Handbook of
Urban Health

Handbook of
Urban Health
Populations, Methods, and Practice

Edited by

Sandro Galea
Center for Urban Epidemiologic Studies, New York Academy of Medicine
Department of Epidemiology, Mailman School of Public Health, Columbia University
New York, New York

and

David Vlahov
Center for Urban Epidemiologic Studies, New York Academy of Medicine
Department of Epidemiology, Mailman School of Public Health, Columbia University
New York, New York

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Sandro Galea
David Vlahov

Contributors

Joseph H. Abraham, Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

Frances K. Barg, Department of Family Practice and Community Medicine, University of Pennsylvania School of Medicine, and the Department of Anthropology, University of Pennsylvania School of Arts and Sciences, Philadelphia, Pennsylvania

Jeremy Barron, Department of Medicine in the Division of Geriatric Medicine and Gerontology at the Johns Hopkins University, Baltimore, Maryland

Mary T. Bassett, Deputy Commissioner of the Division of Health Promotion and Disease Prevention at the New York City Department of Health and Mental Hygiene, New York, New York

Ahmed M. Bayoumi, Center for Research on Inner City Health, St.Michael's Hospital at the University of Toronto, Toronto, Ontario, Canada

Marlon G. Boarnet, School of Social Ecology, Department of Planning, Policy, and Design at the University of California at Irvine, Irvine, California

Luisa N. Borrell, Department of Epidemiology at the Mailman School of Public Health and the School of Dental and Oral Surgery at Columbia University, New York, New York

Kisha Braithwaite, Division of General Pediatrics and Adolescent Medicine in the Department of Mental Health and School of Medicine in the Bloomberg School of Public Health at the Johns Hopkins University, Baltimore, Maryland

Deborah R. Deitcher, Health Promotion and Disease Prevention at the New York City Department of Health and Mental Hygiene, New York, New York

James R. Dunn, Center for Research on Inner City Health, St. Michael's Hospital at the University of Toronto, Toronto, Ontario, Canada

Alex C. Ezeh, The African Population and Health Research Centre, Nairobi, Kenya, Africa

Nicholas Freudenberg, Hunter College Center on AIDS, Drugs and Community Health at Hunter College at the City University of New York, New York

Linda Fried, Center on Aging and Health, Department of Medicine at the Johns Hopkins University, Baltimore, Maryland

Thomas R. Frieden, New York City Commissioner of Health and Mental Hygiene at the New York City Department of Health and Mental Hygiene, New York, New York

Ruth Finkelstein, Office of Special Populations at the New York Academy of Medicine, New York, New York

Crystal Fuller, Center for Urban Epidemiologic Studies at the New York Academy of Medicine and Department of Epidemiology at the Mailman School of Public Health at Columbia University, New York, New York

Sandro Galea, Center for Urban epidemiologic Studies at the New York Academy of Medicine and Department of Epidemiology at the Mailman School of Public Health at Columbia University, New York, New York

M. Chris Gibbons, Johns Hopkins Urban Health Institute at the Johns Hopkins Medical Institutions, Baltimore, Maryland

Michael K. Gusmano, The World Cities Project at the International Longevity Center-USA, New York, New York

Bernard Guyer, Department of Population and Family Health Sciences, Bloomberg School of Public Health at the Johns Hopkins University, Baltimore, Maryland

Stephani L. Hatch, Department of Epidemiology at the Mailman School of Public Health, Columbia University, New York, New York

Donald Hoover, Department of Statistics, Institute of Biostatistics at Rutgers University, Piscataway, New Jersey

Stephen W. Hwang, Center for Research on Inner City Health, St. Michael's Hospital at the University of Toronto, Toronto, Ontario

Tej Kumar Karki, Kathmandu Valley Town Development Plan Implementation Committee, Kathmandu, Nepal

Jane Kauer, Department of Anthropology at the University of Pennsylvania School of Arts and Sciences, Philadelphia, Pennsylvania

Susan Klitzman, Urban Public Health Program and the Department of Environmental and Occupational Health Sciences at Hunter College at the City University of New York, New York

Roderick J. Lawrence, Centre for Human Ecology and Environmental Sciences at the Faculty of Social and Economic Sciences at the University of Geneva, Geneva, Switzerland

Sana Loue, Department of Epidemiology and Biostatistics at the School of Medicine at Case Western Reserve University, Cleveland, Ohio

Thomas D. Matte, Division of Health Promotion and Disease Prevention, New York City Department of Health and Mental Hygiene, New York, New York

Nancy Mendez, Department of Epidemiology and Biostatistics at the School of Medicine at Case Western Reserve University, Cleveland, Ohio

Mark R. Montgomery, Policy Research Division, Population Council at the State University of New York, New York, New York, and Department of Economics, State University of New York at Stony Brook, Stony Brook, New York

Julie Netherland, Office of Special Populations at the New York Academy of Medicine, New York, New York

Patricia O'Campo, Center for Research on Inner City Health, St. Michael's Hospital at the University of Toronto, Toronto, Ontario, Canada

Danielle Ompad, Center for Urban Epidemiologic Studies at the New York Academy of Medicine, New York, New York

Anita Palepu, St. Paul's Hospital at the University of British Columbia, Vancouver, British Columbia, Canada

Wendy C. Perdue, Georgetown University Law Center, Georgetown University, Washington, D.C.

Victor G. Rodwin, Health Policy and Management, Robert F. Wagner Graduate School of Public Policy at the New York University, New York, New York

Johnathan M. Samet, Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

Jan C. Semenza, School of Community Health at the Portland State University, Portland, Oregon

Vijay Singh, Department of Family Medicine, University of California in Los Angeles, Santa Monica, California

Joseph A. Soares, Department of Sociology at Wake Forest University, Winston-Salem, North Carolina

Lois M. Takahashi, Department of Urban Planning at the University of California at Los Angeles, Los Angeles, California

Mark W. Tyndall, the British Columbia Centre for Excellence in HIV/AIDS at the University of British Columbia, Vancouver, British Columbia, Canada

David Vlahov, Center for Urban Epidemiologic Studies at the New York Academy of Medicine and Department of Epidemiology at the Mailman School of Public Health at Columbia University, New York, New York

Michael Yonas, Department of Population and Family Health Studies at the Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland and Kellogg Community Health Scholars Fellowship at the University of North Carolina, Chapel Hill, North Carolina

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Chapter 1

Urban Health

Populations, Methods, and Practice

Sandro Galea and David Vlahov

1.0. WHAT IS A CITY AND WHAT IS "URBAN HEALTH"?

We all know what cities are; or at least we think we do. However, it is more likely that each of our personal experiences has shaped what we think of when we discuss "cities" and that each of us has a different image of "city" in our own head. We may be in good company. Saul Bellow, the novelist and Nobel Prize laureate, in discussing how Americans think of New York City, suggested: " That is perhaps like asking how Scotsmen feel about the Loch Ness monster. It is our legendary phenomenon, our great thing, our world-famous impossibility . . . New York is stirring, insupportable, agitated, ungovernable, demonic. No single individual can judge it adequately" (New York Times, 1970). Indeed, cities can defeat definition and challenge the imagination. Cities are elegant, sophisticated places. Think of Piccadilly Circus in London, the Arc de Triomphe in Paris, or the Copacabana in Rio De Janeiro. But cities are also dense, teeming, and dangerous places. Think of the squatter colonies of Lagos and parts of Los Angeles or New York City. Cities can be distinctive (there is only one Paris) or can look monotonously alike (think of any number of North American mid-size cities). Cities can be small, compact areas that are immediately walkable, and can be vast, extensive, automobile-dependent metropolitan areas that are disconnected, homogenous, and pedestrian-hostile. In short, cities, and by extension the urban experience, can represent diverse conditions within which people live, and represent a range of human experiences.

What then do we mean when we write about "urban health"? In its broadest sense urban health refers to the study of the health of urban populations. We consider urban health inquiry to include two principal aspects: the description of the health of urban populations, both as a whole and as particular subgroups within cities, and an understanding of the determinants of population health in cities, with particular attention to how characteristics of cities themselves may affect the health of urban populations. The practice of urban health can then include a range of clinical, planning, or policy work that aims to improve the health of urban

populations. While both aspects suggested here are broad, they arguably represent a distinct body of inquiry that builds on a long tradition of interest in the role of cities in shaping the health of urban populations. We suggest in this chapter and throughout the book that the study of urban health, nested within the larger parameters of "public health," has much to contribute, both in terms of helping us understand population health, but also in guiding local and global interventions that can improve the health of the public.

There are two primary reasons why we suggest that we should concern ourselves with thinking of urban health as a field of inquiry and practice. First, there is the growing importance, and influence, of cities worldwide. As we discuss in the next section of this chapter, city living is becoming the norm for an ever growing proportion of the world's population. Second, after more than two centuries of organized public health as an intellectual and practical discipline, we are in many ways returning to the roots of the profession and understanding once again that context, including the social, physical, political, or policy environments within which we live, matters. As such, as cities increasingly shape the context within which we live, understanding the urban context, and its possible role in shaping population health, becomes imperative. It is the role of this book to bring together work from different disciplines that can contribute to different aspects of urban health inquiry and practice.

This chapter aims to set the stage for the book. First we discuss the growing importance of cities worldwide and the role they play in shaping population health. Second, we will summarize what we think can be achieved by considering urban health as a cogent field of inquiry and practice, what that field of inquiry can look like, and the challenges it might face. We conclude this chapter by orienting readers to the book itself, discussing its structure and what each of the three principal sections have to offer. We note that we do not attempt to offer either a broad theoretical framework for urban health, nor to be comprehensive in our discussion of the determinants of the health of urban populations. Other work, and the rest of this book, fill these functions (Northridge and Sclar, 2003; Vlahov and Galea, 2002; Galea and Vlahov, 2004; Freudenberg *et al.*, in press). Rather, we intend this chapter to summarize the rationale behind this book and to summarize the gap this book aims to fill. We hope that the chapters that follow will provide the reader with a basis on which to make up her or his own mind about the role of urban health research and practice and how this may contribute to healthier urban populations.

2.0. GROWTH OF CITIES WORLDWIDE

At the beginning of the nineteenth century, only five percent of the world's population was living in urban areas. By 2003, about forty-eight percent of the world's population was living in urban areas (United Nations, 2004). By 2007 it is estimated that more than half the world's population will be living in urban areas and by 2030, up to sixty percent of the world's population will live in cities (Guidotti, *et al.*, 2001; United Nations, 2004). Overall, the world's urban population is expected to grow from 2.86 billion in 2000 to 4.98 billion in 2030 (United Nations, 2004). In addition, current estimates suggest that the trend toward an urbanizing world will continue well into the twenty-first century and that the pace of urbanization may well accelerate. For example, although London took 130 years to grow from 1 million to 8 million inhabitants, it took Bangkok, Dhaka, and Seoul 45, 37, and 25 years

respectively to achieve similar population growths. Overall global population growth in the next thirty years will be primarily in cities; approximately 1 million city residents (a city approximately the size of Pittsburgh) will be added to the world's population weekly.

The pace of increase in urban areas is projected to differ by region of the world and by initial city size. In particular, most global population growth will occur in less wealthy regions of the world, with the most rapid pace of growth expected to occur in Asia and Africa. In the next thirty years more wealthy countries will account for only 28 percent of the predicted growth in the world's urban population. While North America and Europe have the highest proportion of the population living in urban areas (approximately 79.1% in North America in 2000 and in Europe 72.7% in the year 2000), the absolute number of urban dwellers in the least urbanized region, Asia, was already in the year 2000 greater than the urban population in North America and Europe combined (1.36 billion inhabitants in Asia compared to 249 million inhabitants in North America and 529 million inhabitants in Europe).

There are approximately 50,000 urban areas in the world today with close to 400 cities with a population of a million people or more (Satterthwaite, 2002). The first urban area to become a "mega-city" with more than 10 million inhabitants was the New York City metropolitan area around 1940. Today there are more than 15 mega-cities world-wide (Satterthwaite, 2000; 2002). Although, in the coming decades, mega-cities will grow, most of the world's population growth will happen in smaller cities. The proportion of people living in mega-cities is expected to rise from 4.3% of the global population in 2000 to 5.2 % in 2015 (Satterthwaite, 2002). The growth rate of mega-cities in the developing world will be much higher. For example the anticipated growth rate for Calcutta, India between 2000 and 2015 is 1.9%, compared to an anticipated growth rate of 0.4% for New York City, U.S. However, while the growth of large cities in developing countries will account for approximately a fifth of the increase in the world's population, small cities will account for almost half of this increase. Therefore, a growing number of relatively small cities throughout the world will contain most of the world's population in the twenty-first century. The three figures in this chapter provide a summary of world population growth overall and in urban areas between 1950 and 2003. Figure 1 showing the total number of people living in urban areas in different world regions, Figure 2 shows the proportion of regional populations living in urban areas, and Figure 3 shows the proportion of the world's urban population living in specific world regions (United Nations, 2004).

3.0. THE HEALTH OF URBAN POPULATIONS

Why then should we concern ourselves with cities and their relationship to population health? In some ways, having established that cities are the predominant circumstance of living in the twenty-first century one can argue that cities are ubiquitous, and their impact so pervasive, that it is difficult to consider any aspect of health without thinking of the role of cities. Arguably, multiple academic disciplines produce research that is essentially premised on the existence and the importance of cities. For example, epidemiologic research that concerns itself with the health of homeless populations does not generally dwell on urban living conditions as a determinant of either homelessness or of the health of the homeless, but undoubtedly, urbanism, and urbanization are primary determinants both of homelessness

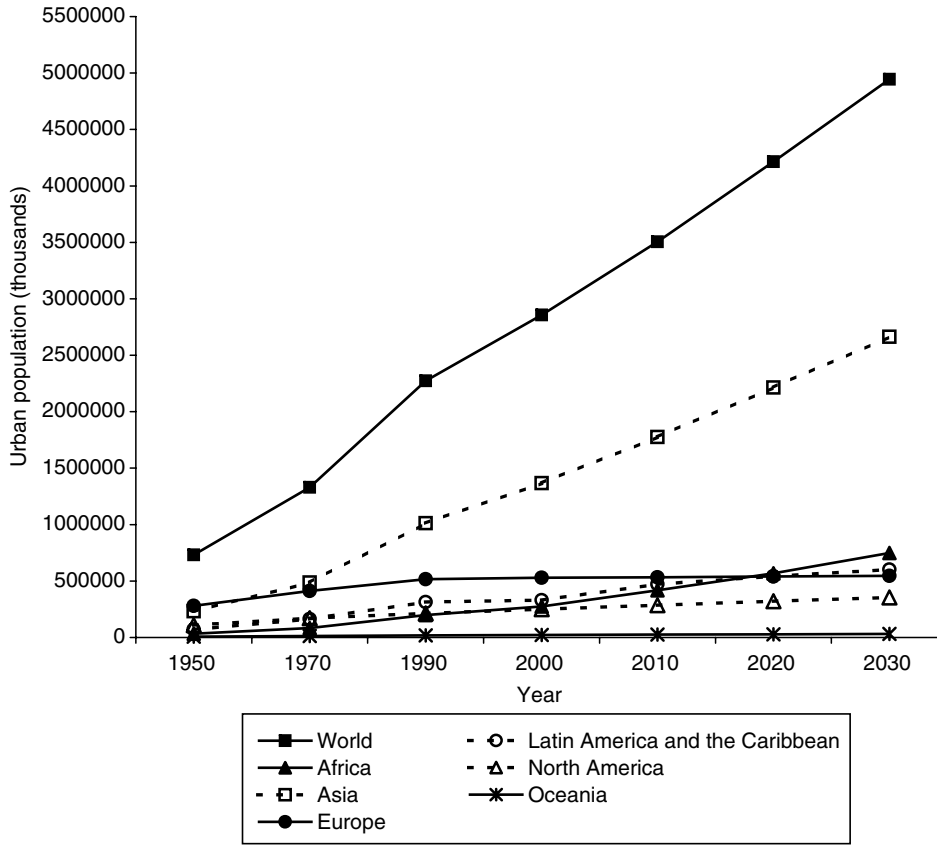

Figure 1. World Urban Population 1950-2030, by Region (*Source* : Data from United Nations Department of Economic and Social Affairs/Population Division. [2004] *World Urbanization Prospects*: *the 2003 Revision*. Report No. ESA/P/WP.190 [March 2004]).

rates and of the conditions of particular homeless persons in different cities. Therefore, research that considers cities as a backdrop for analyses about health does little to shed light on fundamentally *how* cities may affect health. In order to better understand the relations between features of urban living and health we must then identify the features of urban living and the urban condition that have implications for health. The diversity of cities worldwide naturally means that there is no single form of "urban living", but rather a range of living conditions with shared features.

When we think about how cities may affect health, fundamentally we must recognize that cities are places, locations, where large numbers of people live in close proximity. Therefore, we can consider the impact of cities in two primary ways. First, and most obviously, as a growing proportion of the world's population lives in cities, the health of urban populations contributes increasingly to overall population health worldwide. Therefore, factors that influence health in cities gain in importance in influencing global population health. Second, as more of us live in urban areas, it becomes increasingly likely that aspects of the urban environment in which we live will affect our health. We find it useful to think of three broad categories of theories and mechanisms that may explain how city living can affect health – the

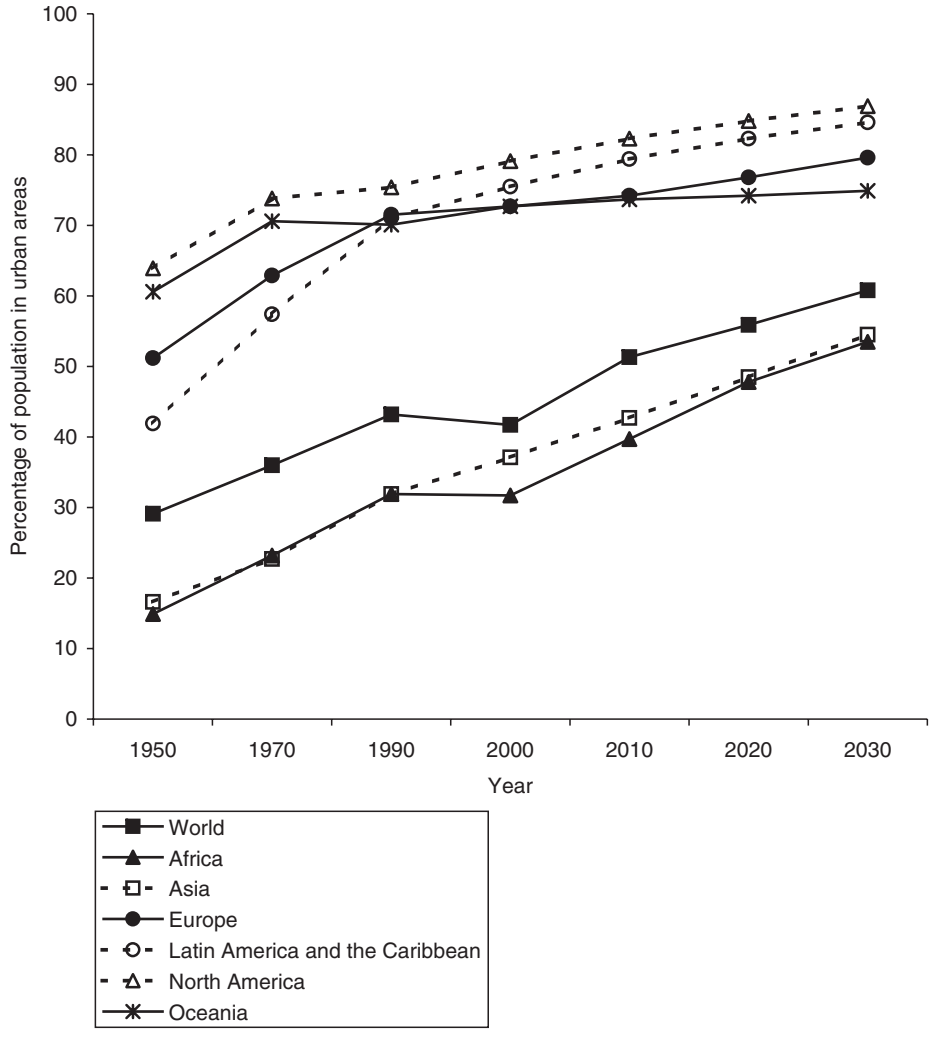

Figure 2. Proportion of Population in Urban Areas, by Region, 1950-2030 (*Source* : Data from United Nations Department of Economic and Social Affairs/Population Division. [2004] *World Urbanization Prospects*: *the 2003 Revision*. Report No. ESA/P/WP.190 [March 2004]).

physical environment, the social environment, and availability of and access to health and social services.

We discuss each of these briefly here and refer the reader to other work that discusses each of these mechanisms in more detail (Galea, *et al.*, 2005; Freudenberg, *et al.*, in press).

The **urban physical environment** includes, among many other aspects, the built environment, air and water quality, noise levels, parks, and climate conditions in cities; all aspects of cities that urban dwellers come in contact with on a daily basis and all having the potential to affect health. The literature on the relation between features of the physical environment and health is vast and we summarize it here briefly. The human *built environment* can influence both physical and mental health; empiric evidence about the relation between the built environment and health

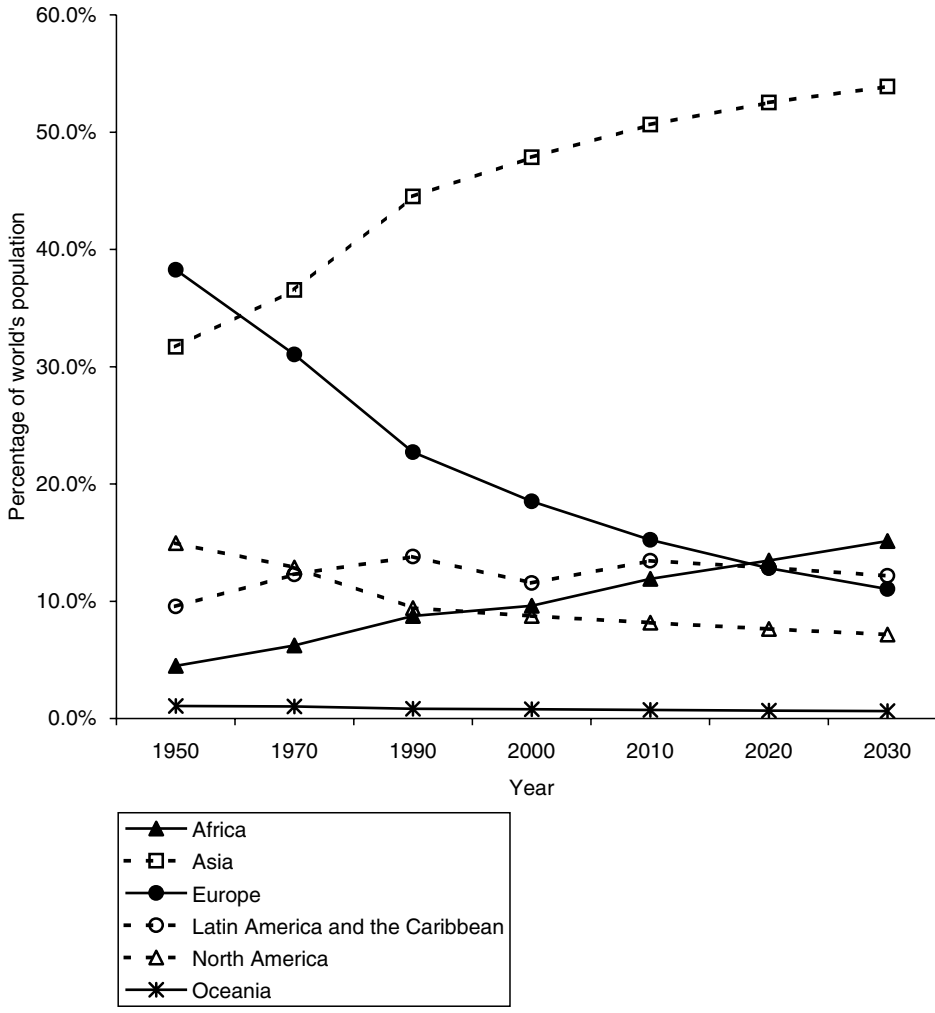

Figure 3. Percent of World's Urban Population Living in Different Regions, 1950-2003 (*Source* : Data from United Nations Department of Economic and Social Affairs/Population Division. [2004] *World Urbanization Prospects*: *the 2003 Revision*. Report No. ESA/P/WP.190 [March 2004]).

conditions includes, among others, asthma and other respiratory conditions, injuries, psychological distress, and child development (Evans, *et al.*, 2000; Krieger, 2002; Northridge, *et al.*, 2003). Different aspects of the built environment have been linked to specific health outcomes. For example, specific features of the built environment including density of development, mix of land uses, scale of streets, aesthetic qualities of place, and connectivity of street networks, may affect physical activity (Handy, *et al.*, 2002). In turn, low levels of physical activity are a well-established risk factor for cardiovascular disease and all-cause mortality in urban areas (Diez-Roux, 2003; Pate, *et al.*, 1995). There is substantial literature on the relation between housing and health (Kingsley, 2003, Thomson, *et al.*, 2003). Urban design may also affect health behaviors, crime, and violence rates (Berrigan and Troiano, 2001; Newman, 1986; Sampson, *et al.*, 1997) suggesting close interactions among the urban physical and social environments.

Urban infrastructure determines how a city provides water, disposes of garbage, and provides energy (Melosi, 2000). Water scarcity and water pollution are serious urban problems, particularly in less wealthy countries. It is estimated that nearly 1.5 billion people lack safe drinking water and that at least 5 million deaths per year can be attributed to waterborne diseases (Krants and Kifferstein, 1998). In longstanding urban areas, the decline of an aging infrastructure, coupled with frequently declining municipal resources, may challenge cities' ability to continue to provide safe water and sanitation for urban residents. In rapidly urbanizing areas, frequently in less wealthy countries, cities are often challenged to maintain adequate fresh water supply to growing numbers of urban residents and transporting accumulating sewage and other waste. (Rodgers, 1979). Inadequate provision for solid waste collection frequently results in contamination of water bodies, which, coupled with the population density inherent to cities, presents a substantial risk for rapidly spreading epidemics (Alexander and Ehrlich, 2000; Chanthikul, *et al.*, 2004; Satterthwaite, 2000).

Although *pollution* in cities in wealthy countries has improved during the past half century, cities still generate close to 80% of global carbon dioxide emissions and account for three-quarters of industrial wood use worldwide (O'Meara, 1999). As late as the mid-1990s, it has been estimated that air pollution contributed to 30,000 to 60,000 deaths per year in the US (Dockery, 1993; Samet, 2000). Indoor and outdoor air pollution are thought to contribute to 3 million deaths globally a year, with 90% of these deaths being in less wealthy countries (World Health Organization, 1997). Worldwide, atmospheric pollution is thought to affect more than a billion people, mostly in cities (Environmental Software and Services, 2002; Roodman, 1998). Recent work has shown that living in areas with walkable *green spaces* was associated with greater likelihood of physical activity (Booth, *et al.*, 2000), higher functional status (Guralnik, *et al.*, 1994), lower cardiovascular disease risk (Lee, *et al.*, 2001) and longevity among the elderly independent of personal characteristics (Takano, *et al.*, 2002; Takana, 1996). Ultimately, *climate* in cities can affect population health. On warm days, urban areas can be more than 5° F warmer than surrounding areas, an effect known as the urban "heat island" effect (Frumkin, 2002). This is primarily due to dark surfaces absorbing heat and the limited ability of urban areas (with relatively few trees), to cool the air through transpiration. Global climate change may exacerbate this effect. Heat is a concern in urban areas in several ways and ambient air temperature is shown to be associated with a large number of hospitalizations and deaths yearly (Basu, *et al.*, 2002; Mackenbach, *et al.*, 1997). Particular groups may be most at risk of the effects of heat in urban areas. Epidemic heat-related deaths have been particularly pronounced among socio-economically disadvantaged and socially isolated elderly persons (Kilborne, *et al.*, 1982; Semenza, 1999).

Other features of the urban physical environment that may have specific relations to human health include the vulnerability of urban structures to natural or human-made disasters, as recent earthquakes in Japan and Iran and the September 11, 2001 terrorist attacks on New York City demonstrated respectively, hazardous waste landfills, often located in or near urban areas, which may be associated with risks of low birth weight, birth defects, and cancers (Vrijheid, 2000), and noise exposure, a common urban problem, that may contribute to hearing impairment, hypertension, and ischemic heart disease (Passchier-Vermeer and Passchier, 2000).

There are multiple ways in which the *urban social environment* may affect health (Barnett and Casper, 2001). Contemporary *social strain* theories suggest that there are sources of strain in modern living, including confrontation with

unpleasant stimuli that may be associated both with deviant behavior and with poor health (Agnew, 1992; Cohen, *et al.*, 2003). A substantial body of research has established a relation between stress and social strain and mental and physical health (e.g., Elliot, 2000; Latkin and Curry, 2003; Pealin, *et al.*, 1981), and newer work has posited that features of the urban neighborhood context are associated with social strain, and adverse health behaviors (Boardman, *et al.*, 2001; Galea, *et al.*, 2003). Separate from social strain, *individual social resources* also may be important determinants of health in cities. For example, limited social support may predispose persons to poorer coping and adverse health (Kawachi and Berkman, 2001; McLeod and Kessler, 1990). In the context of cities, the greater spatial proximity of one's immediate network may well accentuate the role of networks in shaping health. Social networks have been shown to be importantly associated with a range of health behaviors (Kafka and London, 1991; Madianos *et al.*, 1995). Models of social influences on biological contagion, particularly in the context of infectious disease are well established. For example, in recent years, group practices and social norms have been considered particularly important in transmission of sexually transmitted diseases and the transmission of human immunodeficiency virus (HIV) (Pick and Obermeyer, 1996; Wellington *et al.*, 1997). Importantly, newer theories include the possibility of *contagiousness of ideas and social examples.* In epidemiology it is understood that all things being equal, urban populations, characterized by high population density are at higher risk of transmission of biological organisms. Also, because concentrated urban populations share common resources (e.g., water) the practices of one group can affect the health of others. These observations may be extended to behavior and to health. For example, media representations of suicide may have an influence on the suicide of those exposed to them such that suicide becomes more likely (Phillips, 1974).

Spatial segregation of different racial/ethnic and socioeconomic groups may also be an important determinant of health in cities. Many cities worldwide are highly segregated with multiple historical, logistical, and practical barriers to mixing of social groups. Spatial segregation can have multiple effects, including the enforcing of homogeneity in resources and social network ties, suppressing diversity that may benefit persons of lower socio-economic status. Persons who live in segregated communities may have disproportionate exposure, susceptibility, and response to economic and social deprivation, toxic substances, and hazardous conditions (Williams and Collins, 2002). One study of infectious disease transmission suggested that residential segregation contributes to the transmission of tuberculosis through concentrated poverty resulting in conditions such as dilapidated housing and inadequate access to health care (Acevedo-Garcia, D., 2000). Conversely, it is worth noting that spatial segregation, by virtue of keeping persons who are different apart from one another, may serve to minimize social strain (Sampson, 2003).

Although related to many of the other features of the urban social environment, *inequality* potentially is an important determinant of health in urban areas in its own right. While there is ample evidence for the relation between poor individual and group socio-economic status and health (Adler and Newman, 2002), in the urban context, rich and poor populations live in physically proximate neighborhoods. Empiric and theoretical work suggests that this inequality in distribution of income and other resources may in and of itself shape health through multiple mechanisms (Wilkinson, 1992; Kaplan, *et al.*, 1996, Lynch, *et al.*, 2001; Ross, *et al.*, 2000). It has been suggested that perceived and actual inequity, caused by the discrepancies in income distribution, erodes social trust and diminishes the social cap-

ital that shapes societal well-being and individual health (Kawachi, *et al.*, 1997). Therefore, inequalities in urban areas may be important modifiers of the role of several of the other features of the social environment discussed here.

The relation between provision of *health and social services* and urban living is complicated and varies between cities and countries. In wealthy countries, cities are characterized by a rich array of health and social services (Casey, *et al.*, 2001; Felt-Lisk, 2002). However, as discussed earlier, many cities are characterized by sharp disparities in wealth between relatively proximate neighborhoods (Wilkinson, 1992). These disparities are often associated with disparities in the availability and quality of care (Andrulis, 2000; Wan and Gray, 1978). The presence of well-equipped, lucrative, practice opportunities in the same city decreases the likelihood that service providers will work in lower paid, public service clinics, particularly when these latter services face limited resources and wavering political commitment (Franks and Fiscella, 2002). Also, low-income urban residents continue to face significant obstacles in finding health care both in wealthy and less-wealthy countries (Hoffman *et al.*, 1997). In the U.S. context, persons with lower socio-economic status are more likely to lack health insurance coverage (Grumbach *et al.*, 1997; Williams and Rucker, 2000). In turn, uninsured persons face barriers to care, receive poorer quality care, and are more likely to use emergency systems (Merzel, 2000). Recent immigrants, homeless people, inmates released from jail or prison, all disproportionately represented in urban areas, also face specific obstacles in obtaining health care (Acosta and Toro, 2002; Guttmacher, 1984; Hammet, *et al.*, 1998; Kalet, *et al.*, 2002). In turn, these populations put a burden on health systems not adequately funded or prepared to care for them (Felt-Lisk, *et al.*, 2002; Pagano and Hoene, 2004). Internationally, several studies have highlighted the potential inadequacies of health systems in preventing and treating conditions such as malaria, dengue, and tuberculosis, whose spread is facilitated by high-density living that is characteristic of cities (Knudsen and Slooff, 1992; Molbak, *et al.*, 1992; Sodermann, 1997).

In summary, there are multiple mechanisms that may explain how cities affect health, with different mechanisms being potentially important for different morbidities. As discussed here, several characteristics of cities may be associated with poor health, but several others may confer an urban health "advantage" (Vlahov, *et al.*, 2005). Indeed, a "big picture" perspective on the relation between the urban context and health would suggest that these relations are undoubtedly complicated and that any single analysis that isolates a feature of urban living and health is just "scratching the surface". While specific features of cities may affect specific diseases adversely, other features may offer protection. Interrelationships between features of the urban environment further make generalization difficult. For example, further refinements on social strain theory in urban areas include an appreciation of the fact that in urban areas persons with different socio-economic status may be differentially faced with stressors and have differential access to resources that may help them cope with stressors. In particular, in urban areas, formal local resources can complement or substitute for individual or family resources for transient urban populations. Therefore, the relation between urban stressors and health is likely buffered by salutary resources (e.g., health care, social services) that are frequently more prevalent in urban compared to non-urban areas (Galea, *et al.*, 2004). Although these resources may be available to urban residents, socio-economic disparities in cities are linked to differential access to these resources, suggesting that persons at different ends of the socio-economic spectrum may have different opportunities to benefit from the resources available in cities.

4.0. URBAN HEALTH INQUIRY AND PRACTICE

Having established then that the world is rapidly urbanizing, and that this phenomenon will be an important determinant of population health both by virtue of the growing number of persons who will be living in cities and by the very characteristics of cities themselves that may affect health, we return to the central idea raised in this chapter, and indeed in this book–to what extent may we benefit from the explicit study of the health of urban populations and how may different disciplinary perspectives contribute to this inquiry?

The brief summary offered here about how the urban environment may affect health readily illustrates that cross-disciplinary work will be needed to improve our understanding, both general and specific, of the role urban context plays in shaping population health. For example, it will take the contribution of urban planners, medical geographers, and epidemiologists (to name but a few) to fully understand how the availability of green spaces and parkland within cities affects population health and how we may use this knowledge to design healthier cities. Similarly, it will take sociologists, anthropologists and health services researchers to understand how services that are available to urban residents are accessed (or not) and how these services can be implemented in a cost-effective fashion to cope with the ever growing numbers of urban residents who depend on them. However, the challenges inherent in cross-disciplinary work are legion. Speaking different "languages", diverse disciplines frequently rely on different theoretical perspectives and use methods that, while frequently complementary, may be challenging for researchers and practitioners schooled in disparate disciplinary traditions to understand.

What then are key considerations in the study of urban health as a distinct field of inquiry and practice? Urban health may draw upon the theoretical, empiric, and practical contributions of researchers and practitioners who have, thus far, been schooled in different disciplinary traditions. As such, as a coherent theoretical framework emerges for the study of urban health it can build on insights drawn from the multiple theoretical perspectives that inform currently extant disciplines. This makes it possible for urban health to consider the diverse possible roles of, for example, characteristics of the social environment and availability of (and access to) health and social services, from perspectives that include qualitative methods that enable an appreciation of motive and rationalization for behavior coupled with availability and cost-effectiveness of resources. In addition, combining the strengths of different disciplines will enable those trained in urban health to understand, and use, research methods that draw on qualitative and quantitative methodologic traditions, providing a solid empiric base for the emerging field.

Contemplating urban health, either as a subject of inquiry by multiple disciplines or as a cogent discipline in its right is fraught with challenges and in many ways presents a daunting prospect for researchers and practitioners interested in the area (Galea and Vlahov, 2004). One of these key challenges includes the development of more precise definitions of cities and essential concepts to urban health such as "urbanization." Currently there is no definition of urban places that has been universally adopted by national governments and as such, multiple, inconsistent definitions of urban are used by different countries. Similarly, although urbanization, at its simplest level, may be calculated as the change in the proportion of the national population that is urban, this change in proportion is dependent both on the urban population growth, and on the relative growth of the rest of the country. Thus, while countries of vastly different sizes can share urbanization rates,

these urbanization rates can represent vastly different absolute numbers of urban residents.

The adequate specification of research questions that address how and why the urban context may affect health is another challenge in the study of urban health. As much of what may be considered urban health research in the literature thus far has arisen from different disciplines, it has used different theoretical frameworks, and applied different disciplinary orientations and terminologies. Importantly, many questions in urban health research do not meaningfully exist in isolation.

Understanding how the urban context affects health also requires consideration of multiple, often competing, influences. As is discussed throughout this book, cities are complex communities of heterogeneous individuals and multiple factors may be important determinants of population health in cities. Assessing how the urban context may affect health raises challenges and introduces complexity that is often not easily addressed through the application of simple analytic methods.

Cities are different from one another and may change over time. Empiric inquiry in health presupposes that there are identifiable factors that influence health and that these factors can usefully be identified (and potentially intervened upon). The complexity of cities and of city living may mean that urban characteristics that are important in one city may not be important in others, limiting the generalizations that can be drawn about how urban living influences health. Further complicating this task is the fact that cities change over time with implications for the relative contribution of different factors in determining health in cities. As such, in considering urban characteristics that affect health it may be important to note both the prevailing context within which such characteristics operate, and that the role of these characteristics may change over time.

Ultimately we note that we appreciate the perspective of "interest specialization" that has made tremendous contributions to overall population health. It is precisely for this reason that in this book we bring some of these perspectives of different specialties together in order to provide the reader an opportunity to think between and within these perspectives in problem identification and problem solving in the complex environment of cities. The book does not and cannot yet outline integrated approaches that might represent the foundations of an urban health "discipline", but bringing together experts in different areas to share vocabulary, methods, and perspectives represents a hope that the goal of enhancing healthy living in cities can be better articulated and achieved.

5.0. THIS BOOK

This book is intended to be one step toward the systematic study of urban health and a bridge between urban health inquiry and public health practice. As such, this book is divided into three sections. The first section discusses some specific populations in urban areas, providing both descriptions of their health status and discussions about the urban determinants of the health of these groups. It was the charge of the authors of these chapters to consider the health of specific populations in urban areas. In so doing these chapters aim both to describe the health of subpopulations that make up urban populations as a whole but also to consider how features of the urban environment may affect health of these populations. The second section focuses on different disciplinary methods that may be relevant to urban health research. Therefore, different authors comment, for example, on aspects of

statistics and demography that may be suitably applied to urban health. While these chapters are not meant to suggest that these methods integrate easily into one coherent methodologic armamentarium, they are intended to highlight the different methods that may contribute to an improved understanding of urban health and in the process to identify common trends that together can shed light on a larger picture. Finally, the third section deals with the practice of urban health. We consider the practice of urban health to include diverse elements, ranging from the public health considerations that underlie the building of healthy cities, to the clinical considerations that may underlie the delivery of health services to marginalized urban populations. Chapter authors come from a broad range of disciplines and backgrounds and we offer brief editors' comments at the end of each section that are intended to help draw lessons and commonalities from these chapters that may guide our thinking toward a cogent study and practice of urban health. We note that although this book predominantly has a North American focus, a few chapters bring a global perspective. These chapters are intended to round out the picture of city living and population health as a truly global phenomenon. We hope that future work can build on this book and integrate both disciplinary and regional perspectives in the study of urban health.

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Part I

Populations

Chapter 2

Homeless People

Stephen W. Hwang and James R. Dunn

1.0. INTRODUCTION

Over the last quarter century, homelessness has become one of the symbols of urban blight. Regardless of the accuracy of this perception, homelessness is indeed a serious issue in many cities. More than 800,000 Americans are homeless in a given week, and 3.5 million are homeless over the course of a year (Burt, 2001). About 2-3% of the U.S. population, or 5-8 million people, have experienced at least one night of homelessness in the past five years (Link, *et al.*, 1994). About 70% of homeless people in the U.S. live in urban areas (Burt, 2001). Within the countries of the European Union, estimates of the number of homeless people in 1997 were 580,000 in Germany, 166,000 in the United Kingdom, 30,000 to 40,000 in the Netherlands, 10,000 in Finland, 8,000 in Sweden, and 6,000 in Norway (Menke, *et al.*, 2003).

Contrary to stereotypes, a broad range of people experience homelessness, including not only single men, but also single women, runaway adolescents, and families with young children. In the U.S., these subgroups represent about 60%, 16%, 9%, and 15% of the homeless population, respectively (Burt, 2001). In the European Union, substantial numbers of homeless families with children are found only in Germany and the United Kingdom (Menke, *et al.*, 2003). Here and throughout this chapter, we define homeless people as individuals who lack a fixed, regular, and adequate night-time residence, including those who are living in emergency or transitional shelters, in motels or hotels due to lack of alternative adequate accommodations, or in private or public places not intended for human habitation (such as cars, parks, public spaces, abandoned buildings, or bus or train stations).

The health of the homeless and the role of cities in their health present an important challenge. The relationship between urban living and the health of the homeless raises two intertwined questions. First, how does the urban environment influence the creation and perpetuation of homelessness, especially among (but not limited to) individuals with pre-existing health problems such as mental illness and substance abuse? Second, how does the urban environment affect the health of people after they have become homeless? At first glance, these two questions appear almost identical in terms of the specific characteristics and attributes of the urban

environment that warrant scrutiny. For example, both questions will lead to a consideration of the availability of low-cost housing and the ability of the health care system to care for patients with severe mental illness. However, the distinction between these two questions is important as they distinguish factors associated with the likelihood of being homeless due to health reasons versus the likelihood of consequences given homelessness. At another level, it is also important to distinguish if outcomes and their associated factors vary between cities, both in terms of the structural factors that generate homelessness and (given homelessness) health of those who are homeless. These questions frame the issue of the impact of the urban environment on the health of disadvantaged populations.

In the course of such discussions, disagreement often arises as to whether homelessness should be considered primarily the consequence of individual vulnerabilities and failings, or the result of structural inequities in the social, economic, housing, and health care systems. Rather than creating an either/or distinction, we will approach homelessness as the result of a complex interaction between individual vulnerabilities and structural forces in the urban environment. In most cases, the relative importance of these factors in determining the health of homeless people and the prevalence of homelessness remains the subject of ongoing debate.

2.0. KEY HEALTH ISSUES FOR HOMELESS PEOPLE

The burden of illness and disease is extremely high among homeless people (Levy and O'Connell, 2004). However, any consideration of the common health problems of homeless people must first recognize the large degree of heterogeneity among people who are homeless. Among street youth, single men, single women, and mothers with children, the patterns of illness differ notably. Adolescents suffer from high rates of suicide attempts, sexually transmitted diseases, and pregnancy (Greene and Ringwalt, 1996; Greene and Ringwalt, 1998; Greene, *et al.*, 1999; Feldmann and Middleman, 2003). Female heads of homeless families tend to have far fewer health problems than single homeless women, although their health is poorer than their counterparts in the housed general population (Robertson and Winkleby, 1996). Homeless single men have a higher prevalence of alcohol abuse and drug abuse, whereas single women have a higher prevalence of serious mental illness (Fischer and Breakey, 1991).

Health status also tends to be correlated with a person's history of homelessness. Individuals with severe mental illness, substance abuse, and medical conditions are overrepresented among the chronically homeless, whereas those who are homeless for a transient period lasting only a few weeks or months are more likely to be relatively healthy (Kuhn and Culhane, 1998). Although chronically homeless people make up only about 10% of all individuals who experience homelessness in a given year, they account for a disproportionately large share of the demand for shelter beds and health care services for homeless people (Burt, 2001). In addition, the public's perception of homeless people often reflects a stereotyped image of this highly visible subgroup.

Cross-national comparisons of disease patterns among homeless people reveal the strong effect of social factors within each country. Among homeless men in Tokyo, Japan, morbidity due to alcohol dependence (but not drug use) is common, as are musculoskeletal injuries incurred doing construction work (Takano, *et al.*, 1999b). In contrast, 60% of homeless people in Amsterdam, the Netherlands, suffer from drug abuse or dependence (primarily heroin), and most are chronically homeless (Sleegers, 2000c).

2.1. Mental Illness and Substance Abuse

The prevalence of serious mental illness and substance abuse is high among homeless persons. In a nationwide U.S. survey of homeless people, 39% had mental health problems, 50% had an alcohol and/or drug problem, and 23% had concurrent mental health and substance use problems (Burt, 2001). Common psychiatric diagnoses among homeless people include major depression, bipolar disorder, schizophrenia, and personality disorders. A systematic review of the prevalence of schizophrenia in homeless persons found rates ranging from 4 to 16% and a weighted average of 11% in the ten methodologically strongest studies (Folsom and Jeste, 2002). Characteristics associated with a higher prevalence of schizophrenia were younger age, female sex, and chronic homelessness. Marked cross-national variation is seen in the prevalence of schizophrenia, with prevalence rates of 23-46% reported among homeless people in Sydney, Australia (Teesson, *et al.*, 2004).

The prevalence of substance abuse is extremely high among homeless single adults. In a study from St. Louis, Missouri, large increases were seen in the prevalence of drug use among homeless men and women between 1980 and 2000. In 2000, 84% of men and 58% of women had an alcohol or drug use disorder (North, *et al.*, 2004). In another study, about three-quarters of homeless adults met criteria for substance abuse or dependence (O'Toole, *et al.*, 2004). Homelessness increases the risk of adverse health outcomes among substance abusers: in five Canadian cities, the risk of a non-fatal overdose was twice as high among illicit opiate users who were homeless compared to those who were housed (Fischer, *et al.*, 2004).

Homeless adolescents also have very high rates of mental health problems and substance abuse. In a study from Seattle, 83% of street youths had been physically and/or sexually victimized after leaving home, and 18% met criteria for posttraumatic stress disorder (Stewart, *et al.*, 2004). Across the U.S., 55% of street youth and 34% of shelter youth had used illicit drugs other than marijuana since leaving home, in comparison to 13% of youth who had never been runaway or homeless (Greene, *et al.*, 1997). Street youth use a wide range of drugs, including hallucinogens, amphetamines, sedative/tranquilizers, inhalants, cocaine, and opiates. Unfortunately, the initiation of injection drug use is quite common, with an incidence rate of 8.2 per 100 person-years among street youth in Montreal (Roy, *et al.*, 2003).

2.2. Infectious Diseases

Infectious diseases are a common cause of health problems in homeless people (Raoult, *et al.*, 2001). The most serious of these infections include tuberculosis (TB), human immunodeficiency virus (HIV) infection, viral hepatitis, and other sexually transmitted infections. Outbreaks of TB among homeless people have been reported frequently, especially in individuals co-infected with HIV (Barnes, *et al.*, 1999; McElroy, *et al.*, 2003; Morrow, *et al.*, 2003). The incidence of active TB in a cohort of homeless people in San Francisco between 1992 to 1996 was 270 per 100,000, or 40 times higher than that seen in the U.S. general population in 1998 (Moss, *et al.*, 2000). Homeless people with TB require more hospital-based care than non-homeless people with TB, resulting in average hospital costs that are higher by $2,000 per patient.(Marks, *et al.*, 2000) Contact tracing in the homeless population is difficult, and in one study only 44% of identified contacts completed treatment for latent TB infection (Yun, *et al.*, 2003). Among street youth, latent tuberculosis is more common than in the general population, but probably