

Comparison of CDC and Hospital-Based Stroke Mortality Data in Kentucky: The Paul Coverdell National Acute Stroke Program

Christopher J McLouth¹, Aaron D Mullen¹, Lacy K Shumway¹, Kari D Moore², Brent L McKune¹, Larry B Goldstein¹

¹University of Kentucky, ²Regional Brain Institute



Introduction

Stroke Burden in Kentucky:

- Stroke is the fifth leading cause of death in the U.S. and a leading cause of long-term disability. Kentucky ranks among the worst states for stroke mortality, particularly in Appalachian and rural regions, highlighting the need for targeted intervention.

Paul Coverdell National Acute Stroke Program (PCNASP):

- PCNASP is a nationwide initiative aiming to improve stroke care quality by fostering partnerships between hospitals, public health entities, and communities. Participating hospitals contribute data to the GWTG-Stroke registry for tracking patient outcomes and quality metrics.

Gap Addressed by This Study:

- Despite quality improvement efforts, it remains unclear whether in-hospital stroke mortality reflects broader county-level disparities in stroke outcomes, especially in areas with high social deprivation.

Objectives

- Compare in-hospital mortality rates among patients from counties with high and low stroke mortality as defined by CDC data
- Investigate the impact of social deprivation on in-hospital outcomes
- Explore temporal trends in in-hospital stroke mortality from 2021-2023 in PCNASP-participating hospitals

Methods

Study Design:

- A retrospective cohort study examining stroke admissions at PCNASP hospitals in Kentucky. Data from the CDC (county-level mortality rates), GWTG-Stroke registry, and social deprivation were integrated to assess disparities.

Population:

- Inclusion: Adults aged 35+ admitted for stroke.
- Exclusion: Non-residents and patients with missing discharge data.

Key Variables:

- Independent: County-level stroke mortality risk (≥ 80.4 per 100k; high vs. low), social deprivation index tertiles (SDI; low, medium, high) measured by Robert Graham Center's SDI.
- Dependent: In-hospital mortality, discharge to hospice

Statistical Analysis:

- Linear mixed models accounted for county-level clustering and temporal effects.

Results

Key Findings:

1. High vs. Low Mortality Counties:

- No significant difference in in-hospital mortality rates between high and low-mortality counties ($p=.831$).
- No difference in in-hospital or discharge to hospice rates ($p=.804$).

2. Social Deprivation Index (SDI):

- In-hospital mortality did not vary across SDI tertiles ($p=.117$).
- Patients from high SDI counties had a higher likelihood of discharge to hospice care, indicating potential socioeconomic influence on post-discharge outcomes.

3. Temporal Trends:

- From 2021 to 2023, in-hospital stroke mortality showed a consistent decline across all counties ($p=.023$)

Conclusions

Equitable Outcomes:

- In-hospital stroke mortality rates were similar across PCNASP hospitals, regardless of patients' county-level stroke mortality risk or social deprivation.

Expand Quality Programs:

- Expanding stroke quality programs like GWTG-Stroke, Kentucky's SEQIP program, and the UK-Norton Healthcare Stroke Care Network to non-participating hospitals could help address care disparities.

Beyond Hospital Metrics:

- County-level stroke mortality includes out-of-hospital deaths, emphasizing the need for comprehensive public health efforts beyond hospital care.

Post-Discharge Disparities:

- Higher hospice discharge rates in high-SDI counties suggest socioeconomic factors influence post-discharge care.

Promising Trends:

- Declining in-hospital mortality (2021-2023) may reflect advances in stroke care and continuous quality improvement.

Call to Action:

- Public health efforts should focus on prevention, stroke symptom education, timely care access, and addressing socioeconomic barriers.

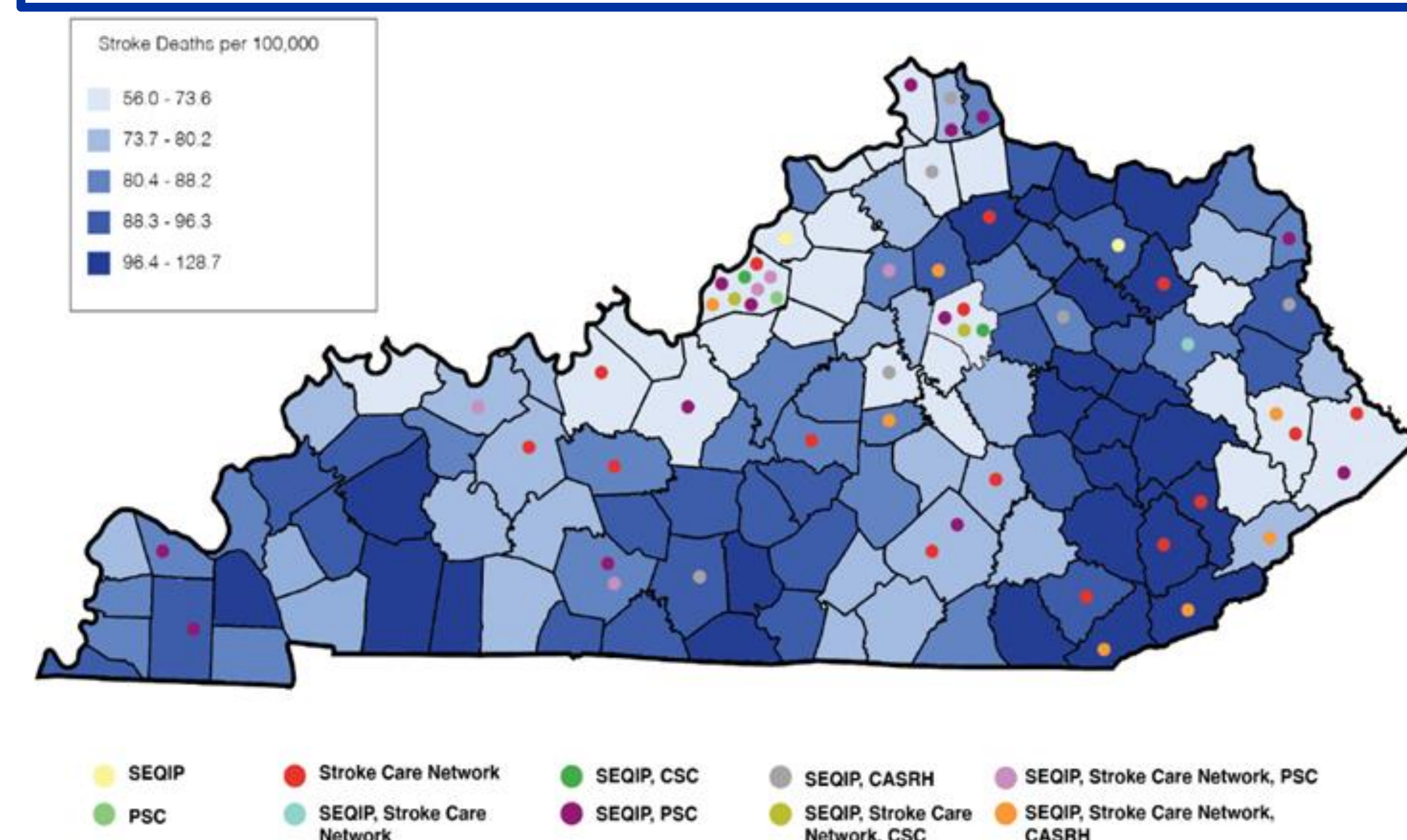


Figure 1. Kentucky Healthcare Organizations by Stroke Program Participation with County Stroke Death Rate per 100,000

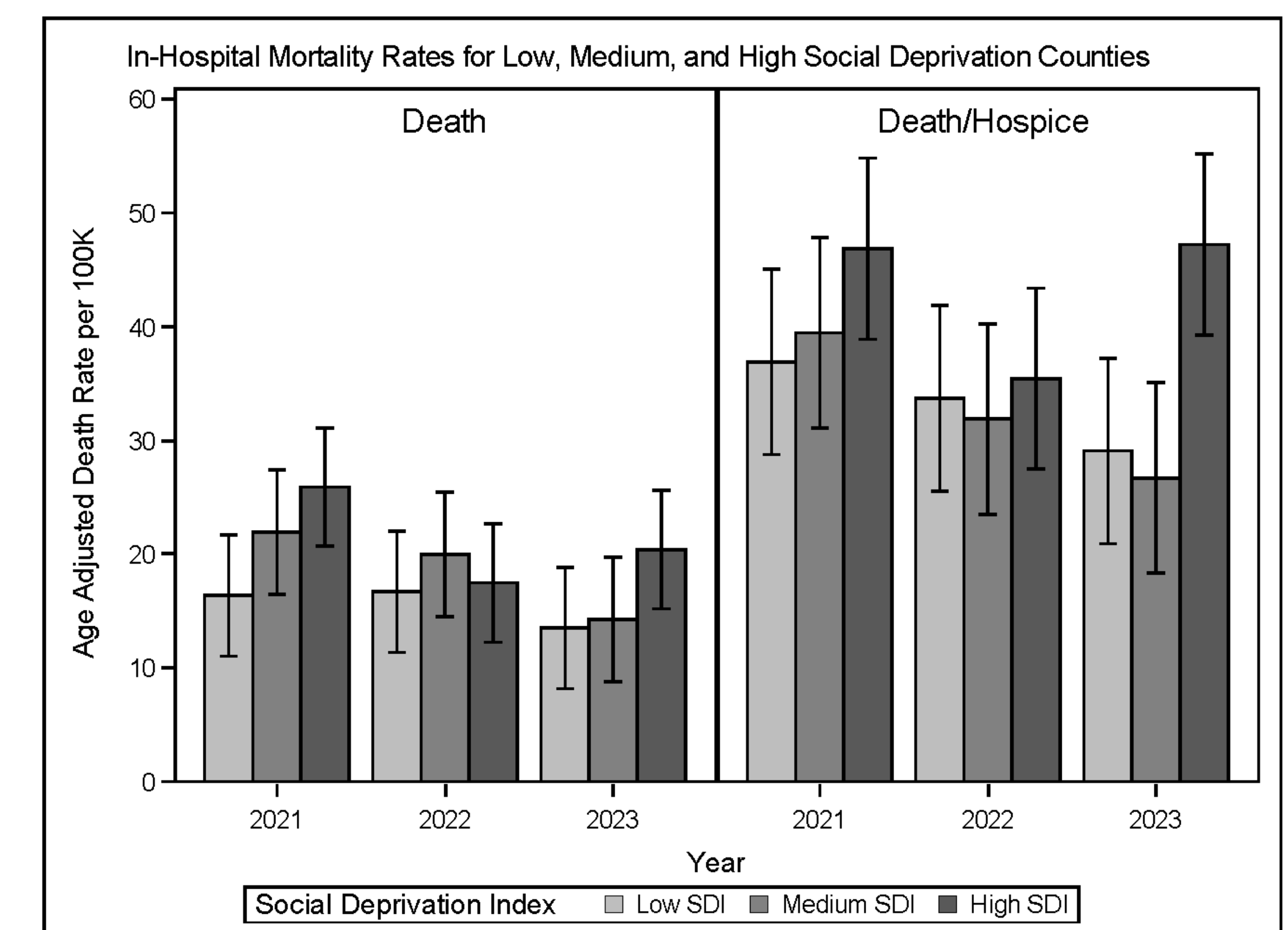
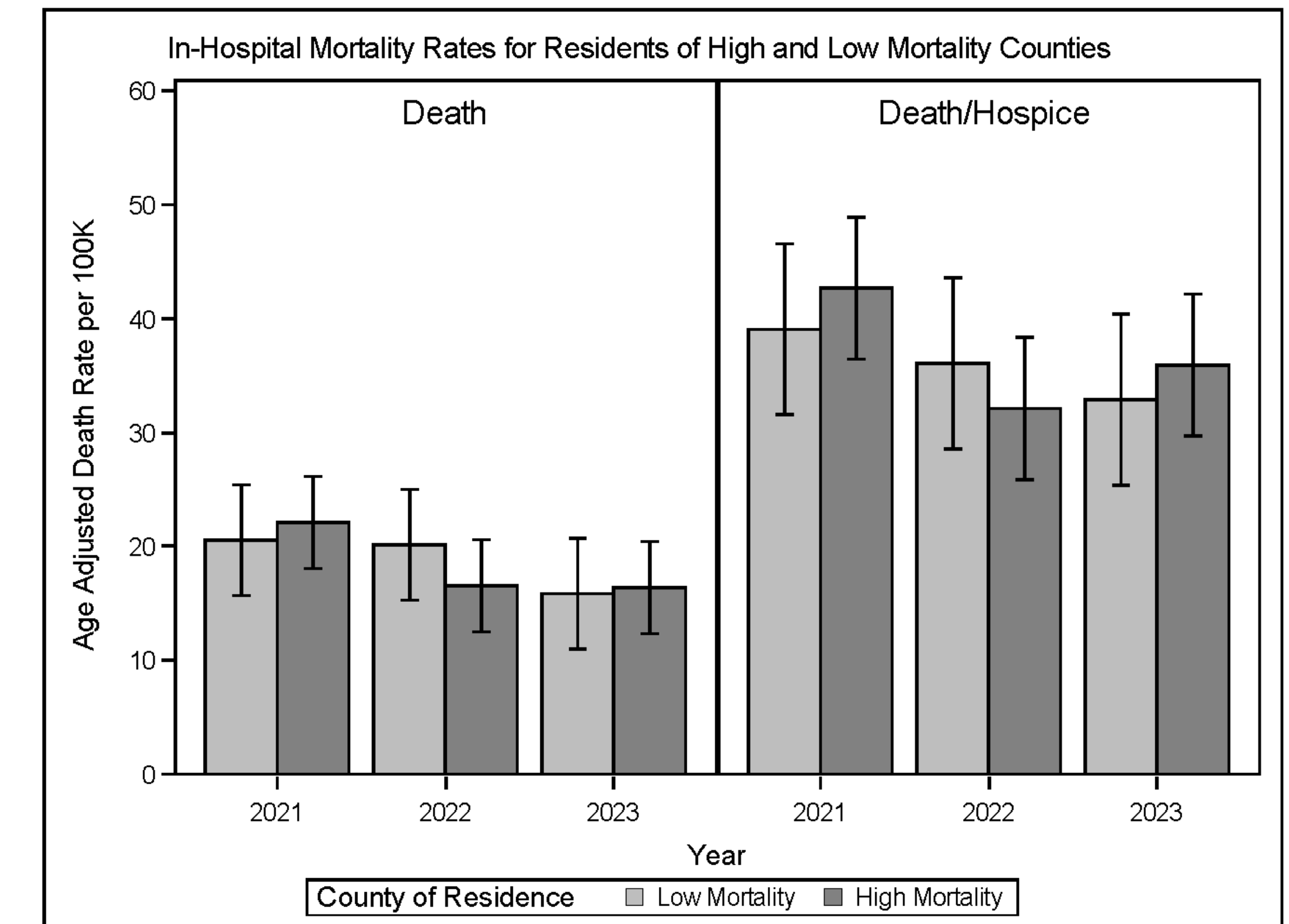


Figure 2. Comparison of age-adjusted in-hospital mortality or discharge to hospice rates (per 100,000 population) and associated 95% CIs between low and high-mortality counties (A) and by social deprivation tertile (B)

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Acknowledgments

This study was supported by the US Centers for Disease Control and Prevention as part of the Paul Coverdell National Acute Stroke Program (NU58DP006953). Get With The Guidelines-Stroke is funded by the American Heart Association and the American Stroke Association.