GLOBAL URBAN HEALTH

Inequalities, Vulnerabilities, and Challenges in the 21st Century

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Throughout history, health concerns have been particularly focused on areas of high population concentration, and hence the interest in public health in cities, in both high- and low-income settings. Each city maintains its own uniqueness and complexity, defined by its often diverse population, geographic setting, built form (including infrastructural support), governance capacity, and historical context. Intricate urban socio-demographic patterns, as sites of concomitant extreme wealth and poverty, marginalization of some sub-populations (such as indigenous groups and minorities), the aging imprint of residents, fertility, and migratory movements, along with the numbers and concentration of city dwellers, shape unique imprints on local public health (Baeza et al. 2018; LeDoux and Vojnovic 2013; Pearson et al. 2013; Satterthwaite et al. 2018; Vlahov et al. 2007; Vojnovic 2006, 2013, 2014; Vojnovic and Darden 2013). Ultimately, these variables have all influenced the condition and lifecycle dynamics of cities and the health of their residents from the past to the present.

Cities are also market hubs and centers of trade, and, coupled with their political, social, cultural, and institutional structure, these features have all influenced health outcomes and the distinct capacities of cities to provide healthcare services and to prevent or address emerging health challenges. From being key activity nodes in transportation and trade networks, to being sites of unparalleled population densities and the concentration of human activities—including production, consumption, and the resulting pollutant emissions and wastes—it is a complex set of factors that is responsible for influencing urban health outcomes (Baeza et al. 2018; Satterthwaite et al. 2018; Vlahov et al. 2007; Vojnovic 2006, 2013, 2014; Vojnovic and Darden 2013). Moreover, before the first decade of the 21st century came to a close, more than half of the world population was living in urban centers, bringing health challenges within cities—which are closely intertwined with political, economic, and environmental conditions—to the forefront of global health concerns, and resulting actions and policies.

With their concentrated populations and their distinct infrastructural support, cities have a unique capacity for potential infectious disease transmission, among other public health challenges. The urban form itself can also either promote or hinder healthy behaviors, including through the provision of basic infrastructure (such as water, sewage, and public transportation), healthy food options (Pearson and Wilson 2013), and neighborhood walkability and connectivity (Lovasi et al. 2008), and by accommodating for places to engage in relaxation, recreation, and physical activity (Nutsford et al. 2013). In addition to physical health, increasingly the mental health consequences and benefits of features of the urban social, natural, and built environments are under investigation in an effort to combat the increasing global health burden of depression and anxiety (Lim et al. 2012). For example,
recent research has shown that, for residents living in a major urban center, increased views of blue space—bodies of water such as rivers, lakes, and oceans—is associated with lower psychological distress (Nutsford et al. 2016).

Equally important within the context of evolving global urban conditions, studies have shown that concentrated poverty and neighborhood disorder—including vacant housing, drug sales, and robbery—within cities hinder mental health, which in turn reinforces cycles of poverty (Anakwenze and Zuberi 2013; Lambert et al. 2015). Conversely, these same areas contain many of the key support services for those with mental illness (Wolch and Philo 2000) and substance abuse issues (DeVerteuil and Wilton 2009), a co-location that is problematic but also increasingly irreplaceable when faced with the threat of widespread gentrification (DeVerteuil 2015a). This tension between vulnerability and support in urban areas for those with mental health and substance abuse issues will be explored further later in this chapter.

Into the 21st century, with continued inequality, pressures on public budgets, and increasing urbanization—coupled in some regions, as in Africa and Asia, with expanding socio-political instability and civil unrest—political and humanitarian concerns, funding, programs, and coordinated action on global urban health have in many ways come into even more intense focus. This was evident, in part, with 189 countries signing the United Nations Millennium Declaration in September of 2000 (U.N. 2000), advancing eight Millennium Development Goals (MDGs). Some of these millennium targets were also directly health related, including eradicating extreme poverty and hunger, reducing child mortality, improving maternal health, and combating HIV/AIDS, malaria, and other diseases.

The MDGs were time-bound targets, with an assessment expected in 15 years from when the Declaration was signed. By the time of assessment in 2015, there were promising outcomes, with many targeted strategies and interventions showing positive results. Over a period of two and a half decades, extreme poverty was more than halved, from 1.9 billion in 1990 to 836 million in 2015, and the proportion of undernourished people in lower-income regions of the world was reduced from 23.3% in 1990–1992 to 12.9% in 2014–2016 (U.N. 2015a). In addition, between 1990 and 2015, the global under-five mortality rate had declined by more than half, being reduced from 90 to 43 deaths per 1,000 live births, with the number of deaths of children under five declining globally from 12.7 million in 1990 to almost 6 million in 2015 (U.N. 2015a).

The study of the health of urban populations and sub-populations, however, is complex, taking on distinct dimensions at different geographic scales, during particular periods of history, and in specific global contexts. Global urban health challenges and outcomes are also shaped by culture, socio-political and economic conditions, networks, national to local institutional capacity, (neo)colonial practices, natural disasters, and technological access. This connects to a growing interest in how cities relate to each other, not just in terms of uneven networks of knowledge, people, and trade, but also in terms of networked diseases (Ali, S. and Keil 2008). The complexity of 21st century conditions is illustrated in the discussion below on the diversity and dynamics of global urban health stresses, and their implications and impacts at different spatial scales.

In the 21st century, growing global interconnections and the speed of travel have transformed the spread of (and speed of spread of) infectious disease and related epidemic control. The 2014 Ebola virus epidemic in West Africa—traced back to the death of a two-year-old child on December 6, 2013 in a small and remote Guinean village, Meliandou—would eventually result in over 28,000 cases and over 11,000 deaths worldwide (Baize et al. 2014). The outbreak, reported in March of 2014, would spread across Guinea, its villages, towns, and cities, and cross the borders into proximate Sierra Leone and Liberia. The Ebola epidemic would eventually reach the capital cities of Conakry (Guinea), Monrovia (Liberia), and Freetown (Sierra Leone). Whole towns were quarantined to end the spread of the virus. Cases and deaths from Ebola would also be reported as far as London (U.K.) and New York City and Dallas (U.S.), as health workers returning home from assisting with the
outbreak in West Africa carried the virus back with them. Since this time, emerging, re-emerging, and endemic infections have greatly impacted numerous countries, sometimes on an annual basis, from Zika virus to influenza. Indeed, over the last 10,000 years, infectious diseases have influenced the evolution of humans, and the end of their influence on life and death in cities does not appear to be in sight.

Ebola is one among many emerging and previously unknown diseases. Others include Sars and Zika, which have spread without warning, with devastating consequences for vulnerable urban dwellers, particularly for pregnant women and infants. Between 2007 and 2016 Zika expanded from remote areas to high-density urban informal settlements. Zika became an explosive threat in 65 countries—amidst possible outbreaks in Africa, the Pacific Islands, the Americas, and Southeast Asia—with the largest number of cases reported in Brazil, the Caribbean, and several Central and South American countries (Ali, A. et al. 2017).

In Brazil, Zika was first identified in 2014 and spread rapidly through the country, reaching over 190,000 by 2016 and an additional almost 10,000 cases reported in 2017 alone. According to the Brazilian Ministry of Health, Zika was responsible for thousands of children born with microcephaly, almost half of them from single mothers. Poor information on contraception, lack of awareness of the fact that Zika can be sexually transmitted, and criminalized abortion are all compounding factors affecting disproportionally women in low-income settlements.

Lack of running water coupled with poor sanitation creates perfect breeding conditions for the *Aedes aegypti* mosquito that spreads Zika. In Brazil’s poor, dry northeast and other parts of South America, thousands of children living in urban areas have been affected by epilepsy, myopia, and visual impairment among many other disabilities after their mothers were infected by the Zika virus. In cities like Recife, those affected are known as the “Zika children” and treated mostly by charitable organizations.

Also in 2014, very different urban health crises were evolving in countries across Africa and into Asia, with protests, revolutions, and political and ethnic conflicts erupting into civil wars, mass casualties, and displacement, at scales never previously witnessed. U.N.H.C.R. (2018), the U.N. Refugee Agency, estimated that by the end of 2017 the numbers of forcibly displaced people worldwide was 68.5 million. One thread to this latest round of socio-political unrest could be traced back to the beginning of the 21st century, to the events and actions stemming from the September 11, 2001 coordinated al-Qaeda terrorist attacks on the U.S. The downing of the flights in New York City and Washington, DC killed close to 3,000 people. The U.S. and coalition forces responded with the invasions of Afghanistan in 2001 and Iraq in 2003, triggering an added round of instability across Asia and Africa. This regional volatility has been unfolding for more than a decade and a half now, being driven by the invasions themselves, erupting sectarian violence, continuing attacks by evolving terrorist organizations, and also, in part, the promise of more democratic rule, or at least the possibility of over-throwing political despots. These evolving and coupled socio-political and public health crises also illustrate the growing relevance of a globalizing world, where at the same time the manifestation and most severe impacts produce stresses with critical urban dimensions.

The invasion of Iraq by the U.S.-led coalition in March of 2003 in itself effectively illustrates the complexity of humanitarian and urban public health challenges during wartime. The public health crisis, and particularly urban health crisis, following the invasion was immediate. A study published in the *Lancet* conservatively estimated that in Iraq, between March 2003 and September 2004, some 100,000 deaths were attributed to the invasion (Roberts et al. 2004). The study also recognized that two-thirds of the violent deaths were reported in one city, Falluja, which was excluded from the initial estimates because of the high mortality in this urban cluster. Falluja was likely the city with the most violence in Iraq, making it an outlier whose inclusion in the study would have skewed the mortality estimates.
An updated study was published in *Lancet* by the same research group, and it showed that by July of 2006 there were over 650,000 Iraqi deaths attributed to the war (Burnham et al. 2006). Les Roberts (2013, p. 85), a leading member of the research team, revealed that there might have been as many as 200,000 deaths in just the Falluja cluster. These and other longer-term studies, including covering the post-2006 period, would also show that Baghdad was another war-related, high-mortality cluster (Hagopian et al. 2013; Lafta et al. 2015), illustrating the acute urban health pressures experienced in cities during war, owing in part to the high population concentrations.

In addition to the deaths and injuries from violence, there were public health challenges resulting from the invasion and ongoing civil unrest, including the large-scale displacement of the Iraqi population. Over a period of about four years—from the point of the invasion and into early 2007—there were approximately 4 million displaced Iraqis, with about 2.2 million crossing into neighboring countries (U.N.I.C.E.F. 2007). This, however, was just the beginning of the refugee crisis, a public health crisis that in itself would almost cripple the region and bring new risks and challenges across Asia and Africa and into Europe. It was also recognized that particular refugee pressures were being placed on large towns and cities, where the migrants were disproportionately concentrating (Overseas Development Institute 2015).

As the above examples show, with increasing urbanization and globalization, and all accompanied with growing socio-political instability, as evident over these first two decades of the 21st century, the political and humanitarian interest in global urban health is perhaps more intense and high-profile than ever. However, the study of the health of urban populations—seen in the brief discussion above, but developed further throughout this and other chapters of this book—can take on distinct dimensions spatially, temporally, and at different geographic scales. Highly localized events can produce global ripple effects, with distinct outcomes over time in specific national and/or more localized urban and even neighborhood contexts.

This chapter is intended to frame some of the key topics in this volume, including outlining the different disciplinary and theoretical approaches that are examined in this collection focused on exploring the diverse and complex nature of 21st century global urban health conditions and challenges. The chapter transitions next to exploring some of the critical emerging pressures of an increasingly urban world, and particularly within informal settlements, and then examines the importance of existing inequities and inequalities in shaping public health outcomes—from infectious diseases to mental health—within the varied, and increasingly globalizing, urban contexts.

**Living in an Urban World**

In 1950, 30% of the world population lived in urban areas, a figure that had increased to 49% by 2000, and stood at 55% in 2018 (see Table 1.1) (U.N. 2015b, 2016, 2018). Over the coming decades, these urbanization trends are expected to continue, with some two-thirds (66%) of the world population expected to be urban by 2050. The world population became predominantly urban in 2007, with urban population growth over the coming decades expected to be most significant in low-income countries, and constituting 99% of all population growth until 2050 (Davis, M. 2006; U.N. 2018). These are regions within which municipalities have fewer resources and are less equipped to deal with the demands, including infrastructure demands, of the predicted population concentrations. Issues associated with cities and health will thus continue to be a growing global challenge, and at the forefront of public policy for governments around the world.

In addition to increasing urbanization, many populations are aging. By 2030, over 1 billion will be over 65 years old—that is one in every eight people. In high-income countries, that is a 140% increase (U.N. 2005). By 2050 in China, an estimated 25% of the population will be 65 years and older. In addition, if current trends towards rapid urbanization, low urban fertility rates, and longer urban life expectancy continue, a large proportion of the Chinese elderly will be living in cities, all
with explicit implications for urban life and healthy living (Gong et al. 2012). At the same time, those regions where the bulk of urban growth is predicted to concentrate—namely Africa and Asia—are home to the highest rate of population under 19 years. In other words, most children across the world will grow up in urban areas.

In addition, while megacities (urban agglomerations of over 10 million) and metacities (urban agglomerations of 20 million or more)—alternatively called hypercities—have been the center of media attention and public interest, they do not constitute a major component of the global urban population (Tables 1.1 and 1.2). It is the grouping of cities with populations of 1 million or fewer residents that accounts for the majority of the global urban population, and it will continue to constitute the most significant growth into 2030 and beyond (U.N. 2018). This is the case, for example, in the Latin America and Caribbean (L.A.C.) region. Although L.A.C. is among the most urbanized regions of the world, the cities of the region encompass not only many megacities but also very large numbers of rapidly growing or “emerging” small and middle-sized cities developing under highly heterogeneous conditions in physical, economic, and social terms, and a high level of experimentation with different interventions to promote simultaneously better urban health and long-term urban environmental sustainability.

Table 1.1 The world population by urban–rural distinction and size of settlement, 2016 and projected 2030

<table>
<thead>
<tr>
<th>Settlement Size</th>
<th>2016</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of settlements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>4,034</td>
<td>5,058</td>
</tr>
<tr>
<td>Over 10 million</td>
<td>31</td>
<td>41</td>
</tr>
<tr>
<td>5 to 10 million</td>
<td>45</td>
<td>63</td>
</tr>
<tr>
<td>1 to 5 million</td>
<td>436</td>
<td>558</td>
</tr>
<tr>
<td>500,000 to 1 million</td>
<td>551</td>
<td>711</td>
</tr>
<tr>
<td>Fewer than 500,000</td>
<td>1,985</td>
<td>2,257</td>
</tr>
<tr>
<td>Rural</td>
<td>3,371</td>
<td>3,367</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>500</td>
<td>730</td>
</tr>
<tr>
<td>Percentage of world pop.</td>
<td>6.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>661</td>
<td>974</td>
</tr>
<tr>
<td>Percentage of world pop.</td>
<td>11.6%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>380</td>
<td>509</td>
</tr>
<tr>
<td>Percentage of world pop.</td>
<td>5.1%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>268</td>
<td>26.8%</td>
</tr>
<tr>
<td>Percentage of world pop.</td>
<td>45.5%</td>
<td>40.0%</td>
</tr>
</tbody>
</table>


Table 1.2 Twenty largest urban agglomerations, 1950 to projected 2030

<table>
<thead>
<tr>
<th>Urban agglomeration</th>
<th>1950</th>
<th>1975</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 New York</td>
<td>12,338,000</td>
<td>26,615,000</td>
<td></td>
</tr>
<tr>
<td>2 Tokyo</td>
<td>11,275,000</td>
<td>15,880,000</td>
<td></td>
</tr>
<tr>
<td>3 London</td>
<td>8,361,000</td>
<td>11,443,000</td>
<td></td>
</tr>
<tr>
<td>4 Paris</td>
<td>5,424,000</td>
<td>10,690,000</td>
<td></td>
</tr>
<tr>
<td>5 Moscow</td>
<td>5,356,000</td>
<td>9,844,000</td>
<td></td>
</tr>
<tr>
<td>6 Shanghai</td>
<td>5,333,000</td>
<td>9,614,000</td>
<td></td>
</tr>
<tr>
<td>7 Rhein–Ruhr North*</td>
<td>5,295,000</td>
<td>9,143,000</td>
<td></td>
</tr>
<tr>
<td>8 Buenos Aires</td>
<td>5,041,000</td>
<td>8,926,000</td>
<td></td>
</tr>
<tr>
<td>9 Chicago</td>
<td>4,999,000</td>
<td>8,630,000</td>
<td></td>
</tr>
<tr>
<td>10 Calcutta</td>
<td>4,446,000</td>
<td>8,545,000</td>
<td></td>
</tr>
<tr>
<td>11 Osaka</td>
<td>4,147,000</td>
<td>7,888,000</td>
<td></td>
</tr>
<tr>
<td>12 Los Angeles</td>
<td>4,046,000</td>
<td>7,623,000</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Another important aspect of the global urban trend is the concomitant expected growth in the number of people living in informal settlements, commonly referred to as slums. Informal communities are characterized by extreme overcrowding, consisting of makeshift substandard housing, and the absence of basic services, including waste removal, water and sewage (Adams 2017), healthcare, emergency services, and schools (Ezeh et al. 2017; Satterthwaite et al. 2018). These neglected urban
spaces also tend to be situated in noxious and hazardous locations, where the fecal contamination and mountains of garbage ensure high environmental burdens for the inhabitants.

**Informal Settlements**

In 2012, in low-income countries, 33% of urban residents lived in informal settlements (U.N. 2014, p. 46). The number of slum dwellers has increased from 650 million in 1990, to 760 million in 2000, and to 863 million in 2012. Informal communities are particularly dominant features of the urban landscape in low- and middle-income countries, where in cities like Nairobi (Kenya), Mumbai (India) (Figures 1.1 and 1.2), Mexico City (Mexico), and Lima (Perú) (Figure 1.3) more than half of the population lives in slum settlements (Ezeh et al. 2017; Satterthwaite et al. 2018). Sub-Saharan Africa is currently confronting a particularly acute condition with its urban informal settlements, with some 60% of urban dwellers living in slum conditions.

While the condition of informal settlements cannot be viewed as homogeneous, since very different physical and social environments are evident across these habitats, nonetheless the high concentration of inhabitants in these communities makes them highly susceptible to violence and adverse health outcomes. Children living within informal settlements are particularly susceptible to the detrimental neighborhood effects of these environments, in part a result of their immature immune systems that can expose them to a high risk of infection (Lilford et al. 2017).

Currently, there are some 1 billion people living in overcrowded informal settlements, and these are populations that are highly susceptible to adverse health outcomes (Satterthwaite et al. 2018; Tacoli et al. 2015). And while there are limitations to understanding the complexity of the social and

![Informal settlement in Wadala, Mumbai.](Figure 1.1 Informal settlement in Wadala, Mumbai. Photo by Shashi Nichani.)
environmental conditions within these communities, and their neighborhood effects, it is acknowledged that their numbers are expected to increase over the coming decades, and that this will only amplify global urban health hazards. It is projected that by 2030 some 2 billion people will live in informal settlements, largely in Asia and Africa (Ezeh et al. 2017).

In-depth analysis of the relationship between the social and environmental determinants of health risks in informal settlements in Lima reveals that a wide spectrum of injuries and illness is in fact linked to the accumulation of everyday risks and small-scale disasters with highly localized impacts, particularly on impoverished urban dwellers (Allen et al. 2017). The same study also examines the way in which risk accumulation works in Barrios Altos, in the historic center of Lima, where vulnerable tenants are highly exposed to a wide range of respiratory and water-related diseases in an area that would not be deemed as “informal.” Despite the fact that Barrios Altos was declared by U.N.E.S.C.O. a World Heritage Site in 1991, the area is subject to a complex web of socio-spatial changes which produce and reproduce inequitable living conditions. The current residents of the quintas (Colonial-era residences) live in overcrowded and unsafe conditions in aging buildings, facing physical, social, environmental, and economic vulnerabilities, as well as being exposed to multiple threats, including the collapse of the old water and sewerage pipes, fires caused by damaged or poorly made electricity lines, and the structural collapse of the buildings, among others. Despite these conditions, most of the quintas are inhabited by low-income families, mainly tenants, who often face the threat of being evicted owing to land and property speculation generated by the high value of the strategically and centrally located Barrios Altos.
Figure 1.3  Living at risk in the center (above) and periphery (below) of Lima.
Photo by Rita Lambert (above); photo by Adriana Allen (below).
Whether in the center or the periphery of a city, risk accumulation cycles or “urban risk traps” bring attention to the cumulative impacts of “extensive risks”—risks related to low-severity, high-frequency events, often associated with highly localized hazards such as fire outbreaks, rock falls, and small floods (Figure 1.4)—which are often invisible to policymakers. This is a problem aggravated by current methodological and data shortcomings, which fail to account for the bulk of health impacts (Allen et al. 2017).

Health impacts of floods and fires in informal settlements across the urban Global South are also severe, with the consequences of frequent fire outbreaks particularly underrepresented in the existing research (Twigg et al. 2017). For instance, data from DesInventar (an international disaster database) highlights that fire outbreaks are the most prevalent of all disasters in Freetown (Sierra Leone), accounting for 65% of houses destroyed or damaged in 2006 and 2009–2015 alone. The full extent of damage to livelihoods, health, and quality of life from this destruction of houses, property, and public infrastructure is undocumented and can only be inferred. Between 2011 and 2015 there were 547 fire outbreaks in the Western Area of Freetown, with residential fires constituting 87% of the total. Spatial data collected with local communities by ReMapRisk in 15 informal settlements in the city reveals that fire outbreaks result from a combination of factors, ranging across building materials, use of kerosene lamps and other hazardous forms of fuel and unsafe electricity connections, forest fires, waste often set on fire, and lack of access to running water to prevent fires from spreading (Allen et al. 2018).

**Infectious Disease and the City**

Infectious diseases are common in cities of low- and middle-income countries where the majority of the urban population lives in informal settlements. By 2012, 62% of the sub-Saharan African urban
population lived in crowded slums or shanty small towns, with countries such as the Central African Republic having 96% of the urban population living in informal settlements (U.N. Habitat 2013; World Health Organization 2010). These habitats are characterized by poor housing, overcrowding, lack of fresh water, poor sanitation facilities, high population mobility, and lack of access to quality healthcare services. All these factors make informal communities potential hotspots for infectious diseases. For example, in Dar es Salaam (Tanzania), Kampala (Uganda), and Mombasa (Kenya) frequent episodes of cholera outbreak have been reported among high population density and low-income
residents living in these cities (Penrose et al. 2010). The cholera outbreaks in informal settlements are exacerbated by flooding surges in the cities due to rudimentary drainage systems which are often clogged by waste (Figures 1.5 and 1.6). When flooding takes place, fecal and other hazardous materials contaminate open wells (Figure 1.7). In 2011, sub-Saharan Africa alone accounted for 86% of all cholera cases reported globally and 99% of all reported deaths (Mengel et al. 2014). Nairobi, a major East African city, experienced an upsurge of cholera in 2017, with 146 cases reported in various hospitals throughout the city, and a total of 136 cases were traced to a point source in a China trade fair held in a five-star hotel (World Health Organization 2017). Other diarrheal diseases such as *Escherichia coli* are also common, as reported in slum settlements in Brazil (Souza et al. 2009).

Poor access to water and sanitation is widely acknowledged as a significant driver for many preventable diseases, including water-based diseases, water-washed diseases, waterborne diseases, water-dispersed infections, and water-related vector-borne diseases (Baeza et al. 2018). Still, the urban poor continue to rely on various forms of unimproved sanitation across most cities in sub-Saharan Africa (Figure 1.8). A comprehensive study conducted in 31 major cities in the region found that the prevalence of open defecation is, on average, increasing (Hopewell and Graham 2014).

Overcrowded housing with poor ventilation in informal settlements also promotes rapid transmission of infectious diseases such as tuberculosis. Slum settlements in Dhaka (Bangladesh) have twice as high prevalence of tuberculosis compared to the overall national average (Banu et al. 2013). A study which profiled the burden of diseases in the informal communities of Nairobi found that tuberculosis and HIV account for 50% of the mortality (Kyobutungi et al. 2008).

Malaria is common in urban sub-Saharan Africa (S.S.A.), with an estimated 200 million people at risk and 25 million to 100 million reported to have clinical episodes every year. City dwellers in
Figure 1.7  Flooding in an urban slum, Kampala (Uganda).
Photo by Gershim Asiki.

Figure 1.8  Hanging toilets are the most generally adopted sanitation “facilities” across most coastal informal settlements in Freetown.
Photo by Adriana Allen.
Asia have also been reported to be at risk of malaria but from a different species than that in S.S.A. Plasmodium Falciparum is the predominant species of malaria parasite in S.S.A., while Vivax is the commonest in Asia. The high prevalence of malaria within informal settlements is attributed to a rapid urban population growth associated with poor housing and lack of sanitation and drainage of surface water in urban S.S.A. and Southeast Asia (Tusting et al. 2017). The prevalence of malaria in most cities varies from 1% in the affluent areas to 90% in the slums. At the peak of the rainy season a malaria prevalence of up to 50% was reported in Niamey (Niger) (Julvez et al. 1997). Rural features in terms of housing type, outside toilets, and agricultural activities in urban areas play a central role in the high prevalence of malaria with the slums as shown in Yaoundé (Cameroon) and elsewhere (Betsi et al. 2003; Briët et al. 2003; De Silva and Marshall 2012; Koudou et al. 2005; Tusting et al. 2017).

The HIV Epidemic and Its Urban Imprint

Mobility, which is characteristic of urban populations, has been demonstrated as a risk factor for HIV and sexually transmitted infections (Asiki et al. 2011; Bershteyn et al. 2018; Bwayo et al. 1994; Kwena et al. 2013). Demographic and health surveys from 20 countries in S.S.A. revealed that the urban poor have significantly higher odds of HIV infection than their urban non-poor counterparts (Magadi 2013).

Africa is the continent most hit by the global HIV epidemic, with East and Southern Africa more severely affected than the rest of Africa. Although East and Southern Africa contribute only 6% of the world’s population, these countries are home to more than half of the total world population living with HIV and 43% of all new HIV infections (U.N.A.I.D.S. 2017). Ten countries—South Africa, Angola, Mozambique, Kenya, Zambia, Tanzania, Uganda, Zimbabwe, Malawi, and Ethiopia—account for nearly all these infections (U.N.A.I.D.S. 2017). New HIV infections are driven by key populations, such as female sex workers who live in major cities and small towns. Through a systematic review, it was established that more than one-third of female sex workers in sub-Saharan Africa are HIV infected (Baral et al. 2012).

Despite several interventions to curb the HIV epidemic in Africa, the poor in cities—where the majority of HIV infections are reported—continue to experience difficulties in accessing HIV prevention and treatment services. The consequence of this is the unabated spread of HIV and high mortality in African cities and beyond. Cities are a hub for international tourists and travelers, and thus a nucleus of HIV infections to travelers who may bring HIV infections to other countries.

A major challenge with controlling HIV in urban Africa is the paucity of urban data disaggregated into informal and non-informal settlements, which would be useful to highlight inequities between communities. Among the urban residents, gradients of disadvantage exist but are often masked by lack of data from the disadvantaged populations in informal settlements. A study conducted in South Africa revealed that the HIV prevalence of those living in urban informal areas is double that of those in formal urban settlements (Shisana et al. 2005). When such differences are masked by lack of data, city planners tend to overlook the allocation of resources, infrastructure, and service delivery needs of informal settlements.

Population based HIV impact assessments (PHIAs) conducted from 2015 to 2017 further echoed the urban disadvantage in accessing HIV prevention and treatment services. For example, in Malawi, among HIV-positive males aged 15–64, HIV prevalence in urban areas was found to be 14.2%, compared to 9.7% in rural areas. In addition, 40.0% of those residing in urban areas were unaware of their HIV status, compared to a 29.6% level of unawareness among those in rural areas. Similarly viral load suppression, which is a marker of treatment success among HIV-infected people, was lower in Blantyre city than in rural areas, signifying a better treatment uptake and control of the
Global Urban Health

HIV epidemic in rural communities (MPHIA 2017). Similarly, in Zambia HIV prevalence among those residing in urban areas was 15.3% compared to 9.2% for those living in rural areas (ZAMPHIA 2017). However, in Zimbabwe there was no difference in HIV prevalence for rural and urban residents (ZIMPHIA 2017).

Analysis of data from 28 countries in sub-Saharan Africa showed a strong association between in-migration to urban areas and HIV infections, especially in Eastern and Southern Africa (Voeten et al. 2010). Economic development often fuels mobility owing to improved opportunities for labor and improvement in transport infrastructure. As African cities continue to grow, HIV infections will remain a permanent danger to economic progress.

Non-Communicable Diseases

Another growing health problem in cities is non-communicable diseases. This has been mainly driven by social and economic changes resulting from urbanization. A shift in dietary habits from traditional foods to fast foods, coupled with lower levels of physical activity, has increased the prevalence of obesity in cities. Most urban dwellers find it difficult to undertake physical activities because of high-volume traffic, heavy use of motorized transportation, poor air quality, and lack of safe public green spaces or affordable recreation/sports facilities. Unhealthy marketing of foods, alcohol, and tobacco products leads to an increased risk of non-communicable diseases (cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases). Urbanity has been consistently shown to be associated with a higher prevalence of cardiovascular risk factors (Allender et al. 2011; Riha et al. 2014).

While informal settlements are within the city, where ideally health services are expected to be better, slum residents are often unable to access services because they cannot afford the costs of treatment, health facilities open within their busy work schedules, there is insecurity at night in the slums, and there is limited availability of free public health facilities (Bakibinga et al. 2016). Above all, promotion of preventive measures, such as improving access to clean water, sanitation, and decent housing, becomes paramount.

Social Unrest, Violence, and the 21st Century Refugee Crisis

By 2018, there was already some half a decade of global focus placed on a particular type of human settlement that became a key aspect of discussions on urban health stresses, the refugee camp. As the first decade of the 21st century came to an end, a wave of demonstrations and revolutions spread across Western Asia and North Africa, with the violence provoking a global refugee crisis (see Figures 1.9 to 1.12). There were popular protests in Tehran beginning in 2009. Over the next couple of years, demonstrations and civil unrest would spread to almost a dozen countries throughout the region, starting with the “Jasmine Revolution” in Tunisia in 2010, followed by the Egypt, Yemen, and Libya uprisings in 2011. The most critical refugee pressures, however, would emerge from Syria, where civil unrest and violence can be traced back to 2011.

By 2016, approximately 13.5 million people within Syria required humanitarian assistance, and some 5 million Syrians had left the country (U.N.H.C.R. 2016). The majority of these Syrian refugees are currently in Turkey (2.86 million), Lebanon (1 million), Iraq (261,900), and Egypt (213,900), but hundreds of thousands of refugees—including from the wider conflicts in the region—would begin to spill over into Europe. With more than 800,000 asylum applications filed in Europe by 2016, there was considerable concern over the prevalence of infectious diseases among asylum seekers and the challenges it might pose for European healthcare systems (Mockenhaupt et al. 2016).

Early in the crisis, research showed that there were increased rates of skin diseases (particularly cutaneous leishmaniasis, lice, and scabies) and systematic infectious diseases (hepatitis, measles, and...
Figure 1.9  Azraq Refugee Camp, Jordan.
Photo by Malek Hashesh.

Figure 1.10  Aida Refugee Camp in Bethlehem, Palestine. Aida has evolved into a permanent Bethlehem refugee neighborhood.
Photo by James Jagger.
Figure 1.11  The landscape of Aida Camp in Bethlehem, Palestine.
Photo by James Jagger.

Figure 1.12  Arroub Camp in Bethlehem, Palestine. Similar to the Aida refugee camp, Arroub has become a permanent neighborhood housing refugees in Bethlehem.
Photo by James Jagger.
Igor Vojnovic et al.

Typhoid fever) among Syrian refugees in Jordan and Turkey. However, research in Europe showed a comparatively low prevalence of harmful parasitic infectious diseases among Syrian refugees arriving in Germany (Mockenhaupt et al. 2016). Researchers began to speculate that distinctions in the physical health of the refugee population may be a result of particular hygiene conditions at refugee centers and different protocols for screening and medical care, including presumptive treatment.

It also became evident that there was a particular urban dimension to the refugee crisis, with the majority of refugees fleeing to urban areas because of the public services, infrastructure, and economic opportunities offered by cities. There have been many cities and towns in Greece, Turkey, Jordan, and Lebanon that have been overwhelmed by the crisis, with some urban centers within these countries doubling in size owing to the refugee population. In an article titled “Cities are at the centre of the Syrian refugee crisis,” David Miliband (2015), President and CEO of the International Rescue Committee, argues that “the overwhelming majority of Syrian refugees are not in camps but urban centres.” For example, in Jordan, there were 655,588 Syrian refugees registered with U.N.H.C.R. in 2017. From this total, there were 139,409 (21%) living in camps, while the rest were dispersed across Jordan’s major urban centers, including 185,455 (28.3%) in Amman, 157,446 (24%) in Mafraq, 135,132 (20.6%) in Irbid, and 108,335 (16.5%) in Zarqa (U.N.H.C.R. 2017). With a substantial increase in population numbers within cities in Jordan, the asylum seekers would exert significant pressures on local urban infrastructure, from waste collection, to low-income housing, to water provision and healthcare.

**Violence within Cities: An Emphasis on the West**

With the violence and the refugee crisis continuing to unfold across Western Asia and North Africa, throughout Europe and North America there are ongoing regionally based concerns of fringe terrorist attacks. There is particular attention to this issue in large Western cities, owing to the high population concentrations and the potential casualties. This has been re-enforced by terrorist attacks across major European urban centers, including the 2004 Madrid train bombings that killed 191 people and injured more than 1,800, the 2005 London bombings that killed 52 people and injured more than 700, the January and November 2015 Paris attacks, which combined left close to 150 dead and over 350 wounded, and the 2016 Bastille Day attack in Nice, which killed 86 people and injured close to 460. In the U.S., high-profile terror attacks include the 2013 Boston Marathon bombings, which killed three and injured more than 260, the 2015 San Bernardino shootings, which left 14 dead and 21 wounded, and the Orlando nightclub shooting, which resulted in 49 deaths and 58 wounded. In 2017 alone, attacks in Barcelona, Stockholm, London, and Paris continued to place major urban centers on high alert to threat of future attacks. However, in the U.S., terrorist attacks emerge as only one aspect—and a relatively small one—of local security concerns and urban health challenges associated with violence, with firearm homicides across cities occurring hourly. For example, approximately one month apart in 2017, the Las Vegas (Nevada) music festival shootings and the Sutherland Springs (Texas) church shootings, in combination, killed 84 and injured 871 (Stewart et al. 2018).

Interpersonal violence remains an important determinant of health, yet one that remains relatively understudied. In the U.S., in the ten years between 2003 and 2012, there were 313,045 people who died from firearm-related injuries, a number of deaths that outnumbers U.S. combat fatalities during World War II (Wintemute 2015). In 2014, during this single year in the U.S., firearm violence accounted for over 100,000 injuries, fatal and non-fatal (Davis, A.B. et al. 2018).

In 2010 alone, the total societal costs of firearm injuries in the U.S. were estimated at over $174 billion. Firearm deaths and injuries are considered a national public health concern. As reported in an article in Nature, “[t]he United States has the most firearms per capita and the greatest number
of gun murders of any developed nation” (Wadman 2013). In a study involving a comparison of 23 populous high-income O.E.C.D. countries, the U.S. firearm homicide rates were 19.5 times higher than the rates in other high-income countries (Richardson and Hemenway 2011). In fact, of all the firearm deaths in these high-income countries—both homicides and suicides—80% occurred in the U.S. (Richardson and Hemenway 2011, p. 241). Research also continues to find a strong association between firearm ownership and firearm homicides and suicides, whether at the population level, the household level, or the individual level (Anglemeyer et al. 2014; Davis, A.B. et al. 2018; Miller et al. 2002; Siegel et al. 2013, 2014). At the same time, and contrary to popular belief and media reports, research continues to show that mental illness by itself is not a prominent contributor to firearm violence (Swanson et al. 2015; Wintemute 2015).

There are also important urban dimensions to firearm deaths in the U.S. From the over 30,000 violent deaths that are associated with gunshot wounds every year, firearm homicides as a rate remain above the national average in large U.S. metropolitan areas, as evident in cities like New Orleans, Baltimore, St. Louis, Detroit, and Memphis (U.S.D.H.H.S., C.D.C. 2013). For instance, a 2004 American Journal of Public Health study by Charles Branas and colleagues found that firearm homicide rates were 90% higher in urban counties when compared to rural counties. More recent CDC published data revealed that during 2009–2010 there was a total of 22,571 firearm homicides and 38,128 firearm suicides in the U.S. (U.S.D.H.H.S., C.D.C. 2013). Table 1.3 shows the U.S. total and the data for the 50 most populous metropolitan statistical areas (MSAs), ordered based on highest firearm homicide rates. The data shows a consistent urban pattern in firearm homicide rates, with residents in

<table>
<thead>
<tr>
<th>MSA (ordered by firearm homicides rate)</th>
<th>Firearm homicides (all ages)</th>
<th>Firearm suicides (aged ≥10 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Rate</td>
<td>No.</td>
</tr>
<tr>
<td>U.S. total</td>
<td>22,560</td>
<td>3.7</td>
</tr>
<tr>
<td>MSA total (50 MSAs)</td>
<td>14,428</td>
<td>4.3</td>
</tr>
<tr>
<td>New Orleans—Metairie, LA</td>
<td>449</td>
<td>19.0</td>
</tr>
<tr>
<td>Memphis, TN—MS—AR</td>
<td>249</td>
<td>9.4</td>
</tr>
<tr>
<td>Detroit—Warren—Dearborn, MI</td>
<td>686</td>
<td>8.6</td>
</tr>
<tr>
<td>Birmingham—Hoover, AL</td>
<td>186</td>
<td>8.4</td>
</tr>
<tr>
<td>St. Louis, MO—IL</td>
<td>436</td>
<td>8.1</td>
</tr>
<tr>
<td>Baltimore—Columbia—Towson, MD</td>
<td>409</td>
<td>7.7</td>
</tr>
<tr>
<td>Jacksonville, FL</td>
<td>198</td>
<td>7.4</td>
</tr>
<tr>
<td>Kansas City, MO—KS</td>
<td>260</td>
<td>6.8</td>
</tr>
<tr>
<td>Philadelphia—Camden—Wilmington, PA—NJ—DE—MD</td>
<td>729</td>
<td>6.2</td>
</tr>
<tr>
<td>Chicago—Naperville—Elgin, IL—IN—WI</td>
<td>1,139</td>
<td>6.0</td>
</tr>
<tr>
<td>Houston—The Woodlands—Sugar Land, TX</td>
<td>701</td>
<td>5.8</td>
</tr>
<tr>
<td>Richmond, VA</td>
<td>134</td>
<td>5.7</td>
</tr>
<tr>
<td>Virginia Beach—Norfolk—Newport News, VA—NC</td>
<td>203</td>
<td>5.7</td>
</tr>
<tr>
<td>Miami—Fort Lauderdale—West Palm Beach, FL</td>
<td>594</td>
<td>5.6</td>
</tr>
<tr>
<td>San Francisco—Oakland—Hayward, CA</td>
<td>439</td>
<td>5.2</td>
</tr>
<tr>
<td>Indianapolis—Carmel—Anderson, IN</td>
<td>188</td>
<td>5.1</td>
</tr>
<tr>
<td>Atlanta—Sandy Springs—Roswell, GA</td>
<td>515</td>
<td>4.8</td>
</tr>
<tr>
<td>Buffalo—Cheektowaga—Niagara Falls, NY</td>
<td>103</td>
<td>4.7</td>
</tr>
</tbody>
</table>

(continued)
Table 1.3 (continued)

<table>
<thead>
<tr>
<th>MSA (ordered by firearm homicides rate)</th>
<th>Firearm homicides (all ages)</th>
<th>Firearm suicides (aged ≥10 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. 2 Rate 3</td>
<td>No. 2 Rate 3</td>
</tr>
<tr>
<td>Nashville-Davidson—Murfreesboro—Franklin, TN</td>
<td>158 4.6</td>
<td>251 8.7</td>
</tr>
<tr>
<td>Milwaukee—Waukesha—West Allis, WI</td>
<td>139 4.5</td>
<td>156 5.6</td>
</tr>
<tr>
<td>Pittsburgh, PA</td>
<td>192 4.5</td>
<td>298 6.8</td>
</tr>
<tr>
<td>Charlotte—Concord—Gastonia, NC—SC</td>
<td>190 4.4</td>
<td>305 8.0</td>
</tr>
<tr>
<td>Columbus, OH</td>
<td>174 4.4</td>
<td>219 6.7</td>
</tr>
<tr>
<td>Louisville/Jefferson County, KY—IN</td>
<td>105 4.4</td>
<td>202 9.1</td>
</tr>
<tr>
<td>Las Vegas—Henderson—Paradise, NV</td>
<td>164 4.2</td>
<td>376 11.4</td>
</tr>
<tr>
<td>Los Angeles—Long Beach—Anaheim, CA</td>
<td>1,141 4.2</td>
<td>755 3.5</td>
</tr>
<tr>
<td>Phoenix—Mesa—Scottsdale, AZ</td>
<td>331 4.0</td>
<td>688 9.8</td>
</tr>
<tr>
<td>Cleveland—Elyria, OH</td>
<td>146 3.9</td>
<td>168 4.5</td>
</tr>
<tr>
<td>Washington—Arlington—Alexandria, DC—VA—MD—WV</td>
<td>440 3.8</td>
<td>418 4.3</td>
</tr>
<tr>
<td>Dallas—Fort Worth—Arlington, TX</td>
<td>469 3.6</td>
<td>762 7.4</td>
</tr>
<tr>
<td>San Antonio—New Braunfels, TX</td>
<td>155 3.6</td>
<td>267 7.4</td>
</tr>
<tr>
<td>Oklahoma City, OK</td>
<td>90 3.5</td>
<td>207 9.5</td>
</tr>
<tr>
<td>Cincinnati, OH—KY—IN</td>
<td>140 3.4</td>
<td>246 6.6</td>
</tr>
<tr>
<td>Orlando—Kissimmee—Sanford, FL</td>
<td>151 3.4</td>
<td>269 7.1</td>
</tr>
<tr>
<td>Hartford—West Hartford—East Hartford, CT</td>
<td>75 3.3</td>
<td>78 3.5</td>
</tr>
<tr>
<td>Riverside—San Bernardino—Ontario, CA</td>
<td>283 3.3</td>
<td>366 5.3</td>
</tr>
<tr>
<td>Tampa—St. Petersburg—Clearwater, FL</td>
<td>161 3.1</td>
<td>490 9.1</td>
</tr>
<tr>
<td>Sacramento—Roseville—Arden-Arcade, CA</td>
<td>132 3.0</td>
<td>231 6.0</td>
</tr>
<tr>
<td>New York—Newark—Jersey City, NY—NJ—PA</td>
<td>1,101 2.8</td>
<td>574 1.6</td>
</tr>
<tr>
<td>Denver—Aurora—Lakewood, CO</td>
<td>117 2.3</td>
<td>375 8.6</td>
</tr>
<tr>
<td>Raleigh, NC</td>
<td>52 2.3</td>
<td>100 5.4</td>
</tr>
<tr>
<td>Boston—Cambridge—Newton, MA—NH</td>
<td>166 1.8</td>
<td>165 2.0</td>
</tr>
<tr>
<td>Providence—Warwick, RI—MA</td>
<td>56 1.8</td>
<td>90 3.1</td>
</tr>
<tr>
<td>Austin—Round Rock, TX</td>
<td>66 1.7</td>
<td>187 6.9</td>
</tr>
<tr>
<td>Salt Lake City, UT</td>
<td>32 1.5</td>
<td>194 11.2</td>
</tr>
<tr>
<td>Seattle—Tacoma—Bellevue, WA</td>
<td>105 1.5</td>
<td>406 6.7</td>
</tr>
<tr>
<td>Portland—Vancouver—Hillsboro, OR—WA</td>
<td>66 1.4</td>
<td>302 7.8</td>
</tr>
<tr>
<td>Minneapolis—St. Paul—Bloomington, MN—WI</td>
<td>90 1.3</td>
<td>295 5.1</td>
</tr>
<tr>
<td>San Jose—Sunnyvale—Santa Clara, CA</td>
<td>48 1.3</td>
<td>106 3.3</td>
</tr>
<tr>
<td>San Diego—Carlsbad, CA</td>
<td>75 1.1</td>
<td>282 5.2</td>
</tr>
</tbody>
</table>


Notes:
1 MSAs ranked based on highest firearm homicide rates. Numbers and rates reflect decedent’s place of residence, not place of occurrence. This table includes only the 50 most populous MSAs among the 381 U.S. MSAs currently delineated, and therefore cannot be used to establish comprehensive national rankings.
2 These national and MSA-specific numbers correspond to age-adjusted rates and exclude a small fraction of records with undocumented decedent age (28 firearm homicides and seven firearm suicides).
3 Rates are age-adjusted to the year 2000 U.S. standard population.

...the 50 largest MSAs representing 54% of the U.S. population during 2009–2010, yet they accounted for 64% of firearm homicide victims nationally.

It is also worth noting that, in the U.S., crime rates have been dropping over the past 20 years. Some of the reasons for crime decline may relate to urban design and investment in neighborhood...
buil infrastructure. For example, Branas et al. (2011) conducted a decade-long study and found that “greening” vacant lots lowered gun assaults, vandalism, and self-reported stress among residents. Likewise, Garvin et al. (2013) found a decrease in total crimes and gun assaults and increased feelings of safety near “greening” intervention sites. These studies suggest that urban interventions to lower crime may involve “signs of care” that promote a sense of community and investment in place (Sampson et al. 2017).

Cities as Dynamic Entities, (Re)constructed through Social and Biophysical Processes

It is important to remember that cities are not static entities. Instead, they are often cyclical, almost organism-like, with changes being driven by both chronic and acute factors, related to social and/or biophysical processes. This is especially true for the city of Detroit, Michigan, which has garnered a worldwide reputation for high crime rates and heavily blighted neighborhoods after a series of decades of economic decline and concomitant de-population. Once a flourishing industrial center, the city of Detroit is an example of the “shrinking cities” phenomenon, with considerable urban public health dimensions (Martinez-Fernandez et al. 2012).

Detroit comprises 130 mi² (208 km²) of land area in the southeast portion of Michigan, U.S. Founded by the French in 1701, the city has an extensive history as a hub for trade, manufacture, and immigration. The population of Detroit peaked in 1950, when 1.85 million residents occupied the city mostly for its role in the booming auto industry (Poremba 2001). Following the decline of this industry, Detroit’s population dropped to only 680,250 residents in 2014 (U.S. Census Bureau 2015). The vast majority of the current population of Detroit is African-American (over 80%) and live in households below the federal poverty level.

Year to year, economic conditions and employment opportunities continued to worsen, leading to widespread flight from the city. Homes were abandoned or subject to foreclosure (Rzotkiewicz 2016), and by 2010 the large but sparsely populated neighborhoods with deteriorating infrastructure, coupled with a minuscule tax base for service delivery, forced the Mayor to propose that Detroit’s remaining population be consolidated to better allocate resources and services (Snyder 2010). In 2013, Detroit had to file for bankruptcy—the largest municipal bankruptcy filing in U.S. history, with an estimated $18 billion to $20 billion debt (Davey and Walsh 2013). The Obama administration then allocated $300 million in aid “to address key areas of importance, including blight removal, public works, and public safety” (Price et al. 2014, p. 2).

A 2014 physical survey of all the approximately 380,000 city land parcels revealed that 30% of structures were considered “blighted” (signs of arson, broken windows, in need of demolition) (Rzotkiewicz 2016). As the majority had been constructed during the peak of the use of lead in construction material, their decay was rendered especially hazardous (Price et al. 2014). Additionally, at least 5% of vacant lots showed evidence of significant dumping of litter, chemicals, and other debris (Price et al. 2014). The health effects of living in a neighborhood overrun with abandoned and blighted homes are myriad, including depression, anxiety, and fear. Abandoned neighborhoods also fuel high crime rates, and both have contributed to poor social cohesion, with its own deleterious effects on mental health (Portes 1998). In 2013, Detroit led the U.S. in violent crime, with a homicide rate ten times the national average at 45 homicides per 100,000 people (Federal Bureau of Investigation 2013).

Spurred by the severity of its situation, the City of Detroit has experienced a cultural revival in recent years, including a growing number of grassroots and aid programs to restore and repurpose Detroit’s thousands of vacant lots (Rzotkiewicz 2016). Activism ranges from “mower gangs” that volunteer to maintain overgrown parks, to independent contractors planting hundreds of mature trees in targeted neighborhoods (Nardone 2016). The urban farming movement has also gained
considerable momentum within the city (Rzotkiewicz 2016), which not only helps restore ecological
diversity and naturally filter contaminated soil, but provides increased access to healthy food choices
(Detroit Dirt LLC 2016). It is unclear whether such efforts reach all neighborhoods, including the
most impoverished. Research shows that the economic benefits are not reaching the predominantly
African-American neighborhoods. Rather, economic investment is disproportionately concentrated
in Detroit’s rapidly gentrifying Downtown and Midtown neighborhoods (Reese et al. 2017).

Elsewhere, in other “shrinking cities,” we have seen tremendous grassroots efforts to improve
healthy food options, reclaim vacant lots (Sadler and Pruett 2015; Sadler et al. 2017), and show signs
of care (Sampson et al. 2017), all with implications for improving mental health (Beyer et al. 2014),
and fostering a rejuvenation in poor neighborhoods in such cities. While the loss of population and
services and the concomitant rise in vacant lots and abandoned homes are critically important to
shrinking cities, they offer the opportunity to (re)think the city. Given that positive neighborhood
conditions are known to promote health, particularly mental health, this large scale (re)considering
of the city means a rare chance to (re)design cities to provide equitable health benefits.

Just as economic decline can propel drastic (re)thinking in cities, so can natural disasters bring to
prominence a host of issues around normally submerged inequalities and social fragmentation. For
example, the devastating 2010/11 earthquakes of Canterbury (New Zealand) led to not only hundreds
of deaths but also the decimation of the built infrastructure of the central city (see Figure 1.13)—and
is deemed the nation’s most destructive seismic event (Bradley and Cubrinovski 2011). Significant

![Figure 1.13](image-url)
seismic activity started on September 4, 2010 in Christchurch and the Canterbury region, followed by over 10,000 aftershocks, including a major event on February 22, 2011, which directly caused nearly 200 fatalities and severely damaged more than 10,000 buildings and homes (Reyners 2011) and much of the city’s water, sewer, and power provision infrastructure.

The 2013 Census counted an increase of 138% empty dwellings in greater Christchurch since the 2006 Census. Most of these empty dwellings were located in the severely affected, socioeconomically deprived eastern suburbs. While an estimated 7,000 to 8,000 people left Christchurch immediately following the February earthquake, there were further declines over time, indicating that even an acute factor such as an earthquake can create a chronic de-stabilization effect. By June 2012, the population had declined an additional 1.5%. The most vulnerable households were also the most affected by housing damage, those in lower-pay service employment which declined post-quake, and were less likely to have the funds to move elsewhere. Disasters lay bare the structure of society. As in New Orleans following Hurricane Katrina, in Christchurch the earthquakes had a proportionally greater impact on low-income areas. Historically, housing for low-income communities has been constructed on cheaper land, often in low-lying areas that are prone to flooding (Howden-Chapman et al. 2014).

Furthermore, this observation reminds us that, while the understanding of linkages between disaster risk and urban development has seen important advances in recent decades, the bulk of policies and studies focusing on the relationship between risk, urbanization, and health still falls short in

Figure 1.14  Mural in Christchurch, reflecting the eviscerating effects of the earthquakes on the heart of the city.

Photo by Amber Pearson.
addressing the production and reproduction of so-called urban “risk traps,” which are accumulation cycles of everyday risks and small-scale disasters with highly localized impacts, particularly on impoverished urban dwellers (Allen et al. 2017).

Just as “shrinking cities” continue to evolve, so do places where biophysical forces (e.g., a natural disaster) intersect social processes (e.g., low-income marginalization). We have seen incredible resilience after natural disasters (Thornley et al. 2013), including the return of businesses to foster health, neighborhood amenities, interaction, and art to bring people together (see Figure 1.14). But, if we are not diligent, such changes can also pave the way for further marginalization of some groups, promotion of criminal activity, and unhealthy built environments (Breetzke and Pearson 2017). Thus, it is imperative to study the current and dynamic conditions of cities, and how re-building, recovery, and rejuvenation can either promote equity or perpetuate historical injustices (Howden-Chapman et al. 2014), in order to understand future health concerns.

CITIES AS BOTH PRODUCERS OF VULNERABILITY AND ENABLERS OF SUPPORT: URBAN MENTAL HEALTH AND SUBSTANCE ABUSE

As previously suggested, there is no doubt that cities can concentrate ill-health and unwell populations. This is certainly the case for those suffering from mental illness and substance abuse, featuring a longstanding tendency towards spatial convergence in transitional, disorganized inner-urban areas with cheap rents and copious support services. These areas were deemed by Dear and Wolch (1987) to be “service-dependent ghettos”; in some cities they are under threat of displacement and gentrification, while in others they have remained spatially resilient (DeVertueuil 2015b). Within mental health geographies, there is a longstanding debate about whether this inner-city concentration is due to the disorganized nature of urban space which, in turn, promotes mental illness among those already prone to it, or whether individuals develop mental illness in all geographic spaces but drift into these service-rich areas (DeVertueuil, Hinds et al. 2007). While the consensus is that both tendencies are at work, there remains the tension between the concentration of unwell populations on the one hand, and the co-location of services on the other hand that support but also potentially entrap the former.

In the sections on urban health services and urban mental health, all chapters touch in some ways on this tension. In effect, the conspicuous concentration of services and the populations that depend on them can be thought of as “service hubs,” many of which are located in the heart of cities in the Global North (DeVertueuil 2015a). Built up in the 1960s and 1970s and stemming from the haphazard deinstitutionalization period when former mental patients drifted into cities to look for housing and services, they are unlikely to be ever replicated again. The irreplaceability of these services hubs makes them the most visible clustering of disabled populations in many cities, but their sheer visibility also makes them vulnerable to threats such as gentrification-induced displacement. In a place like Skid Row, Los Angeles (see Figure 1.15), the saturation of drop-in clinics, subsidized and affordable housing, and emergency services ensures a high concentration of individuals with severe mental illness (especially bipolar disorder and schizophrenia), but also entraps them. In addition, Skid Row contains a high degree of alcohol outlets and street drug dealing, which further complicates the effort at providing humane environments for individuals with mental illness. In effect, very few other neighborhoods would accept the services upon which they depend, and more recently the edges of Skid Row have been gentrified and services displaced within an even tighter cluster (DeVertueuil 2015a).

If the relationship between mental ill-health and urban space is fraught and contradictory, the case of substance abuse treatment is perhaps more straightforward. In effect, the spatial overlap of treatment centers in transitional, insalubrious neighborhoods only makes the process more difficult and challenging (Wilton and DeVertueuil 2006). Research done on substance abuse treatment in Winnipeg and Toronto, Canada (DeVertueuil and Wilton 2009; DeVertueuil, Wilton, and Klassen
2007; Wilton et al. 2014) showed that the inner-city locale of most substance abuse treatment centers created a very challenging set of circumstances, particularly the irksome overlap of being in treatment while being in close proximity to drug dealing and drug culture. Part of this dynamic may be explained by strong community opposition to substance abuse treatment facilities, especially in middle-class neighborhoods, thereby shunting such facilities to areas of weak or absent opposition. This pervasive NIMBYism (Not in My Back Yard) (DeVerteuil 2013) ensures that some of the most vulnerable citizens are unable to access healthy environments so that they may recover.

Structure of This Book

This book explores different disciplinary, theoretical, and methodological approaches to examining the complexity of global urban health, and it is intended as an advanced reference collection, including for policymakers and practitioners. The book provides a comprehensive collection of works organized under a wide arrangement of themed sections focused on 21st century urban health challenges—ranging from urban healthcare and health policy, to urban mental health, to violence and injuries in cities. This collection examines some of the recent approaches to global urban health research and also explores the interplay of spatial and temporal dynamics associated with health challenges in cities and metropolitan centers across the world, and particularly under conditions of extreme inequality.

The book consists of seven parts that explore different dimensions and approaches to the study of global urban health. Each part is organized to ensure a multi-disciplinary and global perspective in urban health research. This chapter opens Part 1, Urban Health: An Introduction and Overview, and provides a broad exploration, including in a historical perspective, of global urban health. In addition to the historical analysis, this part offers an international perspective of healthcare and service
delivery, along with an evaluation of the role of practitioners in the interplay between the urban built environment and public health. The remaining six parts are: Healthcare Policy and Urban Health Services; Mental Health and Wellbeing: An Urban Context; Vulnerable Urban Populations; Violence and Injuries; Pollutants, Environmental Contamination, and Urban Health; and Public Health and the Role of the Built Environment. Each part of the book comes with an introduction to the specific area of research along with recommended readings.

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Igor Vojnovic et al.


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Igor Vojnovic et al.


