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Healthcare Price Transparency: Policy Approaches and Estimated Impacts on Spending

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Healthcare price transparency discussions typically focus on increasing patients' access to information about their out-of-pocket costs, but that focus is too narrow and should include other audiences—physicians, employers, health plans and policymakers—each with distinct needs and uses for healthcare price information. Greater price transparency can reduce U.S. healthcare spending. For example, an estimated \$100 billion could be saved over the next 10 years if three select interventions were undertaken. However, most of the projected savings come from making price information available to employers and physicians, according to an analysis by researchers at the former Center for Studying Health System Change (HSC). Based on the current availability and modest impact of plan-based transparency tools, requiring all private plans to provide personalized out-of-pocket price data to enrollees would reduce total health spending by an estimated \$18 billion over the next decade. While \$18 billion is a substantial dollar amount, it is less than a tenth of a percent of the \$40 trillion in total projected health spending over the same period. In contrast, using state all-payer claims databases to gather and report hospital-specific prices might reduce spending by an estimated \$61 billion over 10 years.

The effects of price transparency depend critically on the intended audience, the decision-making context and how prices are presented. And the impact of price transparency can be greatly amplified if target audiences are able and motivated to act on the information. Simply providing prices is insufficient to control spending without other shifts in healthcare financing, including changes in benefit design to make patients more sensitive to price differences among providers and alternative treatments. Other reforms that can amplify the impact of price transparency include shifting from fee-for-service payments that reward providers for volume to payment methods that put providers at risk for spending for episodes of care or defined patient populations. While price transparency alone seems unlikely to transform the healthcare system, it can play a needed role in enabling effective reforms in value-based benefit design and provider payment.

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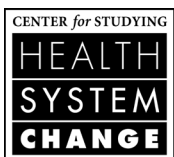
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This work was conducted by researchers at the former Center for Studying Health System Change (HSC). For nearly 20 years, the Center for Studying Health System Change (HSC) was at the forefront of identifying and analyzing emerging health care trends in communities. On Dec. 31, 2013, HSC merged with Mathematica

Policy Research (MPR) and ceased operations as an independent organization. All ongoing HSC projects at the time of the merger will be completed by HSC researchers, many of whom have joined MPR's Health Division.

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Price Transparency in Healthcare: The State of Play

There is broad consensus among policy experts that U.S. health spending is inappropriately high and that the healthcare system is woefully inefficient. Some analysts believe high prices for medical care lie at the heart of the spending problem.¹ But privately insured patients traditionally have had little reason to worry about prices because they were shielded by generous insurance coverage. Historically, even if they wanted to comparison shop, patients seeking price information would have had to burrow through the thickets of secrecy and technical jargon surrounding healthcare prices. As private health coverage becomes less comprehensive and patients shoulder more of the cost of their care directly through increased cost sharing, awareness of questionable healthcare pricing practices is growing.

Today, questions relating to medical prices are at the center of the health spending discussion. A growing body of research makes clear that prices paid to providers by private health plans vary widely within and across markets. But wide differences in unit prices for specific services are just the tip of the iceberg—physicians practice differently and recommend different courses of treatment for the same clinical condition. Visiting a physician who tends to recommend an aggressive course of care, above and beyond accepted guidelines, can significantly raise a patient's out-of-pocket costs.²

Price transparency generally refers to the ready availability of price data for the purpose of comparison shopping. In healthcare, the price transparency discussion usually focuses on patients and providing them with more information on out-of-pocket costs. That focus is far too narrow. Shopping for healthcare is a multistep process involving five key audiences—patients, physicians, employers, health plans and policymakers (see Figure 1)—each with distinct needs and uses for price information.

This analysis describes the different audiences' needs for price information and assesses the extent to which those needs are being met; explores the policy options for promoting price transparency; and quantifies three examples of the many possible policy interventions related to price transparency and their impacts on healthcare spending over the next 10 years.

Patient-Targeted Price Transparency

Patients make several key decisions in the healthcare shopping process: which health plan to enroll in, which primary

care physician or specialist to seek care from, and, in some non-emergency situations, which treatment to receive and where. Different types of price information are relevant at each of the decision points.

When selecting a plan, the necessary price data include both the premium paid by the enrollee and the level and range of out-of-pocket payments they are likely to face at the point of care—for example, the applicable deductibles, coinsurance and copayments. The Affordable Care Act (ACA) has advanced price transparency by requiring health plans available on exchanges to provide standardized benefits and cost-sharing tiers (bronze, silver, gold or platinum). The total cost of the plan—premium plus cost sharing—can then be compared against the breadth of the provider network, the perceived quality and convenience of the providers, and other factors.

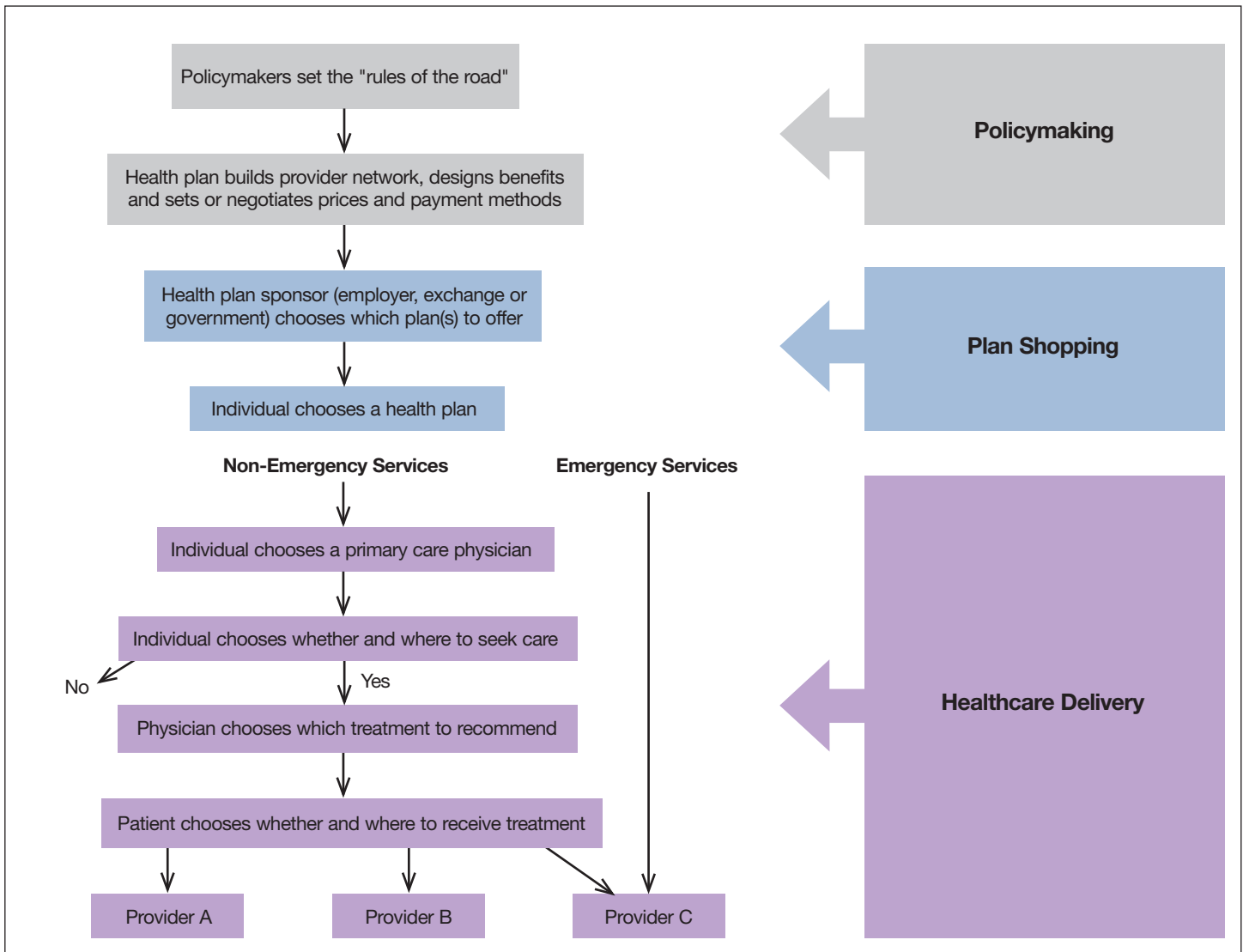
There is broad consensus among policy experts that U.S. health spending is inappropriately high and that the healthcare system is woefully inefficient.

When selecting a physician, patients need to know the out-of-pocket cost for visiting that physician, but the full price of choosing a physician depends on how physicians practice and what treatments they recommend. Patients ideally would know whether physicians are efficient—do they only recommend necessary tests and procedures, and do they refer their patients to efficient specialists and facilities? The out-of-pocket cost of a visit in many cases pales in comparison to the costs associated with the follow-up services physicians recommend.

When selecting a treatment path and where to receive treatment, patients need to know the out-of-pocket costs of different treatment options and providers (see page 5 for more about patient-targeted price tools).

Comparison shopping by patients can reduce healthcare spending in two ways. The first is the direct effect of some patients shifting from higher-price to lower-price providers. If low-price providers render a larger share of services, average prices and total spending will be lower. The second is the strategic effect on high-price providers. If high-price providers perceive that they are losing, or may begin

Figure 1
The Healthcare Shopping Process



Source: Authors' analysis.

to lose, patient volume, they may rein in their prices or change their practice patterns. For example, the California Public Employees' Retirement System (CalPERS) implemented a reference pricing system in 2011 that capped payments for knee and hip replacements and was designed to steer patients to lower-price hospitals. In short order, several high-price hospitals lowered their negotiated prices to retain patients.¹⁰ Such strategic effects are difficult to measure, but they may have even larger spending impacts than the direct effects of shifts in patient volume.

Greater price transparency also is important because patients are being asked to take more responsibility for their healthcare decision making. One aspect of this trend is the

growing prevalence of high-deductible health plans. Private plans with individual deductibles of \$1,000 or more now cover 58 percent of enrollees in small firms—three to 199 workers—and 28 percent of enrollees in large firms—200 or more workers.¹¹ The ACA builds on this trend. Virtually all plans in the bronze tier have very high deductibles, and among plans in the silver tier, which to date is the most popular option by a large margin, the average deductible is nearly \$3,000. Even in the gold tier, the average individual deductible exceeds \$1,000.¹² Moreover, employers increasingly are experimenting with private exchanges where employees essentially are given a voucher—or a defined contribution by the employer—to shop for a health plan from a range

Patient-Targeted Price Tools: Widely Available, Rarely Used

Over the last decade, it has become the norm for private health plans to make a price transparency tool available to enrollees (see Figure 2). All of the major national carriers—Aetna, Cigna, Humana and UnitedHealthcare—offer some sort of patient-targeted price tool, as do the major multistate Blue plans—Anthem and Health Care Services Corp.—and some independent Blue plans. In addition to price tools provided directly by health plans, third-party vendors—for example, Castlight,³ Change Healthcare⁴ and Health Care Blue Book—contract with plans and large employers to provide price transparency tools.

These plan and vendor price tools vary in their functionality but generally allow patients to obtain personalized price quotes, compare different providers and determine their out-of-pocket payment before receiving a service.⁵ A recent review of the strengths and weaknesses of several of these tools, including Aetna’s Member Payment Estimator, United’s myHealthcare Cost Estimator and Cigna’s Health Life,⁶ found that the tools are generally useful for comparison shopping. These tools can help steer patients to lower-price, in-network providers and settings, such as a freestanding imaging center rather than a hospital outpatient department. Some tools can help patients explore the risks and benefits of alternative treatment paths, such as conventional X-rays vs. CAT scans.

Independent organizations, such as FairHealth and Clear Health Costs, also offer patient-targeted price tools as a public service. These tools’ capabilities and usefulness are severely limited, however, because they lack access to several key pieces of data. Those data include large claims databases with allowed amounts, which are needed to estimate service-, provider-, and plan-specific prices, as well as information on each individual’s cost-sharing liability and the plan’s provider network.

Several state governments also offer patient-facing price

tools. Three New England states—Maine, Massachusetts and New Hampshire—stand out for offering price tools that are relatively useful to patients. These tools are based on claims data gathered in state-run all-payer claims databases (APCDs). Despite greater access to detailed claims data, the usefulness for patients of APCD-based tools is limited by a lack of integration with health plans—they cannot, for example, automatically customize price quotes based on the benefit structure of an individual’s plan or an individual’s deductible and spending to date.

While patient-targeted price tools are ubiquitous, the reality is that few patients use them. A 2012-13 survey of health plans found that “while 98 percent of responding plans said they offer a cost calculator tool, just two percent of their patient members use these tools.”⁷ Price shopping—checking the price before receiving a medical service—is more common in high-deductible health plans than in traditional plans, but it is still relatively rare.⁸ Partly this reflects that, over any period, most individuals do not have new healthcare needs arise, and many of those who do are enrolled in plans that largely shield them from out-of-pocket costs. For reasons that are unclear, even patients using healthcare services and enrolled in a high-deductible plan only sought price data for about 10 percent of the services they used.⁹

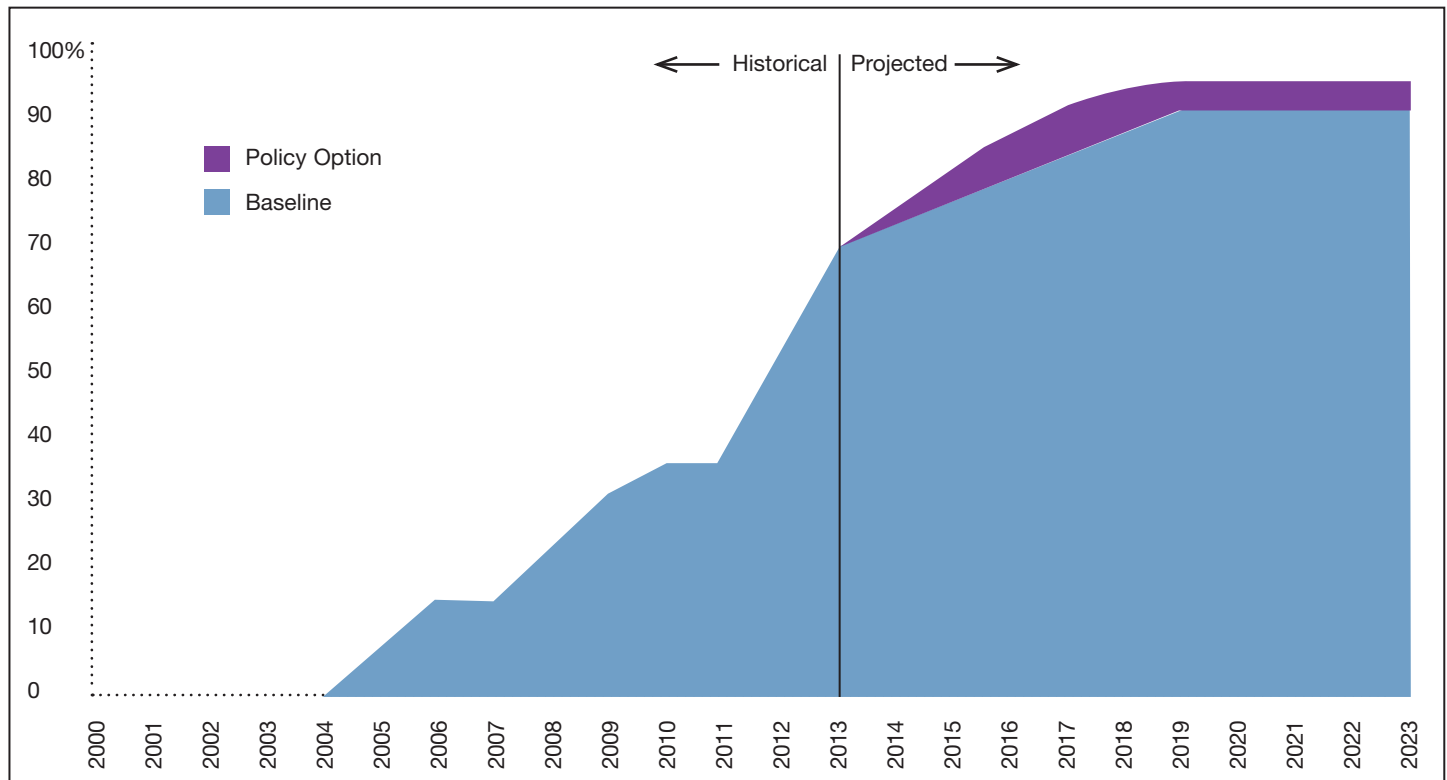
The current challenge is not simply to make a price tool available but to design tools that patients will use and provide incentives that reward such use. Some vendors, such as Compass, offer “high-touch” price tools that include a phone-in call center and financial rewards for choosing lower-price providers. Another vendor, Change Healthcare, uses push technologies to proactively target price information for specific services to individual patients based on their care utilization patterns. It remains to be seen what approaches work best and what level of patient engagement is possible.

of carriers and benefit designs. These public and private exchanges create strong incentives for individuals to enroll in plans that will steer them to lower-cost providers.

Although patients’ decision-making role is important and growing, there are several important limits. First, even though high-deductible plans are becoming more common, enrollees in a typical private plan still pay only about 15 percent of total spending out of pocket at the point of care,

which limits incentives to shop on price.¹³ Much of that 15 percent is spent on services that are not “shoppable,” such as emergency care,¹⁴ and services that are determined to be necessary after the patient chooses a provider, such as an inpatient admission following evaluation in the emergency room. Typical benefit designs—for example, fixed-dollar copayments for physician office visits—further limit the relevance of price information for the privately insured.¹⁵

Figure 2
Share of the U.S. Privately Insured Population with Access to Patient-Targeted Price Transparency Tool



Note: Population shares are historical (through 2013) and projected (2014 and beyond).

Source: Authors' calculations using original data collected on health plans providing a price transparency tool and when they began offering those tools and published health plan enrollment data from HealthLeaders InterStudy, The HealthLeaders-InterStudy Competitive Edge Managed Care Directory (2010).

Second, patients, and even providers, often do not know in advance which services will be required when a provider is chosen, making comparison shopping difficult and imprecise.

Third, many patients reject the notion of price shopping for healthcare, and insist, in principle at least, on getting the best care possible regardless of the cost to themselves or society (see page 7 for more about the complementary roles of price and quality transparency).

Physician-Targeted Price Transparency

Many have said that the most expensive piece of medical technology is a physician's pen. Even though physician income is a relatively small share of overall healthcare revenues, their ordering behavior plays a central role in healthcare delivery and spending trends. Patients rely on physicians' expertise and judgment to guide decisions about treatments, specialists, hospitals and other facilities.

Physician decision making reflects a complex mix of professional ethics, financial self-interest, guesswork and rules of thumb. Historically, both ethical and financial considerations have tended to encourage costly patterns of

care. Physicians can, in principle, use price information to guide patients toward higher-value treatment options and providers. To do so, physicians need to embrace frugality as a value, and they need data on the cost to the healthcare system of the treatments they are ordering and the cost differences between treatment options. They also would, ideally, know patients' out-of-pocket obligations.

Increasingly, professional societies are encouraging physicians to be more cost-conscious. For example, the American Board of Internal Medicine Foundation's charter and Choosing Wisely campaign both promote stewardship of resources as one facet of physician professionalism.¹⁸ Some physicians will accept such a responsibility because they believe it is part of serving the patient. Others will be motivated to obtain this information to respond constructively to reformed payment methods, such as episode bundling and accountable care organizations (ACOs) that put physicians at financial risk for the costs of care. Indeed, insurers contracting with ACOs see delivering real-time claims data as critical to the success of these payment approaches.

However, many physicians, like their patients, reject the notion that price shopping is part of their role, partly on principle and also because of time constraints. Additionally, physicians, when they are ordering services, are generally unaware of costs and the financial impact on patients.¹⁹ Financial incentives, such as shared-savings arrangements, can help change this, but a cultural shift in the medical profession also will be necessary.²⁰ The American College of Physicians significantly advanced that shift in the 2012 edition of its Ethics Manual, which recognized physicians' responsibility to practice "parsimonious care."²¹

Employer- and Health Plan-Targeted Price Transparency

Employers provide coverage to 90 percent of privately insured Americans under age 65 and are a central player in the healthcare shopping process.²² For large employers, buying healthcare in bulk on behalf of their workers may give them significant potential leverage over health plans and providers. Some, however, argue that employers generally fail to use their buying leverage and instead passively finance an increasingly inefficient and dysfunctional healthcare market.²³

Employers delegate to health plans the task of negotiating prices and contracting with providers, and those negotiated prices are key drivers of the premiums that employers pay. Recent research indicates that negotiated prices deserve closer scrutiny. The prices that private health plans negotiate with providers often significantly exceed prices paid by public payers and international benchmarks.²⁴ Private prices also tend to vary widely from market to market, from hospital to hospital and, to a lesser extent, from physician group to physician group.²⁵

In principle, competition among private health plans should encourage aggressive price negotiations with providers. But in practice, negotiated prices reflect a tangled web of market imperfections, including:

- provider market power—health plans are unable to negotiate competitive prices;
- health plan market power—dominant health plans can maintain market share even if they do not negotiate competitive prices;
- pass-through financing of self-funded employer plans—the employer, not the health plan, is paying the negotiated prices;

Price and Quality Transparency Play Complementary Roles

At every step in the healthcare shopping process, the key question is not just price, but value. Assessing value means comparing price information with information on the clinical benefit of the services and the quality of the provider, including their technical skill and the patient experience. Measuring clinical benefits and quality of care are the subjects of massive, multi-pronged research efforts that are moving forward quickly but nowhere near complete.

Some patients assume that higher-price providers offer higher-quality care.¹⁶ As a result, analysts have warned that publicizing price data could perversely steer patients toward higher-price providers.

However, advances in price transparency and quality measurement complement each other, with each spurring the other along and making the other more useful. For example, patient-targeted price transparency tools are increasingly incorporating quality metrics, helping to reassure patients that they can choose a lower-price provider and still receive high-quality care. And the publication of hospital price data in Massachusetts in 2010 led to an ongoing discussion of whether existing quality metrics adequately capture meaningful differences among providers.¹⁷

- historical carryovers—some providers' high prices are perpetuated by standardized annual updates;
- mixed allegiances—some health plans were founded by medical providers and maintain those ties; and
- perverse incentives—plans can satisfy minimum-loss ratios by paying high prices and having high claims costs.

Generally, private health plans hope to avoid conflicts with providers, and each plan merely needs to negotiate prices that allow it to compete with other private health plans, even if they all are paying excessively high prices.

Employer access and use of negotiated price information varies. At one extreme are large, self-funded employers or purchasers, such as Safeway or CalPERS. Because they are self-funded, they are able to access their enrollees' detailed claims records, including paid amounts and provider identifiers. And because they are extremely large, these employ-

ers have large volumes of claims data and the resources to support customized analytics.²⁶ At the other extreme are small employers buying fully insured health plans—they do not have access to their claims data, and they typically have little or no information on their carrier’s negotiated prices. In between are mid-sized employers that may be self-funded but lack the resources to analyze their own data and are instead dependent on carriers and brokers. Data warehouses, such as Truven Health Analytics and Milliman, can analyze self-funded employers’ claims data and compare them with external benchmarks, but their services are expensive, and the findings are provided with stipulations that they not be shared widely.

New Hampshire illustrates the potential for price transparency to increase employer engagement in the healthcare shopping process.²⁷ In that state, a major state-led price transparency initiative made employers more supportive of health plans in their negotiations with high-price hospitals. Employers, faced with wide variation in prices for the same services, also moved toward benefit designs that reward patients for using lower-price providers.

Unlike employers, health plans know, in great detail, the prices and the contract terms they have negotiated with individual providers. In the course of business, health plans also generally become aware of the prices that competing health plans have negotiated with those same providers.²⁸ Where health plans are more limited is in understanding the efficiency and treatment patterns of individual physicians and physician groups. That type of analysis requires a very large volume of claims data that includes standardized physician identifiers.

There has been progress in recent years in making large volumes of claims data available for physician profiling. In 2006, Consumers’ CHECKBOOK, a nonprofit publisher of information enabling consumers to be better purchasers of services, submitted a Freedom of Information Act (FOIA) request to the Centers for Medicare and Medicaid Services (CMS) to receive Medicare physician claims data with physician identifiers. HHS initially denied that request,²⁹ but has since reconsidered and reversed that position.³⁰ On April 9, 2014, CMS completed that turnaround and made a massive Medicare physician claims dataset freely available online. That dataset reports each physician’s name and address, their national provider identifier, the number of Medicare beneficiaries they treated, the specific services they provided, and the amount Medicare paid for each type of service.³¹

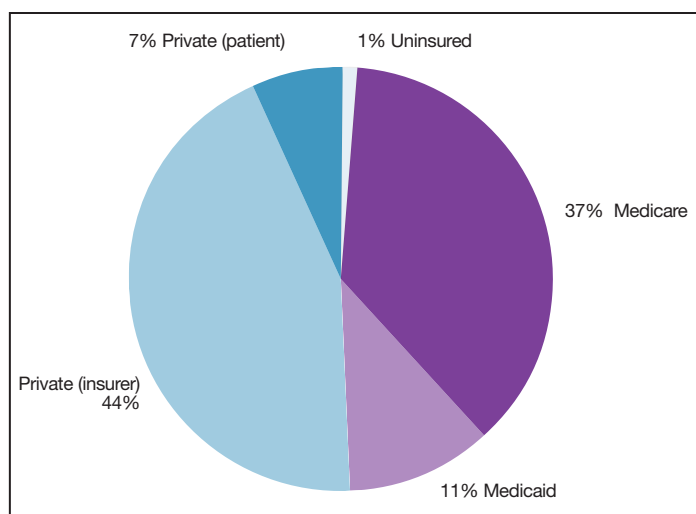
Policymaker-Targeted Price Transparency

There are deep disagreements about the nature of the health system’s dysfunction and the appropriate roles for the public and private sectors. Underpinning these debates are questions related to healthcare prices: Do public plans pay prices that are too low, or do private plans pay prices that are too high? Do some hospitals or physician organizations have too much market power? Or, do some health plans have too much market power?

In the U.S. healthcare market, private and public payers take dramatically different approaches to establishing prices for medical services. Private plans use a market-based approach and negotiate prices and other contract terms with providers. Public plans—primarily Medicare and Medicaid—generally use administered pricing and set prices through statutory formulas and regulations at the state or federal level.³² Public plans generally offer price schedules that are relatively uniform within local healthcare markets. Currently, total U.S. health spending is split roughly evenly between these two pricing arrangements (see Figure 3).

Policymakers need price data at an aggregate level to compare prices with the costs of producing medical services and to assess whether public and private mechanisms

Figure 3
U.S. Health Spending Split Evenly Between Publicly and Privately Insured, 2013



Notes: Spending is allocated to Medicare, Medicaid and private based on the primary source of coverage of the individual. Medicare includes Medicare fee for service and Advantage, and Medicaid includes publicly administered plans and private Medicaid managed care plans.

Sources: Authors’ calculations using the National Health Expenditures (NHE), historical through 2011 and projected for 2013, and the NHE-aligned Medical Expenditure Panel Survey.

for determining prices are operating appropriately. If not, policymakers can decide whether and how to support better price-setting, either by enhancing competitive forces or through regulation.

Price transparency can promote discussion at the policymaking level about how the healthcare market should be organized and regulated. Massachusetts epitomizes that progression—a 2010 report by the state attorney general on hospital price variation helped spawn an ongoing discussion of price variation and price levels and a sweeping set of reforms targeted at reining in healthcare spending growth.³³ However, some warn that publicizing negotiated prices could, depending on the circumstances, enable anti-competitive behavior (see below for more about possible unintended consequences of price transparency).

Policy Options and the Impact on Health Spending

Along with a range of policy options aimed at the various audiences, this analysis includes detailed descriptions and estimates of spending impacts for three examples of price transparency initiatives—chosen because they illustrate a range of feasible approaches and at least some evidence was available to estimate their impacts. For the three examples, spending is compared over a 10-year window—2014 through 2023—with that one intervention in place versus baseline spending without the intervention (see Technical Appendix). This follows some of the conventions that the Congressional Budget Office (CBO) uses to estimate the impacts of proposed legislation on the federal budget. This approach, like CBO's, is intended to illustrate the effects of

Avoiding Unintended Consequences

Some economists have tried to temper the general enthusiasm for price transparency by highlighting its possible perverse effects. Price transparency in healthcare has the potential to support anti-competitive behavior and lead to higher prices, especially in highly concentrated provider markets.³⁴ The notion is that, if all prices are publicized, low-price providers, such as hospitals, will demand so-called me-too price increases, and high-price hospitals will be less willing to offer price cuts to specific health plans. The only well-documented case of such a perverse outcome comes from the market for government-purchased concrete in Denmark—prices rose by 15 percent to 20 percent following a new requirement that they be posted publicly.³⁵ The relevance of this concrete case to U.S. healthcare markets is questionable.

Making healthcare price data more widely available can have a mix of pro- and anti-competitive effects. The Federal Trade Commission (FTC) has described, in very general terms, the sorts of exchanges of healthcare price information that would raise anti-competitive concerns and possibly lead to enforcement action.³⁶ Providers would likely face FTC scrutiny if they shared price information with each other in a non-public way, particularly information regarding future price changes.

However, healthcare price data can be publicized in a way that maximizes pro-competitive effects and minimizes anti-competitive effects—here the details matter.

- Price data that are a year or more old are less likely to produce anti-competitive outcomes, because a provider can cut prices and be rewarded with volume for some time before competitors find out.
- Price reports may be more pro-competitive if they include a level of detail that is appropriate to the audience and not excessive. For example, employers would find it useful to know that one hospital is paid prices 20 percent higher than its competitors after adjustment for case mix. But employers would not find it any more useful to know that the hospital is paid \$X per diem for maternity and \$Y per diem for psychiatric cases, and so on.
- Price reports will be more pro-competitive if anti-competitive practices are discouraged. For example, some dominant private health plans have negotiated so-called most-favored nation (MFN) agreements with providers, which preclude them from agreeing to lower prices with other health plans. Publicizing price data in the presence of an MFN could help the dominant plan enforce the agreement, thereby helping to raise prices and spending. In that case, prohibiting MFNs, as Michigan has done, will have a direct pro-competitive effect and will also make price reports more pro-competitive as well.³⁷

various options, not to promote or argue against them.

However, this analysis differs from a CBO score in key ways: First, it includes spending impacts across the health system not just impacts on federal spending; second, it includes a range of uncertainty based on the strength of the evidence and the range of ways to implement interventions; and, third, the interventions encompass actions by private purchasers, health plans and state governments, not just federal legislation.

Patient-Targeted Policy Options

Require all private health plans to provide a price tool for enrollees. This option could hasten the development and dissemination of patient-targeted price tools and help slow health spending growth slightly. But such an action would impose a regulatory requirement on a field of endeavor that is rapidly progressing and evolving on its own. It could

be difficult or impossible to regulate, in a helpful way, the type of price tool that must be provided, and providing a price tool might add costs to plans where prices are unimportant, such as health maintenance organizations with no deductibles and only fixed copayments (see box below for a detailed example of this policy option).

Allow patients to choose from a variety of price tools. Currently, health plans and price tools come as a package—if your employer offers a United plan, you are more or less locked in to using United’s price tool. That lock-in may be inhibiting creative developments in price tools and patient engagement with those price tools.

One way to expand patients’ price-tool options would be to guarantee patients’ free access to their own claims data in a standardized machine-readable format. Patients could then upload their claims data with an online price tool of their choice. This option builds on two policies already in place.

Patient-Targeted Policy Intervention

Require all private plans to provide enrollees with a price transparency tool. Estimated reduction in health spending over 10 years: \$18 billion.

Background

Among enrollees in private health plans, the share with access to a price transparency tool has increased rapidly over the last decade, but access is not universal. In 2012, Massachusetts enacted legislation that requires private health plans to offer a price transparency tool to their enrollees.³⁸

What the Policy Option Would Do

The policy intervention would require by 2019—the earliest feasible date—that all private health plans provide all enrollees with data on out-of-pocket and total prices using the following parameters:

- provider-specific—reflects the type of provider and the prices negotiated between the plan and the provider;
- patient-specific—takes into account the patient’s plan and benefit design and spending to date; and
- service-specific—to the extent possible, reflects the specific medical service that the patient expects to receive.

These out-of-pocket price data would be made available via a

toll-free telephone number, website and mobile application.

The intervention could be accomplished in several ways. Large purchasers, such as CalPERS and the Federal Employee Health Benefit Program, could require that the health plans they contract with provide these tools to all enrollees, not just to enrollees covered by the large purchasers. Another approach, such as the one taken in Massachusetts, is to pass a state law requiring all carriers and third-party administrators that contract with the state employee plan to provide a price tool to all enrollees.³⁹ Or, Congress could pass federal legislation imposing the price-tool requirement on both self-funded plans and fully insured plans, similar to federal regulation of mental health parity.

Estimated Impact on Health Spending

The estimated reduction in total health spending from this intervention is \$18 billion over 10 years, with a wide range of uncertainty ranging from \$2 billion to \$40 billion (see Table 1). The savings result from some patients, as a result of the intervention, using a price tool and choosing lower-price providers. The savings are relatively small because relatively few privately insured people will be impacted—most are projected to have access to a price tool with or without any intervention.

Table 1
Requiring Patient-Targeted Price Tools: Estimated Effects on U.S. Health Spending

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	10-Year Total
Estimated Effect on Health Spending (billions)	-\$0.9	-\$1.6	-\$2.1	-\$2.3	-\$2.2	-\$1.6	-\$1.8	-\$1.9	-\$2.0	-\$2.1	-\$18.4
Lower Bound	-\$0.1	-\$0.1	-\$0.2	-\$0.2	-\$0.2	-\$0.2	-\$0.2	-\$0.2	-\$0.2	-\$0.3	-\$2.0
Upper Bound	-\$2.0	-\$3.6	-\$4.6	-\$5.0	-\$4.7	-\$3.6	-\$3.8	-\$4.1	-\$4.3	-\$4.6	-\$40.3
Spending on Medical Services among the Privately Insured—Baseline (billions)	\$771	\$815	\$859	\$903	\$960	\$1025	\$1090	\$1156	\$1222	\$1291	
Share of Privately Insured with Access to Price Tool—Baseline	73%	76%	80%	83%	87%	90%	90%	90%	90%	90%	
Share of Privately Insured with Access to Price Tool—Policy Option	76%	82%	87%	91%	94%	95%	95%	95%	95%	95%	

Note: Medical spending includes hospital care and physician and clinical services.

Source: Authors' calculations combining National Health Expenditures data, estimated shares of the population with access to a price transparency tool and published estimates of the impact of the price transparency tools.

One is the Health Insurance Portability and Accountability Act (HIPAA), which guarantees patients access to their medical records on request, including claims data.⁴⁰ The second is the voluntary Blue Button initiative, which is a tool to enable patients to access their healthcare records at various providers and their claims history online in a single place.⁴¹

Physician-Targeted Policy Options

Use federal requirements for electronic health records (EHRs) to make price data available to physicians in computerized order entry systems. The advantage of this option is that it piggybacks on the expanding use of electronic health records and adds price data to those information flows. But the likelihood of physicians using the information will depend to a large extent on the reach of provider payment reforms. So in the same way that benefit designs are critical to the potential for price transparency for patients, provider payment reform is critical to the potential of price transparency for physicians (see page 12 for a detailed example of this policy option).

Promote the discussion of the financial side effects of treatments with patients. Physicians widely recognize patients' right to informed consent, meaning that they have the right to be informed of the risks of a treatment so that they can choose whether to receive the treatment. One goal could be to extend that concept to include a patient's right to know the out-of-pocket costs—the financial side

effects—of a treatment before agreeing to it.⁴⁷

This approach has the advantage of building on the physician's role as advocate for, and adviser to, the patient. Such an initiative would be most effective with the support of physician specialty societies, which could promote it through guidelines and disseminate tools for physicians to use through continuing medical education.

Employer- and Health Plan-Targeted Policy Options

Clarify that self-funded employers own their healthcare claims data and can use it to measure and report prices. Under HIPAA, self-funded employers can access their claims data and, subject to privacy restrictions, use those claims data to manage the plan. Even so, some carriers have objected to self-funded employers contracting with third-party vendors of price transparency tools and providing them with their plans' claims data. Those objections often are based on gag clauses in insurer contracts that prohibit disclosure or contentions that negotiated prices are the carrier's trade secret.⁴⁸

Some employers have been able to overrule carriers' objections. But the trade secrets argument has not been decisively settled in court, and employers are justifiably wary of pushing the issue. Policymakers could help self-funded employers by clarifying that they own their claims data and may use those data to populate a price transparency tool—subject, of course, to HIPAA privacy protections.

Physician-Targeted Policy Intervention

Require that EHRs provide price data to physicians when ordering laboratory and imaging services. Estimated reduction in health spending over 10 years: \$27 billion.

Background

Patients rely on physicians to use their expertise and judgment to determine what treatments are necessary and to recommend where to receive those treatments. This policy option would help inject price data into the mix of factors that physicians consider when making recommendations, and focuses on the question of whether services are necessary and appropriate rather than just lowering unit prices.

This policy option also would build on the federal government's push for physicians and hospitals to expand their use of EHRs and computerized provider order entry (CPOE). Under the Health Information Technology for Economic and Clinical Health, or HITECH, Act, physicians and hospitals receive bonuses from Medicare and Medicaid if they can demonstrate so-called meaningful use of an EHR.⁴² Most hospitals and a large share of physicians have met the initial requirements and are receiving bonuses. Over time, the requirements will become more stringent, and physicians and hospitals will begin to face penalties, in the form of reduced payments, if they do not meet them.

What the Policy Option Would Do

CMS has divided meaningful use requirements into stages (I, II and III). This policy option would add a new core requirement to the stage III meaningful use criteria for both hospitals and nonhospital-based physicians. The requirement would be that CPOEs for laboratory and imaging services present physicians with standardized price data. The price for each service would be programmed into the CPOE by the EHR vendor and would be based on the allowed amount under the Medicare fee schedule. This type of price reporting is rudimentary because it does not represent the price that will actually be paid to the provider unless the patient is covered by Medicare; the cost to the health system of providing the service; or the amount the patient would have to pay out of pocket. But, Medicare allowed amounts would provide a benchmark of the relative resources used to provide different diagnostic options. These price data would be displayed in

real time, so that the physician can consider resource costs at the point of order entry.

A small-scale study conducted at Johns Hopkins Hospital in 2008-09 provides some evidence on possible effects of price displays for laboratory tests.⁴³ The study compared ordering rates for two groups of laboratory tests in the inpatient setting: standard fees (the Medicare allowed amount) were displayed in the intervention group but not in the control group. The study reported significantly fewer tests ordered in the intervention group, suggesting that price displays can alter physician ordering behavior, at least in that type of setting. A series of similar studies also examined the effects of price displays (see Figure 4). Although results range widely, they generally suggest that price displays tend to lead physicians to order fewer services.

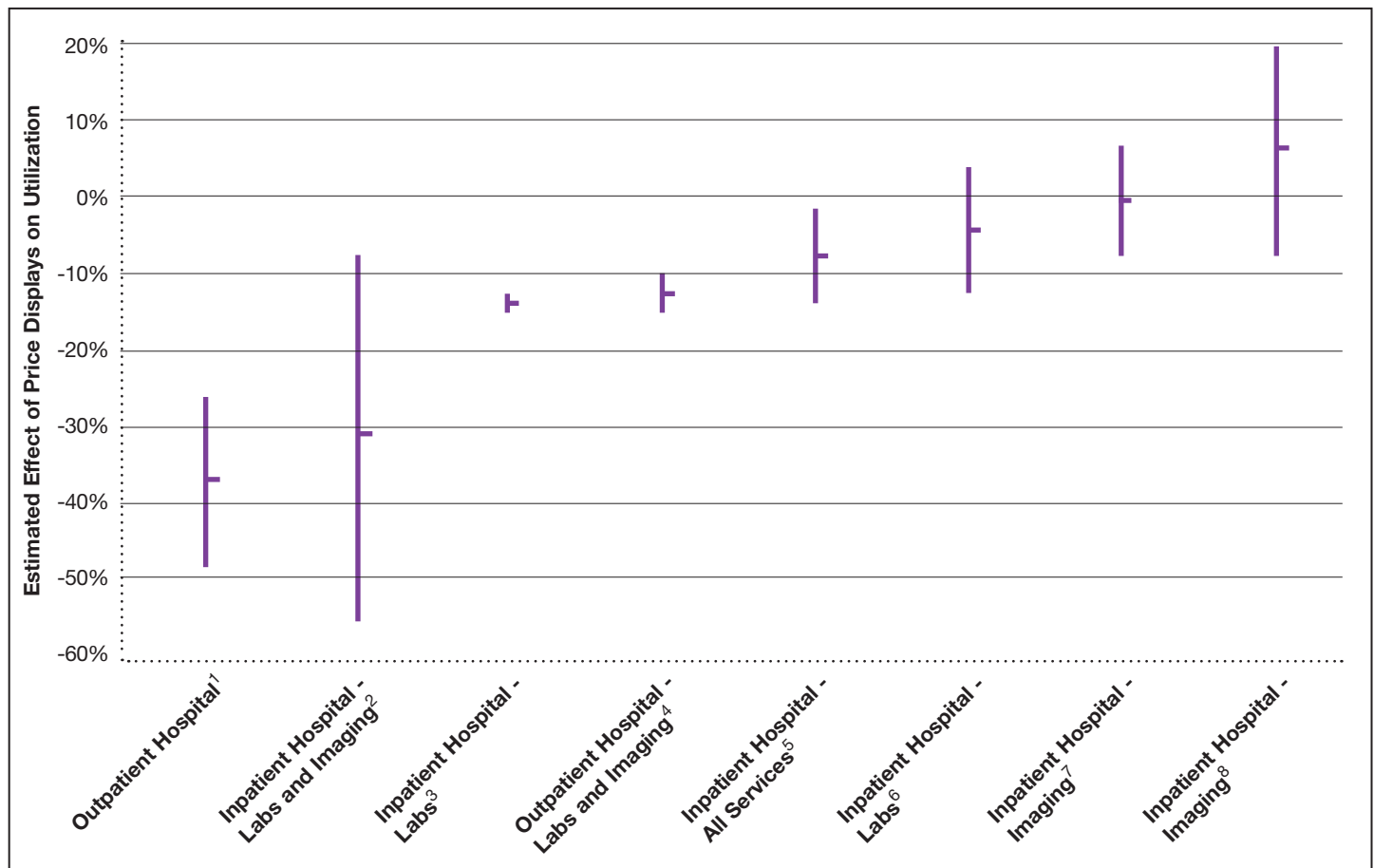
Price displays might lead physicians to order fewer tests for several reasons. Price displays may have a social conscience effect, meaning that physicians consider whether a test provides any useful clinical information that would justify the resources used. Price displays might also encourage physicians to discuss costs with their patients and become more sensitive to the financial side effects of their treatment decisions.⁴⁴

On a potential downside, price displays also might reduce orders by motivating and enabling financially self-interested behavior, but that would depend critically on the payment environment. In a pure fee-for-service environment, in which providers are paid separately for each service ordered, there is no financial pressure to curtail ordering behavior. Medicare physician payments have historically been pure fee for service, but Medicare is shifting away from that model and beginning to reward physicians for being more efficient.⁴⁵ In a bundled payment arrangement, such as Medicare payments for inpatient care, providers face strong financial pressures to curtail test ordering—the Hopkins study was conducted in this type of payment arrangement. At the other extreme are physician offices that provide their own office-based laboratory and imaging services.⁴⁶ In that context, the physician directly benefits from increased ordering, and price displays could, perversely, increase the number of tests ordered.

Estimated Impact on Health Spending

The estimated 10-year savings from this policy option is \$27 billion, with a range from \$11 to \$65 billion (see Table 2).

Figure 4
Range of Impacts of Price Displays on Physician Ordering Behavior



Note: The hi-lo bars indicate 95 percent confidence intervals (+/- 1.96 standard errors).

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Ban gag clauses between health plans and providers.

So-called gag clauses—contractual terms that prohibit health plans and providers from disclosing the prices they have negotiated with each other—can have both pro- and anti-competitive effects. The pro-competitive rationale for allowing gag clauses is that they can promote negotiated discounts. For example, a hospital may be more willing to offer a discounted price to one health plan if that plan agrees not to reveal the discount to other plans or hospitals.

But, from an employer's perspective, gag clauses can impede comparison shopping. They offer carriers an excuse not to provide their claims data to third-party price transparency vendors, and they create gaps in the price data available in those tools. Employers could demand that their carriers not include gag clauses in their provider contracts, or policymakers could ban them altogether as California has recently done.⁴⁹

Make Medicare claims data with physician identi-

Table 2**Price Displays Included in Stage III Requirements for Meaningful Use of Electronic Health Records: Estimated Effects on U.S. Health Spending**

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	10-Year Total
Estimated Effect on Health Spending (billions)	\$0.0	\$0.0	-\$0.7	-\$2.4	-\$3.1	-\$3.6	-\$3.9	-\$4.1	-\$4.4	-\$4.6	-\$26.9
<i>Lower Bound</i>	\$0.0	\$0.0	-\$0.3	-\$1.0	-\$1.2	-\$1.4	-\$1.6	-\$1.6	-\$1.7	-\$1.8	-\$10.6
<i>Upper Bound</i>	\$0.0	\$0.0	-\$1.7	-\$5.8	-\$7.4	-\$8.7	-\$9.5	-\$10.0	-\$10.5	-\$11.1	-\$64.8
Spending on Labs and Imaging Services in Inpatient Hospital Setting (billions)	\$35	\$37	\$39	\$42	\$44	\$47	\$50	\$53	\$57	\$61	
Spending on Labs and Imaging Services in Outpatient Hospital Setting (billions)	\$48	\$50	\$53	\$57	\$60	\$64	\$68	\$73	\$77	\$82	
Spending on Labs and Imaging Services in Physician Office (billions)	\$55	\$58	\$61	\$64	\$68	\$72	\$77	\$82	\$88	\$94	
Spending on Labs and Imaging Services in Freestanding Setting (billions)	\$55	\$58	\$61	\$64	\$68	\$72	\$77	\$82	\$88	\$94	
Cost of Upgrading Electronic Health Records to Include Price Displays (billions)	\$0.00	\$0.00	\$0.00	\$0.02	\$0.02	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	

Source: Authors' calculations combining National Health Expenditures data, estimated shares of physicians with access to price data at the point of order entry and the authors' projected adoption of electronic health records that are compliant with stage III meaningful use requirements.

riers available for wider use. In June, 2013, Sens. Ron Wyden (D) and Chuck Grassley (R) introduced legislation that would require CMS to make Medicare claims data freely and publicly available, with provider identifiers and detailed descriptions of the services provided and amounts paid.⁵⁰ The goals of that legislation—to expose providers and hold them more accountable—have been at least partly achieved by the administration's release of detailed hospital and physician claims data. But health plans and employers will likely find the current public releases of Medicare data only partially satisfying. Those releases can reveal some instances of egregious misbehavior,⁵¹ but profiling providers in a sophisticated way requires data that are much more detailed. CMS could support more sophisticated analyses by streamlining the process of obtaining Medicare claims data and reducing the costs of the files.

Include physician identifiers in all-payer claims databases and clarify that health plans can use those APCDs to profile physicians. As more states move to set up APCDs, key decisions include whether to include identifiers for individual physicians and physician groups, and whether

and how to limit reports on physician behavior. One option is to include identifiers for individual physicians that are linkable with external data sources, such as the national provider identifier, or identifiers for physician groups, with the stipulation that the APCD can be used to measure and report performance and price data and to build tiered-provider networks that vary patient cost sharing depending on the provider used.

Policymaker-Targeted Policy Options

Establish state-based all-payer claims databases to measure and report hospital prices. This approach would mandate that all carriers provide claims data to a state agency in a standardized format. The advantage of this approach is that all employers, even smaller ones and those buying fully insured plans, can access data on the prices their plans have negotiated with different providers and assess whether those prices are reasonable. The disadvantage is that it requires the state and health plans to dedicate nontrivial resources to the collection and processing of the data (see page 15 for a detailed example of this policy option).

Policymaker-Targeted Policy Intervention

Gather and report hospital-specific prices using state all-payer claims databases. Estimated reduction in health spending over 10 years: \$61 billion.

Background

An APCD has been defined as “a database, created by state legislative mandate, that typically includes data derived from medical, pharmacy, and dental claims, combined with eligibility and provider files from private and public payers, including insurance carriers (medical, dental, third-party administrators, pharmacy benefit managers, and public payers (Medicaid, Medicare).”⁵² APCDs can be used to measure a range of outcomes, including the use of preventive services, the efficiency of individual physicians and the prevalence of specific diseases.

This policy intervention focuses on one specific use of APCDs: measuring and publicly reporting the prices that private health plans have negotiated with individual hospitals. States with this type of APCD-based hospital price reporting include Massachusetts,⁵³ New Hampshire,⁵⁴ Maine⁵⁵ and Rhode Island.⁵⁶ Other states, including Minnesota, are developing a similar system.⁵⁷ Although the formats of these price reports vary, they all provide comparisons of negotiated prices that are hospital-specific and, in some cases, health plan-specific.

Patients may occasionally consult APCD-based hospital price reports, but they are not the primary audience.⁵⁸ The more significant audiences for these price reports are employers, health plans and policymakers. Employers can use the price data to identify high-price providers and, with health plans, develop strategies to steer patients away from these providers. Policymakers can use the price reports to assess the level of competition, or lack thereof, in the market for hospital care.

In Maine, the hospital price reports are specifically designed to help employers develop tiered-benefit plans.⁵⁹ In New Hampshire the publication of hospital price data spurred the development of “site-of-service” health plans that have very different out-of-pocket costs depending on whether the patient goes, for example, to a hospital outpatient department or a lower-price freestanding facility. In Massachusetts, the publication of hospital price data

beginning in 2010 fed into a broad movement toward payment reform and cost control that is still unfolding. The Massachusetts data helped draw attention to the high prices and market clout of Partners HealthCare, Boston’s “must-have” hospital system, and some independent hospitals in other parts of the state.

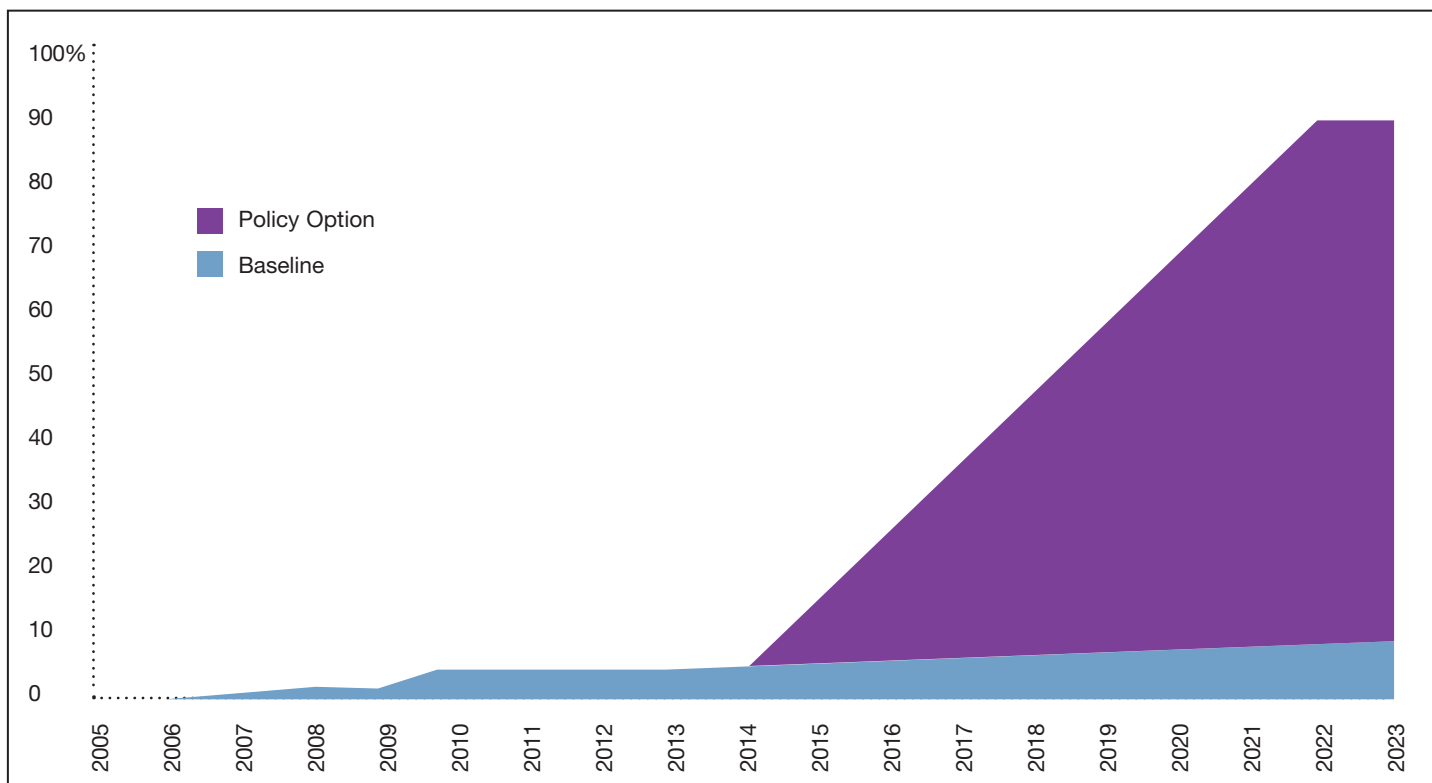
What the Policy Option Would Do

By 2019, private health plans in all states would be required to submit claims data in a standardized format to an all-payer claims database, and by 2022, APCDs in all states would be used to produce publicly available hospital-specific price reports. (These are the earliest feasible dates.) This option would be modeled on the Maine Health Data Organization’s *Hospital Cost Comparison for Hospital Tiered Benefit* report.⁶⁰ This intervention could be accomplished by state legislation, such as in New Hampshire, Maine and Massachusetts, and would require either general funding or a specific fee on payment of health claims. The intervention would require private plans to submit claims data in a standardized format and create an infrastructure for analyzing the data and reporting results. If enacted, this policy would expand the proportion of the U.S. population living in states with an APCD from less than 10 percent to about 90 percent (see Figure 5).

Estimated Impact on Health Spending

This intervention produces an estimated \$61 billion reduction in health spending over 10 years, although the range of uncertainty is wide, from no savings to around \$150 billion (see Table 3). The savings are assumed to result from a mixture of the responses observed in New Hampshire and Massachusetts: 1) increased employer interest in narrow-network and tiered-network benefit designs; 2) increased pressure on high-price hospitals to justify those prices and/or reduce prices; and 3) increased discussion of policy options for controlling prices, such as all-payer rate setting. The range is very wide because evidence is extremely limited, mainly because insufficient time has passed to evaluate existing APCD impacts.

Figure 5
Share of the U.S. Population Living in a State with an All-Payer Claims Database Used to Report Hospital Prices



Sources: Authors' calculations combining state population estimates for each year from the State Health Expenditures data published by the Centers for Medicare & Medicaid Services and the authors' estimates based on various sources of when each state first made hospital prices publicly available.

Incorporate an assessment of unit prices into health insurance rate reviews. The health insurance rate review process currently focuses on the question of whether an insurer's premiums are reasonable relative to its claims costs. The rate review process could be expanded to include an assessment of whether an insurer has negotiated reasonable unit prices with providers and, if not, the rate request could be denied. In a well-functioning market, that type of price review would be unnecessary because competing providers would bid prices down to an efficient level. But, given increasing consolidation on the provider side, price-based rate reviews could help insurers push back and demand lower prices, at least for their fully insured products.

Expanding the rate review process in this way would have uncertain impacts and would represent a significant, but not unprecedented, departure from current practice. CMS has recently begun to support state-based price transparency efforts under the rubric of strengthening the rate review process,⁶¹ and New Hampshire has begun examin-

ing cost drivers, including negotiated prices, as part of rate review.⁶²

Create a price and spending atlas for the privately insured. The Dartmouth Atlas of Health Care has transformed health policy discussions in the United States by providing a vast trove of detailed market- and hospital-level data on spending and practice patterns from the Medicare fee-for-service program.⁶³ Analyses using the Dartmouth Atlas data shine a spotlight on wide variations in practice patterns and the use of discretionary services. No analog to the Dartmouth Atlas exists for the privately insured, although there are some early limited efforts.⁶⁴

A spending atlas for the privately insured would include market-level data on negotiated prices and utilization for different service categories, such as inpatient hospital care and outpatient imaging. Creating such a resource would be a major undertaking, requiring either the creation of a new standardized national multi-payer claims database or combining existing claims databases. For example, the combination of the Health Care Cost Institute's database

Table 3
States Using All-Payer Claims Databases (APCDs) to Measure and Report Hospital Prices: Estimated Effects on U.S. Health Spending

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	10-Year Total
Estimated Effect on Health Spending (billions)	\$0.0	-\$1.0	-\$2.1	-\$3.3	-\$4.7	-\$6.3	-\$8.1	-\$10.0	-\$12.2	-\$12.9	-\$60.7
<i>Lower Bound</i>	\$0.0	\$0.0	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2	\$0.8
<i>Upper Bound</i>	\$0.0	-\$2.5	-\$5.3	-\$8.4	-\$12.0	-\$15.9	-\$20.4	-\$25.3	-\$30.7	-\$32.6	-\$153.1
Spending on Hospital Care for the Privately Insured (billions)	\$455	\$480	\$510	\$541	\$576	\$612	\$653	\$694	\$739	\$787	
Share of U.S. Population in States with APCD-Based Hospital Price Reporting—Baseline	4%	4%	4%	5%	5%	5%	6%	6%	6%	7%	
Share of U.S. Population in States with APCD-Based Hospital Price Reporting—Policy Option	4%	14%	25%	36%	47%	58%	68%	79%	90%	90%	

Source: Authors' calculations combining National Health Expenditures data, estimated shares of the population in states with hospital price reporting based on an APCD and the authors' analysis of the effect of APCD-based hospital price reporting on hospital spending.

(which includes claims data from enrollees in Aetna, Humana, Kaiser Permanente and UnitedHealthcare) with Blue Health Intelligence's database (which includes claims data for enrollees in many Blue plans) would cover a large majority of the privately insured. The hurdles to overcome would include technical challenges—integrating claims data from multiple insurers requires intensive cleaning and standardization—and resistance from healthcare analytics firms that view these claims data as a vital strategic asset.

Discussion

This analysis, focusing on different approaches to price transparency, leads to three broad conclusions. First, the potential reductions in health spending are substantial in dollar terms—more than \$100 billion over the next decade if all three interventions were undertaken—but small relative to total health spending over that period. Second, the range of estimated impacts is very wide. That uncertainty is partly because these interventions have not been widely implemented and many have not been carefully evaluated. In addition, details will be important in how effective these approaches would be in reducing spending.

Third, the effects of price transparency depend critically on the context in which prices are presented. Price transparency can have a major impact if, and only if, it is joined with other shifts in healthcare financing. These shifts

include improvements in quality measurement, changes in benefit design that make patients more sensitive to price differences across providers, and a higher proportion of provider payment coming under reformed approaches that diminish the role of fee for service and place providers at risk for spending per episode or for population spending.

Price transparency seems unlikely, by itself, to transform the healthcare system, but it can play a role in supporting reforms in benefit design and provider payment and increasing their effectiveness. Maximizing the impact of price transparency will require tailoring price information to different audiences—patients, employers, physicians, health plans, and policymakers—and heightening the incentives for those audiences to use the information. ■

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Healthcare Price Transparency: Policy Approaches and Estimated Impacts on Spending

Technical Appendix

Method for Estimating Spending Impacts of Selected Policy Options

The analysis of each of the three policy interventions follows the same general approach. The first step is to project baseline total healthcare spending.¹ The second step is to estimate the scope of spending that would be affected by the intervention. For example, making price tools available to the privately insured would only impact spending by the privately insured. The third step is to estimate the availability of price information in two scenarios: baseline and policy intervention. The baseline takes into account that price information is becoming more available, which will continue, even in the absence of any intervention. The fourth step is to estimate a range of impacts of the availability of price information on in-scope spending.

Patient-Targeted Price Tool

The first step in this estimate was to project the privately insured population and then project the share of the privately insured population with access to a price tool under the baseline and under the policy intervention. The share of the population with private insurance has declined fairly steadily since 2000, with a large decline during the Great Recession of 2007-09. The analysis projects that this decline will continue over the next 10 years. Based on private health plan enrollment data from HealthLeaders InterStudy and a review of the availability of price tools in private plans, the share of the privately insured population with access to a price tool has grown rapidly over the last decade. The analysis projects that, even without any policy intervention, the share of the privately insured with access to a price tool will continue to increase, reaching 90 percent in 2023. Under the policy intervention, that share reaches 95 percent instead, with between 5 percent and 10 percent more of the privately insured population gaining access to a tool than under baseline.

The second step in the analysis was to estimate total spending on medical services for the privately insured. The third step was to estimate the effect of having a price tool

on medical spending among the privately insured. The key study used for this step is a working paper by Lieber (2013)² that examined the impact on prices from providing the phone-based Compass price tool to corporate employees of a large restaurant chain. The key finding is that the prices paid for services used by employees with access to the price tool declined by 3.8 percent relative to a control group of non-corporate employees. The study found that employees with access to Compass called to get price information for services accounting for between 11 percent and 17 percent of their spending. But, price reductions for those services were substantial, because employees apparently switched to lower-price providers.

The third step in the analysis was to estimate the added cost of providing price tools to more people—\$30 per enrollee per year in 2014. That cost reflects collecting and analyzing price data and creating and maintaining a website and call center to disseminate the price data. The total additional cost of providing price tools to a broader population is about \$3 billion over 10 years.

The lower-bound estimate assumes that expanding the availability of price tools has an impact only one-quarter as large as estimated by Lieber (2013). Even though Lieber's analysis found significant savings, those savings might not apply to the 5 percent to 10 percent of the privately insured that would gain access to a price tool through the policy intervention. Health plans vary in benefit design, and price tools are not useful with some benefit designs—those plans are unlikely to provide a price tool unless it is required. For example, health maintenance organization (HMO) plans typically charge flat copayments for physician and hospital visits—providing price information to enrollees in those HMO plans will make no difference to their choice of provider.

The upper-bound estimate assumes a spending impact twice as large as estimated by Lieber (2013). That could occur if increased price shopping by patients puts pressure on providers to temper the prices they negotiate with health plans, resulting in lower prices being paid both for patients who shop and for those who do not. Anecdotal reports suggest that providers will reduce their “ask” if

plans are actively steering patients to lower-price providers. For example, high-price hospitals in California reportedly reduced their prices for knee and hip replacements to meet the reference price CalPERS had established.³ The upper-bound effect could also occur if health plans shift to benefit designs that heighten patients' sensitivity to price—examples include general deductibles, reference pricing and coinsurance rather than copayments.

All-Payer Claims Database

The first step in estimating the impact of this intervention was to project the growth under baseline in the share of the U.S. population living in a state with hospital price reporting. That share has grown over the last decade to about 4 percent of the population, and it is projected to continue to grow even in the absence of any intervention. Under the policy intervention, that population share would grow much more quickly and would reach 90 percent in 2022.

The second step was to estimate the impact of hospital price reporting on spending among the privately insured. Unfortunately, there is only one published estimate of the effects of hospital price reporting. That study examined the early impacts of New Hampshire's price transparency initiative and found no impact on variation.⁴ To augment the evidence base, hospital cost reports were used to compare trends in hospital prices in intervention states (New Hampshire, Massachusetts, Maine and Rhode Island) versus all other states. Price is defined as net operating revenue per discharge equivalent—this price measure includes all payers and both inpatient and outpatient services.⁵

As shown in Technical Appendix Figure 1, hospital prices in the mid-2000s in the intervention states were 1 percent or 2 percent above average. But, starting in 2008, around the time the intervention states were implementing reporting systems, hospital prices in the intervention states began to grow slowly relative to other states, ending about 4 percent below the national average in 2010-11. Because private payers account for roughly half of hospitals' total revenues, a 5-percent decline in all-payer prices corresponds roughly to a 10 percent decline in private-payer prices. Interpreting this finding is complicated by the fact that Massachusetts, which is the largest of the intervention states, implemented several major healthcare financing changes along with initiating hospital price reporting. The changes included the Blue Cross Blue Shield of Massachusetts' Alternative

Quality Contract,⁶ a requirement that health plans offer a tiered-benefit option and a state prohibition on anticompetitive contracting practices, such as most-favored nation clauses in hospital contracts, and a state global spending target. It is impossible to know exactly how much of the observed price slowdown in the intervention states was a result of price reporting per se and how much was other interventions adopted around the same time. The analysis assumes that price reporting would lead to a 2-percent reduction in private prices, which corresponds to roughly one-fifth of the apparent decline in private prices.

The third step in the analysis was to estimate the administrative costs to plans and to state agencies of supplying claims data, analyzing claims data and reporting prices. The analysis assumed that operating that type of system would cost \$3 million per state per year in 2014, and that the amount would grow with inflation.

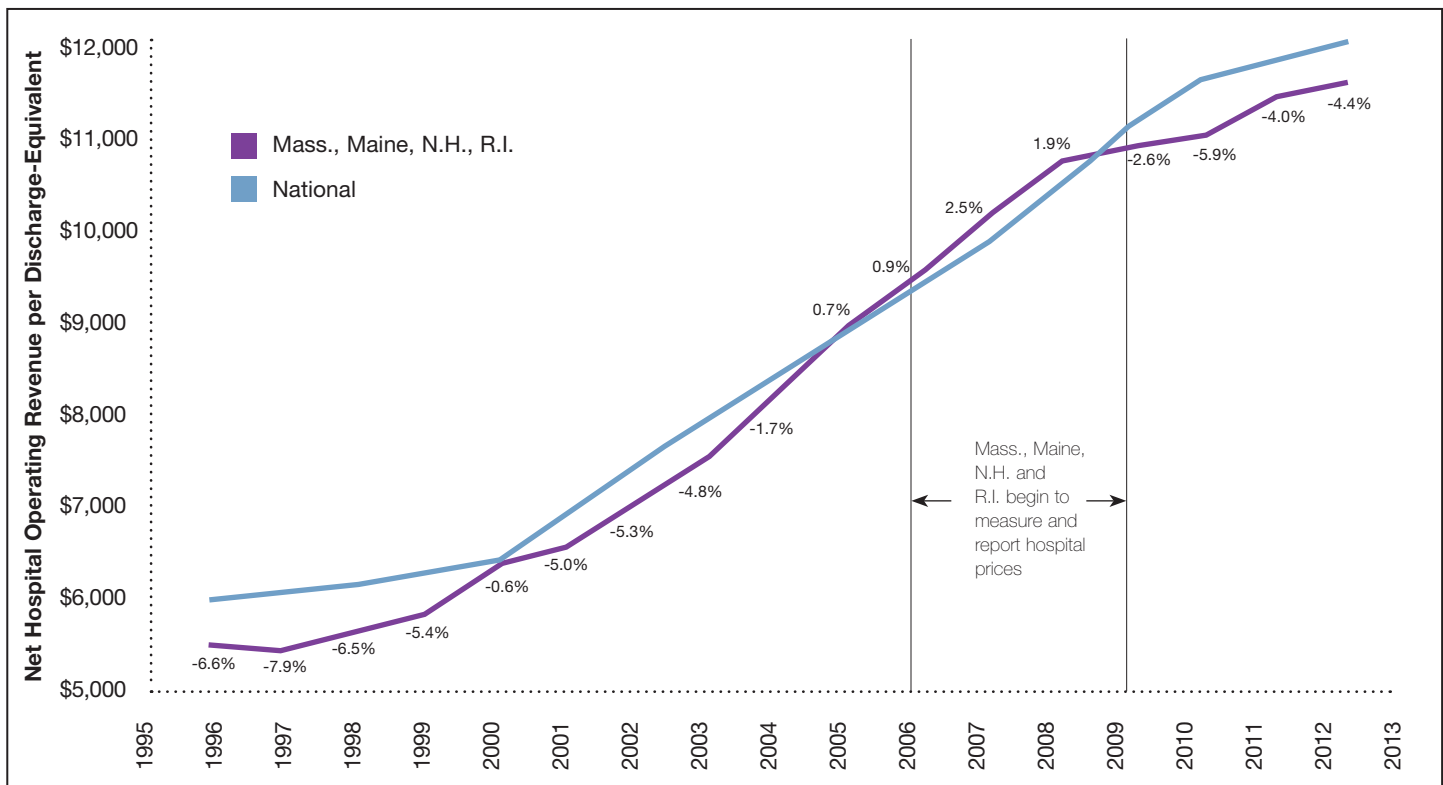
The lower-bound estimate assumes that price reporting has no impact on hospital prices, and that the only effect is the added administrative costs of the data collection and analysis. This assumption would hold true if the apparent price slowdown in the intervention states is a result of factors other than price reporting. The upper bound estimate assumes that private hospital prices are reduced by 5 percent, roughly half of the apparent private price decline. That upper bound estimate assumes that price reporting played an important role in ushering in a set of market changes in New England, and that similar changes can occur elsewhere.

Electronic Health Record Price Displays

The first step in the analysis was to project increases over time in the share of hospitals and office-based physicians meeting stage III meaningful use requirements (see Technical Appendix Figure 2)—these are the providers that, under the policy intervention, would have prices displayed at the point of order entry for laboratory and imaging services.⁷ These projections were based on the observed rapid increases over the last few years in the share of providers meeting stage I meaningful use requirements.

The second step in the analysis was to estimate the effects of price displays on spending on laboratory and imaging services. To do this, baseline spending on laboratory and imaging services was estimated separately for four settings: hospital inpatient, hospital outpatient, freestand-

Technical Appendix Figure 1 Hospital Price Trends in States Measuring and Reporting Hospital Prices Compared to National Trends



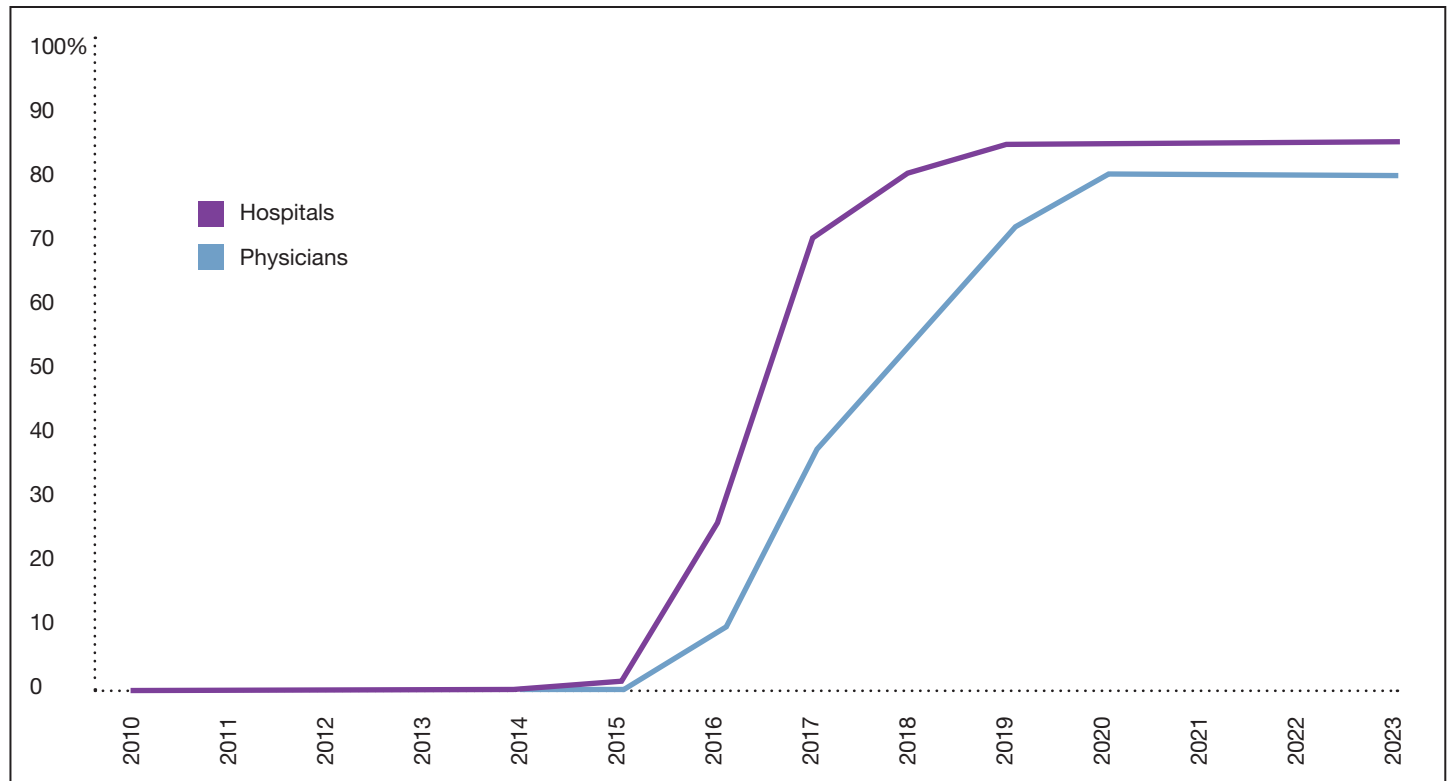
Notes: Discharge equivalents are a measure of hospitals' overall output, including inpatient and outpatient services. Discharge equivalents equal a hospital's inpatient discharges multiplied by the ratio of total operating costs over inpatient hospital operating costs. The percentages indicate the difference between adopting states—Massachusetts, Maine, New Hampshire and Rhode Island—and other states.

Source: Authors' calculations using Medicare hospital cost reports from 1996 through 2013.

ing facility and physician office-based facility. These four settings differ in the strength of the financial incentives for providers to rein in their ordering behavior. Financial incentives are strongest in the hospital inpatient setting and weakest in the physician office-based setting. The analysis assumes that in the hospital inpatient setting price displays would reduce spending on laboratory and imaging services by 5 percent. That estimate is near the center of the range of estimates in the literature.⁸ The spending reductions in the other settings were assumed to be smaller: half as large in the hospital outpatient setting, one-quarter as large in the freestanding setting and one-tenth as large in the physician office-based setting.

The third step was to estimate the costs of upgrading EHR systems to include the price displays. The analysis assumes that 15 vendors supply CPOE systems and that adding price displays to their CPOE systems costs each vendor \$1 million a year. These costs are quite small relative to the estimated spending effects.

The lower-bound estimate assumes that requiring price displays will have a much smaller impact on ordering behavior. This could occur if price displays, even without any policy intervention, are adopted over time in settings where the financial incentives support their use. The upper bound estimate reflects a strengthening over time in the financial incentives for providers to pay attention to their ordering behavior. One movement in that direction is the assignment of physicians to tiers based on their resource use patterns. A second such trend is the expansion of accountable care organizations in both Medicare and private plans—these arrangements put groups of medical providers partially at risk for the total spending of a panel of patients. A third potentially important change is Medicare's implementation of the physician value-based payment modifier, which will adjust Medicare physician fees based on quality metrics and the total costs of their patient panel relative to a benchmark.⁹

Technical Appendix Figure 2**Projected Share of Hospitals and Physicians Complying with Electronic Health Record Stage III Meaningful Use Requirements**

Note: The share of hospitals meeting stage III requirements is weighted by hospital size.

Source: Authors' projections based on an analysis of historical data from the Centers for Medicare & Medicaid Services on trends in compliance with stage I meaningful use requirements.

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