CHSR Center for Health Services Research
Applying Research to Optimize Care©

What We Are Reading

Synopses of recent studies in health services research
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Community Factors and Hospital Readmission Rates

Take Away Points

- 58% of national variation in hospital readmission rates appears attributable to county characteristics including: the number of general practitioners *per capita*, NCHS urban rural classification, percentage of residents never married, number of Medicare beneficiaries *per capita*, and low education area status.
- Hospital readmission rates might be more effectively reduced if community-based readmission reduction strategies are added to ongoing, hospital-focused improvement efforts.

The Issue

Since 2013, Medicare linked hospital reimbursement payments to hospital performance on risk-standardized 30-day readmission rates for acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PN); and added COPD and joint replacement in FY2015. Penalties for elevated readmission rates prompted hospitals across the U.S. to initiate efforts to reduce 30-day readmission rates. Hospital-based programs such as BOOST (http://www.hospitalmedicine.org/Web/Quality_Innovation/Implementation_Toolkits/Project_BOOST/Web/Quality___Innovation/Implementation_Toolkit/Boost/Overview.aspx and RED (http://www.bu.edu/fammed/projectred/) are effective at reducing readmission rates and improving patient care. Yet, to succeed optimally, hospital leaders must understand and address all the causes of variation in 30-day readmission rates. While prior research showed that hospital characteristics such as bed size and teaching status explain some of the variation, other studies emphasize the effect of patient sociodemographic factors such as race, health literacy, and social support. To date, little research documents how community factors might influence readmission rates of hospitals.

Source
Herrin, Jeph, et al. "Community factors and hospital readmission rates."*Health Services Research* 50.1 (2015): 20-39. http://onlinelibrary.wiley.com/doi/10.1111/1475-6773.12177/epdf

Study Methods and Design

For this observational study, publicly reported hospital readmission rates from CMS Hospital Compare (HC) (Hospital Compare 2012) were linked with hospital and county data from a number of sources. County was used as the unit of community for study purposes, due to the wide range of data available at the county level and the exploratory nature of this investigation. Hospital data was collected from the 2010 American Hospital Association (AHA) Annual Survey database, the 2010 Health Resources and Services Administration's Area Resource File (ARF) and CMS Nursing Home Compare (NHC) 2012. Additional county measures were constructed from the 2010 Nielsen PopFacts dataset (Pop-Facts Premier 2010).

The study investigators developed a conceptual model of patient level factors, access to care, and nursing home measures as influencing the likelihood of readmission. This model was used to identify measures for the analysis. Moreover, they hypothesized that the likelihood of hospital readmission for a patient residing in a given community would be only partially explained by the hospital discharging the

patient, and that in addition to patient-risk factors normally adjusted for in readmission models there would be contributions from (1) sociodemographic characteristics, (2) access to care, and the (3) number and quality of nursing homes in a county. These three characteristics were evaluated separately to identify which had the most influence on readmission rates before they were combined in analysis. Publicly reported CMS risk-standardized 30-day hospital readmission rates for patients with AMI, HF, and PN from July 1, 2007 to June 30, 2010 were included. Rates were pooled for each hospital, and an estimate of the standard error for the pooled readmission rate was performed. Federal Information Processing Standard (FIPS) code was used to define the county or county equivalent. Hospitals were linked using Medicare provider numbers or FIPS codes to the 2010 AHA Annual Survey to obtain ownership type, teaching status, bed size, and percentage of Medicaid admissions. The 2009 ARF was used to obtain population, number of Medicare beneficiaries, number of general practitioners, and number of specialists for each FIPS county code. Nursing home data was obtained from the CMS NHC (2011). Nielsen Pop-Facts Premier (2010) database was used to obtain percentages of adults never married, adults 65 or older, families below poverty level, and a zip-code level measure of socio-economic status.
Lastly, the 2006 NCHS Urban-Rural Classification Scheme for Counties was used to classify each county according to urbanization as follows: large central metro, large fringe metro, medium metro, small metro, micropolitan, and rural.
The primary analysis did not include hospital characteristics because hospital characteristics and community factors frequently correlate (e.g. smaller bed size with rural location). However, a secondary analysis assessed whether any community effects were diminished by hospital characteristics.

Key Findings and Limitations

- 4, 073 hospitals located in 2,254 counties were used in the study sample. Before accounting for any hospital or county characteristics, 58 percent of the national variation in hospital pooled readmission rates was attributable to the county where the hospital was located.

"Individual hospital performance accounts for 42 percent of the variation in pooled readmission rates across the U.S."

- In multivariate analysis, several county characteristics were independently associated with higher readmission rates, with the strongest associations related to measures of access to care.
- Accounting for hospital ownership, bed size, teaching status, safety-net status, and patient socioeconomic (SES) status did not substantially affect these results.
- Limitations: As an observational study, associations cannot be interpreted as causal. Second, readmission rates for HF, AMI, and PN conditions were the only conditions examined in the pooled readmission data. In addition, the use of county as a measure of community was one of convenience and real-life conditions might vary significantly within urban counties and across hospitals within those counties.

Final Thoughts

- The majority of unexplained variation in hospital readmission rates can be attributed to county characteristics including: LIST
- Hospital factors such as ownership, teaching status, bed size, safety-net status and patient SES contribute little to the variation in rates of readmission
- The findings from this study indicate that CMS reimbursement adjustments and incentives at the hospital level will lead to marginal improvements in readmission rates.
- Effective health policy should be directed at the entire system of care rather than hospitals alone, including primary care and nursing home quality.