11-15-2022

The Urban Century

Deborah Balk

Recommended Citation

Balk, Deborah. "The Urban Century." In *The World at 8 Billion*, edited by Raya Muttarak and Joshua Wilde, 5–9. New York: Population Council, 2022.

The Urban Century

Deborah Balk

As the planet reaches 8 billion people, we expect that the future population of the world will be older and more urban, and the overwhelming share of population growth will take place in the cities and town of Asia, Africa, and Latin America (UN, 2019, NRC 2003). Concurrent with this demographic future, we can expect a warmer planet, one with more frequent and intense storms and more flooding as well as sea-level rise, drought, and wildfires (IPCC, 2022a). Cities are important in part because their compactness offers critical opportunities in the mitigation of climate change (IPCC, 2022b), but also because their locations place their residents at disproportionate risk of exposure to climate change hazards (Dodman et al., 2022). For example, whereas 1 out of every 10 people globally lives in a low-lying zone proximate to seacoast, 1 in 7 urban resident lives in this zone (McGranahan et al., 2007).

What does it mean to be more urban? In Asia, Africa, and Latin America, it means many people will live in megacities (with populations greater than 10 million), and some of those cities will also be located in ecologically vulnerable areas such as low-lying coastal zones (MacManus et al. 2021), and in particular in Asia, in deltaic areas (McGranahan et al., in review) at very high risk of flooding and other seaward hazards. Other parts of Asia will see its cities facing future water shortages (McDonald et al. 2011). Elsewhere (notably, Europe and North America) urban growth is occurring in areas proximate to well-established urban centers but also in between these locations in areas classified with a range of terms including, suburbs, peri- and ex-urban areas (Lerch 2022, Leyk et al., 2021, Balk et al., 2021, Golding and Winkler, 2020), perhaps challenging climate mitigation efforts and lying beyond the scope of larger city adaptation plans (Hogan and Ojima, 2008, Masson et al., 2014).

The demographic study of urbanization has focused on national-level (or subnational-level) trends and processes, and, while important, that approach is inadequate for understanding the heterogeneity and inherent complexity of populations living in urban areas at a range of spatial scales (Montgomery and Balk, 2011). It is now well accepted that urban processes are not easily classified by a simple dichotomy, and much new work that combines population and settlement data (largely derived from Earth observing satellites)

Deborah Balk, CUNY Institute for Demographic Research and Marxe School of Public and International Affairs, Baruch College, City University of New York (CUNY).

https://doi.org/10.31899/pdr2022.1003

helps to bring the classification along a continuum into focus (Dijkstra et al., 2021, Dorelien et al., 2013). Such new classifications should be seen as an opportunity to engage in an important discourse: what does it mean to be urban from a range of disciplinary and spatial and temporal perspectives? Globally consistent measures are important as are locally informed ones (Balk et al., 2021) not only for understanding current patterns but for preparing for the future, particularly with respect to climate change (Balk et al., 2022, Jiang and O'Neill, 2017, Zoraghein and O'Neill, 2020).

In the urban century, we will need to understand the growth (or decline) of cities as well as national-level urbanization trends. While a careful assessment of the relative contributions of fertility and migration (and mortality) – the basic processes of demographic change – to city growth remains largely unanswered, some research has shown that fertility can be expected to significantly influence city growth (Balk et al. 2009). Similarly, cities have a long history of receiving and sending, and benefitting from, international and domestic migrants. But in a departure from the last century, future migration is likely to be between urban areas, not from rural to urban areas, though measures of internal migration do not currently allow for a clear assessment of such patterns (Bell et al., 2015). Cities are remarkably dynamic and diverse demographically (e.g., in fertility, mortality, and migration status by race, ethnicity, or place of origin but also in marital patterns and living arrangements) and socioeconomically (e.g., education, poverty status, wealth, employment type), and with this diversity comes inequality and associated vulnerabilities. While cities are comparably young (especially in comparison to rural areas), the population of cities is also aging, compounding risks expected with future climate change (e.g., Molinsky and Forsyth 2022). In order to understand city growth and the demographic and socioeconomic well-being of the cities of tomorrow, we need a data infrastructure that matches the dynamism of cities (Montgomery 2008).

Cities are intrinsically spatial, but demographic studies of urbanization tend to treat cities and urban growth in a spatial vacuum, leaving important questions about the form of population change (e.g., whether it occurs vertically or horizontally; as "infill" or the edges of cities) and the demographic heterogeneity of that change (e.g., whether that growth occurs disproportionately to the those living in slums or substandard housing) largely unanswered (Montgomery and Balk 2011). These answers are important because the form of urban growth has implications for both sustainability and climate mitigation and adaptation (e.g., Solecki et al., 2015, Dodman et al., 2022). Furthermore, engagement and representation in adaptation plans is not uniform across or within cities; given that the urban poor and residents of informal settlements, in particular, have been identified as particularly vulnerable to climate change impacts (Satterthwaite et al., 2020, Hardoy and

Lankao, 2011), understanding changes in demographic characteristics and socioeconomic conditions in spatial terms will become even more important.

The 21st century is the urban century. Therefore, it needs an evidence base fit for it: the statistical infrastructure needs to be able to observe all-urban *and* within- and between-city demographic and social patterns and trends. Importantly, it must be able to contribute to an understanding of those trends in spatial terms so that scientists, policy makers, and city residents can adapt to the stormier and hotter reality of the coming decades. Envisioning, projecting, planning for, and understanding our urban future will require interdisciplinary approaches and scientific-community engagement (Hamstead et al, 2021, Balk et al., 2022, Keller and Limaye, 2020), a proposition that I invite readers to embrace wholeheartedly.

References

Balk, D., D. Tagtachian, L. Jiang, P. J. Marcotullio, E. Cook, B. Jones, A. Mustafa and T. McPhearson, 2022. "Frameworks to envision equitable urban futures in a changing climate: a multi-level, multidisciplinary case study of New York City," Frontiers in the Built Environment – *Urban Science* vol. 8: 949433, https://doi.org/10.3389/fbuil.2022.949433.

Balk, D., S. Leyk, M.R. Montgomery, and H. Engin, 2021. "Global harmonization of urbanization measures: Proceed with care," *Remote Sensing* 13(24), 4973; https://doi.org/10.3390/rs13244973

Balk, D., Montgomery, M.R., McGranahan, G., Kim, D., Mara, V., Todd, M., Buettner, T. and Dorélien, A., 2009. Mapping urban settlements and the risks of climate change in Africa, Asia and South America. *Population dynamics and climate change*, 80, p.103.

Bell, M., Charles-Edwards, E., Ueffing, P., Stillwell, J., Kupiszewski, M. and Kupiszewska, D., 2015. Internal migration and development: Comparing migration intensities around the world. *Population and Development Review*, 41(1), pp.33-58.

Dodman, D., B. Hayward, M. Pelling, V. Castan Broto, W. Chow, E. Chu, R. Dawson, L. Khirfan, T. McPhearson, A. Prakash, Y. Zheng, and G. Ziervogel, 2022: Cities, Settlements and Key Infrastructure. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 907–1040, doi:10.1017/9781009325844.008.

Dorélien, A., Balk, D. and Todd, M., 2013. What is urban? Comparing a satellite view with the demographic and health surveys. *Population and Development Review*, 39(3), pp.413-439.

Dijkstra, L., Florczyk, A.J., Freire, S., Kemper, T., Melchiorri, M., Pesaresi, M. and Schiavina, M., 2021. Applying the degree of urbanisation to the globe: A new harmonised definition reveals a different picture of global urbanisation. *Journal of Urban Economics*, 125, p.103312.

Golding, S.A. and Winkler, R.L., 2020. Tracking urbanization and exurbs: Migration across the rural–urban continuum, 1990–2016. *Population research and policy review*, 39(5), pp.835-859.

Hamstead, Z.A., Iwaniec, D.M., McPhearson, T., Berbés-Blázquez, M., Cook, E.M. and Muñoz-Erickson, T.A., 2021. Resilient urban futures. Springer Nature.

Hardoy, J. and Lankao, P.R., 2011. Latin American cities and climate change: challenges and options to mitigation and adaptation responses. *Current Opinion in Environmental Sustainability*, 3(3), pp.158-163.

IPCC, 2022a. Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig,S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001

IPCC, 2022b. Summary for Policymakers. In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.001

Hogan, D.J. and Ojima, R., 2008. Urban sprawl: A challenge for sustainability. The new global frontier: urbanization, poverty and environment in the 21st century, pp.203-216.

Jiang, L., and O'Neill, B. C., 2017. Global urbanization projections for the shared socioeconomic pathways. *Global Environmental Change* 42, 193–199. doi:10.1016/j. gloenvcha.2015.03.008

Keller, A.B. and Limaye, V.S., 2020. Engaged science: strategies, opportunities and benefits. *Sustainability*, 12(19), p.7854.

Lerch, M. 2022. The end of urban sprawl? Internal migration across the rural-urban continuum in Switzerland, 1966–2018. *Population, Space and Place,* e2621. https://doi.org/10.1002/psp.2621

Leyk, S., Balk, D., Jones, B., Montgomery, M.R. and Engin, H., 2019. The heterogeneity and change in the urban structure of metropolitan areas in the United States, 1990–2010. Scientific data, 6(1), pp.1-15.

McDonald, R.I., Green, P., Balk, D., Fekete, B.M., Revenga, C., Todd, M. and Montgomery, M., 2011. Urban growth, climate change, and freshwater availability. *Proceedings of the National Academy of Sciences*, 108(15), pp.6312-6317.

MacManus, K., Balk, D., Engin, H., McGranahan, G., and Inman, R. 2021. Estimating population and urban areas at risk of coastal hazards, 1990–2015: How data choices matter. *Earth System Science Data* 13 (12), 5747–5801. doi:10.5194/essd-13-5747-2021

Masson, V., Marchadier, C., Adolphe, L., Aguejdad, R., Avner, P., Bonhomme, M., Bretagne, G., Briottet, X., Bueno, B., De Munck, C. and Doukari, O., 2014. Adapting cities to climate change: A systemic modelling approach. *Urban Climate*, 10, pp.407-429.

McGranahan, G., Balk, D. and Anderson, B., 2007. The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones. *Environment and urbanization*, 19(1), pp.17-37.

Molinsky J. & A. Forsyth, 2022: Climate Change, Aging, and Well-being: How Residential Setting Matters, *Housing Policy Debate*, doi:10.1080/10511482.2022.2109711

Montgomery, M.R., 2008. The urban transformation of the developing world. *Science*, 319(5864), pp.761-764.

Montgomery, M.R. and Balk, D., 2011. The urban transition in developing countries: Demography meets geography. Global urbanization, Wachter and Birch (eds), University of Pennsylvania: pp.89-109.

National Research Council. 2003. Cities Transformed: Demographic Change and its Implications in the Developing World. Panel on Urban Population Dynamics, M.R. Montgomery, R. Stren, B. Cohen, and H.E. Reed, eds., Committee on Population, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press

Rohat, G., Wilhelmi, O., Flacke, J., Monaghan, A., Gao, J., Dao, H. and van Maarseveen, M., 2019. Characterizing the role of socioeconomic pathways in shaping future urban heat-related challenges. *Science of the total environment*, 695, p.133941.

Satterthwaite, D., D. Archer, S. Colenbrander, D. Dodman, J. Hardoy, D. Mitlin, S. Patel, 2020. Building Resilience to Climate Change in Informal Settlements, *One Earth*, Volume 2, Issue 2, Pages 143-156, https://doi.org/10.1016/j.oneear.2020.02.002.

Solecki, W., Seto, K.C., Balk, D., Bigio, A., Boone, C.G., Creutzig, F., Fragkias, M., Lwasa, S., Marcotullio, P., Romero-Lankao, P. and Zwickel, T., 2015. A conceptual framework for an urban areas typology to integrate climate change mitigation and adaptation. *Urban Climate*, 14, pp.116-137.

United Nations (2019). World Urbanization Prospects: 2018 Revision. UN DESA.

Zoraghein, H., and O'Neill, B. C. 2020. A spatial population downscaling model for integrated human-environment analysis in the United States. *Demographic Research*. 43, 1483–1526. doi:10.4054/demres.2020.43.54