

CHAPTER

4

**Growth and variation in use
of physician services**

Growth and variation in use of physician services

Historically, Medicare has experienced periods of high growth in use of physician services with implications for program spending, beneficiary cost sharing, and quality of care. In response, the program has pursued a number of broad strategies, such as an expenditure target. At issue is whether other policy options should be considered. The most recent data on Medicare beneficiaries' use of physician services show relatively high growth and wide geographic variation in use of some services, particularly imaging services. A host of factors could explain these patterns, making interpretation difficult. Further work is needed to understand the growth and variation in service use and, if necessary, to develop options for changing current policy.

In this chapter

- Trends in use of physician services
 - Geographic variation in use of physician services
 - Interpreting the data
 - Next steps
-

Over the years, the Congress has instituted a number of policies, such as an expenditure target, to control Medicare spending for physician services. The program had experienced rapid growth in spending during the 1980s, largely due to increases in use of services (Board of Trustees 1995). In addition, research has shown wide variation, geographically, in beneficiary use of physician services (Fisher et al. 2003a, 2003b; Miller et al. 1995; Welch et al. 1993; Wennberg and Cooper 1999).

Despite the significance of these issues for the Medicare program, surprisingly little current information is available on use of physician services by Medicare beneficiaries, and it tends to focus on use of services as an indicator of access to care.

This chapter addresses use of physician services from a different perspective: the role of service use in determining expenditures. From the perspective of Medicare as a prudent purchaser, this is important for both beneficiaries and taxpayers. For beneficiaries, increases in service use lead to higher Medicare Part B and supplemental coverage premiums and higher out-of-pocket costs of care. For taxpayers, increases in service use lead to higher Part B expenditures supported with the general revenues of the Treasury.

Total Medicare payments for physician services (program spending and cost sharing) equaled \$55.9 billion in 2001 and increased at an average annual rate of about 5 percent during the previous 10 years. This spending has been volatile at times, partly because of increases in service use. In the 1980s, for example, annual rates of growth in spending per beneficiary ranged from 4 to almost 20 percent, and growth in service use ranged from 4 to 10 percent (Board of Trustees 1995). Growth then slowed during the 1990s, but recently it has accelerated again.¹

This chapter summarizes the recent data on use of physician services by Medicare beneficiaries from two perspectives:

growth over time and cross-sectional variation among geographic areas. The data on growth show some distinctive patterns. Growth in service use is highest for imaging services, such as magnetic resonance imaging (MRI) and computerized automated tomography (CAT). Use of laboratory tests has also grown rapidly. The cross-sectional data show wide variation in use of services among geographic areas. Here again, imaging services and tests stand out with some of the widest variation in service use.

What do these patterns suggest? In the case of growth in service use, a likely major component is technological change that could lead to better outcomes for patients (Cutler and McClellan 2001; Newhouse 1993, 1992). Technological change includes treatment substitution—substituting newer technologies for older ones—and treatment expansion—treating more people for disease.

The cross-sectional variation in service use among geographic areas must be explained by factors other than technological change. Research has shown that, after controlling for input prices and health status, use of physician services is driven partly by practice patterns, and physician supply and specialization, and that greater use of services is often not associated with demonstrable improvement in outcomes, an issue also discussed in Chapter 1 of this report (Fisher et al. 2003a, 2003b). From this perspective, some service use that we observe could represent overuse. Some of the difference, however, could also come from underuse.

Given the importance of service use in determining expenditures, further work on this topic is critical. In response to the growth in use of physician services and its volatility, the Congress has established an expenditure target for physician services. MedPAC has concerns about that mechanism as a tool for controlling spending, however (MedPAC 2001b). The question then becomes, what is the

alternative? Slowing the development and diffusion of technology would affect growth in service use, but advances in medical technology are viewed as desirable (Fuchs 1999). Nonetheless, the ability of Medicare and the program's beneficiaries to sustain large increases in use of services is an issue. In that case, further work on understanding the cross-sectional variation in service use may be a fruitful path to follow. A better understanding of any unnecessary use of services can lead to policies that affect cross-sectional variation and growth, although growth in service use due to technological change will continue to be a factor. MedPAC plans to do further work on these issues and, depending on the findings, to develop policy options for the Congress and CMS.

Trends in use of physician services

Despite the importance of the topic, little recent information is available about growth in use of physician services. One source is the annual reports of the Boards of Trustees of the Medicare trust funds. The reports include a table that decomposes spending per beneficiary into changes in payment rates and other or residual factors. Most of the residual is growth in the use of services per beneficiary.

- Following the rapid growth in the 1980s, growth in use of physician services slowed. The average annual rate of growth per beneficiary averaged 2.1 percent from 1992 through 2002. The comparable number for the 1980s was 6.6 percent (Board of Trustees 1998, 1995; Boards of Trustees 2003).
- The projected average annual growth in use of physician services, from 2003 to 2012, is 3.3 percent. The reasons offered for continued growth in service use include more physician visits per beneficiary, the aging of the

¹ For further discussion of the recent increase in service use, see Appendix A of this report on reviewing CMS's estimate of the payment update for physician services.

beneficiary population, and a greater use of specialists and expensive techniques (Boards of Trustees 2003).

A closer look at the data helps us further understand these general trends. We did this with a measure of service use that captures both the number of services provided and their level of intensity. The measure is the relative value units for each service, from the physician fee schedule, multiplied by the fee schedule's conversion factor. We calculated this measure with data on the number of services provided from 1999 through 2002. To put service use in each year on a common scale, we used the relative weights and conversion factor for 2002.²

The analysis shows that, from 1999 to 2002, the average annual growth rate for use of all physician services was 3.3 percent (Table 4-1). When we group services into five major categories—evaluation and management, imaging, major procedures, other procedures, and tests—and look at 1999 to 2002 average annual growth rates for each, we see that major procedures had the lowest rate, 1.1 percent. Among the other services, the growth rates for evaluation and management and for other procedures were also relatively low at 1.7 and 3.9 percent, respectively. The growth rates for imaging and tests were higher at 9.0 and 6.1 percent, respectively.

Relatively high growth rates for imaging services are concentrated in several specific categories: nuclear medicine, CAT scans of parts of the body other than the head, MRI of parts of the body other than the brain, and MRI of the brain. Use of these services grew by 15 to 20 percent per year.

One of the highest growth rates we find is for a minor-procedures category that primarily includes outpatient rehabilitation. This rapid growth, 16.7 percent, occurred when spending caps for outpatient rehabilitation, enacted under

TABLE 4-1

Change in use of physician services per beneficiary in traditional Medicare, for selected services, 1999–2002

Type of service	Service use per beneficiary			
	1999	2002	Average annual change 1999–2002	Percent of total service use
All services	691.5	762.4	3.3%	100.0%
Evaluation and management	317.5	333.9	1.7	43.8
Office visit—established patient	137.7	144.1	1.5	18.9
Hospital visit—subsequent	65.7	67.6	0.9	8.9
Consultations	40.7	45.6	3.9	6.0
Emergency room visit	18.0	21.3	5.7	2.8
Hospital visit—initial	17.7	17.4	–0.7	2.3
Office visit—new patient	16.5	16.0	–1.0	2.1
Nursing home visit	13.8	13.7	–0.4	1.8
Imaging	82.8	107.3	9.0	14.1
Echography—heart	11.9	15.6	9.6	2.0
Standard—nuclear medicine	9.9	15.1	15.3	2.0
Advanced—CAT: other	9.1	13.8	14.8	1.8
Advanced—MRI: other	6.4	11.1	20.1	1.4
Standard—musculoskeletal	8.3	9.3	3.7	1.2
Advanced—MRI: brain	4.8	7.3	15.3	1.0
Standard—chest	6.6	6.2	–2.1	0.8
Advanced—CAT: head	2.7	3.0	3.6	0.4
Imaging/procedure—heart, including cardiac catheterization	1.9	2.3	6.8	0.3
Major procedures	68.9	71.2	1.1	9.3
Coronary artery bypass graft	6.4	5.4	–5.4	0.7
Knee replacement	3.8	4.5	5.9	0.6
Coronary angioplasty	3.4	4.0	5.4	0.5
Hip fracture repair	3.6	3.2	–4.5	0.4
Hip replacement	2.7	2.8	2.0	0.4
Explore, decompress, or excise disc	2.1	2.5	5.0	0.3
Colectomy	2.5	2.3	–2.4	0.3
Other procedures	141.2	158.2	3.9	20.8
Minor—other, including outpatient rehabilitation	15.8	25.1	16.7	3.3
Cataract removal/lens insertion	15.6	15.4	–0.4	2.0
Endoscopy—colonoscopy	7.0	9.1	9.0	1.2
Endoscopy—upper gastrointestinal	4.2	4.4	1.6	0.6
Endoscopy—cystoscopy	4.4	4.3	–1.1	0.6
Eye procedure—treatment of retinal lesions	3.6	3.7	1.5	0.5
Endoscopy—arthroscopy	1.5	1.9	7.1	0.2
Tests	21.8	26.0	6.1	3.4
Electrocardiograms	6.1	6.1	0.2	0.8
Cardiovascular stress tests	3.3	4.2	8.6	0.6
Lab tests—other (physician fee schedule)	2.2	3.3	15.5	0.4
Electrocardiogram monitoring	1.8	1.9	2.2	0.2

Note: Service use is measured as the relative weights (relative value units) for services received multiplied by the physician fee schedule conversion factor. To put service use in each year on a common scale, we used the relative weights and conversion factor for 2002. For billing codes not used in 2002, we imputed relative weights based on the average change in weights for each type of service.

Source: MedPAC analysis of 5% random sample of Medicare beneficiary claims from first 6 months of each year.

2 This measure of service use is similar to the one used in Chapter 1 in that it does not include the effects of geographic variation in input prices for physician services.

the Balanced Budget Act of 1997, were temporarily lifted. As part of the Balanced Budget Refinement Act of 1999, the Congress passed a moratorium on the spending caps, which CMS implemented in 2000. The Congress later extended the moratorium through 2002.³

Service use decreased for some services. Overall, the reasons for this are not clear. In some cases, they may result from substituting one service for another. The decrease in the volume of coronary artery bypass grafts, for example, may be due to a greater use of coronary angioplasty, which is a newer procedure for treatment of coronary artery disease.

Geographic variation in use of physician services

Geographic variation in Medicare spending per beneficiary has two sources: differences in the cost of providing care and differences in quantity of care provided.⁴ To further understand the differences in the quantity of care, we have analyzed variation in use of physician services among geographic areas. For this analysis, we used either metropolitan statistical areas (MSAs) or the rural areas in different states. The measure of service use is the same as that discussed earlier and shown in Table 4-1 (p. 63). To calculate service use per beneficiary for each area, we assigned beneficiaries to an area based on their county of residence. We then totaled beneficiary use of services for each area and divided by the number of beneficiaries living there. Because service use varies among all beneficiaries depending on their age and sex, we then age- and sex-adjusted our measure. Age- and sex-adjustment partially accounts for differences in the burden of disease among geographic areas. We did not adjust our measure of use of physician

services for differences in beneficiary health status as in Chapter 1 of this report, however. Finally, we calculated the measure for four years—1999 through 2002—and averaged the results for each area to reduce its random component.

For total service use (all services), the results show considerable variation among geographic areas (Figure 4-1). The areas with the highest service use tend to be in the East, the South, and parts of a few states in the West.

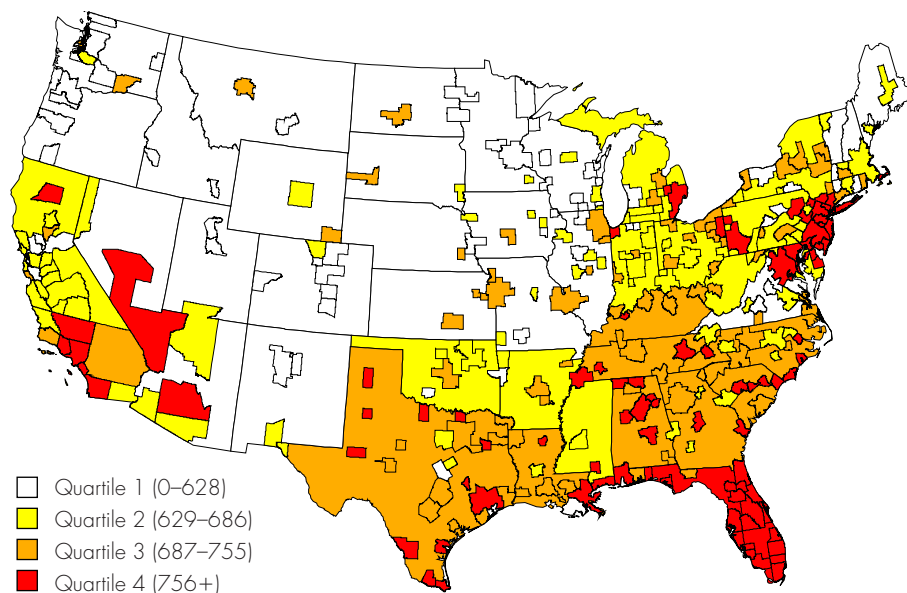
Similar patterns appear when we look at variation in use of imaging services. As in the case of use of all physician services, the areas with the highest use of imaging services are usually in the East and the South, but not so much in the West (Figure 4-2).

To further examine variation in use of physician services, we compared the 50 largest MSAs in terms of adjusted service use per beneficiary, by type of service (Table 4-2). Focusing on these MSAs further reduced the random component of variation in service use.

Comparing the MSAs with the maximum and minimum service use, variation in service use was highest for tests and imaging. For both of these, the ratio of maximum to minimum service use was 3.2. Variation was lowest for major procedures, a type of service category that includes coronary artery bypass grafts, knee replacements, and coronary angioplasties.⁵ The ratio of maximum to minimum service use for major procedures was 1.5.

FIGURE 4-1

Average adjusted per beneficiary use of physician services, by quartile, 1999–2002



Note: Areas within states are metropolitan statistical areas (MSAs) or rural areas outside of MSAs.

Source: MedPAC analysis of 5% random sample of Medicare beneficiary claims from first 6 months of each year.

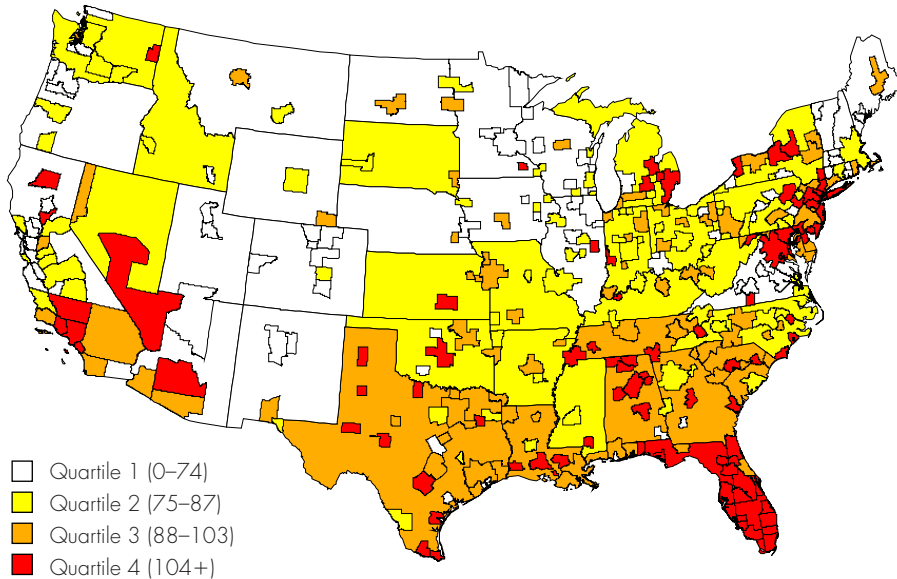
3 Some of the increase in use of outpatient rehabilitation since 2001 may be due to the January 2002 implementation of the prospective payment system for inpatient rehabilitation facilities.

4 See Chapter 1 of this report for further discussion of the sources of geographic variation in Medicare spending.

5 Other examples of major procedures are identified as such in Table 4-1 (p. 63).

FIGURE 4-2

Average adjusted per beneficiary use of imaging services, by quartile, 1999–2002



□ Quartile 1 (0–74)
 ■ Quartile 2 (75–87)
 ■ Quartile 3 (88–103)
 ■ Quartile 4 (104+)

Note: Areas within states are metropolitan statistical areas (MSAs) or rural areas outside of MSAs.

Source: MedPAC analysis of 5% random sample of Medicare beneficiary claims from first 6 months of each year.

TABLE 4-2

Geographic variation in use of physician services among the 50 largest metropolitan statistical areas, 1999–2002

Type of service	Adjusted service use per beneficiary			Ratio of maximum to minimum	Coefficient of variation
	Minimum	Average	Maximum		
Evaluation and management	210	357	506	2.4	18
Imaging	56	105	178	3.2	28
Major procedures	54	68	79	1.5	10
Other procedures	101	151	281	2.8	24
Tests	16	26	50	3.2	30

Note: MSA (metropolitan statistical area). Service use is measured as the relative weights (relative value units) for services received multiplied by the physician fee schedule conversion factor. We averaged service use for four years (1999 through 2002) to minimize random variation. To put service use in each year on a common scale, we used the relative weights and conversion factor for 2002. For billing codes not used in 2002, we imputed relative weights based on the average change in weights for each type of service. We used age- and sex-adjusted service use with the U.S. beneficiary population as the standard.

Source: MedPAC analysis of 5% random sample of Medicare beneficiary claims from first 6 months of each year.

Interpreting the data

Two major findings emerge from our analysis of trends in use of physician services:

- Growth in use of physician services varies by type, with imaging services exhibiting relatively high rates of growth in use.
- Cross-sectional variation in use of physician services among geographic areas varies widely, both for use of all services and use of imaging services.

The cross-sectional findings on geographic variation in service use are consistent with the substantial body of existing research (Fisher et al. 2003a, 2003b; MedPAC 2001a; Miller et al. 1995; Welch et al. 1993; Wennberg and Cooper 1999). The most sophisticated study is the recent one by Fisher and colleagues that, based on data for Medicare beneficiaries, looked for a relationship between geographic variation in use of services and health outcomes. They measured service use for three cohorts with specific conditions—acute myocardial infarction (heart attack), colorectal cancer, and hip fracture—and a cohort representing the general beneficiary population.⁶ Members of these cohorts were assigned to quintiles based on the level of Medicare spending per beneficiary in their place of residence. The study then compared costs, service use, quality of care, and access to care for each cohort.⁷

The findings of Fisher and colleagues were:

- Differences in spending among geographic areas were primarily due to greater use of discretionary services sensitive to the supply of physicians and hospital resources in

⁶ The cohort representing the general beneficiary population consisted of respondents to the Medicare Current Beneficiary Survey.

⁷ Quality measures included receipt of angiotensin-converting enzyme (ACE) inhibitors at hospital discharge (for the acute myocardial infarction patients) and receipt of an influenza vaccine (for the general beneficiary population cohort). Access measures included receipt of a physician office visit within 30 days of discharge (for the acute myocardial infarction patients) and having a usual source of care (for the general beneficiary population cohort).

an area. Examples include evaluation and management services, tests, imaging, minor procedures, and use of the hospital as the site of care.

- On most measures of quality, care was no better in areas with high levels of spending than it was in areas with lower levels of spending. On a few measures, quality was worse in the high-spending areas.
- Areas with high levels of spending had slightly worse access on some measures. For example, among acute myocardial infarction patients, those living in areas with higher spending were less likely to visit a physician within 30 days of hospital discharge than patients living in areas with lower spending.

These findings suggest that Medicare spending and use of physician services may be too high in some geographic areas. Moreover, use of services by Medicare beneficiaries could also affect the non-Medicare population. The Center for Studying Health System Change has documented some declines in access to physician services not only for Medicare beneficiaries, but also for the privately insured (Trude and Ginsburg 2002).

Many hold the view that the growth that we see in use of health care, including physician services, is due to technological change (Fuchs 1999). Support for this view comes from the changes that we see over time in the nature of treatments for certain conditions, including some that are prevalent in the Medicare population. In some cases, such as care for heart attack patients, physicians have substituted more intensive services for less intensive ones. Other examples of technological change involve treatment expansion. For example, evidence indicates that the use of cataract surgery has increased while the acuity of patients receiving it has gone down. For the conditions studied, the net effect is often higher spending but better outcomes, such as longer lives for heart attack patients and improved vision for cataract patients (Cutler and McClellan 2001; Cutler et al. 1999; McClellan et al. 1994; Shapiro et al. 2001).

Next steps

This chapter prompts further questions on growth and cross-sectional variation in use of physician services. For example,

how does growth in service use vary by beneficiary age? Fuchs (1999) has shown that use of selected procedures, such as angioplasty and hip replacement, has grown for all beneficiary age groups and that growth rates were often highest for older age groups, suggesting that indications for use of the procedures has changed. Updating this analysis and expanding it, to include additional procedures, will provide insights about the importance of technological change in determining growth in use of physician services.

MedPAC also plans to use Medicare claims data to analyze growth and variation in use of services during different types of episodes of care, such as treatment of pneumonia and management of diabetes and other chronic conditions. While Medicare has payment rates for over 7,000 discrete services, those services are provided in the context of care for beneficiaries with specific health problems. Analysis of service use in that context will help the Commission better understand growth in service use and its cross-sectional variation. ■

References

Board of Trustees, Federal Supplementary Medical Insurance Trust Fund. 1998 annual report. Washington (DC), Board of Trustees. April 28, 1998.

Board of Trustees, Federal Supplementary Medical Insurance Trust Fund. 1995 annual report. Washington (DC), Board of Trustees. April 3, 1995.

Boards of Trustees of the Medicare trust funds. 2003 annual report of the Boards of Trustees of the Medicare trust funds. Washington (DC), Boards of Trustees. March 17, 2003.

Cutler DM, McClellan M. Is technological change in medicine worth it?, *Health Affairs*. September/October 2001, Vol. 20, No. 5, p. 11–29.

Cutler DM, McClellan M, Newhouse JP. The costs and benefits of intensive treatment for cardiovascular disease. In: Triplett JE (ed.). *Measuring the prices of medical treatments*. Washington (DC), Brookings Institution Press. 1999.

Fisher ES, Wennberg DE, Stukel TA. The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care, *Annals of Internal Medicine*. February 18, 2003a, Vol. 138, No. 4, p. 273–287.

Fisher ES, Wennberg DE, Stukel TA. The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care, *Annals of Internal Medicine*. February 18, 2003b, Vol. 138, No. 4, p. 288–298.

Fuchs VR. Health care for the elderly: Who will pay for it?, *Health Affairs*. January/February 1999, Vol. 18, No. 1, p. 11–21.

McClellan M, McNeil BJ, Newhouse JP. Does more intensive treatment of acute myocardial infarction in the elderly reduce mortality?, *Journal of the American Medical Association*. September 21, 1994, Vol. 272, No. 11, p. 859–866.

Medicare Payment Advisory Commission. Report to the Congress: Medicare in rural America. Washington (DC), MedPAC. June 2001a.

Medicare Payment Advisory Commission. Report to the Congress: Medicare payment policy. Washington (DC), MedPAC. March 2001b.

Miller ME, Holahan J, Welch WP. Geographic variations in physician service utilization, *Medical Care Research and Review*. June 1995, Vol. 52, No. 2, p. 252–278.

Newhouse JP. An iconoclastic view of cost containment, *Health Affairs*. 1993, Vol. 12, Supplement, p. 152–171.

Newhouse JP. Medical care costs: How much welfare loss?, *Journal of Economic Perspectives*. Summer 1992, Vol. 6, No. 3, p. 3–21.

Shapiro I, Shapiro MD, Wilcox DW. Measuring the value of cataract surgery. In: Cutler DM, Berndt ER (eds.). *Medical care output and productivity*. Chicago (IL), The University of Chicago Press. 2001.

Trude S, Ginsburg PB. Issue brief: Growing physician access problems complicate Medicare payment debate. Washington (DC), Center for Studying Health System Change. September 2002.

Welch WP, Miller ME, Welch HG, et al. Geographic variation in expenditures for physicians' services in the United States, *New England Journal of Medicine*. March 4, 1993, Vol. 328, No. 9, p. 621–627.

Wennberg JE, Cooper MM. *The Dartmouth atlas of health care in the United States*. Chicago (IL), American Hospital Association Press. 1999.