The Economics of Medicare for All

AUTHORS

Craig Garthwaite*

ABSTRACT

This memo provides a framework for evaluating the economic trade-offs of expanding the government's role in financing and regulating health care through a single-payer system such as Medicare for All. First, I draw upon international comparisons to highlight important differences in the features of single-payer systems among high-income countries. I then discuss the economic trade-offs that would accompany the adoption of a single-payer system in the United States, including potential changes to the quality and quantity of medical services, and to the quantity of health-care products (such as pharmaceuticals). If such a system were to adopt the existing Medicare price schedule, the average quality of medical services would be expected to be lower, while the impact on the quantity of medical services would depend on the willingness of a single-payer monopsonist to exert downward pressure on the wages of health-care workers. A U.S. single payer could also exert its buying power to lower drug prices but doing so would likely reduce the future quantity of health-care products, since reducing the global profits of drug innovators would deter them from making the large investments in research and development (R&D) that are necessary to develop new products. Finally, I discuss market-based policy reforms that could promote affordability and access in the current U.S. health-care system.

* Northwestern University Kellogg School of Business, garthwaite@kellogg.northwestern.edu

1. Introduction

Current health-care policy debates reveal an unprecedented willingness among policymakers and voters to consider significantly expanding the government's role in the health-care sector in the United States.[1] The political popularity of Medicare for All is one such example. Historically, the term "Medicare for All" has been used to describe proposals that would expand Medicare coverage beyond qualifying elderly and disabled individuals to the entire nation, although there are now a wide variety of proposals that attempt to clarify how such an expansion would take place.

The common denominator of various Medicare for All proposals is an attempt to address two distinct but interrelated problems: The need to increase access to health insurance and the need to reduce health-care costs. Supporters of these proposals believe that a government-sponsored, single-payer system would address both of these challenges by providing universal access while also leveraging the government's buying power to lower prices. However, these changes would undoubtedly have effects on a wide variety of outcomes, and policymakers should be aware of the potential unintended consequences of such an economically meaningful policy change. Rather than attempting to summarize the specifics of all the various proposals (all of which will undoubtedly change in the coming years), the purpose of this memo is to provide a framework for evaluating the economic trade-offs of expanding the government's role in financing and regulating health care through a single-payer system such as Medicare for All.

Even after the passage of the Affordable Care Act (ACA), approximately 10% of Americans remain uninsured. While these individuals may still have access to emergency services funded by hospital uncompensated care (Garthwaite, Gross, & Notowidigdo, 2018), they lack the financial protection of health insurance and have difficulty accessing nonemergency services such as physicians and pharmaceuticals. In addition, rising deductibles and other forms of cost sharing have left millions of low-income individuals underinsured against the financial risk of negative health shocks.

The share of the United States that remains uninsured and underinsured is driven in part by the high cost of health care in the United States. While many policymakers blame high premiums on insurers' profit margins, these premiums primarily reflect the prices of various providers and other firms in the health-care system. For this reason, a second goal of Medicare for All is to lower the cost of health care rather than merely subsidizing the cost of purchasing health insurance. The anticipated savings would primarily come from reducing administrative costs and expanding price regulation. In this memo I focus on the economic effects of expanding price regulation, since it is likely to be a larger source of potential savings and pose a

1 In thinking about this expansion, it is important to keep in mind that the government already has a meaningful presence in U.S. health care, accounting for over half of all spending.

greater potential disruption to the existing market of private providers and firms that serve at the center of U.S. health care.[2] Because price regulation will not exist in a vacuum, we must consider the private sector's response to such changes. These changes will alter the quality and composition of healthcare with meaningful economic costs and consequences. Thus, evaluating these reform proposals based on budgetary effects alone is at best incomplete and at worst disingenuous.

2. International Comparisons

Supporters of health-care reform in the United States often state that "every other developed country" has been able to achieve access to universal health care. This is a true statement, but it obscures the heterogeneity that exists across the health-care systems of developed countries.

In reality, developed countries use a variety of single- and multi-payer systems to achieve universal access to health insurance. Even single-payer systems can evolve in many different ways. Key differences across systems include eligibility criteria, models of cost sharing with patients, and the role of private health insurance (see Figure 1 for a full summary of the various decisions involved in designing a single-payer system). Each of these decisions will have a meaningful impact on the operation of a single-payer system in the United States.

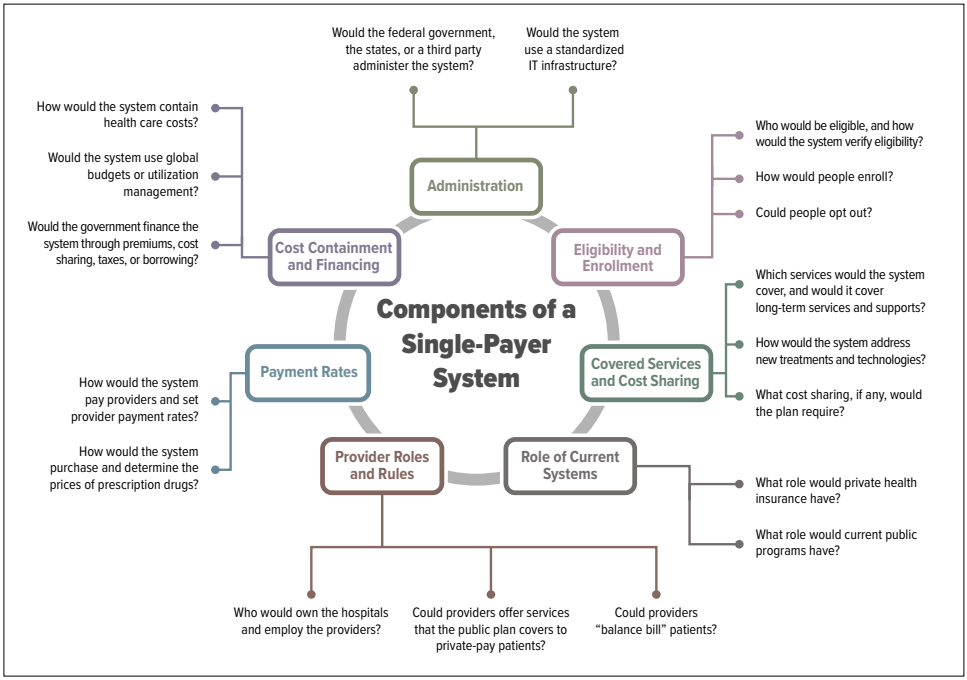
Figure 2 contains a summary of how various developed countries have implemented these decisions. While there are many differences across these settings, one common feature across all systems is the government's involvement in setting health-care prices.

Taken together, these figures make clear the diversity of universal health-care systems that actually exist across the developed world. Three features are particularly relevant when making comparisons to U.S. context: the role of private insurance firms, the role of private providers, and the price-setting mechanism.

Britain's National Health Service (NHS) is often invoked during discussions about single-payer health care, but it is of little relevance as a point of comparison to the U.S. context. Not only does the British system provide universal access, it also features government ownership of facilities and employment of physicians. These features far exceed existing proposals in the United States, and the economic features of such a system are not easily compared to the U.S. context.

2 While administrative cost savings could exist, these will be small compared to the goals of the program. In addition, traditional fee-for-service (FFS) Medicare does not currently save money through a more efficient use of medical services. In fact, if we look at comparisons between Medicare Advantage (the private managed care version of Medicare) and FFS Medicare, we see that the private market is actually far better at providing incentives for lower utilization of health-care services (Curto, Einav, Finkelstein, Levin, & Bhattacharya, 2019; Baker, Bundorf, Devlin, & Kessler, 2016).

Figure 1: Key Decisions for Designing a Single-Payer System



Source: Congressional Budget Office, 2019

The Swiss system provides the closest comparison to a simple expansion of the existing Medicare program, in which 30% of enrollees receive their benefits through the privately administered Medicare Advantage program.[3] The Swiss finance health-insurance purchases through a combination of government subsidies and private premiums. In turn, private firms compete for each citizen's business. While many compare this system to the ACA exchanges, such a comparison misses an important difference: The Swiss system is based on a set of regulated prices for medical services. In that way, the Swiss system is more comparable to the Medicare Advantage market (the private managed care version of Medicare), where both explicit and implicit regulations allow Medicare Advantage prices to mirror those of FFS Medicare.[4] This differs from the commercial market (both non-group plans such as the ACA and

3 Medicare Advantage (or Medicare Part C) is the private managed care form of Medicare that seniors can elect. Under MA, firms are paid a risk-adjusted payment for each enrollee and they are then responsible for all of their Medicare spending.

4 Explicitly, any provider that chooses to not enter an Medicare Advantage network can only charge a patient the FFS Medicare rate. This is vastly different from the commercial market, where out-of-network providers can effectively charge any price that they want. Implicitly, providers face a strategic dynamic where they know that if they attempt to charge too high of a price and Medicare Advantage providers can't stay in the market, the enrollees will all simply default to FFS Medicare. So, the regulated price schedule stands as the outside option in the negotiations.

Table 1: Key Features of Single-Payer Health-Care Systems in Selected Countries

Design Features	Australia	Canada	Denmark	England	Sweden	Taiwan
Level of Administration	National government	Provincial or territorial government	National government; administrative regions provide care	National government	National government; county councils responsible for most financing and purchasing	National government
Eligibility						
Universal coverage	Yes	Yes	Yes	Yes	Yes	Yes
Separate public programs for certain groups other than military	Yes	Yes	Yes	No	No	No
Mandated Benefit Package						
Hospital and physicians' services	Yes	Yes	Yes	Yes	Yes	Yes
Outpatient prescription drugs	Yes	No	Yes	Yes	Yes	Yes
LTSS	Limited	No	Yes	Limited	Yes	No
Dental, vision, and mental health services	Limited	No	Yes	Yes	Yes	Yes
Cost Sharing						
Hospital and physicians' services	Yes	No	No, except visits without referrals	No	Yes	Yes
Prescription drugs	Yes	n.a.	Yes	Yes	Yes	Yes
LTSS	Yes	n.a.	No	Yes	Yes	n.a.
Dental, vision, and mental health services	Yes	n.a.	Yes, for dental and vision	Yes	Yes	Yes
Limit on out-of-pocket spending	Yes, for prescription drugs	No	No, but copayments decrease with higher out-of-pocket spending on prescription drugs	No	Yes	Yes
Reduction or exemption available	Yes	Yes[a]	Yes	Yes	Yes	Yes
Private Health Insurance						
Supplemental[b]	Yes	Yes	Yes	No	No	Yes
Substitutive[c]	No	No	No	No	No	No
Other types of private insurance[d]	Yes	No	Yes	Yes	Yes	No
Participating Provider Rules						
Balance billing allowed	Yes	No	No	No	No	No
Payments from private-pay patients for covered services	Yes	No	Yes	Yes	Yes	No
Hospitals[e]						
Primary ownership	Mixed	Mixed	Public	Public	Public	Private
Primary payment method	Global budgets and DRG in public hospitals; FFS in private hospitals	Global budget	Global budget	DRG	Global budgets and DRG	FFS with overall global budget
Primary Care Physicians[e]						
Primary employment	Private	Private	Private	Private	Mixed	Private
Primary payment method	FFS	FFS	FFS	Capitation	Capitation	FFS with overall global budget
Outpatient Specialist Physicians[e]						
Primary employment	Mixed	Private	Mixed	Public	Mixed	Private
Primary payment method	FFS	FFS	FFS for self-employed providers; salary for public hospital employees	Salary	Per-case payment	Salary

continued on next page

Design Features	Australia	Canada	Denmark	England	Sweden	Taiwan
Prescription Drugs						
Primary payment method	Internal reference pricing	External reference pricing	Internal reference pricing; price-cap agreement for drugs with no generic equivalents	Negotiated profit caps	Value-based payment	Value-based payment
Main Source of Financing	General tax revenues and earmarked tax revenues	Provincial and federal general tax revenues	Earmarked income tax	General revenues and payroll taxes	General revenues raised by county councils, municipalities, and nationally	Payroll-based premium, supplementary premium based on nonpayroll income, general revenues, tobacco tax, lottery gains

DRG = diagnosis-related groups; FFS = fee for service; LTSS = long-term services and supports; n.a. = not applicable.

a. Cost-sharing reductions or exemptions are available for prescription drugs in some provinces.

b. Supplemental insurance could cover services not included in the single-payer plan, such as dental, vision, or hearing. It could also reduce enrollees' cost sharing, like the private plans that many Medicare beneficiaries purchase.

c. Substitutive insurance, which duplicates the benefits of the single-payer health plan, could be offered to people who are not eligible for the single-payer system, such as noncitizens who have recently entered the country or temporary visitors. It could also be an alternative source of coverage if people are allowed to opt out of the single-payer system.

d. Other types of private insurance could provide benefit enhancements, such as faster access to care, private rooms instead of semiprivate rooms for inpatient stays, and a greater choice of providers.

e. Refers to the characteristics of a typical entity in each system.

Source: Congressional Budget Office, 2019

employer-sponsored plans), where insurers often pay prices that far exceed those of FFS Medicare.

The Swiss system is not a true "single-payer" system as it involves multiple private firms that pay medical providers, but it does achieve universal access through a mixture of taxes and individual contributions. In contrast, the Canadian system provides the best comparison for a Medicare for All single-payer system, such as the one proposed by Senator and presidential candidate Bernie Sanders (I-Vermont). In the Canadian system, a single entity provides all health insurance, and residents are not allowed to purchase additional coverage for services that are already covered by the government insurer. Health-care spending is significantly lower in the Canadian system relative to the United States, which is a function of both lower prices for products and lower wages for providers. I will discuss both of these channels below and how they might inform the optimal structure for a U.S. single-payer system.

A distinguishing feature of the Canadian system is that it does not allow firms to offer coverage that enables individuals to "skip the line" or otherwise avoid the explicit rationing that is often inherent in single-payer systems. Patients who wish to do so must pay for such services entirely out of pocket from private providers. This feature

greatly limits the scope of services that can exist outside of the government insurance system. Allowing individuals to purchase additional private insurance can help to mitigate a significant downside of regulated prices—the reduced availability of high-quality options even for those who are willing to pay—though this will ultimately depend on how many people opt out of the public insurance system by purchasing private coverage and the fixed costs of operating private facilities.[5]

3. The Economic Trade-Offs of Single-Payer Health Care in the United States

A single-payer system leverages the buying power of the single buyer to hold prices below the market outcome. However, such a massive change to U.S health-care policy would affect many different levers in the health-care system. Those levers could, in turn, influence the new equilibrium price of health care. Many analyses that are favorable toward a single-payer system are incomplete because they rely upon a "partial equilibrium" analysis. That is, they ask the question: If we hold everything else constant in the system, what happens if we increase the use of Medicare's regulated price schedule?

In reality, all else will not remain constant if such a significant policy change is made. Each actor in the system will re-optimize and create a new equilibrium of prices, quality, and quantities, which would affect current Medicare enrollees, current health-care providers, potential future providers, and new potential enrollees to the program. Therefore, the economist's job is to make an informed prediction about the final outcome of a policy change on prices once all the components of the system have adjusted to the new equilibrium.

Savings from a Medicare for All system would come from many categories. Some of the savings would come from a change in the nature of administrative costs in the system. Changing the nature of administrative costs will have a number of economic effects, with the sign and magnitude of some effects currently ambiguous. First, in a true single-payer system, providers would need to expend fewer resources to comply with insurers' systems, likely reducing costs.

Second, a government single payer would not need to advertise for potential customers, which could greatly reduce expenditures in this category. However, to the extent that advertising and competition provides incentives for differentiation and innovation—particularly with respect to innovations that attempt to limit the moral hazard inherent to health insurance—the magnitude of the economic (as opposed to the accounting) savings are less clear.

5 While a facility would not set its price based on the fixed cost, the very emergence of certain providers would depend on whether they believed in the long run their variable profits would exceed the fixed costs of entry.

The final contributor to Medicare's lower administrative costs is the system's relatively lax approach to utilization management. Broadly speaking, Medicare does little to control the quantity of medical services that enrollees use. The economic savings of moving all enrollees to such a freewheeling system is unclear. While the systems of prior authorization, step therapy, and other attempts to regulate moral hazard utilized by insurers carry meaningful costs, they have the potential to decrease the use of inappropriate and cost-ineffective care. The amount of utilization management under a proposed single-payer system is unclear, but would greatly affect people's interaction with the new system.[6]

The vast majority of proposed savings from a single-payer system would come from the expanded use of regulated prices for providers and other medical services. The common characteristic of universal health-care systems across the developed world is a willingness to exploit the government's buying power, which brings prices below the market outcome and also impacts the optimal quantity and quality of medical services.

A single-payer system in the United States is likely to substantially reduce payments for medical services, including those to physicians and facilities such as hospital and outpatient clinics. The potential scope for price reductions is quite large because most commercial insurers pay rates that are well in excess of those charged to Medicare. For example, a recent RAND Corporation study found that for a sample of hospitals in 25 states, the average hospital charged private insurers 240% more than Medicare rates (White & Whaley, 2019).

Because a single-payer system would grant the government monopsony power in the labor market for health-care workers, policymakers should consider how workers and suppliers would respond to greater price regulation. The response is likely to vary based on the specific markets for different products and services. Firms could adjust quantity, quality, or both. Hospitals, for example, could decrease the use of private rooms, substitute labor for lower-cost sources (i.e. more mid-level providers and fewer MDs), etc. In addition, to the extent the government applies its monopsony power to products such as pharmaceuticals, it will also impact the incentives for private firms to invest capital in the development of new products.

In the next section, I present empirical evidence about the effect of regulated prices on the quality of medical services, the quantity of medical services, and the quantity

6 Describing this point, the Congressional Budget Office (CBO) notes: "In the United States, public programs have implemented few utilization management programs, but private insurers have increasingly used them to lower costs. Some private insurers require prior authorization for patients seeking expensive therapies, for example, and Medicare Part D plans offer low or no copayments to patients who use cheaper generic medications. Many of those strategies could be continued under a single-payer system. The utilization management in such a system might not be much of a change for people who were previously enrolled in a private plan, but it would impose new constraints on the choice of health care services for those who were previously enrolled in the Medicare FFS program."

of products. While this research cannot provide definitive evidence about the exact magnitude of the effect of government buyer power, they provide evidence about the nature of such effects.

3.1 Changes in the Quality of Medical Services Under a Single-Payer System

How will the quality of medical services provided by a strategic firm change in response to the introduction of a single-payer system? Most of today's Medicare recipients are quite happy with the quality of services they receive, and despite the use of regulated prices, they enjoy access to a wide range of high-quality hospitals. But this is not predictive of a beneficiary's satisfaction under a new program, nor of existing enrollees' experience if the program is expanded.

A new equilibrium in which all hospitals earn only the current Medicare reimbursement would result in a very different experience for Medicare recipients.[7] Hospitals serve a broad swath of patients. These patients each pay different prices for the services they receive,[8] but they typically fall into three groups: Medicaid recipients (18.5% of 2016 revenue), Medicare recipients (40.8% of 2016 revenue), and the privately insured (33.4% of 2016 revenue). Medicaid pays a regulated price that is thought to approximate marginal costs; Medicare pays a regulated price that is thought to approximate the average costs of the *average hospital*; and privately insured patients pay a negotiated price that reflects the relative bargaining power of the provider and the insurer and which is usually much higher than those paid by Medicaid and Medicare recipients.

Now, consider the decision of a hospital about how and whether to invest in quality. A hospital could make costly investments in quality in an attempt to attract patients. Doing so, however, would greatly reduce its Medicare margin, which is driven by the cost structure of the average hospital across the country. Effectively, the choice by a hospital to invest in costlier quality than the average hospital lowers the margin they can earn from a public payer because that payer does not respond to an individual hospital's strategic investment but rather to the decisions of the average hospital.[9]

This is not true in the private insurance market, where if costly investments in quality increase patients' willingness to pay, they could also increase the negotiated rate between hospitals and insurers. Thus, hospitals will make investments in quality to

7 Some proposals for Medicare for All recognize this point and therefore propose setting reimbursement at some multiple of Medicare. However, it is unclear (a) whether this multiple is sufficient, and (b) whether this multiple will sufficiently change over time.

8 Note that while people generally refer to this as "cost shifting"—hospitals charge the privately insured more because the public sector doesn't pay enough—this is simply a form of price discrimination where firms charge based on a patient's willingness to pay.

9 This is primarily true for the FFS forms of public insurance. Both Medicare Advantage and Medicaid Managed Care tailor rates to individual hospitals, but not nearly to the same degree as the commercial market.

attract privately insured patients if they believe that the return from that investment will exceed the lost profits from the lower margin that they earn on Medicare patients.

Understanding this trade-off between quality and margin is critical for understanding the trade-offs for any Medicare for All-style plan. While some have suggested that regulated prices would merely trim away profits and unnecessary services, it is far more likely that hospitals will have to make meaningful changes to the quality of services that patients in the private market are currently willing to pay for (via higher premiums). The change in quality is fundamentally related to the reimbursement rate set by the single payer—if a future single payer were to pay a higher rate, the quality declines could be mitigated. However, there would be limited ability of hospital quality to vary to the same degree as consumer preferences. In addition, these higher rates would decrease the potential savings from such a system.

The decline in overall quality in exchange for expanded coverage and reduced prices might be an optimal decision from the point of view of society. This, however, is ultimately the debate that we should be having, rather than suggesting that the only losses from a single-payer system will be profits and inefficiency.

3.2 Changes in the Quantity of Medical Services Under a Single-Payer System

Approximately 60% of health-care spending goes to labor costs. Any attempt to reduce spending through lower prices will ultimately affect the wages of medical providers. There are simply not enough profits in the system to generate the type of savings that would be required for all providers to operate under existing Medicare reimbursements and still earn the same wage.

The economic costs of using market power to reduce these wages depends on the responsiveness of medical providers to lower wages. Some providers may decide to substitute leisure for work, or switch to a different occupation. Fewer individuals may undertake the training necessary to become medical providers in the future (if you reduce the returns to medical school, fewer people will attempt to become physicians and will instead go into other sectors). A large reduction in wages is unlikely to meaningfully lower the absolute quantity of physicians, since medical schools artificially constrain the number of student slots they offer. However, a decrease in the number of applicants could reduce the average quality of physicians entering the market since medical schools make admissions decisions based on their assessment of the quality of the marginal applicant.

While the effects of a single-payer monopsonist are hard to predict, Canada's experience and decisions regarding physicians' salaries may be informative.[10] In

10 This would be a system where the government serves as the only insurer and individuals are not allowed to supplement payments to providers with additional insurance.

Canada, provincial governments offer insurance; care is provided at privately owned facilities by privately employed physicians, which is similar to how I would expect a single-payer system to operate in the United States. Canadian physicians earn lower salaries compared to those in the United States, however it is unclear the extent to which this reflects the single payer's monopsony power or broader labor-market differences across the two countries. I examine this question in ongoing work with coauthors, by comparing the distribution of wages for health and non health workers across the two countries (Chown, Dranove, Garthwaite, & Keener, 2019).

If the lower health-care wages in Canada are the result of buyer power, then we would expect workers with options outside of the health-care market to earn similar wages across the two countries. This would include, for example, unskilled health-care workers who could easily leave health care for another sector. If lower physician wages in Canada resulted from monopsony power, we would expect the wage differences for highly skilled health-care workers in Canada and the United States to be greater compared to the wage differences among workers in other sectors of the economy, with the magnitude of this wage difference reflecting the expression of buyer power by the government insurer.

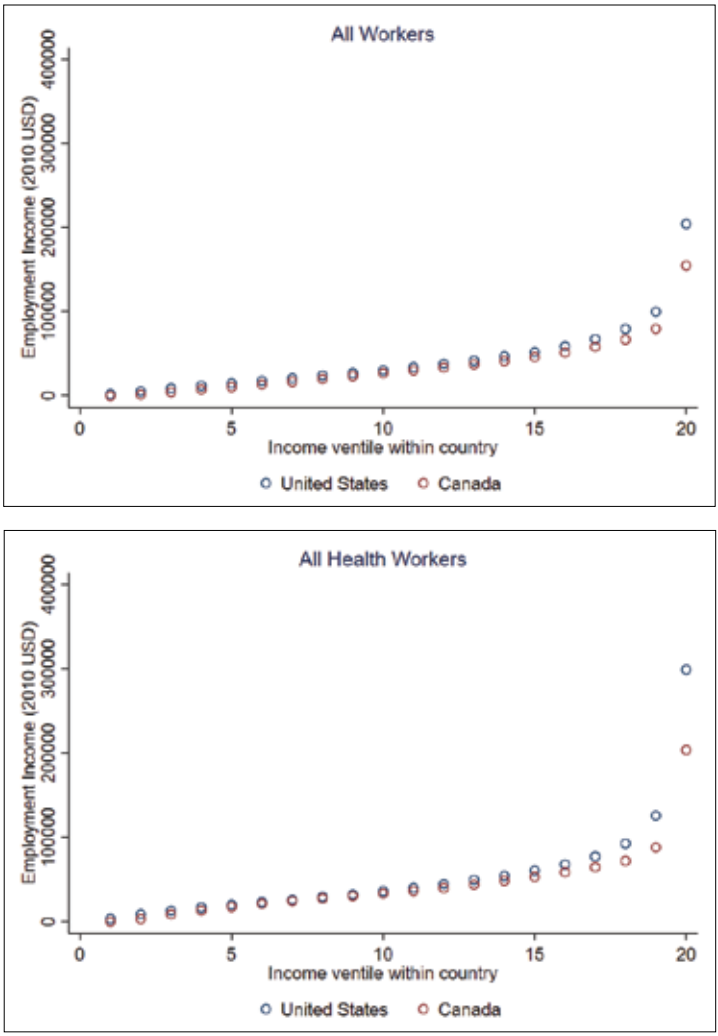
Figures 2 and 3 provide some evidence that the Canadian monopsonist does not meaningfully exert its market power on physician wages. Instead, a large proportion of the difference in provider wages across the two countries reflects other labor-market differences, such as the general wages earned by highly trained professionals in the market. Wages for lower skill employees across health care and other sectors are quite similar, suggesting the monopsonist is not using its buyer power to push down wages of lower skill health-care workers.

Among high-income workers, those in the United States earn more than those in Canada. However, this difference also holds in other sectors throughout the economy and reflects the high wages earned by those at the top of the U.S. income distribution. Chown et al. (2019) estimate highly educated Canadian health-care workers earn 26% less than those in the United States. If we look at similarly educated workers outside of health care, they earn 22% less in Canada than they do in the United States.

These wage differences suggest the Canadian monopsonist does not meaningfully exert its massive buyer power on the wages of health care workers. One reason why a monopsonist would choose not to exert such power is if it were worried that supply of a good (in this case physician labor) is fairly elastic and thus a decline in wages would meaningful deceases the quality or quantity of health-care providers.[11] This suggests that a similarly situated U.S. monopsonist may have limited scope to reduce spending by suppressing provider wages.

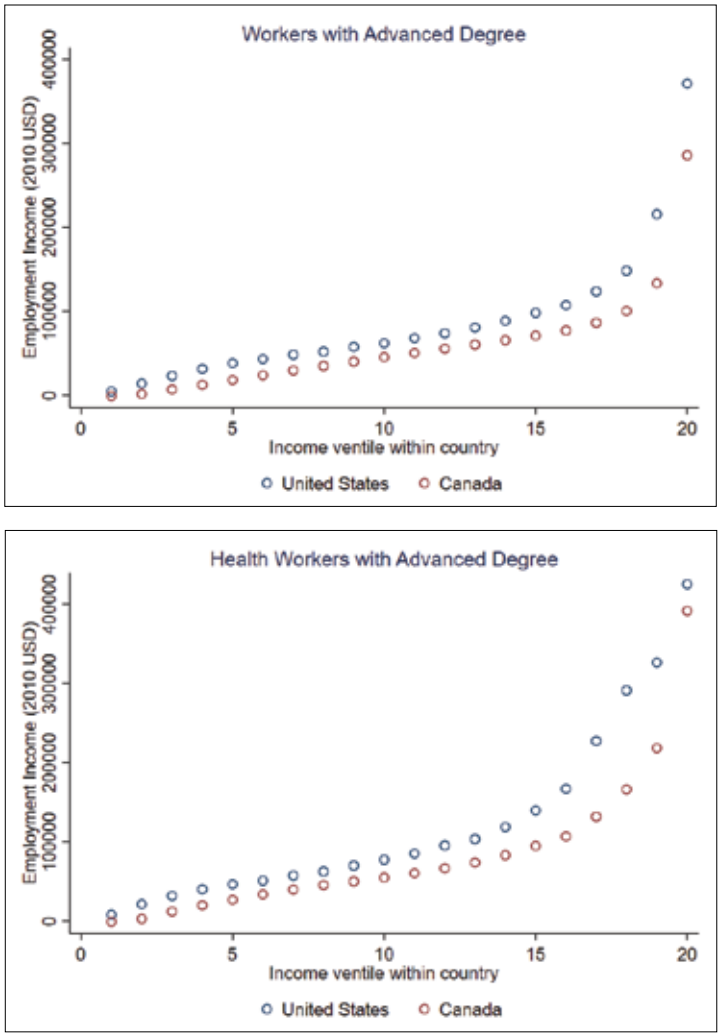
11 It's possible that a health-care monopsonist could exploit altruistic motives of physicians to charge below the market wage, but there is likely a limit to the size of this effect.

Figure 2. Income Distribution by Country



Notes: Figure plots the mean income for each within-country income ventile for all workers and workers in a health-care occupation. For Panel B, income quantiles are calculated only among individuals in health-care occupations. Sample is employed, paid workers in the 2011 National Household Survey (Canada) and 2010 American Community Survey (U.S.), using the harmonized versions of each data source from IPUMS International.

Figure 3. Income Distribution by Country for Advanced Degree Holders



Notes: Figure plots the mean income for each income ventile (within country and degree status) for all workers and workers in a health-care occupation. For Panel B, income quantiles are calculated only among individuals in health-care occupations. Sample is employed, paid workers in the 2011 National Household Survey (Canada) and 2010 American Community Survey (U.S.), using the harmonized versions of each data source from IPUMS International.

While a U.S. single payer could choose to exert more monopsony power than its Canadian counterpart, doing so would involve a different set of economic considerations than is often assumed by those who are concerned about the difference in provider wages across the two countries. These are costs that it appears the Canadian monopsonist is unwilling to incur, based on their revealed preferences.

3.3 Changes in Product Quantity Under a Single-Payer System

A single payer's ability to negotiate pharmaceutical prices is another source of significant potential savings. It is often claimed that Medicare does not currently negotiate pharmaceutical prices. While it is true the Center for Medicare and Medicaid Services (CMS) does not directly negotiate prices, private firms operating under Medicare Part D and Medicare Advantage do negotiate the prices of retail pharmaceutical products. These organizations are quite skilled at negotiations and their bargaining power is strong, so it is not clear CMS would earn a larger discount if it were to negotiate directly.

However, for physician-administered drugs (i.e., those covered by the Medicare Part B program), Medicare does not negotiate any price concessions. Instead, the government has formally established itself as a price taker where they pay a fixed markup over the average price in the private market. There is certainly more room for negotiation for these products.

A single-payer would again leverage its buyer power in the pharmaceutical market. Table 2 shows the average price paid for a comparable basket of drugs across the United States and Canada.[12] The Canadian monopsonist does appear to exploit its position in the market for pharmaceuticals far more than it does in the health-care labor market. For example, Chown et al. (2019) finds that for a comparable set of drugs, Canadian consumers pay approximately 54% less than patients in the United States.[13] This difference is even greater for non-neurological drugs, which likely reflects the heavy consumption of neurological drugs by Medicaid patients in our sample. While some of the difference in prices could result from other differences between the two markets, there are very few differences between U.S. and Canadian prices of non-health-care products.

12 Price data for the United States is backed out of a sample of Medicaid drugs—and therefore accounts to some degree for the existence of rebates. Price data for Canada comes from the province of Ontario.

13 This, in fact, could be an underestimate of the difference given difficulty fully estimating the magnitude of rebates. We use data from Medicaid rebates, but for many reasons this could distort estimated difference.

Table 2. Prescription Drug Price Indices

	Estimated Price Index (Canada relative to United States)	Share of Medicaid Spending in Sample
Full Sample	0.46	0.26
Neurological Drugs	0.48	0.36
Non-Neurological Drugs	0.36	0.12

Notes: Table shows estimated price indices for the sample of brand name prescription drugs described in Chown et al. (2019). Share of Medicaid Spending in Sample gives the fraction of Medicaid spending on prescription tablets and capsules in the first quarter of 2018 reflected in our estimation sample for each drug class group.

The Canadian monopsonist appears to exercise its buyer power when it is optimal to do so. But how is Canada able to exert this power? And why is it optimal for Canada to exert its buyer power in the product market but not the labor market?

A large single payer can extract lower prices not only because of its size but also because of its willingness to walk away from a negotiation if it does not receive a satisfactory price. Although Medicare is a large buyer, it is required to supply nearly all drugs (this is particularly true in the case of Medicare Part B). For this reason, the CBO has estimated that allowing negotiation is unlikely to change prices (Congressional Budget Office, 2007). However, this analysis is based on a scenario in which Medicare has the authority to negotiate but not to deprive access to Medicare enrollees when monopoly prices are too high (known as a closed formulary). If Medicare had this additional leverage in pricing negotiations, it could almost certainly lower prices (particularly on Part B drugs). However, there could be a political cost if the government deprived seniors of access to some medications solely because of their price.

The comparison between Canada and the United States in the product market is less apt. In a *global* product market, a single payer must consider how exercising its buying power will impact the producer's future *global profits* and not simply the price of that product in the domestic market. After all, a monopsonist wishes to avoid reducing the incentives to develop new products, and producers make this decision not based on any one country but instead on the expected global profits. Given the relative market share of Canada and the United States in the global market, the two countries are likely to reach different conclusions. Because the United States accounts for a larger share of the global market, its pricing decisions have far more influence on the pace of development of future products.

To understand the potential effect of buyer power in the health-care product market, consider the strategic decisions of pharmaceutical firms, which make large, risky investments in research and development (R&D). The patent system rewards

innovative firms by granting them a temporary monopoly, which allows innovators to recoup their investment before competitors enter the market.[14]

The pharmaceutical industry is characterized by high fixed costs (R&D) and low marginal costs of production.[15] On the margin, firms will earn profits even at relatively low drug prices once up-front investments are made. Thus a U.S. monopsonist single payer could exert market power to lower prices without scaring away existing pharmaceutical producers. However, lower prices are more likely to deter firms from making large investments in R&D to develop new products. For this reason, a wide body of literature shows a robust connection between market size and investment in R&D (Finkelstein, 2004; Acemoglu & Linn, 2004; Blume-Kohout & Sood, 2013; DuBois, de Mouzon, Scott-Morton, & Seabright, 2015).

The pharmaceutical market illustrates the trade-off between two forms of inefficiency. Governments allow the *static inefficiency* of monopoly prices vis-à-vis patenting in order to avoid the dynamic inefficiency of reduced innovation in the future. Pharmaceutical manufacturers make R&D investments based on the potential global profits. This provides an opportunity for a relatively small country such as Canada (which has fewer than 40 million residents) to choose to exercise buyer power without meaningfully reducing the development of future products. The Canadian monopsonist faces a much lower elasticity of supply of future products.

A larger country faces a higher elasticity of supply for new products because its citizens make up a larger share of the global market. Therefore, its decisions will have a greater impact on global profits. A larger single payer will be less likely to exert the same degree of market power compared to smaller counterparts, since its decision to exercise buyer power will require the sacrifice of future pharmaceutical innovation. Thus, citizens must decide how much they value drug innovation versus low drug prices. This is a very fair debate to have, but it is far more nuanced than a simple discussion about whether the United States should pay lower prices for drugs.

4. How Should We Think About the Cost Estimates of a Single-Payer System?

Just as there are numerous versions of Medicare for All, so too are there a plethora of cost estimates available for a potential single-payer system. At this preliminary point, sorting through these estimates does not serve a lot of value. Instead, it is important

14 While the product is under patent, no firm can make a product containing the exact chemical composition. However, a competitor can make a therapeutic substitute that targets the same condition and even uses the same mechanism of action as long as the product is sufficiently different in composition to secure a unique patent.

15 This is clearly true about small molecule products. As the industry as evolved to produce more biologic products and now with more gene therapy products the marginal costs of production have grown.

to consider what the appropriate methodology would be for evaluating the potential costs associated with any increase in government-provided health care.

An increase in the size of the Medicare population will increase government spending, but does this spending represent net new outlays, or is it simply a shift from private premiums to public dollars? If a new enrollee previously had insurance through her employer, federal spending on her insurance will supplant premiums that she previously paid. As a result, the wage portion of her compensation will increase (Baicker & Chandra, 2006; Gruber, 1994). In turn, tax revenues will also increase because the compensation that was previously provided as health insurance was tax deductible. At a cost of approximately $280 billion per year, the tax deductibility of health insurance is the single largest expenditure in the tax code (Tax Policy Center, 2016).

If individuals are receiving government insurance which reduces their premium expenditures, then the government has the ability to raise taxes without harming economic performance. The distributional implications of such a tax are more complicated since the distribution of the current burden of health insurance premiums for individuals does not necessarily match the distribution of the current burden of their income taxes. This is especially true for wealthy individuals who spend a much greater share of their income on taxes than they do on health insurance premiums. Therefore, if the argument is that new taxes simply reflect existing payments for health insurance premiums (and therefore have minimal negative economic consequences), utilizing a broad-based payroll tax may be preferable to using the existing income tax structure to fund these new government expenditures.

An additional question for consideration is whether individuals will choose to purchase additional insurance coverage (assuming it is legal to do so). To the extent this is an issue, the increase in individual incomes resulting from the introduction of a Medicare for All system would be muted; thus, tax increases would pose greater economic costs.

5. Market-Based Policies to Improve U.S. Health Care

While the costs of Medicare for All could be substantial, the goals of expanding coverage and lowering costs are laudable and should be a policy goal supported by all. Instead of promoting a complete overhaul of the U.S. system, which will likely throw out the good with the bad, I argue the United States should strive for a more modest goal of restoring competition to parts of the health-care market where it is currently lacking.

Admittedly, the package of policies discussed below does not have the "home run" quality of a single, large policy that will "solve" the problem of U.S. health care, but such home runs will most likely cause more harm than good. The U.S. health-care

system accounts for approximately 18% of the U.S. Gross Domestic Product (GDP), placing its size roughly on par with the entire economy of Germany. A system of this magnitude cannot be disrupted overnight. Instead, I argue that policymakers should look for incremental approaches to promote competition in all sectors of health care. If this is accomplished, prices will decline to a competitive level, which will allow our existing social insurance programs (i.e., the ACA marketplaces, Medicaid, and Medicare) to expand coverage.

I will discuss a number of such policies—but will also note that this list is not meant to be comprehensive.[16] Instead, these are examples of the types of focused policies that we should be pursuing. At a high level, we can break these policies into those that make the overall health-care market more efficient and those that strive to make Medicare more efficient.

5.1 Improve Overall Competition in Health-Care Markets

Unlike other developed countries, the United States relies heavily on the private market to finance and provide health-care services for its citizens. There are many advantages to a market-based health-care system. The citizens of a large and diverse country such as the United States will have a wide variety of preferences and meaningful differences in their willingness to pay for health-care quality. Regulated prices and central planning (by either a government entity or an independent third party) are unlikely to maximize welfare, and the market can more efficiently allocate goods and services. This is especially true considering the large number of economic actors involved in developing innovative new health-care products and services. It is hard to imagine what omniscient actor could more efficiently balance these forces. For this reason, despite many contentions to the contrary, an appropriately regulated, market-based system remains the best mechanism for maximizing welfare.

However, relying on the market for the provision of such a vital set of goods and services requires policymakers to recognize that health-care markets, like any other market, can fail. Market structures and institutions must be vigilantly protected in order to promote robust and vigorous competition. Unfortunately, there are many areas of the U.S. system where competition is not being fostered and government policy is actually undermining market competition. I address some of these concerns below.

5.1.1 Promote Generic Competition

U.S. pharmaceutical policy has sought to balance innovation and affordability by granting innovating firms with a new product a temporary period of market exclusivity before generic competitors may enter the market. However, over time, brand-name

16 A more complete discussion of these points can be found at: https://www.kellogg.northwestern.edu/faculty/garthwaite/htm/Garthwaite_Testimony_Judiciary_Final.pdf

drug manufacturers have found ways to deter generic manufacturers from bringing competing lower priced products to market. In addition, some fundamental market structures, such as small market generics, limit the existence of multiple competitors and allow firms without patent protection to effectively act as monopolists and earn excessively high price-cost margins. I will discuss each of these factors in turn.

First, we must lower the barriers to entry for generic drug makers once the patent protection of an innovative firm has ended. Policymakers should ensure that potential generic entrants have an opportunity to demonstrate their product's bioequivalence to a patented product. Unfortunately, some brand-name manufacturers go to great lengths to restrict access to their product so that generic firms cannot accumulate enough samples of the brand-name drug to demonstrate a generic drug's bioequivalence. Brand-name firms often do this by abusing regulations that are intended to promote the safety and security of the pharmaceutical supply chain. This should be illegal. The pending Creating and Restoring Equal Access to Equivalent Samples Act (CREATES) would accomplish this by requiring firms to make such samples available.

While lowering entry barriers should be a primary goal, we also must confront the fact that there are a number of generic markets where the target population is so small the market will never support multiple competitors. In a well-functioning generic market, firms compete primarily on price. Profits therefore are determined by a firm's ability to manufacture products at the lowest marginal cost. This fierce price competition means that successful entrants must be able to produce enough to reach the minimum efficient scale (MES) of their production process (i.e. the quantity at which the costs of production are minimized). Absent sufficient quantity, entrants realize they will find themselves at a perpetual cost disadvantage to incumbent firms and therefore will rationally decline to enter the market. For sufficiently small markets, there is only enough demand for a single manufacturer to reach MES—and the incumbent firm is a natural monopolist that maintains meaningful pricing power.

In recent years, cognizant of the pricing power available to manufacturers of generic products with sufficiently small potential markets, a number of firms have adopted a strategy of acquiring small-market generics and significantly raising prices (Hopkins & Martin, 2018; Pollack, 2015; Rockoff & Silverman, 2015). These cases are not examples of the above-discussed trade-off between access today and innovation tomorrow—society has long since paid for the innovation from any of these products. Instead, the high prices represent firms taking advantage of a market failure created by the small patient population.[17]

17 While large pharmaceutical firms were historically either unwilling to exploit this pricing power or unaware of this financial strategy, the practice of firms charging high prices without fear of entry in small generic markets is now widespread throughout the industry (albeit the strategy is typically employed by smaller firms with fewer invested assets in the industry).

I propose the Food and Drug Administration (FDA) be required to identify markets that appear to be natural monopolies and then undertake a request for proposal (RFP) process for those markets. Under this RFP process, any private firm could apply for the rights to be the exclusive manufacturer of a natural monopoly generic medicine at a certain fixed percentage above manufacturing costs; firms would compete on the amount of margin they would in order to require to serve the market. The winning firm would possess the exclusive rights to sell the drug at this regulated price for a time period sufficient to recover the fixed costs of entry. At that time, the FDA would have the option of re-auctioning off this new form of market exclusivity.[18]

Recent scientific advances have allowed for an increasing personalization of medicine. Along with coauthors, I have documented the rising share of clinical trials involving a patient-specific biomarkers to determine either efficacy or safety (Chandra, Garthwaite, & Stern, 2018). Almost by definition, personalized medicine will involve products with limited patient populations, and for many of these products we should be worried about whether robust generic competition will ever emerge.[19] While the problem of small-market generics is not a dominant feature of today's market, it will only grow in importance. It will likely be easier to address the problem now than it will be when the number of powerful interests manufacturing such products increases.

5.1.2 Improve Biosimilar Adopts by Regulated Contractual Form of Rebates

Price negotiation in pharmaceuticals occurs through the use of rebates, which are discounts off of the listed price that is negotiated between the pharmacy benefits managers (PBMs)[20] and pharmaceutical manufacturers. Manufacturers are willing to give larger rebates when a PBM can credibly signal that they will shift a large volume of sales toward their product. One way that PBMs do this is by promising the manufacturer that their product will have the lowest cost sharing (i.e., copayment or coinsurance) among all its potential competitors in a therapeutic class. This is accomplished through various tiers of a formulary (the list of drugs and cost sharing for consumers).

Many contracts specifically reference potential rival products that might serve as a competitor—they specifically state that other competitors not be on a particular

18 In order to ensure the efficient operation of this process, it may also be necessary for the FDA to set a maximum percentage that they will accept before they will turn to a nonprofit or government supplier for the product. This will limit any ability of firms to collude to divide up the markets in which they choose to enter.

19 The problem of competition for precision medicine will be further complicated in situations where the patented product is a biologic.

20 Pharmacy Benefit Managers are private firms that manage the prescription drug portion of an individual's health insurance benefit. This involves a number of tasks, but perhaps most important is the negotiation of drug prices with pharmaceutical manufacturers through a system of confidential discounts (i.e., rebates) from a publicly known list price.

formulary tier.[21] These contracts that reference a rival can either be pro- or anticompetitive depending on the economic context. If there are a large number of products in the market and patients can be easily moved across products (such as in the small molecule market), then these contracts likely improve efficiency.

However, patients are unwilling to move across some types of products (and we may not want them to switch across products for medical reasons). In those settings, particularly if the incumbent firm has a large market share, rebate contracts that reference a rival can be anticompetitive. This is because a potential entrant can only compete for treatment-naive patients (i.e. those that have not previously successfully used one of the treatments). Therefore, if the rebate for the entire patient population is contingent on the entrant not being on the preferred tier, there is no price the entrant can offer that would be worth more than the rebate on the stock of patients that have already been using the drug. In such settings, we need to more carefully evaluate whether contracts that reference rivals are anticompetitive.

5.1.3 More Complete Review of Potentially Anticompetitive, Hospital-Insurer Contracting

There is a great deal of attention paid to the prices of pharmaceuticals relative to the share of health-care spending (15% to 20%) they comprise. Relatively less attention is paid to the prices charged by hospitals and other medical providers, which comprise a much greater share of health-care spending. Some of these high prices, particularly for hospitals, are the result of quality and brand preferences across consumers. However, we are increasingly worried that some of these prices are the result of hospital consolidation and selective contracting.

In particular, there are concerns that large health systems are exploiting their market power to require contracts that inflate prices across all hospitals in the system. These include contracts that reference rivals, most favored nation clauses, and anti-tiering/steering contracts that require all facilities in a system to be on the most preferential network tier in order for any to be on that tier. Given the increasing prevalence of large health systems, it is important that competition authorities undertake vigorous review of these contracts. In addition, it is important that this review extend to nonprofit hospitals and health systems. Currently, the Federal Trade Commission (FTC) is limited in its ability to regulate these providers (outside of merger review), which stands at odds with the evidence that many nonprofit hospitals appear to act similarly to their for-profit counterparts (Dranove, Garthwaite, & Ody, 2017).

21 Formularies are lists of drugs with tiers based on the cost sharing patients must pay to access the drug. For example, a formulary could have three tiers with a generic tier having a copayment of $5, a "preferred brand" tier with a copayment of $15, and a "nonpreferred brand" tier of $25. Cost sharing can also be based on a percentage of the drugs cost (i.e. coinsurance), which is often the case for expensive specialty drugs. Higher cost sharing decreases utilization, and thus manufacturers attempt to gain access to lower formulary tiers by offering larger price discounts.

5.2 Improve Efficiency of Medicare

There are also incremental changes that could be made to Medicare that would promote competition and improve efficiency. These changes are important for two reasons. First, demographic change in the United States will increase the importance of Medicare to both the federal budget and the health-care sector. Second, to the extent that Medicare becomes the vehicle for greater health-care coverage, improving its efficiency is a useful policy goal.

5.2.1 Improve Competition for Pharmaceuticals Purchased by Medicare Part D

Medicare Part D is an explicit public–private partnership in health care where the government subsidizes the purchase of insurance but the development and offering of plans is undertaken by private firms. When the program was created, its goal was to use market forces to promote competition and efficiency.

There are several features of Part D that subvert this goal. The first is Medicare Part D's reinsurance program, which shields private firms from the cost of very expensive drugs. After an enrollee spends about $5,100 in out-of-pocket spending on drugs, they enter the "catastrophic coverage" range in which the government is responsible for 80% of costs, firms for 15%, and enrollees for 5%. Therefore, private firms have little incentive to engage in price negotiations for the most expensive drugs. Perhaps more concerning, PBMs operating in both the commercial and the Part D markets may face different incentives for rebates across these different markets and could use the confidential nature of rebates to increase government Part D spending.

Reinsurance may have been necessary to initially attract firms to the market at the program's inception. Now that participation in Part D is well established and quite profitable for firms, the reinsurance program is no longer necessary. Therefore, I propose that Congress either end the reinsurance program entirely or greatly curtail its generosity so that plans are responsible for 80% of costs and the government is only responsible for 15%.

A second feature of Part D that decreases competition (and might affect prices) is the institution of "protected classes," which require firms to cover all products in six protected therapeutic areas (immunosuppressants, antidepressants, antipsychotics, anticonvulsants, antiretrovirals, and antineoplastics). Limiting the formulary makes it very hard for plans to negotiate large discounts and may shift investments in drugs toward these classes. While it is clear that we need to balance the trade-off between price and access when we consider optimal formulary design, the current system errs too far on the side of access. Therefore, Congress should consider amending protected classes to allow more utilization management for these drugs.

5.2.2 Introduce More Competition to Medicare Part B

While Medicare Part D has an established structure for negotiating pharmaceutical prices, physician-administered drugs are covered under Medicare Part B and involve no negotiation at all. Instead, Medicare pays for these products on a cost-plus basis (physicians purchase the products and are then paid the average price plus a 4.3% margin). This perverse system creates an incentive for firms to charge higher prices in the private market and for physicians to prescribe drugs with higher prices.

Given the growing importance of physician-administered drugs, a category of products that include oncology products, it is essential that Medicare introduces some competitive pressure into the pricing of Part B drugs. While some have called for covering all products under Medicare Part D, doing so would likely expose many patients to more onerous cost sharing than they currently experience. Therefore, a better potential solution is to create the structures for PBM-like vendors to emerge and handle the negotiation for these products. This would require physicians to no longer take financial title to these products in the first place, which would eliminate the incentive to prescribe more expensive drugs without exposing them to carrying costs associated with the most expensive products.

Some providers may argue that the funds they currently receive for Part B provide reimbursement for other valuable medical services that they provide. This could be particularly true for some safety-net providers. However, to the extent that this is true, we should directly pay providers for these services rather than continue with a system that raises prices in part of the market in a Rube Goldberg-like attempt to finance other parts of the system.

5.2.3 Fixed Risk Adjustment in Medicare Advantage

The greater use of private providers in the Medicare Advantage program introduces a tension between providing strong incentives for cost controls and ensuring that individuals with high medical expenses receive appropriate access. On the one hand, the very purpose of privatizing this benefit is to provide a firm that is the residual claimant on health spending (i.e., they keep what is not spent) with the incentive to control costs. On the other hand, this creates strong incentives for firms to serve only healthy applicants who naturally have lower health-care costs with any effort from the firm.

To address this concern, Medicare Advantage program payments to providers are adjusted for the risk of the patient. For each patient, firms submit diagnostic codes that are used to calculate a patient-specific risk score. The expected spending for each risk score is derived from the spending by people with similar scores in the FFS system.

Under ideal settings, this would result in firms having the incentive to attract sicker patients and then actually manage their risk. Unfortunately, in reality, private plans

have a strong incentive to maximize the risk scores of enrollees by costly activities, such as reviewing the medical charts to provide support for additional diagnoses. At the extreme, this could lead to "upcoding," or the inclusion of inaccurate risk codes. Even without any inappropriate upcoding, the incentive to generate additional risk codes reflect inefficiencies. The economically meaningful excess resource costs that go into generating these codes don't create additional welfare. To the extent that a risk code generated from a review of charts is associated with less medical spending than a similar risk code that came about under the incentives of the FFS program, risk adjustment can end up being an inappropriately large transfer to private firms.

The trouble is that "fixing" risk adjustment is not easy. One solution would be to make risk adjustment a function of immutable characteristics such as age, race, sex, and geography. However, to the extent that there is still meaningful variability within these characteristics, firms would still have incentive to avoid sick individuals, conditional on these immutable characteristics (i.e., firms would still want to cream skim these immutable categories).

Another possibility is to move risk adjustment to a plan-level measure that is based on survey data. Such self-reported data from a random sample of enrollees would be harder to game than the existing system of risk codes. The challenge would be to identify the correct set of survey responses, but this is an area where policy should be focused.

6. Conclusion

If there is one thing that we have learned over the last several years, it is that health care is complicated. There are no easy ways to lower costs, increase access, improve quality, and encourage innovation. That said, the trade-offs inherent to these policy decisions don't get any easier or less concrete by ignoring them. Efficient policy will only emerge from a careful consideration of these trade-offs.

References

Acemoglu, D., & Linn, J. (2004). Market Size in Innovation: Theory and Evidence from the Pharmaceutical Industry. *The Quarterly Journal of Economics, 119*(3), 1049–1090. https://doi.org/10.1162/0033553041502144

Baicker, K., & Chandra, A. (2006). The Labor Market Effects of Rising Health Insurance Premiums. *Journal of Labor Economics, 24*, 609–634. https://doi.org/10.1086/505049

Baker, L. C., Bundorf, M. K., Devlin, A. M., & Kessler, D. P. (2016). Medicare Advantage Plans Pay Hospitals Less Than Traditional Medicare Pays. *Health Affairs (Project Hope)*, 35(8), 1444–1451. https://doi.org/10.1377/hlthaff.2015.1553

Blume-Kohout, M. E., & Sood, N. (2013). Market Size and Innovation: Effects of Medicare Part D on Pharmaceutical Research and Development. *Journal of Public Economics, 97*, 327–336. https://doi.org/10.1016/j.jpubeco.2012.10.003

Chandra, A., Garthwaite, C., & Stern, A. D. (2018). *Characterizing the Drug Development Pipeline for Precision Medicines* (Working Paper No. 24026). National Bureau of Economic Research. https://doi.org/10.3386/w24026

Chown, J., Dranove, D., Garthwaite, C., & Keener, J. (2019). *The Opportunities and Limitations of Monopsony Power in Healthcare: Evidence from the United States and Canada* (Working Paper No. 26122). National Bureau of Economic Research.

Congressional Budget Office. (2007). *Issues Regarding Drug Price Negotiation in Medicare*. Retrieved from https://www.cbo.gov/publication/18550

Congressional Budget Office. (2019). *Key Design Components and Considerations for Establishing a Single-Payer Health Care System.* Retrieved from https://www.cbo.gov/system/files/2019-05/55150-singlepayer.pdf

Curto, V., Einav, L., Finkelstein, A., Levin, J., & Bhattacharya, J. (2019). Health Care Spending and Utilization in Public and Private Medicare. *American Economic Journal: Applied Economics, 11*(2), 302–332. https://doi.org/10.1257/app.20170295

Doyle, J., Graves, J., & Gruber, J. (2018). Evaluating Measures of Hospital Quality: Evidence from Ambulance Referral Patterns. *The Review of Economics and Statistics*. https://doi.org/10.1162/rest_a_00804

Dubois, P., de Mouzon, O., Scott-Morton, F., & Seabright, P. (2015). Market size and pharmaceutical innovation. *The RAND Journal of Economics, 46*(4), 844–871. https://doi.org/10.1111/1756-2171.12113

Finkelstein, A. (2004). Static and Dynamic Effects of Health Policy: Evidence from the Vaccine Industry. *The Quarterly Journal of Economics, 119*(2), 527–564. https://doi.org/10.1162/0033553041382166

Garthwaite, C., Gross, T., & Notowidigdo, M. J. (2018). Hospitals as Insurers of Last Resort. *American Economic Journal: Applied Economics, 10*(1), 1–39. https://doi.org/10.1257/app.20150581

Gruber, J. (1994). The Incidence of Mandated Maternity Benefits. *American Economic Review, 84*(3), 622–641. Retrieved from https://econpapers.repec.org/article/aeaaecrev/v_3a84_3ay_3a1994_3ai_3a3_3ap_3a622-41.htm

Hopkins, J. S., & Martin, A. (2018, April 6). Prescription Drug Prices Often Spike When This Duo Shows Up. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/features/2018-04-06/when-these-new-pharma-bros-show-up-drug-prices-tend-to-go-monumentally-higher

Pollack, A. (2015, September 20). Drug Goes From $13.50 a Tablet to $750, Overnight. *The New York Times*. Retrieved from https://www.nytimes.com/2015/09/21/business/a-huge-overnight-increase-in-a-drugs-price-raises-protests.html

Rockoff, J. D., & Silverman, E. (2015, April 27). Pharmaceutical Companies Buy Rivals' Drugs, Then Jack Up the Prices. *The Wall Street Journal*. Retrieved from https://www.wsj.com/articles/pharmaceutical-companies-buy-rivals-drugs-then-jack-up-the-prices-1430096431

Stensland, J., Gaumer, Z. R., & Miller, M. E. (2010). Private-Payer Profits Can Induce Negative Medicare Margins. *Health Affairs, 29*(5), 1045–1051. https://doi.org/10.1377/hlthaff.2009.0599

Tax Policy Center. (2016). *How does the tax exclusion for employer-sponsored health insurance work?* Retrieved from https://www.taxpolicycenter.org/briefing-book/how-does-tax-exclusion-employer-sponsored-health-insurance-work

White, C., & Whaley, C. (2019). *Prices Paid to Hospitals by Private Health Plans Are High Relative to Medicare and Vary Widely* [Product Page]. Retrieved from RAND Corporation website: https://www.rand.org/pubs/research_reports/RR3033.html