Understanding Medicare's Impact on Innovation: A Framework for Policy Reform

Marta Podemska-Mikluch

MERCATUS CENTER
George Mason University

3434 Washington Blvd., 4th Floor, Arlington, Virginia 22201
www.mercatus.org

Marta Podemska-Mikluch. "Understanding Medicare's Impact on Innovation: A Framework for Policy Reform." Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, 2018.

ABSTRACT

The United States leads the world in per capita healthcare spending, but other countries achieve comparable outcomes at significantly lower cost. Medicare, a defined-benefit universal insurance program for the elderly and the largest buyer of healthcare, discourages cost cutting and encourages wasteful innovation. For one, Medicare pays physicians and hospitals separately, preventing integration and delivery innovation because most providers cannot afford to adopt a noncompliant organizational structure. Second, Medicare covers all "medically necessary" care, a vague term that promotes development of expensive technologies, often of dubious value. Third, Medicare contributes to artificially high prices. Medicare physician payment rates are adjusted by a physician committee that has no incentive to introduce payment reductions. Medicare payment rates influence prices throughout the entire healthcare system because contracts between private insurers and physicians use Medicare payment rates as a benchmark. Since its introduction in 1965, Medicare has caused a dramatic expansion in hospital infrastructure, increased medical device patenting, and led to the diffusion of imaging technologies. However, it has also prevented entrepreneurial experimentation and development of cost-cutting, disruptive innovations. While politically challenging, moving Medicare from a defined-benefit to a defined-contribution program could go a long way to address waste in the US healthcare system.

JEL codes: I13, I18, L26, O38, P48

Keywords: Medicare, innovation, healthcare entrepreneurship, disruptive technologies, payment and delivery system reform, defined-benefit, defined-contribution, waste, telemedicine

This paper can be accessed at https://www.mercatus.org/publications/medicare-impact-innovation.

The United States leads the world in per capita healthcare expenditure, spending 25 percent more than does Switzerland, the second country in the ranking.[1] But the outcomes are not sufficiently better to justify this difference. Spending more without getting more in return suggests waste. In a 2013 report, the Institute of Medicine (now the Health and Medicine Division of the National Academies) estimated the waste in the US healthcare system at $750 billion. In any other industry, entrepreneurs would jump at the opportunity to turn such excess costs waste into profits. In healthcare, however, regulatory and payment laws make it challenging for entrepreneurs to introduce cost-saving innovation or to reinvent service delivery.[2]

This paper explores the obstacles to entrepreneurship and innovation in the US healthcare system, focusing on those originating from the Medicare program. Medicare is a provider of universal health insurance for senior citizens and people with disabilities. Generally speaking, insurance programs can be categorized as either defined contribution or defined benefit. Medicare belongs to the second group, with benefits broadly defined as "medically necessary" care. In contrast to universal health insurance programs in other countries, Medicare coverage is not limited to cost-effective treatments. Instead, Medicare coverage determinations must be cost blind. This encourages development and adoption of expensive treatments, often of uncertain or minor benefit. Waste is augmented by three additional factors: cost-based payments that tie physicians' incomes to the quantity of provided services, low cost sharing that isolates beneficiaries from the cost of care, and separation of hospital and provider payments that contributes to inefficient organizational fragmentation.

1. OECD (Organisation for Economic Co-operation and Development), *Health at a Glance 2017*, https://www.oecdilibrary.org/content/publication/health_glance-2017-en.
2. Einer Elhauge, *The Fragmentation of U.S. Health Care: Causes and Solutions* (New York: Oxford University Press, 2010); Elhauge, "Obamacare and the Theory of the Firm" (SSRN Scholarly Paper ID 2293073, Social Science Research Network, Rochester, NY, 2015), https://papers.ssrn.com/abstract=2293073.

Medicare's inefficiencies affect the entire healthcare system because Medicare is the largest buyer of healthcare in the United States. In 2016, Medicare accounted for 20 percent of the national health expenditure, 25 percent of spending on hospital care, and 23 percent of spending on physician services.[3] In addition to the 25 percent of revenue from Medicare, hospitals received 17 percent of their revenue from Medicaid. With government programs accounting for more than 40 percent of all hospital revenue, hospitals simply must adopt an organizational structure that complies with these programs' requirements. While public expenditure on physician services is not as high as private expenditure, Medicare nonetheless has a profound impact on physician payment rates. For one, in contracts with physicians, private insurers use Medicare payment rates as a payment benchmark. Thus, when Medicare payments change, private payments follow.[4]

Medicare is not only inefficient but also unsustainable. Wasteful services and the wrong services being developed and adopted contribute to Medicare's expenditure growth and impending insolvency. In 2016, Medicare paid $675 billion in total benefits, and this number is projected to double by 2027.[5] This level of spending cannot continue, in part because the Hospital Insurance Trust Fund (HI), which finances much of the Medicare program, is projected to be insolvent by 2025.[6] Additionally, Medicare's rising costs are one of the key contributors to the large and growing federal debt. Compounding this problem, the employee base that financially supports Medicare has been consistently declining. Between 1980 and 2008, there were about 4 workers per Medicare beneficiary. By 2016 that number declined to just 3.1 workers. Projections indicate a further decline so that by 2030 there will be only 2.4 workers per beneficiary.[7] At some point in

3. Calculation is based on Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, National Health Expenditures Tables, "Table 4: National Health Expenditures by Source of Funds and Type of Expenditures: Calendar Years 2010–2016" (December 2017), https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html.
4. Jeffrey Clemens and Joshua D. Gottlieb, "Do Physicians' Financial Incentives Affect Medical Treatment and Patient Health?" *American Economic Review* 104, no. 4 (2014): 1320–49; Jeffrey Clemens and Joshua D. Gottlieb, "In the Shadow of a Giant: Medicare's Influence on Private Physician Payments," *Journal of Political Economy* 125, no. 1 (2016): 1–39.
5. Congressional Budget Office, *Medicare—Congressional Budget Office's June 2017 Baseline* (Washington, DC: Congressional Budget Office, 2017), https://www.cbo.gov/sites/default/files/recurringdata/51302-2017-06-medicare.pdf.
6. Congressional Budget Office, *Medicare—Congressional Budget Office's June 2017 Baseline*.
7. Boards of Trustees for Medicare, *2017 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds* (Washington, DC: Centers for Medicare & Medicaid Services, 2017), https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/Downloads/TR2017.pdf.

the coming years, there will need to be a significant increase in the Medicare payroll tax, a decrease in services provided by Medicare, or, most likely, some combination of both.

This paper starts with an overview of Medicare's influences on innovation in the US healthcare system. Next is an analysis of incentives for waste embedded in the three major aspects of Medicare: (1) the Medicare payment system, (2) low cost sharing, and (3) fragmentation in care delivery. The analysis is followed by an overview of innovations that were spurred by Medicare and those crowded out by the program. The study finds that Medicare encourages development of expensive technologies, often of dubious value, while discouraging disruptive, cost-effective innovations. Furthermore, Medicare has led to a dramatic expansion in hospital infrastructure, has increased medical device patenting, and has led to the diffusion of imaging technologies. While all these investments generate benefits, often the costs far exceed the benefits. At the same time, Medicare prevents experimentation, learning, and disruptive innovation in delivery systems.

OBSTACLES TO INNOVATION

Tremendous advances in technology have provided a foundation for a complete transformation of the healthcare industry. We have all the necessary ingredients for more effective and affordable healthcare, delivered to patients in the comfort of their homes or within hospitals for the most severe cases only.[8] Wearable devices, skin sensors, genome sequencing, teleconferencing—all these new technologies provide a foundation for healthcare that is customized, patient centered, effective, and affordable.[9] Even with all the necessary ingredients, however, there are significant barriers to revolutionizing healthcare. To understand these barriers, or at least to get a better sense of their extent, one should consider how the digital revolution has unfolded in other industries. Manufacturing, retail, shipping, travel, music—all these have been completely transformed by advances in computing power, the spread of the internet, and smartphones. But healthcare is still at the dawn of its digital revolution: for example, the government actually needed to pay healthcare providers to adopt electronic medical records.

8. Robert Wachter, *The Digital Doctor: Hope, Hype, and Harm at the Dawn of Medicine's Computer Age* (New York: McGraw-Hill Educational, 2015).
9. Eric Topol, *The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health Care* (New York: Basic Books, 2012); Topol, *The Patient Will See You Now: The Future of Medicine Is in Your Hands* (New York: Basic Books, 2016).

Why are disruptive innovations not readily adopted in the US healthcare system? In other industries, innovation is driven by customer preferences and by prices, which in turn depend on industry competitiveness and technological feasibility. Customers determine whether new products succeed or fail by balancing their benefits against prices. This incentivizes suppliers not only to develop new products but also to minimize their production costs. Healthcare is different in two major ways. First, patients often seek professional expertise in making decisions about care. This means that preferences of experts, usually physicians, will play a role in the adoption of innovations. Second, patients usually pay for only some of the care they receive; payments often come from a third-party payer, either a private or public insurer.

These two differences, on their own, are not detrimental to disruptive innovation. Physicians will serve the best interest of patients as long as doing so is not contrary to their own interests. And patients will consider prices as long as they share in the financial responsibility and benefit from savings. It is definitely possible to align the incentives of patients, physicians, and payers in a manner that would be conducive to both innovation and providing better care at lower cost. For example, it is in the interest of private insurers to have patients take on a greater financial responsibility and to tie provider payments to cost effectiveness. But such measures are not politically feasible in Medicare. In contrast to private insurers, Medicare's budget pressure is offset by political pressure.[10]

Medicare is obligated to pay for all "medically necessary" care. However, for most health conditions, there is no clear scientific consensus on what constitutes medical necessity.[11] The decision, therefore, is left to the discretion of the prescribing physician, and the government is obliged to pay for all the services physicians deem medically necessary and choose to provide to Medicare beneficiaries.[12] Because only physicians hold medical licenses, legal provisions prohibit any interference from Medicare administrators.[13] Owing to this monopoly on determining what is medically necessary, physicians have significant influence over the direction of technological innovation.[14] Their influence is magnified by the fact that Medicare coverage determinations must be cost blind. This combination

10. Nicholas Bagley, "Bedside Bureaucrats: Why Medicare Reform Hasn't Worked," *Georgetown Law Journal* 101, no. 3 (2013): 519–80.
11. Bagley, "Bedside Bureaucrats"; Jonathan Skinner and Douglas Staiger, "Technology Diffusion and Productivity Growth in Health Care," *Review of Economics and Statistics* 97, no. 5 (2015): 951–64.
12. Bagley, "Bedside Bureaucrats."
13. Bagley, "Bedside Bureaucrats."
14. Office of Technology Assessment, *Medical Technology and the Costs of the Medicare Program* (Washington, DC: US Government Printing Office, 1984).

of incentives excludes any consideration of cost-effectiveness, therefore encouraging development and adoption of expensive treatments, often of uncertain or minor benefit. Healthcare expenditure would be significantly lower if Medicare insurance coverage were limited to medical technologies available at the time the program was introduced[15] or if Medicare paid for cost-effective treatments only. But with coverage based on cost-blind determinations, the scope of that coverage will continue expanding as new technologies are developed.

For the majority of services received by its beneficiaries, Medicare pays physicians directly, based on a fee-for-service schedule. These fees are supposed to reflect the cost of providing a particular service and are not tied to outcomes, which means the physician's income increases with the number of prescribed services. Furthermore, due to Medigap and other supplemental insurance programs, cost sharing for individuals age 65 and older is minimal. The combination of cost-based reimbursement with minimal cost sharing leads to overutilization of care: patients follow what the doctor orders, regardless of cost-effectiveness. Within hospitals, moving to a prospective payment system in the 1980s encouraged greater efficiency. However, since physicians are paid separately, there is no incentive for them to participate in cost saving.

Because of these perverse incentives, providers that adopt cost-effective innovations are not rewarded with higher earnings. In fact, frequently, better outcomes lead to lower revenues. Such was the case with the specialized congestive heart failure program created at Duke Hospital Medical Center. The program improved patients' outcomes, reduced costs by 40 percent, and consequently lowered admission rates. Despite this success, the facility ended up losing money. Why? Because Medicare pays hospitals for providing health services, not for improving people's health status.[16] A similar example comes from Cincinnati Children's Hospital, where the finance team determined that quality improvements would lower revenue since no payer would reimburse them more for higher-quality care. The plan to improve quality was eventually approved as better care meant more rapid discharge, which allowed for admitting more patients.[17]

---

15. Burton A. Weisbrod, "The Health Care Quadrilemma: An Essay on Technological Change, Insurance, Quality of Care, and Cost Containment," *Journal of Economic Literature* 29, no. 2 (1991): 523–52.
16. Regina E. Herzlinger, "Why Innovation in Health Care Is So Hard," *Harvard Business Review*, May 2006, https://hbr.org/2006/05/why-innovation-in-health-care-is-so-hard.
17. David M. Cutler, "Where Are the Health Care Entrepreneurs? The Failure of Organizational Innovation in Health Care," *Innovation Policy and the Economy* 11, no. 1 (2011): 1–28.

MEDICARE PAYMENT SYSTEM

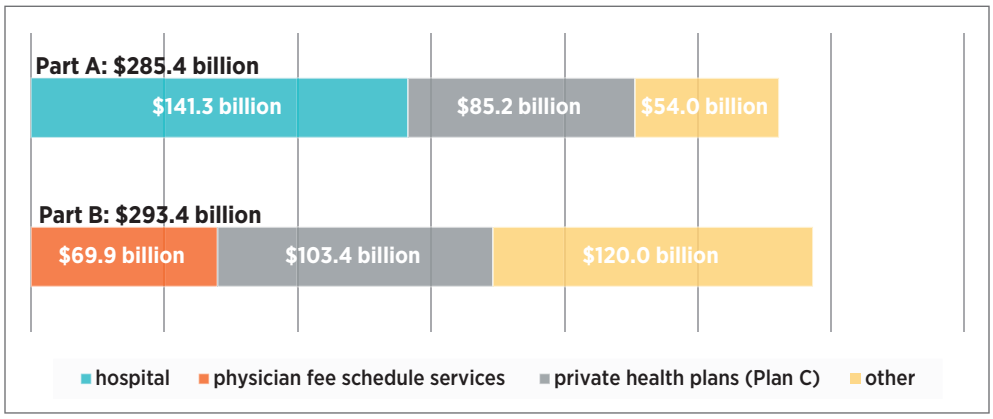
Medicare beneficiaries enroll in one of two programs: Fee-For-Service (FFS) or Medicare Advantage (MA). FFS, also known as the Original or Traditional Medicare, consists of two parts: Part A and Part B. Part A pays for hospital stays, home health services following hospital stays, skilled nursing facility stays, and hospice care. Part B pays for physician visits, outpatient services, and some home health visits. The majority of Medicare beneficiaries, about 70 percent, are enrolled in FFS. The remaining 30 percent are enrolled in MA plans, also known as Part C. MA provides an alternative to FFS by allowing beneficiaries to enroll in private health plans. To participate in MA, private health plans must offer coverage equivalent to or better than what is available through Parts A and B.

Medicare payments are financed out of two government trust funds: the Hospital Insurance Trust Fund (HI) and the Supplementary Medical Insurance Trust Fund (SMI). HI, which mainly covers Part A, is funded by a payroll tax on earned income and an additional Medicare tax levied on all unearned income, such as dividends and capital gains. It is a pay-as-you-go system; current employees fund healthcare for seniors. Due to the aging of the US population and rising healthcare costs, the HI is projected to become exhausted in 2025, which under current law will prevent the Centers for Medicare and Medicaid Services (CMS) from making any payments.[18] Enrollment in Part A is automatic for those who turn 65, and most enrollees are not required to pay a Part A premium.[19] SMI finances Medicare Part B and Medicare Part D, the latter of which was introduced in 2006 and provides prescription drug benefits. The two trust funds also pay for Medicare Part C. Part B premiums are income based, but the majority of enrollees pay the standard amount of $134 per month. Premiums for Part C and Part D vary and depend on a selected plan.

As figure 1 indicates, in 2016, the majority of Medicare expenditure was split almost equally between Part A ($285.4 billion) and Part B ($293.4 billion), while the rest—$100 billion—went to Part D. The majority of Part A payments were paid to hospitals ($141.3 billion), followed by payments to private health plans ($85.2 billion). Payments to private health plans were the highest expense for Part B ($103.4 billion), followed by $69.9 billion to physician fee schedule services.[20]

18. Congressional Budget Office, *Medicare—Congressional Budget Office's June 2017 Baseline*.
19. Only people who paid Medicare taxes for less than 40 quarters (10 years) are required to pay a Part A premium. Those who paid Medicare taxes for 30–39 quarters pay $232, and those who paid Medicare taxes for less than 30 quarters pay $422.
20. Boards of Trustees for Medicare, *2017 Annual Report*.

FIGURE 1. MEDICARE PART A AND PART B EXPENDITURES



Source: Created by the author based on Table II.B1 of Boards of Trustees for Medicare, *2017 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds*, Centers for Medicare and Medicaid Services, Washington, DC, 2017, https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/Downloads/TR2017.pdf.

Original Medicare: Payments for Inpatient Hospital Care

In 2016, hospital inpatient services accounted for 72 percent of all Part A spending, at $141.3 billion. Medicare pays hospitals a predetermined rate for each discharge, using the inpatient prospective payment system (IPPS). Per-discharge rate is a sum of two base rates: one for operating expenses and one for capital expenses. To adjust the payments for the costs associated with a particular condition, CMS uses the Medicare Severity Diagnosis Related Groups (MS-DRG) system. In this system, clinically similar conditions are clustered into diagnosis-related groups, and each discharge is assigned to one of three levels of illness severity within its assigned group. In 2017 there were 757 groups in MS-DRG; the number varies each year because groups and payments are adjusted annually, with payments being adjusted for local input prices. To get reimbursed, hospitals bill Medicare Administrative Contractors. It is worth recalling that Part A payments include pay for nurses, orderlies, administrators, and custodial staff but exclude physician services. Doctors, nurse practitioners, and physician assistants bill Medicare separately and are not covered by the IPPS.

When Medicare was introduced in 1965, hospitals were paid based on "reasonable" cost. But this cost-based reimbursement system was inefficient because it tied revenue to costs: lower costs result in lower revenues. So to increase revenues, hospitals adopted a variety of wasteful measures, namely prolonged hospital stays and investments in new technologies, irrespective of their cost-

effectiveness.[21] In response to the subsequent growth in Medicare expenditure, physician peer review was put in place to control utilization patterns. When that failed to constrain spending, Congress moved to the next round of reforms and, in 1983, adopted the Prospective Payment System (PPS).[22] PPS reversed hospitals' financial incentives by encouraging more cost-conscious and less resource-intensive care. Initially, however, the reform exempted capital costs from prospective reimbursement; only labor expenses were to be covered by the fixed price. As the following sections will explore, excluding capital had a significant impact on subsequent patterns of hospital investment.

Original Medicare: Payments for Physician Services

In contrast to inpatient hospital payments, physician services provided to Traditional Medicare enrollees are predominantly paid on a fee-for-service basis. In fact, the use of fee-for-service to pay for physician services is not limited to Medicare. In 2013, 94.7 percent of all physician office visits were paid on a fee-for-service basis.[23] Even physicians and practices who belong to a managed health plan or an Accountable Care Organization (ACO) are paid this way. The preponderance of fee-for-service payments seems counterintuitive given the efforts of policymakers to reform provider payments, such as with the demonstration projects and ACOs (discussed later in this paper). What is even more puzzling is the direction of change. Despite the reforms, capitation payments to physicians (i.e., payments of a set amount per patient) have declined from more than 15 percent in 1996 to just 5.3 percent in 2013. In that period, fee-for-service became a dominant reimbursement format for office visits for all three types of insurance: private, Medicaid, and Medicare. This shift to fee-for-service was unfolding at the same time that worker enrollment in conventional plans was declining and while Medicare enrollment was shifting from Traditional Medicare to Medicare Advantage.[24]

As it turns out, it is a mistake to assume that capitation payments to a group are the same as capitation payments to an individual physician or practice. While managed health plans might receive capitation payments, the participating

21. Office of Technology Assessment, *Medical Technology and the Costs of the Medicare Program.*
22. Bagley, "Bedside Bureaucrats."
23. S. H. Zuvekas and J. W. Cohen, "Fee-for-Service, While Much Maligned, Remains the Dominant Payment Method for Physician Visits," *Health Affairs* 35, no. 3 (2016): 411–14.
24. From 27 percent in 1996 to less than 1 percent in 2013. See Gary Claxton et al., "Health Benefits in 2017: Stable Coverage, Workers Faced Considerable Variation in Costs," *Health Affairs* 36, no. 10 (2017): 1838–47.

practices and physicians are overwhelmingly paid on the fee-for-service basis.[25] Rewards for quality and efficiency, introduced by the reforms, are far from eliminating fee-for-service and are more accurately described as enhancements to the existing system, not an actual provider payment reform.[26] Physicians' incomes continue to depend on the quantity and intensity of the provided treatments.

Not only is the structure of all physician payments tied to Medicare; so are the payment rates. Medicare rates are used as a benchmark in negotiating physician payments, which change when Medicare payments change. For example, within one year of Medicare's payment change, private payments for surgical services fell by $1.16 for each $1.00 decrease in Medicare payment.[27] Moreover, it is not unusual for contracts with private insurers to have fee schedules described as a percentage of Medicare fees.[28] Even for salaried physicians, the fee-for-service payment schedule is relevant because coding is used to measure their productivity.[29]

So how does Medicare determine how much to pay physicians? As mentioned, Medicare initially used a simple cost-based reimbursement, but in 1992, Congress established a system for centrally determining physician reimbursement rates, known as the resource-based relative value scale (RBRVS). This system assigns a specific number of relative value units (RVUs) to each of the 13,000 distinct procedures. RVUs are supposed to reflect the resources required to provide a particular service, such as time, necessary skills, practice expenses, malpractice insurance expense, and regional differences in input prices.

Since the RBRVS is a cost-based reimbursement, it rewards volume, regardless of healthcare outcomes. Physicians' incomes increase as they see more patients, reduce per-visit time, have patients return more often, and order more tests and procedures. To address these perverse incentives, the reform included volume performance standards that based increases in payment rates on how service volume compared to a predetermined target. It also placed limits on what physicians could charge Medicare beneficiaries. When volume performance standards turned out to be insufficient, a new mechanism was introduced to control the projected growth in Medicare spending. Starting in 1997, physician fees were to be updated based on Sustainable Growth Rate (SGR), an analytical

25. Zuvekas and Cohen, "Fee-for-Service."
26. Paul B. Ginsburg, "Fee-for-Service Will Remain a Feature of Major Payment Reforms, Requiring More Changes in Medicare Physician Payment," *Health Affairs* 31, no. 9 (2012): 1977–83.
27. Clemens and Gottlieb, "In the Shadow of a Giant."
28. Dean H. Gesme and Marian Wiseman, "How to Negotiate with Health Care Plans," *Journal of Oncology Practice* 6, no. 4 (2010): 220–22.
29. Betsy Nicoletti, "Four Coding and Payment Opportunities You Might Be Missing," *Family Practice Management* 23, no. 3 (2016): 30–35.

tool designed to ensure that the yearly increase in Medicare per-beneficiary expenditure did not exceed the growth in GDP per capita. In the years when the growth in Medicare expenditures was higher than the SGR, Medicare reimbursement fees were supposed to be held constant or decreased. But since SGR provided no incentives for individual physicians to limit the number of performed procedures, growth in Medicare expenditure frequently exceeded the SGR target. When that happened, however, Congress intervened and deferred rate decreases.[30] In 2015, SGR was repealed.[31]

The per-service reimbursement rate depends on the number of assigned RVUs, which are regularly updated by a committee of the American Medical Association (AMA) known as the Relative Value Scale Update Committee.

In assigning RVUs, the committee is supposed to estimate the actual cost of performing a procedure. This attempt to reflect costs is meant to approximate the workings of a market system where competition brings prices down to equal the average costs. But it is impossible for this committee, or any other organization, to replicate the market mechanism.[32] The committee lacks the information, the processing power, and the incentives of the market system. For cost information, the committee relies on provider billing data, which are unlikely to be an accurate measure of actual costs or a timely cost predictor.[33] Physician productivity increases over time with experience and technological improvements. In order to reflect increased productivity in assigned RVUs, the committee would need to update the entire list regularly. But there are more than 10,000 procedures on the list, so regular updates for all of them are not feasible. Instead, the committee spends more time establishing RVUs for new procedures, while RVUs for the existing services remain unchanged. As a result, increased productivity leads to relatively higher physician payments and not to lower prices as would be the case in a market system. Over time, services characterized by a rapid increase in

30. Wesley Lowery, "For 17th Time in 11 Years, Congress Delays Medicare Reimbursement Cuts as Senate Passes 'Doc Fix,'" *Washington Post*, March 31, 2014, https://www.washingtonpost.com/news/post-politics/wp/2014/03/31/for-17th-time-in-11-years-congress-delays-medicare-reimbursement-cuts-as-senate-passes-doc-fix/.

31. Stuart Guterman, "With SGR Repeal, Now We Can Proceed with Medicare Payment Reform," *Commonwealth Fund*, April 15, 2015, http://www.commonwealthfund.org/publications/blog/2015/apr/repealing-the-sgr.

32. Friedrich A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, no. 4 (1945): 519–30.

33. Paul B. Ginsburg and Joy M. Grossman, "When the Price Isn't Right: How Inadvertent Payment Incentives Drive Medical Care," *Health Affairs (Project Hope)*, Suppl. Web Exclusives (December 2005): W5-376–84.

productivity end up receiving higher payments, relative to procedures characterized by a slower increase in productivity.[34]

Time required to update RVUs for all the services on the list is not the only obstacle preventing the committee from lowering the number of assigned RVUs. Political incentives are equally, if not more, important:

> This structure and composition of the Relative Value Update Committee makes it very difficult to lower the assigned values for specific services, even when improved efficiencies might dictate such adjustments. Physician specialty societies cannot be expected to identify services their members perform for proposed reductions in relative values, and they can be counted on to resist such attempts by others.[35]

It is not surprising, then, that the committee is seven times more likely to raise estimates of work value than to lower them.[36] The AMA's exaggerated procedure times lead to paradoxical outcomes. For example, even though a typical doctor can perform nine colonoscopies and four other procedures in nine hours, AMA assumptions predict that this workload requires about 26 hours.[37] Such inaccuracies augment waste by encouraging physicians to provide service with a high estimated work value.

Medicare Advantage

In the 1980s, after it became apparent in the private market that prepaid group practices could provide better care at a lower cost, Medicare allowed beneficiaries to enroll in private health plans (Part C Medicare). Currently known as Medicare Advantage, Part C covers all that is included in Parts A and B, often with some additional benefits, but it might involve a limited choice of providers and other cost-sharing measures. At first, there was little interest among beneficiaries in switching to managed plans, but that has recently changed. Since 2006, the share of Medicare beneficiaries enrolled in private plans has doubled,

34. Ginsburg, "Fee-for-Service Will Remain a Feature of Major Payment Reforms."
35. Ginsburg, "Fee-for-Service Will Remain a Feature of Major Payment Reforms."
36. Peter Whoriskey and Dan Keating, "How a Secretive Panel Uses Data That Distorts Doctors' Pay," *Washington Post*, July 20, 2013, https://www.washingtonpost.com/business/economy/how-a-secretive-panel-uses-data-that-distorts-doctors-pay/2013/07/20/ee134e3a-eda8-11e2-9008-61e94a7ea20d_story.html.
37. Whoriskey and Keating, "How a Secretive Panel Uses Data That Distorts Doctors' Pay."

reaching 32.4 percent of total Medicare enrollment in 2016.[38] However, while Part C was supposed to allow Medicare to benefit from savings observed in the private sector, the cost of MA patients is higher than the cost of FFS patients.[39] This is because of multiple limitations that Congress placed on MA plans.

For one, there are minimum benefit requirements. To qualify as Part C, MA plans must include the same benefits as Medicare Parts A and B, except hospice. Most MA plans must also offer Part D drug benefits. These minimum benefit requirements prevent providers from offering coverage based on relative cost-effectiveness of different procedures and services. While MA plans might limit the choice of providers and impose other cost-sharing measures, they must offer additional benefits or premium discounts in return.

Second, capitation rates are not established in a competitive bidding process but instead are closely tied to the reimbursement rates of Traditional Medicare. Payments to plans depend on local Medicare Advantage benchmarks, which in turn are determined based on projected average fee-for-service spending per Medicare beneficiary in a given county, as well as on the plan's quality ranking in what is known as the CMS star system. Plans that bid above or at benchmark receive the benchmark rate. Plans that bid at or below the benchmark receive a payment equal to their bid. Those that bid below the benchmark qualify for an additional "rebate" payment equal to a fixed percentage of the difference between the bid and the benchmark. The percentage can be either 50, 65, or 70 depending on the plan's quality rating in the CMS system. In the best-case scenario, plans that bid below the benchmark receive 70 percent of the difference between their bid and the benchmark. However, the plan must return the rebate to its enrollees in the form of lower premiums or supplemental benefits. That way, the rebate turns into an incentive for new enrollees.

The Medicare Payment Advisory Committee (MedPAC) recommends that Original Medicare and Medicare Advantage be financially neutral; that is, payment rates should be similar for each so that capitation payments continue to be attractive to physician groups. This is the right path if preserving both programs is the intended goal. If the goal is better care at lower cost, however, then complete replacement of Traditional Medicare might be necessary. Otherwise,

38. Boards of Trustees for Medicare, *2017 Annual Report*.
39. Thomas G. McGuire, Joseph P. Newhouse, and Anna D. Sinaiko, "An Economic History of Medicare Part C," *Milbank Quarterly* 89, no. 2 (2011): 289–332.

Traditional Medicare payments create an artificial benchmark and prevent pursuit of low-cost, high-quality care.[40]

Affordable Care Organizations

Concerns over the perverse incentives embedded in the fee-for-service payment system are not new; neither are the efforts aimed at reforming the program. Since 1967, Medicare has had the authority to conduct demonstration projects, whose purpose is to examine alternative payment and delivery methods. The Affordable Care Act (ACA) further extended this authority by creating the Center for Medicare and Medicaid Innovation within CMS and allowing it to expand any successful project nationally without approval from Congress.

Demonstration projects fall into one of two broad categories. In the first category are projects focused on improving disease management and care coordination. In the second group are projects focused on value-based payments to foster improvements in quality and efficiency. In 2012, the Congressional Budget Office (CBO) reviewed 10 major demonstrations and found the results disappointing. Of the six disease management and care coordination projects, not one reduced spending sufficiently to offset program fees. These six projects also failed to reduce hospital admission rates. Of the four reviewed demonstration projects in the value-based payments category, three produced no savings while one reduced spending by 10 percent—relative to what it would have been without the program. Two value-based demonstrations produced slight improvements in quality. The CBO concluded that incentives of the demonstration projects are insufficient to overcome the incentives of the fee-for-service model and that further changes are needed.[41]

Among the value-based demonstrations, programs that negotiated bundled payments with hospitals produced better outcomes than programs that allowed physicians to share in the savings from total Medicare spending. This is not necessarily surprising because to produce substantial savings, physicians would need to provide fewer services—not always a worthwhile tradeoff. The ACA, approved before the CBO's findings were published, adopted the shared savings approach as a key feature of its delivery system reform.

40. MedPAC, *A Data Book: Healthcare Spending and the Medicare Program* (Washington, DC: MedPAC, 2017).
41. Lyle Nelson, *Lessons from Medicare's Demonstration Projects on Disease Management, Care Coordination, and Value-Based Payment* (Washington, DC: Congressional Budget Office, 2012).

To enter the CMS's Shared Savings Program, groups of clinicians, hospitals, and other healthcare providers form ACOs. ACOs are paid for by Traditional Medicare, but in addition to regular FFS revenue, they can qualify for a bonus payment. As long as ACOs meet the care quality performance standards, the Shared Savings Program rewards them for lower growth in their per capita fee-for-service costs. Upon entering the program, ACOs select one of three Shared Savings Tracks. Track 1 ACOs qualify for a bonus but are not responsible for the losses. This track offers a lower share of savings than Tracks 2 and 3 because ACOs in Tracks 2 and 3 are accountable for the losses.[42] In 2018, 460 of the 561 participating ACOs entered the non-risk-based Track 1.[43]

While ACOs are supposed to encourage adoption of managed care, they differ from Health Maintenance Organizations. Beneficiaries do not choose to enroll in an ACO and are not limited to in-network providers but are free to seek care from any provider they choose, whether a member of the ACO or not. This freedom creates a challenge for calculating the actual cost of per capita care within the ACOs. To resolve it, CMS assigns a beneficiary to an ACO if the beneficiary received the plurality of primary care services within the ACO. Plurality of care in this case means that beneficiaries are assigned to an ACO where they receive more primary care than from any other provider. Plurality of care, and not majority of care, was chosen as a standard for patient attribution because the latter was considered overly restrictive. ACO providers are free to recommend that patients see specialists only within the ACO, but there is no cost to patients if they do not follow this recommendation. Since beneficiaries do not share in the costs and savings, they have little incentive to economize on care.

By enabling providers to receive bonus payments, ACOs should encourage greater efficiency in care coordination and management. Whether they have been successful remains to be seen. So far, the results are mixed. As noted, providers within the Shared Savings Programs face contradicting incentives. On one hand, they still receive payments through the FFS, which increase as services increase. On the other hand, they could receive a shared savings bonus when the number of services goes down. To be successful, ACOs will need to select physicians who are willing to be accountable for the quality of care and costs of beneficiaries attributed to them, and reward them by sharing in the

42. Centers for Medicare and Medicaid Services, "Medicare Shared Savings Program: Shared Savings and Losses and Assignment Methodology," 2017, https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/Shared-Savings-Losses-Assignment-Spec-V5.pdf.
43. Centers for Medicare and Medicaid Services, "Medicare Shared Savings Program: Fast Facts," 2018, https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/SSP-2018-Fast-Facts.pdf.

savings through providing quality bonuses. It is probably the strongest advantage the ACO offers—the ability to reward physicians for quality and efficiency. But the contradictory incentives of fee-for-service remain strong: while the overall number of ACOs is growing, only about 30 percent of ACOs on average qualify for a shared savings payment.[44] Furthermore, the total Medicare savings from the program are very modest, at about 0.1 percent of total Medicare expenditure.[45]

LOW COST SHARING

In designing Medicare, policymakers assumed that overutilization of care would be prevented through cost sharing—that relatively high deductibles and cost-sharing requirements, combined with no limit on beneficiaries' out-of-pocket spending, would ensure price sensitivity among patients and therefore reduce overutilization.[46] That is not the case: the cost-sharing requirements became ineffective because the vast majority of Traditional Medicare beneficiaries—80 percent—have supplementary insurance through Medigap coverage, employer-sponsored coverage, or Medicaid.[47] These supplemental sources of coverage make healthcare virtually free for a great majority of Medicare recipients.

Low cost sharing alters patient behavior in three major ways. First, it encourages overutilization of healthcare services. When not required to pay for care, patients show a strong preference for what they perceive as the best care, regardless of expense.[48] Furthermore, since patients lack the proper medical training to correctly evaluate the expected benefits of a test or treatment, they usually leave this decision to the physician. As will be explored below, the result is an epidemic

44. Centers for Medicare and Medicaid Services, "Medicare Shared Savings Program Accountable Care Organization Performance Year 2015 Results," Data.CMS.gov, March 29, 2017, https://data.cms.gov/Special-Programs-Initiatives-Medicare-Shared-Savin/Medicare-Shared-Savings-Program-Accountable-Care-O/x8va-z7cu.
45. James C. Capretta, "Replacing Medicare ACOs with a Better Integrated Care Option" (Mercatus on Policy, Mercatus Center at George Mason University, Arlington, VA, May 2017), https://www.mercatus.org/system/files/capretta-replacing-medicare-acos-mop-v1.pdf.
46. Bagley, "Bedside Bureaucrats."
47. Henry J. Kaiser Family Foundation, "An Overview of Medicare" (Issue Brief, Henry J. Kaiser Family Foundation, Menlo Park, CA, 2017), https://www.kff.org/medicare/issue-brief/an-overview-of-medicare/.
48. Roseanna Sommers et al., "Focus Groups Highlight That Many Patients Object to Clinicians' Focusing on Costs," *Health Affairs* 32, no. 2 (2013): 338–46.

of low-value care—i.e., unnecessary, repeated tests that provide little to no useful information and treatments that have no significant impact on health.[49]

Second, low cost sharing reduces patients' incentives to shop for lower prices, which in turn protects providers from price competition. As claims data indicate, inpatient hospital prices vary significantly. Within one particular hospital referral region, a lower-limb MRI at the least expensive hospital costs 50 percent less than at the most expensive hospital.[50] Patients will continue to have no reason to pay attention to prices unless they share in the savings. In 2013, *Washington Post* journalists investigated a case of Medicare overpaying $1 billion for an eye drug.[51] Per-patient price for this drug was $2,000, while an equally effective substitute was available for $50. It is safe to say that if patients were responsible for even 10 percent of the price, few would choose to pay the extra $195 for the expensive drug. The abundance of evidence from the private market indicates that patients search for less expensive options as long as they can share in the savings. Consider the success of Vitals—a company that pays patients for selecting a less expensive provider. It partners with insurers and employers to redirect beneficiaries to less expensive options and then splits the created savings. Similar incentives are embedded in reference pricing benefits programs. These programs limit how much an employer pays for a specific procedure and require beneficiaries to pay the difference. Facing such incentives, employees seek facilities that offer lower prices. This encourages hospitals to engage in price competition. In California, reference pricing led to a decline in hospital prices by 5.6 percent at low-price facilities and by 34.3 percent at high-price facilities.[52]

The third problem with low cost sharing is that it biases consumption toward reimbursed treatments in place of nonreimbursed alternatives, regardless of their effectiveness. This bias, in turn, increases the relative price of

---

49. Aaron L. Schwartz et al., "Measuring Low-Value Care in Medicare," *JAMA Internal Medicine* 174, no. 7 (2014): 1067–76; Atul Gawande, "The Cost Conundrum," *New Yorker*, May 25, 2009, http://www.newyorker.com/magazine/2009/06/01/the-cost-conundrum; Gawande, "Overkill," *New Yorker*, May 11, 2015, http://www.newyorker.com/magazine/2015/05/11/overkill-atul-gawande.
50. Zack Cooper et al., "The Price Ain't Right? Hospital Prices and Health Spending on the Privately Insured" (NBER Working Paper 21815, National Bureau of Economic Research, Cambridge, MA, November 2017).
51. Peter Whoriskey and Dan Keating, "An Effective Eye Drug Is Available for $50. But Many Doctors Choose a $2,000 Alternative," *Washington Post*, December 7, 2013, https://www.washingtonpost.com/business/economy/an-effective-eye-drug-is-available-for-50-but-many-doctors-choose-a-2000-alternative/2013/12/07/1a96628e-55e7-11e3-8304-caf30787c0a9_story.html.
52. James C. Robinson and Timothy T. Brown, "Increases in Consumer Cost Sharing Redirect Patient Volumes and Reduce Hospital Prices for Orthopedic Surgery," *Health Affairs* 32, no. 8 (2013): 1392–97.

noncovered alternatives. Medicare offers generous coverage, but it does not cover all goods or services that might have a positive impact on health. For example, it covers open-heart surgery but not gym membership or healthy meals. To the extent that vigorous exercise and a better diet might prevent the need for surgery, these are substitutes. Essentially, Medicare contributes to moral hazard—it lowers the cost of unhealthy choices. Not facing financial consequences of the surgery makes signing up for the gym less urgent or important.

FRAGMENTATION

In a 2013 report, the Institute of Medicine (now the Health and Medicine Division of the National Academies) estimated the waste in the US healthcare system at $750 billion. Most of this waste is attributed to the dysfunctional incentives of the payment system. The second-largest chunk, $130 billion, results from inefficiently delivered services: mistakes, fragmentation, use of higher-cost providers, and operational inefficiency at delivery sites.[53] In any other industry, entrepreneurs would jump at the opportunity to turn such excess costs into profits. Eradicating waste allows firms to lower prices, which leads to an increased market share and increased profits. But that is not how the US healthcare system works. Instead, regulatory and payment laws make it difficult for entrepreneurs to reinvent service delivery or introduce cost-saving innovation into the healthcare industry.[54]

Increased industry integration is necessary to lower costs, improve health outcomes, and end perverse incentives. But this is not to say that more integration is always better. The optimal level of industry integration depends on how easy or how hard it might be to measure individual contributions. This varies over time with new technological advances and changes in market conditions. So the optimal level of integration cannot be anticipated by scholars or by policymakers. Rather, it must be continuously discovered by market entrepreneurs.

The $130 billion of waste from service delivery inefficiencies indicates the need for increased integration in the US healthcare system. But for that to happen, providers must be free to experiment with alternative organizational arrangements. Currently, that is not possible because of state regulatory and federal payment laws that prevent substantial changes in delivery systems. Among

53. Institute of Medicine, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America* (Washington, DC: National Academies, 2013).
54. Elhauge, *The Fragmentation of U.S. Health Care*; Elhauge, "Obamacare and the Theory of the Firm."

state regulatory laws, the three main culprits are (1) restrictions on corporate practice of medicine, (2) tort laws that impose liability on hospitals and insurers if they interfere with the medical practice of individual physicians, and (3) accreditation standards that require medical staff to be in charge of medical decisions.[55]

State bans on the corporate practice of medicine began developing in the early twentieth century.[56] They were adopted to make physicians the final decision makers regarding clinical appropriateness and to prevent insurance and hospitals from intervening in healthcare decision-making. Currently, some states merely prohibit the practice of medicine without a license, while others go as far as to prohibit the corporate ownership of medical practices or employment of professionals by nonprofessionals. Closely related to the bans on the corporate practice of medicine are fee-splitting rules. These rules vary by state, but in general, they prohibit splitting fees for induced or deterred treatment. For example, in some states, hospitals are not allowed to pay physicians to participate in care coordination that would lead to a reduced number of procedures. Other states make it illegal to tie payments for management services to billing volume.[57]

Medicare reinforces fragmentation because it pays hospitals (Part A) and physicians (Part B) separately and requires disaggregate payments for individual services. Furthermore, since Medicare often accounts for as much as 55 percent of hospital revenue, hospitals must be organized in a Medicare-compliant manner. Also, Medicare requires that physicians certify the medical need for their provided services—giving them the final discretion over what services they should provide. Ironically, while Medicare laws strongly contribute to fragmentation, it is Medicare patients who could most benefit from integration: Medicare patients on average see seven physicians per year, ten if the patient suffers from a chronic condition.[58]

---

55. Elhauge, "Obamacare and the Theory of the Firm."
56. Sara Mars, "The Corporate Practice of Medicine: A Call for Action," *Health Matrix* 7 (1997): 241.
57. The fee-splitting rules contradict the intentions of the ACOs. Therefore, the adoption of the ACO model, and its potential to generate substantial savings, will be shaped by the extent of fee-splitting rules in each state. For example, in Michigan, Medicare bonus payments will need to be "clearly and accurately described as payments based on cost savings and/or the achievement of quality goals" and cannot be based on the volume or value of referrals. See Arthur F. deVaux et al., "Accountable Care Organizations in Michigan. A Whitepaper on ACOs and Michigan Law," *State Bar of Michigan Health Care Law Section*, accessed May 24, 2018, https://higherlogicdownload.s3.amazonaws.com/MICHBAR/f8a8a213-d7d6-49c4-bdff-e6c7a728e471/UploadedImages/pdfs/aco.pdf; Stuart I. Silverman, "In an Era of Healthcare Delivery Reforms, the Corporate Practice of Medicine Is a Matter That Requires Vigilance," *Health Law & Policy Brief* 9, no. 1 (2015).
58. Elhauge, "Obamacare and the Theory of the Firm."

Fragmentation generates numerous perverse incentives in care delivery. In contrast to a coordinated system, where care is provided by a team and not by independent physicians, in a fragmented system treatment often depends on the specialty of the particular physician the patient is seeing. In a study of patients diagnosed with localized prostate cancer, the type of physician seen (radiation oncology versus urology) was the strongest predictor of treatment choice.[59] Moreover, fragmentation allows physicians to use referrals as a way of getting rid of complex, troublesome cases. Finally, in a fragmented system, repeated medical tests are a source of revenue. What would be considered waste in an integrated delivery system improves the provider's bottom line in a fragmented system.

To address some of the shortcomings of fragmentation, in 2015 Medicare introduced reimbursement payments for case management. Primary care providers are now eligible to bill Medicare for time spent reviewing medical history and attempts to coordinate care among providers. Alternatively, practices might use this as an opportunity to hire specialized care managers. Unfortunately, the reimbursement does nothing to resolve accountability issues, as case managers have no authority over providers and can merely issue recommendations. Moreover, case management reimbursement is significantly lower than reimbursement for medical procedures, the difference amplified by the fact that case management is time-consuming and highly individualized, while for medical procedures, productivity increases over time. Additionally, as the findings from the demonstration projects indicate, case management might cause modest improvement in quality of care but only in specific settings.[60]

MEDICARE-INDUCED INNOVATION

There is no question that Medicare has increased access to healthcare for millions of seniors and people with disabilities. The resulting increase in the demand for physician and hospital services spurred expansion of hospital infrastructure, development of medical devices, and proliferation of imaging technologies. The question is not whether these innovations were beneficial; there is no doubt that many benefited from Medicare expansion. The important question is whether the benefits exceed the costs of forgone resources.

---

59. Benjamin D. Sommers et al., "Predictors of Patient Preferences and Treatment Choices for Localized Prostate Cancer," *Cancer* 113, no. 8 (2008): 2058–67.
60. Nelson, *Lessons from Medicare's Demonstration Projects*.

Expansion of Hospital Infrastructure

As Amy Finkelstein explores,[61] the marketwide changes that resulted from the introduction of Medicare triggered a significant expansion of the healthcare infrastructure. By increasing the share of elderly individuals with significant insurance coverage from 25 to 100 percent, Medicare dramatically increased the demand for healthcare.[62] According to Finkelstein, in its first five years (1965–1970), Medicare led to a 37 percent increase in hospital spending and a 32 percent increase in admissions, for all ages. Finkelstein's results suggest that the impact of Medicare on health spending was an increase in spending over the next five years (1970–1975). She attributes this increase to a dynamic feedback loop between the expansion of health insurance and the adoption of new technologies: Medicare increased the market size for new technologies, increasing the incentive to develop new technologies, leading to increased adoption rates. This interpretation is consistent with the Weisbrod model,[63] which also predicts that expansion of health insurance increases the growth of new technologies. According to Finkelstein, half the impact of Medicare on spending came from the growth of existing hospitals, and half came from the entry of new ones. Finkelstein's findings also show substantial evidence that Medicare induced the adoption of new cardiac technologies, such as open-heart surgery and cardiac intensive care units.

The expansion of hospital infrastructure was driven by the payment system that reimbursed hospitals based on "reasonable cost," with separate payments for operating expenses and capital costs. Operating expenses were tied to the number of days a patient spent in the hospital, which incentivized prolonged stays. For capital expenses—payments for interest, depreciation, return on equity, rent, and leasing fees—hospitals first needed to estimate total capital-related expenses and then determine Medicare's share. Medicare's share in total expenditure was determined separately for routine expenses, such as room and board, and for auxiliary services. For routine expenses, Medicare was responsible

61. Amy Finkelstein, "The Aggregate Effects of Health Insurance: Evidence from the Introduction of Medicare," *Quarterly Journal of Economics* 122, no. 1 (2007): 1–37.
62. Before 1966, about 25 percent of elderly individuals had Blue Cross Blue Shield (BCBS) insurance, while about 55 percent had another form of insurance. Finkelstein focuses on the change from BCBS, arguing that other forms of insurance did not offer meaningful coverage. As documented in great detail by Christy Ford Chapin, strict requirements from the AMA discouraged commercial insurers from participating in the healthcare market. See Finkelstein, "The Aggregate Effects of Health Insurance"; Christy Ford Chapin, *Ensuring America's Health: The Public Creation of the Corporate Health Care System* (Cambridge, UK: Cambridge University Press, 2015).
63. Weisbrod, "The Health Care Quadrilemma."

for its share in total inpatient days, while for auxiliary services, it was responsible for its share in total inpatient charges.[64]

Under "reasonable cost" reimbursement, hospital revenue increased with growing costs. The longer patients stayed in the hospital, the more Medicare payments it received. On the capital side, the "reasonable cost" reimbursement rewarded investments in expensive technologies and continuous expansion, independent of cost-effectiveness or whether the new equipment would end up being utilized. The capital acquisition was also attractive for hospitals because they used it to attract physicians. Physicians were attracted to the hospitals equipped with the newest technologies because that is where they could perform more intensive procedures and therefore bill for their services at higher rates. Also, by investing in capital, hospitals discouraged physicians from referring patients to competitors.

In response to the subsequent growth in Medicare expenditure, Congress adopted the Prospective Payment System (PPS) that is still in place today.[65] PPS reversed hospitals' financial incentives. To increase their net revenue, hospitals would now need to lower costs. As previously mentioned, the reform initially exempted capital costs from prospective reimbursement; only labor expenses (i.e., pay for nurses, orderlies, administrators, and custodial staff but not physician services) were to be included. By exempting capital from prospective reimbursement, the reform increased the relative price of labor, which further increased the incentive for hospitals to adopt expensive capital equipment. Furthermore, although it led to lower operating expenses, the reform also raised the total per-case cost.[66] Contrary to its intentions, PPS encouraged hospitals to invest even more heavily in technology, which led to the adoption of a range of new medical technologies.[67] Hospitals with a higher Medicare share were more prone to these heavy technology investments, which increased their capital-labor ratio. Despite these unintentional technological repercussions, however, the reform was successful in decreasing the lengths of hospital stays.

Although it might seem puzzling at first, PPS also contributed to the adoption of non-Medicare technologies, e.g., neonatal intensive care units, or NICUs.[68] Why? Most likely, the NICU expansion is a result of spillovers from Medicare

64. Congressional Budget Office, *Including Capital Expenses in the Prospective Payment System* (Washington, DC: Congressional Budget Office, 1988).
65. Bagley, "Bedside Bureaucrats."
66. Office of Technology Assessment, *Medical Technology and the Costs of the Medicare Program*.
67. Daron Acemoglu and Amy Finkelstein, "Input and Technology Choices in Regulated Industries: Evidence from the Health Care Sector," *Journal of Political Economy* 116, no. 5 (2008): 837–80.
68. Acemoglu and Finkelstein, "Input and Technology Choices in Regulated Industries."

payments combined with arbitrary apportionment rules. As Leemore S. Dafny shows,[69] using data from the 1988 policy change that increased reimbursement rates for Medicare admissions with specific diagnoses, hospitals spent the extra funds uniformly, across the treatment of all patients. Moreover, as Daron Acemoglu and Amy Finkelstein suggest,[70] the NICU expansion could also be attributed to fungibility in the reimbursement of capital expenses, which is embedded in the Medicare payment rules. Since hospitals had significant discretion in which costs to assign to Medicare, they could pass those costs on from other patients.[71] This behavior indicates yet another channel through which Medicare influences the entire healthcare system.

It was not until 1991 that Congress managed to approve a 10-year transition to a full PPS for inpatient hospital care.[72] While this reform intentionally constrained spending in hospital expenditure, it had multiple unintended consequences, such as shifting costs from inpatient hospital settings to outpatient centers.

In addition to constraining spending, PPS was supposed to encourage hospitals to place limits on physicians,[73] encouraging them to consider the value of care. However, since physicians are not paid by hospitals but by Medicare, they have little incentive to participate in cost cutting. In fact, Medicare statutes prohibit hospitals from making any payments to physicians that could impact Medicare beneficiaries. Payment fragmentation allows physicians to maintain their position as the key decision-makers in the adoption and use of medical technologies.

Development of Medical Devices

Introduction of Medicare and Medicaid significantly increased US-based medical device patenting. In fact, the two programs account for 25 percent of recent worldwide medical equipment patenting.[74] A mechanism of this impact is simple: Medicare and Medicaid increased the profitability of medical equipment innovation, which gave practitioners incentives to patent their existing and new innovations. As Jeffrey Clemens explains, profitability depends on the size

69. Leemore S. Dafny, "How Do Hospitals Respond to Price Changes?," *American Economic Review* 95, no. 5 (2005): 1525–47.
70. Acemoglu and Finkelstein, "Input and Technology Choices in Regulated Industries."
71. Congressional Budget Office, *Including Capital Expenses in the Prospective Payment System*.
72. Philip G. Cotterill, "Prospective Payment for Medicare Hospital Capital: Implications of the Research," supplement, *Health Care Financing Review* (1991): 79–86.
73. Bagley, "Bedside Bureaucrats."
74. Jeffrey Clemens, "The Effect of U.S. Health Insurance Expansions on Medical Innovation" (NBER Working Paper 19761, National Bureau of Economic Research, Cambridge, MA, 2013).

of the market, and the market size is driven by the number of comprehensively insured beneficiaries. By increasing the profitability of medical device innovation, Medicare and Medicaid increased medical equipment patenting by 40 to 50 percent relative to other US patenting and foreign medical equipment patenting. Increases in medical equipment patenting were most dramatic in states where Medicare and Medicaid insurance expansions were largest, with large baseline numbers of physicians per resident.

Clemens points out, "The origins of Medicare and Medicaid provide a compelling natural experiment in part because there was little impact on incentives for the invention of new pharmaceuticals. Consequently, they resulted in a substantial change in incentives for one type of health-sector innovation and not for another."[75] Clemens's conjecture is backed by research on Medicare's impact on pharmaceutical innovation, or lack thereof. In contrast to medical devices, there is no evidence that Medicare's introduction increased drug consumption among elderly individuals or contributed to increased FDA approval of drugs oriented toward the elderly.[76] These findings are not surprising, however, given that Part D drug benefits were not implemented until 2006.

Imaging Technologies

In addition to driving hospital expansion and development of medical devices, Medicare had a significant influence on the adoption and diffusion of imaging technologies. The Medicare payment system provides strong incentives to invest in technologies that have high fixed costs and high marginal profit—for example, MRIs, 64-slice computerized tomography, and robotic surgical machinery. Moreover, payments for capital-intensive services (e.g., diagnostic imaging) are higher than payments for labor-intensive services (e.g., office visits).[77] Clemens and Joshua Gottlieb find that in response to Medicare payment changes, physicians invest in productivity-enhancing technologies—e.g., MRI—and that they increase the intensity of treatments.[78] Another source of evidence for

75. Clemens, "Effect of U.S. Health Insurance Expansions on Medical Innovation."
76. Daron Acemoglu et al., "Did Medicare Induce Pharmaceutical Innovation?" (NBER Working Paper 11949, National Bureau of Economic Research, Cambridge, MA, 2006), http://www.nber.org/papers/w11949.
77. Jeffrey Clemens, "Implications of Physician Ethics, Billing Norms, and Service Cost Structures for Medicare's Fee Schedule" (MPRA Paper, Munich Personal RePEc Archive, Munich, Germany, February 2, 2014), https://mpra.ub.uni-muenchen.de/73392/.
78. Clemens and Gottlieb, "Do Physicians' Financial Incentives Affect Medical Treatment and Patient Health?"

Medicare overpaying for imaging technologies comes from research that shows that private-payer payments for labor-intensive services tend to be adjusted up while payments for capital-intensive services are adjusted down, relative to Medicare reimbursement rates.[79]

EPIDEMIC OF LOW-VALUE CARE

Did Medicare-spurred innovations contribute to improvements in health outcomes? Finkelstein and Robin McKnight explore the benefits of Medicare on longevity and find that Medicare had no impact on elderly mortality in its first 10 years.[80] However, as they argue, there might have been a positive effect of reduced stress exposure from lower out-of-pocket medical spending. What the research seems to indicate is that while there are significant benefits to Medicare expansion, the costs outweigh these benefits. In other words, given the resources expanded through Medicare, we should expect better outcomes, or the achieved outcomes should come at a much lower cost. In fact, the opposite is true: higher Medicare spending and greater intensity of care are linked to lower quality and poorer outcomes.[81] Overuse of low-value care is driven, paradoxically, by well-intentioned physicians. Reasoning that they want to do everything in their power to help patients, physicians prescribe all treatments with an expected positive benefit, even if this benefit is minimal. The incentive to prescribe low-value care is strengthened by low cost sharing and by the payment system that rewards quantity while discouraging cost cutting.

Another consideration is that treatment effectiveness varies across patients—the same technology might offer tremendous benefits to one patient while being completely ineffective for others. Amitabh Chandra and Jonathan Skinner use angioplasties with stents as an example. This treatment is particularly beneficial to patients treated within the first 12 hours of a heart attack. The benefits are less clear for patients with other conditions—for example, those with stable angina. But because reimbursement rates are similar across all patients,

79. Jeffrey Clemens, Joshua D. Gottlieb, and Tímea Laura Molnár, "Do Health Insurers Innovate? Evidence from the Anatomy of Physician Payments," supplement C, *Journal of Health Economics* 55 (2017): 153–67.

80. Amy Finkelstein and Robin McKnight, "What Did Medicare Do? The Initial Impact of Medicare on Mortality and Out-of-Pocket Medical Spending," *Journal of Public Economics* 92, no. 7 (2008): 1644–68.

81. Katherine Baicker and Amitabh Chandra, "Medicare Spending, the Physician Workforce, and Beneficiaries' Quality of Care," *Health Affairs* 23, no. 4 (2004): 184–97; John E. Wennberg et al., "Inpatient Care Intensity and Patients' Ratings of Their Hospital Experiences," *Health Affairs (Project Hope)* 28, no. 1 (2009): 103–12.

the procedure is performed not only in cases where its effectiveness is clear but also for a much larger group of patients for whom the benefits are close to zero.[82]

Expanding this benefit-cost approach to health innovation, Chandra and Skinner categorize medical innovations into three categories based on cost-effectiveness and potential for overuse. The first category groups cost-effective treatments that are administered only to patients who benefit from them—for example, antiretroviral drugs for people with HIV and AIDS, antibiotics for those with bacterial infections, and aspirin and beta-blockers for heart attack patients. Overuse for category I treatments is limited because of serious adverse effects (antiretroviral drugs), decreased quality of life (orchiectomy for testicular cancer), or low treatment price. The second category groups treatments that are cost-effective for some but not for all, such as the already described angioplasties with stents. High price and lack of immediate adverse effects encourage overuse of these treatments. Finally, the third category groups treatments for which benefits are small or there is little proof of their effectiveness—for example, vertebroplasty. Due to difficulties in assessing cost-effectiveness, combined with relatively minor adverse effects, treatments in the second and third groups are more likely to be overused than treatments in the first group.[83]

Similarly, Clemens and Gottlieb find that changes in reimbursement rates have a varying impact on the supply of medical treatments.[84] Using the 1997 consolidation of Medicare's payment adjustment regions to analyze how changes in reimbursement rates impact physicians' supply of healthcare, they find that on average a 2 percent increase in reimbursement rate leads to a 3 percent increase in provision of care. The response is stronger among elective procedures (e.g., colonoscopies and cataract removal) and weaker in oncological procedures. In other words, physicians display weaker response to payment changes in prescribing potentially harmful procedures.

FORGONE INNOVATION

Beyond the obvious waste, low-value care crowds out cost-effective innovation. The Medicare-induced market expansion is different from an actual market expansion. Medicare coverage cannot be used to buy anything but the

82. Amitabh Chandra and Jonathan Skinner, "Technology Growth and Expenditure Growth in Health Care," *Journal of Economic Literature* 50, no. 3 (2012): 645–80.
83. Chandra and Skinner, "Technology Growth and Expenditure Growth in Health Care."
84. Clemens and Gottlieb, "Do Physicians' Financial Incentives Affect Medical Treatment and Patient Health?"

approved services, so the threshold for convincing patients to "buy" is low. Selling to people who can only spend resources on a narrow range of products in one industry is much different than selling to people who can allocate their resources any way they please. When the subsidized price is low enough, consumers will choose subsidized goods, irrespective of quality or effectiveness. That reduces experimentation in areas where reimbursement is unlikely or just uncertain. As a result, there is less experimentation and innovation in those areas. Without experimentation, there is no way to know exactly what sorts of innovations have been forgone. However, the general direction of forgone innovation can be deduced based on cross-country comparisons and by looking at managed health consortiums, such as Kaiser Permanente or Cleveland Clinic.

Organizational Diversity

Before legal rules were introduced to prevent integration, healthcare delivery in the United States was very diverse. For example, mutual aid societies used a portion of member dues to supply members with medical care. Similarly, in the nineteenth century, railroads and corporations hired physicians directly to oversee the work environment and to provide care at on-site clinics. Some, such as the Endicott-Johnson Corporation, went as far as to furnish employees and their families with physician, hospital, and dental care. In a different experiment, Henry J. Kaiser established a "closed panel" of salaried physicians to provide healthcare services to more than 30,000 workers. It was also a time of consumer medical cooperatives that offered medical services through a subscription model. In exchange for an initial fee and a recurring annual fee, families received all-inclusive medical and hospital care. Hospitals and physicians also developed new models of healthcare delivery.[85]

These examples are not given to offer policy solutions but simply to indicate that when free to do so, providers experiment with a variety of different models. The point here is not whether these models would work today but rather that without excessive regulation, entrepreneurs could experiment with diverse solutions. David M. Cutler offers an illustrative example for the lack of innovation in care delivery by looking at sources of wealth in healthcare, pharmaceuticals, and retail. The richest in health and pharmaceuticals made their money by designing innovative drugs and devices. In contrast, the richest in retail made

85. Chapin, *Ensuring America's Health*.

their wealth by redesigning organizational processes and changing how consumers buy products.[86]

One successful innovative model is the integrated healthcare system, an example of which would be the Cleveland Clinic, a nonprofit group practice. It has 3,000 salaried physicians and scientists on staff, representing 120 specialties and subspecialties. They are all on one-year contracts and must undergo an annual performance review. The organization prides itself on being physician run. In an integrated system such as this, there is no reason to order unnecessary tests and procedures. On average, coordinated healthcare expenses are 24 percent lower for physicians and 2 percent lower for hospitals, compared to a conventional setting.[87] Integrated systems are more innovative and deliver better care at lower cost. For example, integrated healthcare systems adopted shared electronic medical records long before the government mandate. Unfortunately, integrated healthcare systems have not been successful in growing beyond their original market. For example, since 1980, California's Kaiser Permanente entered seven new markets but failed in four of them.[88]

Shared medical appointments are an interesting example of organizational innovation within coordinated healthcare systems. Cleveland Clinic introduced shared medical appointments more than a decade ago. The idea is to meet with patients individually but then to complement individual sessions with group appointments. It saves physicians time and removes the need to repeat the same information. Patients also benefit because they get to share their experiences of dealing with the condition and learn from each other. Research findings indicate that shared medical appointments improve health outcomes and boost patient satisfaction while reducing waiting times and costs.[89] But Medicare has yet to offer coding and payment rules for shared group appointments. Without them, rapid adoption is unlikely. Of course, not all patients would be interested in shared medical appointments, and it is possible that the idea would fail when tested more broadly. However, with regular appointments available to Medicare beneficiaries at a price close to zero, there is no point engaging in such experimentation.

---

86. Cutler, "Where Are the Health Care Entrepreneurs?"
87. Alain C. Enthoven, "Integrated Delivery Systems: The Cure for Fragmentation," supplement 10, *American Journal of Managed Care* 15 (2009): S284–90.
88. Cutler, "Where Are the Health Care Entrepreneurs?"
89. Kamalini Ramdas, Elizabeth Teisberg, and Amy L. Tucker, "Four Ways to Reinvent Service Delivery," *Harvard Business Review*, December 2012, https://hbr.org/2012/12/four-ways-to-reinvent-service-delivery.

Telehealth Services

Before the internet revolution, books were bought at a bookstore, groceries at a grocery store, and shoes in a department store. Now, all these items and more are delivered to our homes. The internet has also altered how we consume services: online tutors, online gym instructors, online career coaching. All these options sometimes replace, and often complement, the face-to-face experience at a significantly lower price.

Healthcare is late to the internet revolution, though the internet has the power to transform the industry. Some predict that in the future, physician visits are going to become a thing of the past, and patients will receive almost all care at home. The ability to connect with physicians through video conferencing could dramatically lower costs and expand access to care. Once we move beyond a traditional physician and consider a consultation from an avatar or an algorithm with a connection to the cloud and the supercomputer, then cost implications appear to be even more attractive.[90] At this point, telemedicine might seem relevant for only consultations: checking on symptoms, management of chronic diseases, or appointment follow-ups. But the potential of telemedicine is much greater. A sonogram can now be performed with a handheld device attached to a cell phone. Blood tests can be done at home through a finger prick and processed through a cell phone attachment. In the future, things will be even simpler, with blood tests replaced by skin sensors.[91] In fact, we now have the technology to continuously and remotely monitor all the vital signs.[92]

Advances in telemedicine are not compatible with Medicare reimbursement rules. Currently, Medicare only reimburses for telemedicine appointments if they take place in an eligible originating site (typically located in a remote area, with poor access to a specialist).[93] That is, Medicare only pays for telehealth services if the patient connects to a distant practitioner from an eligible originating site, such as Rural Health Clinic or an office of a local physician. Moreover, beyond Medicare reimbursement rules, telemedicine is constrained by rules that make it illegal to write prescriptions without an in-office consultation and by the state licensing laws that limit the ability of physicians to provide telemedicine to patients in other states. For Medicare Advantage, telehealth services cannot

90. Topol, *The Creative Destruction of Medicine*.
91. Wachter, *The Digital Doctor*.
92. Topol, *The Patient Will See You Now*.
93. Centers for Medicare and Medicaid Services, "Telehealth Services," September 2018, https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Clinical-Laboratory-Fee-Schedule-Fact-Sheet-ICN006818.pdf.

count toward meeting network-adequacy requirements, and plans cannot use the availability of telehealth services to limit access to in-person services. These rules thwart the ability of telemedicine to bring about substantial cost reductions, and as a result, the delivery system reforms will not make a significant difference.[94]

Personalized, Patient-Centered, and Preventative Care

Per-service reimbursement is also inconducive to developing personalized or patient-centered care. It is impossible to talk about patient-centered care when no one is responsible for the outcomes. The fragmented nature of the healthcare system places the focus on the disease, not the patient. This is a mistake because applying care based on health history or information obtained from genome sequencing could lead to better outcomes and prevent significant waste.

We live in a time of great customization, of tailoring services and products to accommodate specific individuals or groups of individuals. To create patient-centered care, coordination is necessary. Personalized and patient-centered care can only be delivered by a team that works together and takes responsibility for the outcomes. The Medicare system of payments fosters fragmentation and therefore blocks patient-centered care. Technology, on the other hand, makes personalized and patient-centered care possible and relatively inexpensive, because teams can collaborate virtually. Of course, for patients with Medicare, inexpensive will not mean much as long as in-office visits are "free."

In addition to discouraging patient-centered, personalized care, Medicare discourages patients from investing in preventive care. Since beneficiaries have access to essentially free medical procedures, they have a lesser incentive to invest in preventive care. More importantly, with Medicare taking over all expenses for patients 65 and older, insurance companies have practically no incentives to invest in preventive care that would result in improved health outcomes by the time beneficiaries turn 65.

CONCLUSION

Without a doubt, Medicare stimulated some forms of healthcare innovation, namely development and preponderance of medical devices, growth of hospitals, and creation and diffusion of imaging and diagnostic technologies—all

94. Erin Dietsche, "CMS Shakes Up Telemedicine, Will Pay for More Services," *MedCity News*, November 3, 2017, https://medcitynews.com/2017/11/cms-telemedicine/.

innovations driven by Medicare's generous reimbursements. But fueling investment in these forms of innovation had a high opportunity cost. In addition to its financial unsustainability and impending bankruptcy, Medicare crowds out development of cost-effective treatments, discourages organizational and care delivery innovation, and prevents development of personalized, patient-centered, and preventive care.

Five decades of Medicare experiment offer one clear lesson: regulatory complexity overwhelms innovation and efficiency. Innovation involves learning to do the unknown, and efficiency involves learning to do the known better. To improve on either margin, entrepreneurs must be able to experiment with new ideas. And regulation is the killer of experimentation because it restricts the spectrum of possible solutions.

Reforming Medicare matters not only for seniors and the federal budget but also for the future of healthcare. So what can be done? Discussions of political plausibility are beyond the scope of this paper, but from an incentives standpoint, moving Medicare from a defined-benefit to a defined-contribution program could go a long way to resolve incentive incompatibility and foster innovation. A defined-contribution program, in the form of either vouchers or premium support, would incentivize beneficiaries to take charge of their care and ensure that resources are used in a more cost-effective manner. It would spur competition among providers and incentivize increased efficiency, as patients would select those who could deliver better care at a lower cost. Such a system would be significantly more conducive to entrepreneurial experimentation and disruptive innovation.

ABOUT THE AUTHOR

Marta Podemska-Mikluch is assistant professor of economics at Gustavus Adolphus College, the Marcia Page and John Huepenbecker Endowed Professor in Entrepreneurship, and the director of the Gustie Entrepreneur Cup, a student entrepreneurship competition.

Podemska-Mikluch's current work explores regulatory obstacles to healthcare innovation, in particular, those originating from the payment system.

Originally from Poland, Podemska-Mikluch earned her PhD in economics from George Mason University, an MS in applied economics from St. Cloud State University, and a BA in political science also from St. Cloud State University.

ACKNOWLEDGMENTS

The author is grateful to her former student, Neal Kroells-Gustavus (class of 2017), for the excellent research assistance he provided in the early stages of this project.

ABOUT THE MERCATUS CENTER AT GEORGE MASON UNIVERSITY

The Mercatus Center at George Mason University is the world's premier university source for market-oriented ideas—bridging the gap between academic ideas and real-world problems.

As a university-based research center, the Mercatus Center trains students, conducts research of consequence, and persuasively communicates economic ideas to solve society's most pressing problems and advance knowledge about how markets work to improve people's lives.

Our mission is to generate knowledge and understanding of the institutions that affect the freedom to prosper and to find sustainable solutions that overcome the barriers preventing individuals from living free, prosperous, and peaceful lives.

Since 1980, the Mercatus Center has been a part of George Mason University, located on the Arlington and Fairfax campuses.