Springfield, Massachusetts

Major urban center for employment, culture, commerce and government in Western Massachusetts.

Who are we?

Springfield is a medium-sized city located at the crossroads of New England.

Serves a metropolitan area of more than 500,000 residents.
How ACS data can be used to help address health problems with GIS?
What is the American Community Survey (ACS)?

- survey by the US Census
- uses questions from the Census long-form
- data collected monthly and reported annually on a sample of the population
ACS Comparison Sites

American Community Survey
(1999 - 2002)
31 Comparison Sites
Advantages of ACS

- most current/accurate estimates
- yearly updates allow tracking of time trends
- additional questions not included in Census
Limitations of Current ACS Data

- estimates from a sample
- estimates based on weights from 1990 Census
- 2002 profiles will be more accurate
Defining the Problem

* Age-adjusted for the 1970 US population

Source: Atlas of Cancer Mortality
http://www.nci.nih.gov/atlas
Breast Cancer Rates by County in Massachusetts

* Rate per 100,000 women
Age-adjusted for the 1970 US population
Source: Atlas of Cancer Mortality
Magnitude of Advanced Stage Breast Cancer

Source: Massachusetts Department of Public Health
Create a profile of communities in Springfield in need of increased breast cancer screening to aid in planning intervention programs
Specific Aims

- identify geographic areas with high rates of advanced disease
- identify socioeconomic and demographic factors in advanced disease
Data Sources

- American Community Survey
- Baystate and Mercy Medical Centers
- City of Springfield Planning Department
ACS Data

Individuals
- Age
- Race
- Ethnicity
- Income
- Education

Families/Households
- Income
- Assistance
- Composition

Housing
- Value
- Tenancy
- Occupancy
ACS Sampling Methods

Data aggregated by police sector

2-4% of population sampled in each sector

9 police sectors
Hospital and Municipal Data

Patient Data
- address
- date of diagnosis
- stage at diagnosis
- race
- age
- marital status

Geographic Data
- street centerlines
- police sector shape files
- location of mammography facilities
Our Approach
Locating Areas of Concentration
Risk of Advanced disease:
1995-1999 Prevalence per 1000 Women > 40

Sector H = 7.7
Spatial Regression: Factors in Advanced Disease

- tests for factors in rate of advanced disease
- police sector is unit of analysis
- ACS estimates are independent variables
- rate of advanced disease per women older than age 40 is dependent variable
- accounts for spatial proximity
## Results of Spatial Regression

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<tr>
<th>Factor</th>
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<th>T-test</th>
<th>Significance</th>
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<td>High School Grads</td>
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<td>Foreign Born</td>
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<td>Married</td>
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</table>
Targeting High-risk Populations

High Rate of Black Women

High Rate of Married & High School Graduate Women
Designing Intervention Programs

- account for educational level of those at risk
- work with organizations for foreign-born
- work with African-American organizations
Summary: How we can use ACS Data in Healthcare

- demographic profile of communities
- calculation of risks (incidence/prevalence)
- planning/resource allocation
- identification of risk factors in disease
- design of intervention programs
Further Applications

- neighborhood level
- state rates
- individual level