# Mortality Worse At Critical Access Hospitals

John Gever

Adjusted death rates among Medicare patients in so-called critical access hospitals, located in rural areas, rose from 2002 to 2010 whereas mortality in other hospitals declined, researchers said.

After controlling for patient, hospital, and community factors, Medicare data on 30-day mortality rates for three major conditions at critical access hospitals showed an average annual 0.1% increase during the 9-year study period versus an annual decrease averaging 0.2% in other hospitals (difference 0.3%, 95% CI 0.2% to 0.3%, P<0.001), reported Karen Joynt, MD, MPH, of the Harvard School of Public Health, and colleagues.

The three conditions were acute myocardial infarction (MI), congestive heart failure, and pneumonia. At the 2002 baseline year, 30-day mortality rates in critical access and other hospitals for Medicare patients with these diagnoses were nearly the same -- 12.8% versus 13% after adjustments, respectively, the researchers noted in their report, appearing in the April 3 issue of the Journal of the American Medical Association.

By 2010, however, a gap of 1.8% favoring the noncritical access hospitals had opened up (P<0.001).

Although Joynt and colleagues noted that the Medicare data did not cover important potential confounders such as patients' smoking status and body mass index, the findings still suggest that critical access hospitals "have not kept pace with [other] hospitals because of the changing nature of hospital care and the inherent limitations critical access hospitals face in keeping up with new technology," they wrote.

"New policy initiatives may be needed to help these hospitals provide care for U.S. residents living in rural areas," Joynt and colleagues added.

But in an accompanying editorial, John P.A. Ioannidis, MD, DSc, of Stanford University in Stanford, Calif., argued that the Medicare data are too flawed and sparse to support any meaningful conclusions.

He applauded Joynt and colleagues for conducting "the best study to date on the important issue of outcomes at critical access hospitals." Nevertheless, it can only "minimally inform" decisions on what policies should be pursued at these hospitals or at the national level, Ioannidis wrote, because of the many unmeasured covariates, miscoding in the Medicare database, and other methodological constraints inherent in retrospective analyses of administrative data.

Before adopting any quality-improvement interventions suggested by such studies,

Ioannidis urged, they should be tested first in cluster-randomized trials.

The critical access hospital program began in 1997 in an effort to stem a rising tide of rural hospital closures, Joynt and colleagues explained. Hospitals with 25 beds or less that were located at 35 miles from the nearest other inpatient facility could qualify for reimbursements of 101% of cost, with exemption from prospective payments. These hospitals were also excused from participating in national quality improvement programs, the researchers noted.

In the study, Joynt and colleagues drew on data from critical and noncritical access hospitals from 2002 to 2010. In the baseline year, there were 860 critical access hospitals treating 34,098 patients with the three conditions. In 2010, the data covered 1,264 critical access hospitals and 62,539 patients.

Corresponding data for noncritical access hospitals in 2002 were 3,108 hospitals and 1.39 million patients; in 2010, there were 3,255 such hospitals and about 970,000 patients.

The researchers adjusted the 30-day mortality data for patient age, race, gender, and comorbid conditions; hospital characteristics including ownership, bed number, and teaching status; and community characteristics such as median income and physician supply.

For each of the three diagnoses examined in the study, adjusted 30-day mortality rates were nearly the same in critical access hospitals versus others at baseline. The gap emerged over time primarily for those with acute MI and heart failure, whereas mortality rates in patients admitted for pneumonia remained similar.

In the acute MI population, adjusted 30-day mortality was just under 20% in both hospital types. By 2010, though, it reached 24% in critical access hospitals, compared with a decline to 15% in the noncritical access facilities.

Mortality among congestive heart failure patients in critical access hospitals increased from about 12% in 2002 to 14% in 2010, whereas it decreased from 12% to about 10.5% by 2010 in the other hospitals.

When the researchers performed a matched analysis, comparing death rates in critical access hospitals only with other small hospitals located in rural areas, 30-day mortality still was significantly higher in the critical access hospitals, by 1.5 percentage points (95% CI 1.2 to 1.7 points, $P<0.001$).

On the other hand, nearly half of critical access hospitals showed improvements in 30-day mortality during the study period. Among other hospitals, 68% showed improvements.

In addition to suggesting that critical access hospitals lacked the resources to keep up with other institutions in technology and care quality improvements, Joynt and colleagues argued that the critical access program itself might share in the blame.

They pointed out that these facilities are exempt from collecting and reporting performance data required for other hospitals.

"Alternatively, it is possible that the [101% reimbursement] mechanism is associated with a lack of improvement because cost-based reimbursement may remove incentives to pursue efficiency," Joynt and colleagues wrote.

They noted several limitations to the analysis, including lack of data on possible social factors (such poverty and unemployment at the patient level) as well as clinical characteristics that might account for some of the mortality differences. Also, the Medicare hospital data could not account for additional factors such as travel time, availability of post-discharge care, and specialist follow-up that also may have affected outcomes.

In all, Joynt and colleagues estimated, their statistical models could explain only 7% to 12% of the variation in 30-day mortality rates for each of the three principal diagnostic categories in 2010.