The Association of a Rural Hospital Closure with 30-Day Post Hospital Discharge Mortality from Selected Conditions

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BACKGROUND AND PURPOSE

- During the last decade, over 100 rural hospitals have closed in the United States[1].

- Concurrently, rural populations, compared to urban, are experiencing disparate trends in all-cause, cause-specific, premature, and in-hospital mortality rates[2-5].

- It is unknown what impact, if any, rural hospital closures will have on these mortality trends.

- 30-day post hospital discharge mortality is a CMS quality indicator that allows for the standardization of mortality outcomes across time and facility[6].

Purpose:
Our study examines, in one state, the association of rural hospital closure with 30-day post hospital discharge mortality for selected conditions impacted most by timely access to health care services.

METHODS

- Data were obtained for one Southeastern U.S. state from its all-payer claims database. 30-day post hospital discharge mortality was linked to individual encounters via the state's Vital Records department.

- Inpatient and emergency department (ED) patient encounters from study counties with ICD-9-CM diagnosis codes for acute myocardial infarction (AMI), stroke, sepsis, and trauma were included in the study.

- Study counties were chosen based on their rural community hospital status over the 60-month study period: *closure* occurred, *open* hospital, and *no* hospital. The closure county was identified first and statistical matching was used to identify four additional counties (2 with open hospitals, 2 with no hospital).

- Demographic characteristics of patients included age, gender, race, payment source, Charlson Index (co-morbidity score), and ED utilization during encounter.
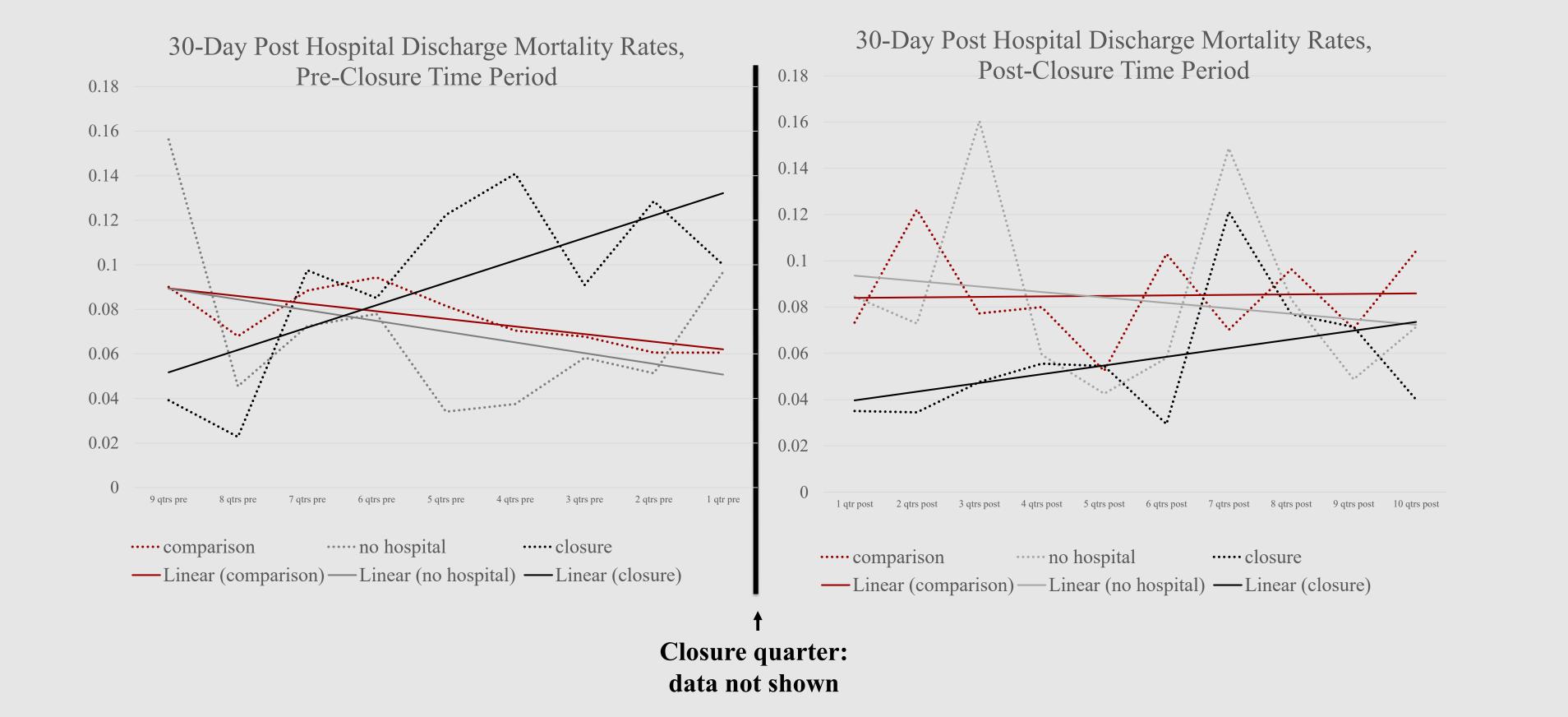
RESULTS

Pre-closure time period characteristics of study sample (n=3,029):

- 30-day post hospital discharge mortality = 7.8% (n=236)
- Mean age = 62.0
- Gender = 48.9% female
- Race = 52.6% white
- Emergency Care Sensitive Condition Diagnoses:
  - AMI = 20.3%
  - Stroke = 24.2%
  - Sepsis = 39.2%
  - Trauma = 16.3%
- Significant differences by county hospital closure status were found for race, payment source, Charlson Index score, ED utilization, and sepsis and trauma diagnoses; adjusted in multivariable analysis.

Patient characteristics associated with 30-day post hospital discharge mortality in pre-closure time period:

- Age (each additional year)
- Gender (female v. male)
- Medicare & Self-Pay payment sources (v. total)
- Charlson Index score (each incremental increase)
- ED utilization (yes v. no)
- Sepsis & Trauma Diagnoses (yes v. no)

30-Day Post Hospital Discharge Mortality Rates, Pre-Closure Time Period

30-Day Post Hospital Discharge Mortality Rates, Post-Closure Time Period

Closure quarter: data not shown

Key Findings

- *Logistic regression analyses showed no significant difference in 30-day post hospital discharge mortality rates between pre and post closure time periods in both unadjusted and adjusted models.*
- *However, for encounters from the closure county, the rate of change slows significantly in the post-closure time period in both unadjusted and adjusted models.*

DISCUSSION

- In our study, 30-day post hospital discharge mortality rates from selected conditions were associated with patient's county of residence hospital closure status.

- It is unknown whether this finding represents improved access for these conditions or increased pre-hospital / in-hospital mortality for residents of counties with these conditions experiencing rural hospital closure.

- Additional analyses are needed. This study only represents one state/one closure in the Southeastern U.S. The explicit impact on vulnerable populations should also be explored further.

ACKNOWLEDGEMENTS & REFERENCES

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