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PAA Submission
Abstract (extended): "Aging and City Decline: Urban aging and city depopulation of large U.S. metropolitan areas from 1970-2010"

Introduction

With the release of the Census 2010 data earlier this year, shrinking cities have recaptured public attention. Chicago, Detroit, Pittsburgh, and other cities have all lost population over the last decade. Indeed, this particular demographic trend of cities is not new and has unevenly affected cities across the U.S. for at least the last fifty to sixty years. Furthermore, around this time period, the U.S. (and world) population had begun to age rapidly. In his book *Shock of Gray,* Ted Fishman says: "Advances in education, public health, urban living, human rights, and the vanquishing of infectious disease are, taken together, the main ingredients in the modern potion that foils early death and gives us the joys and sorrows of longer lives" (pp 67). In 2007, the World Health Organization noted, "Population aging and urbanization are the culmination of successful human development during the last century" (qtd in Fishman 2010, pp 73). So interestingly enough, we notice simultaneous trends of urbanizing (via processes such as rural-urban migration) and steadily increasing life expectancies (through lowering mortality rates from healthcare advances).

In this paper, I explore what scholars mean when they say a city is "declining" with specific attention given to the population characteristic of aging. In general terms, a city starts to decline when it decreases in population or economy or when its infrastructure begins deteriorating. The specificities of *how* urban decline occurs vary though. Moreover, the changes in mortality a population undergoes as it modernizes can be described as an epidemiological transition since the main causes of death change over time, while the collection of mortality and fertility changes a population experiences as it modernizes can be described more generally as a demographic transition. Since the types of medical and health advances that lead to lower mortality tend to originate in cities, it makes sense to hypothesize that the demographic patterns occurring within urban areas could portend the future direction of the general population, Therefore, I focus on how aging is affecting particular metro areas.

Background

City Decline

The notion of urban decline has encapsulated the dialogue surrounding the general trend of U.S. cities in the past half-century. Indeed, from 1950 to 1990, the total population in central cities in the U.S. declined by 17 percent while total metropolitan population grew by 72 percent (Baum-Snow 2007a). This demographic shift from the urban to the suburban is known as "suburbanization" and is widely regarded as greatly influencing the recent trends in central city decline. In addition to central city depopulation, urban decline can also be defined in terms of deindustrialization and changing structures of local government (Clark 1989). Furthermore, the relative age of a city could be attributable to where a city falls in the decline-growth spectrum; that is, older cities may bear more cost than newer cities from negative externalities such as urban poverty (Glaeser 1998) or experience larger losses of household units compared to newer cities (Goodman 2005).

Suburbanization describes the process of people moving away from an urban core to the surrounding suburban areas. While some literature describes suburbanization in accordance with the advent of the automobile (Jackson 1987; von Hoffman and Felkner 2006), Nathaniel Baum-Snow argues that the creation of the interstate highway system in the 1950s helped aid suburbanization, and he puts forth a model and uses empirical data to show that a highway passing through a central city could reduce the central city population anywhere from 10 to 18 percent (2007a; 2007b). Suburbanization

literature also points to housing issues as a reason for the city-decentralizing trend. Gyourko and Voith examined how U.S. housing-related tax expenditures created incentives for people to become homeowners in the suburbs (1997). In a large-scale study of 351 U.S. cities, Goodman noted different housing unit trends for different cities. While cities like Boston or New York saw an increase or stagnation of the number of housing units, declining cities like Cleveland, Detroit, and Pittsburgh lost large numbers of housing units from 1970 to 2000 (Goodman 2005).

Another explanation for city decline rests in economic trends. Bunce and Neal found that although a lot of major economic and demographic changes tended to cluster in large declining cities in the Northeast and Midwest, the primary determinants of urban economic decline changes were national or regional trends (1984). At the same time, however, it must be noted that due to generally increasing personal incomes of city dwellers in U.S. combined with the advent of the automobile, people have increasingly wanted to purchase cars in order to live in larger houses further from the city center (Cox, Gorder, and Redfeam 2008). Indeed, urban spatial theory notes that as the distance from the city center increases, people are willing to trade-off the higher commuting costs that come with living further away for larger lot sizes and potentially-lower rent cost.

City policymakers, of course, want to try to alleviate urban decline, but their policies or the local political dynamics are sometimes the drivers of city decline themselves. In a British example, David Clark argues that the 1985 abolition of metropolitan County Councils led to the downward trend of city decline due to the resulting disunity of regional governance (1989). Contrastingly, Richard Voith offered a possible solution for U.S. central city decline through transforming cities to smaller autonomous communities (1996). Whatever the case is concerning local politics, it is quite evident that there are numerous effects of urban policies on city decline due to the complexity of policy dynamics at play (Woodlief 1998).

Demographic Transition Theory

Looking at the politics from a slightly different perspective, a steadily aging population could have profound effects on a city's direction as well. Yasuo Takao notes that for Japan—the oldest nation in the world—population aging will affect socioeconomic and political issues for the country's future since an aging population will use resources differently than other age cohorts (2009). In East Central European cities, Annett Steinführer and Annegret Haase collectively call the trends of aging, lowering fertility, and diversified household structures the Second Demographic Transition[1], a trend they also say will have significant implications for these urban areas (2007).

Returning to the fundamental changes in the basic demographic variables that lead to population aging, mortality rates decrease with healthcare advances as a population goes through an epidemiological transition where the main causes of death change over time. Initially, an "age of pestilence and famine" reigns when infectious diseases kill most people. With improvements in basic health, there comes a stage of "receding pandemics," followed by an "age of degenerative and man-made diseases" as chronic diseases start to overcome communicative diseases as the main causes of death. With advances in medicine and medical technology, most developed populations are now in an "age of delayed degenerative disease," where chronic diseases are simply "pushed off" for later (Olshansky 2011). This epidemiological evolution describes how mortality rates decrease as related to increasing individual life expectancies. And with increasing survivability rates, people tend to want to have fewer children on average for a variety of reasons. This conscious choice over fertility represents one of the predominant drivers of the Second Demographic Transition where fertility rates start to dip below replacement level as people choose to have fewer children and have more reproductive control themselves (through reproductive knowledge, birth control pills, condoms, etc.). Lowered mortality

[1] The Second Demographic Transition was actually first coined by R. Lesthaeghe and D. J. van de Kaa in 1986.

rates and decreasing fertility rates taken collectively lead to population aging via longer-living people and larger proportions of people in older-age cohorts. And with these types of forces behind population aging, we can start to see demographic trends like decreases in population numbers not only in countries (e.g., Japan and Italy) but also in cities (e.g., Detroit, Pittsburgh, and Cleveland).

The literature on city decline tends to focus on the city itself (e.g., urban policy dynamics) or how metropolitan-level processes affect the central city (e.g., suburbanization). However, a paraphrasing by John S. Adams of Jane Jacobs explains this issue well: "the national economy [can be] understood as an aggregation of urban-centered regional economies competing with one another as they develop and attract resources […] while putting local resources to productive uses" (Adams 2008). Therefore, although it is no doubt quite interesting to think of what will happen to cities (in the sentiment of Glaeser's "Are cities becoming obsolete?"), it is also important to understand what city decline means for the city's metropolitan extent. Hence, as metropolitan areas have become increasing suburbanized, people are still living within a central city's influence and contribute back to the central city in some capacity. Furthermore, in the urban decline literature, there appears a dearth of research looking at how aging will affect the city and how it might decline (or grow) as a result. Usually, aging is thought of as a macro-process and explored at the national or regional level (e.g., aging in Japan and East Central Europe were researched in the articles cited above), so it would be very interesting to think of aging in just an urban context.

Data and Methodology

To look at the age distribution and population size of metropolitan areas, I use U.S. Census data as part of the Neighborhood Change Database (NCDB) Tract Data, which compiles Census data from 1970 to 2000, normalized to 2000 census tracts and U.S. Census 2010 data. Within the U.S. Census data in the NCDB, I sort by the top 35 metropolitan areas in the U.S. based on 2000 population and make use of total population size and age population numbers for each decade from 1970 to 2000. I then look at the age and sex structure of the three declining or slowest-growing metropolitan areas (i.e., Pittsburgh, Cleveland, and Detroit) for 1970 to 2000. I finally append 2010 population numbers for all data points.

In order to determine the slowest-growing metro areas for more in-depth study, I first calculate the percentage growth rate of the top 35 metro areas from 1970 to 2010. The distribution of these rates is mapped to see whether or not there are regional trends. Next, for census years 1970, 1990, and 2010, I map the percentage of the total metro population that is age 65 or older in the 35 metro areas. Lastly, population pyramids from 1970 to 2010 are made for two of the slowest-growing metropolitans: Detroit and Pittsburgh. All five points in time are contained within each chart for each separate metro area, with darker colors corresponding to years closer to the present time. It should be noted that the youngest cohort is only a five-year interval, while the other age cohorts (except the oldest one which is open-ended) are ten-year intervals. This was done for two reasons: 1) the emphasis for this paper is on the older ages, and 2) since there is the inclusion of five points in time within each chart to prevent the creation of a large amount of charts, five-year cohorts were collapsed into ten-year cohorts starting backwards from the oldest non-open-ended cohort[2] for less clutter. These maps and charts appear at the end of this extended abstract.

Discussion

The first map shows the population growth rates from 1970 to 2010 of the top 35 metropolitan areas in the U.S. based on 2000 population. Four metros actually decline in population over this time period: Pittsburgh, Cleveland, Detroit, and Milwaukee. The other slowly-growing metro areas all seem to

[2] That is, the oldest age interval in the NCDB is 75+, so the oldest ten-year interval could only be ages 65-74, as seen in the population pyramids.

cluster in the Midwest and Northeast. The fastest-growing areas are all in the South or Southwest. The middle-growing metros are scattered across the U.S. The other three maps show the percentage of total metropolitan population that is age 65 or older in each census years 1970, 1990, and 2010. In 1970, we notice that percentages of people age 65+ remain under 10 percent for the vast majority of metropolitan areas, with the exceptions in the Northeast, in Portland, and in Florida. By 1990, although we see a steady increase across all metropolitans of the proportion of older-age adults, we also notice that the main areas that are vastly growing in older-age proportions are the Midwest and Northeast, with Florida having already been largely older-age. Pittsburgh becomes the first large metro area outside Florida to have over 14 percent of its metropolitan population over the age of 65. By 2010, Portland actually decreases its older-age percentages, with the lowest percentages of people age 65+ remaining in the South. Meanwhile, Cleveland joins Pittsburgh as the only metro areas outside Florida to have 14 percent or more of its metropolitan population age 65+.

What we can first observe in the population pyramids for the two metropolitans of Detroit and Pittsburgh is that both experience steady growth from 1970 to 2010 of the oldest age cohort. Interestingly, we notice that the longest bar for ages 75+ in both metros for males is for the year 2010, and if we follow this backwards through the decades, we see that the longest year of bars for ages 65-74 is 1990 and the longest year of bars for age 55-64 is 1980. So with the inclusion of five decades in the same chart, we can easily trace the aging of specific cohorts, assuming people do not move away from the metropolitan. Focusing only at the older half of each population pyramid, Pittsburgh is the metro area between the two that has the more “rectangular” shape, which is in line with the typical population pyramid shape of populations further along their demographic transition. Detroit, with a near-zero growth rate, has a fairly pyramidal shape among the older half of its population pyramids, with is typical of developing countries’ population pyramids which generally see vast population growth.

Visually comparing the metro areas with shrinking or slowly-growing populations from 1970 to 2010 and the region of metro areas that widely increase in percentage of population ages 65+, a rough correlation does appear to exist. The inclusion of 35 metro areas across the U.S. for the set of maps in this paper is to contextualize the notion that the declining areas of Detroit, Pittsburgh, Cleveland, and Milwaukee are not necessarily isolated. That is, the entire Midwest and Northeast region is growing slowly and aging comparatively rapidly, with the aforementioned four metro areas just happening to be on the lower end of the spectrum concerning overall growth rates, which is consistent with Bunce and Neal’s findings that city trends tend to follow regional or national trends rather than city-specific patterns. However, it can be noted that city-specific phenomena can be attributable to city-specific fluctuations within a general regional pattern. For example, Pittsburgh’s older-leaning age structure could have pushed it into a negative growth rate from 1970 to 2010, while the smaller negative growth rate of the comparatively younger Detroit could be partially credited to its younger-leaning age structure. Whichever the case, it is undeniable that these and other metropolitan areas are indeed decreasing in population, which could be a harbinger for the future demographic direction of the U.S. and other currently highly-developed nations.

The trend of decline is daunting in a world that essentially functions on constant growth, whether in population, services, innovation, or economy. However, as we move into a post-industrial era and see countries that are shrinking in population (e.g., Japan, Italy, Russia), we are forced to face the idea of decline and how to cope with it. As evidenced by the preliminary findings in this paper, U.S. cities are not necessarily immune to decline either, so the study of how, why, and when decline could happen becomes increasingly important for reasons of policy and planning. Therefore, to better understand modern society, the coupling of the historically new concepts of human aging and urbanizing could prove significant as these two processes increasingly become the norm.

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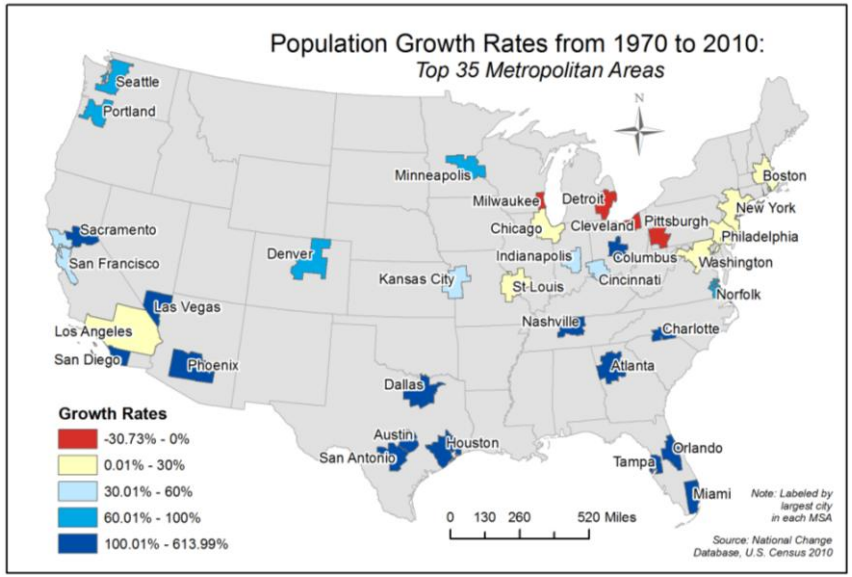
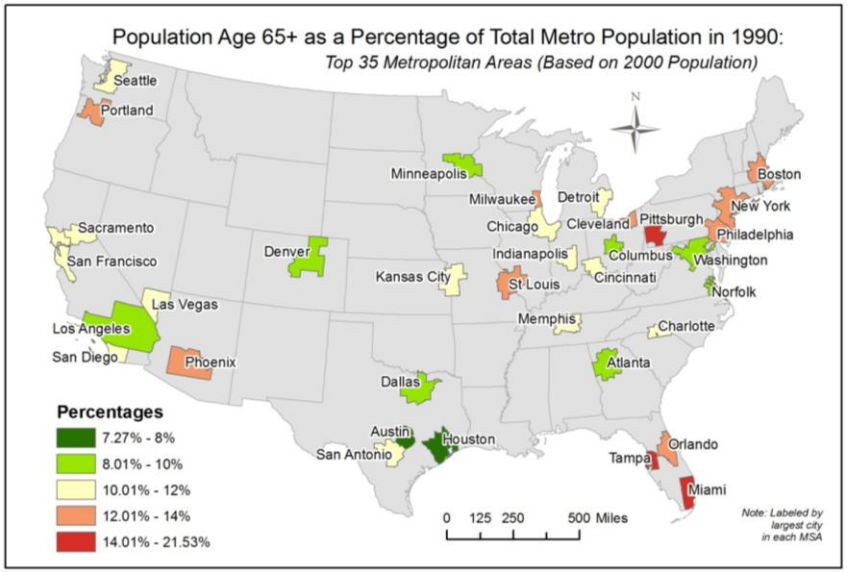
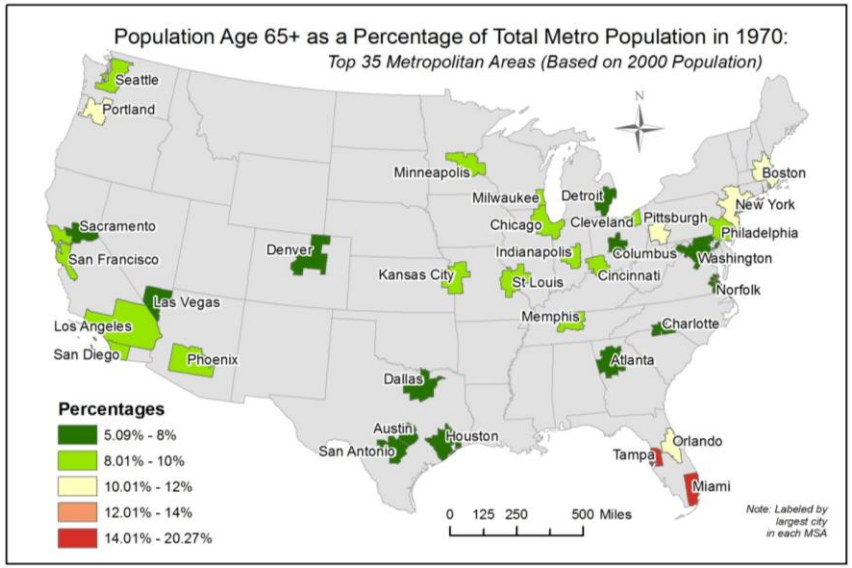

Population Growth Rates from 1970 to 2010:
Top 35 Metropolitan Areas
Seattle
Portland
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
Phoenix
Denver
Kansas City
Minneapolis
Milwaukee
Detroit
Chicago
Cleveland
Pittsburgh
Boston
New York
Philadelphia
Indianapolis
Columbus
Washington
St Louis
Cincinnati
Norfolk
Nashville
Charlotte
Atlanta
Dallas
Austin
San Antonio
Houston
Orlando
Tampa
Miami
Growth Rates
-30.73% - 0%
0.01% - 30%
30.01% - 60%
60.01% - 100%
100.01% - 613.99%
0 130 260 520 Miles
Note: Labeled by largest city in each MSA
Source: National Change Database, U.S. Census 2010


Population Age 65+ as a Percentage of Total Metro Population in 1990:
Top 35 Metropolitan Areas (Based on 2000 Population)
Seattle
Portland
Sacramento
San Francisco
Las Vegas
Los Angeles
San Diego
Phoenix
Denver
Kansas City
Minneapolis
Milwaukee
Detroit
Chicago
Cleveland
Pittsburgh
Boston
New York
Philadelphia
Indianapolis
Columbus
Washington
St Louis
Cincinnati
Norfolk
Memphis
Charlotte
Atlanta
Dallas
Austin
San Antonio
Houston
Orlando
Tampa
Miami
Percentages
7.27% - 8%
8.01% - 10%
10.01% - 12%
12.01% - 14%
14.01% - 21.53%
0 125 250 500 Miles
Note: Labeled by largest city in each MSA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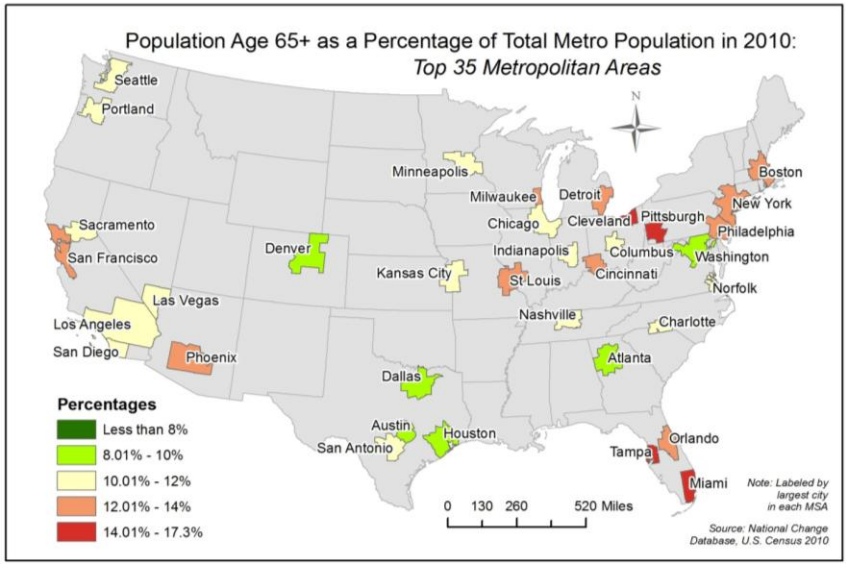
Detroit
Chicago
Cleveland
Pittsburgh
Boston
New York
Philadelphia
Indianapolis
Columbus
Washington
St Louis
Cincinnati
Norfolk
Memphis
Charlotte
Atlanta
Dallas
Austin
San Antonio
Houston
Orlando
Tampa
Miami
Percentages
5.09% - 8%
8.01% - 10%
10.01% - 12%
12.01% - 14%
14.01% - 20.27%
0 125 250 500 Miles
Note: Labeled by largest city in each MSA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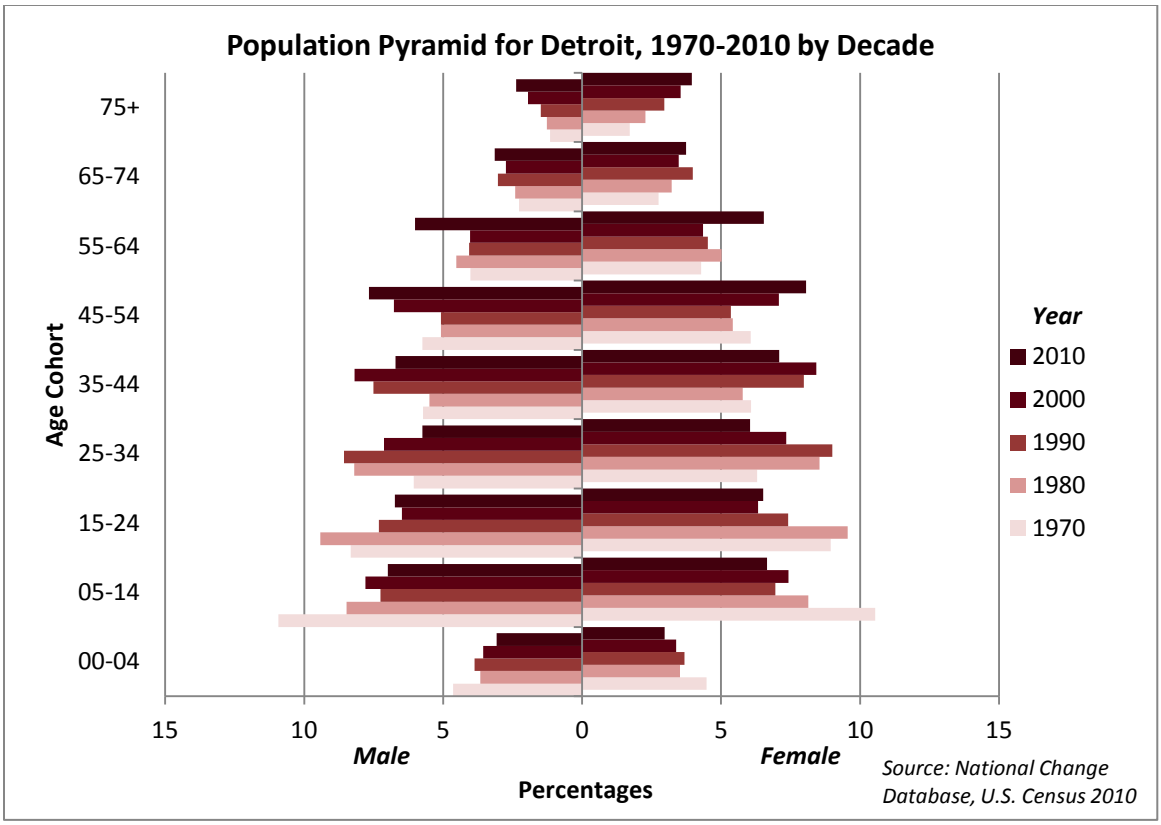
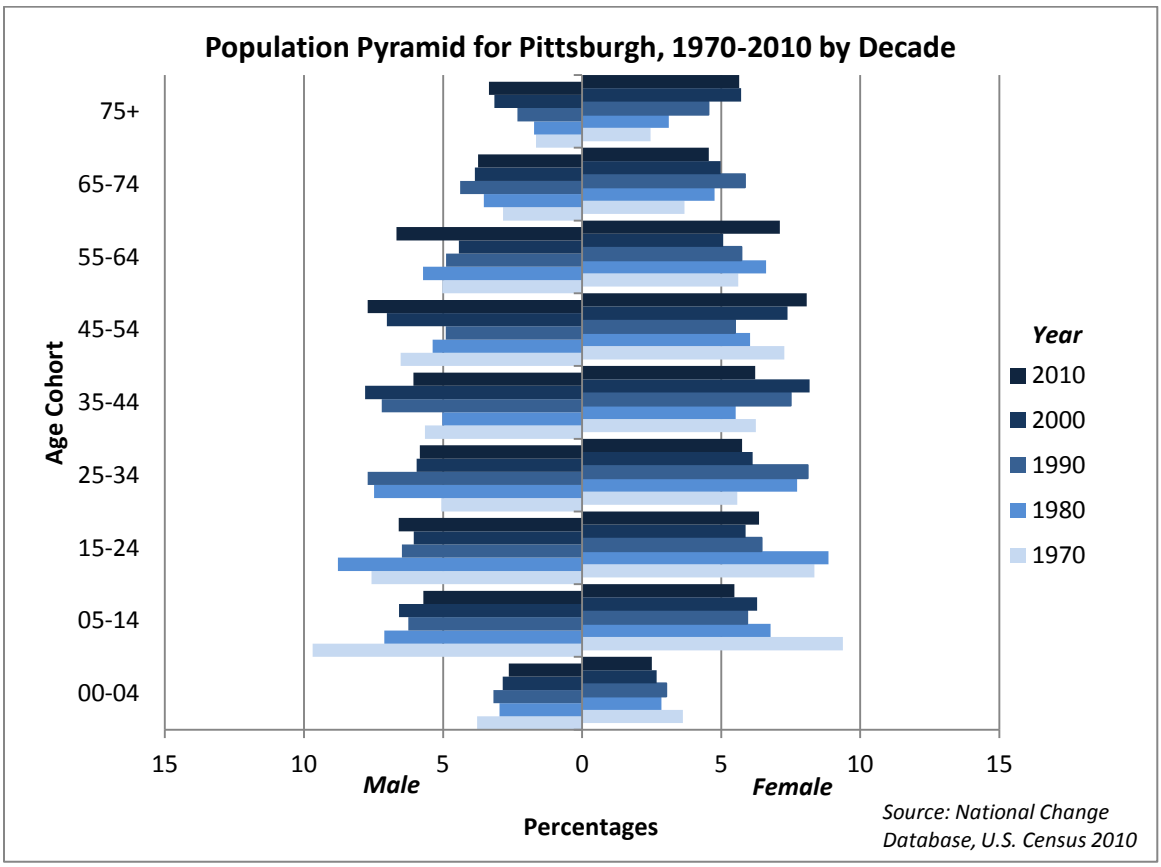
Minneapolis
Milwaukee
Detroit
Chicago
Cleveland
Pittsburgh
Boston
New York
Philadelphia
Indianapolis
Columbus
Washington
St Louis
Cincinnati
Norfolk
Nashville
Charlotte
Atlanta
Dallas
Austin
San Antonio
Houston
Orlando
Tampa
Miami
Percentages
Less than 8%
8.01% - 10%
10.01% - 12%
12.01% - 14%
14.01% - 17.3%
0 130 260 520 Miles
Note: Labeled by largest city in each MSA
Source: National Change Database, U.S. Census 2010


Population Pyramid for Detroit, 1970-2010 by Decade
75+
65-74
55-64
45-54
35-44
25-34
15-24
05-14
00-04
Age Cohort
15
10
5
0
5
10
15
Male
Female
Percentages
Year
2010
2000
1990
1980
1970
Source: National Change Database, U.S. Census 2010


Population Pyramid for Pittsburgh, 1970-2010 by Decade
75+
65-74
55-64
45-54
35-44
25-34
15-24
05-14
00-04
Age Cohort
15
10
5
0
5
10
15
Male
Female
Percentages
Year
2010
2000
1990
1980
1970
Source: National Change Database, U.S. Census 2010