Visualizing Older Age Population Demographics Using GIS: Mapping population, poverty, and race over time in Greater Boston

Overview:

Geographic information systems (GIS) are underused in studies of older age populations (Hirshorn and Stewart, 2003). GIS provides a useful method to consider multiple components to older aged populations at the same time. These visualization abilities can aid the decisions of planners and policy makers so that the needs of an aging population are met. Furthermore, greater focus on "aging in place", keeping older aged individuals in their homes or other non-institutionalized settings, increases the need to better understand the challenges to this approach, such as poverty.

The maps displayed here demonstrate data visualization capabilities of GIS that are available better understand the needs of older aged, community-based populations. The maps show: 1) longitudinal changes in older aged population proportions; 2) geographic concentrations of racial subpopulations; and 3) at-risk or potentially at risk (below of the poverty level) populations for the Greater Boston area.



Census tracts with high or low proportions of persons 65+ in 2000

The maps (above) show, by census tract, persons aged 65+ as a percentage of the total census tract population and as an absolute number. The map displaying a percentage is helpful to show where there may be high or low proportions of persons 65+. However, it is still important to know the absolute number per each census tract, to see where there are high numbers of persons 65+ This is because there can be a high number in a census tract for this particular group, but a they may be a small percentage of the overall population.

These maps show that, in 2000, the census tracts with a higher percentage of persons aged 65+ are generally found in the suburban Greater Boston area compared to the urban areas in and around Boston. The same is true for the absolute number of persons aged 65+, however, when mapped this way, there appears to be less positive spatial autocorrelation between the census

Percent change in number of persons 65+ below the poverty level 1970-2000



1970-2000 -71 - -42

0 2.5 5 10 L I I I I I I I

Miles			

This map identifies, by geographic area, the percent change in number of persons aged 65+ below the poverty. This is helpful to visualize the proportions of at-risk, or potentially at-risk, older age populations. It is also particularly relevant for identifying areas that may need additional resources in order for individuals to age in place. Other relevant maps that this information can be combined with are, age of housing stock, access to vehicle, and proximately to public transportation to develop a broader investigation of areas with at-risk older age persons.

This map shows that overall, persons 65+ below the poverty level, as determined by the federal definition of "poverty", declined in many areas. However, there are some areas that stand out, such as parts of Boston that had a larger increase in the number of persons 65+ over this time.

Percent change in number of persons 65+ for 1970 - 2000

-41 - 0 1 - 44

45 - 138

139 - 269

270 - 500 501 - 1100



The maps (above) depict the changes in proportions of persons aged 65+ for each of the decennial census from 1970 to 2000 by census tract. The change that takes place from 1970-2000 is also depicted in a single map that shows the total change in number of persons, as a percent, for this time period. This map allows the total change in the number of persons +65 for the whole time period to be quickly visualized, while the smaller maps for each decade show the progression of the change.



Percent of population aged 65+ by racial subpopulations

The maps (below) show the different racial subpopulations of the 65+ cohort in the Greater Boston area. A map for each the White, African American, Hispanic, and Asian racial subpopulation was made. These maps show were there are geographic concentrations of each cohort exist. This information can be used to show how these areas may be related to other maps, such as concentrations of persons 65+ below the poverty level.



Percent of population white age 65+, by census tract 2000





0 2.5 5 10 Miles

-94 - -34

-33 - 0

1 - 45

46 - 94

95 - 166

167 - 289

290 - 496





0 2.5 5 10 Miles



Cartographer: Nathan Rawding Date: 5/5/2009

0.5 - 0.7

1.3 - 1.9

2 - 3.5

3.6 - 6

0.8 - 1.2

Tufts University Urban and Environmental Policy and Planning Introduction to GIS for Urban and Environmental Analysis Map Projection: GCS North American 1983 Resources: US Census 1970, 1980, 1990, 2000