

Intro to GIS
Final Paper
12/14/07

Background

A 1997 study in Philadelphia found that certain demographics and socio-economic factors strongly predict shelter admissions. This research identified demographic and economic factors that predict incidence of homelessness including: concentrations of female headed households with children, concentrations of persons of color, unemployment, housing abandonment, housing overcrowding, and high rent-to-income ration (Wong, Yin-Ling, and Hillier 2001). This data was analyzed using GIS to help service providers in Philadelphia identify areas at-risk for homelessness. These areas were then targeted for prevention services. The Philadelphia study gathered geographic and demographic information about the neighborhoods where homeless individuals resided prior to shelter entry. This data was valuable in aiding homeless advocates and providers target specific services. This is not to say that these characteristics cause homelessness but rather that they contribute to vulnerability for homelessness. This research is the basis for my GIS project.

Project Description

In this project I used GIS to identify areas within Massachusetts where households are at high risk for homelessness. Using 2000 U.S. Census data by block group I mapped concentrations of six key variables within Massachusetts. I ranked the percent of population findings for each variable as very low, low, moderate, high, and very high. I divided the findings into these 5 classes based on natural break classifications in most cases, unless the research indicated a crucial threshold. Once the

individually ranked variable maps were generated, I added together the ranked variables to create a “total risk” field with the six risk variables combined. When mapped, this field indicated the geographic concentrations of census block groups with high concentrations of at-risk households. Below is an image of the attribute table once all variables were calculated as percentages, flagged, ranked, and added together to create the total variable field.

Attributes of						
FFC_FLAG	UNEMP_FLAG	CROWD_FLAG	LO_IN_FLAG	B_L_FLAG	CB_FLAG	Tot_Flag2
2	3	1	3	2	4	15
2	4	2	3	2	2	15
2	4	2	4	2	4	18
2	4	2	3	2	4	17
1	4	1	4	2	4	16
2	3	2	3	1	3	14
2	3	1	2	1	3	12
2	1	1	2	1	2	9
2	1	1	2	1	3	10
2	2	1	3	1	4	13
2	2	3	3	1	4	15
3	1	1	2	1	5	13
2	2	4	3	1	3	15
2	2	1	4	1	4	14
1	2	1	2	1	4	11
2	2	1	2	1	2	10
2	1	1	3	2	2	11
3	3	1	3	2	3	15
2	1	1	1	1	4	10
2	1	1	3	1	5	13

Record: 16 Show: All Selected Records (0 out of 5047 Selected)

Variables and Utilized Data Layers:

- Concentrations of housing overcrowding
 - Source: 2000 US Census – Mass GIS
 - Data Layer: housing_residency_characteristics.dbf
 - Fields of Interest:
 - RNT_GT2 H020013 - Renter occupied housing units with 2.01 or more occupants per room
- Concentrations of female headed households with children
 - Source: 2000 US Census – Mass GIS
 - Data layer - CEN2K_BG_HH_AGE_FAM_CHILD.dbf
 - Field of interest - FAM_FEM_C - Other family households with female householder, 15 to 64 years old, with own children under 18 years
- Concentration of high rent-to-income ration
 - Source: 2000 US Census – Mass GIS
 - Data Layer : housing_rent_statistics.dbf
 - Fields of Interest:

- RNT_MED_P H070001 Median gross rent as a percentage of household income in 1999 for all specified renter-occupied housing units
- Concentrations of unemployment
 - Source: 2000 US Census – Mass GIS
 - Data layer - employment_status_by_gender.dbf
 - Field of Interest - M_UNEMPL - Male population 16 years and over, civilian, unemployed and F_UNEMPL - Female population 16 years and over, civilian, unemployed.
- Concentration African-Americans and Latino Populations
 - Source: 2000 US Census – Mass GIS
 - Data layer - CEN2K_BG_LEGATTRIB.dbf
 - Field of Interest – Percent Black and Percent Hispanic
- Concentrations of low-income household
 - Source: 2000 US Census – Mass GIS
 - Data Layer: CEN2K_BG_LEGATTRIB.dbf
 - Field of Interest: Percent low-income

Once all the data was compiled, I created variable maps for each factor listed above, create a map of Massachusetts with all variables combined, and create 4 maps that show the close-up of very-high risk areas (see poster for maps).

Findings

The analysis of this Census data shows that 329,210 individuals, within 82,946 households and 209 Census Block Groups, live in areas with a very high concentration of risk of homelessness. The variables considered in this project do not cause homelessness but rather put households at risk of homelessness if personal crisis were to arise. These findings highlight areas where housing is precarious and unstable.

These very high risk areas (those designated by dark red in the maps on the poster) tend to be concentrated near the cities of Boston, Worcester, Springfield, Lawrence, and Lowell. This is not a surprising finding, yet since these variables were calculated by percent of population I expected to find rural areas with somewhat high risk as well. The Pittsfield area is representative of this hypothesis; it is a rural area with a concentration of

moderate to high risk of homeless.

The 209 census block groups that are categorized as very high risk have a median percentage of income spent on rent of 31.1% and a high of 50%. These block groups are home to a total 21,531 families headed by single mothers, a mean unemployment rate of 7.5%, and these block groups have a mean low-income rate of 57%.

These findings have are important because they can help shape the design and implementation of homeless prevention programs which are expanding all over the country. Prevention has the ability to save cities, states, and federal government a great deal of money in emergency homeless services and have the potential to protect thousands of individuals and families from the trauma of homelessness. Public policy makers and social service planners can and should take into account the geographic concentration of these households when planning and implementing homeless prevention programs.

Limitations

While this study highlights some important information there are limitations and weaknesses to this study. Firstly, the variables are evenly weighted in this study while in reality some factors may have stronger correlations to homelessness than others. Secondly, there are several non-demographic factors which put people at risk of homelessness but are excluded from this study including: incidence of domestic violence, mental health concerns, addictive illness, and broken social networks. Thirdly, this project utilized data from the 2000 Census, which is nearly 10 years old and may no longer reflect the reality of today's neighborhood and demographic characteristics.

While this project gives the homeless advocacy community important information

it does not highlight any particularly new or groundbreaking findings. It may be interesting to include shelter dwellers' prior addresses and addresses of eviction prevention program recipients in order to see geographic areas that are being underserved. This data maybe challenging to compile but would make for very interesting future research on this topic.

Reference:

Wong, Yin-Ling Irene, and Amy E. Hillier. "Evaluating a community-based homelessness prevention program: a geographic information system approach." Administration in Social Work 25.4 (Winter 2001): 21(25).