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FINANCING HEALTH CARE DELIVERY

Jonathan Gruber

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ABSTRACT

I review the key issues that arise in financing health care delivery. I begin by documenting the key features of health care markets that make financing so central in this sector, such as the skewed and unpredictable nature of health care spending and market failures in health care delivery. I then review the key issues that public and private payers face in designing health care markets, from the proper mix of public and private provision to the role of risk bearing for consumers and providers. Finally, I illustrate how these issues manifest in practice by comparing the design of insurance systems in the United States and Canada.

Jonathan Gruber
Department of Economics, E52-434
MIT
77 Massachusetts Avenue
Cambridge, MA 02139
and NBER
gruberj@mit.edu

1. INTRODUCTION

Health care is one of the biggest economic sectors in most developed economies in the world. Across all OECD (Organization for Economic Cooperation and Development) nations, health care amounts to 11.7% of total GDP; in the United States, it is more than 17% of GDP (OECD 2019a). The health sector has grown rapidly around the world over the past 70 years, particularly in the United States. In 1950, only 5% of US GDP was accounted for by health care, less than spending on cars, fuel, or clothing. By 2017, health care amounted to 17.9% of GDP, exceeding spending on housing and food. And this growth is not projected to stop: Health care is forecasted to consume almost half of US GDP by the end of the twenty-first century (Gruber 2022).

Health care is also unique relative to most other sources of economic activity and consumer spending. Spending is unpredictable and highly variable. As such, advance financing of these expenditures is necessary for most consumers. In particular, with risk-averse individuals and risk-neutral insurers, a strong case can be made for insurance to cover large medical expenses. At the same time, markets for the purchase of both medical care and health insurance face a number of imperfections, from incomplete information to imperfect competition to inconsistencies in consumer choice. This makes it unlikely that either private or government entities can achieve the first best in designing a financing regime for health care costs.

Perhaps as a result, enormous heterogeneity occurs around the world in how health care spending is financed. In the United Kingdom, the National Health Service pays directly for all health care services, at regulated prices, while consumers receive care largely for free. In Canada, in contrast, individuals are provided insurance against their medical risk, but that insurance is provided by a single government payer that effectively regulates prices; once again, consumers pay little for covered services, but some services (such as dental care or prescription drugs) are not covered and are often privately insured. Countries ranging from Germany to the United States rely on the employment relationship as the primary source of private insurance, but most countries other than the United States do so in a heavily regulated environment that both sets provider prices and allows limited degrees of competition across insurers.

This heterogeneity reflects the complicated economic nature of health care markets as well as the complicated politics of government regulation of such a large sector. Worldwide, government regulation of health care is certainly more intense than most other large economic sectors—although huge variation occurs across nations.

This article reviews the central issues in the financing of health care. I begin by documenting the key features of health care markets that make financing so central in this sector. First, health care spending is both highly skewed and largely unpredictable, so ex ante insurance is the optimal financing mechanism. Second, enormous uncertainty exists about the efficacy of the majority of health care treatments. Third, health care markets are plagued by informational asymmetries in underlying health risk (leading to adverse selection and potential market failure) and in severity of illness (leading to moral hazard problems on both the patient and provider side). Fourth, health care provider markets are imperfectly competitive due to a host of market failures. Finally, consumers are poorly informed and make inconsistent choices both in health care and health insurance spending.

Faced with the demand for insurance, but also this laundry list of concerns in meeting that demand, public and private insurers face a broad set of design issues that they must resolve, which I review in Section 3. These design issues include (*a*) the proper mix of public versus private provision of both health care and health insurance; (*b*) for private insurance, how much to regulate pricing and insurer discrimination; (*c*) the proper division of the burden of financing across governments, employers, and individuals; (*d*) the extent of consumer cost-sharing that best balances risk sharing and health maximization with moral hazard concerns; and (*e*) the proper reimbursement of providers given the informational asymmetries and misaligned incentives between insurer and provider.

To illustrate how these difficult decisions are resolved, in Section 4, I turn to a comparison of two countries at the extremes: the United States and Canada. While these countries are geographically, economically, and demographically similar, they have chosen radically different paths for financing health care spending. Canada has a single-payer program with highly regulated health care budgets, while the United States has a multi-payer system that relies on the market to determine health care prices for the majority of its citizens. Section 5 concludes.

2. THE KEY FEATURES OF HEALTH CARE MARKETS

2.1. The Nature of Health Care Spending

Any discussion of financing starts with two simple facts: Health care spending is highly skewed, and it is largely unpredictable. In terms of the first point, **Figure 1** illustrates the distribution of health care spending in the United States. The x-axis shows the cumulative percentage of the

population, while the y-axes show the cumulative percentage (and dollars) of health care spending in 2018. The bottom 50% of the population accounts for only 3.2% of health care spending; the top 10% accounts for 64.3% of health care spending; and the top 1% of the population accounts for 21% of health care spending. **Figure 2** shows average spending by percentile of spending; the bottom 50% of the distribution spends on average only US $384/year, while the top 1% spend on average more than US $127,000/year
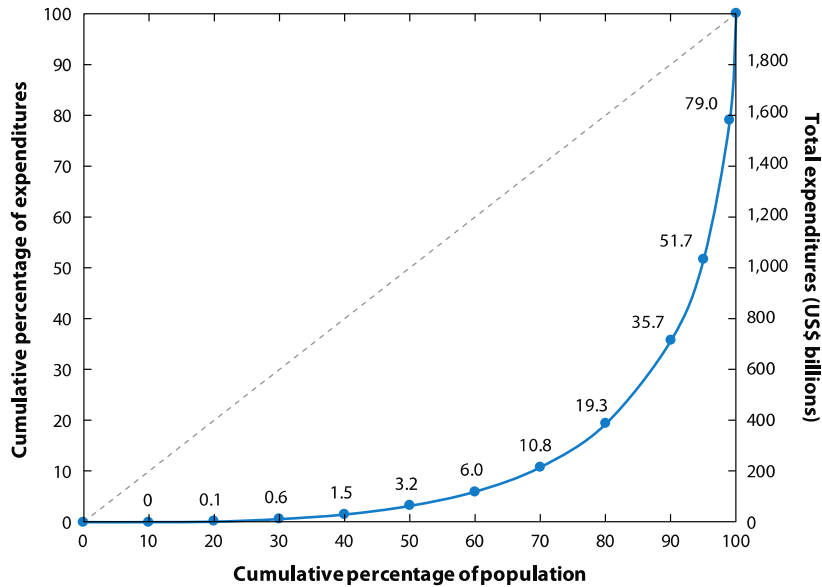
Figure 1 Distribution of health care spending in the United States in 2018. The bottom 50% of the population accounts for only 3.2% of health care spending; the top 10% of the population accounts for 64.3% of health care spending; and the top 1% of the population accounts for 21% of health care spending. Figure adapted with the permission of Dr. Emily M. Mitchell from Mitchell (2021). Data from the Agency for Healthcare Research and Quality.

Figure 2 Average total healthcare expenditure per person by percentile of expenditure in the United States in 2018. The bottom 50% of the distribution spends on average only US $384/year; the top 1% of t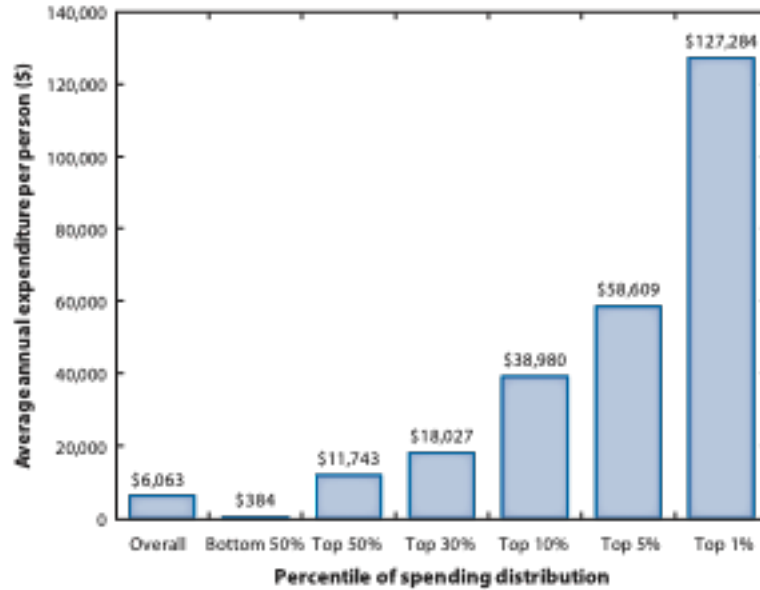he distribution spends on average more than US $127,000/year. Figure adapted with the permission of Dr. Emily M. Mitchell from Mitchell (2021). Data from the Agency for Healthcare Research and Quality.

The second point is harder to document since remarkably little public use data on health care spending has a long panel component and can show predictability of spending over time within individuals. Researchers have adopted two strategies to make this point. The first is to document that, cross-sectionally, even the richest possible set of controls can explain only a minority of health care spending (Morid et al. 2017). The second strategy is to turn to administrative claims data for certain populations to document variability over time. High-cost spenders tend to regress to much lower-cost spending over time. Only 45% of high-cost patients will be high cost the following year and less than 35% high-cost patients will be high-cost patients 5 years later. As a result, there is no consistent high-cost patient; it changes over time (Hirth et al. 2015; Placona, King & Wang 2018).

This highly skewed and variable spending implies that fairly complete ex ante insurance against risks is optimal.[1] If insurance is priced actuarially fairly—that is, on average the premium charged by insurers is the same as their expected cost—then, for risk-averse individuals, it is

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[1] For an intuitive discussion and formal proof, see Gruber (2022), chapter 12 and appendix.

optimal to fully insure. Even as we add insurer profitability and other wedges, fairly complete insurance will be optimal—it would be hard to write down a model with risk-averse individuals in which being completely uninsured is optimal.

But this simple model excludes a number of real-world features of medical and insurance markets that make the welfare analysis much more complicated.

2.2. Uncertainty About Efficacy

There are a variety of almost certain miraculous treatments for disease, ranging from antibiotics to chemotherapy. But the appropriate treatment for the majority of medical problems we face is often uncertain—and many possible alternatives are clinically unproven. According to the *British Medical Journal*, only one-third of medical treatments are shown to be effective or likely to be effective, while 50% of the 3,000 treatments they studied were shown to be ineffective or unproven to be effective (Frakt 2014).

2.3. Informational Asymmetries

The primary challenges facing alternative models of health care financing are two key informational asymmetries in health care markets. The first is the asymmetry of information between the insured and the insurer as to the underlying health spending risk facing the individual. As noted earlier, it is very hard to predict future health care spending based on a rich set of observable covariates. But there may be a series of unobservable characteristics of individuals that are associated with the ultimate level of medical spending, such as preferences for risky activities, family histories of illness, or preferences for receiving medical treatments even for minor ailments.

As classically explained by Rothschild & Stiglitz (1976), such informational asymmetries can lead insurance markets to fail. A modern framework for thinking about the welfare effects of adverse selection is provided by Einav & Finkelstein (2011). They highlight the key correlation between demand and marginal cost that is the essence of adverse selection: At higher prices, only the sickest will buy. As Einav and Finkelstein write:

> The link between the demand and cost curve is arguably the most important distinction of insurance markets (or selection markets more generally) from traditional product markets. The shape of the cost curve is driven by the demand-side customer selection. In most other contexts, the demand curve and cost curve

are independent objects; demand is determined by preferences and costs by the production technology. The distinguishing feature of selection markets is that the demand and cost curves are tightly linked, because the individual's risk type not only affects demand but also directly determines cost. (Einav & Finkelstein 2011, p. 117-118)

An enormous literature documents adverse selection in a variety of contexts, as reviewed by Einav, Finkelstein & Mahoney (2021). To summarize, substantial evidence shows adverse selection both into and out of markets and in terms of the amount of insurance purchased in the market (Browne 1992). In general, the welfare losses from adverse selection within insurance markets appears modest (perhaps because of choice inconsistencies, discussed in Section 2.5). At the same time, less work has been done on the welfare costs of complete exclusion from insurance.

The second important source of asymmetry between insured and insurer, along with their provider, is severity of illness. Since insurers cannot truly observe the severity of illness at any point in time, they cannot be sure that patients are demanding the appropriate level of care and that providers are delivering it. On the demand side, this may make it optimal for insurers to offer incomplete coverage through imposing patient cost-sharing, which typically takes one of three forms: (*a*) a deductible, where the patient pays the full cost of medical care up to some limit; (*b*) a copayment, where the individual pays a fixed amount for each medical good or service; or (*c*) coinsurance, where the patient pays some share of the total medical bill up to some limit.

On the provider side, moral hazard arises through three mechanisms. The first is the desire for providers to maximize patient health, not to optimize medical spending. If patients are fully insured for their medical costs and providers are fully reimbursed for their expenditures, then health-maximizing providers will deliver care well beyond the point where it is cost effective. The second mechanism is liability pressure through the medical malpractice system. If providers face the risk of lawsuit for not trying every avenue of medical treatment, they may provide cost-ineffective procedures to patients. Of course, such defensive medicine pressures may exist in the other direction as well, where providers shun risky procedures because they will be sued if there is a bad outcome. The evidence on defensive medicine generally concludes that the phenomenon is real but limited (for evidence and review, see Frakes & Gruber 2020).

The third mechanism is income maximization. Models of physician behavior such as those by Gruber & Owings (1996) or McGuire & Pauly (1991) typically incorporate a physician who is making the trade-off between maximizing the health of their patients and maximizing their income. All too often, no trade-off exists here (other than wasted patient time), as more testing and low-risk procedures may benefit patients and will certainly increase incomes.

A huge empirical literature explores moral hazard in health care use (Liu & Chollet 2006; Pendzialek, Simic & Stock 2016). Two strands are particularly relevant to this discussion. The first strand explores the responsiveness of health care use to patient cost-sharing. The classic reference here is the RAND Health Insurance Experiment (HIE) (Newhouse 1993), which was conducted in the mid-1970s at several sites in the United States. In the HIE, individuals were randomly assigned to plans with different coinsurance rates. The study showed convincingly that medical care demand is price sensitive: The implied elasticity across the entire study was 0.2, meaning that each 10% rise in the price of medical care to individuals led them to use 2% less care.[2] Across services, the elasticity varied in the fashion predicted by moral hazard theory, with higher elasticities for the most elective services (e.g., dental care, prescription drugs, mental health care) and lower elasticities for the least elastic services (e.g., inpatient hospital care).

The HIE also showed that those who used more health care due to the lower price did not, on average, see a significant improvement in their health, suggesting meaningful moral hazard on the patient side. For those who are chronically ill and do not have sufficient income to easily cover copayments, there was some deterioration in health. In particular, low-income individuals who were hypertensive (had high blood pressure) saw dangerous increases in their blood pressure arising from lack of care. A huge international literature has followed up on the RAND HIE study, and the results have generally been very consistent with these initial findings (Ringel et al. 2002).

The second strand explores the responsiveness of health care use to provider reimbursement. The literature here has focused on two questions. The first is whether moving from retrospective reimbursement through a fee-for-service system, where providers are paid for billed costs, to prospective reimbursement, where providers are paid a fixed amount regardless of the amount of

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[2] Although the figure 2 is frequently used, it requires some structural assumptions to get a summary elasticity from the RAND HIE; for more information, see Einav & Finkelstein (2011).

care delivered, can help lower health care spending; we discuss the evidence on this in Section 3.

The second question is whether changing the level of reimbursement for a procedure will reduce use of that procedure. Here, the evidence is more mixed, since under the standard physician behavioral model outlined above, reducing procedure prices will have both a substitution effect (inducing them to do less) and an income effect (inducing them to do more). A variety of studies have found mixed answers to the sign of the effect (for a review, see Devlin 2021).

2.4. Imperfect Competition in Medical Delivery

Another critical problem facing health care markets is imperfect competition. Imperfect competition arises for a number of reasons in health care markets. The first is incomplete information. Prices in many health care contexts are difficult to understand—particularly when health care procedures are not a simple commodity (e.g., an X-ray) but rather a full suite of services (e.g., heart surgery, which involves physicians, anesthesiologists, hospital resources, drugs, and so forth). And shopping across providers is difficult, particularly for emergent conditions.

In principle, consumers could leave the shopping to their agents, the insurers, to resolve these problems. In practice, insurer shopping does not appear to be very effective. This variation is illustrated in **Figure 3,** which depicts the prices insurers pay for knee replacement surgery (**Figure 3***a*) and lower-limb magnetic resonance imaging (MRI) procedures(**Figure 3***b*) across different hospitals across the United States. The price of these services varies dramatically across different hospitals: The range of knee replacement prices was US $6,404–$52,503, and the price range for an MRI was US $270–$3,251. Some of this variation is due to regional price differences, but not most; for example, even within the same city prices can vary greatly. In Tampa, Florida, the price of the most expensive blood test costs more than 40 times as much as the least expensive blood test (Sanger-Katz 2020).
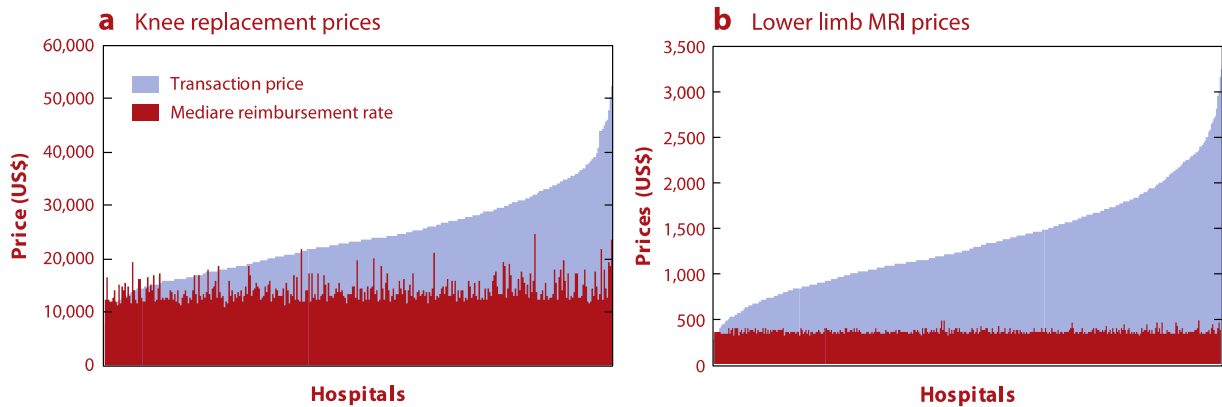
a Knee replacement prices

b Lower limb MRI prices

Figure 3 Prices insurers paid for knee replacement surgeries (*a*) and lower limb magnetic resonance imaging (MRI) procedures (*b*) across different hospitals in the United States in 2011. Each vertical purple bar and its height represent a hospital and the regression-adjusted transaction price of the service at that hospital. Each vertical red bar and its height represent the same hospital and the Medicare reimbursement rate of the service at that hospital Figure adapted with the permission of the *Quarterly Journal of Economics* from Cooper et al. (2019). Data from the Health Care Cost Institute.

Of course, this distribution may reflect quality differences that justify higher prices. But two facts suggest that this is not merely quality differences. First, price differences are quite large even for commodifiable medical services such as MRI procedures. Second, higher prices for medical services are highly correlated with market structure. Cooper et al. (2019) found that prices in monopoly hospital markets are 12% higher than in markets with four or more competitors (although this is a relatively small fraction of the total variation).

Further evidence on imperfect competition comes from studies of the impact of mergers on provider prices. In a review of the merger literature, M. Gaynor finds that hospitals experience a 14% decrease in costs initially but rise to premerger levels eventually while prices rise (US House 2011). Imperfect competition is a prominent feature of insurance markets as well. Guardado, Emmons & Kane (2013) found that the merger between United Health and Sierra Nevada was associated with 13.7% higher premiums in Nevada markets, which the authors pose as evidence that mergers increase the exploitation of market power in insurance markets (for additional evidence, see Dafny, Duggan & Ramanarayanan 2012).

2.5. Inconsistent Decision-Making

Another problem facing health care markets is inconsistent decision-making by consumers. This

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arises both in terms of choosing health insurance plans and in terms of choosing the amount of health care to consume conditional on cost-sharing.

The choice of an appropriate health insurance plan is a complicated one in a largely unregulated market. Insurance plans differ in detailed and subtle ways: (*a*) in the extent of their coverage (particularly with respect to prescription drugs, where plans may have restrictive formularies that exclude coverage of many drugs); (*b*) in the structure of their patient cost-sharing (particularly, when patients face deductibles or coinsurance, they do not have good data on the cost of the medical care they are buying); and (*c*) in the nature of their provider networks (where insurers can have broader or narrower networks of providers that they reimburse). As a result, consumers make highly inconsistent decisions when choosing health insurance plans.

Abaluck & Gruber (2011, 2016a, 2022) document these inconsistencies. First, consumers weigh their certain premium payments much more highly than the expected value of uncertain out-of-pocket costs, violating the notion that certainty equivalent dollars should be weighed equally, controlling for variance. Second, consumers place virtually zero weight on the variance of out-of-pocket spending, violating risk aversion. Third, consumers place excessive weight on plan parameters that should be irrelevant: Conditional on own expected medical spending, plan features such as deductibles should not impact plan choice—but they do (strongly). As a result, Abaluck and Gruber find significant welfare losses on the order of 25–33% of total out-of-pocket spending.[3] Even more convincing, Bhargava, Loewenstein & Sydnor (2017) find consumers making dominated choices in health insurance plans, a welfare-free measure of mistakes.

The other type of inconsistency is in the use of medical care, or what Baicker, Mullainathan & Schwartzstein (2015) call behavioral moral hazard. This is the notion that individuals, facing spot prices for medical care that are well below the value of this service in improving health, may forgo the service. For example, Chandra, Gruber & McKnight (2010) find that modestly higher cost-sharing for prescriptions increases hospital expenditures among the chronically ill, while Chandra, Flack & Obermeyer (2021) find that higher prescription copayments can lead to increased mortality among the elderly.

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[3] Some controversy exists over the assumptions in the Abaluck and Gruber approach; for more information, see Abaluck & Gruber (2016b) and Ketcham, Kuminoff & Power (2016).

3. DESIGNING HEALTH INSURANCE

The issues discussed in Section 2 inform the design of health insurance as a risk-bearing mechanism for health care spending. In this section, I review those key issues and the trade-offs in alternative ways of resolving them.

3.1. Single-Payer Versus Multi-Payer, and Public Versus Private

The most fundamental question facing nations in organizing their health care financing systems is whether they will be single-payer or multi-payer systems. To be clear, this is not the same as the distinction between public and private insurance; in principle, there could be a private single-payer system, although in practice all single-payer systems use the public sector as the single payer. On the other hand, multi-payer systems around the world feature a wide variety of combinations of public and private insurers. Moreover, single payer does not necessarily imply universal health insurance coverage. A single-payer system could have restrictions that leave individuals out of the system, such as premiums that some individuals choose not to pay or residency requirements. Alternatively, a multi-payer system could readily offer coverage to all, while giving them a choice of insurance options.

The primary advantage of a single-payer system is lower administrative costs. According to Himmelstein, Woodhandler & Campbell (2020), the cost of insurance administration in the United States in 2017 was US $274.5 billion, or US $844 per capita, while the cost of administering Canada's single-payer system was only US $5.36 billion, or US $146 per capita. Moreover, the burden on providers in a multi-payer system is stark: Dealing with multiple insurance providers costs, in the value of time, US $169,302 to physicians, while in Canada the time-value cost of dealing with provincial insurance agencies or supplementary insurers was merely US $36,825 per physician. The magnitude of these savings is controversial, however— for an alternative perspective, see Cutler (2020). As Cutler emphasizes, private insurers have to deal with a variety of issues that are avoided in the highly regulated environment of Canadian health care.

The primary costs of a single-payer system are twofold—reflecting the standard reasoning for why offering choice in markets increases welfare. The first is that a single-payer system limits choices that may appropriately reflect heterogeneity across the population in their tastes/needs for insurance. The second is that a lack of competition between insurers can lead to

higher prices and lower rates of innovation. Moreover, lower prices imposed by a public system can impede innovation, as opposed to new financing approaches that may be possible under a private system (Lo & Thakor 2022).

But this standard argument runs into a number of wrinkles in the context of health insurance. On the demand side, as noted earlier, individuals may not do a very good job in choosing across insurance options. On the supply side, competition in health insurance markets has a dark side: risk selection.[4] When there are multiple insurers, each will strongly endeavor to enroll and keep the most profitable patients and to dump the least profitable. In practice, profitability of patients is correlated with their underlying health. Earlier, we discussed a model with passive insurers that shows the welfare losses that can arise from adverse selection. When insurers can actively select patients, they can combat adverse selection through a variety of tools that may be welfare reducing.

Consider the state of the insurance market before the Affordable Care Act was passed in 2010. Most Americans got their insurance from private employers, and virtually every large employer in the United States offered insurance. Employees in this market are offered insurance regardless of their underlying health status, and the costs to employees does not vary with their health.

Contrast this with the nongroup insurance market in the United States. This is a market where individuals purchase products directly from insurers. This market features a wide variety of provisions designed to minimize the risk of adverse selection into insurance. Insurers could, and readily did, deny insurance to those whom they deemed risky. They could charge prices that were orders of magnitude higher for sick than for healthy enrollees. And they could impose preexisting conditions exclusions that did not provide coverage for the expenses associate with recurrence of any illnesses that had occurred before insurance enrollment.

The differences between these two markets reflect nature of selection. For a large group that is brought together for reasons largely independent of health care needs (such as a large employer), insurers do not have to worry about selection. Most employers pay a large share of the costs of health insurance, and most employees enroll. Even if there is some selection, the

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[4] For a detailed overview of the problem of selection in insurance markets, see Einav, Finkelstein & Mahoney (2021).

sample size is large enough that it will not significantly drive average premiums. When insuring an individual, however, insurers must be wary of selection due to the inherent informational asymmetry. Thus, more guardrails are put in place by insurers to protect against providing insurance only to the worst risks. While these mechanisms protect the insurer's bottom line, they significantly weaken the protection that insurance provides to the consumer.

In theory, the problems of both incomplete information to consumers and selection risk lend themselves to technical fixes. Proper decision support that presents potential enrollees with the information on the total cost and risk of each insurance option could overcome these types of choice inconsistencies. And risk adjustment regimes that redistribute from plans that sign healthier enrollees to plans that sign sicker enrollees could offset the damaging effects of selection.

In practice, both of these solutions run into problems. Efforts to improve the health insurance choices of individuals through decision support have proven large unsuccessful—mostly because individuals do not take advantage of decision support tools. Such tools are more powerful, however, when combined with human expertise in the form of insurance agents (Gruber et al. 2020).

And efforts to offset the financial impacts of selection with risk adjustment have also proven problematic. Part of the problem is the difficult trade-off between ex ante (based on variables observed before spending occurs) versus ex post (based on ex post spending differences) risk adjustment. Ex post risk adjustment provides better insurance for employers, since so much of spending cannot be predicted ex ante. But it also interferes with insurer incentives to control medical costs; in the limit, with full ex post reimbursement of excess costs, there would be no reason for the insurer to exhibit effort to limit costs.[5]

One way that nations try to resolve these differences is by having a base set of public coverage but allowing individuals to buy private insurance to top up the public coverage. Sometimes this top up covers benefits not covered by public insurance (e.g., dental coverage in Canada); other times, it exists to buy up to a higher level of coverage than is provided by the single payer (e.g., private hospital room). In the United States, for example, a robust secondary insurance market supplements the universal Medicare program that provides coverage to the

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[5] For an excellent review of these issues, see Geruso & Layton (2017).

elderly and disabled. But these supplemental markets still suffer from the same insurance choice problems noted above. For example, individuals can join supplemental markets without underwriting health status when initially enrolled in Medicare but can get underwritten (and face higher prices) if they try to join later.

3.2. Community Rating

Given the discriminatory nature of insurer restrictions, some governments have banned the underwriting and pricing policies that cause insurers to differentiate the sick from the healthy. This has the advantage of making insurance available and more affordable to those who were denied access to the market. But it has the disadvantage of raising prices for everyone, as insurers are concerned that selection will bring them the worst risks and they are unable to combat that with discriminatory tools.

This is not just idle speculation. In the mid-1990s, a number of US states introduced regulations of adjusted community rating in their nongroup insurance markets. Under such a plan, insurers could not deny insurance or charge different prices based on health status. Rates could be adjusted by geography and (in some cases) age; otherwise, uniform pricing was required. In addition, exclusion of preexisting conditions from coverage was disallowed. Unfortunately, in every case, the adoption of community rating was disastrous in each state. Each state saw a substantial exit of employers and a rapid rise in price (Gruber 2008).

There are three ways to resolve the tension between the insurance provided by community rating and the higher prices that result from selection. The first is risk adjustment; as discussed above, this is highly imperfect in practice. The second is to provide subsidies to offset the cost of insurance. As the net cost of insurance falls, healthier individuals will be willing to purchase, bringing down the cost for all. But this has the disadvantage that the government must finance these subsidies, which involves additional taxation.

The third way to resolve this problem without increasing government spending is through insurance mandates. If there is a binding mandate to buy insurance, then insurers no longer fear adverse selection, since the insurer will be able to predict well the costs of their pool of enrolled (as at-large employers). And such a policy does not involve the new spending required by subsidies. But this policy raises an important distributional concern: It forces those who are healthy to cross-subsidize those who are sick. Very healthy people who might optimally shun insurance will be forced to buy that coverage, and the money that insurers make on the healthy

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will cross-subsidize their losses on the sick.

3.3. Taxation Versus Individual Contributions Versus Employer Contributions

Another major issue in insurance design is how to finance the coverage. At a very high level, there are three sources of financing for the costs of insurance: government taxation, employer contributions, and individual contributions.

The most natural way to finance a single-payer system is through government taxation. Since there is one (presumably government-run) plan, it can naturally be financed by raising revenues to offset the insurance costs. And nations typically rely on dedicated payroll taxes to finance their health care spending. But very few nations rely exclusively on government taxation to finance health insurance, even with a single-payer (or closed) system.

An additional source of financing used in a number of countries is employer contributions—either to their own coverage or to a government plan. The approach is a primary source of financing in nations that rely on employers as an important source of insurance provision. Finally, financing can come from individual premiums—as a supplement to either tax-financed or employer-financed insurance.

In a world of voluntary insurance, a distinct advantage lies in financing insurance through employer contributions rather than through taxation. As emphasized by Summers (1989), the deadweight loss of employer contributions is likely lower due to the tax-benefit linkage between the contributions made by employers and the benefits received by their workers. But if coverage is universal, then no linkage occurs—employer contributions are just a tax since individuals get insurance whether they work at that employer or not.

On the other hand, an advantage of either tax-financed or individual premiums over employer financing is that it can be more distributionally targeted. Health insurance is a per-person cost, so employers likely finance it at least partially through lump sum reductions in employee wages, which is less progressive than a proportional income tax, or income-related individual contributions.

3.4. Consumer Cost-Sharing

The proper design of consumer cost-sharing trades off the protective effects of insurance against the moral hazard inducement of inappropriate care. An early example of such a design is Martin Feldstein's Major Risk Insurance (Feldstein 1973). This system set a coinsurance rate of 50% on

all medical spending until individuals had spent 10% of their income on out-of-pocket expenses. It resolved the balance between protection and moral hazard by keeping consumers heavily invested in their health care purchases up to the point where it became a financial hardship. Feldstein & Gruber (1995) estimate that such a system would provide large welfare gains.

But this approach is far from optimal, because it does not recognize consumer undervaluation of low-cost and highly effective treatments. This was illustrated first by the RAND HIE, which found some health benefits for the low-income, chronically ill population, and it is confirmed by work cited above showing that even low copayments on high-value drugs can have health consequences. These considerations have led to a rise in interest in value-based insurance designs, which would raise the costs of the lowest-value medical services and lower the costs of higher-value medical services.[6]

3.5. Provider Reimbursement

As highlighted earlier, the fundamental fee-for-service system for reimbursing providers is broken, due to both moral hazard and imperfect competition. But countries have followed very different paths in addressing this issue.

3.5.1. Path 1: Regulating/Negotiating Prices

The most common path followed by developed countries is to (effectively) regulate the specific prices charged by doctors, hospitals, and prescription drug manufacturers—either through explicit regulation or through monopsony negotiation between a dominant government buyer and producers. The results of this approach are most striking when contrasted with the most unregulated market for health care services in the developed world, the United States.

Figure 4 shows data from a comparative cross-national study carried out by the International Federation of Health Plans (available at https://www.ifhp.com). This organization gathers data on prices paid for medical goods and services from a variety of health insurers around the world. **Figure 4a** represents the cost of five medical services, ranging from hip replacement to appendectomy, and **Figure 4b** shows the price of medical drugs used for treatment of diseases

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[6] For an overview of issues and resources on this topic, visit the Center for Value-Based Insurance Design at https://www.vbidcenter.org.

and conditions such as multiple sclerosis, arthritis, and leukemia.[7] The United States pays higher prices on average for every single one of these services and drugs than those paid in other nations, and many multiples of the prices charged in the lowest-cost countries.
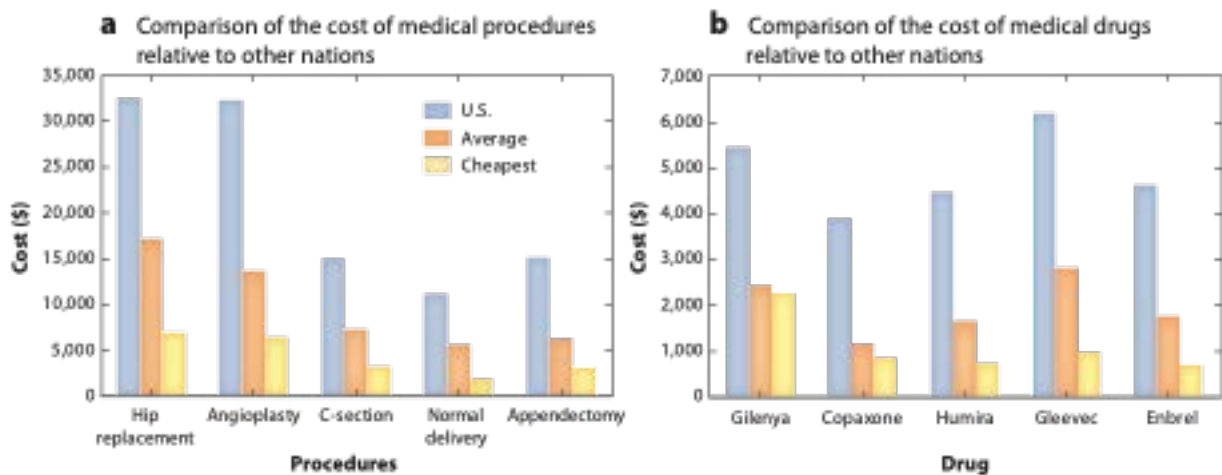

Figure 4 Cross-country comparison of the cost of five medical services (*a*) and the price of medical drugs (*b*) in 2017. The figure shows the lowest price worldwide (*yellow bar*), the average cost worldwide (*orange bar*), and the cost in the United States (*blue bar*). Figure adapted with the permission of Macmillan Learning from Gruber (2022). Data from the International Federation of Health Plans.

Price regulation can potentially address the failures in this market, but it raises three key issues. The first is the fact that regulation of prices can readily be undercut by offsetting increases in quantity. Physicians who trade off physician care versus their income will be induced to deliver excessive care when it is not dangerous for the patient. Ultimately, what matters to nations is total health care spending, not price per unit.

The second problem is that setting appropriate prices is very difficult. In principle, prices would reflect the relative value of each service in terms of improving health. This is easiest to see in the case of prescription drug prices since they are readily unbundled. Prescription drugs are generally approved by country regulatory agencies on the basis of clinical trials, which demonstrate efficacy. For drugs that lengthen lives, the evidence from these clinical trials can

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[7]The most frequent countries that are used for comparison are Australia, Switzerland, New Zealand, the Netherlands, Spain, and Argentina.

then be combined with estimated values of a life-year to measure the benefits of the drug. But for drugs that also impact health state, estimating value is more challenging. A large literature exists on quality-adjusting life-years to account for variation in health states, and it is fraught with controversy, as discussed by Conti et al. (2020).

The third problem is that regulating prices that are too low could impact quality—and if resultant incomes are too low, it could result in fewer individuals being willing to provide care. Indeed, a large US literature shows that low reimbursement rates under the public Medicaid program leads to less physician participation in the program; nearly one-third of physicians reported that they would not accept Medicaid patients (Decker 2012). Evidence is less clear on whether limiting reimbursement will deter individuals—particularly those are most skilled—from providing care or even entering the medical profession.

3.5.2. Path 2: Setting Budgets

An alternative to setting prices for specific services is to set global budgets—that is, to specify total spending targets as opposed to specific prices. In fact, many of the countries that regulate health care prices also use global budgets (Wolfe & Moran 1993). That is, in addition to regulating unit prices, these countries also regulate the rate of growth of total expenditures. In some nations, these budgets are applied to broad classes of health care, such as all hospital care; in others, they are provided to specific classes, such as just for teaching hospitals in Belgium.

The United States is a mixed system, with roughly one-third of the insured covered under public insurance, which pays regulated prices for hospital and physician care, and two-thirds in private insurance that does not—but which appears to set relative prices to match public payers (Clemens & Gottlieb 2017). But rather than try to regulate medical prices for all payers, the United States has used two alternative tools to control costs.

The first is to move from retrospective reimbursement to prospective reimbursement. The signal event in this transition was the move by the largest single health care payer in the United States, the Medicare program, to its prospective payment system (PPS) for hospitals in 1983. Hospitals were no longer retrospectively billed based on their treatments; instead, a set of ex ante prices were set based on roughly 500 diagnosis-related groups (DRGs) that were based on diagnosis on admission. The program was a short-lived success in controlling costs and did not appear to have negative health impacts on recipients.

Unfortunately, the program was not able to control costs in the longer run, as Medicare

hospital costs continue to rise rapidly ([Coulam & Gaumer 1992](#)). Additionally, the original goals for the PPS system with respect to costs and intensity, as [Coulam & Gaumer (1992)](#) reviewed, did not materialize. This illustrates the problem of partial reimbursement reform: There are many avenues for providers to respond that can undercut these incentives. For example, under the PPS system, some DRGs were based not just on diagnosis but also on treatment, causing a shift into those treatments; meanwhile, providers could maximize reimbursement by shifting patients into more expensive diagnosis categories.[8]

The other approach in the United States is the shift toward managed care through enrollment in prospective payment organizations (PPOs) or health maintenance organizations (HMOs). PPOs attempt to address the failures of shopping in this market by negotiating agreements whereby patients agree to only go to a limited set of providers—in return for which providers give a large price discount. HMOs go one step further, trying to fully coordinate the delivery of insurance with the delivery of medical care. Perhaps the canonical example is Kaiser Permanente, a staff model HMO where individuals are restricted to go to Kaiser physicians and hospitals. Physicians are paid a salary to reduce financial incentives for patient overtreatment. Most other HMOs are not staff model but rather independent practice associations where providers are in a particular network and HMOs use financial incentives to reward cost-effective care. Those who are insured pay the HMOs a fixed monthly payment, so that the HMO bears the full risk of excess medical care (or the full benefit of limiting that care).

In principle, this model should allow for cost control. And during the 1990s, as these models grew rapidly, this did seem to be the case. Health care costs grew slowly, and over the entire decade the ratio of health care costs to GDP actually fell. Unfortunately, this success was short-lived. There was a large backlash against managed care plans that restricted choice of doctor; despite a lack of systematic evidence, consumers assumed that their quality of care was being compromised. Managed care restrictions on provider choice were weakened, often by state regulatory intervention, and this may have contributed to the subsequent rapid rise in health care costs during the 2000s ([Pinkovskiy 2020](#)). A move back to restrictive network formulation during and after the passage of the Affordable Care Act in the United States may be a primary reason for very slow health care spending during the 2010s.

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[8] For a review of these points and some entertaining examples, see [Gruber (2022)](#), chapter 16.

4. RESOLVING THESE ISSUES: THE UNITED STATES VERSUS CANADA

Section 3 lays out a set of issues that must be faced by health care systems as they address financing problems. In this section, I discuss how two nations have resolved these tensions. I choose the United States and Canada as two wealthy industrialized nations facing relative similar underlying economic conditions—but two nations that have taken very different paths forward in financing health care. Most other nations in the world fall somewhere between these two nations in financing health care.

4.1. Canada

Canada provides perhaps the textbook example of a single-payer public insurance system, called Medicare (not to be confused with the US Medicare program, discussed below). Each of the provinces runs its own insurance system, with shared financing with the federal government; on average, the federal government pays 24% of the costs of insurance (Tikkanen et al. 2020). The average Canadian spends CA $6,604 on taxes related to health care (Feinstein 2019). State costs are paid with federal transfers and province-level taxes. Provincial governments negotiate with medical associations and unions separately from the federal government. Coverage varies widely from province to province (Tikkanen et al. 2020).

The Canadian Medicare system covers all physician, diagnostic, and hospital care with little cost-sharing. Coverage of outpatient drugs, vision, dental, and home care (including hospice and midwifery) varies province to province but is significantly lacking in many areas (Tikkanen et al. 2020). On the other hand, most provinces do not cover prescription drug coverage, an omission of growing significance as prescription drug spending has risen to 15.1% of Canadian medical spending (CIHI 2021).

For those benefits, most individuals in Canada turn to private supplemental coverage. In Canada, 67% of citizens are covered with some sort of private complementary coverage, which amounts to 12% of total health spending in Canada (Brandt, Shearer & Morgan 2018). Employers or unions pay 90% of premiums, while the rest is purchased on the individual market (Tikkanen et al. 2020).

To control costs, Canada relies primarily on regulations on both the price and the quantity of medical services as well as of pharmaceuticals. First, providers negotiate their fees with the government. Additionally, the government controls budgets for hospitals. The Canadian

government restricts investment in health care capital and technology as well as restricting resources for physicians ([Tikkanen et al. 2020](#)).

As a result, Canada pays a lot less for medical services than the United States does. Health care spending in the US in 2019 was $10,921 per capita, which accounts for 16.8% of GDP. Canada spent merely 10.8% of GDP on health care, 5,048 per capita ([World Bank](#)).

Providers earn much less in Canada than in the United States. Pre-Canadian Medicare, doctors, on average, earned as much or more than doctors in the United States. When single-payer was established, however, average US physician incomes started to exceed those of Canadian physicians. Additionally, over the last few decades, US doctors earned five to eight times more than the US GDP per capita, while Canadian doctors earned four times Canadian GDP per capita ([Duffin 2011](#)).

In terms of quantity of care, despite some superior outcomes, Canadians wait an average of 9.8 weeks, more than the 6.5 maximum that is considered reasonable. Canadians often come to the United States for prompter care, with 2.6% of Canadian neurosurgery patients traveling abroad for care, and 1.1% of Canadians as a whole ([Barua & Ren 2015](#)). US physician visits are lower than those in Canada, with a mean of 5.25 visits in the bottom income quintile for Canada and 4.56 for the United States. In the top income quintile, Canadians visited physicians an average of 3.92 times, while the equivalent number was 4.14 in the United States ([van Doorslaer 2003](#)).

To further control costs, Canada imposes global budgets. Provinces allocate fixed payments to providers that are based on historical costs, inflation, and political consideration. Global budgets serve to dampen the growth of costs by capping the amounts hospitals and providers can spend. However, providers may underserve patients or restrict admission of patients due to these cost caps ([Sutherland et al. 2013](#)).

4.2. The United States

At the other extreme from the relatively straightforward single-payer system in Canada is the multi-payer system in the United States. As noted earlier, 60% of US residents receive insurance from their employer. The costs of this insurance are shared between employers and enrolled employees, with employers typically covering 83% of the costs of coverage for individuals and 73% of the costs of coverage for families. The employee share has been relatively flat over time: The share for families was 27% in 1999 and 2020, while the individual employee share of costs

increased slightly from 14% to 17% from 1999 to 2020

The other major source of private insurance is the nongroup insurance market. As noted above, before the Affordable Care Act (ACA), this was a market that offered insurance quite cheaply for healthy individuals but largely excluded or priced out the sick. As a result, the market was relatively small. The reforms of the ACA were dramatic, imposing adjusted community ratings, and introducing new insurance exchanges on which individuals could more easily shop for coverage. Subsidies were available for purchasers in this market, in the form of tax credits that limited the share of income that individuals had to spend to get coverage. It is notable that this tax credit structure prioritized affordability over cost control; by making the government the marginal payer once individuals had paid a certain share of their income, it reduced incentives for cost control (Tebaldi 2017). The ACA led to a roughly doubling of the size of this market.

But only approximately two-thirds of those insured in the United States have private insurance; the rest rely primarily on two large government programs. Medicare provides universal coverage to the elderly and disabled. It is financed partly through a payroll tax (currently 1.45% of payroll on both individuals and their employers), partly through general revenues, and partly through individual premiums. Part B premiums are currently US $148.50 per month for lower income families, but they are means tested, rising to US $207.90 for those with incomes more than US $88,000 (Medicare 2021).

Medicare provides two options for individuals. The first is traditional fee-for-service Medicare. Under this plan, individuals get largely unregulated care, but their providers are paid regulated prices. Individuals do face significant cost-sharing, such as a high deductible for hospital care, and an unlimited 20% coinsurance rate on physician visits. Most enrollees with Fee for Service (FFS) have some form of supplemental coverage to cover these costs, either from their employer, from the government, or self-purchased.

FFS Medicare has a number of similarities to the Canadian counterpart that shares its name— as well as critical differences. Both are single-payer plans that provide universal coverage; however, while the Canadian Medicare program covers all residents, the US program covers only those over the age of 65 and the disabled. Both plans are financed by a payroll tax, but the US program also includes general tax financing as well as individual premiums. Both plans regulate provider prices, but the Canadian program also includes a global budget and what is

effectively an income limit on physicians. The Canadian system also regulates supply, which is left largely unregulated in the United States. The US program has much larger cost-sharing, leading to the wide use of supplemental coverage even for this universal program. On the other hand, the US program now covers prescription drugs, while the Canadian system does not.

But one major difference between the two Medicare programs is that the United States offers another route to coverage. Called Medicare Advantage, individuals who enroll in this program leave behind traditional Medicare and enroll in a managed care plan that does much more to control their care—including significant limits on the providers that they can see. In return, individuals receive coverage of the large cost-sharing in Medicare without having to purchase any supplemental coverage. Medicare pays these plans a flat monthly payment for all the costs of each enrollee, shifting the full risk to the managed care plans.

The existence of a parallel FFS system and managed care system allows us to compare the two approaches that jointly dominate the US health care system. A large literature on managed care has studied the impacts of these two approaches. The general conclusion is that Medicare Advantage delivers care more efficiently, with lower costs and no worse outcomes (Duggan, Gruber & Vabson 2018). At the same time, Medicare Advantage traditionally has been a net cost to the Medicare program. Medicare Advantage enrollees cost the federal government 13% more than those in traditional Medicare (Guglielmo 2015), and the additional spending on Medicare Advantage enrollees amounted to 6.7 billion dollars. This is because these insurers are reimbursed based on the average costs of those in traditional Medicare—and the healthiest individuals self-select into Medicare Advantage. On net, these patients are then highly profitable. The government continually changes risk-adjustment rules for Medicare Advantage to try to address this point, but whether this is successful is subject to some debate. McWilliams, Hsu & Newhouse (2012) found that the implementation of risk-adjustment models helps slow disenrollment from Medicare Advantage but that the remainder of disenrolled patients were more likely to suffer from health declines. They argue that the risk-adjustment model may have led those with declining health to enroll in traditional Medicare for unrestricted access to care. Overall, they find that the risk-adjustment model was partially responsible for a reduction in patients with favorable risk conditions into Medicare Advantage.

The other major public program is Medicaid, which provides coverage for the poor (including poor elderly and disabled individuals, who are covered jointly by Medicare and

Medicaid). This is a state-run system that is jointly funded with the federal government, which covers on average 57% of program costs. The states and the federal government determine who is eligible for this program: In most states, the program covers all persons up to 138% of the poverty line, children and pregnant women to more than 200% of the poverty line, and seniors and the disabled to approximately 225% of the poverty line.

As with Medicare, Medicaid has moved increasingly to the use of managed care plans to control its costs; today, 39% of Medicaid enrollees nationally are in Medicaid-managed care plans (KFF 2020). The literature on the effects of this shift to managed care is mixed, with a variety of findings on both the quality of care and the net cost/savings of the Medicaid program. Duggan, Starc & Vabson (2016) have found that one-eighth of the net reimbursement from Medicare advantage has been passed on to consumers, while 22% of the increased benefit passes on to insurers through higher stock prices. Medicare advantage also introduces advertising into the Medicare framework, with significant impact on consumers, allowing insurers to select risks that are favorable to them.

Finally, despite this variety of options, the United States has a large number of uninsured individuals. Roughly 30 million Americans lack health insurance. These are typically not the poorest (who have Medicaid) or the richest (who have private insurance) but lower middle class individuals who do not qualify for Medicaid but often do not have jobs that provides insurance. The ACA provided some assistance to this group through its mixed public-private approach, setting up state marketplaces (exchanges) on which individuals could shop for a variety of private insurance options, armed with government tax credits that offset the cost of those plans on an income-related basis. But this coverage does not extend to undocumented immigrants, who make up 15.9% of the uninsured (Blumberg et al. 2016). There also remain many of the poorest who are without insurance, despite their entitlement to free care through Medicaid, suggesting that there are important information or stigma barriers to taking up this free coverage.

4.3. Lessons

The comparison between Canada and the United States is illustrative, with two key lessons. First, as a result of all the interventions described above, Canada spends much less on health care than the United States does. Total medical costs amount to 10.84% of GDP, or US $5,048 per capita. In contrast, the United States spends 16.77% of GDP and US $10,921 per capita (World Bank).

At the same time, health care supply is much more limited in Canada. Canada has only 24.3

doctors per 10,000 persons, while the United States has 26; Canada has 100 nurses/midwives per 10,000 persons, while the United States has 157; Canada has 25.3 hospital beds, including 1.3 intensive care unit (ICU) beds per 10,000 persons, while the United States has 28.7 hospital beds and 2.6 ICU beds per 10,000; and Canada has 15 computed tomography scanners per 1 million persons, while the United States has 45 (World Bank; OECD 2020).

In the Joint Canada/United States survey of health, most Canadians age 18–64 reported wait times as their reason for unmet health care needs, while the majority of Americans reported cost as the biggest issue. Wait times in Canada make up 56.3% of unmet needs in Canada, but only 13.2% of unmet needs for the United States in the 18–64 age demographic (O'Neill & O'Neill 2007).

Whether these limitations result in worse health care in Canada is a topic of some controversy. Life expectancy is 82 years in Canada and 78.8 years in the United States. While the survival rate to age 65 in Canada is higher for men at 88.5 years and higher for women at 92.35 years, whereas in the United States, survival rate to age 65 is 79.9 years for men and 87.6 years for women. Infant mortality is 4.2 per thousand in Canada and 5.6 per thousand in the United States. (O'Neill & O'Neill 2007). And 30-day mortality after admission to a hospital for a heart attack is 5 in the United States compared to 4.8 in Canada (OECD 2019b).

On the other hand, cancer survival rates are higher in the United States than in Canada (Todak 2018). Moreover, US health care passes the market test, with much more extensive medical tourism into the United States than from the United States to other countries (Forbes 2008). Taken together, the results indicate that the US system may deliver better outcomes for those who can benefit most from cutting-edge care, even while outcomes are worse on average.

5. CONCLUSIONS

The financing of health care delivery is one of the most important—and complicated—decisions facing countries around the world. With a growing fiscal burden partly driven by the rapid aging of the baby boom cohort, the time is right for nations to reconsider the financing of their health care. This article highlights the key issues they face in doing so.

LITERATURE CITED

Abaluck J, Gruber J. 2011. Choice inconsistencies among the elderly: evidence from plan choice in the Medicare Part D program. *Am. Econ. Rev.* 101(4):1180–1210

Abaluck J, Gruber J. 2016a. Evolving choice inconsistencies in choice of prescription drug insurance. *Am. Econ. Rev.* 106(8):2145–84

Abaluck J, Gruber J. 2016b. Choice inconsistencies among the elderly: evidence from plan choice in the Medicare Part D program: Reply. *Am. Econ. Rev*. 106(12):3962–87

Abaluck J, Gruber J. 2022. When less is more: improving choices by limiting choices in health insurance markets. *Rev. Econ. Stud.* Forthcoming

Baicker K, Mullainathan S, Schwartzstein J. 2015. Behavioral hazard in health insurance. *Q. J. Econ.* 130(4):1623–67

Barua B, Ren F. 2015. Leaving Canada for medical care, 2015. *Fraser Res. Bull.,* March

Bhargava S, Loewenstein G, Sydnor J. 2017. Choose to lose: health plan choices from a menu with dominated options. *Q. J. Econ.* 132(3):1319–72

Blumberg LJ, Karpman M, Buettgens M, Solleveld P. 2016. *Who are the remaining uninsured, and what do their characteristics tell us about how to reach them?* Rep., Urban Inst., Washington, DC. http://www.urban.org/sites/default/files/publication/79051/2000691-Who-Are-The-Remaining-Uninsured-And-What-Do-Their-Characteristics-Tell-Us-About_How-To_Reach_Them.pdf

Brandt J, Shearer B, Morgan SG. 2018. Prescription drug coverage in Canada: a review of the economic, policy and political considerations for universal pharmacare. *J. Pharm. Policy Pract.* 11:28

Browne, MJ. 1992. Evidence of adverse selection in the individual health insurance market. *J. Risk Insur.* 59(1):13

Chandra A, Flack E, Obermeyer Z. 2021. *The health costs of cost-sharing*. NBER Work. Pap. 28439. https://www.nber.org/papers/w28439

Chandra A, Gruber J, McKnight R. 2010. Patient cost-sharing and hospitalization offsets in the elderly. *Am. Econ. Rev.* 100(1):193–213

CIHI (Can. Inst. Health Inf.) 2021. *National Health Expenditure Trends.* Can. Inst. Health Inf., Ottawa, Can. https://www.cihi.ca/en/national-health-expenditure-trends. Accessed on July, 5, 2022.

Clemens JD, Gottlieb J. 2017. In the shadow of a giant: Medicare's influence on private physician payments. *J. Political Econ.* 125(1):1–39

Conti RM, Gruber J, Ollendorf DA, Neumann PJ. 2020. *Valuing rare pediatric drugs: an economics perspective*. NBER Work. Pap. 27978. https://www.nber.org/papers/w27978

Cooper Z, Craig S, Gaynor M, Van Reenen J. 2019. The price ain't right? Hospital prices and health spending on the privately insured. *Q. J. Econ.* 134(1):51–107

Coulam RF, Gaumer GL. 1992. Medicare's prospective payment system: a critical appraisal. *Health Care Financ. Rev.* 1991(Suppl):45–77

Cutler DM. 2020. Reducing administrative costs in US health care. *Brookings*, Mar. 10. https://www.brookings.edu/research/reducing-administrative-costs-in-u-s-health-care/

Dafny L, Duggan M, Ramanarayanan S. 2012. Paying a premium on your premium? Consolidation in the US health insurance industry. *Am. Econ. Rev.* 102(2):1161–85

Decker SL. 2012. In 2011 nearly one-third of physicians said they would not accept new Medicaid patients, but rising fees may help. *Health Aff.* 31(8):1673–79

Devlin A. 2021. Estimating volume responses to Medicare reimbursement changes

Duffin J. 2011. The impact of single-payer health care on physician income in Canada, 1850–2005. *Am. J. Public Health* 101(7):1198–1208

Duggan M, Gruber J, Vabson B. 2018. The consequences of health care privatization: evidence from Medicare Advantage exits. *Am. Econ. J. Econ. Policy* 10(1):153–86

Duggan M, Starc A, Vabson B. 2016. Who benefits when the government pays more? Pass-through in the Medicare Advantage program. *J. Public Econ.* 141:50–67

Einav L, Finkelstein A. 2011. Selection in insurance markets: theory and empirics in pictures. *J. Econ. Perspect.* 25(1):115–38

Einav L, Finkelstein A, Mahoney N. 2021. *The IO of selection markets*. NBER Work. Pap. 29039. https://doi.org/10.3386/w29039

Feinstein C. 2019. What I learned as a Canadian reporting on healthcare in America—and what Americans can learn from Canada. *Business Insider*, Nov. 22. https://www.businessinsider.com/american-misconceptions-about-canadian-healthcare-2019-

Feldstein M. 1973. The welfare loss of excess health insurance. *J. Political Econ.* 81:251–80

Feldstein M, Gruber J. 1995. A major risk approach to health insurance reform. *Tax Policy Econ.* 9:103–30

Forbes. 2008. U.S. hospitals worth the trip. *Forbes*, May 29. https://www.forbes.com/2008/05/25/health-hospitals-care-forbeslife-cx_avd_outsourcing08_0529healthoutsourcing.html?sh=5ab4469552e1

Frakes M, Gruber J. 2020. Defensive medicine and obstetric practices: evidence from the military health system. *J. Empir. Legal Stud.* 17(1):4–37

Frakt A. 2014. Half of medical treatments of unknown effectiveness. *The Incidental Economist*, Jan. 16. https://theincidentaleconomist.com/wordpress/half-of-medical-treatments-of-unknown-effectiveness/

Geruso M, Layton TJ. 2017. Selection in health insurance markets and its policy remedies. *J. Econ. Perspect.* 31(4):23–50

Gruber J. 2008. Covering the uninsured in the United States. *J. Econ. Lit.* 46(3):571–606

Gruber J. 2022. *Public Finance and Public Policy*. New York: Macmillan Learning. 7th ed.

Gruber J, Handel BR, Kina SH, Kolstad JT. 2020. *Managing intelligence: skilled experts and AI in markets for complex products*. NBER Work. Pap. 27038. https://www.nber.org/papers/w27038

Gruber J, Owings M. 1996. Physician financial incentives and cesarean section delivery. *RAND J. Econ.* 27(1):99–123

Guardado JR, Emmons DW, Kane CK. 2013. The price effects of a large merger of health insurers: a case study of UnitedHealth-Sierra. *Health Manag. Policy Innov.* 1(3):16–35

Guglielmo A. 2015. *Competition and costs in Medicare Advantage*. Work. Pap., Einaudi Inst. Econ. Finance, Rome. https://www.eief.it/files/2015/12/guglielmo-rev.pdf

Himmelstein DU, Woodhandler S, Campbell T. 2020. Correction: Health care administrative costs in the United States and Canada, 2017. *Ann. Intern. Med.* 173(5):415

Hirth RA, Gibson TB, Levy HG, Smith JA, Calónico S, Das A. 2015. New evidence on the persistence of health spending. *Med. Care Res. Rev.* 72(3):277–97

Ketcham J, Kuminoff N, Power C. 2016. *Rejoinder to Abaluck and Gruber*. SSRN Work. Pap 2884875. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2884875

KFF (Kaiser Fam. Found.) 2020. *2020 Employer Health Benefits Survey.* Rep., KFF, San Francisco. https://www.kff.org/health-costs/report/2020-employer-health-benefits-survey

Liu S, Chollet D. 2006. *Price and income elasticity of the demand for health insurance and health care services: a critical review of the literature*. Rep., Mathematica Policy Res., Washington, DC. https://www.mathematica.org/publications/price-and-income-elasticity-of-the-demand-for-health-insurance-and-health-care-services

Lo AW, Thakor RT. 2022. Financing biomedical innovation. *Annu. Rev. Financ. Econ.* 14. In press. https://doi.org/10.1146/annurev-financial-031721-081537

McGuire TG, Pauly MV. 1991. Physician response to fee changes with multiple payers. *J. Health Econ.* 10(4):385–410

McWilliams JM, Hsu J, Newhouse JP. 2012. New risk-adjustment system was associated with reduced favorable selection in Medicare advantage. *Health Aff.* 31(12):2630–40

Medicare. 2021. Part B costs. *Medicare.gov.* https://www.medicare.gov/your-medicare-costs/part-b-costs

Mitchell EM. 2021. *Concentration of healthcare expenditures and selected characteristics of high spenders, U.S. civilian noninstitutionalized population, 2018*. Stat. Brief 533, Med. Expend. Panel Surv., Agency Healthc. Res. Qual., Rockville, Md. https://meps.ahrq.gov/data_files/publications/st533/stat533.shtml

Morid MA, Kawamoto K, Ault T, Dorius J, Abdelrahman S. 2017. Supervised learning methods for predicting healthcare costs: systematic literature review and empirical evaluation. *AMIA Annu. Symp. Proc*. 2017:1312–21

Newhouse JP. 1993. *Free for All? Lessons from the RAND Health Insurance Experiment*. Cambridge, MA: Harvard Univ. Press

OECD (Organ. Econ. Coop. Dev.). 2020. Intensive care beds capacity, retrieved July 5, 2022. *OECD, Paris*. https://www.oecd.org/coronavirus/en/data-insights/intensive-care-beds-capacity

OECD (Organ. Econ. Coop. Dev.). 2019a. Health expenditure and financing, retrieved July 5, 2022. *OECD, Paris*. https://stats.oecd.org/Index.aspx?DataSetCode=SHA

OECD (Organ. Econ. Coop. Dev.). 2019b. Figure 6.18, thirty-day mortality after admission to hospital for AMI based on unlinked data, 2007 and 2017. In *Health at a Glance 2019: OECD Indicators*. Paris: OECD. https://doi.org/10.1787/888934016284

O'Neill, J, O'Neill D. 2007. *Health status, health care and inequality: Canada versus the U.S.* NBER Work. Pap. 13429. https://doi.org/10.3386/w13429

Pendzialek JB, Simic D, Stock S. 2016. Differences in price elasticities of demand for health insurance: a systematic review. *Eur. J. Health Econ.* 17:5–21

Pinkovskiy ML. 2020. The impact of the managed care backlash on health care spending. *RAND J. Econ.* 51(1):59–108

Placona AM, King R, Wang F. 2018. Longitudinal clustering of high-cost patients' spend trajectories: delineating individual behaviors from aggregate trends. *AMIA Annu. Symp. Proc*. 2018:907–15

Ringel JS, Hosek SD, Vollaard BA, Mahnovski S. 2002. *The Elasticity of Demand for Health Care: A Review of the Literature and Its Application to the Military Health System.* Santa Monica, CA: RAND Corp.

Rothschild M, Stiglitz J. 1976. Equilibrium in competitive insurance markets: an essay on the economics of imperfect information. *Q. J. Econ.* 90(4):629–49

Sanger-Katz M. 2020. They want it to be secret: How a common blood test can cost $11 or almost $1,000. *New York Times,* Apr. 30. https://www.nytimes.com/2019/04/30/upshot/health-care-huge-price-discrepancies.html

Summers LH. 1989. Some simple economics of mandated benefits. *Am. Econ. Rev.* 79(2):177–83

Sutherland J, Crump RT, Repin N, Hellsten E. 2013. *Paying for hospital services: a hard look at the options*. SSRN Work. Pap. 2303809. https://doi.org/10.2139/ssrn.2303809

Tebaldi P. 2017. Estimating equilibrium in health insurance exchanges: price competition and subsidy design under the ACA. SSRN Work. Pap. 3020103. https://doi.org/10.2139/ssrn.3020103

Tikkanen R, Osborn R, Mossialos E, Djordjevic A, Wharton GA. 2020. *International health care system profiles: Canada.* Rep., Commonwealth Fund, New York. https://www.commonwealthfund.org/international-health-policy-center/countries/canada

Todak A. 2018. US cancer survival rates remain among highest in world. *HemOnc Today*, Jan. 31. https://www.healio.com/news/hematology-oncology/20180131/us-cancer-survival-rates-remain-among-highest-in-world

US House, Comm. Ways Means Health Subcomm. 2011. *Health care industry consolidation,*

Sept. 9, statement of Martin Gaynor. https://gop-

waysandmeans.house.gov/UploadedFiles/Gaynor_Testimony_9-9-11_Final.pdf

van Doorslaer E. 2003. Equity in the use of physician visits in OECD countries: Has equal

treatment for equal need been achieved? In *Measuring Up: Improving Health System*

Performance in OECD Countries, pp. 225–48. Paris: Organ. Econ. Coop. Dev.

https://doi.org/10.1787/9789264195950-13-en

Wolfe PR, Moran DW. 1993. Global budgeting in the OECD countries. *Health Care Financ.*

Rev. 14(3):55

World Bank. *Indicator.* World Bank, Washington, DC, retrieved on July 5, 2022.

https://data.worldbank.org/indicator/.