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1 WHY HEALTH ECONOMICS?

Almost everyone in the world has a good reason to care about health economics. The following quiz can determine whether or not health economics is important to you:

- Do you have finite resources to draw upon in case you get sick?
- Are you incapable of predicting the future with perfect accuracy?
- Do you live in a country that levies taxes on its citizens?

If you answered "yes" to any of these questions, health economics is important to your well-being, and understanding it can make you healthier and happier. (Or perhaps you will be happier once you get *less* healthy. We will discuss that possibility in Chapter 3.)

Health economics is not just an alphabet soup of esoteric acronyms like HMO and QALY. Nor is it an endless droning debate about arcane minutiae pertaining to the national budget. Instead, it is a lively field where we study real-life health decisions: why people lie to insurance companies about their health, why people smoke even when they know exactly how bad it is for them, and why health insurance might make you fat. Understanding health economics not only helps you make better decisions about your health, it is also inherently intriguing and compelling, even fun.

Understanding health economics is vital. Our argument rests on three facts: the health care economy is massive and expensive; health is a major source of uncertainty and risk; and governments around the world are deeply involved in financing health care systems.

1.1 The health care economy is massive

The gross domestic product (GDP) of the US in 2008 was just about $14 trillion. This means that $14 trillion worth of economic activity took place in the US that year. People spent money on a mind-bogglingly vast array of goods and services: meals at restaurants, baseball tickets, gasoline, new houses and cars, raw materials and machinery for factories, salaries for soldiers and schoolteachers, and retirement benefits (to name just a few).

Perhaps even more mind-boggling is the fact that one out of every six dollars spent in the US that year was spent on health care, to pay for things like checkups at the doctor's office, bariatric surgeries, anti-cholesterol medicines, and new investments in medical research. This statistic is all the more shocking when we compare today's mammoth health care sector to that of fifty years ago. In 1960, barely one out of every *twenty* dollars spent in the US went toward health care.

The trend has been similar in countries around the world, although no one spends quite as much on health care as Americans. In the past hundred years, the health care sector has grown massively across the developed world. Part of the story of this expansion in health care has to do with the wealth of scientific discoveries and technological improvements that have occurred in the last century, as we will see in Chapter 13. Today, billions are

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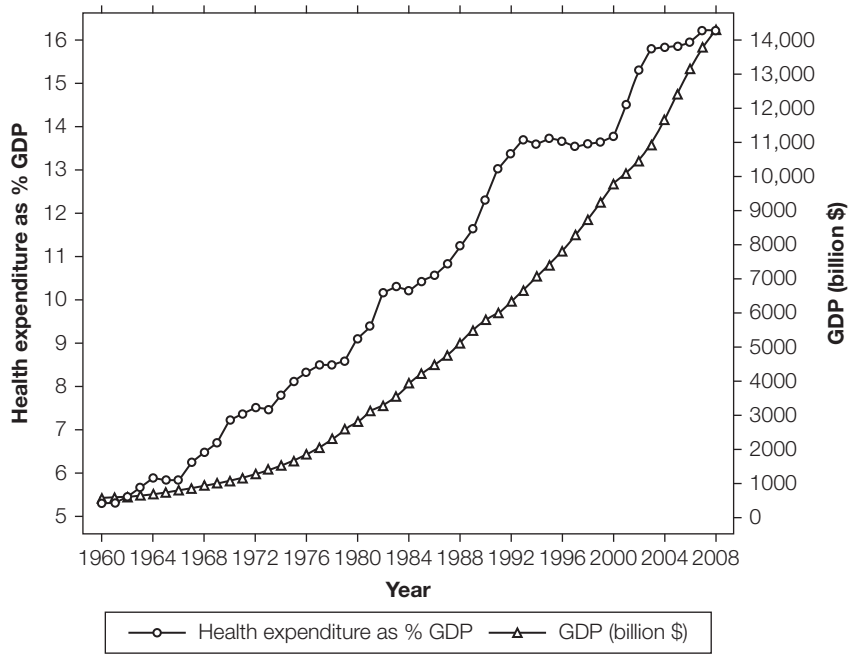

Figure 1.1. *Health care expenditure as a proportion of US GDP, 1960–present.*

Source: Data from the US Center for Medicare and Medicaid Services, Office of the Actuary.

spent on insulin, antibiotics, chemotherapy, open heart surgery, and blood transfusions – but none of these things even existed in 1900.

The size of the health care sector also means that millions of people make a living working in the health care sector. In Chapters 5, 6, and 12 we will explore the role of doctors, hospitals, and drug companies in the health care economy, and learn about some unusual features of the markets for their services.

What do we get for all of this money we spend on health care? And are we spending too much or too little? Health care can certainly extend lifespans and improve quality of life, but then Americans, for all of their expenditures, are not the longest-living or healthiest people on the globe. These complicated questions are examined in much more depth in Chapter 14.

1.2 Health is uncertain and contagious

So the health care sector is quite large, but why are the economics of health any *different* from the economics at work in other, smaller markets, like the market for televisions or the market for bananas? Basic economic theory concludes that any competitive market, in the absence of externalities and asymmetric information, will produce an efficient outcome where there is no way to make anyone better off without making someone else worse off. Why should we assume that the market for health care is operating inefficiently or in need of any government intervention? For many years, economists did not treat health economics differently at all. But a seminal paper published in 1963 by Stanford professor Kenneth Arrow established health economics as its own field of study.

Arrow argued that health is different from other goods, and a source of "special economic problems," for one major reason: *uncertainty*. Most people know roughly how many

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Kenneth Arrow, founding father of health economics. Arrow won a Nobel Prize in 1972. Credit: With permission of Kenneth Arrow.

televisions or bananas they are likely to buy in the next week, but demand for health care is highly uncertain. An unforeseen broken leg or heart attack can suddenly create demand for expensive health care services. Because most people are averse to risk, health-related uncertainty is unpleasant and, as we will see in Chapter 7, this uncertainty motivates individuals to demand health insurance.

The ubiquity of insurance in health care distinguishes it from other markets. Insurance markets are peculiar because they feature information asymmetries between buyers and sellers. Simply put, health insurance customers tend to know more about their health risks than insurance companies do. This would not be a problem if sickly insurance customers volunteered information about their health. But this is not in their self-interest because health insurers would charge them more for coverage. Instead, sickly customers have a strong incentive to masquerade as healthy customers. In a sense, most of the problems in health economics stem from the fact that people have every incentive to lie about their health. In Chapters 8 through 11, we will discuss the twin problems that arise in markets with information asymmetry: *adverse selection* and *moral hazard*.

Additionally, health care markets are rife with externalities because health status is a uniquely contagious quantity. It probably does not matter very much to you if your neighbor decides to purchase a television or eat a banana. But it certainly does matter if your co-workers decide to skip their flu shots or come to the office with tuberculosis. The fact that other people's health decisions affect you – and that your health decisions affect others – can undermine the efficient functioning of markets. In Chapters 20 through 22, we discuss health externalities and the economics of public health.

1.3 Health economics is public finance

Headquarters of the world's largest health insurance company? The US Capitol Building in Washington, DC. Credit: Image Source.

So health care is expensive, and health is a source of uncertainty and externalities. But what if you are healthy, face little risk of falling ill, and have generous insurance coverage to pay for treatment if you do? Even then, health economics should still be of interest to you because governments are deeply involved in the health care economy. Each year, the size of your tax bill depends greatly on the decisions of politicians and bureaucrats about how to manage your nation's health care system.

The prominent role of governments in health care goes as far back as the 1880s, when German Chancellor Otto von Bismarck established a national health care system to gain political advantage over the Socialist Party. After World War II, more governments became extensively involved in health care markets as many countries introduced new government-financed insurance programs. Notable examples include national, single-payer health insurance systems like the National Health Service (NHS), in the UK and Medicare and Medicaid in the US.

By 2008, when one out of every six dollars spent in America was spent on health care, one out of every two of those dollars was spent by the government. And this is in a country with a health system that is relatively private. In countries like the UK, Sweden, and Canada, the government is responsible for the vast majority of health care expenditures. In Chapter 15, we introduce the range of health policy options that countries use to steward their health care systems.

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The pressure on governments to finance the costs of health care will grow in the coming decades. As we will see in Chapter 19, increasing life expectancies and aging populations throughout the developed world will place enormous stress on public health insurance systems which are responsible for paying for health care. In addition, governments will have to cope with ongoing questions about whether or not to pay for expensive new medical technologies.

Together, these trends imply that health care will be an ever-growing item on government balance sheets. The critical role that governments play in health care means that all taxpayers – even healthy and rich ones – have a stake in ongoing political debates about uninsurance, cost-effectiveness, and the regulation of health care markets.

1.4 Welfare economics

Given the major role of government in health care, and the high stakes of the debate for taxpayers and patients, disagreement in health policy debates is inevitable. In practice, debates about health policy are among the most emotional and vociferous in all of politics. Sometimes these disagreements turn on *normative* issues, which are different ideas of how the world should be. Some people feel that adequate health care is a human right, while others feel that no government should be allowed to force anyone to purchase health insurance. These are philosophical questions that no amount of economic analysis can resolve.

But all too often these debates concern *positive* issues, which are different ideas of how the world actually is. One role of health economics is to decrease the level of unnecessary disagreement about health policy by determining positive facts. Do strict patent protections for newly developed drugs increase innovation? How much will it cost Medicare to pay for a new expensive type of laproscopic surgery? Does a tax on fatty foods save money and make people healthier? How much would consumers save if individuals without medical degrees were allowed to offer health care services just like doctors? Unlike normative questions, these questions are amenable to careful economic reasoning.

In order to answer these questions, though, we need a coherent way of thinking that allows us to measure the costs and benefits of any policy proposal. Throughout this book we use the principles of *welfare economics*, an approach that will be familiar to most economics students. The central contention of welfare economics is that people know what is best for them. Their preferences – as revealed by their choices under constraints – are the best guide for determining good policy.

But welfare economics, as useful as it is for analyzing health economics, is not universally accepted. We end the book with Chapters 23 and 24, which cover prospect theory and time inconsistency, respectively. These chapters cover *behavioral economics*, a growing field that challenges the fundamental assumptions of the welfare economics framework and calls into question much of what we think we know about health economics.

1.5 A special note for non-American readers

If you live and receive health care in a country other than the US, a few of the topics we discuss in this book that make sense to American students will seem, well, foreign. In

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many countries, including Canada and the UK, patients almost never pay directly out of their own pockets when they receive basic health care, except for peripheral services like dentistry and prescription drugs. But in the US, patients sometimes pay out of pocket for routine health care like flu shots and visits to the doctor.

Another major difference is that, in almost all developed countries, uninsurance is extremely rare or even nonexistent. Insurance is either provided for free by the government, or provided by a mix of public and private insurers. But in America, some people are not eligible for government insurance and cannot afford (or do not want) to buy private insurance.

Paying out of pocket for health care and going without insurance may be unfamiliar at first, but these concepts will come up over and over again in this book. This is because we focus largely on private markets for health insurance and for health care. This may seem a strange choice given that, as we have just pointed out, so much of the world's health care is not delivered this way. But learning how health insurance and hospitals work in private markets is key for understanding two major health economics concepts: adverse selection and moral hazard. It is also crucial to understanding what motivates other countries to operate their systems in other ways.

Because the US currently provides the best examples of private health insurance markets and private markets for hospitals and doctors, much of the evidence we study will come from American data. Then, in Chapters 15 through 18, we will turn to a discussion of international health policy. By that point, we will have spent enough time understanding private markets to think intelligently about the vast array of policies in place in different countries. Understanding the economics of private health markets provides a deep insight into the functioning and tradeoffs implicit in public health provision.

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2 DEMAND FOR HEALTH CARE

Before we left for college, our parents counseled us always to follow the doctor's advice and never to skimp on health care. If the doctor says get a flu shot, get one. If the doctor says get ten flu shots, get all ten – even if they cost $100 each.[1] While our parents' counsel was loving advice, it implies that health care is so valuable that it is worth ignoring any and all economic tradeoffs. In the words of introductory economics, our parents are encouraging us to be *price-inelastic* or *price-insensitive* when it comes to health care.

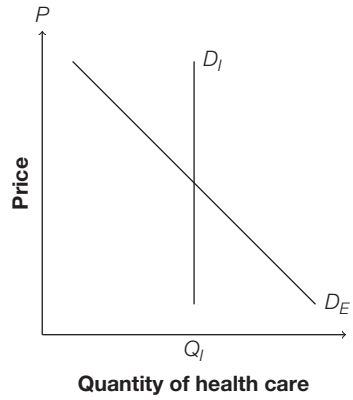

Figure 2.1. *A price-inelastic demand curve,* D_I*, and price-elastic one,* D_E*. This chapter discusses which curve more accurately resembles the demand for health care.*

Are people actually price-insensitive when it comes to health care? Or does demand for health care respond to price, even for health care that may be a matter of life and death?

Figure 2.1 shows two possible demand curves. D_I reflects our parents' advice: the individual with this demand curve is insensitive to price. He wants a certain level of care Q_I and is willing to pay any price to get it. D_E, on the other hand, represents the demand of an individual sensitive to price. She takes price into account when deciding how much care to seek. A non-vertical curve like D_E is said to be *downward-sloping*.

Figure 2.1 may seem simple, but it lies at the center of health economics. Much of the policy debate about how best to organize the provision of health care is grounded in two questions:

- Is the demand curve for health care downward-sloping? Put another way, are people sensitive to the price of health care?
- If the answer to the above question is "yes," people who face different prices or have different willingness to pay get different amounts of care. Do they end up with different health outcomes as a result?

If the answer to the first question is "no," and the demand curve for health care resembles D_I, then the economics of health and medical care is of little interest. The incentives of patients seeking care are inconsequential; instead, there exists a medically optimal level

1 One of the authors, despite being both a professional economist and a medical doctor, gives this questionable advice to his children.

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of health (Q_I). Achieving that optimum is a medical problem to be solved by doctors and medical researchers. It is not an economic problem to be solved by utility-maximizing consumers. In this world, health economics is an accounting exercise involving the comparison of different medical treatments and the measurement of different medical outcomes. Health economists studying incentives and markets have little to add.

But the evidence we outline in this chapter overwhelmingly suggests that the answer to the first question above is "yes" – consumers are price-sensitive when it comes to medical care. People with different budget constraints, different life expectancies, different qualities of life evaluate the tradeoff between medical care and other goods differently. One person may decide to skip a knee replacement surgery to pay for his child's tuition. Another person may decide to get laser eye surgery rather than a fancy Christmas gift for his spouse. Determining the right amount of care is not merely a medical matter, but is the outcome of economic tradeoffs that balance the marginal cost of care against the marginal benefit of that care. In other words, demand for health care is downward-sloping.

In many countries, this is rarely an issue because all citizens are entitled to subsidized health insurance or are eligible for free care from the government. But in some countries, notably the US, people must routinely decide how much to pay for care. In those contexts, evidence suggests that people who face different prices or have different abilities to pay for health care receive unequal amounts of health care. But even in countries where patients pay nothing for care at the point of service, whether health care demand is downward-sloping has important consequences for the design of good health care policy, as we will see throughout the book.

Are people who can better afford health care healthier because they receive more and better care? If so, what should a society do, if anything, in response to this possible inequity? These questions underlie the ferocious political debate about health care in every country and motivate much of our study in this textbook.

2.1 Experiments on the demand for health care

Imagine a consultant working on his first case. He is tasked with helping a surgeon predict what will happen to her customer base if she raises prices. To do so, the consultant sets out to plot a demand curve for the surgeon's services.

One method he might use to plot this demand curve is to take a survey of the surgeon's patients and ask them if they would have chosen a different surgeon if the price had been higher or lower. One major problem with this approach is that it ignores the population of people who are not currently patients of the surgeon. A change in price for the surgeon's services may have a different effect on that population. Since the surgeon's patients are likely to be more devoted to her than patients who do not know her, they may be less sensitive to price changes than the people not surveyed.

Alternatively, the consultant could commission a survey of the entire local population. He asks respondents whether they visit surgeons like his client and how much they pay. The main advantage of this approach is that different groups of people – covered by different insurance plans – face different prices for surgical visits. This allows the consultant to construct a demand curve, since he observes different levels of demand at different effective prices. Unlike the first survey, respondents are not asked to conduct any hypothetical thought experiments.

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But this survey design is also problematic because the prices that respondents face are not randomly assigned. People choose their insurance plans based on what is advantageous to them. For instance, a respondent who knows he is likely to require surgery will search for an insurance carrier that comprehensively covers surgical services. As a result, people with generous insurance – and therefore facing lower out-of-pocket costs – are exactly the people who are most likely to demand surgery in the first place.

This non-random selection distorts the estimated demand curve because the groups facing each price level differ in important ways. In this case, the people who choose generous insurance are sicker than the typical population, and consequently have higher demand for services. Conversely, people who choose less generous insurance are healthier and have lower demand. Figure 2.2 shows what the measured demand curve D_M might look like if the true demand curve is actually D_T. Under these conditions, the consultant underestimates the demand at the high price P_H and overestimates the demand at the low price P_L.

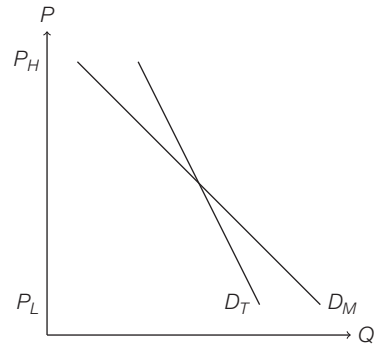

Figure 2.2. *True demand,* D_T*, and measured demand,* D_M*, in a non-randomized study. A non-randomized study such as a broad survey will tend to overestimate health care demand at low prices (and underestimate demand at high prices) because the people who face low prices are the same ones who purchased generous insurance coverage and tend to need more services.*

To calculate a true demand curve, we need to find how the *same* population reacts to different prices. Ideally, we would track the same population in two parallel universes where they face different price levels, but of course this thought experiment cannot be performed in real life. The next best alternative is a **randomized experiment** that assigns treatments randomly to different groups of study participants. Randomization generates experimental groups that are statistically similar. Done correctly, this becomes the best approximation for the parallel universes with actually identical groups. Distortions like the one in Figure 2.2 disappear if there are no meaningful differences between the groups except for the random assignment.

Definition 2.1

Randomized experiment: a study that assigns treatments randomly to different groups of study participants. A **randomized controlled experiment** includes a control group which is randomly chosen and receives either no treatment, a placebo treatment, or the usual treatment they would have received if not enrolled in the trial. Such studies provide the most persuasive evidence on questions of causality in the social sciences and medicine.

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Two randomized health insurance experiments

For this chapter, we rely primarily on two influential randomized experiments of health care demand: the **RAND Health Insurance Experiment (HIE)** and the **Oregon Medicaid Experiment**. The RAND study, conducted between 1974 and 1982, was particularly groundbreaking because it was the first large-scale randomized study in which insurance status was randomly assigned, and it is still the only such study ever conducted in the US. Before RAND, there were many non-randomized studies but little consensus about the effects of price on the demand for health care. Since the RAND HIE was published, there has been little dispute that the demand curve for health care is not vertical but in fact downward-sloping.

Parallel universes would be the ideal setting for estimating demand curves, but researchers lack the grant money to build such a testing environment. They rely on randomized experiments instead. Credit: © rolffimages – Fotolia.com.

For the HIE, the RAND researchers randomly assigned two thousand families from six American cities to one of several different health insurance plans for several years. These plans varied on the generosity of coverage; in particular, the plans had different **copayment rates**.

The copayment rate for an insurance plan is the fraction of the medical bill for which the patient is responsible. Thus, people assigned to different plans had to pay different prices for the same services. There were four different plans: one plan with completely free care (0% copayment rate), and three other **cost-sharing plans** with 25%, 50%, and 95% copayments.[2] Because the plans studied in the RAND HIE differed in only this respect, they are ideal for estimating the effect of price on health care decisions.

Definition 2.2

Copayment rate: the fraction of the medical bill for which the patient is responsible. A **cost-sharing plan** is one with a positive copayment rate, so that costs are shared between the insured and the insurer.

One problem with the RAND HIE is that the health economy has changed in fundamental ways since the 1980s. Consequently, the results found in the RAND HIE may not apply to the demand for health care today. A recent study, the Oregon Medicaid Experiment, provides an interesting update to the RAND results. In general, like the RAND HIE, the Oregon Medicaid Experiment finds downward-sloping demand for health care (Finkelstein et al. 2011).

Unlike the RAND HIE, the Oregon Medicaid Experiment did not assign participants to different insurance plans. Instead, it compared two groups of low-income adult Oregonians: (a) people who won a 2008 lottery to receive the opportunity to apply for public

2 In addition to plans that varied on the copayment rate, there were also other plans including a health maintenance organization (HMO) plan and an individual deductible plan. Interested readers should check out *Free for All?* by Joseph Newhouse (1993) for an in-depth look at the experiment and many details that we lack the space to cover here.

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health insurance coverage through Medicaid, and (b) lottery entrants who did not win and were not given a chance to apply for Medicaid. In effect, this lottery randomly assigned insurance coverage to a subset of the winners. Hence, the lottery winners tended to face lower out-of-pocket prices for care.

The approaches of the RAND HIE and the Oregon Medicaid Experiment each have their advantages and disadvantages. The Oregon Medicaid Experiment exclusively focuses on a low-income population, unlike the RAND HIE, which studied a nationally representative population. Furthermore, the RAND HIE used a direct randomization of health insurance coverage, while the Oregon Medicaid Experiment relied on a randomization scheme that was only indirectly related to insurance coverage (Medicaid enrollment was not automatic for lottery winners; they were only 25 percentage points more likely to be covered in the year following the lottery than the lottery losers were). Lastly, the Oregon Medicaid Experiment included an uninsured group that was in part randomly assigned, while the RAND HIE did not include any participants who were totally without insurance.

2.2 Is demand for health care downward-sloping?

If we wish to estimate a demand curve for health care, there are two basic questions to answer before we can even start: How do we define quantity, Q? And how do we define price, P? This may be simple in some cases: in the market for bubblegum, quantity is naturally defined as the number of sticks purchased and price as the cost of a stick.

Matters are more complicated when it comes to health care. A quick visit to the doctor's office is not equivalent to an overnight stay at the hospital. Counting both as one unit of health care is not appropriate, nor is it clear if an overnight stay should count as five doctor's visits or one hundred. Researchers handle this difficulty by measuring separate demand curves for different kinds of care.

Measuring price in health care is also not straightforward. Most health care is paid for by third parties such as private health insurers or the government. Unlike bubblegum buyers, patients pay a *premium*, or an upfront cost, to join an insurance plan, and in exchange they pay lower out-of-pocket prices for each medical service they receive. When calculating demand, the appropriate measure of price is the marginal cost that patients pay when consuming a fixed amount of care. Researchers treat the copayment rate as a measure of price because it is proportional to the marginal cost faced by patients.

The remainder of this section summarizes the experimental evidence on downward-sloping demand for different types of health care.

Outpatient care

If you have ever visited the doctor's office, hospital, or emergency room and gone home the same day, you were the recipient of **outpatient care**. Depending on the severity of your condition, you may not care that your insurance company requires you to pay $20 for the visit. If you have a broken leg, you still want a cast set even if you have to pay the fee. On the other hand, if you just have a runny nose, you might choose chicken soup and *Simpsons* reruns instead of a visit to the doctor.

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