

# 1

## USING SPATIAL TECHNIQUES TO EXAMINE RURAL/URBAN DIFFERENCES IN SERVICE USE IN A SYSTEM OF CARE

Matt Vogel, MA  
Research Associate

**CENTER FOR HUMAN SERVICES RESEARCH**  
UNIVERSITY AT ALBANY State University of New York

## Service Utilization

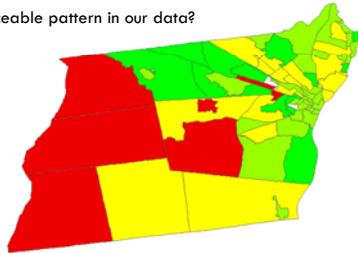
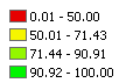
- Research Question: What role does geographic space play in service utilization?
  - EDIF 13a
    - Child is not eligible for continuing services
    - Child is eligible but will not be continuing services
    - Child is eligible and continuing services
  - Classified service utilization as a dichotomy
    - 1 = continuing services
    - 0 = not continuing services
  - Computed percentages of families continuing services in each census tract

## Service Utilization by Census Tract

### STEP 1:

#### Spatial Description

- Is there a noticeable pattern in our data?



## Inferential Statistics

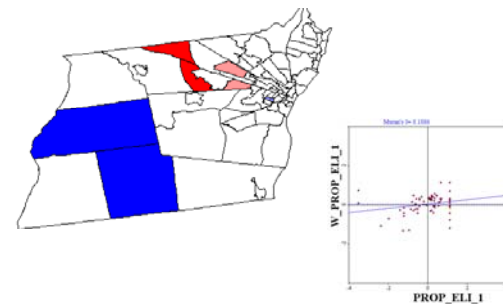
- Not only can we describe the population, but we can also use spatial techniques to determine if our patterns are statistically meaningful
  - Tobler's Law: Everything is related to everything else, but near things more so than distant things.
  - Null hypothesis – spatial randomness
  - Research hypothesis – spatial dependence
    - Is there a meaningful relationship between service utilization and geographic space?

## Examining the Spatial Relationship

### Step 2: Spatial Weights Matrix

- Allow census tracts to be influenced by tracts bordering them
  - Contiguity Matrix
- Compute a statistic to determine whether spatial clustering exists
  - Measure of association between the proportion using services in a census tract with the proportion using services in surrounding census tracts

## Clusters of Families Not Continuing Services



## Modeling the Spatial Relationship

7

- Step Three: Explaining the Spatial Clusters
  - ▣ Why is it that families presenting in the rural areas are less likely to continue using SOC services?
    - Competing hypotheses
      - (Cutrona et al., 1996; McKernan et al., 1998)
      - Stigma associated with mental health services is higher in rural areas
      - Stringent eligibility requirement does not match need in this area
      - Greater distance to travel to receive services in rural areas
  - ▣ Ordinary Least Squares Regression
    - $Y_{(tract)} = \beta_0 + \beta_1 U_i$ 
      - Assumes that error terms are independent
      - Without controlling for spatial dependence, error terms could potentially be correlated

## Modeling the Spatial Relationship

8

- Spatial Analysis of Variance
  - ▣ Model the effects of census tracts characteristics on the proportion of families continuing services
- What characteristics might be associated with service utilization at the tract level?
  - ▣ Census 2000 data
  - ▣ Unemployment rate
  - ▣ Percent of families on public assistance

OLS Regression of Unemployment, Public Assistance, Rural Status and Average Distance to Portal on the Proportion of Eligible Youth Continuing Services by Census Tract in Albany County (N=71)

9

	Model 1	Model 2	Model 3
Unemployment	-5.35*	-5.91*	-3.95
% Public Assistance	3.68	3.51	3.21
Rural (=1)	----	-6.05**	-3.10
Distance	----	----	-11.66**
ADJ R <sup>2</sup>	0.06	0.12	0.22
Moran's I	0.13*	0.06	0.00

Standardized betas are presented  
 \*\*\* p < 0.001; \*\*p<0.01; \*p<0.05

## Results...

10

- The results suggest that the spatial regimes in our data can be explained by the average distance that families need to travel to receive services
- Distance may operate in two ways
  - ▣ Limited services in this area may increase the number of *ineligible* families presenting at the rural resource center
  - ▣ Longer distances may discourage eligible families from continuing services
    - Lack of transportation

## Future Directions

11

- Caveats
  - ▣ Limited data on rural 'culture' / stigma
  - ▣ Distance is measured in decimal degrees, the effect in the rural areas could be even more pronounced
    - Fewer roads, less public transit, etc
- Future directions
  - ▣ Multi-level multinomial regression models with spatial weights
    - Nest families within their census tract and model individual, community and spatial characteristics contributing to the odds of a family presenting and being eligible and continuing, eligible and not continuing, or ineligible.