NETWORKED DISEASE

EMERGING INFECTIONS IN THE GLOBAL CITY

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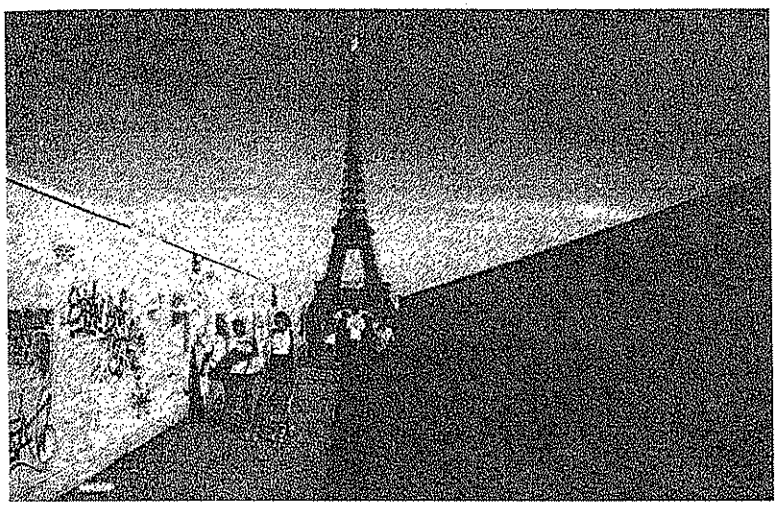
Part I

Infectious Disease and Globalized Urbanization

2

Health and Disease in Global Cities: A Neglected Dimension of National Health Policy

Victor G. Rodwin



Richard Horton (1998), editor of *The Lancet*, once noted, "... for all of its rational efficiency and benevolent intent, the city is likely to be the death of us." Will global or world cities (terms I use interchangeably here) evolve into socially infected breeding grounds for the rapid transmission of disease? Or can they become critical spatial entities for the protection and promotion of population health (Freudenberg 2000)? The presumption of this book is that the inhabitants of global cities are increasingly vulnerable to infectious diseases, particularly those that may spread rapidly across global city networks (Ali and Keil 2006). In an age of SARS, and increasing concern about the possibility of an avian flu pandemic, can global cities take effective measures to protect themselves against emerging threats to population health, or will these vulnerable giants increasingly be viewed as risky places to live? However

one might answer this question, it seems evident that the problem of disease transmission across global cities is a neglected dimension of health policy among nations around the world.

I examine the four largest cities among some of the wealthiest nations in the world: New York, London, Paris, and Tokyo. I begin by highlighting the health risks faced by these cities and summarize, more generally, two contrasting views of urban health. Next, I provide an overview of population health status, the health system and public health infrastructure in these cities.[1] Finally, I suggest that despite the differences, there is an emerging and noteworthy form of public health intervention in all four of these cities – the attention to geographical concentrations of poor and vulnerable populations that pose disproportionate health risks.

Health Risks and Contrasting Views of Urban Health

In a rapidly urbanizing world, New York, London, Paris, and Tokyo – in contrast to most megacities of the global South – have a recent history of relative success in assuring their population's health and share in common a range of characteristics and problems. They are great centers for prestigious university hospitals, medical schools, and medical research institutions. Despite these resources and the success of public health reformers and urban planners in improving their quality of life, these world cities still confront onerous health risks for at least four problems:

1 The return of infectious diseases (e.g., tuberculosis) and the emergence of new ones – AIDS, SARS, and perhaps one day Avian Flu (H5N1).
2 Terrorism, including bioterrorism, and emergencies stemming from climate change; for example, heatwaves (Cadot et al. 2007). Since the release of toxic sarin gas in Tokyo's subway, bombs in the Paris and London subways, and 9/11 followed by anthrax in New York and beyond, there has been an acute awareness of these risks.
3 Barriers in access to medical services for ethnic minorities and/or the poor. This has been recognized as a problem not just in New York City, but also in London and Paris. Only in Tokyo is there less public discussion of this issue.
4 Rising inequalities among social groups. This is reflected in the simultaneous growth of homelessness, poverty, and wealth in all four cities.

These problems will challenge any big city to develop a solid public health infrastructure. With or without such investments, there is already a widespread belief that urban health is not as good as that of the population as a whole. This belief is supported by a substantial body of work. But those who disagree point to contrary evidence.

The sick city

Since the city is, by definition, the place where human density is greatest, it is hardly surprising that it is a vector for the transmission of infectious disease. The Chicago Department of Health collected data on basic measures of population health for 46 large cities across the United States (Benbow et al. 1998) Such measures – for example, average incidence rates for infectious diseases such as tuberculosis, AIDS, and syphilis – are much higher in these cities than for the United States as a whole. More striking, however, are the mortality data reported by these cities for the leading causes of death from non-communicable diseases; for example, heart disease and cancer (Table 2.1). Another important source on urban health in the United States, a compendium of data on the 100 largest cities (NAPH 1995), also reveals a greater prevalence of a large number of health problems in cities than in suburbs and rural areas (Table 2.1), which suggests that there is an urban health penalty (Andrulis1997).

In Europe, a valuable source of information on urban health, among capital cities, comes from *Project Megapoles*, which has compared age-specific mortality for most European capitals to their respective national rates (Bardsley 1999). Once again, this comparison provides supporting evidence for the "sick city hypothesis." For example, on average, mortality rates for infants (0–4 years) are 7 percent higher in European capital cities than in their respective nations. In five cities, however – Helsinki (–18 percent), Lisbon (–9 percent), Lazio (–12 percent), Madrid (–20 percent), and Lyon (–25 percent) – these rates are lower than the national average. This raises

Table 2.1 Population health status in the largest US cities and in the United States as a whole (1997)

Health status measures	*Largest cities*[a]	*United States*
Average age-adjusted mortality		
Heart disease[b]	164	145
Cancer[b]	153	132
All causes[b]	654	507
Years of potential life lost (YPLL)	75	54
Gonorrhea (25 largest cities, 1995)	434	172
Infant mortality (100 largest cities)	12.2	9.8

[a] Forty-six largest cities.
[b] Per 1,000 population aged 45 years and over.
Sources: Data for the 46 largest cities are from Benbow et al. (1998). Data on mortality rates and YPLL are from Chicago Department of Health. Data on gonorrhea and infant mortality rates are from NAPH (1995).

Table 2.2 Infant mortality and life expectancy (LE) in world cities and their nations (2000–4)

		Infant mortality	*LE at birth, males*	*LE at birth, females*	*LE at age 65, males*	*LE at age 65, females*
2002–4	New York City	6.2	74.5 (2000)	80.2 (2000)	17.0 (2000)	20.1 (2000)
	United States	7.0 (2002)	74.3 (2000)	79.7 (2000)	16.3 (2000)	19.2 (2000)
2000–2	Greater London	5.4	76.1 (2000–4)	80.9 (2000–4)	15.6 (1997–9)	19.2 (1997–9)
	England and Wales	5.3 (2003)	76.3[a] (2000–4)	80.8[a] (2000–4)	15.7 (1999–2001)	18.9 (1997–9)
2002	Paris	4.0[b]	77.6[c] (2002)	83.1[c] (2002)	17.7 (1999)	21.7 (1999)
	France	4.1	77.1 (2002)	83.4 (2002)	16.5 (1999)	21.0 (1999)
	Tokyo: 23 wards	2.8 (2001–4)			17.7 (2000)	22.2 (2000)
	Japan	3.2 (2000)	78.0 (2000)	84.4 (2000)	17.5 (2000)	22.5 (2000)

[a] For England only;
[b] for Paris and First Ring;
[c] for Paris only.

Sources: US – National Center for Health Statistics/Centers for Disease Control (CDC); London and England – Office of National Statistics, London Health Observatory; Paris and France – INSEE, Observatoire Régional de la Santé de l'Île de France.

second thoughts about the hypothesis that urban health is necessarily worse than national averages.

What about world cities such as New York, London, Paris, and Tokyo? With respect to infant mortality and life expectancy, available data indicate that there is no urban health penalty and perhaps even a qualified advantage for their residents (Table 2.2). This advantage appears to be decisive across all four cities with respect to life expectancy at the age of 65. Such findings – however intriguing – do not refute the hypothesis that cities are unhealthy, for the strongest case has yet to be made. It is that these wealthy world cities, along with all other megacities, are places where flagrant inequalities exist among neighborhoods and subpopulation groups. All of the averages we have considered mask pockets of poverty with disadvantaged groups that suffer disproportionately poor health status.

The healthy city

The case for the healthy city is typically grounded in economic arguments, or celebrations of its vitality and innovation in such diverse realms as architecture, urban design, culture, technology, and more. For example, President Clinton's State of the Union message in 1998 refers to American cities as the "vibrant hubs of great metropolitan regions" (HUD 1998). Indeed, between 1982 and 1998, metropolitan areas in the United States generated 85 percent of all jobs and 86 percent of the nation's total economic growth (HUD 1998). This economic power is concentrated among some regional giants that dwarf not only their own states but most of the world's nations. Metropolitan New York's economic output, for example, is greater than that of 45 of the 50 states (HUD 1998).

Claims for the enduring power of cities, including big cities, often come from the literature on urban planning and do not typically invoke measures of population health. But there is also some evidence from public health in support of the hypothesis that urban health compares favorably to that of the nation as a whole. The National Health Interview Survey (NHIS), for example, is one of the most reliable indicators of perceived functional health in the United States. In contrast to the *Big Cities Health Inventory* (Benbow et al. 1998), which relies on outcome measures of health, NHIS suggests that most indicators of self-assessed health status are better in major metropolitan areas than for the country as a whole (Table 2.3).

Beyond these comparisons of metropolitan areas, there is also evidence, from the literature on urban and rural differences, in support of the urban advantage hypothesis (Liff et al. 1991; Mainous and Kohrs 1995; Alexey et al. 1997). We can conclude, then, that while there is clearly evidence of an "urban penalty" in the United States, there is also evidence of an "urban advantage" in terms of self-assessed health status, health habits, and with

Table 2.3 Selected health characteristics (1988–9)

	All large CMSAs and MSAs[a]	*Rest of the country*
Health characteristics		
Percent limited in activity	12.4	13.7
Percent with fair or poor respondent-assessed health	8.7	9.4
Disability days		
Restricted activity days per 100 persons	1,389.8	1,470
Chronic conditions per 1,000 persons per year		
Arthritis	113.1	129.9
Deafness	71	90.8
Deformities or orthopedic impairments	121.6	111.6
Heart disease	71.6	84.1
High blood pressure	108.2	121.5
Hemorrhoids	43.6	45.8
Chronic bronchitis	46.2	49.4
Asthma	44	41.2
Hay fever	88.6	93
Chronic sinusitis	114.2	139.7

[a] MSAs are metropolitan statistical areas. The NHIS report contains data for 18 Consolidated Metropolitan Statistical Areas (CMSAs) and 15 MSAs. The total population represented in the survey is 117,211,000. The definition and titles of MSAs are established by the US Office of Management and Budget (OMB), with the advice of the Federal Committee on Metropolitan Statistical Areas.

Sources: US data from *Current Estimates from National Health Interview Survey 1988, Series 10, #173*; MSA and CMSA data from *Health Characteristics of Large Metropolitan Statistical Areas: US, 1988–1989*.

respect to quality cancer screening services. What is more, among the four world cities, there appears to be an urban advantage with respect to persons 65 years and older. The reasons why the evidence reviewed here is mixed and possibly confusing are two-fold. (1) There are many ways to define and measure health, ranging from disease prevalence, infant mortality, and life expectancy at birth to life expectancy at 65 years, age-specific mortality rates, and indicators of self-assessed health. (2) There are many ways to define and measure cities. For example, some United Nations' publications equate New York City with the entire metropolitan region, while many Europeans view New York as the borough of Manhattan. Likewise, definitions of London, Paris, and Tokyo range as widely in population size and spatial dimensions (Rodwin and Gusmano 2006).

A selective review of evidence can support the urban advantage hypothesis. There is insufficient evidence, however, to provide strong support for either the urban health penalty or the urban health advantage hypothesis. The reason why we have so little solid evidence is that there are no routine information systems for monitoring the health of populations living in cities. While institutions responsible for disease surveillance – at the international, national, and local authority levels – collect vital statistics and epidemiological data by geographical location, national health policy in most nations is typically made without systematic analysis of information for monitoring health status, public health infrastructure, and the performance of health systems in cities.

The rationale for comparing New York, London, Paris, and Tokyo is to illustrate the extent of variation in health status, health systems, and public health infrastructure among cities that share important characteristics and problems in so many other respects (Rodwin and Gusmano 2002). Although this analysis also illustrates many of the difficulties of finding comparable data across relevant spatial units and time periods, it is nevertheless a good starting point, because these cities have some of the most extensive databases available anywhere.

An Overview of Health and Health Systems in Four World Cities

New York, London, Paris, and Tokyo are not only the largest urban centers of the wealthy nations belonging to the Organization for Economic Cooperation and Development (OECD) nations; they also play a special political and social role as the "cultural capital of a wide orbit, generally heir to a long history, and always … (belonging) to the entire world as much as to … (their) own country" (Gottmann 1979). These world cities exercise a dominant influence over other cities, worldwide, and serve as models that range from best practices to interesting failures across different policy sectors. Although these cities have been compared along multiple dimensions – their architecture and transportation systems (Focas 1988), their economic development strategies (DOE 1996), and more – with respect to the health sector, there is no readily available database akin to those of the UN, the WHO, or the OECD for comparing cities.

New York, London, Paris, and Tokyo have survived devastating disease epidemics. In response, they developed systems of public health infrastructure, reflecting their distinctive institutional and cultural characteristics, which have resulted in a history of relative success in assuring their population's health and averting potential catastrophes. It is difficult, however, due to the difficulties of obtaining comparable data, noted above, to assess their population health and health systems. Moreover, their public heath

infrastructure has never been described systematically, let alone compared. I shall therefore summarize some of what we have learned to date about population health and the health systems of these cities, based on research from the World Cities Project (WCP – see http://www.ilcusa.org), and conclude by pointing to some common directions in which these cities are moving to meet the public health challenges that they face.

Comparable spatial units of analysis

The first task of any comparative inquiry is to define the relevant units of analysis, and this is not self-evident in comparing these four world cities, because there is no agreement in the literature on what spatial boundaries make up the relevant units. I therefore begin by summarizing how the WCP distinguishes their urban cores from their surrounding first rings (Figure 2.1).

The definition of their urban core was guided by five criteria: (1) historic patterns of urban development; (2) large populations; (3) high population

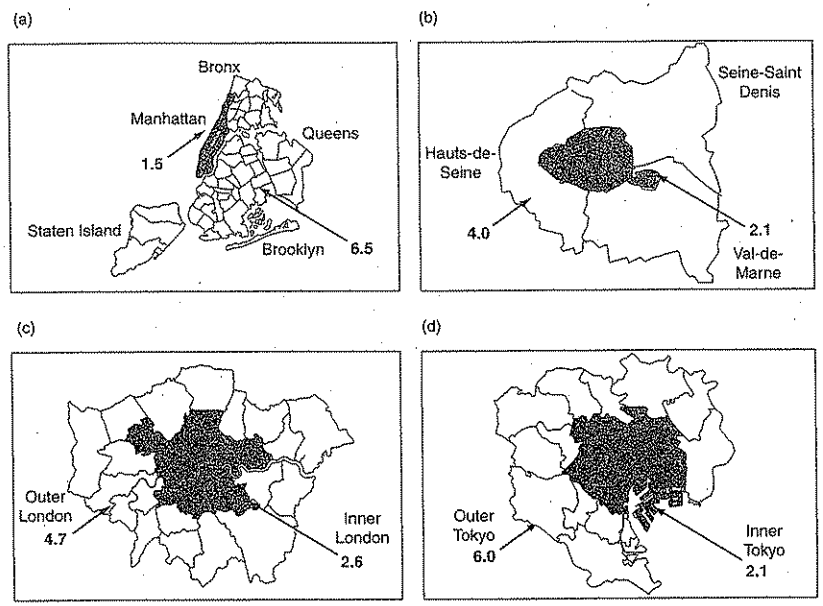


Figure 2.1 Four world cities: urban core and first ring populations (millions). (a) New York City; (b) Paris and First Ring; (c) Greater London; (d) Central Tokyo

density; (4) a mix of high- and low-income populations; and (5) functions as central bubs for employment and healthcare resources.

First, with respect to urban development, Manhattan, Inner London, and Paris represent the historic centers from which these metropolitan regions grew. In Tokyo, the same can be said of its 11 inner wards within the surrounding Yamanote railway line. Second, in terms of population size, Manhattan, Inner London, and Paris range from 1.5 to 2.7 million. Third, in terms of density, Manhattan and Paris are similar: 66,000 versus 53,000 inhabitants per square mile. Both Manhattan and Paris have almost twice the population density of Inner London. Likewise, however, one might define an urban core in Tokyo: the density is much closer to that of London than to Manhattan or Paris. Fourth, the urban cores of these cities combine a mix of high- and low-income populations. Finally, a number of criteria related to their functions as central hubs – what geographers call "central place theory" – suggest two striking parallels among Manhattan, Inner London, Paris, and Inner Tokyo (Berry 1961; King 1984):

- *Concentrated employment centers.* They function as employment centers that attract large numbers of commuters. Approximately one third of the first ring's employed labor force commutes to Manhattan, Inner London, Paris, and Inner Tokyo every day.
- *Concentrated healthcare resources.* The urban core as a unit of analysis provides a frame within which to focus cross-national comparisons on a more coherent and discernable set of health system characteristics. For example, with respect to the concentration of medical resources, Manhattan, Paris, and Inner Tokyo are characterized by a high density of teaching hospitals, medical schools, acute hospital beds, and physicians (Table 2.4).

In summary, Paris – the city of 2.1 million inhabitants all living within its nineteenth-century walls and the peripheral freeway that surrounds its 20 *arrondissements* – is the "urban core" against which a comparable urban core for New York, London, and Tokyo can be defined. The Paris population and area (105 square kilometers) is miniscule in comparison to Greater London's 7.1 million people and 1,590 square kilometers; New York City's 8 million people and 826 square kilometers; and Central Tokyo's 7.9 million people and 616 square kilometers. Paris is comparable to the urban core of these cities (Figure 2.1). For New York City, this is Manhattan; for London, it is the 14 boroughs known as "Inner London." For Tokyo, since there is no conventional definition of an urban core, we rely on the five criteria noted earlier and define an urban core comprised of 11 inner wards that cover an area of 67 square miles (roughly 173 square kilometers) and have a population of 2 million.

Table 2.4 Healthcare resources: Manhattan, Inner London, Paris, and Inner Tokyo (1995–2000)

	Manhattan	*Inner London*	*Paris*	*Inner Tokyo*
Number of teaching hospitals	19	13	25	9
Number of medical schools	5	4	7	7
Acute hospital beds per 1,000 population	5.5 (2002)	4.1 (1990)	7.0 (2002)	12.8[a] (2000)
Physicians per 10,000 Population	85.5 (2004)	36.9 (2000)	84.6 (2002)	70.0 (2000)

[a] This figure is an estimate derived by reducing the number of general hospital beds by 30 percent so as not to include beds in which length of stay is over 30 days.
Sources: Manhattan – New York State Department of Health (NYSDOH), 1998. London – UK Department of Health and Health of Londoners Project. Paris – physicians, Ministère de l'Emploi et de la Solidarité, Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques (DREES) repertoire ADELI, January 1, 2002; hospitals, DRESS, SAE, 2001. Tokyo – "Report on Survey of Physicians, Dentists and Pharmacists 1998," Tokyo Metropolitan Government, Bureau of Public Health, 2000.

Health status and access to health care

Where is population health status the best? Drawing on the spatial units defined above, Table 2.5 compares infant mortality rates among the urban cores and broader spatial areas of these cities. Table 2.6 compares life expectancy at birth (LEB) and life expectancy (LE) at 65 years for the broader spatial areas only. Beginning with infant mortality, a well-accepted indicator of social conditions, New York City and Greater London stand out – both for their urban cores and first rings – as having higher rates than Tokyo and Paris. Among their urban cores, over the 2000–4 period, Manhattan has lower rates than Inner London. Among the broader areas, Greater London does better than New York City. This reflects the greater extent of concentrated poverty within Inner London in comparison to outer London, a condition well documented with respect to older persons as well (Evandrou 2006). In Manhattan, infant mortality rates have dropped below those for Inner London since the decade of the 1990s, when Manhattan had the highest rates. What continues to distinguish Manhattan, however, are the greater disparities among its neighborhoods than those found in the other urban cores (Neuberg and Rodwin 2002). These disparities reflect Manhattan's greater income disparities, among other factors, for in stark contrast to Tokyo, Paris, and London, there is a statistically significant association between infant mortality rates and income in Manhattan (Rodwin and Neuberg 2005).

Table 2.5 Infant mortality rates: Manhattan, Paris, and London (2001–4)

	Rate[a] (N)
Urban core	
Manhattan[b] (2002–4)	4.4
Inner London[b] (2002–4)	5.9
Paris (2003)	3.6
Inner Tokyo (2001–4)	2.8
Urban core and first ring	
New York City[b] (2002–4)	6.2
Greater London[b] (2002–4)	5.4
Paris and First Ring (2002)	4.0
Central Tokyo (23 wards)	2.8

[a] Per 1,000 live births.
[b] Three-year average.

Table 2.6 Life expectancy at birth and at age 65: New York, London, Paris, and Tokyo

	Life expectancy at birth		*Life expectancy at age 65 years*	
	Male	*Female*	*Male*	*Female*
New York City[a] (2000)	74.5	80.2	17	20.1
Greater London[a] (2000–2)	76.1 (2000–4)	80.9 (2000–4)	15.6 (1997–9)	19.2 (1997–9)
Paris and First Ring (2002)	76.4	83.1	17.7 (1999)	21.7 (1999)
Central Tokyo (23 wards)			17.7 (2000)	22.2 (2000)

[a] Three-year average.

Turning from infant mortality to life expectancy comparisons among these cities, once again, Tokyo comes out on top with the longest LEB as well as LE at 65 years of age (Table 2.6). The evidence is not consistent with regard to Greater London and the broader Paris agglomeration, but New York City and London, respectively, do worse for LEB and LE at 65 years than Paris and Tokyo (Table 2.6). Consistent with these patterns, a comparison of mortality from heart attacks ranks Tokyo as number one, followed

Table 2.7 Age-adjusted mortality rates from acute myocardial infarction for people aged 65 years and over:[a] New York, London, Paris, and Tokyo (1998–2000)[b]

	Men (N)	Women (N)
New York	485.3 (1,735)	415.8 (2,492)
London	654.0 (2,302)	366.3 (2,171)
Paris and First Ring	244.2 (746)	147.2 (811)
Central Tokyo (23 wards)	176.2 (933)	127.0 (961)

[a] Per 100,000 population.
[b] All rates for New York, London, and Paris are standardized by a direct method using age-adjustment weights based on the 2000 US population aged ≥65 years. These were previously published by Weisz and Gusmano (2004).

by Paris, New York, and London (Table 2.7). This ranking is consistent at all levels of aggregation – the urban core, the broader city agglomeration, as well as the national level. With respect to cumulative cases of AIDS, New York bears the highest burden of this disease, followed by Paris, London, and Tokyo (Rodwin and Gusmano 2002).

In contrast to these rankings, however, there are two indicators for which New York City ranks number one. The first is with respect to age-specific mortality rates at 85 years and over, where Tokyo has the highest rates, followed by London, Paris, and New York. The second is with respect to case incidence rates of tuberculosis, where Tokyo, once again, has the highest rates, followed by Paris, London, and New York (Table 2.8). The case of TB is notable because in contrast to the previous indicators, all of which reflect social determinants of health, the TB rates tell us something about the health system's capacity to contain an infectious disease. New York City's aggressive and well-financed program of directly observed therapy made an extraordinary dent in TB rates in the decade of the 1990s, and has drawn delegations from each of the other cities to learn about this program.

Another more general way to gauge the health system's capacity is to compare a measure of mortality amenable to medical care, often referred to as "avoidable mortality" (Nolte and McKee 2004; Weisz et al. 2007). At the city-wide level, Tokyo drops to number two, after Paris (number one), London is number three, and New York returns to the bottom of the gradient (Table 2.9). Still another measure of the health system's capacity is to rely on a well-recognized measure of access to primary care – population-based hospital admissions, by area of residence, for discharge diagnoses that could most probably be avoided if patients had received timely and competent primary care. These discharge diagnoses are known in the literature as avoidable hospital conditions (AHCs). Discharge rates for these conditions are two and a half times less in Paris than in Manhattan (Gusmano et al. 2006). Data for calculating AHCs are not available for Tokyo, but calculations for Inner London place it closer to Manhattan than to Paris, despite

Table 2.8 Tuberculosis case incidence rates:[a] New York, London, Paris, and Tokyo (1996–2000)

	Year	Urban core	First ring
New York	2000	24.3	17.3
London	1999	36.0	33.4
Paris	1999	48.6	29.8
Tokyo	1998	53.9	

[a] Per 100,000 population.
Sources: New York – NYCDOH, 2001, Tuberculosis Control Program, "Information Summary: 2000"; London – UK Department of Health, 1999, Centre for Public Health Monitoring, Compendium of Clinical and Health Indicators; Paris – Observatoire Régional de la Santé de l'Île-de-France, 1999, "La Tuberculose en Île-de-France"; Tokyo – Tokyo Metropolitan Government, Bureau of Public Health, 2000, "Tuberculosis in Tokyo, 1998."

Table 2.9 Avoidable mortality (AM) and hospital conditions (AHCs): four world cities (1998–2001)

	Mortality rate, all causes[a]	AM rate[b]	AHC[c] admission rate
Manhattan	3.69	0.91	27.6
Inner London	4.32	1.07	9.3
Paris	2.94	0.58	10.4
Central Tokyo[d] (23 wards)	2.76	0.8	NA

[a] Calculated for ages 1–74 years, per 1,000 population.
[b] Calculated for ages 1–74 years, per 1,000 population. Causes of death amenable to health care include cerebrovascular disease, hypertension, maternal death, a range of malignancies, and all infectious diseases, and are based on the work of Nolte and McKee (2004). These rates exclude ischemic heart disease, because its prevalence ranges so widely among these cities.
[c] Calculated as a three-year average (1998–2000) for ages 45 and over, per 1,000 population.
[d] AHC data are not available for Inner Tokyo.

the presumption of good access to primary care under the National Health Service (Table 2.9).

What, then, can one conclude from such comparisons of health status and access to health care? To be sure, it is difficult to draw definitive conclusions – even for cities that are relatively well endowed with data for a range of comparable indicators. It is even more difficult to make comparisons and monitor health status for the 20 megacities of the world, let alone all cities with a population of a million or more inhabitants. Yet surveillance of this kind, as well as careful monitoring of disease outbreaks in large cities, is an important function of public health infrastructure, and the capacity to conduct it will increasingly become recognized as an important component of national health policy.

Public Health Infrastructure across Four World Cities

Differences among world cities – for example, patterns of income inequalities and family structure – may reflect national patterns and policies with regard to income maintenance and immigration. Other differences – patterns of infant mortality and AHCs – may reflect distinctive urban characteristics, such as the striking contrasts between exceedingly high- and low-income subpopulations and neighborhoods. London, Paris, and Tokyo are capital cities in strong unitary states that have more power and willingness than the federal government in the United States to intervene in the life of their capital. But in all four cities the organization of public health functions involves important links between local, regional, national, as well as global health authorities. In what follows, I sketch, in pointillistic fashion, some of the distinguishing characteristics of public health in each of these cities.

New York City (NYC): a strategic local role in health

New York City has the greatest local authority and responsibility for managing its local public health infrastructure. Its Department of Health and Mental Hygiene (DHMH) has exercised this authority in containing tuberculosis, regulating smoking, and more generally integrating its public health surveillance system and developing community health profiles that have led to targeting high-risk areas of the city.

In comparison to other big cities in the United States, NYC is exceptional (Bellush and Netzer 1990). It is the largest city in the nation, with the oldest and most autonomous health department, and has twice the national average rate of uninsured Americans, children living below the poverty line, and recent immigrants. The DHMH was established in the 1860s in response to a cholera epidemic. Although much has changed about New York City and the DHMH, its mission to protect New Yorkers against infectious disease remains strong in light of the recent AIDS and TB epidemics, the West Nile and SARS scare, and post-9/11 concerns about the risks of terrorism, bioterrorism, and, more generally, emergency preparedness.

Having recognized the need to improve public health infrastructure at the local level in 1999, the CDC awarded grant funding to the DHMH to improve the city's public health surveillance activities, including the capacity to develop community health profiles across the city's neighborhoods. Reinforced by the post-9/11 world, these activities led the DHMH to integrate its public health surveillance programs, especially the nature of its collaboration and organizational relationships with the New York State DOH, the CDC, and other local agencies: the municipal Health and Hospitals Corporation (HHC), the city's Office of Emergency Management (OEM), and, of course, the fire and police departments. Also, the DHMH developed improved relations with the physician community so that 80 percent of NYC physicians now communicate reportable diseases directly to the Department. Finally, DHMH developed a system of syndromic surveillance in which 60 percent of hospital department emergency departments participate.

London: strategies to improve the health of Londoners

London's health institutions are paradoxically more fragmented, even though many of them are part of the centralized National Health Service and Department of Health and Social Security. For example, with regard to the regulation of restaurants, each of the 33 local authorities (the boroughs of Greater London) exercises this function independently, whereas in Paris it is handled by the prefecture for all of Paris, and in NYC by the DHMH.

Since 2000, the Greater London Authority has had an elected mayor. There were some notable health-promoting efforts associated with this change in city-wide governance, which were highlighted by the city government in an attempt to secure "healthy city" status from the WHO. To begin with, the new mayor, Ken Livingstone, was given a powerful mandate to develop a public health agenda for Greater London. He placed significant emphasis on intersectoral interventions to improve health, which included a strategy affecting transportation, a biodiversity action plan, a municipal waste management strategy, an air quality strategy, and an ambient noise strategy.

To implement this new approach, the new mayor emphasized partnerships with the London Development Agency, the government health agencies, and the city's voluntary sector. There is currently more public health

monitoring and epidemiological surveillance than ever before. Also, given the growing gap, in London, between a well-off majority and a poor minority, and the fact that nearly a quarter of the capital's population are ethnic minorities (Bellush and Netzer 1997), much attention was placed in thinking about what policy interventions, programs, and monitoring activities should be developed to make Londoners more healthy.

Paris – a strategic local health role in a centralized state

Despite a long tradition of French centralization, Paris illustrates the critical role of local authorities in assuming safety-net responsibilities that have eluded its system of universal coverage under national health insurance. Although there are relatively minor financial barriers to health care in comparison to NYC, where 28 percent of the population is uninsured, the Paris Department of Health and Social Action nevertheless plays an important role in the organization and financing of health centers and social services. With a slew of new public health agencies (for AIDS, food safety, and public health surveillance), however, the central government continues to play the dominant role in health.

The Paris authorities have taken strong measures, since the Middle Ages, to protect their citizens from health risks, including bubonic plague. Following the French Revolution, local responsibility for public health was explicitly defined. Despite its national commitment to the public hygiene movement in the nineteenth century, and its identity as a strong centralized state, until recently the central government has played a limited role in public health. At the time of the cholera epidemic (1837) and the outbreak of Spanish influenza (1918–19), the Paris Health Council was largely responsible for addressing the public response. Since World War II, three public agencies have shared responsibility for the public health of Parisians: the public hospital system, *Assistance Publique*, the Directorate for Sanitary Action, and the Bureau of Social Aid.

Following the crisis over contaminated blood in the 1990s, concern about AIDS and drug-resistant TB, and new awareness about the dangers of food poisoning, many new national agencies were established to safeguard public health. At the same time, the Paris Department of Health and Social Action, the *Assistance Publique*, and the voluntary sector have forged new alliances to protect public health and confront the rise of social inequalities, homelessness, delinquency among youth, and social exclusion.

With respect to disease surveillance, Paris resembles London, in that both would quickly come under the direction of national institutions. For example, in France, the *Institut de Veille Sanitaire* (the French equivalent of the US CDC) has established local agencies (*CIRE*), including one for the greater Paris metropolitan region (the Île de France) whose charge is to coordinate epidemiological surveillance for the region. In the event of an emergency – for example, an avian flu pandemic – key decisions would be taken by the French Department of Homeland Security (the *Ministère de la Défense*) and Paris would come under the responsibility of a designated zone connected to the Prefecture for the Police.

Tokyo – a healthy city with emerging problems

Tokyo is the city with the most even income distribution and interesting forms of social cohesion (Bestor 1989). Since it is the healthiest city of these four giants, by traditional health indicators (Tables 2.5, 2.6, and 2.9), and a WHO-sponsored "healthy city," it makes an intriguing standard of comparison. The problem, however, in studying Tokyo is that disaggregated health and social data, by local administrative wards, is often unavailable.

Tokyo suffered the devastation of the Great Kanto Earthquake, in 1923, and significant population evacuation, damage, and near famine during World War II. In the early 1990s, Tokyo was the richest city in the world. It may no longer be the richest; but it is the largest metropolitan area of these four world cities. It is the only one that has an active WHO-sponsored healthy cities movement and research team (Takano 1991; Takeuchi et al. 1995). The Tokyo Metropolitan Government (TMG), which includes Central Tokyo's 23 wards, is one of Japan's 47 prefectures. TMG has a Bureau of Public Health that exercises supervisory responsibilities over the entire Prefecture. In the event of an emergency – for example, an earthquake – TMG would exercise key control functions. But each of the wards of Central Tokyo is a semi-independent municipality, with its own elected mayor and council nation (Takeuchi et al. 1995), and each is responsible for making its own city health plan within the context of a unitary, centralized state that provides strong guidelines for the entire nation.

Just as Japan is number one, in comparison to OECD nations, with respect to infant mortality and life expectancy, Central Tokyo, in comparison to New York, Greater London, and Paris, has the lowest infant mortality rates and the longest LEB. Despite these impressive achievements, however, Tokyo must now face new public health problems – congestion and road traffic noise, the risks of more subway terrorism, AIDS, and homelessness (not to mention water and air pollution, mental disorders, iatrogenic disease due to enormous consumption of drugs, and more).

Will neighborhoods within Tokyo's wards maintain their past ability to promote solidarity and social cohesion in a relatively homogeneous society? Will the information that is routinely collected for disease surveillance be sufficient to address the threats that face global cities today? I have not found these questions easy to answer. But there are nonetheless some convergent patterns that seem to unite all of these cities in their efforts to protect themselves from disease.

Convergent Trends in Public Health Intervention

New York City stands out, in contrast to London, Paris, and Tokyo, because it has the largest share of its population not covered under a national system that eliminates financial barriers to healthcare access. Likewise, it stands out in comparison to the other cities with respect to its electronic surveillance systems, because it probably has one of the most sophisticated ones, particularly with respect to syndromic surveillance. It is, indeed, paradoxical that the health system characterized by the most severe access barriers to basic primary health care should be the one that is most prepared – from the perspective of surveillance – to move decisively in the event of an infectious disease epidemic.

Beyond these differences, however, and the contrasts in terms of public health organization, what is perhaps most striking is the emergence of convergent trends in public health intervention. Among all four cities, there is increasing awareness, among public health leaders, that the neighborhood is a critical spatial unit for targeted interventions to protect against risk factors for disease and to promote health. All four cities are characterized by significant spatial disparities among income, unemployment, educational attainment, housing, environmental conditions, and crime. These factors exercise profound effects on differential population health status measures across city neighborhoods. They have important implications not only for how to target health protection and promotion programs, but also for how to improve emergency preparedness and communication with diverse urban populations.

Broader forces of globalization have, no doubt, reduced somewhat the contrast between New York and the other cities over the past few decades. Consider an example of this phenomenon – the disparities in infant mortality rates among neighborhoods of these cities across two five-year periods in the 1990s (Figure 2.2). There is a slight diminution of disparities within Manhattan and an increase in Paris, London, and Tokyo, which suggests a possible Manhattanization of global cities. Another way of interpreting these data and many more of the health indicators compared is to distinguish between hard and softer global cities (Body-Gendrot 1996). The softer ones tend to implement national programs that protect their most vulnerable populations from some of the forces of globalization. Thus, London and New York come out on the harder end and Paris and Tokyo are distinctly softer. Beyond such a taxonomy, however, it is important to elaborate on the convergent trends in public health intervention, which are increasingly targeted to "high-risk" neighborhoods (Figure 2.3).

New York City's DHMH has embarked on a decisive strategy to place disproportionate emphasis on the city's highest-risk neighborhoods in the south Bronx, east Brooklyn, and central Harlem. It has even engaged in a

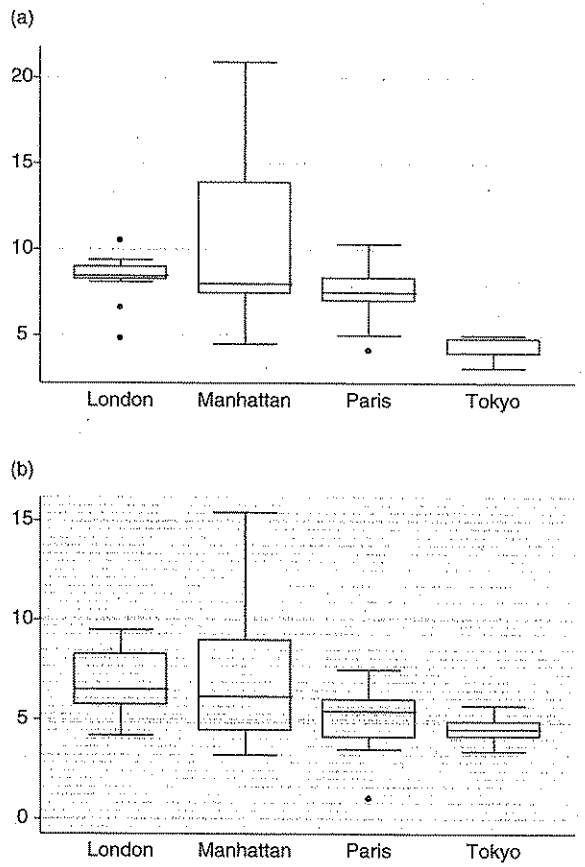


Figure 2.2 Box plots of neighborhood infant mortality rate distributions: London, Manhattan, Paris, and Tokyo: (a)1988–92; (b) 1993–7. These box plots show differences in spread and symmetry in the distribution of neighborhood infant mortality rates for the four cities. The common vertical axis is the neighborhood infant mortality rate. The thick middle horizontal line across the full rectangle is at the median neighborhood rate on the vertical axis. The upper and lower horizontal lines of the full rectangle are at the 75th and 25th percentile rates, respectively. The remaining two horizontal lines, the whiskers, are at the largest and smallest rate of the distribution on the vertical axis, unless there are rates a substantial distance from the others. Such rates are outliers, and a box plot represents them as dots

For Inner London, we included each of the 14 boroughs (Camden, City of London, Hackney, Hammersmith and Fulham, Haringay, Islington, Kensington and Chelsea, Lambeth, Lewisham, Newham, Southwark, Tower Hamlets, Wandsworth, and Westminster); for Manhattan, each of the ten sub-borough units used by the HVS (Greenwich Village/Financial District, Lower East Side, Chinatown, Stuyvesant Town/Turtle Bay, Upper West Side, Upper East Side, Morningside Heights/Hamilton

Caption for Figure 2.2 (cont.)
Heights, Central Harlem, East Harlem, Washington Heights, and Inwood); for Paris, each of the well-known 20 *arrondissements* (I^{e}–XX^{e}); and for Inner Tokyo each of the 11 *ku* (wards): Chiyoda, Chuo, Minato, Shinjuku, Bunkyo, Taito, Sumida, Koto, Shibuya, Toshima, and Arakawa.
Sources: The birth and death data on which these rates are based may be found in our Data Appendix, online at http://www.ilcusa.org/media/pdfs/ajph.dataappendix.pdf.
We obtained them from the following sources:

London – Office of National Statistics, birth registration and linked mortality files: number of live births (1990–7); population below one year of age and number of infant deaths (1988–97).

Manhattan – data were extracted from birth and death files, Division of Vital Statistics, Department of Health and Mental Hygiene.

Paris – the number of live births and infant deaths for 1988–92 are from "La santé de la mere et de l'Enfant à Paris," Department des Affaires Sanitaires et Sociales, Ville de Paris, July 2000. For the period 1993–7, these data were provided by Eric Jougla, Institut Nationale Scientifique d'Etudes et de Recherches Medicales (INSERM).

Tokyo – data for 1988–92 are from Tokyo Eiseikyoku (1993), "Annual Report on Health in Tokyo." Data for 1993–7 are from Fiscal Year 2000 Report of the Bureau of Public Health, Tokyo Metropolitan Government, 2000.

form of bureaucratic decentralization by opening up three DHMH offices in each of these areas. In addition to establishing a DHMH presence in these areas, the mission of these health department branch offices is to coordinate a range of formerly vertical public health programs and serve as advocates for improving community health.

In London and Paris, the highest-risk areas tend to be located along an east–west divide, although the extent of residential segregation and social polarization is less severe than in New York. Both cities are also engaged in some targeting of higher-risk areas, but their approach is more influenced by national policies. In London, health "inequalities" have been the subject of many reports by the Department of Health and Social Security. As part of the effort to target health action zones (HAZs) at the national level, areas such as Tower Hamlets, Newham, Hackney, Camden–Islington, Lambeth, Southwark, and Lewisham have been selected for special attention. This involves borough-wide efforts to promote neighborhood "regeneration" through partnerships with social service agencies, housing improvement programs, and a variety of players ranging from local government, chambers of commerce, the police, and other voluntary organizations.

In Paris, the national urban targeting program (the *politique de ville*) identified 11 neighborhoods based mostly on such criteria as high unemployment rates, for special targeting of resources for community development. In contrast to London, efforts in these neighborhoods involve less explicit

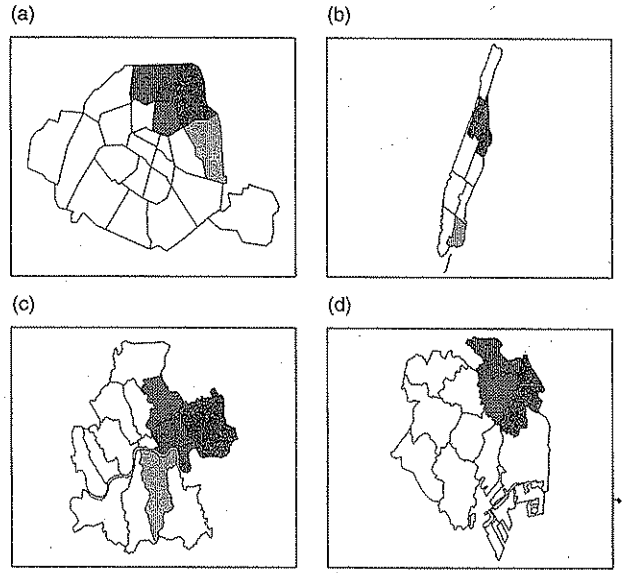


Figure 2.3 Poor areas in four world cities. (a) Paris (X^{e}, XVIII^{e}, XIX^{e}, and XX^{e} *arrondissements* highlighted); (b) Manhattan (Lower East Side, Morningside Heights, Central Harlem, and East Harlem highlighted); (c) London (Hackney, Newham, Southwark, and Tower Hamlets highlighted); (d) Inner Tokyo (Taito-ku; Sumida-ku, and Arakawa-ku highlighted)

and active participation of the public health community. Rather than formulating explicit health improvement programs from which relations to other agencies radiate, this approach subsumes public health concerns within the broader net of social prevention, inclusion, and renewal programs. But, increasingly, there are discussions among city authorities about how to target limited resources to areas of the city in the greatest need. The areas selected by the *politique de ville* are spread out across all of Paris, but five out of the 11 projects are concentrated in the VIII^{e} and XX^{e} *arrondissements*, in neighborhoods such as the Goutte-d'Or, Barbes, Belleville, and Chateau Rouge, in the north-east of Paris, and parts of the XIII^{e} *arrondissement*, in the south-east.

In Tokyo, although it is generally assumed that the city is one with great uniformity compared to other world cities, analysis of socio-economic conditions and health status reveals considerable differences among wards. Beyond the affluence of the most central wards such as Chiyoda, Chuo, and Minato, some of the northeastern wards of the city – for example, Arakawa, Sumida, and Taito – have far lower per capita incomes and larger shares of their population

receiving public assistance. In comparison to New York City, London, and Paris, there appears to be less targeting of these areas for city-wide public health interventions. Perhaps this reflects a greater local discretion for individual wards, with respect to social services, as among local authorities in London. Nonetheless, as Tokyo responds to the threats of emergent infectious disease, its health authorities may well become more interested in what can be learned from the experience of other world cities in targeting "high-risk" areas.

In conclusion, all global cities are increasingly exposed to similar health risks, as well as to speculation about how the coming pandemic alluded to in the introduction of this book might be transmitted across the global cities network. We would do well to begin systematic comparative analyses of how global cities are addressing these risks and how they may learn from their respective successes and failures.

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NOTE

1 By "public health infrastructure," I mean the capacity of local officials to perform what Roper et al. (1992) call the core functions of public health: (a) assessment, "The regular, systematic collection, assembly, analysis, and dissemination of information on the health of the community;" (b) policy development, "The development of … health policies (on the basis of) scientific knowledge …"; and (c) assurance, "The assurance to constituents that … necessary (services) … are provided …" The capacity of local officials to perform these functions will depend, in part, on the size and quality of their workforce; their information systems for epidemiological surveillance; and the organizational links that they can forge to implement regulations and deliver public health services.

Part II

SARS and Health Governance in the Global City: Toronto, Hong Kong, and Singapore