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This article explores the connection between the significant health improvements made in the developing world, particularly after World War II, and the goal of providing clean water and sanitation services to large urban centers in these countries. Using Manila and Lima as case studies, it argues that increases in life expectancy stemming from reduction in the incidence of infectious diseases led to significant rural population growth, spurring rapid migration to urban areas. This migration in turn created enormous public health challenges in cities. Migrants generally lived in unsanitary informal settlements. In some cases, particularly in the short term, moving to the city posed significant health risks to migrants. However, a combination of activism by migrants and increased managerial competence on the part of urban authorities is beginning to yield an urban health dividend, at least in most Latin American and Asian cities. Drawing on the theories of the demographic transition and the epidemiological transition, this analysis links urban health issues to larger-scale transformations in population and health trends.

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David Soll

In 1993 the World Bank observed that “[h]ealth conditions around the world have improved more in the past forty years than in all previous human history.” During this period, the world also experienced the most intensive burst of urbanization ever. People across large swaths of Asia and Latin America flocked to cities. They transformed the ecology and culture of scores of modest-sized cities, establishing bustling and sprawling urban centers that became beacons for rural migrants.¹



Both of these changes – health improvements and rapid urbanization – are defining features of twentieth-century history. The thread that connects them is population growth. Dizzying and unprecedented levels of population growth are another hallmark of the twentieth century. The statistics are familiar, but awe-inspiring nonetheless. It took humanity until 1800 to reach a global population of one billion. In 1950, two and a half billion people called earth home; by the turn of the millennium, humans had crossed the six billion threshold.²

The size and scope of these transformations are difficult to comprehend, but their significance is undeniable. They have altered the daily lives and aspirations of billions of people around the globe. This essay explores the interactions between health improvements, population growth, and urban expansion in the Philippines and Peru. Both countries are notable for what demographers call “primacy,” the extreme concentration of urban growth in a single city. The development of the capital cities, Manila and Lima, far exceeded that of other urban areas. This explosive growth made health and sanitary conditions precarious for millions of urban dwellers in the Manila and Lima metropolitan areas. Health improvements in rural areas led to rapid population growth that spurred mass migration to urban areas. However, heavy urban migration flows overwhelmed the sanitary infrastructure of these metropolitan areas, creating dangerous health conditions for those who had fled rural areas in search of a more prosperous life.

Much of the literature on the informal settlements that housed these new migrants can be divided into two camps. The first, represented most clearly in the work of urban historian Mike Davis, views slums as the product of an imbalanced international economic system that elevates profit for a few over the welfare of the poor in the developing world. An alternative perspective emphasizes the extraordinary entrepreneurial energy and capacity for self-governance exhibited by the residents of

¹ World Bank, *World Development Report 1993: Investing in Health*, Oxford University Press, New York 1993, p. 21.

² A useful overview of twentieth-century population trends is available at the Population Reference Bureau website, <http://www.prb.org/Educators/Teachers-Guides/HumanPopulation/PopulationGrowth.aspx>, accessed July 2011.

informal settlements. Delving into this debate is beyond the scope of this essay. However, viewing informal settlements through the prism of the demographic transition illuminates their origins and provides some clues about the future of urban life in the developing world.³

This introduction has, of necessity, oversimplified the complexities of both rural to urban migration and population dynamics. The remainder of this essay will examine other links in the causal chain between rural population growth and migration to urban areas. Although migration theorists have paid some attention to population growth, it seldom figures prominently in their analysis. Similarly, the literature on environment and migration focuses primarily on the role of disasters, rarely probing the possible migratory implications of changes in the larger disease environment.⁴ This essay fills these gaps by connecting the unprecedented health improvements that occurred in the middle decades of the twentieth century to the massive migration flows that transformed cities throughout much of the developing world.

It is important to clarify two points. The first is to address the connection between the themes of this essay and the topic of environment and migration. In the last two decades, environmental historians have become increasingly interested in the connections between human bodies and the places people live and work.⁵ The

³ M. Davis, *Planet of Slums*, Verso, London 2006; for a good summary of contrasting perspectives on slums, see P. Hall, *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*, third edition, Blackwell, London 2002. Journalist D. Saunders offers the most recent prominent counterpoint to Davis in *Arrival City: How the Largest Migration in History is Reshaping Our World*, Pantheon, New York 2011. Saunders celebrates the dynamism of cities in the developing world, contrasting them with rural living, which he calls “the largest single killer of humans today, the greatest source of malnutrition, infant mortality, and reduced lifespans” (p. 23).

⁴ A notable exception to this trend is A. Crosby’s classic exploration of the role that disease played in facilitating European colonization. See Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900*, Cambridge University Press, Cambridge 1986.

⁵ G. Mitman, *Breathing Space: How Allergies Shape our Lives and Landscapes*, Yale University Press, New Haven 2007; L. Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge*, University of California Press, Berkeley 2007.

interaction between humans and microbes – a critical aspect of these narratives and also of this essay – is no longer the exclusive domain of medical historians. The steep reduction in deaths from communicable diseases that began around 1940 and accelerated in the decades after World War II established a new environmental reality for millions of Peruvians and Filipinos.

Second, this inquiry into health and migration is a prequel to a larger project on urban sanitation in the twentieth century. Understanding the forces driving large-scale urban migration provides the necessary context for examining the environmental challenges that dense populations pose in urban and peri-urban environments. Isolating specific factors and weighing their respective contributions to complex social phenomena such as migration is necessarily more art than science, but these two case studies suggest that historians and social scientists have underestimated the important role that health improvements played in generating large-scale rural to urban migration.

Success Story: Health Improvements in the Post-War Developing World

Neither country is particularly notable for the strides it made in improving health conditions and extending life expectancy in the middle decades of the twentieth century. For decades, Peru and the Philippines lagged behind many other countries in their regions in improving health outcomes. Better known for exporting large numbers of health professionals to the developed world than for improving the health of its own citizens, the Philippines failed to match the gains in life expectancy enjoyed by other Southeast Asian countries such as Thailand and Malaysia.⁶ Likewise, in recent years the human

⁶ On the migration of Filipina nurses, see A.R. Gievarra, *Marketing Dreams, Manufacturing Heroes: the Transnational Labor Brokering of Filipino Workers*, Rutgers University Press, New Brunswick 2010. From 1990-2008, the Philippines made impressive strides in life expectancy, surpassing Thailand in 1995. However, it lags well behind Singapore and Malaysia. See M. Liu and Y. Yin, *Human Development in East and Southeast Asian Economies: 1990-2010*, United Nations Development Programme, New York 2010, p. 22.

rights organization Amnesty International has put pressure on Peru to reduce its high rates of maternal mortality.⁷ However, the introduction of antibiotics, insecticides, and more effective tuberculosis drugs in the 1940s and 1950s led to sharp declines in deaths due to communicable diseases throughout Latin America and Asia, even in those countries with relatively undeveloped health infrastructures. Success in fighting infectious diseases yielded significant increases in life expectancy because these diseases were responsible for a high percentage of premature deaths, especially among young children.⁸ A Peruvian born in the 1940s could expect to live to her mid-30s; by 1961, life expectancy had surpassed 50 for both men and women.⁹

The dramatic health improvements that swept the developing world in this period reflect what health experts refer to as the epidemiological transition. In the first stage, countries experience high mortality due to pestilence and famine. The second stage is characterized by receding pandemics that raise average life expectancy to 50 years and above. In the third and final stage, life expectancy approaches or exceeds 70 years, and degenerative diseases and illnesses linked to unhealthy lifestyles, such as heart disease, become the primary cause of death.¹⁰

Although modern medicine offered the possibility of greatly improved health outcomes, developing countries had many obstacles to overcome in their efforts to combat infectious diseases. Peru faced three significant challenges. The first and arguably most intractable was the country's challenging landscape. The country can be divided into three geographic zones: the coast, the highlands, and jungle ar-

⁷ See Amnesty International USA, "Fatal Flaws: Barriers to Maternal Health in Peru" (Pdf file), <http://www.amnestyusa.org/our-work/campaigns/demand-dignity/maternal-health-is-a-human-right/maternal-mortality-in-peru>.

⁸ D. Gwatkin, "Indications of Change in Developing Country Mortality Trends: The End of an Era?," in *Population and Development Review*, 6, 1980, pp. 615-44.

⁹ T.L. Hall, *Health Manpower in Peru: A Case Study in Planning*, Johns Hopkins University Press, Baltimore 1969, p. 6.

¹⁰ J.C. Caldwell, "Population Health in Transition," in *Bulletin of the World Health Organization*, 79, 2001, pp. 159-70.

east. The coast, site of most export-oriented agriculture and virtually all industrial activity, is dry; large-scale irrigation projects were required to produce cotton and other crops for export. The highlands consist primarily of small villages scattered at different altitudes along the Andean range. These villages are the traditional heartland of Indian Peru and, until the initiation of heavy migration flows to coastal areas, were home to the bulk of the population. Peru's Amazonian holdings contain the majority of the country's land area, but relatively few people live in these jungle areas.¹¹

The second challenge – the wide range of diseases that can flourish in these distinct environments – is effectively part and parcel of the country's unique geography. The Rockefeller Foundation's yellow fever campaign underscored the difficulty of combating disease in different ecosystems. The foundation is credited with eradicating yellow fever from Latin American cities from 1916 to 1923, but it continued to wage war against the mosquito-borne disease in rural areas for several more decades.¹² In the 1920s, a foundation official tracked an outbreak of yellow fever in the coastal area of Piura. Ironically, modernization, in the form of railroad lines and irrigation canals, provided fertile breeding ground for the disease's vector, the *Aedes aegypti* mosquito.¹³ Two decades later, several outbreaks of so-called jungle yellow fever occurred in the Amazon valley region, prompting the dispatch of a medical team that vaccinated 6,000 people in two weeks.¹⁴

¹¹ For a general introduction to Peru, see R.A. Hudson (ed.), *Peru: A Country Study*, GPO for the Library of Congress, Washington 1992.

¹² S. Preston, "Causes and Consequences of Mortality Declines in Less Developed Countries during the Twentieth Century," in *Population and Economic Change in Developing Countries*, R.A. Easterlin (ed.), University of Chicago Press, Chicago 1980, p. 314.

¹³ R. Watson, *Notes on Malaria Studies and Control in Peru*, 2 May 1946, Series 331, Box 5, RG 1.1 Projects, Peru, Folder 331 I (Malaria), 1942-1949, Rockefeller Foundation Papers, Rockefeller Archive Center, Sleepy Hollow, NY (hereafter RFP, RAC).

¹⁴ Letter to Captain A.W. Howard from W.A. Sawyer, 10 February 1943, Series 331, Box 5, RG 1.1, Series 331, Box 6, Folder 331 O (Yellow Fever), 1942-1951, 1955, RFP, RAC.

The third challenge was redesigning Peru's notoriously centralized and uncoordinated health delivery system. To combat the multiple diseases plaguing the country, the government created separate services for specific diseases – one for yellow fever, one for malaria, etc. This disease-specific approach created absurd inefficiencies. As a Rockefeller Foundation official observed, “[i]n some small towns, two or three services carried on activities each in its own building and each in charge of a part-time doctor.”¹⁵ In 1945, with guidance from the Rockefeller Foundation, Peru revamped its health system. The new priorities included establishment of rural health programs focused on prevention and curative medicine, the decentralization of funds and personnel from Lima, and the hiring of full-time physicians and health professionals who viewed public health as their career rather than as an adjunct to their private practices.¹⁶

Exceptionally strong economic growth in the immediate post-war decades fueled significant expansion of the public health system. The country operated two social insurance funds under which particular categories of workers received care, but the majority of Peruvians relied on the facilities of the Ministry of Health. The Ministry created a spectrum of facility types for different sized communities, ranging from health centers in larger towns to people's drugstores in rural villages that lacked access to pharmacies. The Ministry dramatically expanded the number and reach of health facilities throughout the country from the mid-1950s to the mid-1960s. The number of medical posts that provided care for residents of small towns increased from 23 to 190. Physicians assigned to medical posts oversaw the operation of clinics and drugstores in smaller communities.¹⁷

The combination of increased access to basic health services such as antibiotics, vaccinations, and physicians, and the deployment of insecticides to reduce transmission of mosquito-borne diseases led to substantial improvements in longevity and quality of life. When

¹⁵ Estimated 1949, State Health Services, 1943-1948, Record Group 1.1 Projects, Section 331 Peru, Folder Health Services, RFP, RAC.

¹⁶ Ibid.

¹⁷ Hall, *Health Manpower in Peru* cit., pp. 24-5.

the Rockefeller Foundation initiated a cooperative malaria control program with the Peruvian government in the 1940s, the disease ravaged large sections of the country. Survey results revealed that “the fertile coastal valleys are believed to have as high an incidence of malaria as almost any other part of the world.”¹⁸ By the 1960s, malaria was largely confined to sparsely populated jungle areas; only 2,300 cases were reported in 1963.¹⁹ As in much of the developing world, Peru significantly reduced both the absolute number and percentage of deaths attributable to infectious diseases. By the mid-1980s, Peru had achieved a milestone in public health: non-communicable diseases had become the primary cause of death.²⁰ The most tangible sign of progress against infectious diseases was the reduction in the number of childhood deaths: from 1960 to 1991, Peru reduced the mortality rate for children aged five and under by 54 percent.²¹

Despite Peru’s success in reducing childhood deaths, its childhood mortality rate in 1991 exceeded that of all other Latin American countries except Bolivia and Haiti.²² Health gains were also notably precarious; Peru experienced a major cholera outbreak in the early 1990s. Nonetheless, during the post-war decades, both Peru advanced to the relatively late stages of the epidemiological transition.

The Philippines’ passage through the epidemiological transition varied somewhat from Peru’s, in large part due to the American colonial presence. In his study of American colonial medicine in the Philippines, Warwick Anderson argues that the tendency of American health officials to view public health through the prism of race undermined disease control campaigns. In an era when germ theory had supposedly triumphed over alternative explanations of disease

¹⁸ Peru-Control, Series 331, Box 5, RG 1.1 Projects, Peru, Folder 331 I (Malaria), 1942-1949, RFP, RAC.

¹⁹ A. Buck, T. Sasaki, and R. Anderson, *Health and Disease in Four Peruvian Villages: Contrasts in Epidemiology*, Johns Hopkins Press, Baltimore 1968, p. 57; Hall, *Health Manpower in Peru* cit., p. 16.

²⁰ World Bank, *World Development Report 1993* cit., p. 206.

²¹ Hudson, *Peru: A Country Study* cit., (no page numbers, see section titled “Health.”)

²² Ibid.

transmission, American officials' obsession with "civilizing" Filipinos often resulted in muddled policies that reflected political and racial ideologies more than best practices in public health.²³

Nonetheless, certain interventions did improve public health during the colonial period. The 1908 construction of reservoirs on the Marinka River outside of Manila marked the first in a long line of upgrades to the city's water system. Despite periodic shortages and the absence of a filtration system, the delivery of water from rural areas dramatically reduced urban death rates within a few years.²⁴ Colonial officials concentrated their efforts on smallpox, cholera, and leprosy, but deaths due to malaria also decreased significantly under American rule. The Rockefeller Foundation found willing partners in its campaign to control mosquito populations through insecticide spraying. *Hacenderos*, the men who managed the large plantations where many rural Filipinos labored, became convinced of the efficacy of insecticide application. Paul Russell, who managed the foundation's malaria control project in the 1920s and early 1930s, observed that *hacenderos* "were able to see such clear cut results in a practical way that they were willing to take over the demonstration control work and make it routine." In concert with spraying on US Army bases and increasing utilization of bed nets, malaria rates declined by almost three quarters between 1922 and 1932.²⁵

Isolated progress on a few diseases did not produce an epidemiological transition. It was not until the turmoil of World War II abated and the Philippines gained independence that deployment of the medical technologies developed during the war began to make

²³ W. Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines*, Duke University Press, Durham 2006.

²⁴ D. Doepper, "Manila's Imperial Makeover: Security, Health, and Symbolism," in *Colonial Crucible: Empire in the Making of the Modern American State*, A. McCoy and F. Scarano (eds), University of Wisconsin Press, Madison 2009, pp. 495-96.

²⁵ Final Report on the Malaria Investigations of the International Health Division of the Rockefeller Foundation in the Philippine Islands, 1921-1934, Record Group 5, Box 72, Series 3, Reports, Routine, Folder 242 I, Philippine Islands-Malaria, Final Report, 1921-1934, RFP, RAC.

a significant dent in stubbornly high mortality rates.²⁶ Widespread use of antibiotics, greatly increased vaccination coverage, improved nutrition, and decentralization of the health delivery system – the approach followed by Peru and other developing nations – produced rapid gains in life expectancy. By taming (but no means extinguishing) the scourge of communicable diseases, the nation made growing up a notably safer proposition. Communicable diseases claimed the lives of 1,100 of every 100,000 Filipinos in 1930; by the late 1970s, the toll had decreased to less than 300. Death rates for bronchitis, tuberculosis, and a host of other diseases decreased sharply. By the 1970s, a conclusive sign of the epidemiological transition had emerged: deaths from heart disease began to increase in the Philippines even as rates of infectious diseases continued to decrease.²⁷

Population Growth and the Demographic Transition: The Backdrop to Urban Migration

The postwar decades appeared to substantiate the first part of Thomas Malthus's famous equation that, in the absence of "checks" such as war and disease, human populations would grow exponentially. The Philippines, whose post-war growth rates ranked among the highest in the world, was the tenth-most populous country by 2000. In the early stages of the epidemiological transition the population doubled in 33 years; it took only another 24 years to double again. The story was similar in Peru, where several decades of annual growth rates in excess of two percent resulted in the tripling of the population from 1940 to 1990. Skyrocketing population growth, which occurred throughout most of the developing world, sparked fears of famine and ecological catastrophe. In his 1968 bestseller *The*

²⁶ J. Sarol, "A Twenty-Five Year Review (1967-1991) of Epidemiological Profile and Trends of Selected Diseases," in *Philippine Institute for Development Studies Discussion Paper Series 95-19*, Philippine Institute for Development Studies, Manila 1995, pp. 7-20.

²⁷ Disease Intelligence Center, Ministry of Health, Philippines Department of Health, *Philippine Health Statistics 1978*, Department of Health, Manila 1982, pp. 150-2.

Population Bomb, Paul Ehrlich painted a nightmare scenario of urban population density in India: “The streets seemed alive with people. People eating, people washing, people sleeping. People visiting, arguing and screaming. People thrusting their hands through the taxi window, begging. People defecating and urinating. People clinging to buses. People herding animals. People, people, people, people.”²⁸

While Ehrlich fixated on the looming consequences of growing populations, other scholars looked to the past to gain some perspective on the startling growth in Asia and Latin America. These rapid advances in life expectancy intrigued many social scientists in the Cold War period because they challenged the notion that the Third World would develop along European and North American lines. Although particular public health interventions, such as smallpox inoculations, did reduce deaths and increase life spans in the West, most of the gain in life expectancy was due to the broad diffusion of the benefits of modern life over the course of many decades: improved nutrition, better hygiene, less crowded housing, and more advanced water supply and sewerage systems. Thomas McKeown’s careful study of life expectancy in Wales and England in the nineteenth and twentieth centuries highlighted the benefit of improved nutrition and downplayed the effect of improved healthcare.²⁹

Post-war increases in life expectancy in the developing world did not conform to the Western experience. The rate of population growth was unprecedented. In 1976, sociologist T. Lynn Smith reflected on Latin America’s tremendous growth in the preceding quarter century: “No other great world region has ever experienced a comparable growth of population over a twenty-five year period.”³⁰ High growth rates were the result of a combination of rapid reduction in death rates stemming from the introduction of a range of

²⁸ P. Ehrlich, *The Population Bomb*, Ballantine Books, New York 1968, p. 1.

²⁹ S.H. Preston, “Mortality Trends,” in *The Reader in Population and Development*, P. Demeny and G. McNicoll (eds), St. Martin’s Press, New York 1998, pp. 28-36; T. McKeown, *The Modern Rise of Population*, Academic Press, New York 1976.

³⁰ T. Smith, *The Race between Population and Food Supply in Latin America*, University of New Mexico Press, Albuquerque 1976, p. 51.

low-cost public health practices and continued high birth rates.³¹ Paul Demeny and Geoffrey McNicoll explained the math: “If the drop in death rates is precipitous, as was clearly observed to be the case in the early postwar years, and if the decline in the birth rate is tardy, as was [...] the case in the less developed countries, the population will grow fast and will do so for an extended period.”³²

Demographic changes in the post-war developing world posed a direct challenge to conventional wisdom among economists and social scientists, which held that poor countries must adopt the basic economic, political, and social practices of the West in order to modernize their economies and societies. This notion, generally known as modernization theory, dominated Cold War thinking in everything from development policy to war strategy. Modernization theory relied heavily on analogy: just as a person passed through childhood and adolescence before reaching maturity, so too would developing countries transition from rural, primarily agricultural societies with communal values and ways of life to urban, industrial economies based on the rule of law and individual aspirations.³³

Another theory – generally referred to as the demographic transition – helped explain why the experience of Western countries proved a poor guide to the developing world in the post-war decades. Looking back on the history of humans over the millennia, demographers detected three basic stages in the history of human populations. In the first stage, high death rates due to illnesses and accidents encouraged couples to have many children. A world of high death rates and high birth rates produced stable populations. In the second stage, death rates declined, but couples continued to have large families. The result

³¹ A. Palloni, “Mortality in Latin America: Emerging Patterns,” in *Population and Development Review*, 7, 1981, pp. 623-49.

³² P. Demeny and G. McNicoll, “World Population 1950-2000: Perception and Response,” *Population and Development Review*, 32, Supplement, p. 8.

³³ N. Gilman, *Mandarins of the Future: Modernization Theory in Cold War America*, Johns Hopkins University Press, Baltimore 2003. Economist and presidential adviser Walt Rostow is generally seen as the most forceful proponent of modernization theory. See W. Rostow, *Stages of Economic Growth: A Non-Communist Manifesto*, Cambridge University Press, Cambridge 1960.

was rapid population growth. In the final stage, couples reduced the number of births to replacement level or slightly above, producing stable populations. Countries with low death and birth rates are considered to have completed the demographic transition.³⁴

In the West, the demographic transition was embedded in a larger set of social, economic, and political changes that encouraged steep decreases in birth rates. Democratic governance, salaried labor, urbanization, and industrialization formed the backdrop of a relatively stable modernizing world. The improved nutrition and hygiene practices that accompanied the rise of industrial capitalism led to slow but steady reductions in death rates. In essence, the same forces that reduced death rates also induced couples to limit their fertility. As a result, the period during which births significantly outnumbered deaths was relatively short. The critical factor here is the gradual decline in death rates due to economic development. The demographic transition was only one piece of a much larger shift to a more urban and predictable world.³⁵

By now, the reasons for the contrasting demographic trajectories of the Western and non-Western worlds should be clear. In 1969, Joaquin Roces, the publisher of the *Manila Times*, observed that “All over the world, modern medicine has slashed death rates drastically while birth rates have remained constant.”³⁶ Roces accurately described the demographic transition unfolding in his native Philippines and throughout the developing world. Improvements in health far outstripped the pace of other social and political developments. As these other changes – notably urbanization, increasing governmental

³⁴ Demeny and McNicoll, *World Population 1950-2000* cit., pp. 1-10; T. Dyson, “A Partial Theory of World Development: The Neglected Role of the Demographic Transition in Shaping Modern Society,” in *International Journal of Population Geography*, 7, 2001, pp. 67-90.

³⁵ D. Reher, “The Demographic Transition Revisited as a Global Process,” in *Population, Space and Place*, 10, 2004, pp. 19-41; Dyson, *A Partial Theory* cit.

³⁶ RAC, J.P. Roces, “Population Growth: Peril or Opportunity,” speech delivered Feb. 14, 1969, RG 1.3, 242 Philippines, Box 12, Folder 242 a, Philippines, Population Center Foundation, Inc., Family Planning Supplementary Materials, RFP, RAC.

competence, and the implementation of family planning programs – took hold, birth rates did begin to fall. In the intervening decades, however, as the second stage of the demographic transition slowly yielded to the third stage, populations soared. As sociologist Ronald Preston noted, much of the population growth stemmed from the reduction in childhood mortality; each additional child surviving to adulthood had the potential to produce yet more children.³⁷

Urbanization and Migration

The relationship between urbanization and migration is complex, and varies across time and space. For most of human history, poor hygiene conditions made cities unhealthy and dangerous places; in order to maintain population levels, cities relied on a continuous stream of migration from rural areas. As journalist Doug Saunders observed in his study of rural to urban migration, cities “soaked up large numbers of rural people, held them for a few years, and promptly killed them, usually before they could reproduce or settle in any meaningful way.”³⁸ By the twentieth century, the growing acceptance of germ theory, sophisticated water supply and sewerage systems, and increased access to healthcare greatly reduced the danger of urban living. The flow of rural migrants did not merely sustain population levels; it began to significantly increase the size of urban populations.³⁹

Permanent migrants typically increase the population in several ways. Take the case of a young Filipina woman, the most common profile of a newcomer to the Manila metropolitan region in the 1960s and 1970s.⁴⁰ Her arrival in the Manila area adds one person to the urban population. However, within a few years, her mother and two sisters join her. A decade later, she and one of her sisters

³⁷ Preston, *Causes and Consequences* cit., p. 317.

³⁸ Saunders, *Arrival City* cit., p. 135.

³⁹ E. Pernia, *Urbanization, Population Growth, and Economic Development in the Philippines*, Greenwood Press, Westport, 1977, p. 63; D.L. Dufour and B.A. Piperata, “Rural-to-Urban Migration in Latin America: An Update and Thoughts on the Model,” in *Journal of Human Biology*, 16, 2004, pp. 395-404.

⁴⁰ Pernia, *Urbanization, Population Growth* cit., p. 116.

have each given birth to two children. The phenomenon of chain migration – in which the decision of an original migrant to settle in an area induces family and friends from her home region to follow in her path – is common throughout much of the world. Though not a particular focus of this essay, chain migration underscores the long-term impact of migrants’ reproductive decisions. Decades after rural to urban flows peak, migrants continue to increase the urban population by reproducing. As the director of the Filipino census observed in the mid-1970s, “[i]f internal migration were to suddenly cease, population would pile up in areas where fertility is high.” Estimating rural migrants’ share of the natural increase in urban population due to births in excess of deaths is difficult, but it is impossible to gain a complete picture of the environmental impact of migration without taking into account the offspring of rural migrants.⁴¹

In recent years, the environmental implications of heavy migration flows to urban areas of the developing world have begun to attract significant attention both in the popular press and in the development community.⁴² However, in parts of the developing world, including Peru and the Philippines, rural to urban migration peaked decades ago. A closer look at migration patterns to Lima and Manila suggests that rural population growth made possible by improved health conditions was a major factor in the rapid development of these cities. These metropolitan areas have struggled to provide basic environmental services for decades. These struggles are rooted in post-war migration patterns that overwhelmed the capacity of municipal authorities to manage urban environments.

⁴¹ W. Fliieger, B. Koppin, and C. Lim, *Geographical Patterns of Internal Migration in the Philippines: 1960-1970*, National Census and Statistics Office, Manila 1976, p. iii.

⁴² See, for example, M. Montgomery, “The Urban Transformation of the Developing World,” in *Science*, 319, 2008, pp. 761-74; G. Bugliarello, “Megacities: Four Major Questions,” in *Journal of Urban Technology*, 16, 1, 2009, pp. 151-60; D. Ferris, “Asia’s Megacities Pose a Stark Environmental Challenge,” *forbes.com* blog, 21 August 2012, <http://www.forbes.com/sites/davidferris/2012/08/31/the-stark-environmental-challenge-of-asias-megacities/>, accessed August 2012.

Coming to Manila

In the 1950s and 1960s, Filipinos were on the move like never before. In 1960, an estimated 15 percent of the population moved across municipal boundaries.⁴³ The country's three main geographical areas – Luzon, the Visayas, and Mindanao – exhibited distinct migration patterns. In Luzon, home to Manila and the country's most populous region, migrants primarily settled in metropolitan Manila. Visayan natives headed in two directions – north to the Manila area and south to Mindanao, where they sought out virgin land to farm. Migration from Mindanao was slight; the sparsely populated region attracted many more migrants than it produced.

These patterns reflected the basic structure of the country's economy. Industrialization in Metropolitan Manila attracted millions of rural residents seeking greater economic opportunity. In 1900, one in eight Filipinos lived in urban areas; only 70 years later, one in three did. Women, generally more successful than men at securing factory employment, became the backbone of the urban labor force. At mid-century fewer than a third of female workers labored off the farm; by 1970, more than two-thirds had non-agricultural jobs.⁴⁴ But most Filipinos continued to rely on the land to earn a living. High rates of rural population growth created land shortages in many parts of the country. Mindanao provided migrants from the Visayas and other parts of the country with a classic agricultural safety valve. Land was relatively plentiful and affordable, prompting millions of Filipinos to move to the southern tip of their country to re-start their lives.

Many of those who relocated to Metropolitan Manila also concluded that land shortages in their home regions offered little prospect for economic advancement. Agricultural pressures did not lead rural Filipinos to reduce the size of their families. Even as death rates tumbled, birth rates remained well above five per woman until the 1970s, causing the number of people per square kilometer to

⁴³ Flieger et al., *Geographical Patterns* cit., p. 10.

⁴⁴ Pernia, *Urbanization, Population Growth* cit., pp. 61-70.

rise inexorably.⁴⁵ From the 1950s to the 1980s, the amount of land per agricultural worker decreased by about half. The failure of crop yields to keep pace with population growth, coupled with the lack of government investment in the agricultural sector, made migration a logical choice for those families unable to acquire more land.⁴⁶ Rural migrants tended to come disproportionately from densely populated areas. Of the 33 provinces with above average population density from 1960-1970, 26 were net exporters of people.⁴⁷

Increasing rural population density reflected the interaction of three factors: births, deaths, and land ownership. As in most developing countries, the government's efforts to redistribute land only marginally altered ownership patterns: As a US government study of the Philippines observed, "Although nationwide approximately 50 percent of farms in 1980 were less than two hectares, these small farms made up only 16 percent of total farm area. On the other hand, only about 3 percent of farms were over 10 hectares, yet they covered approximately 25 percent of farm area."⁴⁸ Prior to the epidemiological transition, high death rates maintained a balance between food production and population. The rapid reduction in death rates that began in the 1940s increased population density because birth rates remained high and land was not redistributed in response to population growth. Perhaps the most surprising element of the new demographic picture was the broad-based gains in life expectancy across much of the country. With the exception of Mindanao residents, who remained outside the managerial ambit of the central government for much of the century, Filipinos from both rural and urban areas enjoyed longer life spans. Life expectancy in places with

⁴⁵ A.C. Orbeta, Jr., *Population and Poverty: A Review of the Links, Evidence and Implications for the Philippines*, Discussion Paper Series No. 2002-2, National Census and Statistics Office, Manila 2002, p. 2.

⁴⁶ For a helpful overview of agricultural developments in the Philippines, see A.M. Balisacan, "Agriculture in Economic Development Strategies: The Philippines," in *ASEAN Economic Bulletin*, 6, 1989, pp. 81-93.

⁴⁷ Fliieger et al., *Geographical Patterns* cit., p. 151.

⁴⁸ R. Dolan (ed.), *Philippines: A Country Study*, GPO, Washington DC, 1993 (no page numbers, material quoted is in ch. 3, "The Economy" by Chester Hunt).

heavy outmigration such as the Visayas and rural Luzon was almost on par with Metropolitan Manila.⁴⁹

Urban residents joined in the migration movement. In the 1940s, migrants flocked to Manila, but by the 1950s, it had begun losing people to neighboring communities. Highway construction, the conversion of agricultural land to housing, and industrial growth dramatically expanded the effective boundaries of Metropolitan Manila.⁵⁰ Rather than moving directly to Manila, urban migrants headed for the neighboring province of Rizal, the epicenter of urban growth in the Philippines. By arriving in such large numbers, they transformed the region's villages and small towns into teeming cities. Prior to the 1960s, three provinces bordering Manila – Bulacan, Laguna, and Cavite – exported people to the capital. The extension of industrial development into these predominantly rural areas quickly turned them into prime locations for the migrants who now found Manila too crowded for their liking. By the 1970s, 30 percent of Rizal's residents were migrants and the province was home to almost eight percent of Filipinos.⁵¹

Rapid urbanization was by no means inevitable. Land reform, a national policy of diffusing industrial development, and more vigorous family planning efforts could all have conceivably made migrating to Metropolitan Manila less appealing. Filipino commentators generally focused on the country's stubbornly high birth rates relative to other Asian countries. In the 1970s, the Philippines and Thailand each had populations of around 45 million people, but Thailand's aggressive population control program resulted in much more modest growth. In 2007, there were 65 million Thais, whereas the Filipino population had reached nearly 90 million.⁵² These divergent experiences highlight the variety of possible responses to environmental pressures, in this

⁴⁹ Pernia, *Urbanization, Population Growth* cit., p. 75.

⁵⁰ W. Stinner, and M. Bacol-Montilla, "Population Deconcentration in Metropolitan Manila in the Twentieth Century," in *The Journal of Developing Areas*, 16, October 1981, pp. 3-16.

⁵¹ Fliieger et al., *Geographical Patterns* cit., p. 13, p. 147.

⁵² A.C. Abaya, "Let Them Eat Bio-Fuels," *Manila Standard Today*, 10 April 2008.

case greatly reduced death rates. Millions of Filipinos responded to these pressures by migrating. However, the example of Thailand and countries such as South Korea and Indonesia suggest that more effective social policy can help blunt the negative social and economic effects of dramatic improvements in life expectancy.⁵³

Coming to Lima

Post-war Lima had much in common with Manila. It developed rapidly, attracted hundreds of thousands of long-distance migrants, and was the center of industrial and economic activity. In both cities, growth in outlying districts far outstripped population increases in the central city. Most importantly, in both countries the political system proved unable to adjust to the demands of rapid growth. By the 1970s, the mass influx of migrants and continued high birth rates had created sprawling conurbations. The fragmentation of political authority across existing towns and villages led to a profound mismatch between the needs of growing communities and the organizational and fiscal resources of local governments.

The extreme concentration of economic activity in the capital region was largely responsible for dramatic geographical shifts in population. Peru's economy prospered in the 1950s and early 1960s due to the boom in the fishmeal industry, the expansion of the port of Callao just north of Lima, and increased manufacturing. These economic opportunities utterly transformed the country by encouraging massive migration to the Lima area. The interval between the decrease of death rates and the decline in fertility rates led to high overall rates of population growth: the country's population almost

⁵³ For a comparison of growth rates in Thailand and the Philippines, see D. Reyes, "Population and Health Policies in Thailand and the Philippines: A Comparative Study," in *The Asian Scholar*, 1, available at <http://www.asianscholarship.org/asf/ejournal/abstracts05.html>. One indication of the shifting population dynamics in South Korea is its inclusion in a book focused on Asian countries with rapidly aging populations. See K. Eggleston and S. Tuljapurkar, *Aging Asia: The Economic and Social Implications of Rapid Demographic Change in China, Japan, and South Korea*, Walter H. Shorenstein Asia-Pacific Research Center, Stanford, CA 2010.

tripled from 1940 to 1980. What distinguished Peru from most other developing countries was the extent to which this population growth was concentrated in one geographic area. In the 1960s and 1970s, population growth rates in the Lima area exceeded the already high national rates by 20 percent. By the early 1980s, almost one-third of the country's population resided in the Lima area, compared to 20 percent in Metropolitan Manila.⁵⁴

This mass migration also reflected deteriorating conditions in rural areas. In part, these conditions were a product of the physical conditions in the mountainous regions where most Peruvians lived. Only river valleys and gorges provided residents with significant amount of tillable land, forcing communities to rely on resources from multiple altitudes to grow enough food. This subsistence strategy made sense in an era of stable populations, but villages tended to hoard resources when populations soared. Although land reform initiated in the late 1960s did succeed in breaking up some large estates, only 16 percent of the farming population received land.⁵⁵ A 1971 report concluded, “[t]he pressure of population on the land is so strong that people tend to leave the sierras.”⁵⁶ The difficulty of supporting their families prompted many men to leave the highlands for urban centers. Most of them ended up in Lima, often living in provincial centers briefly before moving to the capital. Unlike the Philippines, where educated young women were in the vanguard, men dominated the early stages of Peruvian migration.⁵⁷

⁵⁴ P. Klaren, *Peru: Society and Neighborhood in the Andes*, Oxford University Press, New York 2000, pp. 289-322; D. Vining, Jr., “Population Redistribution towards Core Areas of Less Developed Countries, 1950-1980,” in *International Regional Science Review*, 10, 1986, p. 26.

⁵⁵ G. Malmberg, *Metropolitan Growth and Migration in Peru*, Dept. of Geography, University of Umea, Sweden 1988, pp. 60-72.

⁵⁶ A.A. Laquian (ed.), *Rural-Urban Migrants and Metropolitan Development*, Intermet, Toronto 1971, p. 112.

⁵⁷ R.P. Shaw, “Land Tenure and the Rural Exodus in Latin America,” in *Economic Development and Cultural Change* 23, 1974, pp. 123-32; T. Altamirano, “From Country to City: Internal Migration,” in *Revista: Harvard Review of Latin America*, 2003, <http://www.drclas.harvard.edu/revista/articles/view/206>, accessed June 2011.

The most remarkable features of migration flows to Lima were their scale and inclusiveness. The 1961 census revealed that 16 of Peru's 24 geographical departments were losing people, almost entirely as a result of heavy migration to the capital region. The same census reported that fully 45 percent of Lima residents were migrants. Migrants hailed from the coastal region and the mountains, from villages and provincial centers.⁵⁸

Drawing definitive links between population growth and urban migration is notoriously difficult. As Paul Shaw observed in 1974, raw numbers may not be particularly revealing: "Considering only absolute levels of population relative to the land base without considering factors influencing the nature of productive activity is of little utility in understanding conditions leading to rural emigration."⁵⁹ By the same token, simply dismissing the effect of population growth on migration because its influence is contingent on intervening factors makes little sense. Evidence from Peru and the Philippines suggests that population growth had powerful economic and social ripple effects leading to high levels of urban migration.

The point here is not to claim that high rates of rural population growth, stimulated by public health improvements, were the sole or even primary reason motivating rural Peruvians and Filipinos to migrate to urban areas. The possibility of earning a better living clearly operated as a "pull" factor inducing rural residents to migrate to urban areas. However, as migration experts have observed since the 1980s, the push-pull model of migration does not capture the complexity of either lived experience or the welter of cross-cutting historical, economic, and social factors that drive migration.⁶⁰ Urban standards of

⁵⁸ Laquian, *Rural-Urban Migrants* cit., pp. 112-15.

⁵⁹ Shaw, *Land Tenure* cit., pp. 131.

⁶⁰ For a perspective that emphasizes the role of power imbalances in international migration and the role of European domination, see M. Paret and S. Gleeson, "International Migration in Macro-Stratification Perspective: Bringing Power Back In," in *Berkeley Journal of Sociology*, 50, 2006, pp. 120-46. For a critical perspective on push-pull theory from a historical perspective, see D. Massey et al., "Theories of International Migration: Review and Appraisal," in *Population and Development Review*, 19, 1993, pp. 431-66.

living were not simply appealing in some sort of abstract universe, but rather in comparison to migrants' low expectations for their rural futures. Whether they realized it or not, these expectations reflected the effect of dramatic population increases in the post-war era. When rural residents arrived in the city, they faced a series of environmental challenges, particularly with respect to water supply and sanitation.

Life in the City

Informal settlements, slums, extra-legal housing arrangements – whatever name one prefers – proliferated throughout the developing world in the second half of the twentieth century. Lima and Manila were no exception to this trend. Because Lima's development patterns were radically altered by the boom in the number and size of such settlements, it is the focus of this concluding section.

Outsiders have generally relied on sociologists and anthropologists to explain the workings of slum life. At first glance, the traditional archival approach of historians seems ill-equipped to explore the life of places that often operate outside the bounds of the law. But informal settlements are in desperate need of historicizing. Why did they crop up where and when they did? Has their character changed over time?⁶¹

Informal settlements vary across and within cultures. Life in a Rio favela run by a drug kingpin may have little in common with enormous slums in Lagos or Delhi. What they do share is timing. With a few notable exceptions, the benefits of modern medicine have spread throughout much of the world. Despite the enormous disparity in access to healthcare, most developing countries enjoyed significant increases in life expectancy from the 1940s through the 1980s. Not surprisingly, this is the same era when informal settlements became fixtures of the urban and suburban landscape in the developing world. The enormous influx of rural migrants overwhelmed the capacity of cities to provide housing, sanitation, and other services. In this sense,

⁶¹ For an anthropological perspective on Lima's *barriadas*, see C.I. Degregori, C. Blondet, and N. Lynch, *Conquistadores de un Nuevo Mundo: De Invasores a Ciudadanos en San Martín de Porres*, IEP, Lima 1986.

slums are a response to failure. But in a broader sense, informal settlements are the physical manifestation of unprecedented improvements in public health: never before in human history had hundreds of millions of people experienced such a rapid improvement in their health status. These people had to live somewhere, and in much of the developing world, they chose to live in urban areas.

The development of informal settlements in the Lima area, where they are known as *barriadas* or *pueblos jóvenes*, provides a clear example of the way in which urban residents and political authorities responded to the surge in post-war urban migration. The lack of suitable housing led many of Lima's newest residents to abandon the crowded central city in favor of riverbanks, hillsides, and desert areas on the urban fringe. Residents constructed a handful of *barriadas* before the war, but the real boom occurred in the 1950s and 1960s, when hundreds of thousands of rural residents streamed into the capital region in search of work and housing.⁶² The government funded the construction of about 5,500 new homes for these migrants, less than one percent of the estimated need, prompting migrants in urban areas throughout the country to establish *barriadas*.⁶³ By the early 1960s, an estimated 17 percent of capital-area residents lived in *barriadas*. Older settlements became saturated, forcing new arrivals to construct new *barriadas*. The enormous migration pulse of the 1960s and early 1970s, when Lima's population increased from 1.8 million to 3.3 million, recast the place of *barriadas* on the urban landscape. In less than three decades, a once-marginal feature of urban life had become absolutely central to daily existence.⁶⁴ In the early 1960s,

⁶² For a good overview of *barriada* development on Lima's periphery, see A.M. Fernández-Maldonado, "Fifty Years of *Barriadas* in Lima: Revisiting Turner and De Soto," paper presented at the International Conference on Sustainable Urban Areas, Rotterdam, Netherlands 2007, <http://www.enhr2007rotterdam.nl/pages/papersdownload.htm>, accessed July 2011.

⁶³ Laquian, *Rural-Urban Migrants* cit., p. 122.

⁶⁴ P. Avellaneda, "Lima: Cuando la Sostenibilidad No Es Sola una Cuestion Medioambiental," in *Ecología Política: Cuadernos de Debate Internacional*, 17, 1998, pp. 73-81; M. Hordijk, "Nuestra Realidad es Otra: Changing Realities in Lima's Peripheral Settlements: A Case Study from San Juan de Miraflores,"

President Prado, seeking political support from the growing number of squatter residents, took steps to legalize the property claims of existing Lima-area *barriadas*. A decade later, the government relocated a group of squatters who had invaded a plot near the city, giving them land well outside city borders. By 1984, the Villa El Salvador *barriada* had become a city on the edge of the city. Its 160,000 residents made it not only one of the country's largest informal settlements, but one of the largest population centers in all of Peru.

Half a century after *barriadas* began to creep across Lima's suburban landscape, the state of sanitation is decidedly mixed. Established squatter communities have generally developed along the lines envisioned by optimistic urban planners in the 1960s. British planner John Turner predicted that *barriadas* would pass through three main stages: incipient, developing and complete. In the first years after initial construction, residents often lived in huts, relied on candles for light, and devoted much of their time to collecting water from distant supplies. One resident of the Pampas de San Juan *barriada* recalled these difficult early days:

There was nothing when we came here, no roads, no transport, no water, nothing. It was just desert. We had to struggle for everything. In the first years we had to go to Ciudad de Dios to get our water, all the way to the Avenida de los Heroes. There just was a trail in the loose sand, that was all. I constructed a barrow with wooden wheels, you could always hear me coming with the buckets of water, bumping over the stony road, four-five kilometres up and down. We have achieved everything through our joined efforts.⁶⁵

Within two decades, most of the *barriadas* in the area enjoyed water and sewer connections. Areas where older *barriadas* dominate, such as the North Cone, have come to assume many of the characteristics of the central city. Shopping centers have proliferated in recent years, and residents enjoy legal title to their property. Many residents of these areas can recall the marches and protests they staged in the

N-Aerus XI Conference, 2010, www.n-aerus.net/web/sat/workshops/2010/pdf/PAPER_hordijk_m.pdf, accessed July 2011.

⁶⁵ Hordik, *Nuestra Realidad es Otra* cit.

1970s to secure basic services such as water. Despite the dramatic slowdown of migration beginning in the 1980s, Lima's population continued to increase due to the large number of migrants who had settled in the area over the preceding decades. This growth led to the establishment of yet more *barriadas*, which tended to be located in marginal areas. These newer settlements are home to most of the estimated one million Lima-area residents who have inadequate access to water supplies.⁶⁶

The continued low-density sprawl of *barriadas* may prove incompatible with human and ecological health. Most people associate squatter settlements with extremely high population densities; dense packing of human bodies is one of the core characteristics of slum life. *Barriadas* defy this stereotype. The vast majority consist of single-family homes. Moreover, they are scattered across a wide expanse of desert, scrubland, and mountains to Lima's north, east, and south. The government's ability to provide sanitation services to these far-flung settlements has ebbed and flowed with the economy and the activism of *barriada* residents. In 2004, the government passed a law stating that no future land invasions would be legalized. Faced with the Sisyphean task of providing services to ever-proliferating *barriadas*, the government concluded that it needed a new approach. Nonetheless, land invasions, particularly on hillsides and other areas unsuitable for permanent development, continue. As one researcher observed, "as long as the public policies do not organize viable and efficient alternatives to provide housing for the poor, the cycle of *barriadas* will reproduce in increasingly intricate and unsafe ways."⁶⁷

Authorities in the Philippines took a different approach to water and sanitation problems. For decades, Manila's publicly operated water system struggled to provide basic services to residents. Its performance was generally regarded as abysmal. Despite heavy borrowing, the system failed to serve millions of Manila residents. Less than two-thirds of households had access to piped water and only seven

⁶⁶ Maldonado, *Fifty Years of Barriadas* cit., pp. 8-17.

⁶⁷ *Ibid*, p. 17.

percent of the population had sewer connections. The public water and sewer authority disposed of raw sewage in Manila Bay, creating a severe environmental and health hazard. In 1997, the central government awarded contracts to two private concessionaires to operate Manila's water system and improve access. The experiment has been a mixed success: one operator is generally credited with expanding access to water for low-income residents, while the other has had severe difficulties maintaining basic services. Although the specific strategies adopted in the two countries to provide water and sanitation services varied, both determined that a change of course was required to address widespread service failures.⁶⁸

Making Sense of it All

Environmental and humanitarian concerns about rampant urban expansion in the developing world have secured a place on the international agenda in recent years. Although these concerns are legitimate, some historical perspective can help relieve the worst dystopian nightmares. Human populations expanded at an unprecedented rate in the second half of the twentieth century. In Peru, the Philippines, and much of the developing world, birth rates have declined precipitously in recent decades. These countries are well on their way to the final stage of the demographic transition. Future population increases will be a product of "demographic momentum," as large cohorts of young people enter their reproductive years.

Urban residents who confront daily environmental challenges, such as the lack of a toilet and poor access to water supplies, can take little solace in knowing that their predicament is due in part to the tremendous advances in healthcare and associated increases in life expectancy enjoyed by their parents and grandparents. Im-

⁶⁸ "Manila, Philippines, Water/Wastewater Improvements (Water/Wastewater)," from United Nations Development Programme website, <http://www.ncppp.org/undp/manila.html>, accessed 2011; A. Innocencio, "Serving the Urban Poor through Public-Private Community Partnerships in Water Supply," in *Philippine Institute for Development Studies Policy Notes*, 2001, pp. 1-8.

proved health led to high levels of population growth, which in turn prompted millions of rural residents to seek better lives in places like Lima and Manila. The failure of countries like the Philippines and Peru to provide high-quality sanitation services to all urban residents is a result of financial, managerial, and political challenges compounded by skyrocketing urban population growth. To cite just one example, prior to privatizing its water system, Manila's public utility had four times as many employees per 1,000 water connections as comparable countries. Decades of patronage undermined efforts to improve water and sewerage services.⁶⁹

The backdrop to these failures, and what ultimately gave them such potency, was the tremendous expansion in urban populations. Millions of people, many who would not have been alive without the rapid diffusion of medical advances in the post-war period, sought the equally rapid expansion of sanitation services. In developing cities throughout the world, sanitation infrastructure failed to keep pace with societal needs. Sprawling growth and incredible concentration of population in the Lima and Manila areas posed particularly difficult challenges for government planners.

Of course, rapid urbanization is not confined to Asia or Latin America. Africa has experienced a wave of urbanization in recent decades and, according to United Nations estimates, is expected to be a majority-urban continent by 2035. But urbanization there differs in important ways from what has transpired in much of Asia or Latin America. As demographer Barney Cohen observed, “[m]any cities in Africa are marginalized in the new global economy. African cities are growing often in spite of poor macroeconomic performance and without significant direct foreign investment, making it next to impossible for urban authorities to provide adequate basic infrastructure or essential services.”⁷⁰

⁶⁹ United Nations Development Programme, “Manila, Philippines, Water/Wastewater Improvements” cit.

⁷⁰ B. Cohen, “Urbanization in Developing Countries: Current Trends, Future Projections, and Key Challenges for Sustainability,” in *Technology in Society*, 28, 2006, pp. 70-72.

Case studies of African urbanization support Cohen's pessimistic outlook. An important study of informal settlements in Nairobi concluded that mortality rates exceed those of Kenya's rural residents. Researchers identified low levels of vaccination, high rates of malnutrition, and poor access to health care as the primary culprits. They speculated that Africa's urban future "would turn into a curse if the prevailing urbanization decay characterized by poor governance and planning, poor infrastructure and basic amenities, growing poverty, and deteriorating health outcomes are not compellingly and sustainably addressed."⁷¹

These challenges are by no means limited to Africa. In recent decades, many researchers have begun to complicate the conventional wisdom that urban residents are, on balance, healthier than their rural counterparts. This generalization, they note, obscures the perilous sanitary conditions common in the informal settlements where most recent migrants reside. The poor in urban areas appear no better off than those who elected to remain in the countryside. These analysts have identified a "double burden" facing recent migrants. In addition to overcoming the respiratory and diarrheal diseases that threaten rural and urban residents alike, they must contend with poor housing, automobile accidents, and industrial pollution.⁷² Urban development expert David Satterthwaite even concluded that "where local government is incompetent, incapable and unwilling to work with those living in informal settlements (and this is the reality for a very large section of the world's urban population), there may well be an urban health penalty. Without effective local governance, concentrating people, enterprises, motor vehicles and all their wastes produces very unhealthy conditions."⁷³

⁷¹ E.M. Zulu et al., "Overview of Migration, Poverty and Health Dynamics in Nairobi City's Slum Settlements," in *Journal of Urban Health*, 88, Supplement 2, pp. 185-99.

⁷² A.J. McMichael, "The Urban Environment and Health in a World of Increasing Globalization: Issues for Developing Countries," in *Bulletin of the World Health Organization*, 78, 2000, pp. 1117-26.

⁷³ D. Satterthwaite, "Why is Urban Health so Poor Even in Many Successful Cities?," in *Environment and Urbanization*, 23, 2011, pp. 5-11.

Other researchers have arrived at more nuanced conclusions. In a 1994 study, migration expert Martin Bockerhoff analyzed health results among migrants from more than 15 developing countries. He concluded that in almost every case, child migrants to cities enjoy better long-term health prospects than if they had remained at home. However, he cautioned, in the first two years after migrating to the city children face significantly greater health risks than either rural children or other urban youngsters. Factors such as suspension of breastfeeding and exposure to new infectious disease agents explain why “rural-urban migration in developing countries clearly results in a dramatic short-term increase in children’s likelihood of dying.”⁷⁴

These are important caveats, and, given the scale of urban migration, demand concerted attention from government officials. Nonetheless, there are ample reasons for hope in many parts of the developing world. As population expert Tim Dyson has observed, urbanization triggered by the reduction in death rates may provide the tools required to remedy the problems it created. He argues that “urbanisation leads inevitably to a more complex society, *inter alia* with greater occupational specialisation, greater reliance upon systems of exchange, and the growth of other institutions which provide a measure of integration and coordination. Urbanisation focuses attention on the distribution of political power in society, so helping to bring about the rise of modern democracy.”⁷⁵ The successful campaigns by Lima’s *barriada* residents to obtain reliable water supplies and the willingness of squatters in Manila to pay for water when it is provided on reasonable terms suggest that Dyson is right. The growing pains associated with rapid urbanization are severe and, in

⁷⁴ M. Bockerhoff, “The Impact of Rural-Urban Migration on Child Survival,” in *Health Transition Review*, 4, 1994, p. 141.

⁷⁵ Dyson, *A Partial Theory* cit., p. 83. Of course, non-democratic regimes have also encouraged urbanization. Urbanization by no means guarantees democracy, but, as the events of the Arab Spring demonstrate, it can effectively channel discontent, putting enormous pressure on unpopular regimes.

some cases, deadly. But in many neighborhoods throughout Lima and Manila these pains have begun to subside.