The Demographic Burden of Population Decline in U.S. Cities, 2000–2010

Although population growth at the national level continues unabated, many areas of the United States face recent or ongoing population decline, with no immediate prospect of a demographic turnaround. Between 2000 and 2010, 35 percent of U.S. counties, both urban and rural and in all regions of the country, experienced population loss. Where cities are concerned, 18 percent of those with a population 100,000 or more in 2010 lost population during the same period. This is a substantial number of cities and a substantial number of inhabitants who are affected. This paper goes beyond superficial measures of decline that equate magnitude of loss to actual impacts by focusing on inhabitants rather than areas: who and how many are affected by population loss and how is this different from the characteristics of those living in non-shrinking locations? A secondary goal of the paper is to explore whether some demographic groups are more likely than others to be embedded within multiple spatial layers of population loss (i.e. tract, city, and metropolitan area). To accomplish these aims, which may be thought of as an effort to estimate the demographic burden of population decline (i.e. who bears the brunt of population loss as it occurs across multiple spatial scales), this paper assesses not only the macro-level demographic characteristics of cities losing population, compared to those that are growing, but also the characteristics of those living in the sub-areas driving the population loss.

It is important to note that this paper does not purport to draw conclusions regarding the underlying demographic processes that lead to population loss within census tracts or cities. In fact, population loss and the characteristics of those located in the area at the end of the period are most likely connected. This paper emphasizes rather the connection between the changes "on the ground" that occur with depopulation (e.g. school closings, vacant properties, or possibly fewer retail opportunities) and the characteristics of those who live in those areas—some groups are therefore more *exposed* to the effects of population loss. Moreover, the paper hypothesizes that living in a growing neighborhood, albeit within a shrinking city or metropolitan area, is likely different than living in a neighborhood that is doubly or triply jeopardized by population loss. The question is whether some groups are more likely than others to live in these areas.

Sample and Data Employed

The sample for this paper is U.S. cities with populations 100,000 or greater in 2010, along with their companion metropolitan areas, which are composed of central and outlying counties. Census tracts within these cities/metropolitan areas are employed as a proxy for neighborhoods. The study period is 2000–2010. Harmonized tract population data for 2000 and 2010 were released as a special tabulation by the U.S. Census Bureau and city and county data for the two periods are accessed via the Bureau's website. The same is true for demographic characteristics in 2010 at the tract level; these come from 5-year American Community Survey estimates.

Research Questions and Methodology

The demographic burden of population decline is evaluated in two stages. First, the number of individuals in 2010 living in each city is calculated and a basic demographic profile of each type of area—growing or shrinking—is constructed, including measures that capture age structure, racial/ethnic population composition, and income. Second, the issue of community-level exposure to decline is introduced, with the aim of capturing who is living in declining neighborhoods—and how their characteristics compare to

those living in declining areas in growing cities and how they differ from those living in neighborhoods in the same locations that are not declining.

Although the areal extent of population decline within urban areas is important and is discussed briefly in the opening sections of the paper, the main portion of the analysis focuses on the number and characteristics of the individuals exposed to population decline in different areas and at multiple spatial scales. The areal aspect of decline is undeniably important for maintaining effective service delivery or infrastructure, but its effects may be compounded if those living in shrinking areas come from potentially marginalized or vulnerable populations. The main question to be answered here is: do age, population composition, and poverty levels at the city and tract scales differ depending on whether a city/tract is growing or shrinking? What is the demographic profile of those living in shrinking cities and tracts? The characteristics of those individuals living in areas affected by decline at multiple spatial scales (e.g. declining tract, city, and metropolitan area) are also explicitly considered.

Data for 2010 census tracts are integrated with 2000-2010 tract-level change data and data at the city and metropolitan level. From that a spatial hierarchy of exposure to decline is constructed for individuals in census tracts—where decline is captured at the tract, city, and metropolitan area levels. Paired with the demographic and socio-economic characteristics listed above, this analysis shows who bears the burden of decline across multiple levels of geography.

The analysis calculates the share of city and metropolitan populations living in a declining neighborhood and their characteristics. These figures are then compared to the characteristics of those living in growing neighborhoods in the same area to capture disparities in who is most impacted by decline. The analysis produces statistics by type of place, extent of decline, and type of individual but also characteristics of individual cities and metropolitan areas (e.g. The average elderly person in City X lives in a neighborhood that is growing or shrinking).

Background Literature

Existing research on population loss in urban areas is strongest where planning is concerned. As the brief literature survey below demonstrates, less is known about the demographic sources and impacts of urban population decline—although guidance for appropriate research questions can be found in a variety of related research areas. The impacts of population decline are myriad: an aging of the population, shrinking tax base, loss of sense of community, difficulty attracting outside investment, and mismatch between service needs and available infrastructure (see e.g. Hummel and Lux, 2007; Reher, 2007; Beauregard, 2009; Coleman and Rowthorn, 2011). All of these are hypothesized to operate at multiple spatial scales: the neighborhood, as well as the larger city and metropolitan area. Population decline (and growth, naturally) is uneven across space, and it occurs sometimes in specific pockets and sometimes covering broad regions. Even within a growing or shrinking city, some neighborhoods will grow while others lose population. Moreover, given the uneven spatial distribution of different populations—racial, ethnic, or age groups, for example—some sub-populations will be more exposed than others to the impacts of population decline. It is this last point that this paper addresses.

In general, the demographic literature on population loss has tended to be either national or local/regional in scale and outlook. As Coleman and Rowthorn (2011) note, decline at the national level can be tied to

issues of national self-worth and in terms of impacts is most closely associated with aging of the population, economic activity and productivity, and national defense priorities. On the local and regional side, research has focused on either rural or non-metropolitan counties (e.g., Johnson and Purdy, 1980) or cities (e.g. Beauregard 2009; Rieniets, 2009; or Short and Mussman, 2014). Where shrinking cities are concerned, the planning literature is burgeoning (e.g. Hollander and Nèmeth, 2011), but with little explicit demographic analysis; outmigration or changing population distribution and composition are stated as facts and are not topics of investigation unto themselves.

The Unites States has arguably been slow to devote research and policy effort to the issue of population loss simply because it has not had to: the country continues to experience robust overall growth, almost 10 percent between 2000 and 2010, and no need for a national-level policy response has arisen. Within the field of urban planning, however, and at the individual city level, a great deal of knowledge and research has accumulated. One way of thinking about urban planning policy responses to population decline is to divide them into two broad categories: those that seek to slow the trend and those that seek to adapt to it. On the former side are those policies, such as Kansas's tax break for in-migrants (Cooper, 2011), intended to halt or reverse decline (Savitch, 2011). On the adaptation side are policies, conceived and implemented primarily at the individual city level, often referred to as "right-sizing," "smart shrinkage," or "smart decline" (Schilling and Logan, 2008; Hollander, 2011; Hollander and Nèmeth, 2011). These strategies aim to maintain or improve quality of life and administration of the city through matching the scale of the built environment and infrastructure to the current and anticipated population size. As noted above, a common weakness throughout this literature is its failure to incorporate a demographic component into what is essentially a demographic issue.

Finally, another important body of knowledge for the purposes of the present analysis is the literature on county-level population distribution and composition. Taken as an ensemble, this literature studies how population distribution trends vary over time (Johnson and Purdy, 1980; Johnson and Beale, 1994; Fuguitt and Beale, 1996; Johnson, Nucci, and Long, 2005), leading not only to population loss in some areas, but also changing population composition in terms of age and race/ethnicity (Johnson and Lichter, 2008, 2010; Franklin, 2014). Moreover, the changing concentration of population across different spatial scales over time documented by Long and Nucci (1997) is the result not only of regional shifts in internal migration flows but also, of course, regional variations in births and deaths (Rogerson and Plane, 2013).

Expected Results

This paper offers a new perspective on the subject of urban population loss, shifting the emphasis away from planning-related solutions and towards a fuller recognition of the importance of both geography and demography in understanding *who* is affected by population loss. The analysis generates city-specific findings but also contributes new knowledge regarding the phenomenon of urban population decline: its existence at multiple spatial levels and the sub-populations most affected.

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