Deconstructing Medicare Spending Across States

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BY ARTHUR W. WRIGHT

Medicare has been much in the news, amid the swirling public-policy debate over President Obama's push for "health care reform". It is Exhibit #1 as a public health insurance program, which many Democrats insist is essential to true reform. President Obama's chief budget officer, economist Peter Orszag, has long viewed differences across states in health care reimbursements per Medicare enrollee as opportunities for budget savings without cutting quality. This article explores possible empirical reasons why interstate Medicare spending per enrollee varies so much, to see whether federal dollars could be saved by redesigning (nobody said "cutting") Medicare reimbursements.

MEDICARE DESCRIBED

Medicare is a federal-government program that provides health insurance to all seniors 65 and older, plus certain younger people, who qualify to enroll. Most private health insurance policies, individual and group, require participation in Medicare as the primary insurer as a condition of coverage. Medicare is funded by a 2.9% tax on all money earnings (1.45% each for employers and employees). In contrast, Social Security levies a 6.2% tax on wages below a certain cap ($106,800 in 2009) that rises gradually over time. All Medicare enrollees must also purchase so-called "part B" supplemental coverage of non-hospitalization expenditures; the current premium is $96.40 per month, deducted from Social Security benefits, per enrollee. Other optional supplemental coverages are also available, including the relative new part D for prescription drugs.

In principle, Medicare reimburses health care providers at uniform rates across the nation. In practice, amounts paid over the course of a given illness or injury may vary considerably, depending on how medicine is "practiced" in different parts of the country. That in turn varies with training, state policies and laws, and other factors. Two examples: state insurance regulation affects the scope and price of the optional supplemental coverages, and state laws (from statutes to court rulings) materially affect malpractice litigation: which cases may be brought, how trials proceed, damages that may be awarded, and so on.

If state-to-state variations in Medicare spending per enrollee are to be the source of savings, then something would need to change. To find the best levers to effect change, it would be essential to be able to identify the sources of the interstate variations.

STATE-BY-STATE MEDICARE SPENDING RATES, 1991-2004

In 2007, the federal agency that administers Medicare, the Centers for Medicare and Medicaid Services or CMS, released comprehensive data on Medicare reimbursements per enrollee (hereafter, "spending rates"), by state of residence, covering the period 1991-2004. Those data (search CMS on the Internet) were compiled as part of a much broader effort to amass national and state data on health-care spending.

Between 1991 and 2004, the national average Medicare spending rate, in current dollars, increased from $3,435 to $7,439 per enrollee, or by an average annual rate of 6.1% (see the

line graph). The real increase—adjusted for the change in the purchasing power of the dollar as measured by the CPI-U, which averaged just under 2.6% annually over the period—was about 3.5% per year. Viewed differently, the nominal increase of 6.1% was about 1.7 percentage points faster than the average yearly increase in the "medical care" component of the CPI-U for 1991-2004. So, on average, total Medicare spending per enrollee rose 1.7 percentage points a year faster than the price index component for all medical care.

Thus, U.S. Office of Management and Budget (OMB) director Orszag might appear justified in viewing the Medicare program as a potential source of budgetary savings. Of course, the 1.7-point differential could just reflect a different, and more costly, mix of medical care that geezers (of whom I am one) receive, compared with the treatments needed by the younger set. For example, the elderly may make more frequent use of hospitals, with longer stays. And we've all read—and (in the August 2009 "town hall" shouting matches) heard—about how expensive end-of-life treatments can be, whence the controversial proposal to offer (*not* compel) hospice counseling to patients and their loved ones.

So Orszag may have to look to interstate differences in Medicare spending rates to find real savings. The 1991 rates (in current prices) ranged from a low of $2,406 in Idaho to a high of $4,334 in Pennsylvania. In 1991 Connecticut registered $3,595 per enrollee, just $160 above the U.S. average, and $45 higher than the New England average.

By 2004, the states' Medicare spending rates had all risen substantially, along as had the national figure. But the average compound rates of increase differed considerably among the states, scrambling the 1991 rank-ordering. By 2004, pride-of-place at the top belonged to Louisiana, at $8,659, just ahead of Maryland ($8,535), New Jersey ($8,512), and Florida ($8,462). Connecticut ranked 7th, at $8,185.

Looking at average rates of increase, 1991-2004, Nebraska and South Carolina tied for tops at 7.6% a year, while Pennsylvania—highest in spending per enrollee in 1991—saw the smallest average yearly increase (in fact, its 4.3% increase was a shade below that for the CPI-U medical care component).

MODELING INTERSTATE VARIATIONS IN MEDICARE SPENDING RATES

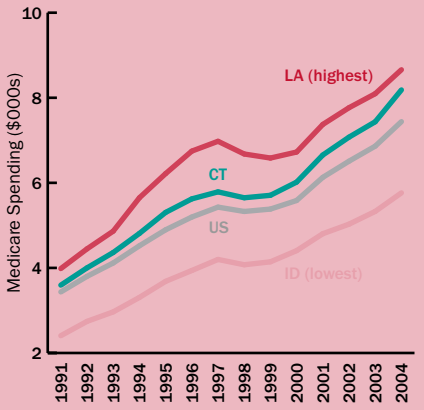
The starting point of my empirical analysis was 1991-2004 data on real state-by-state Medicare spending per enrollee—the dependent (to-be-explained) variable. I deflated the CMS nominal-dollar data with the "medical care" component of the CPI-U. The "panel" regression model combined cross-section and time-series data for the 50 states. Data (and time) limitations compelled limiting the time series to the period 1999-2004—in essence, leaving the experience of 1991-1998 on the table, for subsequent research.

My hypotheses were that Medicare disbursements per enrollee varied across states due to variations in (1) the number of active physicians per capita; (2) the number of "community" hospital beds per capita; (3) real per-capita personal income (deflated by the chained-price deflator for "personal consumption expenditures"); and (4) real non-Medicare spending on personal health care per non-Medicare-enrolled person (state population minus Medicare enrollees), deflated as the dependent variable was.

I expected the independent variables for doctors and hospital beds to affect a state's Medicare spending rate positively: The more physicians and hospital beds available, the greater the propensity to order tests, recommend hospital-based procedures, and the like. In other words, competition among doctors and hospitals would lead not to price effects but in other directions, such as more thorough or careful services. Similarly, I expected the coefficients on real per-capita income and the non-Medicare spending rate to be positive. Health care is a "normal" good: higher income leads to greater demand for it. Also, the greater the propensity to spend on health care before age 65, the greater the expected propensity to spend on it once a person goes on Medicare.

(continued on page 14)

MEDICARE SPENDING PER ENROLLEE BY STATE OF RESIDENCE, 1991-2004



SOURCE: *The Connecticut Economy*, based on CMS data.

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Besides the four independent variables just discussed, I also controlled for so-called "fixed effects", both among states ("cross-state") and among years ("time-period"). In essence, adding fixed-effects variables checks for "hidden" forces not captured in the independent variables that are specific to each state or each year, and that may significantly affect the dependent variable.

My results from estimating the above model (see table) were mixed in terms of the hypothesized relationships for the four independent variables. To get positive and significant coefficients on three of the four—all except the non-Medicare spending rate—it was necessary to ignore fixed effects altogether; however, that specification explained only 5% of the variation in the dependent variable. The results shown, which incorporate (alternatively) cross-state effects only (the left-hand set) or both cross-state and time-period effects (the right-hand set), explain far higher percentages of that variation, 95% and 99% respectively. But because the coefficient estimates and their degrees of significance are not that robust, these results suggest that the fixed effects are the real story here. And the model is silent on what accounts for the strength of those effects.

Controlling only for cross-state effects, the coefficient on the number of doctors per capita is highly significant and positive, as predicted: more doctors per person are associated with higher real Medicare spending per enrollee. Of course, we can't be sure about the direction of causation: doctors may simply prefer to locate in areas where (for whatever reason) the Medicare reimbursements are richer. But wait: if I also control for time-period effects, the magnitude of this relationship becomes much smaller, and there is a relatively high 16% probability that the coefficient could be zero or negative. Choosing between the two different specifications of the regression equation in terms of the doctors variable alone is problematic: controlling for both fixed effects adds only 3 percentage points to the adjusted R-square obtained by controlling for cross-state effects only.

In either specification, the sign of the coefficient on hospital beds is negative, contrary to prediction. Evidently, the Medicare spending rate tends to be lower in states with more hospital beds per capita. Part of the explanation for that result in the left-hand regression, which does not control for time-period effects, may be that, in all but two states, the number of beds per capita declined steadily over the period, while health-care spending per person rose. Of course, the contrary sign is also to be found in the other regression, with the time-period effects included, but controlling for time makes the coefficient much smaller, and the p-value, at 0.187, iffy.

Also in both specifications, non-Medicare health-care spending per capita moves opposite to its Medicare counterpart, contrary to prediction. This suggests a substitution effect of some kind: spending more per Medicare enrollee is linked with spending less per younger person, or the reverse (which could make sense: spending more per capita at younger ages could reduce the need to spend, once people grow older). The significance of the estimated relationship between the variables for the two age-categories of health-care spending actually improves, from 13% to 0.0% when I control for time-period as well as for cross-state effects.

Finally, the predicted positive sign on a very significant coefficient for the real per capita income variable in the left-hand regression does a flip-flop when I control for time-period effects as well—but the coefficient remains highly significant. Per capita income, of course, has a pronounced time-trend, so the contrary sign in the right-hand regression is probably the more reliable one. Instead of the predicted effect of increasing the demand for health care services, the varible may be capturing a lifestyle effect: people in higher-income states have less expensive medical care needs when they get older, than do people in lower-income states.

IMPLICATIONS

The vagaries of the reported results suggest that the main implication of this effort to explain state-to-state variations in Medicare spending rates is to go back to the drawing board. With considerable effort, one should be able to extend the time period covered by both the doctors and hospital-beds variables, to take advantage of the full 1991-2004 range of the CMS data. And it may be possible to find time-series data by state for added independent variables. Three that come to mind are utilization rates for hospital beds, the age-distribution of Medicare-eligible populations—some states have a higher proportion of older old-folks than others—and differences in policies across states.

As for budget director Orszag, my preliminary results indicate that his only hope of saving any real money would seem to be by changing the distribution of doctors across states. How he might propose to do that without the use of monetary incentives—which would erode the cost savings—I leave to his staff, or perhaps to the town-hall meeting experts on health care reform.

EXPLAINING INTERSTATE VARIATION IN MEDICARE SPENDING PER ENROLLEE

	With cross-state effects only		With cross-state and time-period effects	
	Coefficient	p-value	Coefficient	p-value
Intercept	574.6956	0.019	2558.3260	0.000
Doctors	4.8450	0.000	0.5998	0.162
Hosp. Beds	-221.1160	0.000	-30.7848	0.187
Non-Medicare Spending Rate	-0.0405	0.134	-0.0565	0.000
Real PCI	0.0374	0.000	-0.0154	0.001
	Adj. R^2 = 0.9528		Adj. R^2 = 0.9861	

SOURCE: *The Connecticut Economy*.

A p-value is the chance of finding such an extreme value for the coefficient, if in fact no relationship actually exiists between the dependent and independent variable. The smaller the p-value, the more statistically significant the result.