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Guest Editorial: "Spatializing Demography for the Urban Future"

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Today's demographic methods inherit traditions from an era when far less than half of the world's population lived in cities and towns. Now that the world's population as a whole has become more urban than rural, it is an opportune moment to ask whether these methods and the concepts that have informed them would benefit from a reappraisal. To ensure that demographic thinking continues to add value in the upcoming urban era, we should ask: What features of urban context and demographic behavior are distinctive from rural? In what way do the multiple spaces of urban life—its neighborhoods, the social networks that traverse neighborhoods, the connections and flows that reach across cities and link to rural areas, the multiple levels and units of government, and the highly diverse private sector of the urban economy—need to be considered in fashioning new methodological and conceptual tools? In the high-income West, one can draw insight from a venerable tradition of detailed sociological, geographic, and economic analysis of cities. But it remains surprising how limited to high-income settings this "Chicago School" of analysis has been, and how seldom its theoretical apparatus has been trained on the cities and towns of poor countries. Furthermore, to rely on methods that for the most part treat the wide variety of cities and towns as if they are all

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alike—that is, simply an 'urban' dichotomy—denies the complex reality of today's urban world and leaves us ill-prepared to understand the urban future.

This volume—which has been a decade in the making—gives special consideration to urban spaces. The work presented here evolved from a small workshop, "Rethinking the Estimation and Projection of Urban and City Population", that took place at Columbia University in 2006.[1] To our knowledge, this was the first meeting (http://archive.iussp.org/Activities/wgc-urb/urb-agenda06.php) to bring demographic methodologists and remote sensing specialists together in the search for common ground in the study of urbanization in poor countries.

The premise of that 2006 meeting, and of this volume, is simple: What is underway is a fundamental reshaping of patterns of human settlement across much of the globe. The United Nations Population Division forecasts that over the next 30–40 years, the Earth's population will grow by more than two billion persons, the vast majority of whom (over 90 %) will be added to the cities and towns of poor, developing countries (UN 2014), predominantly in Asia and Africa. This urban transformation can be expected to alter the terms upon which the human and natural environments interact, whether in the ecosystems with which urban areas are linked, in the extent and nature of air pollution, in the consumption of fuels and other non-renewable sources of energy, or in human vulnerability to hazards.

As social scientists prepare their methods and data sources for an urban future, they must grapple with gross deficiencies in basic information about the dimensions of urban populations, particularly in poor countries. In light of these challenges, social scientists will certainly need to rework their non-spatial methods and modes of data collection (Montgomery and Balk 2011). Critical data, especially on internal migration, are still sadly lacking (Chandrasekhar and Sharma 2015). Long-standing methods for forecasting urban populations are now widely acknowledged to be flawed, producing systematic biases in projections of the urban future (Bocquier 2015).

Social scientists—economists, demographers, sociologists, geographers, political scientists, and public health analysts—cannot pursue core research questions without data on the spatial features of urban settlements. Yet at present, there is no systematic program underway in the social sciences whereby spatial information on urbanization is gathered (Buettner 2015). In many poor countries—especially in Africa, low-income Asia, and parts of the Americas—conventional methods of data collection do not even delineate the spatial extents of large cities, leaving planners without the spatially disaggregated data they need to anticipate urban growth, and leaving social scientists without adequate sampling frames for surveying growing populations living in poor, underserved, and rapidly expanding neighborhoods (Montana et al. 2016). A National Research Council study (2003) report argued more than a decade ago that central scientific and policy questions will go unanswered until urban research can be firmly embedded within a spatial context. That challenge remains with us today.

Because national statistical agencies vary considerably in their abilities to collect geographically-coded data, remote sensing approaches are today the most

[1] The workshop was hosted by Columbia University's Center for International Earth Science Information Network, and its NASA-funded Socioeconomic Data and Application Center. Funding for that workshop was provided by the International Union for the Scientific Study of Population and an NSF-Advance Award to Columbia University, and the United Nations Population Division.

systematic means for assembling much of the needed spatial information. While surveys, censuses, and other conventional methods will remain essential for the forseeable future, the value of these methods is much enhanced when they can be combined with remotely sensed urban data. There is growing recognition of the scientific potential. Physical scientists working with satellite information on urban areas are becoming increasingly concerned with the societal implications of urban changes being monitored by their instruments. Satellite-derived information about urban areas provides a platform for fruitful interdisciplinary collaboration among social and Earth scientists working on urban issues (Small 2016).

In addition to producing papers for this volume, the 2006 meeting was successful in encouraging new collaborations among social and Earth scientists. The joint efforts that were stimulated by the meeting stand out for their imaginative combination of a variety of satellite data and demographic data, and are also noteworthy for producing research results in a variety of applied outlets (for example, McGranahan et al. 2007; Nghiem et al. 2009; Jacobson et al. 2015; Martine et al. 2008, 2009). The meeting also influenced the National Research Council, which at the time was undertaking the 2007 Decadal Survey for Earth Science Application (NRC 2007, pp. 68–69). With increased importance on understanding urbanization, new satellite products and derived data continue to be produced, such as the VIIRS (http://viirsland.gsfc.nasa.gov/index.html) and GHSL (http://ghslsys.jrc.ec.europa.eu/) projects. Exciting new developments such as these will substantially enhance our spatial understanding of urban change and its determinants and consequences. The related challenge for readers of this volume is to make sure that social, behavioral and health sciences are keeping pace.

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