The Urban Transformation of the Developing World
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Science **319**, 761 (2008);
DOI: 10.1126/science.1153012

PERSPECTIVE

The Urban Transformation of the Developing World

Mark R. Montgomery

Sometime in the next 20 to 30 years, developing countries in Asia and Africa are likely to cross a historic threshold, joining Latin America in having a majority of urban residents. The urban demographic transformation is described here, with an emphasis on estimates and forecasts of urban population aggregates. To provide policy-makers with useful scientific guidance in the upcoming urban era, demographic researchers will need to refine their data sets to include spatial factors as well as urban vital rates and to make improvements to forecasting methods currently in use.

By 2030, according to the projections of the United Nations (UN) Population Division (*1*), each of the major regions of the developing world will hold more urban than rural dwellers; by 2050 fully two-thirds of their inhabitants are likely to live in urban areas. The world's population as a whole is expected to undergo substantial further growth over the period, almost all of which is expected to take place in the cities and towns of poor countries. The total urban population of these countries was estimated by the UN Population Division to have been 1.97 billion persons in the year 2000, but that total is projected to increase to 3.90 billion by 2030 and further to 5.26 billion by 2050. This will be an enormous change in both relative and absolute terms. The urban demographic transformation influences and is influenced by four allied trends in economic development worldwide: globalization, which binds cities to each other through international networks; the decentralization of governments of poor countries, which is placing greater responsibilities on local and municipal governments (*2*); evolving international development strategies to fulfill the Millennium Development Goals, which explicitly recognize urban as well as rural poverty (*3*); and the urban implications of global climate change, which is likely to put large coastal city populations at risk from flooding, storm surges, and other extreme weather events (*4*, *5*).

In spite of its centrality to economic development, the urban transformation of poor countries has somehow largely escaped the attention of the demographic research community. When it has focused on urbanization, the demographic literature has tended to overstate the role being played by very large cities and has underemphasized the importance of small- and medium-sized cities. The literature has also given insufficient weight to urban natural increase versus rural-to-urban migration as a source of city population growth.

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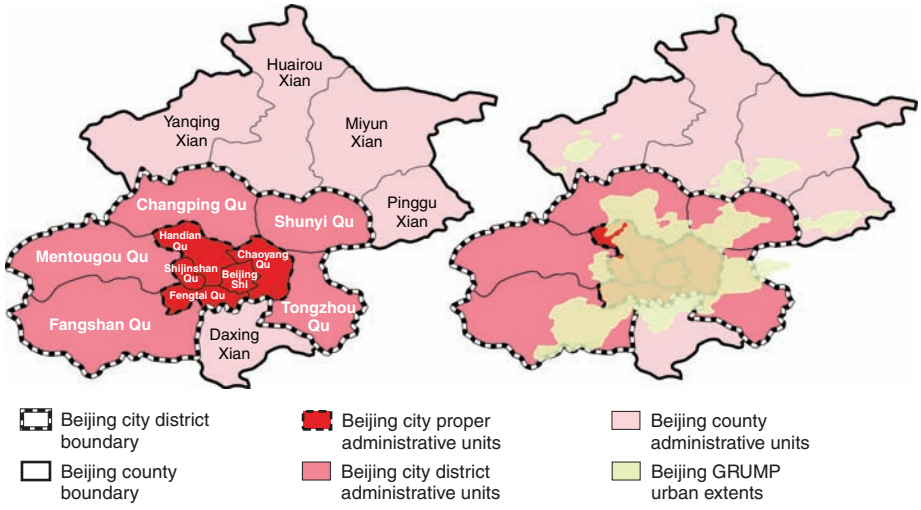

Fig. 1. Administrative Districts of Beijing Province, China.

There are policy opportunities here that warrant far more attention than has been given to date (*6*). In turning belatedly to urbanization, demographers have brought one important issue to the forefront: the poor performance of the methods currently being used to forecast city and urban growth in developing countries (*2*, *7*).

Urban and City Definitions

Much of what is known about the demography of the urban transition stems from research conducted by the UN Population Division, which since the 1970s has been the sole source of internationally comparable city and urban estimates and projections. The main challenge for its analysts is that of heterogeneity: The national definitions that yield these data vary substantially across countries and over time.

Beijing offers one example of the difficulties (*8*, *9*). For the year 2000, the population of "Beijing" was reported by Chinese authorities to be 11.5 million people. But depending on how the city boundary is drawn, the estimate could have been as low as 8.5 million had the boundary encompassed only the administrative units of the city proper (depicted in darkest shading in the left-hand side of Fig. 1). The official definition also includes the populations of surrounding city districts, which contain more rural than urban residents but are functionally linked to the city proper. Multiple social, economic, administrative, and political judgements come into play in the formulation of such city definitions, and it is not obvious that the adoption of any single definition is advisable. Although the conventional urban-rural distinction still retains value, a consensus is emerging that future classification schemes will need to reserve a place for third categories and degrees of urban-ness, as well as the rural and urban ends of the spectrum (*10*–*12*).

Although an international database that would allow for consideration of multiple definitions is not yet in hand, a template for this work has been developed by the Global Rural-Urban Mapping Project (GRUMP), which combines detailed administrative boundary data with urban and rural population counts for all countries and which has supplemented these data with imagery derived from remote sensing and other geographically coded sources (*13*, *14*). A sample of the GRUMP results can be seen in the right-hand side portion of Fig. 1, in which the irregularly shaped areas depicted in light shading indicate where the urban concentrations of population are located in Beijing province as determined by satellite observation of night-time lights (*15*). In this case, the physical proximity of lights might serve as a proxy for social, economic, and administrative interaction. New measures such as these may aid in the development of alternative urban and city definitions (*16*, *4*, *17*–*19*).

The Urban Population Transition

The following analysis has its basis in an October 2006 update of the UN Population Division's

cities database (*1*). Although the units in which city and town populations are recorded vary a good deal and systematic biases have plagued urban and city population forecasts based on these data, there is little disagreement about the broad patterns and trends.

During the period 2000–2024, the world's total population is projected to grow by 1.76 billion persons, with some 86% of this growth expected to take place in the cities and towns of developing countries (Fig. 2A). These near-term prospects stand in sharp contrast to what was experienced from 1950 to 1974, an era when rural growth still exceeded urban. The projections suggest that relatively little additional rural growth will occur in developing countries (an increase of some 190 million rural dwellers in total from 2000 to 2024) and that the UN anticipates that the rural populations of more-developed countries will continue to decline.

Among the major regions of developing countries, Asia now holds the largest number of urban dwellers and will continue to do so (Fig. 2B). By 2025, Africa will have probably overtaken Latin America in terms of urban totals, moving into second place among the regions. (The urban population of developing Oceania is also shown, but with only 1.92 million urban residents as of 2000 and 6.47 million urban dwellers projected for 2050, the totals for this region are hardly perceptible.)

In the 1950s, 1960s, and well into the 1970s, regional urban growth rates (Fig. 2C) approximated 4% per annum, although declines were already making an appearance in Latin America. Had the growth rates of this early era been sustained, the urban populations of the three regions would have doubled roughly every 17 years. By the year 2000, however, urban growth rates had fallen considerably in each of the three major regions. As Fig. 2C indicates, further growth rate declines are forecast for the first few decades of the 21st century, with urban Latin America projected to approach a state of zero growth. Much as with population growth rates overall in developing countries, the urban growth rates in force before 2000 are substantially higher than the rates that were seen during comparable historical periods in the West, with the difference being due to lower urban mortality in present-day populations, stubbornly high urban fertility in some cases, and an built-in momentum in urban growth that stems from the distinctive age and sex structures bequeathed by in-migration of young adults and past population growth (*2*). Even if the projected downward trends in growth rates come to pass, by 2050 urban growth rates in Africa would remain about 2% per annum, a rate that would double the urban population of that region in 35 years.

In each of the developing regions, the urban percentage is advancing in a seemingly inexorable fashion, and by 2030 urban majorities are projected to emerge in both Asia and Africa. Despite what is often assumed, when compared with the historical experience in Western countries, these decade-to-decade changes in urban percentages—sometimes termed the pace of urbanization—are not especially large (*2*). The literature exhibits some confusion on this point, often failing to distinguish rates of urban growth, which are rapid by historical standards, from the pace of urbanization, which falls well within the historical bounds.

What has no historical parallel is the emergence of hundreds of large cities, especially in Asia and Latin America, which each have several cities above 10 million in population. This remarkable feature of the urban transition has attracted a great deal of interest and seems to have fostered the impression that most urban residents in the developing world live in huge urban agglomerations. In fact, of all urban residents in cities of 100,000 and above in the developing world, only about 12% live in megacities, i.e., about 1 in 8 of

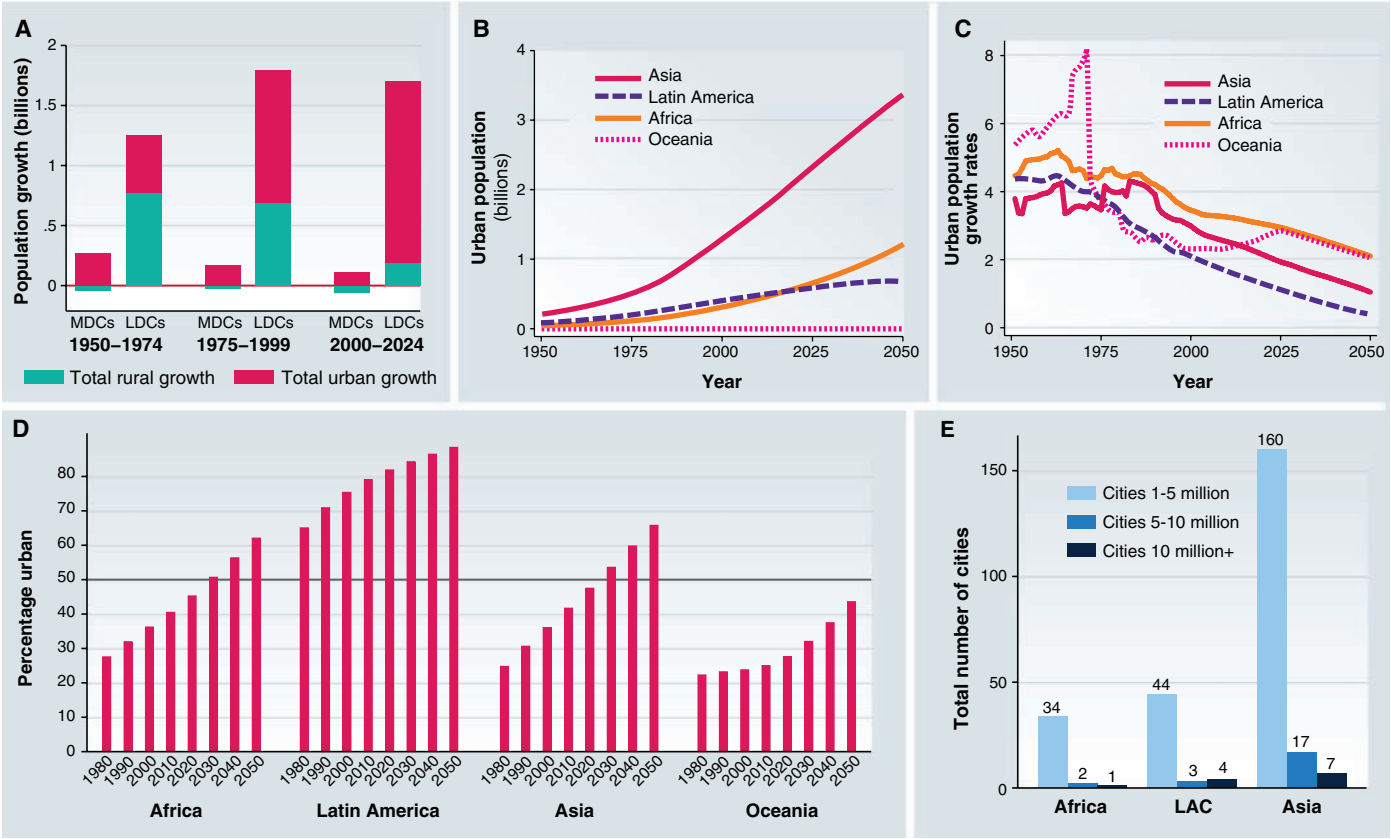

Fig. 2. (**A**) Urban population growth in more-developed countries (MDCs) and less-developed countries (LDCs), 1950–2024. (**B**) Total urban population by region in developing countries. (**C**) Growth rates of total urban population by region in developing countries. (**D**) Increasing percentage urban in developing countries. (**E**) Number of cities of 1 million residents or more in developing countries in 2000 by region.

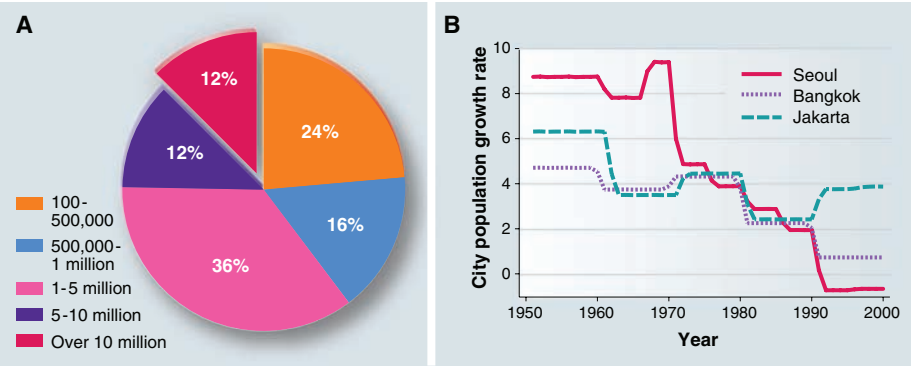

Fig. 3. (**A**) Distribution of urban population by city size in developing countries in 2000. (**B**) City growth rates for Seoul, Bangkok, and Jakarta, 1950–2000.

urban residents (Fig. 3A). Smaller cities are generally less well provided with basic services than large cities, such as improved sanitation and adequate supplies of drinking water (*2*). Rates of fertility and infant and child mortality in small cities can be little different from the rates prevailing in the countryside. Their municipal governments seldom possess the range of expertise and managerial talent found in the governments of large cities. Yet in an era of political decentralization, these smaller cities are increasingly being required to shoulder substantial burdens in service delivery and take on a larger share of revenue-raising responsibilities (*2*). Given all this, it is surprising how often small cities have been neglected in policy discussions (*20*).

The empirical record suggests that various social and spatial feedback mechanisms cause large cities to exhibit declining rates of population growth, as illustrated by the cases of Jakarta, Seoul, and Bangkok (Fig. 3B). In offering explanations, urban economists emphasize how increases in city size drive up rents and the many costs of congestion, discouraging prospective migrants and encouraging business relocation. Urban geographers stress the difficulties of locating and measuring the growth of large cities, noting that faster population growth at an urban periphery, which may not necessarily be recorded in growth rate statistics, often accompanies slower growth in the city center.

Another plausible explanation that receives far too little attention is that city growth rates are driven down over time by declines in urban fertility rates. Research by the UN Population Division, based on a sample of countries providing two or more national censuses, allows urban population growth rates to be divided into a natural urban growth component (the difference between urban birth and death rates) and a residual that combines net migration with spatial expansion (*21*). The details are complicated and the sample of countries small; nevertheless, the results are strikingly at odds with the usual perception of the sources of urban growth. In developing countries, about 60% of the urban growth rate is attributable to natural growth; the remaining 40% is due to migration and spatial expansion. Recently, a very similar rule was established for India over the 4 decades from 1961 to 2001, with urban natural growth again accounting for about 60% of the total [p. 32 of (*22*)]. Not surprisingly given its low fertility levels, the tight controls that kept migration in check until the 1980s, and the subsequent unleashing of migration, China presents something of an exception. There, the UN's estimate puts the contribution of natural urban growth at about 40% of the growth rate total.

Many developing-country policy-makers have expressed greater concern about rates of city growth in their countries than about national population growth, and they have not infrequently acted on such concerns with aggressive tactics aiming to expel slum residents and repel rural-to-urban migrants (*6*). It is therefore surprising how little attention has been paid to a growth-rate policy of a very different character: urban voluntary family-planning programs. Over the past half-century, such programs have compiled an impressive record across the developing world in facilitating fertility declines and reducing unwanted fertility. Empirical analysis of developing-country city growth and fertility suggests that when national total fertility rates decline by one child, this is associated with a decline of nearly 1 percentage point in city population growth rates for that country (*23*). Family-planning programs offer an effective and humane alternative to the ineffective and brutalizing measures that have been applied all too often.

Table 1. Urban population forecast errors for the year 2000 [from (*2*)].

	Mean percentage forecast errors		
	1980–2000	1990–2000	1995–2000
East Asia and Pacific (EAP)	3.9	26.7	−2.8
EAP excluding China	18.4	9.8	−0.4
Latin America and Caribbean	19.8	5.4	−0.9
Middle East and North Africa	13.3	6.8	8.5
South Asia	27.2	19.7	2.7
Sub-Saharan Africa	21.8	23.4	5.5
Level of development			
Low	23.1	18.3	3.2
Lower middle	6.9	26.1	−1.3
Lower middle excluding China	25.6	9.9	3.7
Upper middle	12.8	8.9	0.8

Forecasting City Growth

The performance of the UN urban and city population forecasts leaves much to be desired: As Table 1 indicates, they have consistently projected growth rates (and thus population sizes) that are too high (*2*, *7*). The mean percentage forecast errors are large for the 20-year- and 10-year-ahead forecasts; for example, the 20-year-ahead forecast for Latin America, made in 1980, proved to be 19.8% too high when the region's 2000 urban population was finally counted. The tendency to overproject is not evident in the UN's forecasts of total population at the national level, and it persists despite the insertion of an algorithm in the city forecasting model designed to slow projected growth rates as city size increases. Diagnosing the source of these errors is difficult given that the UN's method makes no use of fertility or mortality rates (which the UN projects in separate exercises) and has not yet incorporated spatially disaggregated data such as shown for Beijing (Fig. 1). Alternative forecasting methods are now being actively explored (*7*, *23*).

If the details remain in doubt while these scientific issues await resolution, at least the broad outlines of future urbanization can be perceived from the UN figures, as can the items in the research agenda that urgently need attention if demographic data and methods are to provide useful scientific guidance. Perhaps the greatest need on the demographic front is to ensure that the censuses regularly fielded by developing countries are analyzed at the level of small geographic units and the results placed in the hands of the local and municipal governments that will need to make use of such data to effectively plan for the pace and spatial distribution of future growth. Remote-sensing methods can serve as a valuable supplementary tool, if not in estimating population as such, then in monitoring the spatial spread of city populations in the intercensal periods.

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10.1126/science.1153012

PERSPECTIVE

Reproducing in Cities

Ruth Mace

Reproducing in cities has always been costly, leading to lower fertility (that is, lower birth rates) in urban than in rural areas. Historically, although cities provided job opportunities, initially residents incurred the penalty of higher infant mortality, but as mortality rates fell at the end of the 19th century, European birth rates began to plummet. Fertility decline in Africa only started recently and has been dramatic in some cities. Here it is argued that both historical and evolutionary demographers are interpreting fertility declines across the globe in terms of the relative costs of child rearing, which increase to allow children to outcompete their peers. Now largely free from the fear of early death, postindustrial societies may create an environment that generates runaway parental investment, which will continue to drive fertility ever lower.

Reproducing in cities has been seen as a difficult enterprise ever since cities were created. Cities were, and often still are, havens of disease and crime, characterized by costly and crowded housing, transitory communities, and a lack of kin support among inhabitants. Indeed, the notion that the "country" is the best place to rear children dates back to the Romans (*1*). Urban dwellers faced higher rates of infant mortality than their rural compatriots right up to the early 20th century (*2*), such that most cities were only maintained by a constant influx of migrants. Infanticide and infant abandonment were used as means of controlling family size, and even if rescued, the prospects for foundlings were precarious (*3*). The famous 18th-century naval captain and philanthropist Thomas Coram, when home from his seafaring duties, was distressed by the number of abandoned babies he observed on the streets of London, which inspired him to set up England's first foundling hospital in 1741 (*4*). Unfortunately, similar institutions in other cities could not sustain such levels of philanthropic support in the face of rising numbers of foundlings.

An alternative to such drastic and cruel measures to defray the costs of child rearing is not to have so many children in the first place. The strategy of limiting fertility through techniques such as delaying marriage and sexual abstinence within marriage were not limited to city life; we know they were first used by rural groups, ranging from African pastoralists relying on slow breeding livestock such as camels (*5*) to preindustrial German farmers trying to maintain the integrity of their farms by reducing the numbers of offspring claiming the inheritance (*6*). The industrial revolution and its resulting urbanization seem ultimately to have led to a population-wide desire to curb fertility by these techniques. In the late 19th and early 20th centuries, fertility in Britain plummeted in 70 years, from families of six to eight children being common to families of more than four children becoming rare. This fertility decline has since become a global phenomenon, albeit with many local differences. Family sizes shrunk first throughout Europe and then in the Americas and Asia, and by the end of the 20th century, this process finally began in earnest in Africa (*7*). There is a broad association between declining fertility and declining mortality across countries, although the latter does not necessarily precede the former across individual states or regions, and fertility has continued its downward trend in the West, long after mortality rates were greatly reduced. Here, I have taken an evolutionary perspective to explain some of the mechanisms that might be underpinning this phenomenon.

The fertility decline in Africa is happening fastest in urban areas. In Ethiopia (Fig. 1), a difference of nearly four children between family sizes in the capital city (Addis Ababa) and in rural areas is the highest such difference seen anywhere (*8*, *9*). Although HIV/AIDS can depress fertility to some extent (*10*), this cannot fully explain the urban fertility decline, which started before the HIV epidemic took hold. The rural-urban difference is not specific to Ethiopia (even in Europe, where the rural-urban division is somewhat blurred, fertility is still higher in rural than in urban areas). But examining a case where the difference is so dramatic highlights what underlies this trend. Contraceptive services

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