

# States With More Health Care Spending Have Better-Quality Health Care: Lessons About Medicare

Health care spending is an important contributor to quality, but the determinants of quality reach more deeply into a community's sociodemographic fabric.

by **Richard A. Cooper**

**ABSTRACT:** Based on broad measures of health system quality and performance, states with more total health spending per capita have better-quality care. This fact contrasts with a previous finding that states with higher Medicare spending per enrollee have poorer-quality care. However, quality results from the total funds available and not from Medicare or any single payer. Moreover, Medicare payments are disproportionately high in states that have a disproportionately large social burden and low health care spending overall. These and other vagaries of Medicare spending pose critical challenges to research that depends on Medicare spending to define regional variation in health care. [*Health Affairs* 28, no. 1 (2009): w103–w115 (published online 4 December 2008; 10.1377/hlthaff.28.1.w103)]

HEALTH CARE SPENDING CONTINUES TO GROW at a pace that exceeds the overall rate of economic expansion. This creates an ever-stronger imperative to understand the dynamics of its growth and the value of this spending. An important source of information that bears on this problem is the extensive base of Medicare administrative data maintained by the Centers for Medicare and Medicaid Services (CMS).<sup>1</sup> Drawing on this source, researchers associated with the *Dartmouth Atlas* project have found much variation in Medicare spending per enrollee across regions of the country and have concluded that higher spending is not associated with better-quality health care.<sup>2</sup> Indeed, at the state level, more Medicare spending per enrollee is associated with poorer health care quality.<sup>3</sup>

The notion that quality is poorer in the face of more health care spending is extremely important. But is it correct? Answering this question requires answering

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three. First, does Medicare spending provide a valid assessment of health care spending overall? Second, are commonly used “quality” standards valid measures of the value of health care spending? And third, is regional variation in Medicare spending a valid tool for assessing the dynamics of the health care system?

The answer to the first question is “no.” Medicare spending per enrollee correlates poorly with total health care spending per capita.<sup>4</sup> Although “quality,” as measured by broad indices, correlates negatively with Medicare spending, this paper shows that quality is better in states with higher total per capita health care spending. Medicare cannot be used as a proxy for health care spending overall.

The answer to the second question is also “no.” Although more health care spending correlates with better quality, causality between health care spending and quality should not be inferred, since, as described below, both spending and quality also correlate with a host of other parameters that reflect the sociodemographic context in which health care resides.

And finally, is regional variation in Medicare spending a valid metric of health system performance? The answer, again, is “no,” which calls into question the vast array of studies that depend on cross-sectional analyses of Medicare spending to assess regional variation in health care.

## **Study Data And Methods**

Estimates of health care spending for 2000 and 2004 were obtained from the CMS, and data on spending for 2000 were also obtained from Katherine Baicker.<sup>5</sup> The latter had been adjusted for age, sex, race, and cost of living. Population estimates were from the Census Bureau, and estimates of per capita income were from the Bureau of Economic Analysis.<sup>6</sup> Data at the state level concerning race and ethnicity, economic status, mortality rates, poverty rates, insurance status, K–12 education spending, prison incarceration rates, and related sociodemographic characteristics were obtained from the Commonwealth Fund, the Henry J. Kaiser Family Foundation, the Census Bureau, and other public sources.<sup>7</sup> Relationships were analyzed by means of linear regressions and expressed as Pearson correlation coefficients.<sup>8</sup> All correlations that were not significant at the 0.05 level are so indicated. In general, correlations above 0.30 were significant at the 0.01 level, and correlations between 0.25 and 0.30 were significant at the 0.05 level.

Quality was expressed as state rankings of health system performance, as developed by Stephen Jencks and colleagues and used in the previous study by Baicker and Amitabh Chandra, and as developed by the Commonwealth Fund for its recent State Scorecard.<sup>9</sup> The Jencks quality rankings for 1998 and 2000, which correlated closely with each other ( $r = 0.91$ ), were averaged. Most items in the Jencks scale relate to screening and prevention or to processes of care (for example, appropriate use of discharge medications), and only one-third relate directly to medical care for conditions such as heart disease, stroke, or pneumonia. Similarly, most items in the Commonwealth Fund’s scale, which was constructed from data

gathered in 2006, relate to screening, prevention, access, referral, satisfaction, equity, and custodial care, and only a few, such as postoperative care and the treatment of acute myocardial infarction (AMI), congestive heart failure (CHF), and pneumonia, relate directly to the goals of most health care expenditures. The similarity of the Jencks and Commonwealth scales is evident by the strong correlation between the state quality rankings obtained with each ( $r = 0.85$ ). Both ranking systems assign higher numbers to states with poor quality. Therefore, positive correlations between spending and quality would indicate that more spending is associated with lesser quality.

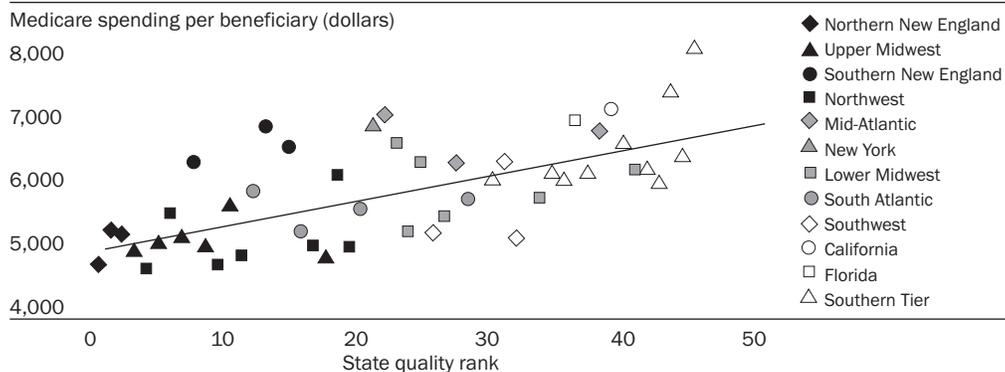
For descriptive purposes, states were grouped as follows: Northern New England (ME, NH, VT); Southern New England (MA, CT, RI); Mid-Atlantic (NJ, PA, MD); Upper Midwest (WI, MN, IA, ND, SD, NE); Northwest (WA, OR, UT, ID, MT, WY, CO); Lower Midwest (KS, MO, IN, IL, MI, OH); South Atlantic (DE, VA, NC, SC); Southern Tier (WV, TN, KY, GA, AL, AR, MS, LA, OK, TX); and Southwest (AZ, NV, NM). Because of their size and prominence, California, Florida, and New York are shown individually. The District of Columbia, Alaska, and Hawaii were excluded.

## Study Results

■ **Quality and Medicare spending.** Using the Jencks quality scale and adjusted Medicare spending data from 2000, we observed a strong correlation between Medicare spending per enrollee and state quality rankings ( $r = 0.65$ ; Exhibit 1), with poorer quality associated with higher spending, as previously reported.<sup>10</sup> Similar correlations between spending and quality, as measured by the Jencks scale, were

### EXHIBIT 1

#### Quality And Medicare Spending Per Beneficiary, By Census Region, 2000



**SOURCES:** Medicare spending data from 2000, adjusted for age, sex, race, and cost of living, were obtained from Katherine Baicker and were previously published: K. Baicker and A. Chandra, "Medicare Spending, the Physician Workforce, and Beneficiaries' Quality of Care," *Health Affairs* 23 (2004): w184-w197. Quality rankings are the averages from S.F. Jencks et al., "Quality of Medical Care Delivered to Medicare Beneficiaries," *Journal of the American Medical Association* 284, no. 13 (2000): 1670-1676; and S.F. Jencks, E.D. Huff, and T. Cuerdon, "Change in the Quality of Care Delivered to Medicare Beneficiaries, 1998-1999 to 2000-2001," *Journal of the American Medical Association* 289, no. 3 (2003): 305-312.

**NOTES:** Correlation coefficient = 0.65. Lower numbers on the quality rank indicate better quality.

observed with unadjusted Medicare spending data from both 2000 and 2004, and significant correlations between more Medicare spending and poorer state quality rankings were also obtained using the Commonwealth quality scale (Exhibit 2). Thus, over a period of years and with two different (although overlapping) quality scales, there was a consistent association between more Medicare spending per enrollee and poorer state quality rankings.

■ **Quality and total health care spending.** A very different picture emerges when state quality rankings are compared with total health care spending per capita. Using unadjusted spending data from 2004, we observed strong correlations between total per capita spending and better quality, with either the Jencks or the Commonwealth scales (Exhibit 2). Note that because better quality is associated with a lower numerical ranking, the signs of these correlations are negative. Correlations were even stronger when Medicare spending and enrollees were excluded and spending per capita for the non-Medicare portion of the population was compared with quality, using the Jencks ( $r = -0.47$ ) or Commonwealth ( $r = -0.62$ ) scales (Exhibits 2 and 3). Thus, while more Medicare spending is associated with poorer health care quality at the state level, more non-Medicare spending and more total

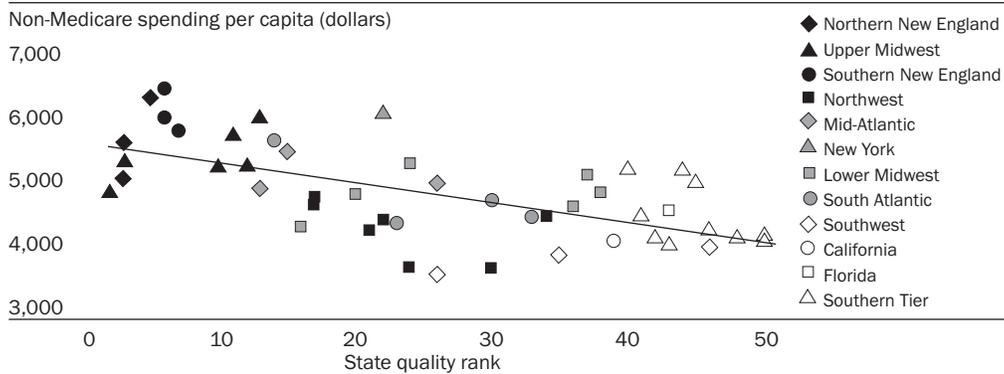
**EXHIBIT 2**  
**Health Care Spending Correlations**

	Medicare 2000 (adjusted)	Medicare 2000 (unadjusted)	Medicare 2004 (unadjusted)	Non- Medicare 2004 (unadjusted)	Total 2004 (unadjusted)	Ratio 2004
Jencks quality rank	0.65	0.53	0.44	-0.47	-0.34	0.69
Commonwealth quality rank	0.41	0.28	0.25	-0.62	-0.51	0.64
Percent black plus Latino	0.59	0.59	0.52	-0.46	-0.34	0.76
Percent non-Hispanic white	-0.56	-0.53	-0.45	0.44	0.34	-0.69
Percent poverty	0.26 <sup>a</sup>	0.10 <sup>a</sup>	0.03 <sup>a</sup>	-0.41	-0.37	0.35
Percent DSH	0.42	0.46	0.40	-0.17 <sup>a</sup>	-0.04 <sup>a</sup>	0.45
Percent employer-sponsored health insurance	-0.25 <sup>a</sup>	0.01 <sup>a</sup>	0.09 <sup>a</sup>	0.39	0.38	-0.27
Medicaid spending per enrollee	0.00 <sup>a</sup>	0.12 <sup>a</sup>	0.10 <sup>a</sup>	0.73	0.70	-0.49
Percent uninsured	0.38	0.22 <sup>a</sup>	0.30	-0.62	-0.56	0.60
Percent of adults with usual source of care	-0.05 <sup>a</sup>	0.13 <sup>a</sup>	0.13 <sup>a</sup>	0.55	0.56	-0.36
Infant mortality rate	0.32	0.25	0.29	-0.27	-0.17 <sup>a</sup>	0.39
Preventable mortality rate, white	0.46	0.38	0.37	-0.25	-0.14 <sup>a</sup>	0.46
Preventable mortality rate, black	0.52	0.34	0.36	-0.22	-0.13 <sup>a</sup>	0.45
K-12 spending per pupil	0.21	0.38	0.22	0.68	0.66	-0.37
Prison incarceration rate	0.57	0.53	0.45	-0.30	-0.20 <sup>a</sup>	0.60

**SOURCES:** See Notes 5, 6, and 7 in text.

**NOTES:** Correlations are expressed as Pearson coefficients. DSH is disproportionate-share hospital.

<sup>a</sup> Not significant at alpha = 0.05.

**EXHIBIT 3****Quality And Non-Medicare Spending Per Capita, By Census Region, 2004**

**SOURCES:** Health spending data for 2004 were obtained from Centers for Medicare and Medicaid Services, "Health Expenditures by State of Provider, 1991–2004," September 2007, [http://www.cms.hhs.gov/NationalHealthExpendData/05\\_NationalHealthAccountsStateHealthAccounts.asp](http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccounts.asp) (accessed 8 October 2008). Quality rankings were obtained from Commonwealth Commission on a High Performance Health System, *Aiming Higher—Results from a State Scorecard on Health System Performance* (New York: Commonwealth Fund, 2007).

**NOTES:** Correlation coefficient = 0.62. Lower numbers on the quality rank indicate better quality.

spending are associated with better quality.

The fact that Medicare and non-Medicare spending behave differently with respect to quality is reflected most simply in the associated fact that although both sources of reimbursement vary among states by approximately 30 percent, the relationship between the two channels of payment was not significant ( $r = 0.19$ ), as noted previously.<sup>11</sup>

This pattern of divergence extends to other health-related parameters. For example, preventable mortality among both blacks and whites is greater in states with higher Medicare spending and less in states with higher non-Medicare spending (Exhibit 2). Infant mortality follows the same pattern. More adults in states with higher non-Medicare spending report having a usual source of care ( $r = 0.55$ ), while there is no association between Medicare spending and the existence of a usual source of care. Correspondingly, the frequency with which Medicare patients obtain timely mammography correlates positively with non-Medicare spending ( $r = 0.44$ ) and negatively with Medicare spending ( $r = -0.37$ ).<sup>12</sup>

**■ Regional relationships.** These differences in Medicare and non-Medicare spending and their relation to quality are not randomly distributed geographically. Rather, they follow distinct regional patterns (Exhibits 1 and 3). Quality is best in New England, the Upper Midwest, and the Northwest, and it is poorest in the Southern Tier states, extending from Georgia and Florida across to Texas and Oklahoma, and in California.

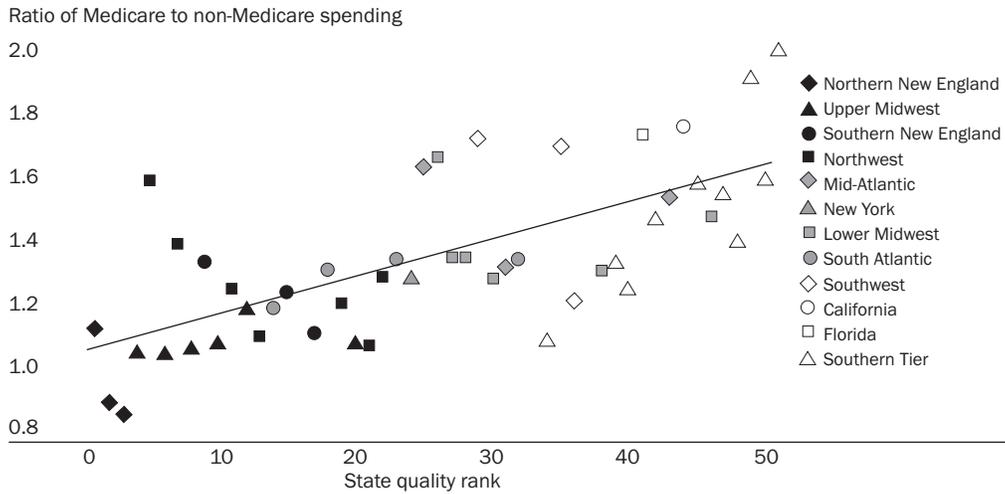
Medicare spending is lowest in Northern New England and the Upper Midwest, where quality is high, and these states have among the highest non-Medicare spending. Conversely, Medicare spending are highest in the Southern

Tier states and in California, where quality is poor, and these states have among the lowest rates of non-Medicare spending. Also, Southern New England and New York, where quality is average to high, have high spending through both Medicare and non-Medicare channels, whereas the Northwest, with similar quality, has lower spending through both channels.

The contrast between Medicare and non-Medicare spending in relation to quality was most pronounced when the data were expressed as a correlation between quality and the ratio of Medicare to non-Medicare spending (Exhibits 2 and 4). Ratios closest to 1.0 tend to be associated with the best quality, and they were found in Northern New England and the Upper Midwest (Exhibit 4). Conversely, ratios closest to 2.0, representing disproportionate Medicare spending, were found principally in the South, and they were associated with the poorest quality. The overall polarity displayed in Exhibit 3 starkly separates regions of the country in terms of spending patterns and quality.

■ **Medicare versus non-Medicare spending.** Exhibit 5 independently displays Medicare and non-Medicare spending in the various states. Four general patterns were observed: low/low—states that had both low Medicare and low non-Medicare spending were principally in the Northwest, Southwest, and South Atlantic regions. High/high—states with high levels of spending through both channels included New York and Southern New England. Low Medicare/high non-Medicare—like Southern New England, Northern New England had high levels of non-Medicare

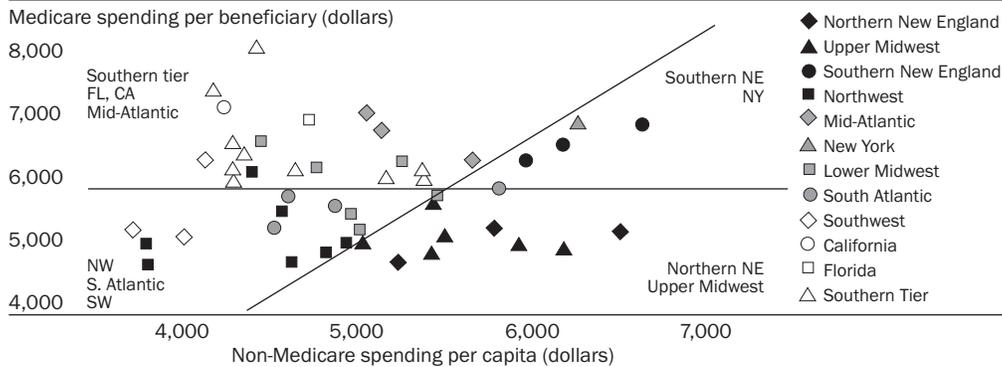
**EXHIBIT 4**  
**Quality And Ratio Of Medicare To Non-Medicare Spending, By Census Region, 2004**



**SOURCES:** Health spending data for 2004 were obtained from Centers for Medicare and Medicaid Services, "Health Expenditures by State of Provider, 1991–2004," September 2007, [http://www.cms.hhs.gov/NationalHealthExpendData/05\\_NationalHealthAccountsStateHealthAccounts.asp](http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccounts.asp) (accessed 8 October 2008). State quality rankings were obtained from Commonwealth Commission on a High Performance Health System, *Aiming Higher—Results from a State Scorecard on Health System Performance* (New York: Commonwealth Fund, 2007).

**NOTES:** Correlation coefficient = 0.69. Lower numbers on the quality rank indicate better quality.

**EXHIBIT 5**  
**Medicare Spending Per Beneficiary And Non-Medicare Spending Per Capita, By**  
**Census Region, 2004**



**SOURCES:** Health spending data for 2004 were obtained from Centers for Medicare and Medicaid Services, "Health Expenditures by State of Provider, 1991–2004," September 2007, [http://www.cms.hhs.gov/NationalHealthExpendData/05\\_NationalHealthAccountsStateHealthAccounts.asp](http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccounts.asp) (accessed 8 October 2008).

spending, but Medicare spending was low, and this pattern was also found in the Upper Midwest. High Medicare/low non-Medicare—a pattern of higher Medicare spending in association with lower non-Medicare spending was found in states within the Southern Tier, including Florida; in California; and in the populous Mid-Atlantic states.

Thus, high Medicare spending tends to follow a band extending from the California across the Southern Tier and up the East Coast through New York into Southern New England, a pattern that is evident both at the state level and at the level of Hospital Referral Regions (HRRs).<sup>13</sup> However, because Medicare and non-Medicare spending vary independently, some states with high levels of Medicare spending have low levels of non-Medicare spending, whereas others have high levels of both. Examples of the former include Texas, Louisiana, Florida, and Mississippi, while examples of the latter include Massachusetts, Connecticut, and New York. Aggregating and averaging individuals from these high-Medicare-spending states, some with high total spending and other with low total spending, as has been done in studies reported by the Dartmouth group, creates unintelligible units of observation.<sup>14</sup>

■ **Sociodemographic correlates.** Insight into the causes of this divergence between Medicare and non-Medicare spending is provided by various sociodemographic correlates. States with higher non-Medicare spending tended to have lower percentages of blacks and Latinos and higher percentages of non-Hispanic whites; lower percentages of individuals below the poverty level and higher percentages of workers in professional and technical jobs; and lower percentages of uninsured people and higher percentages covered by employment-sponsored health insurance (Exhibit 2). Conversely, states with higher Medicare spending per enrollee tended to have larger percentages of individuals who are black and Latino and smaller per-

centages who are non-Hispanic white; higher percentages of uninsured people; and, correspondingly, higher percentages of Medicare reimbursement based on disproportionate-share hospital (DSH) funding. Assessing relationships such as these in terms of the ratio of Medicare to non-Medicare spending yielded even stronger correlations (Exhibit 2). Examples include the positive correlations between the Medicare to non-Medicare ratio and the states' percentages of blacks and Latinos ( $r = 0.76$ ) and uninsured people ( $r = 0.60$ ).

Additional insight into community differences that correspond to Medicare and non-Medicare reimbursement can be found by examining characteristics that reflect other aspects of a community's social strengths. Two such characteristics are its investment in K-12 education and its rates of prison incarceration. Non-Medicare spending correlated strongly and positively with per pupil spending for K-12 education ( $r = 0.68$ ) and negatively with per capita rates of prison incarceration, whereas Medicare spending per enrollee correlated weakly with K-12 expenditures but had a strong and positive correlation with prison incarceration rates (Exhibit 2).

■ **Sociodemographic correlates of quality.** Demographic characteristics, such as those described above, relate independently to quality (Exhibit 6). For example, quality is poorer in states where higher percentages of the population are black and Latino, uninsured, in poverty, and in prison; and mortality is higher in such states by

**EXHIBIT 6**  
**Health Care Quality Correlations**

	Jencks quality rank	Commonwealth quality rank
Percent black plus Latino	0.65	0.56
Percent non-Hispanic white	-0.63	-0.51
Percent poverty	0.60	0.58
Percent Medicare disability	0.48	0.58
Percent DSH	0.58	0.50
Percent uninsured	0.60	0.75
Medicaid spending per enrollee	-0.45	-0.58
Percent employer-sponsored health insurance	-0.49	-0.62
Percent adults with usual source of care	-0.30	-0.51
K-12 spending per pupil	-0.31	-0.53
Prison incarceration rate	0.59	0.46
Per capita income	-0.33	-0.51
Age-adjusted mortality, all	0.66	0.75
Age-adjusted mortality, white	0.63	0.76
Age-adjusted mortality, black	0.58	0.55
Infant mortality rate	0.58	0.55
Preventable mortality rate, white	0.72	0.71
Preventable mortality rate, black	0.64	0.53

**SOURCES:** See Notes 5, 6, and 7 in text.

**NOTES:** Correlations are expressed as Pearson coefficients. DSH is disproportionate-share hospital.

all measures. Conversely, quality is better in states where higher percentages of populations are non-Hispanic white, where more have employment-sponsored insurance, and where more is spent on K–12 education. Per capita income correlates positively with better quality. Thus, a web of economic, demographic, and health spending patterns independently and collectively unite quality, health care spending, and social structure. The picture that emerges is that states with higher Medicare spending per enrollee tend to have a higher social burden and poorer quality, while states with more non-Medicare spending have greater economic and social strength and better quality.

■ **Medicare’s special characteristics.** It is important to note that Medicare reimbursement accounts for only half of the total spending for the care of Medicare enrollees, with the rest provided through either other public programs (such as through Medicaid or the Department of Veterans Affairs ) or private sources (such as through supplemental insurance or out-of-pocket payments).<sup>15</sup> In addition, although reimbursement through Medicaid and other local and state programs and through employers is generally influenced by local economic conditions, Medicare reimbursement results from policies at the national level that are designed not only to reimburse caregivers but also to achieve particular social or political goals.<sup>16</sup> These features of Medicare reimbursement help explain why it is a poor proxy for health care spending overall.

*Disability.* Although Medicare is generally thought of as the health plan for older Americans, 19 percent of Medicare beneficiaries in 2005 were under age sixty-five, up from 15 percent seven years earlier. Most nonelderly beneficiaries are covered under Social Security disability, but this category also includes 300,000 people in the end-stage renal disease (ESRD) program. The percentage of enrollees who are on disability varies widely among the states, from 10 percent in North Dakota to 25 percent in Mississippi, and these percentages correlate directly with lower quality and higher rates of preventable mortality (Exhibit 6).

*DSH.* DSH payments are allotted to hospitals that provide disproportionate amounts of care for the poor. These payments account for approximately 3 percent of total Medicare reimbursement. This amount does not distort the relationships discussed herein; however, it is noteworthy that states in which DSH payments account for a higher percentage of Medicare reimbursement have higher total Medicare spending per enrollee and lower-quality health care (Exhibits 2 and 6).

*Graduate medical education.* Medicare reimbursement also includes the direct costs of medical education (DME) and the associated indirect medical education (IME) payments, which are meant to reimburse teaching hospitals for other unusual costs. These, too, differ among states.

*Input costs.* Another factor that influences reimbursement is the manner in which Medicare adjusts its payments for input costs. Although the health care component of the cost of living index varies among the states by approximately 10 percent, Medicare’s wage index, which adjusts its payments to hospitals for local la-

bor costs, varies by more than 20 percent, often because of congressional mandates. Indeed, given the plethora of issues and inconsistencies that surround the current wage index, the Medicare Payment Advisory Commission (MedPAC) has recommended changes in methodology, which Congress has directed the Department of Health and Human Services to consider for fiscal year 2009.<sup>17</sup>

■ **Economic correlates of non-Medicare spending.** Medicaid and employer-sponsored insurance are the two largest components of non-Medicare spending, and both relate to fiscal resources in the community. The effects of state and local economic considerations on eligibility criteria and reimbursement levels for Medicaid are reflected by a strong correlation between state per capita income and Medicaid spending per enrollee ( $r = 0.59$ ). Conversely, the percentage of the population that is uninsured correlates inversely with state per capita income ( $r = -0.35$ ).

Similar considerations apply to the prevalence of employment-sponsored insurance, which correlates strongly with state per capita income ( $r = 0.60$ ). At the level of Metropolitan Statistical Areas (MSAs), Richard Kronick and colleagues have found that both personal income and aggregate communal income are important.<sup>18</sup> They attributed two-thirds of the likelihood that workers would be covered by employer-sponsored insurance to the workers' individual characteristics (principally income) and one-third to communal characteristics (principally aggregate income in the same MSA). Ultimately, the interplay of both was most strongly predictive. These factors spill over to supplemental insurance, which is less than half as prevalent among Medicare enrollees who are black or poor.<sup>19</sup>

## Concluding Comments

■ **Quality depends on total health care spending.** Higher Medicare spending per enrollee correlates with poorer-quality health care at the state level, which has led members of the Dartmouth group to conclude that higher Medicare spending is attributable to waste and inefficiency.<sup>20</sup> However, the observed relationship between Medicare spending and quality is principally due to the fact that many states in the South have high Medicare spending per enrollee but low health care spending per capita, and their poor quality correlates with their overall low levels of health care spending. Medicare patients within a given hospital or health care market would not be expected to experience better or worse quality because of the payment levels from Medicare alone. Staffing decisions, the availability of information technology, preventive services, and other investments that contribute to quality and system performance depend on total funds available, not on the funds from any particular reimbursement stream. In that light, it seems reasonable to expect better quality in states with higher per capita spending overall, as was observed.

■ **Quality relates to a broad array of sociodemographic characteristics.** The relationship between health care spending and quality at the state level may have elements of causality. It seems likely that more spending would lead to stronger local health care systems. However, quality, as assessed in this and similar studies, reflects

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a broad set of health care system attributes, whereas most health care spending is directed more narrowly to hospital and physician services. Moreover, quality rankings correlate not only with health care spending but also with other sociodemographic characteristics, such as income, race, and spending for K–12 education. Similar relationships have been observed between spending for education and other public services and all-cause mortality.<sup>21</sup> These observations suggest that although health care spending is an important contributor to quality, the determinants of quality reach more deeply into the sociodemographic fabric of the community.

■ **Medicare spending among states is a misleading indicator.** Although levels of non-Medicare spending relate to services provided, Medicare reimbursement is influenced by other factors. Some are created by legislative and administrative mandates that reward particular regions, institutions, or contractors—a process that Bruce Vladeck has termed “interest-group politics.”<sup>22</sup> Others are in response to sociodemographic differences, such as those noted above. David Cutler and Louise Sheiner have attributed two-thirds of the variation in Medicare spending to health status and demographics, and MedPAC has attributed 55 percent to demographics and practice patterns.<sup>23</sup> Indeed, Medicare is a major means of income redistribution among areas of the country. Considerations such as these led Daniel Zabinski and Robert Reischauer to conclude that Medicare spending at the state level is “misleading” for analyzing variation in the amount of care provided to beneficiaries.<sup>24</sup>

■ **Medicare spending is a poor proxy for health care spending overall.** The evidence that Medicare spending is a poor proxy for overall health care spending seems clear. First, there is no significant correlation between Medicare and non-Medicare spending. Second, although more Medicare spending per enrollee correlates with poorer health care quality, more non-Medicare spending per capita correlates with better quality. Third, although more Medicare spending correlates with community characteristics that reflect greater social needs, more non-Medicare spending correlates with characteristics that reflect more economic strength.

Observations such as these lead inevitably to the conclusion that regional variation in Medicare spending does not reflect the behavior of the health care system overall. This is a critical point, since Medicare spending data form the basis for many studies of regional variation, including those that are associated with the *Dartmouth Atlas* project.<sup>25</sup> The supposition in each is that Medicare is a proxy for the whole. Indeed, Dartmouth researchers recently claimed that “state-level Medicare spending is closely correlated with overall per capita spending.”<sup>26</sup> Yet the cited source stated unequivocally that “Medicare spending does not explain much of the variation in total per capita personal health care spending.”<sup>27</sup> Thus, the vagaries of Medicare spending across the nation pose critical challenges to any re-

search that depends on this index of spending to define the behavior of physician practices, hospitals, or the health care system overall.

The dual realization that more health care spending at the state level is associated with better-quality health care and that Medicare spending, which bears an inverse relationship to quality, is not a proxy for the whole should refocus thinking about the impact of health care spending on society, as politicians and the public prepare to address the vexing issues of national health care reform.

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**NOTES**

1. Centers for Medicare and Medicaid Services, "Health Expenditures by State of Residence, 1991–2004," September 2007, [http://www.cms.hhs.gov/NationalHealthExpendData/05\\_NationalHealthAccountsStateHealthAccounts.asp](http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccounts.asp) (accessed 15 January 2008).
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