The Poverty of Cities in Developing Regions

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A LONG-STANDING BELIEF in development studies holds that, on the whole, living conditions in developing countries are superior for residents of large cities than for persons living in smaller cities, towns, and villages. The concept of big cities as "islands of privilege" (Harrison 1982: 145) is fundamental to otherwise discrepant theories of modernization, dependency, world systems of cities, and the global division of labor, each of which posits long-lasting disadvantages for populations outside of major urban centers.[1] It is also supported by evidence from numerous developing countries of lower child mortality rates, greater income-earning opportunities, less frequent and less severe famines, and better access to publicly conferred entitlements in big cities than in smaller areas in the era since World War II.

Since the late 1980s, however, the presumed superiority of large cities in developing countries has been widely disputed. One argument, informed by evidence of rapid population growth and economic stagnation in many cities, and by perceptions of associated negative externalities imposed on city environments, asserts deteriorating or relatively unfavorable living conditions for big-city residents, on average, as compared with conditions for inhabitants of smaller cities and towns. Paul Kennedy (1993: 26) observes that "Asian, Latin American, and Central American megacities of 20 million inhabitants have become increasingly centers of poverty and social collapse."[2] The International Labour Organization reports that by around 1990, most residents of Bombay, Cairo, and Lagos were living in slums (Oberai 1993: 8). Specialists on Latin America (for example, Gilbert 1993) emphasize that the impact of economic restructuring since the 1980s, including trade liberalization and economic stabilization measures, has been most severe on residents of major cities as a result of reduced public expenditure on (or subsidization of) municipal services, housing, infrastructure, and so forth. Terms used to convey the new situation—"Cities of Despair" (Kaplan 1996a), "The Giant Diseased City" (Linden 1996)—evoke

Dickensian images of London, Manchester, and other industrializing cities of the mid-1800s.[3] Such terms also revive dormant claims of overurbanization in developing countries (Davis and Hertz 1954; Hoselitz 1957), with the modification that human misery in cities, rather than negative consequences for national development, is now viewed as the distinct outcome of this phenomenon.[4]

Perceptions of decline in living conditions in big cities are buttressed by recent literature that documents substantial and growing inequality within cities; the benefits of city life are experienced by some but not by others. For example, numerous health studies document rates of morbidity and child mortality that are several times higher in slums and periurban areas than in more privileged neighborhoods (Harpham, Lusty, and Vaughan 1988; Stephens 1996; Timæus and Lush 1995). Rapid commercialization since the 1980s of informal land markets in many cities has widened disparities in household amenities and increased residential segregation (Payne 1989; UNCHS 1996). Deregulation of labor markets, while enriching industrial elites, has greatly increased the casual adult workforce and expanded the number of *gamines*, or working street children, in Latin American cities (Standing 1989; Szanton Blanc 1994), while heightening unemployment among young adults in cities of West Africa (Lachaud 1994). Such trends invite comparison to inner-city decline and suburban affluence in metropolitan areas of the United States since the 1960s (Frey and Speare 1988). These apparent patterns have also provoked ominous visions of future cities. For Massey (1996: 410), this entails "escalating crime and violence punctuated by sporadic riots and increased terrorism as class tensions rise." For others, big-city inequality fueled by resource scarcity, bounded opportunities, and rising ethnic and religious cleavages portends urban unrest (Homer-Dixon 1991) and social conditions conducive to national revolution (Kaplan 1996b).

The purpose of this article is to evaluate the extent to which residents of developing cities with one million or more residents, which we refer to as "big" or "large" cities, do indeed have superior living conditions as compared with persons living in smaller settlements.[5] Building on the work of economists (Mera and Shishido 1983; Sen 1993), we assess relative well-being across settlements in terms of demographic and social indicators that reflect basic human needs, primarily infant survival, as well as adequate shelter, nutrition, education, health, and health care. A particular focus on "million-plus" cities, rather than on larger "mega-cities," is of interest given patterns of population concentration in developing countries around 1995: Whereas 8 percent of the urban population resided in agglomerations of 10 million or more inhabitants, cities of one million or more encompassed 36 percent of the urban population (United Nations 1995a). Our premise is that, on average, big-city residents enjoyed favorable living conditions in

the late 1980s and early 1990s as compared with other urbanites, as a result of common patterns of supply and demand associated with urban agglomeration—that is, in most poor countries, publicly financed services and infrastructure and the highest incomes are heavily concentrated in the largest city. Contradictory findings of overall unfavorable living conditions in large cities can therefore be interpreted, broadly, as confirmation of the aforementioned negative development trends for major cities in recent years.

A second objective of the study is to ascertain the impact of population size and rate of growth on wellbeing in cities, and whether the effects of living in a big city are contingent on how rapidly that city has grown in recent years. This analysis responds to popular concerns over the absorptive capacity of urban areas in developing regions (Brown and Jacobson 1987; Ehrlich and Ehrlich 1990; Moffett 1994) at a time when the urban population is growing twice as quickly as total population (United Nations 1995a). It is also conducted to test the prevailing view—expressed at the 1996 United Nations Global Conference on Human Settlements (HABITAT II) and maintained by leading urban scholars (for example, Prudh'homme 1994; Richardson 1993)—that problems of cities are not a consequence of size or growth (that is, there is no optimal city size or rate of expansion), but are related to the efficiency of urban management, good governance, available revenues, and similar factors.

We draw on a wealth of newly available, nationally representative urban data from 43 countries representing four geographical regions—Latin America and the Caribbean, sub-Saharan Africa, North Africa and the Near East, and Asia. Separate analysis of these regions is conducted in light of their distinct patterns of recent and projected urban change, as discussed below.

Challenges for big cities: A case of "growing pains"?

Anxiety over the quality of life in big cities is nothing new. For example, a trebling of London's population in the second half of the nineteenth century, to over 6 million,

> came to be associated in the minds of many politicians and commentators with the growth of 'urban problems'—the spread of slums and disease, the breakdown of law and order, the increase in infant mortality rates and a plethora of other phenomena—all of which attracted mounting comment and consternation on the part of the Victorian middle classes. (Saunders 1986: 14)

Such a pejorative view of cities and their poor is echoed, of course, by lasting images projected by leading social theorists of the day—by Marx's alien-

ated and revolutionary urban proletariat, Durkheim's cities of moral breakdown, Tönnies's loss of communal sentiment and action ("gemeinschaft") in the emerging metropolis, Simmel's anonymous and impersonal urbanite.[6] Negative perceptions of big cities at that time were not entirely unjustified. For instance, child mortality rates were higher and life expectancy was lower in cities than in rural areas in Europe and the United States in the late 1800s, mainly as a result of greater germ transmission in densely populated areas (Preston and Haines 1991). These and other disadvantages of city residents in then-industrializing countries generally subsided, however, with subsequent expansion of social welfare measures, medical innovation, economic growth, and other developments of modernization.

Much of the disinclination to believe that big cities of developing countries will follow such historical precedent can be attributed to demographic forces since the 1970s, during a time of unfavorable economic conditions in most developing regions (East Asia being an obvious major exception). While many aspects of recent population change in cities have been amply documented (UNCHS 1996), three facets of that change have received insufficient attention: the large population increase absorbed by many megacities (defined here as agglomerations of 5 million or more residents), the rapid growth of other large cities, and the increasing concentration of population in cities of one million or more residents. To be sure, most patterns of urban population change during the period 1950–75 discussed by Preston (1979) have persisted since that time, as shown in Table 1. Whereas the levels and pace of urbanization[7] experienced by now-developed countries from 1875 to 1900 were virtually identical with those of developing countries during 1950–75, with proportions residing in urban areas rising from

TABLE 1 Comparative patterns of estimated and projected urban population change in now-developed countries (1875–1925) and in the developing world (1950–2025)

Pattern	Developed countries		Developing countries		
	1875–1900	1900–25	1950–75	1975–2000	2000–25
Proportion urban (percent)	17.2→26.1	26.1→39.9	17.3→26.7	26.7→40.7	40.7→57.0
Urban population growth over 25-year period (percent)	100	90	188	150	99
Average annual rate of population growth (percent)					
Urban	2.77	2.57	4.02	3.66	2.75
Rural	0.66	0.05	1.81	1.13	0.01
Total	1.12	0.87	2.29	1.98	1.40
Contribution of urban growth to total population growth	53.6	96.2	38.8	62.5	96.1

SOURCES: Preston 1979. Calculated from Grauman 1976 and United Nations 1995a.

17 to 26 percent, United Nations projections suggest that this consistency is likely to hold for the subsequent quarter-centuries as well. Much more rapid urban growth in developing countries over these comparable periods continues also, though slightly abated from a 25-year increase of almost twice (188/100 percent) to two-thirds (150/90) higher, partly as a result of a larger urban population in these countries in 1975 than in 1950.[8] As in the earlier case of now-developed countries, urban growth rates in developing countries are slowly declining, even while they remain very high and several times greater than rural rates. And although over 95 percent of population growth in the developing world between 2000 and 2025 is projected to occur in urban areas—as compared with less than 40 percent from 1950–75—this too is not without precedent, as more than 95 percent of growth in now-developed countries during 1900–25 is estimated to have taken place in cities and towns (Grauman 1976).[9]

However, the size of population expansion in the largest cities of the developing world in recent years is historically without parallel. Table 2 indicates that the anticipated decline in city growth rates between 1950–75 and 1975–2000 will, nevertheless, entail an enormous expansion of the size of most of the very large cities mainly as a result of their already huge populations.[10] Some cities (for example, Bangkok, Cairo, Lima, and Manila) will increase in population size more in 1975–2000 than they did in 1950–75, even as their populations exhibit a roughly one-third slowdown in their rate of growth between these quarter-centuries. Where anticipated 1975–2000 growth rates remain very high or fail to decline substantially (for example, in Dhaka, Istanbul, Jakarta, Karachi, and Lagos), the number of residents added will more than double between the periods. Even Mexico City, where the growth rate has plunged, will have added more than 5 million inhabitants since 1975 (as will São Paulo). By comparison, population increase in the largest cities of now-developed countries a century earlier was modest, and thus offers little guidance concerning the likely consequences of contemporary large-city growth. However, most of the 2.3 million residents added to New York City's population during 1875–1900, at a time of rapid economic progress in the city, were forced to settle in housing officially designated as unsanitary and unhealthy (Ward 1989). Therefore, it is appropriate to question the economic prospects of Lagos, for instance, in light of a projected increase of 10 million residents—on average, an additional one million persons every two-and-a-half years—between 1975 and 2000.

Because relatively few cities with more than 5 million inhabitants exist and because they usually contain small proportions of national populations, the situation of the next lower category of large cities, of one to 5 million inhabitants, is of greater interest in discussing demographic pressures confronting cities in the developing world. Although currently about

TABLE 2   Rates and scale of population growth in selected cities of
now-developed countries (1875–1900) and in the developing world
(1950–2000)

City	Average annual rate of population growth		Number of persons added (thousands)	
	1875–1900		1875–1900	
Now-developed countries				
Chicago	5.78		1,312	
Berlin	3.81		1,662	
Manchester	3.56		845	
New York	3.21		2,342	
Tokyo	2.61		717	
St. Petersburg	2.53		675	
Philadelphia	2.33		627	
Vienna	2.04		678	
London	1.70		2,239	
Paris	1.57		1,080	
	Average annual rate of population growth		Number of persons added (thousands)	
	1950–75	1975–2000	1950–75	1975–2000
Developing countries				
Bangkok	4.15	2.58	2,482	3,478
Cairo	3.70	2.27	3,669	4,662
Dhaka	6.09	6.67	1,505	8,268
Istanbul	4.83	3.80	2,524	5,715
Jakarta	4.79	4.29	3,362	9,277
Karachi	5.42	4.43	2,955	8,096
Lagos	9.75	5.62	3,012	10,155
Lima	5.30	3.31	2,687	4,721
Manila	4.70	3.09	3,456	5,801
Mexico City	5.09	1.50	8,089	5,118

SOURCES: For now-developed countries Chandler 1987; for developing countries United Nations 1995a.

30 cities in developing countries have more than 5 million inhabitants—
nine of them in China and India—roughly 200 other cities have a popula-
tion of more than one million, comprising a much larger share of the world
population. Sub-Saharan Africa, for example, contains a single mega-city,
Lagos, but the region also has about 25 other "million-plus" cities dispersed
among 20 countries. Figure 1 indicates that, contrary to the experience of
mega-cities, other cities with a population of more than one million in 1970
generally did not undergo substantial decline in their growth rates in the
1980s.[11] Indeed, their average pace of growth, at over 3 percent per an-

FIGURE 1   Average annual urban growth rates
in developing countries, by settlement size,
1970–90
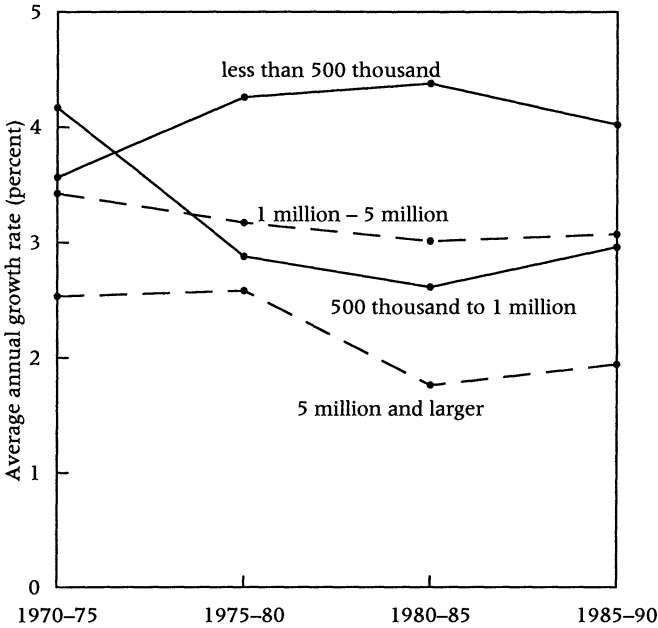
NOTE: Cities are classified by estimated population size in 1970.
SOURCE: Calculated from United Nations 1995a.

num, exceeded that of medium-sized cities of 500 thousand to one million
persons in 1970, and is projected to remain near this level through the
1990s, even as national population growth rates decline steadily (United
Nations 1995a).[12] The question arises whether such sustained rapid
growth—a near population doubling, on average, between 1970 and 1990—
has overstrained the capacity of some of these large cities to accommodate
population increase. In any case, as Figure 1 makes clear, claims of a na-
scent slowdown of big-city growth in developing regions (for example,
Satterthwaite 1996) are premature: Deceleration of growth applies to some
mega-cities, but has not been the experience of large cities in general.

　　While the estimate is frequently cited that half of the developing
world's population will reside in urban areas by around 2015—some in
places of 20,000 or fewer inhabitants that arguably bear no significant "ur-
ban" characteristics other than their designated status—it is rarely noted
that more than one in five people in developing countries will probably
reside in "million-plus" cities by that time. Figure 2 illustrates that, as the
number of such big cities more than doubles over successive 20-year peri-
ods, and is expected to increase more than tenfold to 376 between 1950

**FIGURE 2   Estimated and projected number of
cities with one million or more inhabitants, and
the percentage of total population residing
within them, developing countries, 1950–2010**
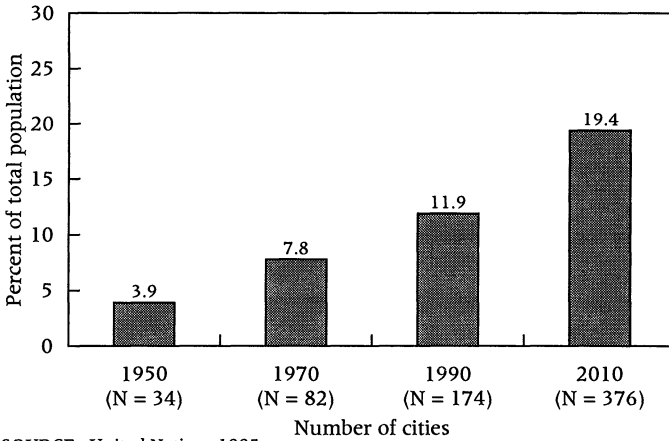
SOURCE: United Nations 1995a.

and 2010, the percentage-point change in the share of population residing
in big cities has increased between successive 20-year periods as well, with
an expected marked upsurge during 1990–2010. Whereas the almost uni-
versal positive association between urbanization and national economic
development has been well documented and has been argued to apply even
to the seemingly contradictory situation of most contemporary African
countries (Mohan 1995: 148), the relationship between total population
concentration in large cities and the economic and social wellbeing of mu-
nicipal populations remains unexamined. In the many low-income coun-
tries where several additional cities of more than one million inhabitants
have emerged since 1970—as in Brazil, India, Iran, Pakistan, South Africa,
and most obviously China—and in countries where an increased concen-
tration of population in the largest cities has been most pronounced—such
as in Colombia, Dominican Republic, Lebanon, Senegal, and Turkey—it is
a matter of speculation whether growing needs and demands for essential
goods and services implied by increasing municipal populations have been
met satisfactorily.

A case of management and governance?

Scholarly interest in the costs and benefits associated with city size and
growth can be dated at least to Sir William Petty, whose essay in 1682
deduced, on balance, considerable social gains from a much expanded popu-

lation of London (with the notable exception of a possibly increased le-
thality of the plague) (*Population and Development Review* 1984). Concern
that population pressure represents a threat to human welfare in cities was
reflected in the notions of optimal city size and overurbanization, two in-
terrelated ideas that fell in and out of favor with, but consistently preoccu-
pied, urban planners and social scientists from the 1950s to the 1980s.[13]
Attempts to validate these two concepts, particularly optimal city size, on
an international basis through statistical analysis were on the whole futile,
however, and the ideas subsequently have been widely discredited for ap-
plication in urban research (Findley 1993). In consequence, there has been
no serious investigation in recent years of whether or not population forces
are associated with, or exert, unfavorable effects on living conditions in
cities of developing regions.

     Since the 1980s, there has been a remarkable shift of research atten-
tion from the demography of cities to the polity of cities, with particular
focus on issues of urban management and, in the 1990s, urban governance
(Stren 1995). With respect to management, a virtual consensus has emerged
among urban scholars that the costs and benefits of cities are not merely a
product of population size (hence growth), but are primarily a consequence
of the commitment and capabilities of municipal governments to under-
take and sustain policies that improve population welfare, particularly
infrastructural maintenance, increased productivity of the labor force, and
poverty alleviation (Cheema 1992). The assumption that good manage-
ment overcomes population constraints of cities would seem tenable based
on recent history. Clearly, many cities of the world, for instance those of
recent origin in sub-Saharan Africa, appear too big relative to their mana-
gerial capacities, and some of these "oversized" cities are quite small, for
example in the range of 100,000 to 200,000 inhabitants. Similarly, many
mega-cities—Jakarta is cited most often—are seemingly well managed and,
therefore, not too large. From this perspective, moving the benefit curve
upward and the cost curve downward (each as a function of city size) could
be defined as the task of city management. Further support for a focus on
the quality of urban management, rather than on population size and
growth, comes from the fact that settlements of similar size and growth
can obviously have different attributes, derived from their functions and
origins, that for better or worse affect the welfare of their residents irre-
spective of population size. In the case of small cities, for example, some
locales develop because of an administrative role as a center for provincial
or state government; some serve growing agricultural production and pro-
cessing in their microregion; some meet demands for goods and services
from agricultural populations; some are important nodes on transporta-
tion systems; some fill a specialized niche in the national or international
market, centered on the production of a single good or service; and so on.

   The prevailing concept of urban governance—while subject to ongo-
ing redefinition and loose interpretation—is an attempt to address practi-
cal limitations of the urban management approach. These shortcomings
include, most notably, a preoccupation with technical and administrative
rather than political aspects of local government; insufficient revenues and
lack of empowered coordinating bodies to implement centrally managed pro-
grams effectively; persistent corruption among some municipal authorities; and
the failure of many governments to incorporate indigenous urban institutions
into local program planning and decisionmaking (McCarney, Halfani, and
Rodriguez 1995; Werna 1996). Hence, common propositions and themes
in the literature on urban governance are that weak or fractured formal
municipal structures in developing cities must engage nongovernmental
actors—communities, civic groups, individuals, private contractors—in
meeting basic needs; that the effective locus of decisionmaking authority
in any case is often not in government but within indigenous groups; and
that municipal governments need to enhance their performance, hence
their credibility, through improved "responsiveness" to local needs (for in-
stance through decentralization), "accountability" for actions, and "trans-
parency" of decisionmaking, particularly with respect to financing (De Soto
1989; United Nations 1996a).
   A skeptic might note that such observations of governance have been
inspired by the ostensible movement of some governments toward democ-
ratization in the 1990s, and that such a political trend conveys unrealistic
images of consensus and cooperation among groups in big cities that are
more commonly marked by class conflict, gender discrimination, exten-
sive use of child labor, ethnic and religious violence, and other maladies. A
demographer could note furthermore that views of good governance, like
the ideal of efficient management, imply without proof that population
size and growth are of little relevance to the problems that confront devel-
oping cities and are therefore inappropriate areas for research and public
intervention (notwithstanding the recognition by some nondemographers
that massive population dispersal in some metropolitan areas of Latin
America and Asia demands decentralization of public functions and other
measures). A more balanced assertion might be that wellbeing in big cities
usually results from an interaction of various aspects of population and
political economy. Accordingly, large size and rapid growth may overwhelm
the managerial capacity and commitment to inclusive governance of indi-
vidual cities. Conversely, healthy policy institutions and processes may en-
able a city to cope successfully with formidable demographic strains. In
each case, the adequacy of municipal resources and economic prospects is
likely to mediate the impact of demographic and nondemographic factors
on the welfare of city populations. In this respect, the diverse economic
conditions under which recent urban change, including demographic
change, has occurred warrant discussion.

Regional distinctions of urban change in an economic context

An emphasis on municipal management, urban governance, and other is-
sues, such as the economic roles of cities, suggests that the influence of
population on wellbeing will vary across individual cities. However, dis-
tinct regional patterns of recent urban change suggest that the quality of
life in big cities will differ, more generally, between major developing ar-
eas as well. Detailed accounts of urban change in the developing world are
presented elsewhere, most thoroughly in HABITAT's *Global Report on Hu-
man Settlements* (UNCHS 1996). We highlight below a few critical aspects of
change to assert that broad regional contrasts exist such that residents of
big cities may be relatively advantaged in some regions but not in others.

In Latin America—the most urbanized of developing regions, with
nearly three-quarters of the population living in cities and towns—the 1980s
and 1990s have been characterized by much-publicized economic devel-
opments: a general reduction in government expenditures, high levels of
inflation and sharp declines in real wages, and widespread deterioration of
infrastructures, together with a sweeping withdrawal of urban subsidies of
various kinds (de Oliveira and Roberts 1996). In countries such as Mexico,
for instance, the largest city, where finance and trade are concentrated,
has been exposed to volatile capital outflows, whereas smaller cities (such
as Guadalajara, Monterrey, and the northern border towns) have fared rea-
sonably well from international economic ties. Intrametropolitan employ-
ment dispersal has been taking place for a number of years, but the scale
has increased greatly since the 1980s, with manufacturing plants moved to
increasingly distant places and often beyond metropolitan boundaries—in
some cases to as far as 200 kilometers from the central core (Pick and But-
ler 1997).

There are claims that such processes have harmed residents of the
very largest cities most (Gilbert 1996). Indirect support for such claims comes
from the sharp and unanticipated slowdown in the population growth of
the very largest cities since the 1970s, with results of the 1990 census round
surprising even local observers. This declining rate of growth can be inter-
preted as a rational demographic response—a substantial fertility decline
accompanied by migration reversals—to unfavorable macroeconomic im-
pacts on cities. More visibly, the effects of economic change are evidenced
by the variety of survival strategies spawned among various social groups
in cities. The phenomenon of middle-income households "trading down"
by moving into low-income peripheral neighborhoods is conspicuous
throughout the region (Gilbert 1993). Meanwhile, the poorest households
survive at the fringe of subsistence, as sharp reductions in expenditure have
led to a worsening of nutritional levels and often their exclusion from ac-
cess to public utilities such as water, light, and gas (Minujin 1995). For the

big-city poor, the "myth of marginality" (Perlman 1976) may no longer be a myth.

Throughout almost the entire region of sub-Saharan Africa, as in Latin America, urban dwellers are believed to have suffered sustained declines in income per capita as a result of severe economic crises; structural adjustment programs in most countries have been held responsible for large-scale layoffs and the abrupt abolition of subsidies targeted almost exclusively to urban centers, bringing about large increases in the prices of food, transport, and housing (White 1996). Along with a general deterioration in public services and infrastructure, central business districts have become less well maintained and more populated with small-scale hawkers and vendors; meanwhile, more of the population has been moving to unplanned settlements on the periphery of the larger cities, where land is cheaper. This horizontal expansion of African cities into their rural hinterlands has attenuated major infrastructural elements such as piped water, electricity, sewerage, and roads to a point where their efficacy has been greatly reduced.

Unlike the situation in Latin America, however, it remains unclear whether residents of Africa's big cities have fared particularly badly: it is claimed that "the deterioration in the built environment is sharply in evidence throughout most of urban Africa" (UNCHS 1996: 92). Yet urban scholars maintain, with little solid data, that urban bias in favor of the largest city or the national capital is still stronger in sub-Saharan Africa than in other developing regions (Gugler 1996). Consistent with this belief, other commentators point to the proliferation throughout the region of "urban villages" of 200,000 to 300,000 residents, places that typically lack the basic amenities necessary for a decent standard of living (Crossette 1996). The actual number of such settlements, however, is unknown. More certainly, persistent rapid growth of both small and large urban areas—at nearly twice the world average—despite years of sustained recession has put increased pressure on already strained economies and management capacities of both large and small urban centers, and gives special poignancy to notions of population stress in cities of this region.

Few generalizations are valid for Asia, given the vast disparities in population size and levels of economic development among countries. Moreover, a widening gap is occurring within the region between those countries where urban dynamics have been strongly and positively linked to the globalization of the world economy, as in much of Southeast Asia, and those that are more closely linked to political and economic functions of the nation-state.

A distinguishing feature of recent urbanization in Southeast Asia has been the extension of the largest cities beyond city and metropolitan boundaries. This has particularly affected the very largest cities, but is also now

occurring in other cities, such as Bandung in Indonesia, Cebu City in the Philippines, and Chiang Mai in Thailand (McGee and Robinson 1995). Metropolitan regional growth has sprawled along major expressways and railroad lines radiating out from urban cores, putting down new towns, industrial estates, housing projects, and other urban forms in areas hitherto agricultural and rural. As a result, one might hypothesize that disparities in living conditions as existed in the past between residents of core cities and smaller places have declined over time as city economies have prospered. Such convergence would be reinforced by traditional patterns of circulation or seasonal migration in many countries of the region, insofar as temporary migration serves to redistribute wealth and income among locales.

The largest cities of the Indian subcontinent have displayed a different pattern, more similar to that of sub-Saharan Africa, with urban growth being fueled less by economic dynamism than by rural poverty and continuing high fertility. Many of the largest cities on the subcontinent have fairly stagnant economies, yet, as suggested in Table 2, they have absorbed huge population increments in recent decades; clearly, the challenge facing a country such as India (and China) is one of magnitude—no state system as large as India or China has yet undergone rapid urbanization. In India, however, a major surprise in the 1991 census was the significant decline recorded in the rate of urban population growth relative to the previous decade—a decline that was apparent at all levels of the urban structure. Mohan (1996) has speculated that the lack of jobs, compounded by a worsening quality of life in urban areas, may have discouraged would-be migrants from searching for better livelihoods in cities. Such a circumstance would imply actual or perceived superior welfare in smaller areas. Yet most of the thousands of small and medium-sized cities in South Asia, encompassing most of the urban population, do not have dynamic economies. Many became urban centers simply because they incorporated minor administrative functions or served as market towns or centers of local or regional road networks.

Generalization of urban change, and of potential changing fortunes of settlement types, is most problematic in discussion of North Africa and the Near East, given the diversity of state economies in the region that are variously dependent on exports or imports of oil and labor, on tourism, industry, foreign assistance, and so forth. One clear consistency is that many of the largest cities in the region grew between 1970 and 1990 at high rates equaled only in cities of sub-Saharan Africa (United Nations 1995a: Table A.14). Growth rates of some cities would have been higher in the absence of emigration to less densely populated neighboring countries for employment. Although timely data are unavailable, the largest cities of some countries—most notably, Amman in Jordan and Sanaa in Yemen—are re-

ported to have been overwhelmed by massive inmigration during recent periods of political turmoil (for instance, during the Gulf War and the civil war in Yemen), to the point that severe housing, job, and service crises emerged (Europa Publications Ltd. 1995). While the World Bank (1995) documents a steep regional decline in gross national product per capita since 1980, and remittances from emigrant labor generally declined in the 1980s (Keely and Tran 1989), the relative impact of these trends on various settlements within countries of the region remains unexplored.

A central concern of the analyses that follow is how these regional patterns of urban change—under very different conditions—correspond to trends and current living conditions in big cities and smaller areas.

Data and methods

Our analyses address two questions. First, are big-city residents advantaged, on average, as compared with other urbanites and villagers in terms of wellbeing? Second, are observed advantages, or deprivations, related to the pace at which big cities have grown in recent years? To assess differences in living conditions across different settlement sizes, Demographic and Health Survey (DHS) data from 43 developing countries are analyzed. Appendix A lists the large cities examined, and Appendix B indicates the countries and survey years (ranging from 1987 to 1995). Because individual analysis of 43 countries would inhibit generalized testing and comparison, and because presentation of results for so many countries is unwieldy, data have been pooled according to four geographic regions: Latin America and the Caribbean, sub-Saharan Africa, North Africa and the Near East, and Asia.[14] The number, size, and geographical spread of these countries allow for firm generalization for the first three regions, but more tentative inference for low-income countries of Asia because China, India, and areas of the former Soviet Union are not included in our data set. Because we use data aggregated by region, we caution that findings from our analyses do not necessarily apply to particular cities of the individual countries.

All Demographic and Health Surveys stratify sampling to obtain nationally representative populations of households and reproductive-age women in urban and rural areas.[15] In countries where geographical areas were over- or undersampled, individual record weights have been applied, prior to pooling the data, to obtain valid representation of the urban stratum at the national level. Application of weights to the stratified data produces a total sample that is representative as well for any subset selected from the sample for analysis.[16] For the first set of analyses (examining living conditions across settlements), we select residents according to size categories identified by the DHS: one million or more persons (big cities), 50 thousand to one million inhabitants (small cities), towns of less than 50

thousand population, and rural areas (villages).[17] National capitals, which the DHS routinely groups with big cities, are classified in this analysis according to their population size at the time of the survey, as based on (or interpolated from) United Nations (1995a).

Conceptual and measurement problems have long confounded attempts to compare levels of poverty, inequality, and other indicators of wellbeing and deprivation across low-income settings (World Bank 1990). Whereas lack of accurate and comparable data on income and consumption in most countries has been a well-recognized concern—leading to advancement of the Human Development Index (UNDP 1996) and similar composite social measures—recent literature questions the possibility of any such comparison on grounds that human welfare is a matter of individual psychological perception (Wratten 1995).

International comparison of human wellbeing may be intractable, but we maintain with Sen (1993: 40) that "mortality data can be used to . . . identify vital aspects of economic deprivation in particular nations and in specific groups within nations."[18] Differences in infant mortality among children born in the five years preceding the DHS in each country are therefore applied in this study to gauge general disparities in living conditions at this high level of population aggregation, that is, between settlement types in global regions.[19] Information on early mortality is supplemented by disaggregated data on a broad range of social indicators—school enrollment, dwelling facilities, nutritional status, diarrheal episodes, use of preventive health care—as manifest among young children. A description of all variables appears in Appendix C. Use of children's status to indicate welfare at the areal level is suggested by practical considerations—we lack information on most of these basic characteristics for the adult population—but is also guided by reason. Because young children are dependent and essentially involuntary social actors, they are exposed not only to their own inherent disadvantages but also to those of their parents, households, and locales. Hence examination of children captures deprivation within areas at large.[20] Moreover, children represent at least a large minority of the population in all of the countries examined.

The second set of analyses investigates whether relative conditions of big-city residents are related to the pace at which their cities have grown. For these analyses, we augment the DHS data with United Nations estimates of average annual population growth rates in the period five to 20 years preceding the surveys in cities of 750,000–1,500,000 and more than 1,500,000 residents (referred to as medium-sized and giant cities).[21] We restrict analysis to these areas because relatively reliable estimates of growth rates are available only for national capitals and for agglomerations of 750,000 or more inhabitants in 1990 (United Nations 1995a). City growth rates in the five years preceding the surveys are not considered because of

potential simultaneity bias arising from direct and indirect relationships be-
tween infant mortality and population growth. Three average rates of an-
nual population growth are examined: less than 3 percent (slow), 3 to 5
percent (moderate), and greater than 5 percent (rapid). A full description
of the statistical procedure involved in this analysis is presented in Appen-
dix D. Because our sample of countries in North Africa and the Near East is
comparatively small, includes relatively few cities of more than 750,000
inhabitants, and shows modest variation in the growth rates of these cities,
countries of this region have been grouped with countries of Asia to test
hypotheses pertaining to city growth rates; the region is referred to as North
Africa/Asia.

Are big-city residents disadvantaged?

Table 3 presents trends in infant mortality from the late 1970s through the
early 1990s, for urban size categories and for rural areas. Although fewer
children are represented in 1985–90 and the early 1990s than in earlier
periods because survey dates preceded 1990 in some countries, all rates
are based on urban settlement samples of more than 6,000 and are highly
reliable (that is, have small associated error terms).[22]
        Aggregate infant mortality levels since the late 1970s have barely changed
in big cities of Latin America and the Caribbean, with a reduction of about
five deaths per 1,000 births (or 7 percent). By comparison, small cities,
towns, and rural areas have experienced large declines in the range of 34
to 38 percent. Similarly, in sub-Saharan Africa, the early mortality levels
of big cities have remained virtually constant, whereas levels have declined
modestly in towns and villages. More significant, the infant mortality rate
of small cities has risen from 73 per 1,000 to 90 per 1,000 over time. An
implication of such change in urban Africa, as reflected by an inverted-U
pattern in rates across urban settlement sizes, and of decreasing discrepan-
cies in urban Latin America, as exhibited by an opposite pattern, is that
conventional claims of sharp urban–rural contrasts in living conditions ap-
parently are no longer valid for these regions. Indeed, mortality rates now
appear identical in small cities and villages of sub-Saharan Africa and in
big cities and small areas of Latin America. In the North Africa/Near East
region, another striking trend is observed: Early mortality has declined sub-
stantially in the largest cities over time, but again, much more slowly than
in smaller places. The long-held advantage of urban areas, particularly of
big cities, in living conditions—found as recently as the 1980s—no longer
applies to much extent in this region either, at least as inferred from this
indicator of population wellbeing. Only in Asia, where our sample of coun-
tries is less representative, have mortality differentials between settlement
types remained stable over time.

**TABLE 3   Regional trends in infant mortality rates, by settlement size, developing-country regions, 1970s–90s**

Region and settlement size	1975–80	1980–85	1985–90	Since 1990	Percent change, late 1970s–early 1990s
Latin America and Caribbean					
Urban					
>1 million	66.8 (2.8)	68.0 (2.2)	63.3 (2.0)	62.2 (1.6)	−6.9
50 thousand–1 million	81.9 (3.1)	71.8 (2.2)	51.2 (2.1)	54.0 (2.3)	−34.1
< 50 thousand	97.3 (4.0)	79.3 (3.3)	69.5 (2.9)	63.0 (2.8)	−35.3
Rural	104.7 (2.6)	95.0 (2.1)	88.7 (2.0)	65.1 (1.8)	−37.8
Sub-Saharan Africa					
Urban					
>1 million	63.3 (3.0)	67.6 (2.3)	65.7 (2.4)	60.3 (2.4)	−4.7
50 thousand–1 million	73.0 (3.7)	77.1 (2.3)	82.2 (2.4)	89.7 (2.5)	+22.9
< 50 thousand	92.7 (3.2)	88.2 (2.7)	86.6 (2.7)	80.4 (2.6)	−13.3
Rural	104.2 (1.6)	97.8 (1.2)	100.9 (1.1)	89.3 (1.0)	−14.3
North Africa/Near East					
Urban					
>1 million	85.3 (4.1)	66.0 (3.9)	57.9 (3.0)	52.6 (3.4)	−38.3
50 thousand–1 million	99.1 (4.4)	75.2 (3.1)	68.1 (3.3)	42.7 (2.9)	−56.9
< 50 thousand	116.6 (6.1)	82.2 (4.2)	68.7 (4.0)	53.3 (3.7)	−54.3
Rural	139.0 (3.0)	117.9 (2.3)	97.2 (1.9)	61.5 (1.8)	−55.8
Asia					
Urban					
>1 million	60.7 (3.2)	50.1 (2.8)	44.9 (2.5)	40.3 (2.7)	−33.6
50 thousand–1 million	61.9 (2.9)	62.3 (3.1)	58.6 (2.7)	43.1 (2.2)	−30.4
< 50 thousand	81.4 (3.9)	69.1 (2.8)	64.6 (2.7)	55.6 (3.2)	−31.7
Rural	96.8 (1.8)	89.2 (1.5)	84.4 (1.3)	68.5 (1.3)	−29.2

( ) = Standard error of estimate
NOTES: Rates represent number of deaths before age 12 months per 1,000 live births. Children born in the year preceding the surveys are excluded because they could not have been exposed to mortality risks for 12 months.
SOURCE: DHS data; for list of countries included see discussion in text and Appendix Table B.

Figure 3 illustrates interurban variation in early mortality trends more vividly for the three regions where large change in variation has occurred. The figure depicts odds ratios of dying in large and small cities in relation to the smallest urban settlements (towns), as estimated from logit regression models. The odds ratios are normalized at one (1.00) for the reference category, residents of towns; hence, odds of 0.7, for instance, represent a 30 percent lower chance of death in a small or big city, whereas 1.5 represents a 50 percent higher chance.

The three regions reflect distinct trends in urban inequality. In Latin America and the Caribbean, odds of infant mortality were 30 percent lower

FIGURE 3   Interurban infant mortality differentials, by settlement size, developing-country regions, 1970s–90s
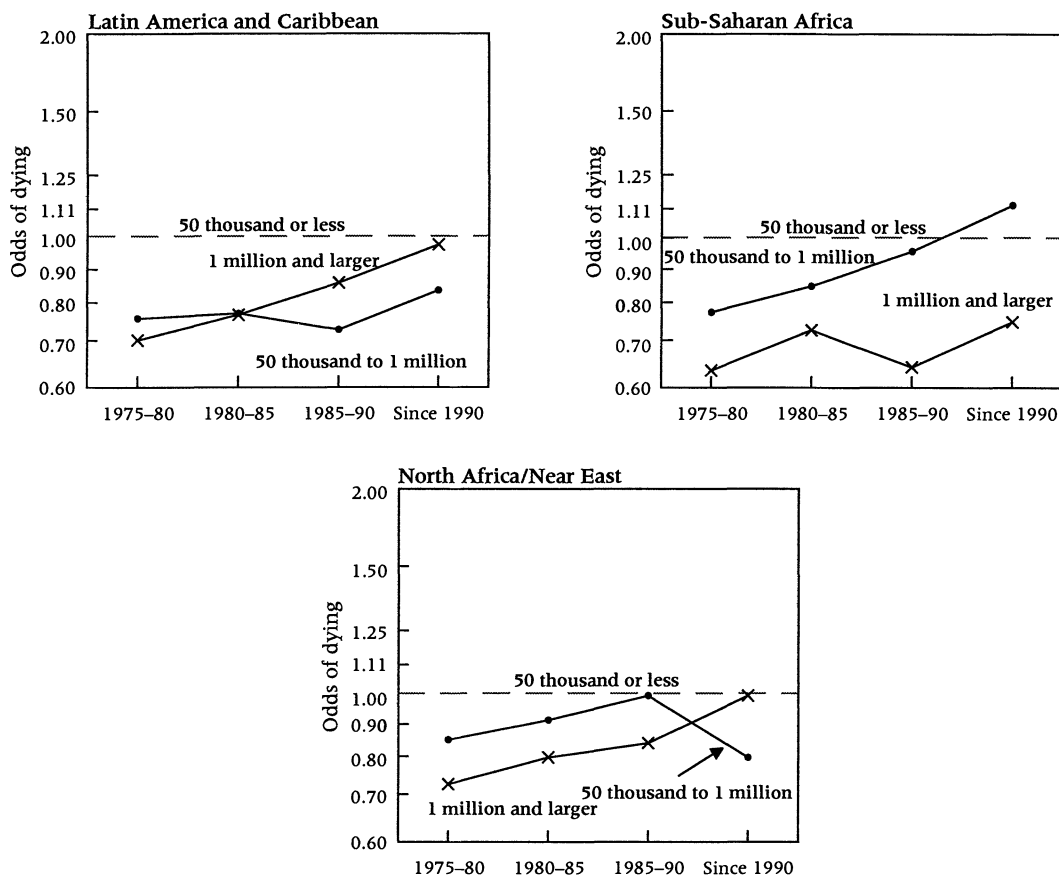
NOTE: Calculation of mortality estimates excludes births during the 12 months prior to country surveys.

in big cities than in small urban areas in the late 1970s, but the advantage of big-city residents since then has declined steadily and was not apparent by the early 1990s. This finding supports an interpretation of almost stagnant living conditions in the largest cities of Latin America and the Caribbean in recent years in relation to conditions in small urban areas, particularly as compared with conditions in small cities, where odds of mortality have been lowest since the late 1980s. A strikingly different pattern is observed in sub-Saharan Africa, where the highly favorable situation of big-city residents has scarcely changed. A unique development in this region, again, has been the change in the relative standing of small cities, in which mortality now exceeds that of the smallest urban areas. In North Africa and the Near East, the disadvantage of towns relative to the biggest cities

has decreased substantially since the late 1970s, while the relative standing of small cities has become very favorable since 1990.[23]

Although infant mortality differentials may represent disparities in overall living standards validly at this level of aggregation, Table 4 presents additional comparative information on wellbeing in these same urban areas for broader age cohorts of children (see Appendix C). Results pertain to the mid-1980s to mid-1990s, depending on survey years (see Appendix B).

TABLE 4   Children's living conditions by settlement size (in percent), developing-country regions, 1987–95

| Region and settlement size	Inadequate facilities in dwelling	Stunted growth	Diarrhea	Incomplete preventive health care	Enrolled in school (ages 7–12)
Latin America and Caribbean					
Urban					
>1 million	42.8	18.4	20.8	67.3	73.3
50 thousand–1 million	59.2	15.3	16.4	57.8	97.1
< 50 thousand	71.9	23.0	16.3	58.9	76.9
Rural	97.7	23.9	19.7	69.0	75.2
Cases (N)	(48,757)	(34,738)	(44,810)	(48,757)	(81,744)
Sub-Saharan Africa					
Urban					
>1 million	80.6	20.9	12.8	51.0	75.0
50 thousand–1 million	90.4	34.6	19.4	66.4	33.4
< 50 thousand	89.2	29.4	15.9	66.9	50.9
Rural	99.5	34.9	19.1	69.4	51.6
Cases (N)	(84,966)	(61,440)	(83,168)	(84,966)	(118,663)
North Africa/Near East					
Urban					
>1 million	47.0	17.9	15.3	71.6	65.3
50 thousand–1 million	40.0	12.1	17.6	65.6	90.4
< 50 thousand	56.9	22.1	16.6	71.7	78.2
Rural	95.1	24.9	15.5	77.4	61.7
Cases (N)	(35,572)	(15,993)	(32,595)	(35,409)	(52,093)
Asia					
Urban					
>1 million	75.0	40.3	8.1	62.7	92.4
50 thousand–1 million	65.6	34.1	11.8	61.8	91.6
< 50 thousand	88.7	51.5	11.8	69.1	72.3
Rural	96.7	44.3	10.8	74.6	75.2
Cases (N)	(47,749)	(5,894)	(43,751)	(44,696)	(57,011)

NOTE: See Appendix C for a description of variables and samples.
SOURCE: DHS data; for list of countries included see discussion in text and Appendix Table B.

In sum, results in Table 4 are consistent with infant mortality trends shown in Table 3. In countries of Latin America and the Caribbean, young children in big cities are less likely than children in small cities to have received extensive preventive health care directly or through their mothers and much less likely to be enrolled in school; they are more likely to have stunted growth, perhaps reflecting chronic malnutrition, and to have experienced diarrhea (which may be an outcome of several other diseases as well). Most striking is that levels of early schooling, preventive health care, and morbidity appear equally unfavorable in the largest cities as in small villages of the region. In sub-Saharan Africa, unfavorable conditions are particular to small cities as compared with both big cities and towns. Nutrition and morbidity appear worse in urban settlements of 50 thousand to one million than in towns, while two-thirds of children ages 7–12 in small cities are not enrolled in school, as compared with half of children in smaller settlements. Indeed, these indicators imply that quality-of-life is similar in small cities of less than one million residents—which in Africa include the largest city of some of the countries analyzed—to that in small villages, which in many countries are typically scattered remotely in the countryside. As in Latin America, children in the largest cities of North Africa and the Near East are far less likely to be enrolled in school—with 35 percent not enrolled—and more commonly experience incomplete preventive health care and poor long-term nutrition than children in small cities. Meanwhile, in Asian countries, children in large cities, which include several mega-cities, show no remarkable advantage as compared with children in small cities, and conditions in rural areas, with the exception of housing quality, are not exceptionally disadvantageous.

Insofar as generalization from our sample of countries is possible, mortality, health, and social indicators clearly uphold the thesis of declining advantages of big-city residents, as compared with other urbanites and in some cases even rural residents, in countries of Latin America and the Caribbean and North Africa and the Near East. In sub-Saharan African countries, small-city residents have remarkably poor living conditions, while in Asian countries no substantial big-city advantage is detectable. Moreover, mortality trends indicate that living conditions since the late 1970s have not much improved for big-city residents in Latin America, and have perhaps worsened on the whole for city residents in sub-Saharan Africa. These findings are arguably of greatest relevance to the Latin America and Caribbean region. Figure 4 illustrates that total population concentration in "million-plus" cities is roughly twice as high in this region as in other developing regions, at almost 30 percent in 1995, and is projected to increase steadily in the future and remain much higher than in other developing regions. A conservative interpretation of results for Asian countries is that no linear relationship exists between the size of an urban settlement and the wel-

FIGURE 4   Percent of total population residing
in cities of one million or more inhabitants by
region, 1970–2015
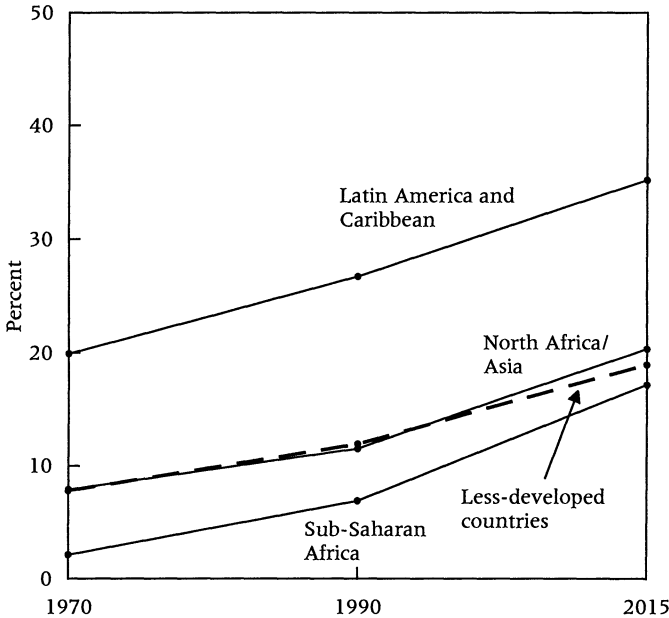
SOURCE: Calculated from United Nations 1995a.

fare of its residents. Observed patterns of poor and deteriorating living con-
ditions in small cities of sub-Saharan Africa are particularly disturbing in
that low urbanization and rapid urban growth—most clearly driven by per-
sistent high fertility—are resulting in an emergence of so-called mega-vil-
lages throughout the region. Moreover, because 33 of the 46 national capi-
tals in sub-Saharan Africa currently have populations of less than one
million, generally inferior conditions in such cities, as compared with cir-
cumstances in even very small towns and villages, are sufficient to qualify
the assertion of gross urban bias in national development strategies in tropi-
cal Africa (Stock 1995). Such bias may be limited to cities of several mil-
lion people, cities of clear international importance (for instance, Abidjan
and Lagos).

Does rapid population growth disadvantage giant cities?

The large cities of each region represented in Figure 3 and Tables 3 and 4
have not experienced uniform rates of population growth in recent years.

For example, during 1970–90 population grew approximately twice as fast in Santo Domingo as in Medellin, in Dar es Salaam as in Accra, in Istanbul as in Cairo, and in Dhaka as in Manila. Living conditions in these cities, and changed conditions over time, may be less a consequence of large size per se than of how rapidly cities have grown. Variation in the speed of population growth may, in fact, partly underlie the apparent successful development patterns of some big cities but not of others.

Table 5 presents effects (odds ratios) of city size, growth, and national capital status on recent infant mortality, for agglomerations of 750,000 or more inhabitants. Average annual growth rates are calculated for the period from five to 20 years preceding the survey in each country (roughly encompassing the late 1960s through 1990, depending on the year of survey). Again, we emphasize that mortality experience is applied as a summary indicator of a population's wellbeing in cities; that is, we assume that size and growth are related to an amalgam of factors that bear on infant mortality rather than that they exert direct effects on mortality exclusively.

TABLE 5   Effects (odds ratios) of city size, growth rate of urban population, and capital city classification on infant mortality, developing-country regions, 1982–95

City size/growth rate	Latin America and the Caribbean	Sub-Saharan Africa	North Africa/ Asia
City size (at time of survey)			
750,000–1,500,000	1.000	1.000	1.000
> 1,500,000	1.362***	0.830***	1.191*
Average annual rate of city population growth (at 5–20 years prior to survey)			
< 3 percent	1.000	1.000	1.000
3–5 percent	1.079	1.369**	1.096
> 5 percent	1.277**	1.421**	1.244*
Capital city			
No	1.000	1.000	1.000
Yes	0.924	0.933	1.037
Baseline odds	0.236***	0.379***	0.411***
Model chi square	145.011***	106.381***	79.834***
Cases (N)	(16,395)	(15,753)	(18,766)

Significant at * p<0.05, ** p<0.01, *** p<0.001 (two-tailed test).
NOTES: Results are based on logistic regression. Models adjust for potential nonindependence of observations resulting from shared maternal or household characteristics among siblings by use of the Huber formula as computed by Stata. Births in the 12 months preceding the surveys are excluded from analysis because these children could not have been exposed to mortality risks throughout infancy. Baseline odds represent the exponentiated constant term (that is, the residual effect when modeled parameters are set to zero).

Results shown in Table 5 suggest that the welfare of city residents in developing regions is strongly influenced by both the size and the recent pace of growth of the cities in which they live. Consistent with results of the preceding analyses, odds of infant mortality are greater in giant cities (with more than 1.5 million residents) than in medium-sized cities of Latin America and the Caribbean and North Africa/Asia, by 36 percent and 19 percent, respectively, whereas in comparative terms residents of giant cities of sub-Saharan Africa experience mortality some 17 percent lower. From this analysis of pooled regional data, it therefore may be appropriate to perceive an urban bias in favor of the very largest cities of tropical Africa as compared with smaller cities with populations of 750,000–1,500,000. Long-term city growth rates in excess of 5 percent a year have unfavorable effects, raising infant mortality odds by 24 percent in North Africa/Asia, 28 percent in Latin America and the Caribbean, and 42 percent in tropical Africa. Moderate growth of 3 to 5 percent per annum has adverse results in sub-Saharan Africa of almost equal magnitude. Residence in a national capital confers no benefits independent of city size and growth.

Findings shown in Table 5 can be interpreted to reflect an exacerbating role of population size and growth on wellbeing in cities; that is, both giant size (except in sub-Saharan Africa) and rapid growth of cities can be considered undesirable insofar as they apparently strain cities' capacities to accommodate individuals. As noted, however, the negative effects of city size shown in Table 5 and earlier may be conditional on a city's historical pace of expansion. To disentangle effects of size from effects of growth, Table 6 shows odds ratios of recent infant mortality in giant cities, as compared with those in medium-sized cities, according to various city growth rates in the 15 years preceding exposure to mortality risks. The table also summarizes results, in regional column headings, of likelihood ratio tests of whether effects of living in giant cities vary according to rates of growth (see Appendix D).

Effects of city size vary across growth-rate categories. Giant cities that have experienced relatively slow rates of growth (less than 3 percent per annum) show favorable effects—31 percent lower odds of infant mortality—as compared with smaller, slow-growing cities in the North Africa/Asia region and no disadvantage in the other two regions. A different pattern between city sizes is observed, however, at higher growth rates. In Latin America, giant cities have 44 percent higher odds of infant mortality at growth rates of 3 to 5 percent, and 53 percent higher odds at more rapid growth. In North Africa/Asia, very large cities that have grown at rates greater than 5 percent have 38 percent higher odds than fast-growing smaller cities. In sub-Saharan Africa, by contrast, moderate and rapid growth has been most unfavorable for medium-sized cities, as large cities experience lower infant mortality odds of roughly 20 to 30 percent at such growth.

TABLE 6   Effect (odds ratio) of city size on infant mortality for different urban population growth rates, developing-country regions, 1982–95

Average annual growth rate/city size	Latin America and the Caribbean[a]	Sub-Saharan Africa[a]	North Africa/ Asia[a]
< 3 percent			
City size (at time of survey)			
750,000–1,500,000	1.000	1.000	1.000
> 1,500,000	0.889	1.058	0.693*
3–5 percent			
City size (at time of survey)			
750,000–1,500,000	1.000	1.000	1.000
> 1,500,000	1.439**	0.823*	1.110
> 5 percent			
City size (at time of survey)			
750,000–1,500,000	1.000	1.000	1.000
> 1,500,000	1.526*	0.729***	1.379*
Cases (N)	(16,395)	(15,753)	(18,766)

[a] Effect of city size varies over growth rate at p>chi2=0.01.
Significant at * p<0.05, ** p<0.01, *** p<0.001 (two-tailed test).
NOTES: See Appendix D for description of estimation procedure. Results are based on logistic regression. Models adjust for potential nonindependence of observations resulting from shared maternal or household characteristics among siblings by use of the Huber formula as computed by Stata. Births in the 12 months preceding the surveys are excluded from analysis because these children could not have been exposed to mortality risks throughout infancy. Average annual growth rate is based on the period from five to 20 years preceding survey; it assumes exponential growth.

Again, this may reflect aforementioned patterns of possible economic and social-sector bias in favor of the very largest of Africa's cities.

Expressed alternatively, examination of odds ratios within each region suggests a strong negative impact of more rapid growth on living conditions in giant cities of Latin America and the Caribbean and North Africa/Asia, and on living conditions in medium-sized cities of sub-Saharan Africa. Such effects are formally confirmed by highly significant (p<0.01) results of likelihood ratio tests. Thus, while patterns of disparities between large and smaller cities presented earlier are observed here as well (albeit for different size categories), relative disadvantages associated with city size are found to depend on city growth rates. For example, the generally highly unfavorable conditions of giant-city residents in Latin America, as compared with those of residents of medium-sized cities, are dependent on (and presumably partly a result of) the rapid growth of many big cities, excluding some mega-cities, from the 1960s into the 1980s. Insofar as growth rates of most giant and medium-sized cities in the developing countries represented in this study are projected to decline in future (United Nations 1995a), one might anticipate improved overall welfare of these city populations as well. Less happily, an increasing number of large cities of ex-

panding size in developing regions, including cities approaching the 750,000–1,500,000 population range in sub-Saharan Africa, may counterweigh such an optimistic scenario.

Discussion

In its *World Development Report 1990*, the World Bank claims that "urban poverty will become the most significant and politically explosive problem of the next century" (cited in Harris 1992: 201). Such broad statements, based largely on dramatic trends and projections of urban population change in developing countries, suggest a need to scrutinize current living conditions of urbanites in low-income countries. Along with complementary information on children's status, this study applies an objective criterion by which one can compare wellbeing and synonymous concepts across highly diverse urban populations worldwide: level of infant mortality. Subject to the validity of this indicator, the quality of our data, and the propriety of our analytic methods, our findings generally support the contention that the highly favorable living conditions of big-city residents, as compared with persons residing in smaller localities, have narrowed considerably in several developing regions since the 1970s. While evidence does not suggest a deterioration in the welfare of big-city residents, levels of early mortality in countries of Latin America and the Caribbean, sub-Saharan Africa, and North Africa and the Near East underwent a much slower decline in cities of one million or more residents than in towns and villages. Meanwhile, infant mortality has risen substantially in small and medium-sized cities of sub-Saharan Africa, which include the capital city of most African countries. These trends in mortality correspond closely with a broad range of statistical measures of children's wellbeing in the late 1980s and 1990s, which reveal scant differences between cities and rural areas in these regions as well as in Asian countries. These conclusions derive strength from the large body of comparable data on characteristics of urban populations that we have analyzed, representing 63 percent of the urban population of the developing world outside of China and India.

Results of this study do not imply a narrowly demographic determination of human welfare in big cities. Indeed, the 1996 UN Global Conference on Human Settlements, HABITAT II, attributed worldwide problems of cities—inadequate shelter, underemployment, environmental decay, resource and service constraints, and so forth—not to population pressures but to aspects of local political economy, most notably inadequate responsiveness, accountability, and management of municipal governments; insufficient mobilization of community resources; and lack of private-sector involvement in bridging supply–demand discrepancies. This perspective is shared by urban theorists who reject notions of potential overurbanization

and who point to the efficiency of urban economies and management as the key to wellbeing in cities of all sizes (Mills and Becker 1986; Prudh'homme 1994). It may be, as we note in our introduction and elsewhere, that an apparent lack of appreciable improvement of living conditions in big cities is largely attributable to changes in the global economy that have reduced the formerly prevailing urban biases of national development policies. But reliable economic time-series data for individual cities and smaller settlements across countries are unavailable to test this hypothesis. What our findings suggest, however, is that in addition to nondemographic factors, population variables of size and growth are critical components affecting wellbeing in cities of developing regions, or of what is euphemistically called sustainable urban development. This should not be construed as validation of the concepts of overurbanization or optimal city size; city-size categories used in this study are dictated by the structure of our data, and an overoptimal size, if such a condition exists, may be defined by a different cutoff point, either higher or lower, than one million or more inhabitants. More important, our study demonstrates that individual-level data on urban living conditions in developing countries— data that are now readily available—should be examined along with economic indicators available for some more-developed cities, to assess comprehensively the effects of city size and rapid urban population growth. Analysis of such data from many countries, as conducted here, is necessary before defensible conclusions can be reached regarding optimal city size and overurbanization in the developing world.

The question arises whether massive inmigration in recent years— resulting in shantytowns, slums, and squatter settlements in some big cities—has contributed to the worsening relative situation, in the aggregate, of large city populations in some regions, and if so, to what extent. If such worsening had occurred, that would support the demographic "law" that cityward migrants become less positively selected with respect to personal characteristics as urbanization proceeds, and would refute the hypothesis that the largest metropolitan areas of countries attract the best-endowed migrants (Lee 1969). Available migration data are inadequate to address this question. Common concern that large-scale migration is worsening overall conditions in many large cities, however, should be tempered by recognition that the preponderance of urban growth in the developing world, excluding China, is probably attributable to natural increase rather than net inmigration or other factors.[24] Insofar as the maxim that demographically induced social pressures ultimately provoke varied corrective demographic responses is true (Davis 1963), deceleration of city growth (and resulting smaller-than-expected size) could therefore be anticipated primarily from fertility reduction in cities as residents perceive or expect deleterious changes in their living standards. This would also suggest that

any adverse effects of inmigration on big cities would eventually be lessened or reversed as would-be migrants recognize that their living circumstances might be better if they remain sedentary or move instead to small urban settlements.

Predictions that growing concentration of poverty in big cities will generate major conflict within cities or countries are currently in vogue (for example, Massey 1996). This perspective derives from a rich body of social conflict theory (most obviously associated with Marx), and from a common apprehension that the "truly disadvantaged" of large cities will challenge the established urban social order violently, as has occurred sporadically in some Western cities, particularly since the 1960s. We caution, however, against deriving broad societal implications from our findings. In cities where growing relative poverty is accompanied by rising inequality, ethnic, racial, or religious strife, severe constraints in natural resources (for example, in land for housing), and other factors conducive to social change, gloomy outcomes are not implausible. The general assertion that rampant city poverty per se breeds upheaval, on the other hand, is untenable. In non-welfare states, the typical response of urbanites to poverty has not been to revolt, but to work harder: to take on multiple jobs, work longer hours, spend more time seeking formal or informal employment, and increase household participation (particularly of women and youth) in the labor force. Such has been the experience, for example, in independent Africa (Iliffe 1987) and throughout Latin America during the economic downturn of the 1980s (de Oliveira and Roberts 1996). While some authors (for instance, Gugler 1988) argue that national revolutions in the developing world since 1979 (in Iran and Nicaragua) have been motivated predominately by urban living conditions and acted out in national capitals, such city-based insurgency has been instigated not by the poor, but by middle-class constituencies (military cadres, university students, worker associations, disaffected politicians and religious leaders), much as have urban labor disruptions and riots over food subsidies. In any case, even a remotely accurate prediction of the social consequences of city poverty would require assessment of conditions of individual cities in their national contexts and more disaggregated information than we had use of in this study.

While we have used the level of infant mortality as a general indicator of wellbeing across settlements worldwide, the mortality trends documented here are of interest also in shedding light on recent mortality transitions in the developing world. The convergence of infant mortality rates between cities and towns and villages in some developing regions, shown in Table 3, invites comparison with the experience of Europe and North America during industrialization in the nineteenth century, which often featured higher child mortality in cities than in the countryside (Preston

and Haines 1991). A central question for future research is whether the disparity between urban and rural infant mortality decline in contemporary developing regions is simply a passing phase in the developing world's transition to overall lower mortality, as it was in the North. It is tempting to suggest that it is not, as many developing cities, contrary to historical precedents, are experiencing rapid population growth during a period of prolonged economic stagnation and, as discussed earlier, of vastly greater magnitude. Whatever the case, it is remarkable that infant mortality levels have remained virtually static in big cities of Latin America and sub-Saharan Africa and have risen in smaller cities of Africa, despite improvements of the so-called child survival revolution—expanded immunization coverage, use of oral rehydration therapy, and other measures—implemented by WHO, UNICEF, governments, and nongovernmental organizations since the 1970s. While these measures have apparently achieved considerable success in rural areas throughout the world, their effectiveness in big-city environments warrants critical scrutiny.

Finally, given their particularly weak economies, countries of sub-Saharan Africa deserve special focus in the comparative study of poverty and wellbeing in developing regions. While mass media and urban studies have directed much attention to problems of mega-cities in Asia and Latin America, what has emerged in sub-Saharan Africa are, in effect, "mega-villages." An urban growth rate of almost 5 percent per year in the post-colonial era, accompanied by widespread economic stagnation since the 1970s, has spurred an upsurge of urban settlements of several hundred thousand people, many of which, our findings suggest, lack (or do not avail themselves of) basic amenities found even in small towns and villages. Contrary to popular perception, destitution and violence in rural areas are not driving Africa's exceedingly rapid urban growth: More than half of urban growth in the 1970s in Ghana and Liberia, and in the 1980s in Côte d'Ivoire, Senegal, and Mali, appears to have resulted from natural increase in urban areas (United Nations 1996b). Hence, even if all inmigration to African cities were to cease immediately, many cities would still have to absorb large future population increments. Under the most optimistic scenario of rapid and sustained national economic progress and benevolent governance, prospects for improved welfare in most cities confronted by swelling populations would remain dim, given the frailty of existing infrastructures, service provision, and public institutions. One must certainly allow from this study, however, that the relative poverty of Africa's cities, in those countries with functioning governments, might be alleviated even in the short term by continued efforts to facilitate fertility reduction within cities.

APPENDIX A   Cities of one million or more residents (at time of survey*) included in the analysis

Sub-Saharan Africa	North Africa/ Near East	Asia	Latin America and the Caribbean
Abidjan, Côte d'Ivoire	Adana, Turkey	Bandung, Indonesia	Baranquilla, Colombia
Accra, Ghana	Alexandria, Egypt	Bangkok, Thailand	Belém, Brazil
Dakar, Senegal	Amman, Jordan	Bogor, Indonesia	Bogotá, Colombia
Dar es Salaam, Tanzania	Ankara, Turkey	Chittagong, Bangladesh	Cali, Colombia
Douala, Cameroon	Bursa, Turkey	Davao, Philippines	Fortaleza, Brazil
Harare, Zimbabwe	Cairo, Egypt	Dhaka, Bangladesh	Guadalajara, Mexico
Ibadan, Nigeria	Casablanca, Morocco	Faisalabad, Pakistan	Guatemala City, Guatemala
Lagos, Nigeria	Istanbul, Turkey	Gujranwala, Pakistan	Guayaquil, Ecuador
Lusaka, Zambia	Izmir, Turkey	Hyderabad, Pakistan	La Paz, Bolivia
Nairobi, Kenya	Khartoum, Sudan	Jakarta, Indonesia	León de los Aldamas, Mexico
Yaoundé, Cameroon	Rabat, Morocco	Karachi, Pakistan	Lima, Peru
	Shubra El-Khemia, Egypt	Lahore, Pakistan	Medellin, Colombia
	Tunis, Tunisia	Manila, Philippines	Mexico City, Mexico
		Medan, Indonesia	Monterrey, Mexico
		Multan, Pakistan	Naucalpan, Mexico
		Palembang, Indonesia	Port-au-Prince, Haiti
		Peshawar, Pakistan	Puebla de Zaragoza, Mexico
		Rawalpindi, Pakistan	Quito, Ecuador
		Semarang, Indonesia	Recife, Brazil
		Surabaja, Indonesia	Salvador, Brazil
		Tanjung Karang, Indonesia	Santiago de los Caballos, Dom. Rep.
		Ujung Pandang, Indonesia	Santo Domingo, Dom. Rep.

*See column 1 in Table Appendix B.

APPENDIX B Availability of information in 43 country surveys

Region, country, and survey year	Settlement size	Electricity	Toilet facilities	Drinking water source	School enrollment (ages 7–12)	Height-for-age (stunting)	Tetanus immunization	Measles immunization	Prenatal care	Diarrhea
Sub-Saharan Africa										
Botswana, 1988	X	X	X	X			X	X	X	X
Burkina Faso, 1992–93	X	X	X	X	X		X	X	X	X
Burundi, 1988	X	X	X	X		X	X	X	X	X
Cameroon, 1991	X	X	X	X	X	X	X	X	X	X
Central African Republic, 1994–95	X	X	X	X	X	X	X	X	X	X
Côte d'Ivoire, 1994	X	X	X	X	X	X	X	X	X	X
Ghana, 1993	X	X	X	X	X	X	X	X	X	X
Kenya, 1993	X	X	X	X	X	X	X	X	X	X
Madagascar, 1992	X	X	X	X	X	X	X	X	X	X
Mali, 1987	X	X	X	X		X	X	X	X	X
Namibia, 1992	X	X	X	X	X	X	X	X	X	X
Niger, 1992	X	X	X	X	X	X	X	X	X	X
Nigeria, 1990	X	X	X	X	X	X	X	X	X	X
Rwanda, 1992	X	X	X	X	X	X	X	X	X	X
Senegal, 1992–93	X	X	X	X	X	X	X	X	X	X
Tanzania, 1991–92	X	X	X	X	X	X	X	X	X	X
Togo, 1988	X	X	X	X		X	X		X	X
Uganda, 1995	X		X	X	X	X	X	X	X	X
Zambia, 1992	X	X	X	X		X	X	X	X	X
Zimbabwe, 1994	X	X	X	X	X	X	X	X	X	X

	C1	C2	C3	C4	C5	C6	C7	C8	C9
North Africa/Near East									
Egypt, 1992	X	X	X	X	X	X	X	X	X
Jordan, 1990	X	X	X	X	X	X	X	X	X
Morocco, 1992	X	X	X	X	X	X	X	X	X
Northern Sudan, 1989–90	X	X	X	X	X		X	X	X
Tunisia, 1988	X	X	X	X			X	X	X
Turkey, 1993	X	X	X	X	X	X	X	X	X
Yemen, 1992	X	X	X	X	X	X	X	X	X
Asia									
Bangladesh, 1993–94	X	X	X	X	X		X	X	X
Indonesia, 1994	X	X	X	X	X		X	X	X
Pakistan, 1990	X	X	X	X	X	X	X	X	X
Philippines, 1993	X	X	X	X		X	X	X	X
Thailand, 1987	X	X	X	X		X	X	X	X
Latin America and the Caribbean									
Bolivia, 1993–94	X	X	X	X	X	X	X	X	X
Northeastern Brazil, 1991	X	X	X	X	X	X	X	X	X
Colombia, 1995	X	X	X	X	X	X	X	X	X
Dominican Rep., 1991	X	X	X	X	X	X	X	X	X
Ecuador, 1987	X	X	X	X	X		X	X	X
Guatemala, 1995	X	X	X	X	X		X	X	X
Haiti, 1994–95	X	X	X	X	X		X	X	X
Mexico, 1987	X	X	X	X	X	X	X	X	X
Paraguay, 1990	X	X	X	X	X	X	X	X	X
Peru, 1991–92	X	X	X	X	X	X	X	X	X
Trinidad & Tobago, 1987	X	X	X	X	X	X	X	X	X

APPENDIX C   Description of variables used in the analyses

Variable	Categories
Infant mortality	Survived to age 12 months* Died before age 12 months
Inadequate facilities in dwelling	Absence in dwelling of either piped drinking water, flush toilet, or electricity
Stunted growth	Height shorter for age than two standard deviations below median in NCHS reference population
Diarrhea	Had episode in last two weeks
Incomplete preventive health care	Mother did not receive prenatal care from doctor, nurse, or midwife or tetanus toxoid injection during gestation or at birth, or child did not receive measles immunization
Enrolled in school (ages 7–12)	No\Yes
Urban settlement size – A (at time of survey)	< 50,000 residents* 50,000–1,000,000 residents >1,000,000 residents
Urban settlement size – B (at time of survey)	750,000–1,500,000 residents* > 1,500,000 residents
Average annual rate of population growth (5–20 years preceding survey)	< 3 percent* 3–5 percent > 5 percent
National capital	No* Yes

* = Reference category in regression analysis.
NOTES: Countries with omitted variable are not included in the analysis. All missing values and "Don't know" responses are omitted from the analysis. Analysis of infant mortality excludes births in 12 months preceding surveys. Modern facilities, diarrhea, and full preventive health care refer to surviving children younger than five years. Growth stunting refers to surviving children aged 0–36, 3–36, 6–36, or 0–59 months at time of survey (depending on country). These variables pertain to children of interviewed mothers of reproductive age. Enrolled in school refers to residing children aged 7–12 of interviewed households.

APPENDIX D   Estimation procedure for Table 6

The model used to derive results in Table 6 takes the following form:

logit = a + b*(city size > 1,500,000) +
c_1*(3–5% growth rate) +
c_2*(>5% growth rate) +
d_1*(3–5% growth rate)*(city size > 1,500,000) +
d_2*(>5% growth rate)*(city size > 1,500,000),

where
a denotes the intercept
b denotes the main effect for city size
c denotes the main effects for growth rate, and
d denotes interaction terms.

The odds ratio for city size for different growth rates is calculated as *exp(b)* for <3%, *exp(b+d_1)* for 3–5%, and *exp(b+d_2)* for >5%. To derive statistical significance levels for city size within each growth-rate category, the above model is reparameterized as follows:

logit = a + c_1*(3–5% growth rate) +
c_2*(>5% growth rate) +
d_0*(<3% growth rate)*(city size > 1,500,000) +
d_1*(3–5% growth rate)*(city size > 1,500,000) +
d_2*(>5% growth rate)*(city size > 1,500,000).

This model is statistically equivalent (same log-likelihood) to the initial model, but replaces the main effect of city size with an interaction term between city size and low growth rate (<3%). The odds ratio for city size for different growth rates is now calculated as *exp(d_0)* for <3%, *exp(d_1)* for 3–5%, and *exp(d_2)* for >5%. The significance level of the "d" coefficient represents the significance level of the odds ratio for city size within a given growth-rate category.

To determine whether the effect of city size varies over growth rate, we use a likelihood-ratio test comparing the saturated model above to a constrained model without the interaction terms:

logit = a + b*(city size > 1,500,000) +
c_1*(3–5% growth rate) +
c_2*(>5% growth rate).

As compared to the constrained model, the saturated model with interaction terms is significant at p<0.01 in all three regions. Statistical analysis is performed using the lrtest procedure in Stata.

Notes

1 The advantage of cities posited by each theory can be summarized as follows. The modernization framework and its variants emphasize the initial emergence in cities of educated and "rational" (that is, nontraditional) industrialists and workers committed to economic growth (Inkeles and Smith 1970; Myrdal 1958). As growth proceeds, modern ideals of social and economic equalization spread benefits to rural hinterlands (Kuznets 1973), although no time frame is specified for such diffusion. As articulated first by André Gunder Frank (1967) with reference to Latin America, dependency theory holds that surplus extraction resulting from capitalist expansion in precolonial societies benefited city elites within these societies. "Rural underdevelopment and poverty for the masses were the inevitable outcomes of this historical process" (Gilbert and Gugler 1982: 16). Similarly, original formulations of the world-systems perspective (Wallerstein 1974) maintained that the minority share of the extracted surplus value not diverted to "core" (that is, more-developed) countries by foreign corporations or through unequal trade relationships remains concentrated among the elites of major cities in "peripheral" countries. One argument of the global division of labor paradigm (Sassen 1994) is that, along with informal-sector employment, major cities of the South are experiencing increased employment in high technology and advanced service industries through linkages with cities of the North.

2 Within these regions, however, only metropolitan Tokyo has a population this large.

3 Depictions of big-city life in much American fiction of the time tend to be similarly grim, as exemplified by Theodore Dreiser's Chicago in *Sister Carrie* (1900) and Stephen Crane's New York in *Maggie: A Girl of the Streets* (1893).

4 Original theses of overurbanization were based on evidence that developing countries had small ratios of industrial labor to urban population size as compared with ratios of now-developed countries in the late nineteenth and early twentieth centuries (at similar levels of urbanization). Such evidence was critiqued, however, as being historically and statistically invalid (most notably by Sovani 1964 and McGee 1971). The concept of overurbanization has subsequently been interpreted more broadly to denote situations "in which cities cannot adequately provide their rapidly growing populations with basic services and reasonable job opportunities" (Todaro and Stillkind 1983: 196). More specifically, the concept has been supported by arguments that "the provision of a subsistence minimum is more costly for additions to urban than rural populations" (Gugler 1982: 183)—due to the higher relative cost of providing urban goods and services—and more pointedly, that the poorest city residents suffer disproportionately from crime, overcrowding, pollution, and other hardships imposed by excess city size that cannot be captured adequately in economic models based on aggregate populations (Smith 1987). Where most proponents and critics of overurbanization conceptions have been consistent is in their common failure to base their positions on analysis of primary and detailed data drawn from populations representative of a broad range of cities in developing countries; conclusions have generally derived, initially, from gross national-level statistics of developing countries, later from studies of cities predominantly located in highly industrialized countries, and more recently from essays unduly informed by a singular dreary outlook (for instance, Linden 1993) applied uniformly to conditions in all big cities. As a result, generalizations that large population size is, on the whole, either beneficial or detrimental to the quality of life of municipal populations in developing countries remain questionable.

5 Cities of one million or more residents at the time of the survey are identified by the Demographic and Health Surveys (DHS)

used for most of the analyses in this study. Because a well-known diversity exists in national definitions of "urban" settlements, as well as in geographic and administrative boundaries used to measure populations of small areas, categorization based on population size in this study obscures such diversity, particularly among towns and villages, as well as diversity of population density and dispersion within urban agglomerations.

6 Certainly, however, Marx (1863) predicted the emergence of an urban proletariat primarily as a function of industrial capitalism operating in society at large, and most manifest in cities, rather than as an outcome of city size or spatial concentration of population.

7 Urbanization is defined as change in the proportion of the national population residing in urban areas. It should not be confused with urban growth, which indicates change in urban population size independent of any change in rural population.

8 Urban population growth rates depend greatly on the size of the initial population to which increments are subsequently added. Very high recent growth rates in some cities, notably cities in sub-Saharan Africa, are clearly related to small populations in earlier years.

9 A major distinction, however, is that the 95 percent of population growth occurring in urban places probably added about 100 million urbanites in the more-developed countries during 1875–2000, but will add approximately 2 billion people to urban places in the developing world during 2000–25.

10 Table 2 shows only those ten mega-cities of developing countries included in the following analyses. Their patterns of population change, however, are representative of those expected in other mega-cities of the South (United Nations 1995a).

11 Growth rates are calculated based on population size in 1970 because meaningful comparison of rates is otherwise precluded by graduation of smaller cities to categories of larger size. The United Nations (1995a) estimates that in 1970, less-developed regions contained 11 cities of more than 5 million residents, 71 cities with one to 5 million persons, and 90 cities with a population between 500,000 and one million.

12 This projection refutes the notion that rapid city growth is purely a statistical artifact reflecting small initial population size.

13 In brief, the initial theory of optimal city size rested on the naive supposition that all of the economic and social costs and benefits associated with different city sizes could be aggregated into two smooth functions, one representing costs and the other benefits, presumably expressed in real or imputed monetary values. Moreover, the theory usually stipulated that the benefit function was S-shaped, eventually approaching some asymptotic limit, while the cost function was U-shaped. Given these assumptions, the marginal benefit and marginal cost functions were bound to intersect at some finite city size, thus defining the optimal size. The original version of the theory posited intersection at a relatively small city size, in the 100,000–250,000 range, reflecting an ideal concept of a "liveable" city free from congestion, pollution, and other negative externalities associated with large population size. In a seminal paper, Alonso (1971) later advanced a modified version, suggesting that even if the intersection point occurred at a much larger population size, very large cities would be far beyond the optimal size. Alonso's argument was straightforward: Urban benefits increase with city size in a less than proportional way, while urban costs increase with city size in a more than proportional way. Therefore, there comes a point at which urban marginal costs become greater than urban marginal benefits; this point defines an overoptimal size. Alonso's hypotheses have since been contradicted by case studies and cross-sectional analysis of cities mainly in industrialized countries (as well as in Brazil and India), which conclude, on the basis of various measures of economic output, that there is no overoptimal city size (Mera 1973; Richardson 1981).

14 A two-step weighting procedure is applied so that results of analyses of the pooled data represent the experience of individuals at the regional level validly (based on countries included in the study). First, individuals are weighted so that each DHS country sample size is equivalent to the mean sample size of surveys in that region.

Second, individuals are weighted according to their countries' national population sizes as a proportion of the total population size of countries represented in the samples. All weights are interpolated from United Nations (1995b). Different weights are applied to different age groups. Infants are weighted according to the number of children born in each country in the midpoint year of five-year periods of interest (for example, 0–5, 5–10, . . . years preceding the survey). Children younger than five are weighted by the number of such children in each country in the year of the survey. Children aged 7–12 are weighted by the number of children aged 5–14 in each country in the year of the survey.

15 Some surveys, mostly in Asia, did not collect data from never-married women of reproductive age. Some surveys excluded a small minority of geographical areas, and the representativeness of all surveys is affected modestly by nonresponse of households.

16 If data are stratified and weights are not used, then the data are representative only within the groups on which the sample was stratified, because unequal probability of selection exists within the total sample. In our data, a subset of households or women would be representative of any characteristic, including settlement size, although statistical problems associated with small sample size may still be present.

17 For surveys before 1990, small cities are distinguished from towns on the basis of sampling cluster maps provided by the DHS project. The terminology used here—big city, small city, town, rural—and corresponding sizes are the construct of the DHS project and have been used consistently in these surveys. It should be recognized that settlements of 50 thousand to one million, in particular, do not necessarily represent "small" cities; in some countries, the largest city falls in this category. Cities in the range of 250,000 to one million, for instance, could justifiably be classified as medium-sized, but use of additional terms would confuse the discussion.

18 While Sen uses the phrase "in particular nations," his focus has been cross-national. Examination of specific groups within nations can be extended to include specific areas.

19 The analysis assumes that all children were residing with their mothers at the time of exposure to mortality and other conditions. This assumption is necessary because DHS surveys do not indicate whether dead children were residing with their mothers when they died. Data limitations also require the assumption that mothers did not relocate between different settlement types in the five years preceding the survey.

20 The difficulties of using households, for instance, as units of analysis in measuring poverty are discussed by Bruce (1989) and Lloyd (1995).

21 United Nations (1995a) presents the estimated population size of urban agglomerations of 750,000 or more persons in 1990 at five-year intervals (for example, 1970, 1975, 1980, . . .), whereas most DHS surveys were not conducted in these years. Linear interpolation is therefore used in most cases to calculate urban settlement size in the survey year and at five and 20 years preceding the survey.

22 Examination of specific rates should not convey the impression that infant mortality is now lower, for instance, in sub-Saharan Africa than in Latin America and the Caribbean, since regions have different patterns of spatial distribution of population, and because of the necessary exclusion of particular countries from this study (for instance, Argentina, Chile, Costa Rica, and other relatively low-mortality countries of Latin America).

23 Comparison of estimates for non-reference categories in Figure 3 and Tables 4 and 5 is performed using variance-covariance matrix as computed by Stata. See Judge et al. (1985: 211–213) for computation procedure.

24 Preston (1979) attributed 61 percent of urban growth in developing countries to natural increase, although this figure was based on data from only 29 countries, with African countries unrepresented. More recent estimates conclude that in the 1980s natural increase accounted for 75 percent of urban growth in Africa, 66 percent in Latin America, and 51 percent in Asia, excluding China (United Nations 1996b). These estimates are for urban areas including towns; figures for cities alone may differ.

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