Geographic Information Systems and Medicare/Medicaid Older Adult Enrollees: Benefits and Barriers to Secondary Analysis

Kathy Wright, MSN, GCNS-BC, PMHCNS-BC
PhD Student
Clinical Nurse Specialist Summa Health System-Senior Services

John A. Hartford Foundation Building Academic Geriatric Nursing Capacity Scholar
Substance Abuse and Mental Health Services Administration Minority Fellow at the American Nurses Association

wrightk@summahealth.org
K.wright@utah.edu
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The Problem...

• Medicare/Medicaid enrollees have poorer emotional and physical health as compared to Medicare only.
• House’s model of social inequalities in health and aging explores individual, environmental and policy, differences that contribute to poorer health outcomes.
• Missing Data
• Changes in Census 2010 require gathering additional data from the American Community Survey (ACS) that created benefits and barriers to use of data for secondary analysis.
The purpose of this study is to describe the benefits and barriers of secondary analysis using Geographic Information Systems (GIS) to link socio-demographic data and health outcomes in a sample of community-dwelling frail Medicare/Medicaid enrollees.
Theoretical Rationale

Race Ethnicity
Gender
Social, Political, and Economic Conditions and Policy

Socioeconomic Status

EXPLANATORY VARIABLES
Medical Care and Insurance
- Psychosocial Risk Factors
  1. Health Behaviors
  2. Social Relationships and Supports
  3. Chronic and Acute Stress
  4. Psychological Dispositions
  5. Social Roles and Productive Activities
- Physical/Chemical and Social Environmental Hazards

Health Outcomes
1. Mortality
2. Institutionalization
3. Morbidity (Chronic)
4. Functional Limitations
5. Self-Rated Health
6. Cognitive Function
7. Depression
“The Journey...”

• Secondary analysis of baseline data from After Discharge Care Management of Low-Income Frail Elderly Trial (AD-LIFE) (R01 HS014539)

• N= 409 > 65 years; hospitalized; Medicare/Medicaid; Medicaid waiver program

• At least 1 chronic health condition; and a deficit in 1 activity of daily living or 2 instrumental activities of daily living
Identify the construct of interest and generate a list of possible indicators

Identify the databases and select the variables

Link the data to the subject
## Deconstruction Reconstruction

<table>
<thead>
<tr>
<th>House ‘s Model</th>
<th>Reconstructed Model</th>
<th>Measurement Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic (race, ethnicity, gender)</td>
<td>Same plus age added</td>
<td>African American, Caucasian, male/female, age in years</td>
</tr>
<tr>
<td>Social, political and economic conditions and policy</td>
<td>Neighborhood disadvantage</td>
<td>Percent of persons living in poverty</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Deconstructed to income and education</td>
<td>Proxy income based upon occupation at retirement, years of education</td>
</tr>
<tr>
<td>Explanatory Variables</td>
<td>Health Behaviors</td>
<td>Cigarettes, physical activity, unstructured physical activity</td>
</tr>
<tr>
<td>Health Outcomes</td>
<td>Physical Function and Emotional Well-being</td>
<td>Physical components summary score/mental components summary score SF12®</td>
</tr>
</tbody>
</table>
Results

Dotted lines minor indicate pathway. Green lines indicate moderate and solid blue lines represent the strongest pathway to health outcomes. The red line indicates a modification by adding age to the model.
Barriers and Benefits...

- American Community Survey 5 year estimate

- Barriers included delay in data analysis due to procurement of a business associates agreement

  *GIS link data missing from secondary analysis*

  *Data Sharing Plan (United States National Library of Medicine, 2003)*
Future Directions...

• Center for Disease Control (CDC) has made leveraging geospatial data, technology and methods to improve the health of communities a priority (Elmore, Flanagan, Jones & Heitgerd, 2010)

• GIS genome mapping

• Hot spot analysis service provision
Questions?

Thank you!