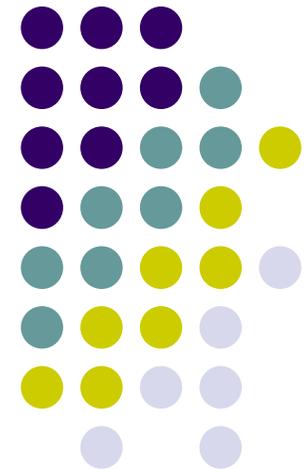


# Geographic Access to Hospice in the United States

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Melissa D.A. Carlson, Ph.D., M.B.A.  
Department of Geriatrics & Palliative Medicine  
Mount Sinai School of Medicine





# Background

- There has been dramatic growth in the number of hospices in the U.S., with more than 900 new hospices since 2000 (a 41% increase)
- However, only 39% of decedents in 2008 received hospice care and there is persistent evidence of disparities in hospice use by
  - Race/ethnicity (*Han, 2006; Lackan, 2004; Greiner, 2003; Connor, 2002; Virnig, 2000*)
  - Income (*Lackan, 2004; Greiner, 2003; Virnig, 2000*)
  - Education (*Lackan, 2004; Greiner, 2003*)
- Given that more than 90% of hospice care involves staff making home visits, proximity to a hospice is important in ensuring access to hospice services

## Why Proximity to a Hospice Might be Related to Hospice Use



- Greater distance may...
  - may make it logistically more difficult for hospice staff to visit patients
  - community members may be less likely to serve as volunteers or employees which may increase language, trust or other cultural issues
  - may impede the diffusion of knowledge and understanding of hospice within a community



# Existing Literature

- Existing studies of geographic access to hospices have documented limited access in rural compared with urban areas\*
  - These studies do not reflect the recent growth in hospice
  - Do not evaluate if hospice availability varies by sociodemographic characteristics of communities (racial composition, income and education levels)
  - Do not evaluate state-specific Certificate of Need policies for hospice which were designed to manage the supply of hospices in a state

*\*Virnig, 2006; MedPac 2002*



# Objectives

- Provide a more comprehensive and up-to-date evaluation of geographic access to hospice services
- Determine the proportion of the U.S. population living in communities within 30 minutes and 60 minutes of a hospice
- Identify community characteristics associated with more limited geographic access to hospice

# Methods



- Cross sectional study of geographic access to U.S hospices using data from 2008: Medicare Provider of Service data, U.S. Census data
- Used a geographic information system (ArcGIS) to estimate the driving time between each community in the U.S. (N=64,260) and the nearest hospice (N=3306)
  - Translate each hospice's address and the center of each community into sets of longitude and latitude coordinate points
  - Calculate the driving time between community centers and the nearest hospice as the product of estimated distances and travel speeds
- We used multivariate logistic regression to estimate the associations between hospice availability and sociodemographic characteristics of communities



# Results

- As of 2008, 88% of the U.S. population lived within 30 minutes of a hospice; 98% lived within 60 minutes
- Time to nearest hospice:
  - Mean = 15 minutes (s.d. 18)
  - Median = 9 minutes
  - Range = (less than 1 minute, 403 minutes)

# Characteristics Associated with Greater Hospice Availability



- Some gaps in hospice availability remain (35 million individuals > 30 minutes from a hospice)
- Population per square mile strongest predictor of hospice availability:
  - More urban areas:
    - mean=6.5 minutes (s.d. 4.6 minutes)
  - More rural areas:
    - mean=33.1 minutes (s.d. 25.1 minutes)

# Community Characteristics Associated with Being Within 30 Minutes of a Hospice (adjusted for PPSM, region)



|  | Adjusted Odds Ratio | 95% Confidence Interval |   |
|--|---------------------|-------------------------|---|
| <b>Median Income</b>                           |                     |                         |   |
| Less than \$30,000                             | 1.00                |                         |   |
| \$30,000 to \$39,999                           | 1.44                | (1.33, 1.55)            | * |
| \$40,000 to \$49,999                           | 2.20                | (2.00, 2.43)            | * |
| Greater than or equal to \$50,000              | 3.84                | (3.42, 4.33)            | * |
| <b>Percent with &lt; high school education</b> |                     |                         |   |
| Less than 10%                                  | 1.00                |                         |   |
| 11% to 19%                                     | 0.62                | (0.55, 0.69)            | * |
| 20% to 29%                                     | 0.52                | (0.46, 0.59)            | * |
| Greater than or equal to 30%                   | 0.47                | (0.41, 0.54)            | * |
| <b>Black Population Percentage</b>             |                     |                         |   |
| Less than 1%                                   | 1.00                |                         |   |
| 1% to 3%                                       | 1.44                | 1.31, 1.57)             | * |
| 3% to 14%                                      | 1.39                | 1.27, 1.51)             | * |
| Greater than or equal to 15%                   | 1.75                | 1.58, 1.93)             | * |
| <b>State has a Certificate of Need program</b> |                     |                         |   |
| No   | 1.00                |                         |   |
| Yes  | 0.49                | (0.45, 0.52)            | * |

# U.S. Population Nearest to a Hospice Established Since 2000



|                              | N (in millions) | %   | Minutes to Nearest Hospice Mean (SD) |
|------------------------------|-----------------|-----|--------------------------------------|
| Total                        | 94.9            | 34% |                                      |
| Population per Square Mile   |                 |     |                                      |
| First quartile (more rural)  | 18.4            | 30% | 32.2 (24.5)                          |
| Second quartile              | 25.0            | 34% | 12.3 (11.0)                          |
| Third quartile               | 26.0            | 37% | 7.5 (6.1)                            |
| Fourth quartile (more urban) | 25.5            | 36% | 5.9 (3.7)                            |



# Variation in Geographic Access by State



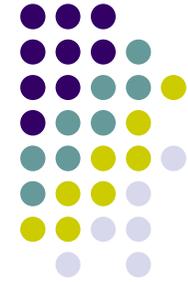
- Geographic access to hospice highly correlated with a state's population density:
  - States with more than 90% of population within 30 minutes:
    - CT (100%) ; MA, NJ (99%) ; RI (98%) CA (95%)
- with some exceptions:
  - States with more than 90% of population within 30 minutes:
    - NH (95%), population density below national median
    - OH (94%), population density in third quartile
    - MI (90%), population density in third quartile



# Limitations

- Analysis only includes Medicare certified hospices
- Estimates distance from community centers to nearest hospice and not each individual's address
- Analyses do not include satellite offices of hospices which may improve availability of hospice in rural areas

# Conclusions



- Growth in the U.S. hospice industry has been dramatic and there is now almost universal geographic access to hospice
  - There exists a small subset of communities where geographic access is a concern – tend to be more rural, lower income, less educated
- The hypothesis that disparities in hospice use by race are due to more limited geographic availability of hospice is not supported by these data
- Future research regarding variation in hospice use should focus on other potential barriers to hospice use including admission criteria, hospice size/capacity, patient level cultural and financial factors

# Acknowledgements



- Co-authors:
  - Elizabeth H. Bradley, PhD, Yale University
  - Qingling Du, Mount Sinai School of Medicine
  - Sean Morrison, MD, Mount Sinai School of Medicine
- Funding
  - National Institute for Nursing Research
    - Career Development Award (K99/R00)
  - National Palliative Care Research Center grantee
  - Brookdale Foundation Leadership in Aging Fellowship