities, facilities and services)
3. A healthy natural environment
4. A safe living environment (i.e., with low risk of injuries and few negative impacts on mental health)
5. Food security and healthy nutrition
6. Physical activity

The literature on the relationship between the physical urban environment and health inequity is discussed below in relation to these six pathways.

URBAN PLANNING/DESIGN AND ADEQUATE HOUSING AND INFRASTRUCTURE

Health inequities are underpinned by social and economic inequities. These social and economic inequities, in turn, are often exacerbated by differences in the physical urban environment. In many cities of the world, poor people live in poor-quality living environments lacking clean water, adequate sanitation, economic opportu-

nities, recreational facilities, and health facilities. For example, more than 50% of urban residents in Africa live in slums, which are urban areas characterized by lack of adequate water supply, adequate sanitation, durable housing and/or sufficient living area.[22] Urban planning/design can potentially assist in reducing social inequity by creating cities in which all residents have access to good quality living environments and adequate housing.

Adequate housing is a broad concept that includes location (presence or absence of hazards, e.g., pollution or risk of flooding); access to basic services (water, sanitation, refuse removal, an energy source); and the quality of the shelter itself (protection from the elements and sufficient living space). There is a vast literature on housing and health, highlighting the enormous impact of location, shelter, living space, and access to services on health and well-being.[23–27]

Slums are urban areas where problems of land tenure, poor shelter, overcrowding, lack of services, and hazardous location intersect. Overcrowding can also place residents at increased risk of communicable diseases. A review of health conditions in slums notes that the "harsh physical and social conditions of urban slum life lead to chronic stress in slum dwellers."[28(902)]

Slum upgrading is therefore an important strategy in reducing health inequities (although the health equity aspects are seldom explicitly spelled out in the literature on slum upgrading). In recent decades, there has been a shift toward a more integrated and participatory approach to slum upgrading programs. An integrated approach to upgrading informal settlements incorporates a range of complementary interventions that address physical, social, and economic development needs.[29–31] These interventions typically include the provision of flexible and secure forms of land tenure, the provision of basic infrastructure and facilities in ways that minimize the need for relocations, and appropriate support for residents to upgrade their dwellings. In addition, it is important that issues of location are carefully considered. When residents of slums live there for particular reasons—for example, to be close to livelihood opportunities and social networks—relocation may negatively impact their livelihoods and social networks, and thus ultimately their health and well-being.[32,33]

URBAN PLANNING/DESIGN AND EQUITABLE ACCESS TO THE OTHER BENEFITS OF URBAN LIFE

The spatial form of cities can contribute to social and economic inequalities, which underpin health inequities. Spatial inequities can have a direct impact on disposable income, for example, where low-income residential areas are located far from concentrations of employment, resulting in transportation costs and transportation time being a high burden for poor households.[34] Similarly, the uneven distribution of community facilities (such as schools, libraries, clinics) can also result in residents of deprived areas having poorer access to many of the benefits of urban life.

The spatial justice approach aims to ensure that all residents have more equitable access to the wider benefits of urban life, including livelihood opportunities, recreational facilities (parks, sports fields, community halls, etc.), human services, and cultural/educational facilities.[35] A good summing up of the spatial justice approach in practice is that "City planning should not be primarily for the construction of buildings and the use of automobiles, but for the populations and communities inhabiting urban spaces."[36(p57)]

Key ways of ensuring cities that are more equitable include:

- Encouraging densification, compaction, and integration of land uses, so that all residents have easy access to economic opportunities and community facilities. Financial modeling on South African cities suggests that low-income households are particularly negatively impacted by low-density urban sprawl and the monofunctional separation of land uses.[37] Key tools for planners in encouraging dense integrated development are land use zoning schemes (which need to be more flexible in terms of allowing a range of land uses and accommodating subdivisions and higher densities) and the setting of urban edges to prevent uncontrolled urban sprawl.[38]
- Ensuring that low-income households are not excluded from well-located areas. Key tools for planners include inclusionary zoning measures, which typically provide incentives or rules for including low-income households in new housing and commercial developments.[38]
- Ensuring that public transport is accessible to all, which usually requires concentration of urban development along transport corridors, where densities should be high enough to make efficient and affordable public transport systems viable.[38]
- Most importantly, ensuring that cities become more equitable requires participatory planning and budgeting processes that allow all residents to have a say in the allocation of government resources in cities.[39,40]

Cities such as Bogota and Curitiba are notable examples of the practical implementation of spatial justice, through participatory planning and budgeting processes and through focusing investment on public transport and improving the living environment of low-income residential areas (e.g., through the provision of local parks and bicycle lanes).[41,42] Curitiba's "Lighthouses of Knowledge", which provide access to books and the internet for residents, and the "Citizenship Streets" located next to transportation nodes, which provide access to a range of local government services, are further examples of this approach. Through reducing intra-urban social and economic inequalities, interventions such as these can potentially play a big role in reducing health inequities.

URBAN PLANNING/DESIGN AND SAFE LIVING ENVIRONMENTS

The issue of safety is concerned with the rate of injuries and the extent to which the physical urban environment contributes to or prevents injuries. Injuries can be broadly categorized into two forms – unintentional injuries and intentional injuries (deliberate acts of violence against oneself or others, including both homicide and suicide). Global statistics confirm that injuries are particularly high in the global South. Based on 1998 data, 88% of traffic-related deaths, 86% of suicides and 95% of homicides occurred in LMICs.[43] For most types of injuries, mortality rates are higher in LMICs than in high-income countries. The poor are often at a particularly high risk of injury, because they are often faced with hazardous situations on a daily basis, for example, the risk of fire from unsafe dwelling or injuries from unsafe workplaces or unsafe roads. Making cities safer can therefore potentially reduce health inequities.

There are four potential ways in which planning and design of the urban environment can create safer living environments and thus reduce health inequities:

- Reducing risk of violent crime through creating neighborhoods that facilitate "defensible spaces."[44,45]
- Reducing traffic injuries through appropriate layout and design of streets and pedestrian/cycling areas.[46]
- Promoting mental health through appropriate planning and design. In particular, access to green space can have a beneficial impact on mental health and social well-being.[47–49]
- Creating more resilient urban environments that are better able to cope with disasters such as floods and earthquakes.[50(pp32–33)] Given the expected increase in climate-change-related disasters, this is an issue of growing importance.[51] Ways of ensuring that urban environments are more resilient include creating standardized infrastructure networks in small, autonomous units that are easy to maintain.[52]

URBAN PLANNING AND IMPACT ON A HEALTHY NATURAL ENVIRONMENT

The quality of the natural environment in different parts of cities (e.g., air and water quality) has an enormous impact on intra-urban health inequities. Indoor and outdoor air pollution is a major environmental risk to health and is estimated to cause approximately 2 million premature deaths worldwide per year, with most of the burden of disease being in LMICs.[53] Increased air temperatures in densely built-up areas (the "urban heat island" effect) can also have a negative impact on health equity, and this is expected to worsen with climate change.[54] Dense urban development can result in high levels of polluted runoff of storm-water, which then pollutes water sources.[55] Water pollution (and the scarcity of clean water) is a serious urban problem, especially in LMICs, and disproportionately affects poor people.

As the burden of poor air quality and water quality disproportionately affects poor urban residents, urban planning/design interventions to increase air and water quality will thus assist in reducing health inequities. Interventions aimed at reducing motor vehicle traffic (such as facilitating increased use of public transport) and restrictions on the location of industrial activities that contribute to air pollution can help create cleaner air in urban areas. A decrease in hard impervious surfaces and an increase in pervious/green surfaces (green roofs and permeable paving) can reduce the urban heat island effect and the runoff from precipitation, while simultaneously improving the quality of runoff so that it can potentially be reused.[56,57]

URBAN PLANNING/DESIGN AND FOOD SECURITY/HEALTHY NUTRITION

Changing global social and economic conditions have resulted in both increased levels of food insecurity for the urban poor in LMICs and a shift toward unhealthier diets, resulting in a double burden of malnutrition and obesity for the urban poor.[58]

The urban food system has traditionally received little attention from urban planners,[59,60] but recent research suggests that access to supermarkets and convenience stores has a significant impact on diet and health.[61–63] Urban agriculture can also potentially be important for food security.[64]

There are a number of possible urban planning/design interventions which can promote the access of poor urban residents to healthy food, and which can therefore potentially help reduce health inequities:

- Redesigning local markets to provide greater availability of foodstuffs and to be more welcoming and accessible to city residents, as with the food and small goods markets in Sam Chuk, Thailand, and Bugurini Market in Dar es Salaam, Tanzania.[65]
- Using spatial plans and land use zoning schemes to ensure space for urban agriculture, either communally or on individual plots.[66]
- Using land use zoning schemes to regulate the location, nature, and size of food outlets, although the evidence for the effectiveness of this intervention is mixed.[67]
- Designing suitable spaces, and providing appropriate infrastructure (e.g., public sources of water supply and protection from the sun), for the cooking and selling of street food. Street food is an important source of food security for the poor, and can have a positive impact on food security and nutrition.[68]

URBAN PLANNING/DESIGN AND PHYSICAL ACTIVITY

Current and projected growth in mortality rates from non-communicable diseases (NCDs) is mainly in LMICs, and the burden "disproportionately affects poor people living in urban settings."[69(p934)] The number of people with obesity-related diabetes is expected to double to 300 million between 1998 and 2025, with three-quarters of that growth projected in the developing world.[70] Among the common risk factors for many of these diseases are unhealthy eating and physical inactivity.

There is a large literature, based on research mainly from high-income countries, which suggests that there is a strong relationship between urban planning/design, the built environment, physical inactivity, obesity, and health outcomes for residents. There is also evidence that appropriate planning and design can result in neighborhoods that are more conducive to outdoor activities and can therefore potentially reduce obesity levels and thus reduce disparities in the burden of NCDs.[71–73] Neighborhoods that have a high density, a mix of land uses, a fine-grained street network, and pleasant, human-scaled streets are typically regarded as pedestrian and cyclist-friendly (i.e., as having a high degree of "walkability") and provide greater opportunities for physical activity.[74] Evidence suggests that cities in LMICs paradoxically have lower levels of "walkability" than cities in high-income countries, even though levels of automobile ownership are substantially lower.[75] The burden of this falls on poor households, who are forced to walk and cycle in unsafe and unhealthy environments. In one of the few studies of physical activity and the built environment in developing countries, it appears that newer urban development has often resulted in the propagation of even fewer and less conducive spaces for outdoor physical activity.[76]

Evidence suggests that the appropriate planning/design and/or retrofitting of built environments can facilitate and promote safe outdoor physical activity, and thus contribute to better health outcomes.[77–83] Possible interventions include: designing new neighborhoods with a fine-grained street network, a mix of land uses, and a range of appropriate public spaces for recreation; upgrading sidewalks and public spaces (e.g., better paving and the planting of trees); and improving street lighting. As poor urban residents often live in neighborhoods that are not conducive to safe outdoor physical activity, these interventions could potentially have a significant impact on reducing health inequities.

TOWARD A RESEARCH AND ACTION AGENDA

The lack of an evidence base for understanding the relationship between the physical urban environment and health inequities in LMICs, and how urban planning/design can contribute to reducing urban health inequities, necessitates a new research and action agenda. The proposed agenda consists of four main components.

First, we need to understand intra-urban health inequities in LMICs. Although some case studies of particular slums exist and there are some profiles of health inequity at a city-scale, there are insufficient comprehensive data on the extent, nature, and trends of intra-urban health inequities in cities in LMICs. More studies that describe and analyse intra-urban health inequities in cities in LMICs, categorized by urban typologies, are therefore needed.

Second, we need to understand how changes in the built environment in cities in LMICs affect health equity. Retrospective case studies of planned and unplanned changes in the built environment, and what the impact on health/health equity was, are proposed, for example, of the health equity impacts of slum upgrading and of different models of "green fields" development.

Third, we need to understand how to plan, design, and implement for improved health/health equity in cities in LMICs. This would involve prospective studies to monitor interventions to improve urban health/health equity: what was intended, what was done, how it was done (decision-making, participation, institutional arrangements), obstacles/blockages, impacts, and outcomes for both health and health equity. Barton[13] has suggested a set of research topics that would be worth addressing, although this list would need to be adapted for LMIC cities, in consultation with those cities and with researchers in those countries. Such research would also require the development of new data and information systems, as proposed by another Rockefeller Foundation-funded network, the Round Table on Urban Living Environment Research (RULER).

Fourth, we need to develop recommendations for healthy urban planning/design in LMICs. This will need to be based on a review of current healthy urban planning/design guidelines and tools and an assessment of the extent to which these guidelines are evidence-based or opinion-based, and their relevance to LMICs.

With this in hand, an exploration of the potential ways to place health, well-being, and health equity at the center of urban planning design processes in cities in LMICs should be conducted. This would include developing, or contributing to the development of, training programs and curricula for both urban planning/design and public health students, and developing decision-making support tools/methodologies and educational materials for urban planning/design and public health professionals, politicians, officials, and civil society activists.

We hope that these thoughts on a research agenda will help stimulate new research on the relationship between urban planning/design of the built environment and health equity in cities in LMICs, and will ultimately contribute to changes in policies and practices that will help reduce these inequities and improve health and well-being for all residents.

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