
PRODUCTIVITY IN THE HEALTH CARE SECTOR

Louise Sheiner and Anna Malinovskaya
Hutchins Center on Fiscal and Monetary Policy at Brookings

SUMMARY

Traditional measures of health care productivity show that the sector has significantly lower productivity growth than the economy as a whole. Some believe that this suggests that the health sector is technologically incapable of achieving high rates of productivity growth. Others believe that productivity in the health sector has been much higher than suggested by these traditional measures, mostly because traditional measures ignore improvements in the quality of care over time. Still others believe that, regardless of what health care productivity has been in the past, the scope for future improvements is very large. They believe that payment reforms that increase the incentives for cost-effective high-quality care can yield significant improvements in quality and reductions in costs.

INTRODUCTION

The United States spends more per person on health care than any other nation. And over most of the past five decades, health spending has increased at a significantly faster pace than almost any other category of spending.

Some analysts believe that part of the reason health care spending increases so quickly is that there is little productivity growth in health care. They argue that, because health care is a labor-intensive occupation, there is little scope for increasing productivity by substituting capital for labor, as is done in other industries. Why would low productivity translate into increased spending on health care? In general, when productivity increases, employers can raise wages without raising prices because each worker produces more. When wages in the overall economy rise because labor productivity is increasing, wages also will rise in sectors with low productivity growth so that workers in that industry won't quit their jobs and move into other industries. If health care productivity isn't increasing, but health-care worker wages are, that translates into higher costs, higher prices and more spending.

But other analysts argue that health care productivity is rising. They note the tremendous advances in medical care over time—with improvements in survival rates and quality of life for people with cancer, heart attacks, depression and a host of other illnesses. These advances are valued highly by consumers, suggesting that the increases in health spending may well be worthwhile. That is, we are spending more on health care, but we are getting more too. So, it isn't as if the prices of the same services are increasing over time; instead, the services are getting more expensive, but they are getting better as well.

WHY IT MATTERS

The issue of productivity growth in health care long has been an issue of interest to academics, but recent changes to Medicare payments under the Affordable Care Act (ACA) give this issue important policy significance as well. Prior to the ACA, the law specified that Medicare payment rates for hospital and other non-physician services were to be adjusted annually by the change in input costs—if wages and other input costs rose 5 percent, for example, payments to these providers also would rise 5 percent.¹ The ACA changed that. Now, provider payment rates are updated annually by the increase in input cost growth less the 10-year average of economy-wide multifactor productivity (MFP) growth, which is expected to average about 1 percent per year going forward. (Multifactor productivity growth is the increase in output that is not explained by an

¹ As also noted in the 2012 [Technical Review Panel report](#), Congress often made downward adjustments to these payment updates, but each downward adjustment required legislation.

increase in labor or capital; it measures the ability of an industry to produce more output over time with the same inputs.)

If health productivity growth is lower than that of the general economy, Medicare payment updates under the ACA will be inadequate to allow providers to offer the same level of services over time. But, if health productivity growth is (or can be) equal to or even greater than economy-wide productivity growth, Medicare payments will increase sufficiently to finance the same or improving services over time.

THE CASE FOR LOW PRODUCTIVITY GROWTH IN HEALTH CARE

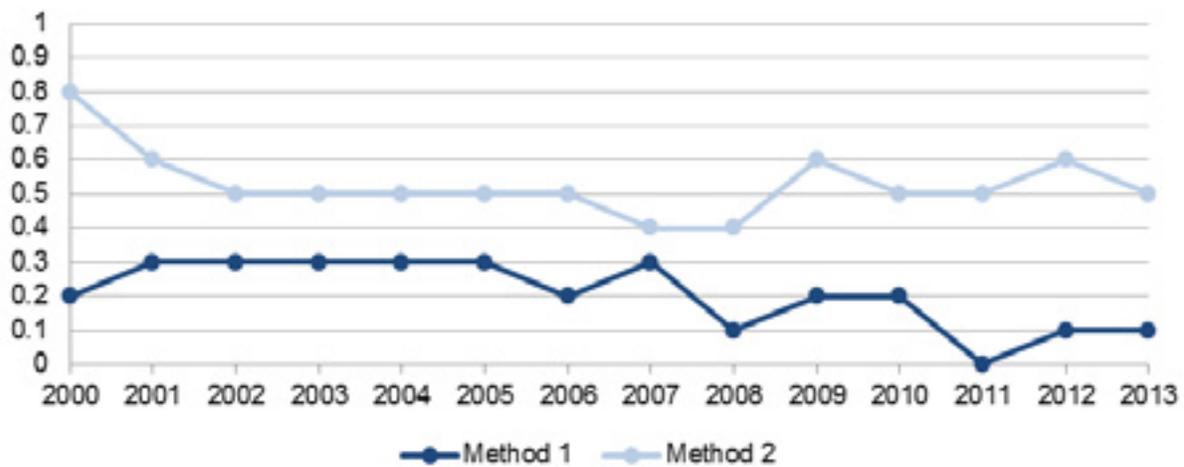
Many studies of productivity in the health sector show that productivity growth has been much lower than economy-wide productivity growth, or even negative. Prominent proponents of the view that the health care industry is inherently incapable of achieving the same rates of productivity growth as the rest of the economy include the actuaries at the Center for Medicare and Medicaid Services, who write:

Based on the historical evidence of health sector productivity gains, the labor-intensive nature of health care services, and presumed limits on the extent of current excess costs and waste that could be removed from the system, actual health provider productivity is very unlikely to achieve improvement equal to the economy as a whole over sustained periods ([Shatto and Clemens \(2015\)](#)).

Their views are buttressed by recent CMS research on productivity growth in the hospital sector by [Spitalnic et al. \(2016\)](#). The CMS researchers examine health productivity by site of care—for example, a hospital or doctor’s office. They define output as spending deflated by a price index, which provides a measure of the quantity of services provided. Because these price indices typically are not adjusted for changes in quality, the CMS measure of output can be viewed as a measure of the number of services provided. For example, the total spending on hip replacements divided by the price per hip replacement measures the number of hip replacements performed. The researchers use two different methods to define the inputs into hospital care. The methods are conceptually similar but yield somewhat different results because of data limitations. Figures 1 and 2 provide the CMS analysts’ most recent estimates of MFP growth in the hospital sector. For both methods, they find that productivity growth in the hospital sector is significantly lower than that in the overall economy: for the period of 1990-2013, productivity growth in hospitals averaged between 0.1 and 0.6 percent per year, compared to an average of 1 percent per year in the private non-farm business sector.

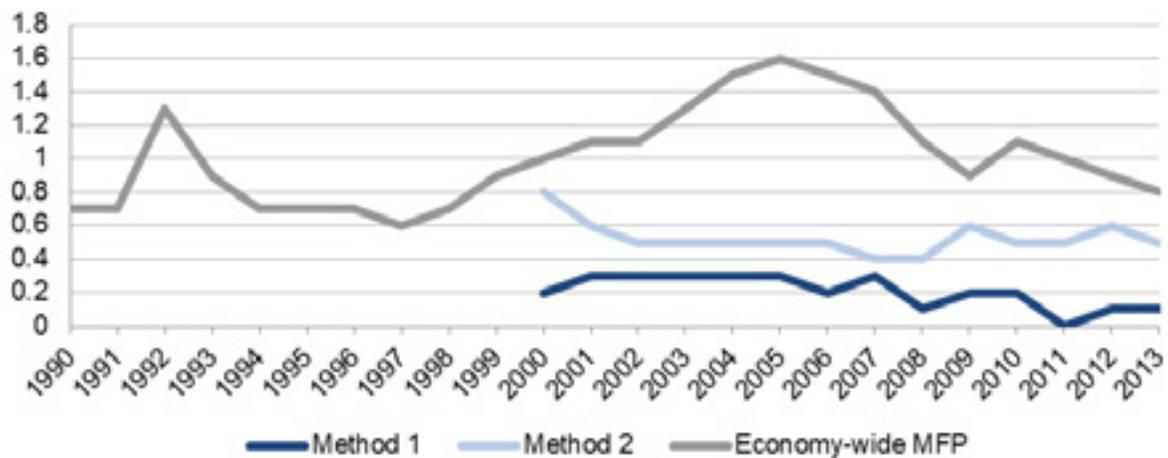
Figure 1. Hospital Multifactor Productivity

10-year moving average growth rate



Source: Spitalnic et al., 2016

Figure 2. Hospital Multifactor Productivity and BLS Private Nonfarm Business MFP



Source: Spitalnic et al., 2016

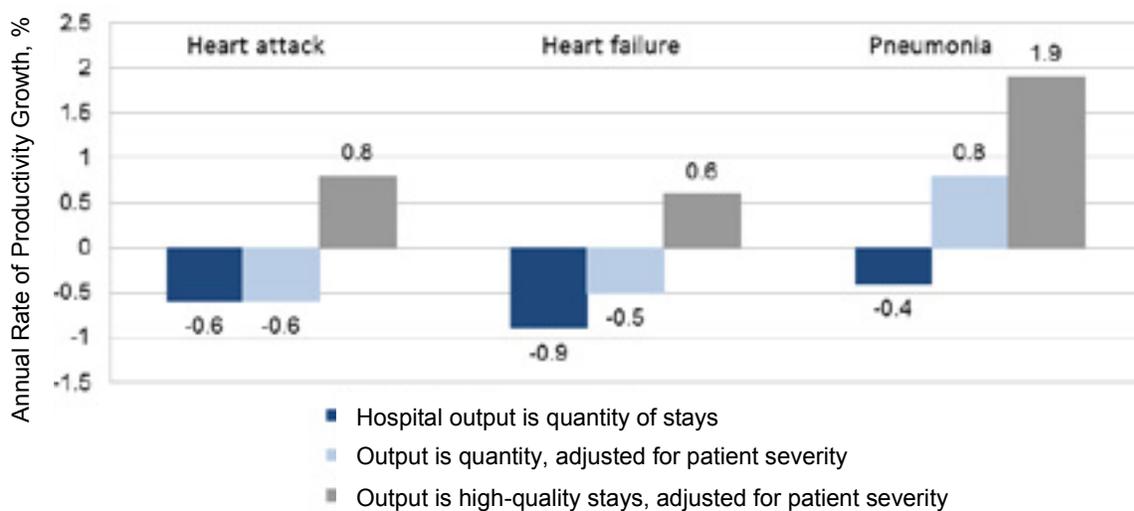
EVIDENCE FOR HIGHER PRODUCTIVITY GROWTH IN HEALTH CARE

The traditional method of calculating hospital productivity makes no adjustment for either the illness of the patients being treated or the outcomes achieved. If patients are getting sicker over time and require more intensive care, the traditional method will count the increased resources used to treat

them as lower productivity; if outcomes are improving over time, the traditional method won't count this as higher productivity. In a recent effort to account for these factors, [Romley, Goldman, and Sood \(2015\)](#) focus on hospital treatments for heart attacks, heart failure, and pneumonia during the period from 2002 to 2011.

The authors first calculate a traditional measure of productivity growth for these three conditions. For this calculation, they define hospital output as the number of admissions and productivity as the inflation-adjusted change in the cost per admission. They find that this measure shows negative productivity growth for each of the three conditions, meaning that hospitals were increasing the resources used to treat each patient. Second, they adjust for the severity of patients' illnesses, arguing that if patients are sicker, then increased costs of treatments shouldn't be counted as reductions in productivity. Their severity adjustments improve measured productivity growth for two of the three conditions. Finally, they account for the changing quality of treatment over time by redefining the unit of output from the simple number of treatments to the number of "successful" treatments, defined as admissions where the patient survived 30 days without an unplanned readmission (Figure 3). With this adjustment, measured MFP growth improved sharply, ranging from 0.6 to 1.9 percent annually for the three conditions during the 2002-2011 period.

Figure 3: Accounting for quality, U.S. hospitals actually performed well over 2002-2011



Source: Romley et al., 2015

EVIDENCE FOR HIGHER PRODUCTIVITY GROWTH IN HEALTH CARE

There are a variety of different ways to adjust health care output and productivity for improvements in quality, which are explored in greater detail in Sheiner and Malinovskaya (2016).

The Romley et al method accounts for increases in the quality of health care over time by redefining the service being purchased: rather than counting the number of treatments, it counts the number of successful treatments. In this way, improved outcomes are counted as increased quantities. Under this approach, health care productivity increases when the cost per successful treatment declines, rather than when the cost per treatment—successful or not—declines.

An alternative, but related method, subtracts the costs expended by the health sector to achieve any given improvement in quality. For example, if between year 1 and year 2 hospitals improve outcomes by spending an additional \$1000 in nursing costs for each heart attack patient, then a quality-adjusted price would subtract \$1000 from the actual price of heart attack treatment in year 2, as an attempt to measure what the cost of heart attacks would have been had quality been held constant at the year 1 level.

Both of these methods focus on the cost of achieving a particular level of quality. An alternative method is to adjust the output of the health sector by the utility value of the improved quality. Imagine that, when the hospital increases its spending on nursing by \$1000, average life expectancy following a heart attack increases by one month. If the monetary value of an additional month is worth \$10,000, then one can argue that health sector output increased by \$10,000, at a cost of \$1,000. Under this measure, the cost of heart attacks can be viewed as having fallen by \$9,000 (the \$10,000 benefit less the additional \$1,000 cost.)

WHICH METHOD IS BEST?

Economists have different views on the question of how health output should account for changing quality. In part, the answer depends on how the information will be used. To answer the question: “Has increased health spending been valuable?” most economists would agree that accounting for the utility value of the health spending is appropriate. If every \$1 of health spending yields more than \$1 worth of value, then clearly the spending is worth it.

However, this method doesn’t address the question of whether the health sector is technologically capable of providing a constant quality of health services with fewer inputs (fewer workers, fewer costly tests) over time. To answer this question, a cost-based method—like the one used by Romley and co-authors—might make more sense. (Again, see Sheiner and Malinovskaya (2016) for a more in-depth discussion.)

Still others, like the CMS actuaries, think that the traditional method is most meaningful when asking whether the ACA's productivity adjustments are sustainable: Essentially, they are suggesting that, unless the old payment method resulted in excess hospital profits, then any cuts in payments mean that health care providers won't be able to provide the same improvements in care over time in the future as they did in the past.

PROSPECTS FOR IMPROVING PRODUCTIVITY IN THE HEALTH CARE SECTOR

Regardless of whether health care productivity has decreased or increased over the past few decades, many analysts look at our current health sector and see a lot of potential for productivity improvements. They note the tremendous amount of waste in the health care system—as noted in [Blumenthal, Stremikis, and Cutler \(2013\)](#), up to 30 percent of health spending may be unnecessary—and the wide array of new payment reforms being implemented as part of the Affordable Care Act that are aimed at improving quality while reducing cost. These economists suggest that, given these increased incentives for cost-effective care, the payment reductions under the ACA should be manageable without impinging on the quality of care or on the pace of quality improvement.

Of course, it remains unclear what measures might be necessary to achieve significant increases in productivity. One view is that health care providers will figure out how to do more with less if they have to. For example, research by the [Medicare Payment Advisory Commission \(MedPAC\)](#) finds that hospitals that face significant fiscal pressure from their non-Medicare population (that is, hospitals in markets where insurers are able to drive down reimbursements or that are very dependent on Medicaid), have lower costs for their Medicare patients. In a similar vein, research from the United Kingdom shows that when hospitals face competitive pressures, they tend to respond by improving productivity. For example, [Gaynor, Propper, and Seiler \(forthcoming\)](#) found that a reform to the UK's National Health Services that allowed patients greater choice in hospitals (which meant hospitals had to compete for patients more than before) led to an increase in the average quality of hospital care. This effect was attributable to two factors. First, when consumers had more choice in hospitals, they tended to choose higher quality hospitals. And second, when faced with competition, hospitals managed to improve performance, as measured by things like hospital mortality rates following heart attacks. Both of these lines of research suggest that health care providers do have the scope for improving productivity.

The ACA contained numerous reforms aimed at increasing the incentives for health care providers to raise quality and lower costs. For example, a number of penalties and bonuses were introduced to Medicare's hospital payment system: Under the Hospital Readmissions Reduction and the Hospital-Acquired Condition Reduction programs, hospitals are penalized for excess rates of readmissions and hospital-acquired conditions, respectively, and under the Hospital Value-Based Purchasing program, hospital payments are adjusted up or down based on how a hospital performs

on a set of quality and cost measures.

In addition, the ACA introduced a number of delivery system reforms. For example, under the Shared Savings Program, groups of doctors and other providers can form Accountable Care Organizations (ACO). These organizations are intended to foster greater coordination among providers with the hope of improving quality, reducing waste, and lowering costs. ACOs that meet quality standards and reduce costs relative to a benchmark get a share of the cost savings (and, in some models, have to pay part of the cost if they exceed their budget target). And the recently enacted Medicare Access and CHIP Reauthorization Act of 2015 will establish a merit-based incentive payment system for physicians that will tie payments more closely to measures of performance.

The ACA also created the Center for Medicare and Medicaid Innovation to develop and test value-based alternative payment methods, and granted the HHS secretary the authority to adopt innovations found to save money and improve quality for use throughout the Medicare program. Thus, looking forward, new more effective payment models are likely to be implemented. According to [the U.S. Department of Health & Human Services](#), by 2019, 90 percent of traditional Medicare provider payments is expected to be tied to quality or value.

Research to date has shown some modest increases in productivity arising from these new payment models. For example, [McWilliams and co-authors \(2015\)](#) found that, among the 32 organizations entering the Medicare Pioneer ACO program in 2012 (in which providers can share savings with Medicare if spending falls below a financial benchmark), spending per Medicare beneficiary on acute inpatient care, hospital outpatient care, and post-acute care fell, resulting in aggregate savings of 1.2%. Importantly, these spending reductions were not associated with declines in quality, and even led to improved quality in some cases. Another study by [McWilliams and co-authors \(2016\)](#), this time focusing on participants in the Medicare Shared Savings Program ACOs, found aggregate savings of 1.4% for organizations entering the program in 2012, but much smaller results for 2013 entrants. Again, the authors found that these savings were not associated with a decline in quality of care, suggesting improved productivity.

Of course, these programs are quite new, and so it is too early for any definitive conclusions on their potential to increase productivity over time. Few analysts believe that huge gains in productivity will be achieved overnight—instead, the hope is that our payment system will increasingly pay providers on the basis of value rather than volume and that this change in incentives will lead to significant increases in productivity.

References

- Blumenthal, David, Kristof Stremikis, and David Cutler (2013). Health Care Spending — A Giant Slain or Sleeping? *The New England Journal of Medicine* 369. doi: 10.1056/NEJMhpr1310415
- Gaynor, Martin, Carol Propper, and Stephan Seiler (Forthcoming). Free to Choose? Reform, Choice, and Consideration Sets in the English National Health Service. *American Economic Review*. <https://www.aeaweb.org/articles?id=10.1257/aer.20121532&&from=f>
- McWilliams, John Michael, Michael E. Chernew, Bruce E. Landon, and Aaron L. Schwartz (2015). Performance differences in year 1 of pioneer accountable care organizations. *The New England Journal of Medicine* 372(20). doi: 10.1056/NEJMsa1414929
- McWilliams, John Michael, Laura A. Hatfield, Michael E. Chernew, Bruce E. Landon, and Aaron L. Schwartz (2016). Early Performance of Accountable Care Organizations in Medicare. *The New England Journal of Medicine* 374. doi: 10.1056/NEJMsa1600142
- Medicare Payment Advisory Commission (2011). Chapter 3: Hospital Inpatient and Outpatient Services. March 2011 Report to the Congress: Medicare Payment Policy. http://www.medpac.gov/documents/reports/Mar11_Ch03.pdf?sfvrsn=0
- Romley, John A., Dana P. Goldman, and Neeraj Sood (2015). US Hospitals Experienced Substantial Productivity Growth During 2002–11. *Health Affairs* 34(3). doi: 10.1377/hlthaff.2014.0587
- Shatto, John D. and M. Kent Clemens (2015). Projected Medicare Expenditures under an Illustrative Scenario with Alternative Payment Updates to Medicare Providers. Office of the Actuary, Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/Downloads/2015TRAlternativeScenario.pdf>
- Sheiner, Louise and Anna Malinovskaya (2016). Measuring Productivity Growth in Health Care: An Analysis of the Literature. Hutchins Center on Fiscal and Monetary Policy, The Brookings Institution.
- Spitalnic, Paul, Stephen Heffler, Bridget Dickensheets, and Mollie Knight (2016). Hospital Multifactor Productivity: An Updated Presentation of Two Methodologies. Office of the Actuary, Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends->

[and-Reports/ReportsTrustFunds/Downloads/ProductivityMemo2016.pdf](#)

Technical Review Panel on the Medicare Trustees Reports (2012). Review of Assumptions and Methods of the Medicare Trustees' Financial Projections.

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/Downloads/TechnicalPanelReport2010-2011.pdf>

U.S. Department of Health and Human Services (2015). Better, Smarter, Healthier: In historic announcement, HHS sets clear goals and timeline for shifting Medicare reimbursements from volume to value. <http://www.hhs.gov/about/news/2015/01/26/better-smarter-healthier-in-historic-announcement-hhs-sets-clear-goals-and-timeline-for-shifting-medicare-reimbursements-from-volume-to-value.html>