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

Melinda A. Merrell, MPH1,2, Janice Probst, PhD1, Kevin Bennett, PhD3, Bankole Olatosi, PhD1, Jeffrey Hall, MD3
University of South Carolina1, South Carolina Office of Rural Health2, University of South Carolina School of Medicine3

BACKGROUND AND PURPOSE

• During the last decade, over 100 rural hospitals have closed in the United States1.

• Concurrently, rural populations, compared to urban, are experiencing disparate trends in all-cause, cause-specific, premature, and in-hospital mortality rates2-3.

• 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 facility4.

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)

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.

REFERENCES & ACKNOWLEDGEMENTS


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.