Proximity to Uninsured Populations and Hospital Services in the U.S.
Two tiered system for health care
  - Private and Public
  - Medicare and Medicaid

Left out: uninsured individuals
  - Not qualified for provision
  - Employment or financial issues
  - Not purchase private insurance

Increase in uninsured population for the past decade

In 2006, uninsured population (US Census)
  - 47.0 million, which is 15.7% of total population
  - Roughly 1 out of 7 Americans
Literature Review

- Uninsured population
  - Counting uninsured population ¹, ²
  - Rural and urban children ³, ⁴
- Hospital closures on access to health care
  - Impact of hospital closure to uninsured patients ⁵, ⁶
  - Influence on efficiency of hospital among competitors ⁷, ⁸
- Uncompensated care
  - Analysis of Medicare and Medicaid and costs ⁹, ¹⁰
- Hospital concentration
  - Linkage between managed care and concentration of hospital ¹¹, ¹², ¹³

Objective of this paper

- To analyze the relationship between hospital service areas and proximity to uninsured population (Medicare and Medicaid discharges) including socio-economic and demographic attributes.
Data and Sources

- **U.S. Census Bureau**
  - County level
    - Uninsured population and Population in poverty
  - Zip code level
    - Population (White, Black, Hispanic and Asian), and Per capital income

- **American Hospital Association Annual Survey Database 2004**
  - Hospital information: Hospital Service Areas
    - Inpatient days, Number of beds, Surgical operations, ER visitors
    - Medicare and Medicaid discharges
    - Percentage of ownership

- **Federal Interagency Forum on Aging-Related Statistics**
  - County level
    - Elderly over 65
Hospital Market Concentration

Herfindahl-Hirschman Index:
- Measure of the size of hospitals market concentration
- 0 if perfect competition, 1 if monopoly
- Beds, inpatient days, surgical operations, ER visitors, etc..

Model:
$$HHI (\text{Beds}) = f (\text{Uninsured, Hospital info, Socio-economic, and demographic attributes})$$

Source: University of Alabama at Birmingham.
Data Integration Issue

- Counties: Uninsured, Socio-demographic characteristics (3141)
- Hospital Service Area (HAS): Local health care markets (3436) ArcGIS
- Hospital Referral Region (HRR): Regional health care markets (306) Union

County and HSA Boundaries

Legend
- COUNTIES
- HSA_Bdry

County and HRR Boundaries

Legend
- COUNTIES
- HRR_Bdry
Maps: HHI at HSA level
Population at HSA
Per Capita Income at HSA
HSA: Uninsured, Poverty, and Elderly
Weight Matrix: Connectivity
Moran’s I Scatter Plot: 0.5% Level
Concluding Remarks

Some Highlights

- Growing uninsured population in the U.S.
- Data aggregation: County level into HSA
- Hospital market concentration: Beds, Inpatient days, Surgical Operations and Emergency room visits.
- Spatial clustering in population, per capita income, and bad debt
- Solve data integration
  - Metropolitan Statistical Areas, HSA or HRR
Acknowledgements

- Dr. Chen, and Dr. Florax (Dept. of Agricultural Economics)
- Dr. Avery (Dept. of Health and Kinesiology)
- Indraneel Kumar (GIS Specialist, Purdue Center for Regional Development)
- Valerian Pede (Office mate, Dept. of Agricultural Economics)
References


