

ONLINE APPENDIXES

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**Medicare's role in  
supporting and motivating  
quality improvement**

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ONLINE APPENDIX

# 3-A

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## **Data and methods**

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We identify hospitals in the highest quintile of risk-adjusted readmission rates for 2005–2007 and compare them with hospitals in the remaining four quintiles. The readmission measure, developed by 3M, adjusts for the severity of the patient’s illness and removes clearly unrelated readmissions such as certain malignancies and trauma (3M Health Information Systems 2008, Goldfield et al. 2008). We measure readmissions from 2005 through 2007 and identify hospitals in the top quintile of readmission rates for all three years. Roughly 400 hospitals meet this criterion. This and other hospital-level readmission estimates are sensitive to the risk-adjustment methodologies used.

We examine hospitals with high risk-adjusted readmission rates to assess whether they serve a larger proportion of minority Medicare beneficiaries than hospitals with lower risk-adjusted readmission rates. To identify the racial mix of Medicare beneficiaries admitted, we use Medicare Provider Analysis and Review (MEDPAR) data from 2007. From these data, we calculate the number and percentage of minority Medicare beneficiaries admitted to each hospital.<sup>1</sup> This approach mirrors that of previous research analyzing hospital-level racial mix (Jha et al. 2007, Jha et al. 2008). We also attempt to control for “frequent flyer” patients—those who may have had multiple admissions to the same hospital in a given year—by calculating the number and percentage of unique Medicare beneficiaries by race and ethnicity admitted to each hospital. Our results did not vary based on counts and percentages of total admissions or unique beneficiaries.

We also examine hospitals with high risk-adjusted readmission rates to assess whether they serve a larger proportion of socioeconomically disadvantaged Medicare beneficiaries than hospitals with lower risk-adjusted readmission rates. There is no accepted source of national hospital-level data on the socioeconomic status of patients served. To understand the socioeconomic status of patients at hospitals with consistently high readmission rates, we use the Medicare disproportionate share hospital (DSH) percentage as a proxy. CMS assigns each hospital a value based on its fraction of Medicare beneficiaries eligible for Supplemental Security Income and its fraction of patients with Medicaid coverage. We use the DSH percentage from the 2007 impact file and use this measure in two well-precedented ways (Jha et al. 2009). First, we use the DSH percentage as a continuous variable. Second, we categorize all hospitals into quartiles by DSH percentage to ascertain whether the highest readmission hospitals are more or less likely than their lower readmission counterparts to be in the top quartile for DSH percentage. Both constructions of the DSH percentage measure are imperfect proxies for the number of poor patients at a hospital.

Additionally, we link our data set with the American Hospital Association survey, which has hospital-level information on urban or rural location, for-profit or nonprofit status, bed size, membership in the Council of Teaching Hospitals, and percentage of Medicare and Medicaid days. ■

## Endnotes

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- 1 For each hospital, we calculated the admittance volume and proportion of white, African American, Hispanic, Asian, and North American Native beneficiaries as identified by the MEDPAR 2007 data. We also constructed an all-minority volume and proportion by aggregating all non-white and non-unknown observations.

## References

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3M Health Information Systems. 2008. *Potentially preventable readmissions classification system*. Murray, UT: 3M.

Goldfield, N. I., E. C. McCullough, J. S. Hughes, et al. 2008. Identifying potentially preventable readmissions. *Health Care Financing Review* 30, no. 1 (Fall): 75–91.

Jha, A. K., E. J. Orav, Z. Li, et al. 2007. Concentration and quality of hospitals that care for elderly black patients. *Archives of Internal Medicine* 167, no. 11 (June 11): 1177–1182.

Jha, A. K., E. J. Orav, J. Zheng, et al. 2008. The characteristics and performance of hospitals that care for elderly Hispanic Americans. *Health Affairs* 27, no. 2 (March–April): 528–537.

Jha, A. K., D. C. Chan, A. B. Ridgway, et al. 2009. Improving safety and eliminating redundant tests: Cutting costs in U.S. hospitals. *Health Affairs* 28, no. 5 (September–October): 1475–1484.

