

Choices: Money, Medicine, and Health

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QUESTIONS

1. Who pays when you skip a workout to watch television?
2. Is health scarce?
3. Do some people pay more (or less) than their fair share?
4. Does everyone get the same kind of care?
5. Who decides: the patient, the doctor, the hospital, or the government?
6. Who is made better off: the surgeon or the patient?
7. Why does health care cost so much?
8. How will we afford health care in the future?
9. Why is health care bought and sold differently from other goods and services?

What to do, how to do it, and for whom are core issues of economics. Should Melanie go to the emergency room to have her twisted knee examined now, or wait until Tuesday when she already has appointment with the doctor or use telehealth? Is it better to get medication or surgery for that injury? Which seriously ill patient will get the kidney transplant? Is it worth extending the Supplemental Children's Health Insurance Program (SCHIP) legislation to cover legal immigrants? Questions like these are dealt with every day in peoples' homes, in hospitals, and in the halls of Congress. They are the subject of health economics, along with more mundane decisions that cumulatively have an even greater impact on your health: partying until 3 A.M. or getting a good night's sleep, how much exercise to get, who to vote for in the next election, whether to major in accounting or enlist in the army reserves, eating more vegetables or less cake, and so on.

Economics is often described as the "theory of choice," and health economics is about the choices people make with regard to health, choices medical providers make in order to care for people and earn money, and choices made collectively (by Congress, community groups, or professional associations). Making a choice means deciding that what is given up, the **opportunity cost**, is not worth as much as what is obtained. Choosing to go to the doctor for treatment means the time and money it will take is worth less to me than the benefit I expect to receive. Those of lower socioeconomic status often have to choose between food and medication or rent and a preventive test. A hospital choosing Mark rather than Mary to receive a heart transplant must expect that the therapeutic benefits to (and insurance payments from) Mark are greater than what is lost by leaving Mary on the wait list. When a patient and a medical provider agree to a transaction, making a trade that exchanges money for services, both have decided that it will make them

better off. During the pandemic of 2021 when Congress voted to approve a \$1.9 trillion relief package, they decided that increasing the deficit, raising taxes, or cutting some other program is less important to the American public than the additional financial support.

1.1 What Is Economics?

Trade, “making a buck,” is a quintessential economic activity. Its focal point is the market, the place where buyers and sellers exchange dollars for goods and services. Without buyers and sellers there would be no economy—no highly paid surgeons, no insurance companies, no hospital billing departments (or textbook royalties for economists). To say that there would be no highly paid surgeons is not a statement of envy but one of fact. Without an advanced economy, a person could not spend 15 years studying and practicing eye surgery, and hence could not provide a highly specialized form of labor; therefore, patients could not reap the benefits of so much knowledge and training.

For a surgeon to be a seller, the patient must be a buyer. They both must agree on a price so that an exchange can occur. The surgeon would probably prefer that the price be higher and the patient would probably prefer that it be lower, but both must be satisfied in order for a trade to take place. As economists, we can observe that since a transaction took place, there must have been mutual agreement that made both the buyer and the seller better off. If the surgeon would rather have watched television than perform another operation, she would have turned down the case. If the patient would rather have saved the money, or gone to a different surgeon, he could have done so. The insight that both parties must be benefiting if they freely agreed to make a trade is central to an economic vision of the world, and is known as the *fundamental theorem of exchange*.

Fundamental Theorem of Exchange

The foundation of market economics is that trade makes both parties better off. People make a deal because they expect it will provide more satisfaction than not making the deal. The surgeon and the patient expect to gain from trade—the surgeon by receiving money and gratitude, and the patient by being healed. It may turn out that the patient dies and the surgeon gets sued for malpractice,

but both made the transaction with the expectation that they would become better off. Trade does not take advantage of people so that one party is made better off at the expense of the other (that is stealing). Trade takes advantage of differences in skills, endowments, and tastes so that people can make exchanges that are mutually advantageous.

Terms of Trade

The “terms of trade” specify what the buyer is to give to the seller and what the seller is to give to the buyer in return. When you buy a common item in a store, such as aspirin, a simple price of \$9.55 per bottle of 50 may tell you everything you need to know about the transaction. For services, and for medical care in particular, the transaction is apt to be much more complex. For example, consider the transaction for an operation to implant an artificial intra-ocular lens (IOL) in a patient’s eye to replace the natural lens that has become clouded by cataracts. The patient is to pay a \$200 deposit up front and \$800 more within 30 days after the surgery is completed and all sutures are removed. Reduced to its most simple element, the terms of trade in this exchange can be expressed as a monetary price of \$1,000 for the IOL implant. Yet much more than the \$1,000

is being agreed to in this transaction. The physician agrees to provide not just any artificial lens, but to choose the correct one, continuously monitor the quality of the operation, and control possible adverse events like reactions to postoperative medications and infection. The patient agrees to make payment in two parts, with a time limit, and may assume that the operation will be redone without further charges if the first attempt is not satisfactory. Many of the agreed-upon conditions (that the physician is licensed, will use only qualified assistants, will not try to boost the bill needlessly to increase her fees, and will keep the patient informed of any possible adverse consequences, and that the patient will wear bandages as long as necessary and not go skydiving) will never be specified explicitly unless some disagreement and subsequent legal action force the doctor and patient into court.

In the simplified neoclassical model of perfectly competitive behavior with which most textbooks begin, price is the only term that matters in a transaction and both the buyer and seller are “price takers.” That is, there are so many buyers that whether one person buys or not has little influence on the price in the market; therefore, buyers must “take” the price as given. Similarly, there are so many firms selling the same product that no single firm can affect prices; hence, all firms must take the price as given. This uncomplicated model of perfectly competitive behavior is not too distant from reality when you buy a bottle of aspirin. The model works reasonably well for most of the purchases made by consumers, and thus can be used to frame the analysis of the economy as a whole. However, buying a bottle of aspirin is not representative of most medical decisions, and an elementary model does not capture many of the essentials when life and death decisions are being made by doctors in the operating room. No one needs a prescription to rent a car. You don’t have to have insurance or sign a consent form to have your car’s fuel pump worked on, and almost anyone can cut your hair without a license. Treating disease requires knowledge and entails risks that are quite special—forcing a patient to trust the judgment of the surgeon and leading to special forms of economic organization and contracts in medicine (professional licensure, hospital staff bylaws, regulatory review). Studying such adaptations reveals the potential of economics as a discipline in a way that the analysis of more standard markets cannot.

Value

Why does health care cost so much? Because health is so precious that its value exceeds that of all the things we possess. What benefit do I get from spending my money on food or music or cars or clothes if I am dead? Sick and in pain, confronted with the possibility of death, people would be willing to spend almost any amount of money to get their health back. Health care costs so much because people are willing to pay so much for it. The many years a surgeon spends in training, the billions of dollars government spends on public health, and the comprehensive health insurance plans provided by employers are consequences of the value we as a society place on health care. They are effects, rather than causes. We are willing to spend so much on physician training, public health, and health insurance because what they produce is valuable to us. If we stopped caring about (or paying for) health, no new magnetic resonance imaging (MRI) scanners would be built, surgeons would stop spending years in training, and our taxes would go toward highways or national parks instead of AIDS and cancer research. Cows can get just as many diseases as humans do and we could put all those resources to work saving cows, but we don’t. Cows, I am sure, would set priorities rather differently, but they are not paying the bills.

Value in health care has been discussed extensively¹ by Michael Porter and is defined “as the health outcomes achieved per dollar spent.” The relationship between cost and health outcome is a fundamental principle of population health where David Nash² has been known to say, “no outcome, no income.” Outcome refers to the improved health we are willing to pay for and this concept formally connects our payment to our improved health. Value-based payment

models (discussed later in the book) that include reimbursement for achieving mutually agreed upon quality goals have emerged as alternatives to common fee-for-service payments that reward volume of care provided, not necessarily quality. This is often referred to as shifting from “volume to value” reimbursement.

Can We Pay Somebody to Care?

Doctors and nurses want to care for patients. Given a chance, they will make extraordinary efforts on your behalf. Medicine is as much about caring as it is about curing. Does paying somebody make them care for you? Probably not. However, not paying people can make it impossible for them to care for you. If doctors and nurses had to find another way to make a living and pay the bills, then they could not spend their time looking after your health.

Do your friends expect to be paid because they care for you? Not precisely, but they do expect to be paid back in kind, by your caring for them. If you treat your friends as if you did not care, eventually you will not have any friends. Parents are a bit more understanding, but in part that is because they know that however ungrateful you may be for their help, you will probably be willing to help your own ungrateful kids (their grandchildren) someday. Medical professionals are even more compassionate. They work for many hours even when a case is nearly hopeless, knowing they will not get additional pay for all the extra effort. However, as professionals, they can expect respect, and a reasonable income. The development of medicine as a **profession** dedicated to science and caring, is a great social innovation—one of the adaptations of economic organization mentioned above. Sometimes it is only the professionalism of the helpers that keeps someone who is poor and sick from being left all alone to deal with an illness.

Doctors work on your behalf. Most important, to an economist, it is doctors who decide what medicine is right or wrong, not you. Although patients do ultimately have the right to make their own decisions, in practice, those decisions are made largely by the professionals who take care of them. In the operating room, it is not the patient who decides, but the surgeon (in some ways, it is a bit like a family, where the parents make decisions on behalf of their children). In basic trades, all that is required is that a buyer and a seller agree on a price. In medicine, the buyer/seller distinction is not clear. Is the doctor the one who is “buying” the surgery, or the one selling it? A medical “trade” is made on the patient’s behalf by someone who cares about them, not by the patient acting on their own. The situation is complex and involves a set of professional expectations and external forces (quality regulations, consent forms, insurance) as well as the patient’s illness or their personal tastes and preferences. Caring, from an economic point of view, means making decisions for someone else—to help them, rather than just to help yourself.

Financing Health Care

What does it mean “to finance” something—a house, a car, your education? When you finance a car, you have to make payments over many months. To buy a house, you go to a bank for a loan, which is then usually bundled with other mortgages by Fannie Mae or some other financial entity and sold to many investors. Financing your education often means making tuition payments over time, taking out student loans, getting money from parents, and maybe a scholarship from the university. If it is a public university, taxpayers are usually covering a large part of the costs. At a private college, donations and income from the endowment are used to supplement student fees (and indirectly subsidized by tax breaks). Financing means that many parties are involved, not just the buyer and the seller. Frequently there are *financial intermediaries*, like banks, that help to make the transaction possible by providing guarantees over time and spreading the risks across many investors. For student loans, Sallie Mae (the Student National Loan Agency) is the financial intermediary making loans possible with the backing of the federal government, which

is the largest intermediary of all and makes possible the whole banking system as well as all the subsidies from taxpayers for national defense, schools, and health care.

The development of medicine as a caring profession is a kind of primitive financial intermediation—those who can afford to, pay more, so that those who can't pay still get professional care. With transplants and therapies costing hundreds of thousands of dollars, professional goodwill and charity alone are hardly sufficient, so there are public and private insurance plans pooling funds and sharing risks across millions of people that provide most of the financing for health care. Looking into the funding of research provides additional insight. The people who benefit from medical research are not usually the people who pay for it. A study of brain function or cell structure will do nothing for a patient in the hospital today, and not much for the foundation that donated money or the taxpayers funding a research grant. Tomorrow's miracle drugs are paid for by adding overhead into the price of today's pharmaceuticals (see Chapter 10), and advances in surgical technique by adding overhead into the price of an operation or new technology. Many of the basic discoveries that make all of this new technology or pharmaceuticals possible are funded by federal grants, other forms of taxpayer support, or manufacturer investment with benefits coming far into the future, if at all. Only sometimes do the efforts succeed, and those few successes must provide sufficient rewards to make the overall returns on a risky investment worthwhile. Recovering the investment is often cited by the drug manufacturer as a justification for the extremely high prices that are charged for new medications.

The two core concepts of financial analysis are **timing** and **risk**. Something that cannot be used until far into the future is not worth as much as something you could start using today. Uncertainty also makes a thing less valuable (risk adjustment or discounting). Usually the longer you wait for something the more risky it is, so value is discounted both for time and risk. Discounting for uncertainty and the lapse of time are factors that make it hard for college sophomores to spend less so they will have more savings for retirement, or to stop eating French fries so that they can be healthier when they are in their 50s, or for a soldier being sent to war to give up smoking. In health care, the benefits are almost never immediate or certain and thus must be discounted, and are almost always financed by others rather than paid for directly, so that the patient almost never stops to compare costs and benefits before going to the doctor. The fundamental theorem of exchange becomes complicated and diffuse when trades involve millions of people in complex transactions with uncertain effects lasting for decades or generations.

Full Cost: Paying for Medical Care

All goods and services must be paid for. Many regular goods are paid for by consumers at the point of purchase. Some large purchases, such as cars and houses, are financed by paying over time. Then there are those, like medicine and college, which are mostly paid for with “other peoples’ money” from philanthropists, grandparents, or taxpayers.

Many people believe that because they pay something for medical care or college, that they are bearing the full costs. Usually they are not. The total cost of health care in the United States was about \$3.8 trillion dollars in 2020. Thus, the various providers that make up the U.S. health care “system” must take in an average of \$11,582 from every person (man, woman, child; old, young; rich, poor; sick, well; working, disabled—everybody) in America. The average household has 1.9 people and paid approximately \$500 per month on medications, doctor visits, copayments, and insurance premiums directly (termed “out-of-pocket” or OOP), meaning that most (>75%) of the financing came from “other people’s money.” College students and recent grads are less expensive than the average, but also pay in much less. The elderly spend significantly more from their equally limited incomes, but also cost the system much, much more. The only way we can begin to get a full financial picture of the whole health system is to carefully trace *all* the payments in and out.

1.2 The Flow of Funds

Goods and services are provided in a market economy only if the people who want them are willing to pay for them and if suppliers are willing to accept those payments in return. Exchange is based on voluntary agreement, so that trade between a buyer and seller occurs only when both parties believe that they will be made better off by trading (the fundamental theorem of exchange). In the simplest form of trade, consumers buy from businesses, exchanging money for goods and services in a two-party transaction.

Consumers make up the demand side of this simple service market, while firms make up the supply side (see Chapter 2). In legal terms, firms are contractual entities that can own, buy, and sell property, and pay taxes just as people do. To get the labor, land, and other inputs needed for production, the firm (the seller) in Figure 1.1 must also be a buyer, as shown in Figure 1.2. These secondary two-party transactions are characteristic of derived demand, purchases made as an intermediate step in production, rather than for final consumption. Firms are owned by individuals (or other firms) that provide the capital, labor, and organizational effort necessary to get them started and keep them running. Thus, every dollar that a consumer gives to a firm, whether used for wages, profits, or purchase of input from another firm, ultimately ends up in the hands of someone who wants to spend it. When workers or owners spend money, they become consumers, and therefore complete the circular flow of funds through the economy, as shown in Figure 1.3.

Health Care Spending in the United States

Medical care in the United States is a trillion-dollar business (\$4,014,200,000,000), with an estimated average of \$12,118 spent per person in 2020.³ It is estimated to grow at an annual rate of 5.4 percent for 2019–2028 and to reach \$6.2 trillion by 2028. In 2018, the health share of the economy was 17.7 percent, and it is expected to grow to 19.7 percent in 2028.⁴

Medicare is expected to grow the most, about 7.6 percent, due to the continued aging of the population. Managing this growth represents the challenge students of health economics and finance face. These trillions of dollars are spent in a variety of areas. Table 1.1 below from CMS shows these allocations over time. All are increasing consistent with the projected share of the economy.

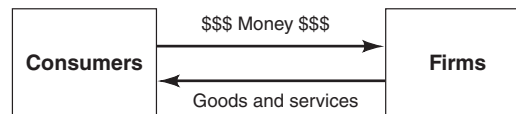


FIGURE 1.1 Two-Party Transaction

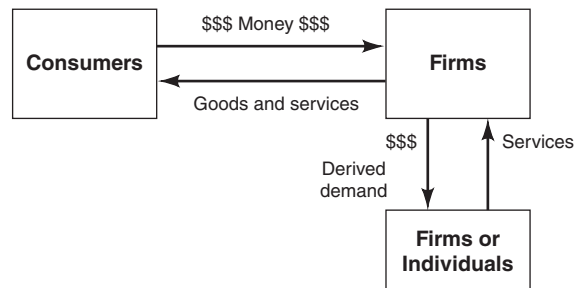
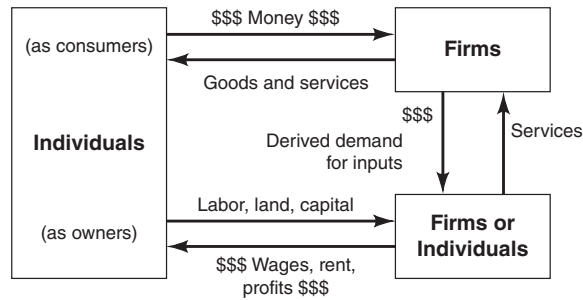


FIGURE 1.2 Derived Demand between Firms

**FIGURE 1.3** Circular Flow of Funds**Table 1.1 Health Care Spending**

Spending category Expenditure, billions	2016	2017	2018	2019	2020	2023	2028
National health expenditures	3,347	3,487	3,649	3,815	4,014	4,706	6,193
Health consumption expenditures	3,191	3,319	3,475	3,633	3,824	4,483	5,903
Personal health care	2,838	2,955	3,076	3,219	3,378	3,980	5,256
Hospital care	1,090	1,141	1,192	1,253	1,316	1,563	2,088
Professional services	883	924	965	1,009	1,058	1,236	1,609
Physician and clinical services	666	697	726	757	794	932	1,224
Other professional services	93	98	104	109	115	135	176
Dental services	125	130	136	142	148	169	209
Other health, residential, and personal care	174	183	192	200	210	249	327
Home health care	93	97	102	109	116	143	201
Nursing care facilities and continuing care communities	163	166	169	175	183	211	266
Retail outlet sales of medical products	436	443	456	474	494	578	764
Prescription drugs	322	327	335	346	359	420	560
Durable medical equipment	51	52	55	58	62	74	98
Other nondurable medical products	63	64	66	70	73	84	106
Government administration	45	45	48	50	52	62	84
Net cost of health insurance	219	228	259	268	295	332	433
Government public health activities	89	91	94	96	99	109	131
Investment	157	168	174	181	191	224	289
Noncommercial research	47	50	53	56	59	70	89
Structures and equipment	109	118	122	126	132	154	200

Source: Based on Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group.

There are many reasons health care spending has grown rapidly. An increasingly wealthy population is willing to spend more on all goods and services. Extra spending on health care has a greater appeal after basic necessities such as food and housing are taken care of. Technological advances make modern medicine more desirable. An aging population favors health care over other goods. Insurance now finances more of the cost. Shifting the financial burden from

individuals to third parties through insurance not only changed the way funds flowed, but also made more funds available, so that the health care system could grow rapidly and absorb an ever-larger share of total economic output.

Such “cost-shifting” has made the financing system complex and opaque—almost no one knows who is paying for what. Billed charges bear little resemblance to what is paid or what the provider receives, and provider revenues are usually identified not as “income” but as “reimbursement.” Third-party payments are made with:

- Taxes paid to government agencies
- Employer and employee payments to commercial insurance companies and for-profit and non-profit managed care firms, including health maintenance organizations (HMOs), preferred provider organizations (PPOs), and other organizations
- Philanthropic contributions to charities

Each of these major categories of third-party payments exists in endless variations. The details differ widely, but from a financial perspective they all have a similar purpose: pooling funds from many people to pay the bills of the few patients who need care.

Who gets care and what kind of care are decisions made according to embedded rules and the opinions of professionals who run the health care system. In each case, indirect third-party payment weakens the monetary linkage between buyer and seller that characterizes the direct two-party transactions typical in most other sectors of the economy. For most medical transactions, there is no exchange of money between the recipient of services and the provider. The patients or their employer pay insurance premiums and taxes, and the doctors and hospitals are paid by the government and insurance companies. In the absence of a direct link between the amount paid and the resources used in treatment, “prices” become more ambiguous and less important to the transaction than ongoing relationships of trust, outcomes, and professional behavior. One of the purposes of this textbook is to explain how economic forces continue to operate when prices do not function in a normal way and how other organizing principles (professionalism, licensure, regulation, health outcome) serve as replacements.

Sources of Financing

As noted in Table 1.1, health care spending will continue to grow. Table 1.2 shows that of the total national health expenditures, the majority are used for health consumption. It is noteworthy that in 2016 \$357 billion was paid out-of-pocket by 322 million people or approximately \$1,100 per man, woman, and child. In 2028, that will be approximately \$1,600 per person. How is a family of four earning \$75,000 per year going to afford \$6,400 out-of-pocket for health care? That is 8.5 percent of their income attributed to health care, not including their own contribution to the insurance the employer purchases and the salary increases forgone because of the health care benefit. Understanding the economics and finances of healthcare will help address this alarming concern.

Health Care Providers: The Uses of Funds

Table 1.1 shows that payments by patients, government, and insurance companies have increased 200-fold over the past seventy years; thus, payments received by doctors, hospitals, and other care providers have increased by the same amount. In general, both the public, as users of the system, and providers, as suppliers of care, have been happy with this large increase in spending. The public has gotten a health care system that is technologically advanced and responsive to their needs. Providers have gained glory in the fight against disease and substantial gains in income, making them eager to continue the struggle.

Table 1.2 Sources of Financing

Source of funds Expenditure, billions of dollars	2016	2017	2018	2019	2020	2023	2028
National health expenditures	3,347	3,487	3,649	3,815	4,014	4,706	6,193
Health consumption expenditures	3,191	3,319	3,475	3,633	3,824	4,483	5,903
Out of pocket	357	365	376	390	405	458	564
Health insurance	2,488	2,592	2,729	2,858	3,020	3,578	4,794
Private health insurance	1,120	1,175	1,243	1,290	1,357	1,555	1,982
Medicare	677	705	750	801	859	1,076	1,559
Medicaid	565	580	597	621	649	766	1,017
Federal	358	359	371	384	402	475	629
State and local	207	221	227	237	247	290	388
Other health insurance programs	125	132	138	147	156	182	236
Other third-party payers, programs, and public health activity	346	362	371	385	398	447	546
Investment	157	168	174	181	191	224	289

Sources: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; National Health Expenditure Accounts: methodology paper, 2018; Baltimore (MD): Centers for Medicare and Medicaid Services, cited 2020 Feb 20; Medicare Trustees Report, Annual growth, 2015–16.

Part of the increase in health care spending from \$4 billion in 1929 to \$4,014 billion in 2020 is just an accounting fiction due to inflation, because \$1 in 1929 is roughly the same as \$15.23 in 2021. Also, some of the increase reflects a rise in the number of people who must be cared for. Yet even after adjusting for changes in population and inflation, real per capita spending is more than 25 times larger today than in 1929. Part is due to a real increase in wages. As per capita incomes rise, workers expect more goods and services per hour of work. Therefore, expenditures on labor-intensive services tend to rise more rapidly than expenditures on goods and capital-intensive commodities. Furthermore, the wages of health care workers have risen more rapidly than for other types of labor.⁵ This probably reflects both the increased education of health professionals today and the increased demand for their services. Increases in the quantity of services provided account for some of the growth in total expenditures, but the medical services most commonly counted, number of days spent in the hospital and number of visits to physicians, have actually declined since 1970.⁶ However, nursing home days and number of prescriptions per person have increased substantially.

After taking all these factors into account—inflation, higher health care wages, and use of services—there still has been a tremendous increase in expenditures over the last forty years, more than 500 percent. How can spending increase so much more rapidly than the number of services or the wages of those who provide them? By increasing the **intensity and quantity of services**. More tests are done for a patient in a modern intensive care unit during a single day than were done for a patient over the course of a month in his or her wooden bed in 1929. Many of those tests (MRIs, blood glucose, heart monitoring) were not available back then. The physician who drove to the patient's house and worked alone out of a black bag has been replaced by a team of therapists, technicians, and support staff assisting a group of specialists using an array of medical equipment. Also, as some common, acute (short-term) diseases have become curable or preventable, medical care is increasingly applied to chronic diseases that once were considered hopeless. The shift from simple caring to technologically sophisticated curing is reflected by shifts in the categories of expenditure; more is going to institutional care in hospitals and nursing homes, while the share devoted to personal service by doctors has declined. The fraction of

the health care dollar spent on manufactured goods has also fallen as the cost of labor-intensive services has risen.

1.3 Economic Principles as Conceptual Tools

Tracing the flow of funds through the health care system makes it possible to apply principles of price theory to situations involving life and death, nonprofit organizations, professional licensure, addiction, and other issues. The powerful generalizations and concepts of microeconomics, macroeconomics, finance, and industrial organization allow us to see how medical transactions are like, and yet unlike, most of the rest of the economy. Chapters 1–3 use a simplified set of economic constructs common to most basic Econ 101 presentations. Chapters 4 and after move on to consider the complications (uncertainty, information asymmetry, life and death, etc.) necessary to understand medical transactions. As a practical matter, it will be helpful if you already have a basic grasp of economic theory and applications.

It is not easy to “think” like an economist. Doing so requires a certain amount of practice to develop the necessary twist of perspective and narrowness of focus that allows thinking in terms of incentives, fixed and variable costs, profit margins, and market power. Starting out with a complex subject such as art, or marriage, or medicine makes it more difficult to study basic economic forces. That is why most textbooks begin with a simplified and abstract process such as operating a lemonade stand or widget factory. Reviewing an introductory text like *Economics* by Samuelson and Nordhaus, *Principles of Economics* by Mankiw, *Microeconomics* by McConnell and Brue, or *The Economic Way of Thinking* by Heyne may prove useful. There is also an instructor’s manual available to professors. Some of the most common principles used by economists as tools for understanding society and the decisions people make are listed below. Most of these will be evident to you based on your own experience or previous study.

Scarcity (Budget Constraints)

Why does a decision always involve giving something up? It is because reality imposes constraints or limits on what you can do. The most basic limit is time. You have only 24 hours per day and once your days are gone (due to death) you have no more life to use in production or consumption. Your income and your bank balance, the place you live, the things and friends you have, and even your credit rating all put limits on what you can do to make yourself better off. Economists call them “budget constraints.” This term applies not only to money but also to time, things, relationships, and any other limited resource.

Opportunity Cost

The best measure of what something costs is what you have to give up to get it. The trip to Cancun might cost you \$750 in savings; an extra weekend date might cost you an A as your grade falls to a B+ because you gave up study time. Conversely, you might say that the decision to be a grind and get an A cost you a date. It is the decision you make, not the price tag or money, that really determines the cost of something. The primary cost of attending this class is the time it takes (the fun you could have had and/or the money you could have earned), not the amount spent on tuition and books.

Willingness to Pay

The best measure for the value of what you get is your “willingness to pay”—the complement and mirror image of “opportunity cost.” Value includes money, time, pleasure, relief from pain—all

of those things that when given up are counted negatively as costs and when received are considered positively to be benefits. The only real difference between a “cost” and a “benefit” is the sign. Note however that *value* often differs depending on who gets and who gives, which is why trading can increase the total value to society even when all that happens is that some things (including dollars) are moved back and forth from one person to another.

Trade

People engage in trade, exchanging things, time, favors, money, and information, because it makes them better off. Both sides must benefit, or they would not agree to trade. This is the “fundamental theorem of exchange” and perhaps the most basic principle of economic reasoning.

Money Flows in a Circle

When someone buys something, the money spent must be received by someone else. The seller wants those dollars for what he or she, in turn, can buy. The dollar is almighty because it flows—because it can be changed into anything else—not because there is any inherent value in a wrinkled piece of paper. Circularity implies that every dollar of “cost” is also some provider’s “income.” Protecting income is one reason few cuts in spending are actually made in practice even though most doctors, hospitals, and insurance companies claim that they want to reduce costs.

The Margin: What Matters?

The “margin” is whatever is different between the options in the choice being made. If you are choosing how long to study before going out to eat, the marginal is “hours.” If you are choosing whether to eat another slice of pizza, then it is “the difference between four and five slices.” If you are deciding between plain and pepperoni, then it is “pepperoni.” If you are deciding whether or not to add mushrooms, then “mushrooms” become the margin. When deciding between a small and a large, then “size” is the margin. Deciding between two places? Then perhaps “flavor” or “distance” is the relevant margin (and you may have to consider multiple margins when making a choice). Differences such as slices, minutes, miles, or dollars with uniformly measured units are often termed quantity margins, while flavor, brand name, hipness, and other incommensurables are called quality margins. The important point is that most **decisions are made at the margin**. The relevant question is not “Will I ever eat pizza?” but rather “*How many slices?*” or “*With mushrooms?*” or “*Which place?*” In health, the margin might be rent or medication, or gas for the car or the copay for a preventive doctor visit. The decision between one’s health and putting food on the table is real for many of lower socioeconomic status.

Maximization: Marginal Costs and Marginal Benefits

Productive effort and exchange (trade) are ways people make themselves better off. What principle determines when to stop? When the incremental (marginal) benefits from the next step are outweighed by the incremental (marginal) costs. Each decision increment (read one more page, eat one more slice of pizza, play one more game) adds a little value (marginal benefit). Each step also takes a little more time or money (marginal cost). The real issue is not whether something (grades, food, playing time) is good, but whether you would be better off with more or less of it. As more and more is done a point is usually reached at which the benefits of each additional step become smaller and smaller (**diminishing marginal returns**), and the costs of each additional unit become greater. Maximum net benefits are obtained by pushing to the point at which rising marginal costs equal falling marginal benefits.

Choice: Are Benefits Greater than Costs?

Every decision involves a trade-off, giving something up to get something else, choosing the option that means more to you. This is obvious when you engage in trade with someone else. It is also true whenever you make a choice, even though you “trade” only with yourself (e.g., giving up a workout at the gym in order to study, passing up a new CD in order to buy dinner at a restaurant, giving up some of your savings in order to take a trip to Cancun). Economists assume that people tend to make choices that make them better off in a way they value (not necessarily financially). This is known as the “benefit-cost principle.” In the abstract, economists assume that people behave perfectly rationally, precisely conforming to principles of maximization expressed mathematically in “rational choice theory.” More realistically, we accept that people behave “sort of” rationally, not deviating too much from the model of perfect rationality, but not exactly conforming to it or meeting that exact standard even in everyday affairs—smoking when they say they want to quit, failing to save enough for retirement, or morosely lamenting the sunk costs of the job they did not take (see “Social Science and Rational Choice Theory” below).

Investment

Investment increases future productivity by diverting current output to infrastructure improvement rather than to immediate consumption. The economic approach to *human capital* uses concepts such as depreciation and rate of return to analyze going to school, having children, getting married, brushing teeth, and other activities that depend upon a long-run perspective. Taking time to exercise and giving up sweets are forms of investment. It is difficult to improve your health once it has deteriorated. Spending money on medicine once you are seriously ill is a little like spending money on your car after the engine has begun to burn oil; regular maintenance is a lot cheaper. How healthy you are when you get old depends not so much on the medical care you get then but on what you have done to and for your body over the years. Income at age 55 depends not on how hard you work then but on what you have done to advance in your career. Most readers of this textbook are studying now for a future reward: knowledge, grades, a degree, and enhanced earnings.

Contracts: Complex Exchanges to Deal with Timing and Risk

The seller must have faith that the money obtained in trade will have value. The buyer must have faith that the goods received are what they are supposed to be. Both buyer and seller must be able to trust each other. More complex transactions require more trust and external guarantees. Buying on credit or for future delivery (mail order, new custom home, knee surgery) creates potential problems and requires a financial intermediary, as does shared purchasing through insurance, cooperatives, or public funds. Acceptance of risk and uncertainties in value (a used car “as is,” a share of stock in a start-up company, an experimental drug to treat your rash, trip insurance for your vacation) also force greater reliance on trust and contract specifications. Using a financial intermediary as a third party that handles the money (purchasing agent, insurance company) can make a transaction easier and safer, but it also makes transactions complex and vulnerable. Two of the parties may collude to take advantage of the third party. Often, tracing the flow of funds helps reveal the underlying economic forces at work, even if the contracts are confusing or people lie.

Organizations Adapt and Evolve

Organizations evolve to build trust and increase the efficiency of exchange. Laws, rules, political parties, mandatory labels, certified measures, corporate financial statements, clubs, professions,

and nonprofit organizations are all in a sense market responses to market failure, as difficulties in making simple price transactions are resolved by more comprehensive contracts. Government is the most comprehensive of such social structures. Exchange and economic potential remain limited until a solid base of personal trust, laws, contractual organization (markets, firms, credit, regulations), and social structure evolves. The growth and output of a modern economy has more to do with the efficiency of organization than the endowment of natural resources, numbers of people, financial aid, or any other factor.⁷ Health care organizations have evolved to address the increased complexity of illness but have been challenged to become more efficient and engender the trust of those they treat.

Distribution: Who Gets What

Laws, rules, and organized exchanges determine not only how much the economy produces, but also *distribution*, who gets the benefits and who bears the cost. A society in which the top decile (10 percent) of the population took 30 percent of the money and goods, the next decile also had 10 percent, and the bottom half of the families had exactly 50 percent would be described as having no inequality (and does not exist). Conversely, a society in which just 2 percent of the people took 20 percent of all the income and goods would be relatively unequal (and many nations are far less equal than that).⁸ Make a change in the rules—and you change the outcomes, the distribution. That is one reason laws and organizations are so resistant to change. Virtually any modification will make some people better off and some worse. Whether productivity goes up or down matters less than “what happens to me.” Build a railroad bridge, ban cigarette ads, move the three-point line, redraw congressional boundaries: any change will create winners and losers. In theory, efficiency may trump inequality after all the gains and losses are redistributed to make everyone happy. In the real world, action is driven by perceived costs and benefits, profits and losses, by what each person thinks might happen to them—and a real-world economist excels at identifying those incentives and outcomes.

1.4 Health Disparities

Although most goods are distributed privately through markets to whoever can pay for them, anything considered vital to life and fundamental to human happiness (freedom, the right to vote, protection of the law, air and water) is usually made available to everyone by the government and paid for with taxes. One way of defining who belongs in a society and who is excluded is access to such services. Medical care can be viewed as a matter of life and death or, in other circumstances, as just one of many goods that it would be better to have more of. Few societies would stand aside and watch someone die when vital medical intervention was easily available, yet the extent to which medical care is made dependent upon ability to pay varies widely. In Australia, Canada, Japan, and many European countries, every citizen (and often noncitizens as well) have access to high-quality medical care at minimal or no charge regardless of income. In most poor developing countries, only very wealthy families can obtain good care. In the United States the picture is mixed. Most have access to high-quality medical care, but responsibility for payment can vary widely depending upon insurance status, and medical bills are a not-infrequent cause of personal bankruptcy. Over 35 percent of the uninsured delay care for cost reasons compared to 7 percent of the insured.⁹

Spending money on medical care is only one of many ways that the economy affects people's health. Economic prosperity enables people to have a better diet, to avoid hazardous jobs, and to clean up the environment, as well as to purchase more medical care. A major benefit of higher incomes is education, which changes values and production possibilities in ways that are favorable to health. The complex relationships between economic growth, income distribution, medical

Table 1.3 Annual Mortality Rate among Middle-Aged Men

Income Category	Mortality Rate	
	White	Black
<\$9,999	0.918%	1.234%
\$10,000–\$14,999	0.840%	1.123%
\$15,000–\$19,999	0.706%	0.899%
\$20,000–\$24,999	0.660%	0.867%
\$25,000–\$29,999	0.591%	0.603%
\$30,000+	0.542%	—

Source: Based on G. D. Smith et al., American Journal of Public Health 86 (1996): 486–504.

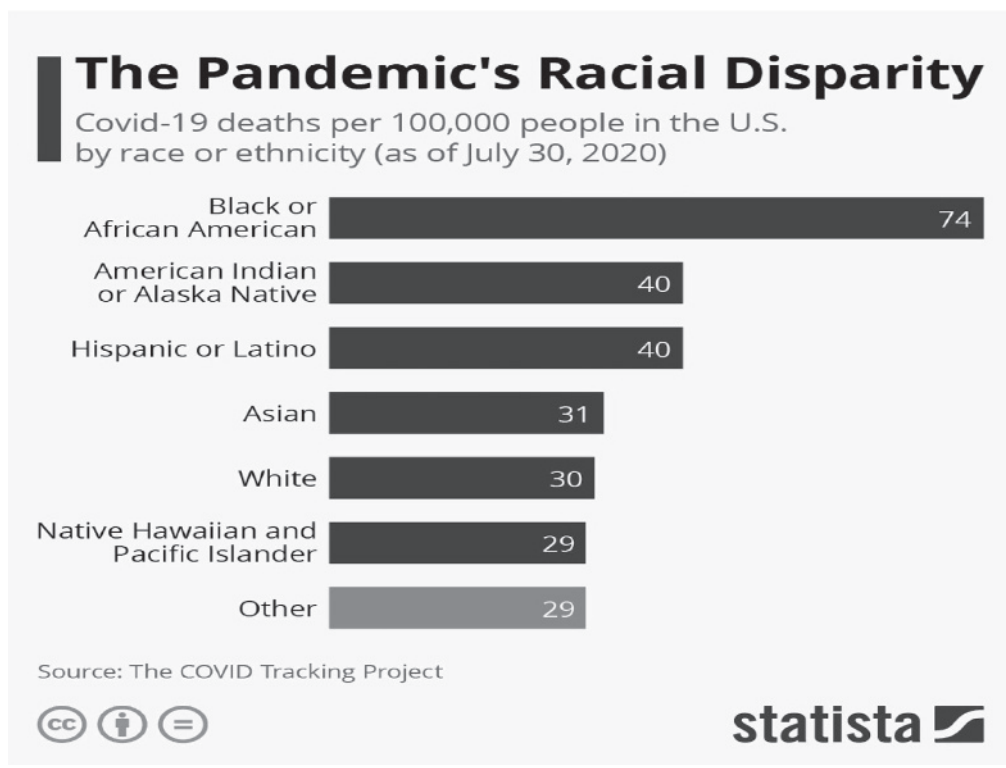
care, and health are discussed throughout the book. An introductory example of some issues regarding distributional equity in health is provided in Table 1.3, which presents the results of research on 320,000 middle-aged men enrolled in a trial of cardiac risk reduction.¹⁰ Income for this study is based not on individual wages but on the community in which the person lived (average per capita income of the zip code of residence). Reading down the columns, it becomes evident that men in poorer communities face a much higher risk of death each year, a finding that holds even as the groups are adjusted for age, unemployment, use of medical care, and other factors. Indeed, those living in areas with average incomes below \$10,000 per year were twice as likely to die as those in areas with average incomes above \$30,000 per year. Blacks were more likely to die than whites, largely because of living in lower income areas. Yet even after controlling for differences in income, black mortality is still significantly greater each year. Maternal mortality is another example of inequity.¹¹ In 2018, maternal mortality in the United States was 17.4/100,000 live births. However, the maternal mortality rates for non-Hispanic blacks were 37.3/100,000, non-Hispanic white 14.9/100,000, and Hispanic 11.8/100,000. In the COVID pandemic of 2020, Table 1.4¹² demonstrates strikingly higher rates of mortality in Blacks, American Indians, and Hispanics. Differences in morbidity and mortality rates by socioeconomic and ethnic grouping are observed among women, the elderly, and children and a consistent problem in health care.

Although insurance and government assistance has done much to equalize access to medical care, large disparities in actual health and life expectancy endure. Inequalities in health are found throughout the world. Countries such as Sweden and the United Kingdom, which have universal national health systems, also show substantial differences in mortality between groups, as do poorer countries such as Bangladesh and Ghana, where a national health infrastructure is almost nonexistent. Indigenous minority groups in Canada (Inuit), Australia (Aboriginal), Brazil (Indian), and Finland (Sami) have much poorer health than recently arriving “European” population. It is striking that the United States leads select developed countries in maternal mortality as shown in Table 1.5.¹³

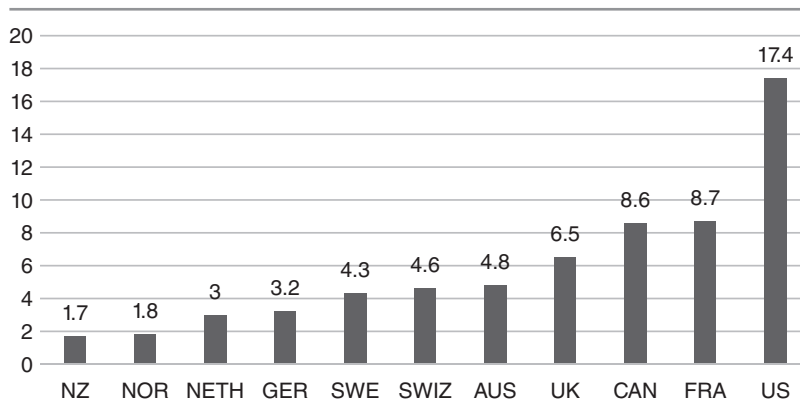
Health economists are still working to understand the persistence of excess mortality among disadvantaged groups despite tremendous increases and redistribution in health care spending.

1.5 Whose Choices: Personal, Group, or Public?

A common quip from geneticists is: “Want to live longer? Choose better parents!” Superficially silly, from another perspective this statement is quite sensible. Parents not only determine your

Table 1.4 Pandemic and Racial Disparity

Source: Niall McCarthy, The Pandemic's Racial Disparity, Jul 30, 2020.

Table 1.5 Maternal Mortality Ratio

genetic makeup, they also determine your nutrition and lifestyle during your formative years, provide for your education, and are the basis for many of the work and health habits you carry into later life. Your “personal” choices are as much a reflection of what they wanted for you, and the expectations of the social group where you were born, as of any purely individual preferences or effort. Do you smoke cigarettes? Is that a personal choice or a result of your background and

social group? As a result of a choice have you developed a physiologic addiction to nicotine? All are likely true.

Smoking has been banned on airplanes, trains, and buses, and in office buildings of many firms, universities, and hospitals. Air quality has been improved without paying for pollution control equipment or raising taxes. Does this mean that these improvements in air quality came without a price tag or that no trade-offs had to be made? Of course not. Listen to the smokers gripe or to the complaints of nonsmoking libertarians who worry that the next distasteful behavior to be banned will be drinking, or sex, or gun ownership. While it does not appear that anything has been bought or sold, a transaction has in fact taken place. The opportunity cost of a smoke-free workplace was a discernible, but small, loss of personal liberty. This is the “price” of the gain in air quality. People have made it clear that this is a price they are willing to pay—and just as clear that some measures advocated by health advisors are too costly to be implemented. Even though such collective relationships are inherently complex, involving millions of people, the fundamentals of opportunity cost, budget constraints, and trade-offs still apply.

“Private” and “public” are polar concepts. Few goods are so purely private that they are entirely unregulated regarding safety, ingredients, and disposal, and few goods are so public that there are no differences among individuals regarding use or quality.¹⁴ The economic organization of medical care clusters more services toward the public end than is immediately apparent. Even though each of us goes individually to the hospital emergency room, in a small city we must all go to the same emergency room and get pretty much the same quality of care. The mayor may get better service than a homeless person who is brought in off the street, but the mayor will be operated on by the same surgeon, will be cared for by the same nursing staff, and might end up in the same room as the homeless person. In a large city with many hospitals, there is somewhat more variation, but patients are rarely able to choose their surgeon, nursing staff, or room. Contrast that with the purchase of a coat, a birthday cake, or even a wheelchair, in which there are many more choices and much more individual control over quality. Financing systems also tend to make medical care a public good. All employees in a firm often have the same insurance plan. Therefore, the mail clerk and the executive vice president are equally valued customers of the hospital. Later we will examine how the pooling of funds into insurance for payment of medical expenses can distort choices and obscure budget constraints.

Connecting the public and private spheres are choices made as a group. An informal group (seniors at Hilltop High, friends of the band, libertarians) may exert a powerful social influence, but only formally constituted groups (corporations) that have legal status as fictitious collective “persons” can enter into contracts and create the circular flow of funds (opening a bank account, buying or selling a truckload of cigarettes, hiring an employee, getting sued). Physician groups, insurance plans, hospitals, and nurses’ unions are all corporate entities engaging in medical care. Of particular interest to health economists is why so many of the relevant organizations in medicine are different from those in other markets—licensed professions or nonprofit voluntary hospitals, for example.

1.6 Social Science and Rational Choice Theory

Groups are a pervasive force because humans are *social* beings, working constantly to set up and maintain markets, clubs, governments, medical facilities, and other institutions. Economics, sociology, anthropology, and politics are often lumped together as “social sciences,” but each emphasizes a different perspective to study interpersonal exchange. Economists look first and foremost at markets, and thus concentrate on the formal transactions between people and organizations using money. However, the economic principles developed in studying those transactions can also be used to study the family, group psychology, education, war, the behavior of birds, and health, even when no money is changing hands. The core conceptual tools of economic

price theory—scarcity, investment, maximization, marginalism, equilibrium, cost-benefit—are expressed mathematically as “rational choice theory” and have been popularly applied to other areas, invigorating new fields of study such as sociobiology and neuroeconomics. “Rationality” in economics means that people make choices to make themselves better off (maximize utility, minimize risk) subject to constraints, and organizations make choices to meet their objectives (maximize profits, minimize cost, get elected). It does not mean that people are “perfectly rational” but that they tend to choose in ways that make them better off rather than worse. Rather like “natural selection” in biology, “rationality” is a concept that organizes and guides a field of study rather than a precisely specified term. Just as physics uses the equations of Newtonian mechanics to analyze motion, “rational choice theory” describes actions as if they occurred in a vacuum, without the complications and frictions of the real world. The equations tell us as much, and as little, as knowing that the force of gravity is 32 feet per second squared tells us about the trajectory of a home-run hit or a dancer leaping across the stage. Like gravity, economic rationality and self-interest is always there. It is not the whole story, though, and may sometimes miss the human meaning even as it calculates the path traced by the ball and the ballerina.

What makes “health” economics so special is the focus on humanity. Questions of life and death are as salient as buying and selling. It definitely matters that we are talking about *people* rather than things. Selling human tissue or attaching a patient to a ventilator is not the same as buying chicken fingers or attaching a car to a tow truck. “Behavioral economics” examines what it means that human beings rather than rational calculators are making these decisions, looking at “consistently irrational” behavior such as stock-market bubbles and why people’s willingness to pay for X is often different from the amount they want to receive in compensation in order to give it up, or why a \$1,500 bonus is spent differently than a \$1,500 check from the insurance company. A widely noted application of behavioral economics has been that moving to automatic enrollment (*must check “no” to opt out* instead of *must check “yes” to opt in*) greatly increases the number of employees with 401k plans and total amount saved for retirement. A similar experiment with elderly Medicare part D (drug plan) recipients indicated that, after directing seniors to the relevant price comparison website, those sent a printed letter listing their individual results were more likely (28% compared to 17%) to switch plans and save money. Just as the principles of economics have been used to study politics, mating behavior, and even baseball, the quirks of human psychology can be used to analyze the twists and turns in perception and monetary flows.¹⁵

The effects of medical care on the economy are as profound as the effects of economics on health. Not only has medicine led to better health, greater longevity, and increased productivity, it has also become one of the largest businesses in the world. Investments are made in hospital bonds and biotech stocks to make people better off monetarily, not just better off in terms of health. To those who directly or indirectly earn their living from medicine (physicians, nurses, hospital administrators, equipment vendors, and even health economists), the business aspects—the contracts that are used to allocate health services—are important. The invisible hand plays a role in creating a demand for health economics that is just as powerful, and more direct, than the desire to improve the standard of living and care for the sick.

SUGGESTIONS FOR FURTHER READING

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SUMMARY

1. **Trade** is not the goal of health care; it is the means. For people to get what they want from the system, exchanges between patients and providers must be made. **Health economics** is the study of how those transactions are made and of the bottom-line results.
2. The **terms of trade** are the specifics of a transaction. Only in a very simple exchange are all of the terms of trade captured in the money price. The **fundamental theorem of exchange** states that for a trade to take place, both the buyer and the seller must believe that it makes them better off.
3. **Value** is not inherent in a good, but rather in the trading relationship. **Health care costs so much because people are willing to pay for it.** As a wealthy country, the United States was willing to spend more than 4 trillion dollars in 2020, \$12,118 per person, supporting a dynamic and technologically sophisticated health care system. In health care, value refers to the relationship between outcomes and cost.
4. Health care costs have consistently **risen 2 to 5 percent more rapidly than incomes** and now account for **18 percent of GDP.** Costs are **unevenly distributed.** Seventy percent of total health care dollars are spent on the 10 percent of people who become most ill during a year. Due to the uncertain and uneven distribution of medical costs, most health care is financed by **third-party insurance** intermediaries, which pool and transfer funds. This system replaces the direct exchange of money for services between two parties (consumers and providers), which is common to most markets.
5. Most choices in medicine are made by **professionals** such as doctors (rather than consumers), and these choices are mostly about quality (rather than price or quantity), making the economics of this special market more interesting and complex. **Physicians** account for about 0.6 percent of the U.S. labor force, about the same percentage as in 1880. However, the number of nurses and other health workers per physician has risen from 0.2 to 15. **Hospitals** (31 percent) are the largest users of health care funds.
6. **Government** is the largest provider of health care funds (50 percent). Most **research** into new drugs and therapeutic techniques is financed directly by government or indirectly by cost-shifting overheads added to the prices of hospitals, drugs, and surgery. Although research is very expensive, the forgone **opportunity cost** of not innovating would be much greater. Research, health statistics, airline safety, environmental regulations, and malpractice laws are **public** goods and involve choices that must be made by society as a whole. Pooled financing through insurance can make medical care into a form of public good even though services are provided and consumed in private transactions between doctors and patients.
7. Improvement in **health and longevity** has come mostly from **economic growth, more knowledge, social factors,** and inexpensive **public health** activities rather than the application of expensive medical technology. Insurance and government programs have greatly reduced disparities in the use of medical care between income groups, but **socio-economic differentials in health status have persisted.** Residents of poor neighborhoods are twice as likely to die as are people of the same age and sex who live in wealthy neighborhoods.

PROBLEMS

1. {*economic principles*} What is the opportunity cost of going to a doctor to be examined for skin cancer?
2. {*economic principles*} What is the primary budget constraint facing an 84-year-old billionaire?
3. {*distribution of health expenditures*} Ranking everyone by the amount spent on medical care, 30 percent of the total (all expenditures for all people) is accounted for by the top 1 percent of patients. Take the overall average per capita personal health expenditure and determine how much on average is spent on each of these high-cost patients. The top half of the population accounts for 90 percent of total spending. What is the average amount spent on the remaining people in the bottom half of the distribution? Is the median (i.e., amount spent on the person who is at the middle of distribution, with half of all people spending more, and half of all people spending less) higher or lower than the mean?
4. {*philanthropy, \$ versus percent*} Has the dollar amount of charitable giving for health increased or decreased since 1929? Has the percentage of health expenditures paid for by charity increased or decreased?
5. {*manpower*} Which has increased more rapidly since 1929: the number of physicians or the number of ancillary health workers? As medicine becomes more technologically advanced, which will grow faster: the number of more-skilled workers or the number of less-skilled workers?
6. {*utilization*} Did people go to the doctor more often or less often in 2012 than in 1970? In 1929? Did they spend more or fewer days in the hospital? Why?

7. {causality} Have health expenditures increased because the number of people employed in health care has increased, or has health employment increased because total health expenditures have increased?
8. {causality} Would eliminating research reduce or increase the cost of U.S. health care?
9. {normative and positive judgments} Are public choices better or worse than private choices?
10. {fieldwork} Contact three people and find out how much they spent on health care last year. Try to estimate how much they spent out of their own pockets and how much was spent by their employers, insurance companies, or the government. Did the people with more serious health problems always end up spending more of their own money on health care? Did they personally end up paying a larger or smaller percentage of their total health bills out of pocket?

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