Concentrated Poverty, Race, and Death Amenable to Health Care:
Geographic Variation in Minnesota by Census Tract from 2011 to 2015

Nathan M. Hierlmaier,* MPA

Background

The low statewide rate of preventable deaths in Minnesota belies the large variation in rates of death within the state due to health disparities for certain subpopulations.

This study investigated differences in rates and causes of early death across areas in Minnesota with pronounced poverty, racial and ethnic diversity of the population, and the combination of these factors.

Methods

Data sources: The study analyzed death records from the Minnesota Mortality Registry and population data from the American Community Survey.

Study population: We identified amenable mortality records under age 75 occurring from 2011-2015 from the Minnesota Mortality Registry (14,027 of 76,907 observed deaths) and studied patterns at the census tract level (n = 1,339) by geocoding addresses of the decedent. Tracts where more than one in five residents were living at or below the federal poverty guidelines were high poverty. In addition, diverse areas were areas where the majority of residents do not self-identify as non-Hispanic white.

Outcome of interest: Mortality from chronic heart disease, treatable cancer, stroke, and other underlying causes of death that are likely preventable with access to timely and effective health care.

Data analysis: Age and gender adjustment as well as incident rate ratio contrast were estimated using Poisson regression in SAS version 9.4 (Cary, NC).

Results

Health care amenable mortality rates were **1.83 times higher (95% CI: 1.71, 1.97; p<.001)** in areas with high poverty and **2.17 times higher (95% CI: 1.96, 2.40; p<.001)** in areas with high poverty and diversity in Minnesota.

Even after controlling for diversity, areas with high poverty still had amenable mortality rates that were **1.57 times higher (95% CI: 1.45, 1.71; p<.001)**.

Premature death led to additional lost future earnings of **$114.8 million per year** in all high poverty areas combined and **$73.2 million per year** in diverse, high poverty areas.

Contact: nathan.hierlmaier@state.mn.us

*Health Economics Program, Minnesota Department of Health, St. Paul MN

Areas of Minnesota with both **high diversity and poverty had twice the risk** of health care amenable death.

Chronic heart disease was the leading cause of death in all high poverty areas, followed by treatable cancer and stroke.

High-poverty communities in Minnesota suffered additional **productivity losses of over $114 million per year.**

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High Health Care Amenable Mortality and Poverty in Minnesota

High Health Care Amenable Mortality
Racially or Ethnically Diverse High-Poverty Areas
Other High-Poverty Areas

Minneapolis and St. Paul
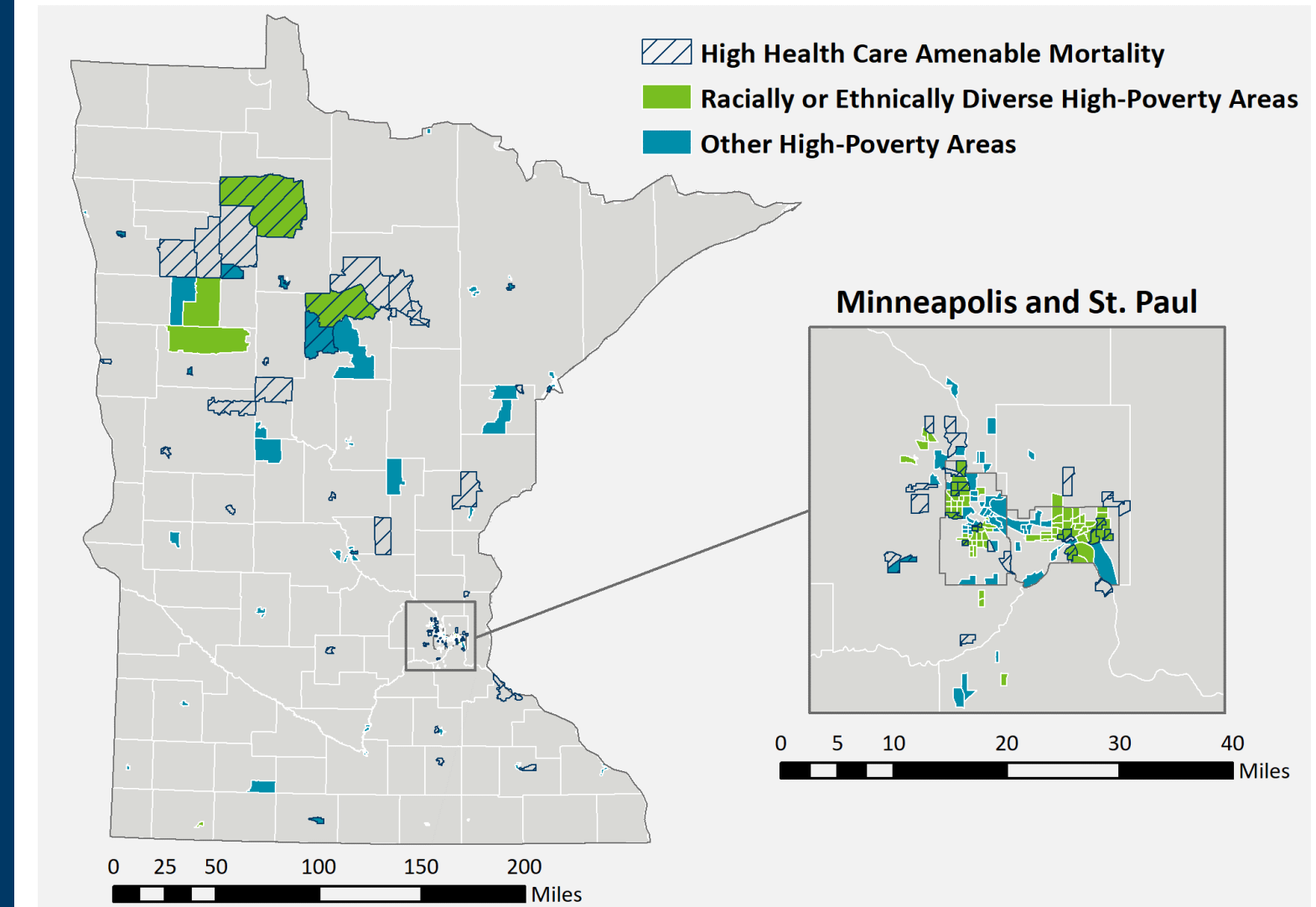
Note: Rates of mortality amenable to health care (premature death) were adjusted by age and sex. Census tracts with a higher number of actual deaths amenable to health care than the expected number based on the population are considered high mortality. Expected numbers are derived from the statewide rate of mortality amenable to health care. Source: MDH, Health Economics Program analysis of the Minnesota Mortality Registry and the US Census Bureau's American Community Survey 2011-2015

Policy Implications

This study adds to other evidence linking social determinants of health to life expectancy in a state that does comparably well in terms of residents living long and healthy lives.

Quantifying the economic burden of these disparities for high-risk communities points to an urgency beyond the loss of emotional support, family integrity, and community history.

Identifying areas with possible barriers to timely and effective health care allows citizens, policymakers, public health officials, and health care providers to further explore community needs.

Limitations

This observational study does not show a causal relationship between poverty, race, and premature death—only a suggestive contribution to premature death.

Productivity loss can be unpredictable and decedents could have died of other causes or achieved different income levels. Therefore, a discount rate of 3% was applied per year of life lost.

Care should be taken when identifying mortality rates in specific census tracts to account for random variability in infrequent events, and rates with less than 20 events or a relative standard error of 23% or more are suppressed.