# Economic Dimensions of the Healthcare System

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**OBJECTIVES**

1. Identify the key economic units in the healthcare market.
2. Describe the flows of money and services in an uninsured and an insured healthcare market.
3. Describe the flows of money in the Medicare and Medicaid programs.
4. Describe the flows of money and services in a health maintenance organization and a preferred provider organization.
5. Describe the meaning of managed care and how it may affect the flow of services in a healthcare market.
6. Define the concept of cost.
7. Identify the key components in the cost of healthcare services.
8. Understand the growth of costs in the American healthcare system over time.
9. Compare the magnitude of healthcare costs in the United States to other developed countries.
10. Understand the concept of "cost of illness" or "economic burden of illness," and describe how cost-of-illness studies have helped us to understand the overall impact of various illnesses in the United States.

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## 2.1 INTRODUCTION

The purpose of this chapter is twofold: to introduce readers to some basic concepts used in describing healthcare activity and to provide a description of some of the key elements of health care in the United States. To achieve its purpose, it focuses on three aspects of economic activity. First, it will examine the basic economic units that participate in the healthcare economy. Second, it explains how simple flow analysis can be used to describe the economic

relationships among the various units. Finally, it presents the concept of economic cost, which is used in measuring the amount of economic activity performed to produce economic output, as well as the potential impact of illness.

It should be pointed out that this chapter describes what happens over time as a result of activity in the healthcare economy. It identifies the economic units and their characteristics and describes the flows of money and services that occur.

Section 2.2 identifies the main "actors" in our analysis—the economic units of the healthcare sector—and describes some of their central characteristics. It also identifies the concepts economists use to study how these units are organized. Finally, using flow diagrams, it shows how transactions among the various economic units can be understood.

Of considerable importance is the measurement of the magnitude of economic activity. Section 2.3 elucidates the concept of "economic cost," which is a measure of economic activity in terms of money. This concept is used to measure various aspects of healthcare activity, including the total expenditures on healthcare services, the total economic costs of illness, and the burden of economic costs on various groups.

## 2.2 ECONOMIC UNITS AND ECONOMIC FLOWS

### 2.2.1 Economic Units

Units observed for economic analysis include individuals and organizations. In examining the activity of consuming health care, one can take the economic unit to be an individual or a household. Both alternatives are commonly employed by economists in describing and explaining economic activity. One reason the household is so frequently used is that more consistent data can be collected at this level. For example, if one examined housewives' consumption of health care in relation to their *personal* incomes, a biased picture of the relationship might emerge, because their consumption of health care is more closely related to the income of their households. The roles of individuals include those of demanders of health care and health insurance, employees, and taxpayers. Employers are also economic units in the healthcare system, primarily in their role as demanders of healthcare insurance for their employees.

Insurers are firms that have the function of taking on the healthcare expenditure risk of their customers. They collect premiums from their customers and reimburse the providers for the care they provide for their customers. Providers of health care can include physicians, nurse practitioners, nurses, hospitals, long-term care facilities, and providers of various forms of ambulatory care.

There has been a trend in recent years toward the integration of units. "Horizontal integration" is a term that refers to the joining together of providers (and sometimes consumers) of the same type. Physicians have joined group practices. Hospitals and long-term care facilities have joined chains. And there have been some instances of small businesses joining together to form group purchasing cooperatives for health insurance. There has also been

a considerable movement toward "vertical integration," which is the amalga-mation of purchasers and sellers. Insurers and providers have joined together to create health maintenance organizations (HMOs).

## 2.2.2 Flows Between Units

Economic flows can involve both money and services. Generally, a flow will summarize a transaction in which a service or good is exchanged for money. Such transactions occur in simple markets, with the degree of con-centration influencing the terms of the exchange. The market for lettuce is a simple market in which vendors provide lettuce to consumers in exchange for money. The exchange is at a price that is determined, in part, by how concen-trated the vendor market is. In this section, we are concerned with describing which flows take place, not with the terms of the transactions. Further, as we shall see presently, the flows in typical healthcare markets are much more complex than those in markets for lettuce because they often contain two sets of flows—one for insurance and one for healthcare services.

### 2.2.2.1 Flows in a "Generic" Healthcare Market

The flows in a simple, or "generic," healthcare market are shown in Figure 2-1. In this market, consumers purchase health insurance from insur-ers. The cash payments by the consumers and employers are called *premiums*. When a consumer uses services that are covered by the insurer, the insurer *reimburses* the provider for the services.

The contract between the insurer and the consumer can have another very important dimension. The consumer can purchase varying degrees of insurance coverage. If the consumer is partially covered, the insurer reimburses the provider for only a portion of the bill; the consumer must pay the remainder. The consumer's portion is called a *copayment* (or an *out-of-pocket payment*). If the consumer is fully insured, there is no
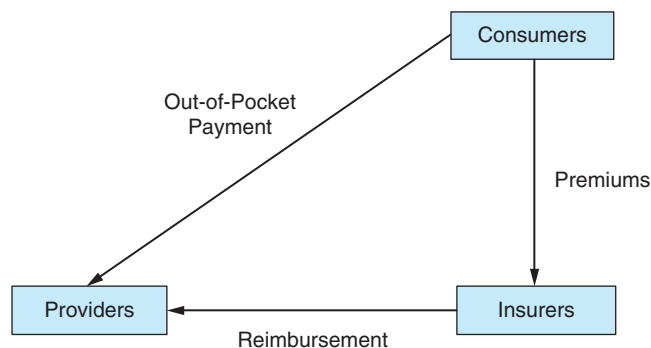


**Figure 2-1**   Flow of Funds in a Typical Healthcare Market. Consumers purchase insurance from third-party insurers, who pay providers for services. Providers include physicians, hospitals, nursing homes, and other healthcare organizations, and professionals.

out-of-pocket payment. The reimbursement provided by the insurer is payment in full for the services.

The economic importance of out-of-pocket payments is that they are borne by the consumer. It is this cost that governs the consumer's decision as to how much of the service he or she demands. Among the types of direct consumer payments are deductibles, which are fixed upfront payments; and coinsurance, which are payments related to quantity used. For example, an insurance policy might have a deductible of $200 and a coinsurance rate of 10%. This means that the consumer pays the first $200 for services rendered before insurance coverage begins. After the deductible is used up, the consumer pays 10% of the bill and the insurer reimburses the other 90%. Typically, hospital care has the highest coverage, with over 95% of expenses being covered; physician care has a lower degree of coverage (91% on average), and nursing home care has less still (71%).

With regard to insurer payments, there are numerous bases on which providers can be reimbursed. Hospitals can be reimbursed on the basis of a given budget or on a unit basis—per patient day, per case, or per service. Over the decades, there has been a movement on the part of insurers toward reimbursing hospitals on a per-case basis, recognizing differences in resource use among different case types. In this instance, hospital cases are categorized into *diagnosis-related groups* (DRGs), and a separate reimbursement rate is set for each DRG. Each time a patient is admitted to the hospital, the hospital is paid a rate corresponding to the patient's particular DRG. Physicians are largely reimbursed on a fee-for-service basis, and long-term care facilities on a per diem (per day) basis.

### 2.2.2.2 Introducing the Employer

In 2011, only about 58% of all private health insurance was provided through employers (Kaiser Family Foundation, 2011). A basic set of flow relationships for employer-provided health insurance is shown in Figure 2-2. In these circumstances, both the employer and the employee pay a share of the premiums. Typically, the employer pays about three-fourths of the premium, although the percentage will vary depending on the plan and upon the size of the firm. In 2011, the number of employers offering insurance to employees was still only about 60%, down from the 69% in 2010, but similar to the 2009 figure. (Kaiser Family Foundation, 2011).

Note that the employer's share of the premiums is not a "free" benefit given to the employee; it is, rather, a form of compensation received by the employee. Total compensation takes the form of money benefits (wages) and nonmonetary benefits, such as health insurance coverage. From a financial standpoint, the employer is affected the same by either form of compensation: a dollar in wages costs the same to the employer as a dollar in noncash benefits. But the employee will have a preference because of income tax regulations. In 2011, average family premiums for health insurance exceeded $15,000, and premiums for an individual were over $5,400 (Kaiser Family Foundation, 2011).
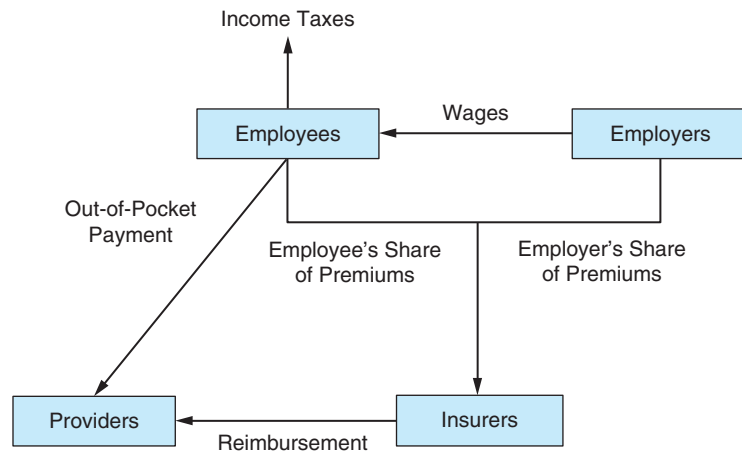
**Figure 2-2**   Healthcare Services and Insurance Markets with Employer-provided Health Insurance. Employers and employees typically share premiums. Health insurance premiums are a tax-free benefit to the employee.

Unlike wages, many noncash benefits are not subject to income tax. Thus, noncash benefits, such as health insurance, are cheaper to obtain if they are "purchased" through an employer rather than paid for out of after-tax income. As an example, assume that a family's tax rate is 20% and that the family wants to buy $100 of health insurance. If the employee takes compensation in the form of wages, the employee must earn $125 in order to have $100 after paying the 20% tax (20% of $125 is $25). The employee need earn only $100 if compensation is taken in the form of benefits. Or put another way, $100 of compensation in the form of nontaxable benefits will buy more health insurance than the employee could with $100 in wages. The economic importance of this is that present taxation arrangements make health insurance cheaper and encourage more of it to be bought.

It was mentioned earlier that when economic units are bigger or have a larger share of the market, they may be able to obtain better terms when selling or purchasing services. One type of arrangement that has been increasing in importance is the employer coalition, which is formed by businesses in local markets. Coalition members share information on provider prices, utilization trends, and so on, and they also cooperate with each other in developing benefit designs (e.g., common copayment arrangements). The original purpose of forming coalitions was to develop a sort of countervailing power in the market so that the buyers—the employers—would be able to exert some degree of market influence over price (McLauchlin, Zellers, & Brown, 1989). Another type of arrangement is the health insurance purchasing coalition (HIPC), which is a coalition of purchasers of insurance designed to garner the benefits associated with group purchasing (Reinhardt, 1993). HIPCs have been set up in some states to improve the access of smaller purchasers to health insurance.

The Patient Protection and Affordable Care Act, passed in 2010, provided funds to states to establish high-risk insurance pools to provide access to uninsured individuals with preexisting medical conditions who had been unable to obtain private health insurance coverage in the past because of these conditions. The intent of these temporary high-risk insurance pools (officially called the Preexisting Condition Insurance Plan) is to fill the gap until 2014, when insurance companies will no longer be able to deny coverage or charge excessive premiums to individuals because of their preexisting medical conditions. Beginning in 2014, consumers with preexisting conditions will be able to access affordable care through health insurance exchanges, which are also being established by the Affordable Care Act. Under the reform law, the premiums are set to not exceed 100% of the standard nongroup rate in the state and cannot vary by age by more than 4 to 1. While many states had offered different forms of high-risk pool insurance plans in the past, the premiums charged by these plans (usually 125 to 200% of prevailing individual market premiums) were still often prohibitive for individuals, effectively shutting them out of the insurance market.

### 2.2.2.3 Medicare

Many individuals are insured by government programs. Medicare is a program of the federal government that covers individuals 65 years old and over, certain disabled groups, and individuals with certain kidney diseases. Medicare is a form of limited national health insurance. The essential flows in Medicare are shown in Figure 2-3.

Medicare currently has four parts. Part A, Hospital Insurance (HI), helps cover inpatient care in hospitals, skilled nursing facilities (for limited services, not long-term care or custodial care), hospice, and home health care.
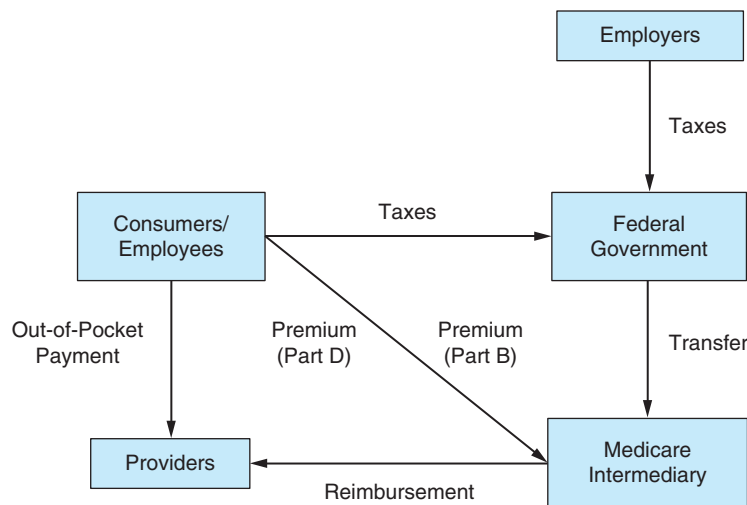


**Figure 2-3**    Medicare Part A, B, and D Flows. Consumer and employer taxes include the payroll tax, which is paid into the Hospital Insurance Trust Fund (part of the federal government). Medicare enrollee premiums are only for Parts B and D.

If an individual has paid Medicare taxes while working, there is no premium associated with enrollment in Part A (see Figure 2-3 for essential flows in Medicare). Eligible individuals are automatically enrolled in Part A upon obtaining eligible status. Part A is largely financed by a federal payroll tax paid by both employers and employees. In 2011, this tax was 2.9% of every dollar of salary and wages (taxable earnings); the employee's rate was 1.45%, as was the employer's rate. These taxes are placed in the Hospital Insurance Trust Fund, forming the bulk of the revenues for funding hospital and other institutional expenditures.

Because of the way the Trust Fund was established, it cannot be supplemented, to any great extent, by other forms of receipt, such as general taxes, without major changes in the legislation. Because expenditures from the fund have been greater than tax revenues, there are concerns that the Trust Fund will be bankrupt soon. The projections made in the 1980s regarding potential deficits by the end of the century led to major changes in the 1990s in the method by which Medicare reimbursed hospitals, converting from a cost-based reimbursement system to the prospective payment system based on DRGs. In addition, beginning in 2013, the healthcare reform law increases the Medicare HI payroll tax for higher-income taxpayers by 0.9 percentage points, in which higher-income taxpayers are defined as earnings of more than $200,000 per individual and $250,000 per couple.

Although Part A Medicare has no premiums, the level of copayments is high. In 2010, there was a deductible of $1,100, which covered the first 60 days of care for each spell of illness, and for anyone needing 61 to 90 days of hospitalization, there was a copayment of $275 for each day. If someone exceeded 90 days of care during a year, they could draw upon a lifetime reserve totaling 90 days. For many enrollees, the out-of-pocket payments have been considerable, and many individuals have purchased a private form of insurance called *Medigap*, which covers Medicare direct expenses. For individuals needing long-term facility service, there was a payment required in 2010 of $137.50 per day for days 21 through 100; home health requires no copayment.

Medicare Part B is the Supplementary Medical Insurance (SMI) program, and it helps pay for physician, outpatient, home health, and preventive services. It also pays for ambulance services, clinical laboratory services, durable medical equipment, outpatient mental health care, kidney supplies and services, and diagnostic tests. Enrollment in Part B is voluntary, and does require a monthly premium; the premium was $110.50/month in 2010, although 73% of beneficiaries were not required to pay the increase from the 2009 amount of $96.40 because there was no cost-of-living increase in Social Security benefits. The Affordable Care Act also added a free annual comprehensive wellness visit and personalized prevention plan to the benefits. The Act also added an income-related monthly Part B premium for individuals with annual incomes greater than $85,000 and for couples with incomes of $170,000 in 2010; this premium ranged from $154.70 to $353.60 in 2010. The reform law freezes these thresholds at 2010 levels through 2019. In addition, Part B benefits include an annual deductible ($155 in 2010), and most Part B services are subject to a coinsurance of 20%, although, beginning in 2011,

no coinsurance and deductibles will be charged for preventive services rated as A or B by the U.S. Preventive Services Task Force (USPSTF). Revenues for Part B come from premiums, copayments, and general taxation.

Part C, Medicare Advantage (MA) plans, are private health plans that pay for Medicare benefits under Part A, Part B, and Part D. Medicare Advantage enrollees typically pay the monthly Part B premium plus an additional premium directly to their plan. While health maintenance organizations were originally an option, other private plans are now covered. In 2010, areas in which the plans were available offered, on average, 33 different plans from which beneficiaries could choose. These plans provide all benefits covered under traditional Medicare, plus many offer additional coverage, including prescription drugs. Plans must use any extra payment they receive (rebates) to provide additional benefits, such as lower premiums, lower cost sharing, or vision, hearing, preventive dental care, podiatry, chiropractic, and gym memberships. In 2010, the weighted monthly premium was $48.

The Medicare Prescription Drug, Improvement, and Modernization Act (MMA) was enacted in 2003, creating Medicare Part D, a voluntary outpatient prescription drug benefit plan that began in 2006. Enrollees in Part D generally pay a monthly premium; the plan is also funded through general revenues. Part D is very complex in terms of coverage and implementation. The law requires a standard benefit that must be covered or an alternative equal in value (actuarially equivalent); enhanced benefits can also be offered, and most Part D plans have a coverage gap, called the "doughnut hole." In 2010, there was a $310 deductible and 25% coinsurance up to an initial coverage limit of $2,830 in total drug costs under the standard benefit. Enrollees then paid 100% of their drug costs until they spent $4,550 out of pocket, not including premiums. Then the individual pays 5% of drug costs or a copayment of $2.50 per generic prescription or $6.30 per brand prescription for the rest of the year. The standard benefit amounts increase annually by the rate of per capita Part D spending growth. The health reform law provides enrollees with any spending in the doughnut hole in 2010 with a $250 rebate and gradually phases in coverage in the gap between 2011 and 2020.

### 2.2.2.4 Medicaid

Medicaid (Figure 2-4) is a joint cooperative federal-state program introduced in 1966 to cover certain low-income and categorically defined individuals. Federal guidelines set basic minimum criteria for eligibility, but each state's program is unique and operates differently. Medicaid is the largest health insurance program in the country. States set their own eligibility requirements within the federal parameters; select the services that will be offered and specify the amount, duration, and scope of services; design delivery systems; determine payments for services; and administer the program. To secure Medicaid eligibility, the person must be in one of the statutorily recognized categories or eligibility groups. There are six broad coverage categorical groups: children, pregnant women, adults in families with dependent children, adults and children with disabilities or are blind, and older persons. In addition, Medicaid is a means-tested entitlement program, and so individuals who meet the categorical criteria must also have incomes below the
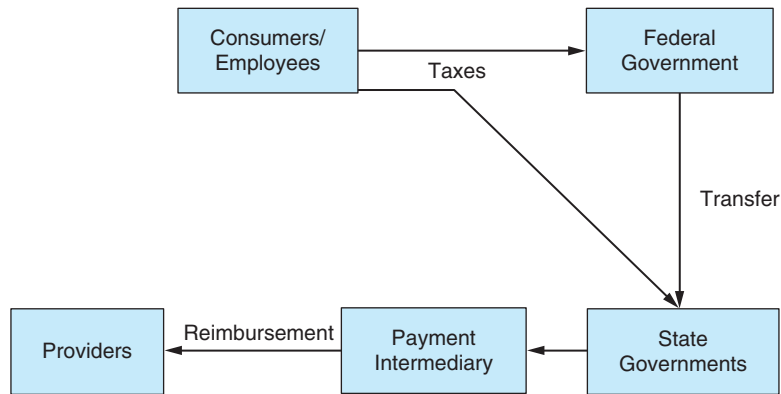
**Figure 2-4**  Flow of Funds for Medicaid Program. Federal government transfers to state governments are for federal share of the combined state-federal program. Beneficiaries pay no premiums, and direct consumer payments are minimal to providers.

income standard for the category. Because of the complicated combinations of categorical and financial factors, the mixture of mandates and options, and discretion afforded each state, eligibility varies considerably state-to-state. Federal policy, however, generally prevents Medicaid eligibility being extended to childless, nondisabled, nonelderly adults, and individuals who have primary addictive disorders, regardless of income. Currently, Medicaid covers more than two-thirds of all nursing home residents.

The Balanced Budget Act of 1997 created the State Children's Health Insurance Program (S-CHIP) to assist states in providing insurance coverage to low-income children who were not eligible for Medicaid but couldn't afford private insurance. In 2009, the Children's Health Insurance Program (CHIP) Reauthorization Act was passed and prohibits states from implementing eligibility standards, methodologies, or procedures that are more restrictive than those in place as of March 23, 2010, with the exception of waiting lists for enrolling children in CHIP. Under health reform, CHIP is maintained through 2019.

The Affordable Care Act contains provisions for dramatic expansion of the Medicaid program. Almost half of the expected gains in health insurance coverage under health reform are expected to be achieved through expansions in the Medicaid program. Historically, nonelderly adults without dependent children were not eligible for Medicaid. Under the health reform law, the categorical exclusion of these adults ends in 2014, expanding Medicaid eligibility to reach adults under 65, and provides states the option of beginning the coverage in 2010 instead of waiting until 2014.

### *2.2.2.5 Health Maintenance Organizations*

Managed care refers to forms of insurance coverage in which enrollee utilization patterns and provider service patterns are monitored by the insurer, or an intermediary, with the aim of containing costs. An HMO is one type of managed care organization.

Payment of most HMO premiums are on a "capitation" basis. That is, there is a set fee for each enrollee, and the HMO receives a single annual amount for each enrollee, whether it provides much or little care. This form of payment puts the HMO at risk for all expenses incurred when serving enrollees, which incidentally means that the HMO serves as an insurer as well as a provider. Enrollees in HMOs may also be expected to pay a small copayment amount (e.g., $10) each time they visit a provider.

Traditionally, an HMO had one of two forms: either it was a self-contained unit that functioned as insurer and provider, or it was an amalgamation of private practice physicians (called an independent practice association) who were separately reimbursed by the HMO on a discounted fee-for-service basis. Recently, several new forms of HMOs have sprung up, many owned by traditional insurance companies, such as Blue Cross or commercial companies. These new types receive the capitation fee and contract out for services with providers that the HMO enrollees use.

One of the salient features of any HMO is the restriction of access to providers. Whereas under traditional coverage individuals can go to any provider, enrollees in an HMO must use a group of designated providers in order for the services to be covered. This closed-panel arrangement allows the HMO to monitor the providers and possibly have some impact on provider behavior. The providers on the panel may be employees of the HMO or contractors; in either case, monitoring providers is more likely to be feasible than if the enrollees have an unrestricted choice of providers. Such monitoring can potentially encourage providers to practice in a more conservative, less costly manner.

Beginning in the 1980s, HMO enrollment expanded rapidly, reaching a peak in 1999. In 2010, an estimated 66 million individuals had HMO-type coverage. HMO coverage is offered to enrollees of Medicare and Medicaid, as well as those who are traditionally covered. A simple flow diagram for HMO coverage is presented in Figure 2-5. Typically, HMO receipts would include employer contributions as well. It should be noted that, unlike in the case of traditional insurance coverage, there is typically no pass-through from insurer
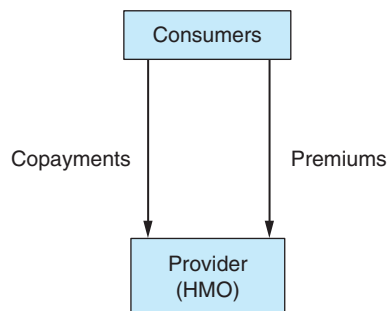


**Figure 2-5**   Flow of Funds for an HMO. Consumers pay premium to the HMO, which is also the provider. Copayment levels vary among plans, and some plans do not require any copayment.

to provider; the insurer is, in essence, the provider. However, there are some types of HMOs that do contract with independent providers.

### 2.2.2.6 Preferred Provider Organizations

A major drawback of HMO coverage is that enrollees can only choose from a limited panel of providers to have services covered. In many cases, an enrollee may be attached to or prefer a specific physician. If the physician is not on the provider panel, the enrollee must pay the provider's full price. Preferred provider organizations (PPOs) were designed to expand consumer choice while maintaining many of the monitoring benefits of managed care.

A PPO will contract with certain providers ("preferred providers") who agree to charge lower prices and submit to utilization monitoring in exchange for being designated as a preferred provider (see Figure 2-6). The PPO will then contract on behalf of these providers with insurance companies to gain their business. The insurers offer their enrollees a dual pricing system—one price for those who use the preferred providers and a higher price for those who use nonpreferred providers. This price differential might take the form of varying copayment rates; for example, a low (or zero) copayment rate for those who use the preferred group and a higher direct payment for those who use nonpreferred providers. This creates an economic incentive for the consumers to use the preferred group, but it allows partial coverage when a consumer chooses a nonpreferred provider.

Preferred providers gain from the fact that they will likely get a greater volume of business from the enrollees. Their agreeing to submit to some form of utilization monitoring will, if the monitoring is successful, translate into lower utilization patterns and lower premiums, which, in turn, translates into savings for the employer and employees.
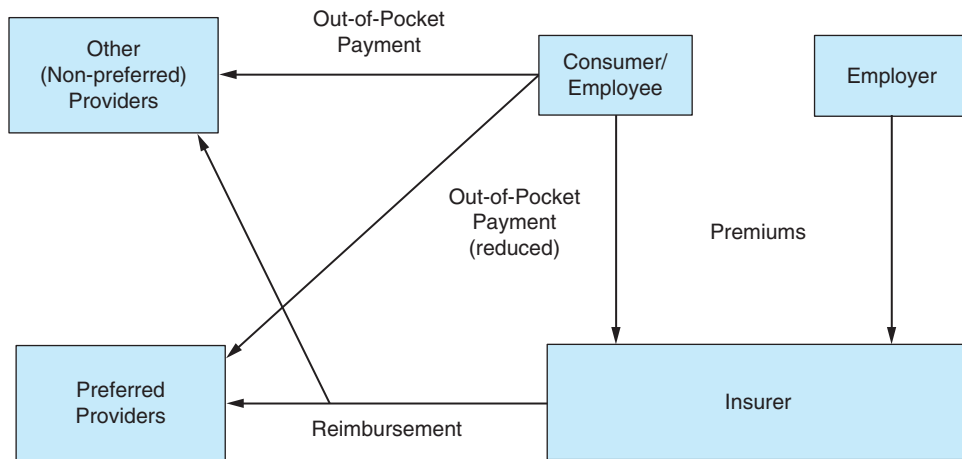


**Figure 2-6**  Outline of Flows in a Preferred Provider Arrangement. The preferred provider organization (PPO), not shown, arranges the preferred reimbursement rate from the preferred providers and conducts reviews of utilization. The PPO could be the preferred provider, the insurer, or an independent organization.

A PPO can be a separate contractor that receives a fee from the insurer. It can be part of the insurance company itself, or it can be owned by provider groups and used as a marketing mechanism. In fact, there are many types of PPOs. What distinguishes them from HMOs is their allowance of greater choice of provider. Recently, however, HMOs have been relaxing their closed panel restrictions in favor of coverage that is more similar to PPO coverage. An HMO that allows members to seek care from nonpanel providers for a differential fee is called a point-of-service (POS) plan.

PPOs have been growing in popularity in recent years. Between 1993 and 2011, the proportion of all insured persons who were enrolled in PPOs increased from 26% to 55% (Kaiser Family Foundation, 2011). In fact, their popularity has earned them a place in a popular health insurance package now offered by many employers: the "triple option" package. With such a package, the employer offers each employee a choice among types of coverage: traditional coverage, HMO coverage, and PPO coverage. In order to make the three types roughly comparable, the employer can alter the out-of-pocket payments and employee premiums. For example, for traditional care (the least restrictive in terms of consumer choice) the employer might set higher copayments and premiums, and enrollees who choose the more restrictive managed care options might be offered lower copayments and premiums.

### 2.2.2.7 The Meaning of Managed Care

Managed care is most frequently associated with HMOs and PPOs, because these types of organizations were the first to try to control the utilization of care. In a traditional HMO, providers are typically employed by the HMO or are contractually tied to it and subject to some degree of regulation. More recently, indemnity insurers have also introduced regulatory controls over providers, such as second-opinion requirements for surgery, length-of-stay reviews, and drug formularies. Providers transact with indemnity insurers at arm's length, and so indemnity insurers have had to develop such mechanisms to restrain utilization. Also, HMOs have been changing in form. In many cases, providers are more loosely tied to the HMO than has been true historically. In this type of arrangement, controlling utilization requires the establishment of contractual mechanisms. For example, providers who serve HMO members often have to obtain permission from the HMO before initiating expensive therapies in order for the services to be covered.

The regulatory function of indemnity and contractual HMOs is shown in Figure 2-7. In this diagram, the financial flows are shown as before. The flow of services from the providers to the consumers is also shown. A dotted line from the insurer to the service flow line indicates the care-management function established by the insurer. Under managed care, the service flow is regulated.

In order to set standards for providers, HMOs engage in profiling, which involves collecting comparative data on the treatment patterns of providers. Using this information, the insurers can set benchmarks that can be used to regulate the utilization of care. In addition to specific controls on services, managed care organizations can also affect utilization through choosing providers to employ or with whom to contract. A cost-efficient practice style may be one characteristic such an organization is seeking when recruiting new providers.
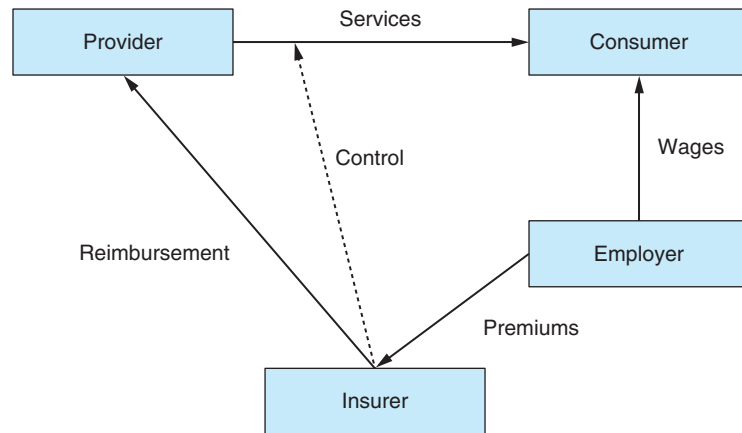
**Figure 2-7** Flow of Money and Services that Are Consistent with any Insurance Arrangement. What is added is a control function by which the insurer establishes some form of control over the provider, thus regulating the flow of services from the provider to the consumer.

## 2.3 COST OF ACTIVITIES

Having identified productive activities as efforts involving resource inputs whose aim is to create goods or services we now need to find some common measure. The concept of cost is often used. In the context of a flow, cost is taken to be the magnitude of the resources devoted to an activity during a given period of time. Several different meanings can be attached to this concept. One definition of cost is the money outlay, or expenditure, that has been paid to the providers for their services. For example, if an optometrist performs an eye pressure test, the money cost is simply what is paid for the optometrist's services. Money cost is a convenient way to measure the magnitude of an activity, but it is not always a complete measure. The same optometrist may do the same test for free; in this case, the money cost would be zero. Yet some activity has taken place, and this activity has used scarce resources.

In the healthcare sector, there are many examples of free (i.e., zero money cost) services. Clinical teachers in medical schools frequently donate their efforts. Volunteer collectors for such organizations as the American Heart Association, United Way, and March of Dimes donate their time. The notion of *opportunity cost*, defined as the value of the most valuable alternative course of action given up for the chosen course of action, is used as a measure that does not depend on whether providers are paid in money for their services. Opportunity cost is relevant when a resource has several alternative uses. If the resource is used in activity A, the opportunity cost is what that resource would have earned if it had been used in alternative activity B, in which B is the highest valued alternative employment for that resource. For example, if an optometrist who performs a refraction for free in a clinic could have obtained a fee of $100 had he or she performed it in the office, by valuing this service at $100,

**Table 2-1**   National Health Expenditures by Type of Service, United States, 2010

| Expenditure Category | Amount (billions of dollars) | Percent of Total |
|---|---|---|
| National Health Expenditures | 2,593,644 | 100.0% |
| Health Consumption Expenditures | 2,444,600 | 94.3% |
| Personal Health Care | 2,186,013 | 84.3% |
| Hospital Care | 814,045 | 31.4% |
| Professional Services | 688,625 | 26.6% |
| Physician and Clinical Services | 515,483 | 19.9% |
| Other Professional Services | 68,357 | 2.6% |
| Dental services | 104,785 | 4.0% |
| Other Health, Residential, and Personal Care | 128,533 | 5.0% |
| Home Health Care | 70,172 | 2.7% |
| Nursing Care Facilities & Continuing Care Communities | 143,078 | 5.5% |
| Retail Outlet Sales of Medical Products | 341,559 | 13.2% |
| Prescription Drugs | 259,061 | 10.0% |
| Durable Medical Equipment | 37,736 | 1.5% |
| Other Non-Durable Medical Products | 44,762 | 1.7% |
| Government Administration | 30,069 | 1.2% |
| Net Cost of Health Insurance | 146,029 | 5.6% |
| Government Public Health Activities | 82,489 | 3.2% |
| Investment | 149,045 | 5.7% |
| Research | 49,267 | 1.9% |
| Structures and Equipment | 99,778 | 3.8% |

*Source:* Derived from Centers for Medicare & Medicaid Services, NHE60-10_Final.csv. Accessed on April 4, 2012 from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html.

we make it comparable to services performed for a fee. Whenever a service is provided at a price below its alternative value, the money cost will not take into account the portion of cost that is, in effect, subsidized; opportunity cost is a better measure of the true size of the total resources committed to an activity.

Costs can be categorized, among other ways, as direct or indirect. *Direct costs* are money expenditures, while *indirect costs* (also called *lost-productivity costs*) are unpaid resource commitments. Although these are unpaid, they may still have significant opportunity costs.

Table 2-1 shows the value of all direct national health expenditures for one year (2010) in the United States (Centers for Medicare and Medicaid, 2010). These expenditures amount to $2,593.6 billion. The largest portion of funds went to hospital care (31.4%), followed by physician care (19.9%). The prescription drug portion has been growing considerably, and in 2010, it equaled 10.0% of the total. In 1980, it had been only 4.7% of the total.

The growth in health expenditures, on a per capita basis, is shown in Figure 2-8. Since 1970, the growth has been steady. In 1990, health expenditures equaled $2,853 per person. By 2010, they had reached $8,402 per person.

A frequently used benchmark for health spending is total health spending expressed as a ratio of the total of all final goods and services produced in the economy during a year (the gross domestic product [GDP]). In 2010, the ratio for the United States was 17.9%. That is, of all final goods and services, 17.9% were healthcare services. The ratio of national health expenditures to the GDP is generally considered a critical indicator of resource use in the healthcare
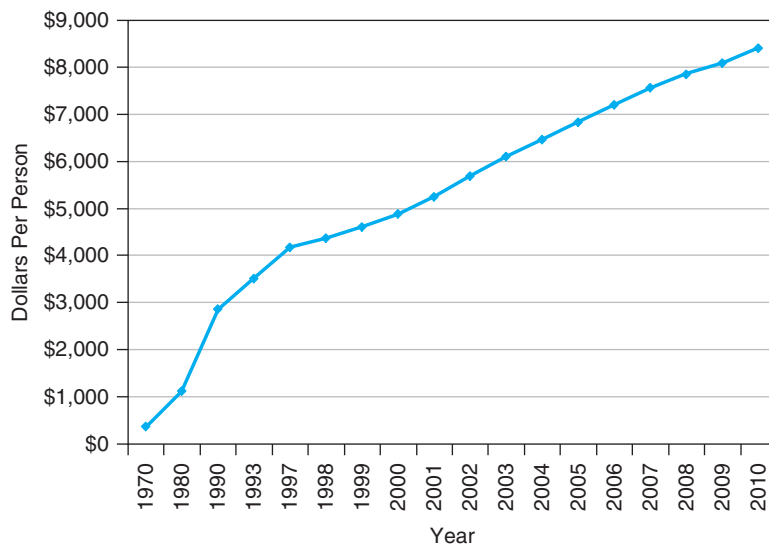


**Figure 2-8**   Per Capita Health Expenditures, United States, 1970–2010.

*Source:* National Health Expenditures Tables, Table 1, Centers for Medicare and Medicaid Services. Accessed April 4, 2012 from http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/tables.pdf.

**Figure 2-9**   National Health Expenditures as a Percent of Gross Domestic Product (GDP), United States, 1970–2010.

*Source:* National Health Expenditures Tables, Table 1, Centers for Medicare and Medicaid Services. Accessed April 4, 2012 from http://www.cms.gov/ResearchStatistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/tables.pdf.
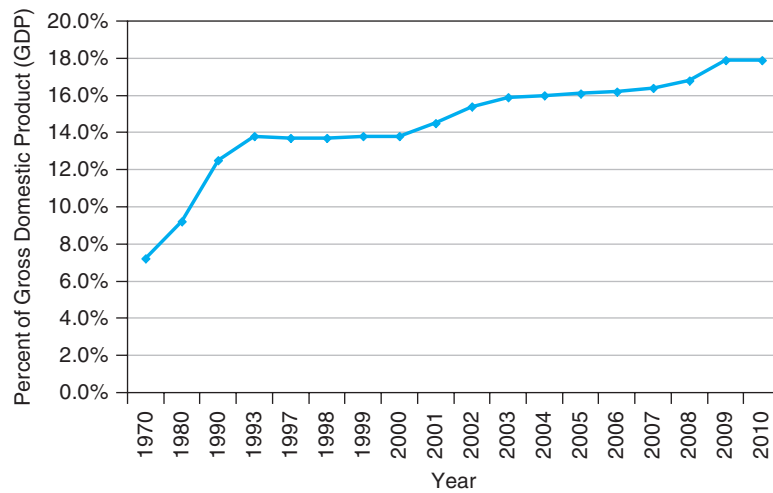
sector. In fact, as seen in Figure 2-9, this ratio had been growing steadily and significantly over the past several decades (Centers for Medicare and Medicaid, 2010). While there was a relatively stable period in the mid to late 1990s, when government spending was reduced, there has been a rapid increase the past couple of years, reflecting the depressed economy. As seen in Figure 2-8, per-capita spending on health care was unabated after 1993. In fact, the national economy experienced tremendous growth during the 1990s, and this increase (which is the denominator in the ratio of health spending to GDP) helped reduce the ratio. In recent years, the ratio has increased again. When compared with other developed countries, the United States has a very costly healthcare system. As can be seen in Figure 2-10, the health spending to GDP ratio is much lower for other countries (World Health Organization, 2011). In Germany, in 2008, for example, the ratio was 10.5%, in Japan it was 8.3%, and in the United Kingdom it was 8.7%. Investigators have focused on this statistic as an important indicator of the economic performance of the healthcare system (Anderson, 1997).

The data provide us with some idea of the direct costs of services provided. They do not, however, provide an indication of the total "burden" of costs—direct and indirect—that falls on all members of society as a result of illness. This total measure composes what are called the *social costs*.

Ideally, a cost-of-illness study will include all of the relevant resources that are influenced by the illness. The economic effects of illness can be experienced for years, and they can have a very broad impact in terms of the types of resources that are affected.
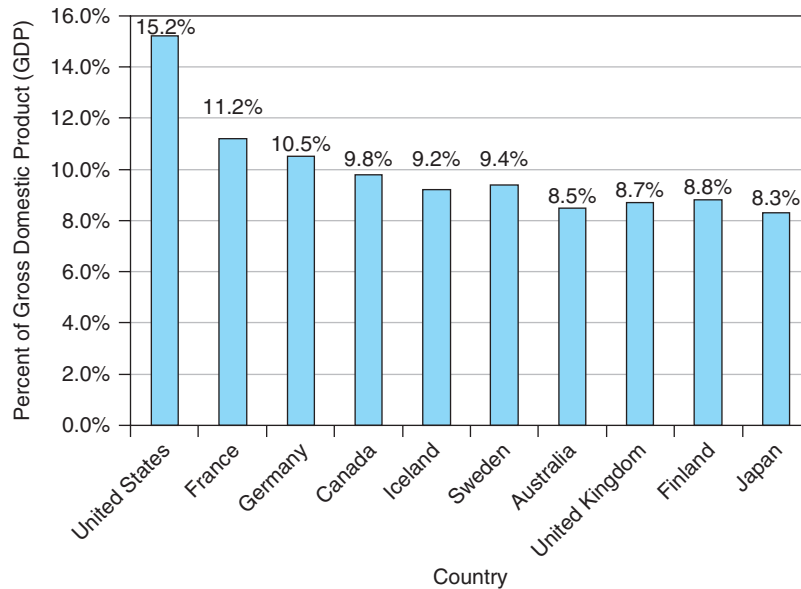
**Figure 2-10** Health Expenditures as a Percentage of GDP, Selected Countries, 2008.

*Source:* Reprinted with permission from: World Health Organization. World Health Statistics, 2011. Geneva Switzerland. Accessed April 19, 2012 from http://www.who.int/whosis/whostat/EN_WHS10_Full.pdf and http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf.

An illness can be diagnosed years after it was acquired. For example, a person can be affected with the hepatitis C virus for many years before finally being diagnosed. It is only when he or she has been diagnosed that one can measure the economic impact of the illness. Furthermore, the illness can generate economic costs for years after it has been diagnosed, even after the person has died. Chronic diseases last for years, and resources can be used as long as an illness lasts. If the person with the disease dies prematurely because of the disease, earnings that would have been experienced, but were not, are an indirect cost and part of the economic picture. The following resource components might be affected by the illness: healthcare resources used in diagnosis and treatment (also called *direct care costs*); direct nonhealth resources, such as transportation, special diets, and household goods; patient loss of work time due to illness and injury (also called *indirect care costs*); and other related indirect costs, such as work time lost by unpaid caregivers. The collection of all of these data is expensive, and so most studies will not include all the components.

Cost-of-illness studies can be conducted on a prevalence or incidence basis. With a prevalence basis, the annual costs of all existing cases during a year (including newly and previously diagnosed) are included. The future mortality-related costs for all persons with the disease who died during the year are also included (Rice, 1990). In contrast, an incidence-based analysis

includes all present and future costs *only for cases newly diagnosed during the year*. In theory, one can also conduct an incidence-based analysis for cases that were contracted during the year, although this is seldom done for chronic diseases because of a lack of data. The cost of a premature death would include the lost work time from future deaths.

The prevalence approach is useful for budgeting purposes. For many purposes, the incidence approach is preferred, although it is much easier to obtain prevalence data than incidence data. If we are conducting a study on the economic effects of preventing or detecting illness, we should obtain data on the costs of all downstream events of the illness. The incidence approach would provide that information. If we used the prevalence approach, we would be obtaining the cost of many of the cases in midstream.

Data on the cost of several of the more economically important illnesses are shown in Figure 2-11. The costliest condition is injuries, with direct costs of $145.1 billion and indirect costs of $556.8 billion. The disease with the highest direct medical costs is heart disease, with annual costs of $257.6 billion. However, persons who suffer from injuries are generally younger than those who suffer from heart disease, and so their indirect costs are higher. Diabetes and cancer have roughly the same total cost of illness, but diabetes generally occurs in older persons, and so the ratio of direct to
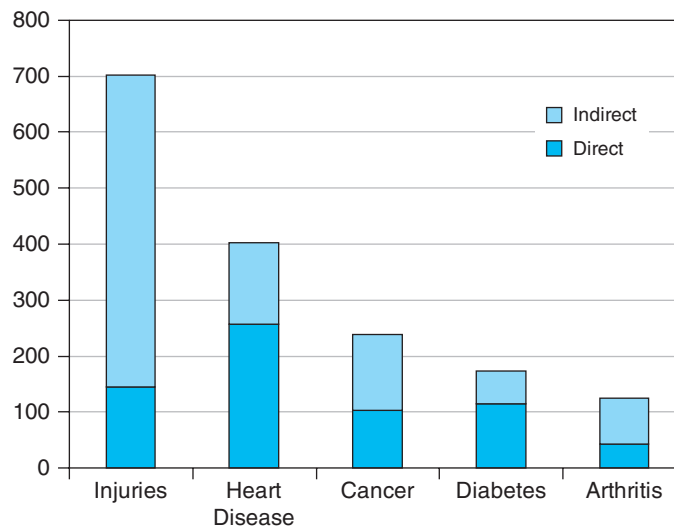


**Figure 2-11**    Cost of Illness, Selected Diseases, United States, c. 2006.

*Source:* DeNavas-Walt, C., et al. US Census Bureau, Current Population Reports, P60-238, Income, Poverty, and Health Insurance Coverage in the United States: 2009, US Government Printing Office, Washington DC, 2010. Department of Health and Human Services. Fact sheet–Temporary High Risk Pool Program. http://www.hhs.gov/ociio/initiative/hi_risk_pool_facts.html. Dunlop D., et al. Change. The costs of arthritis. Arthritis and Rheumatism (Arthritis Care Research), 2003. 49(1): 101–113. George A. Mensah, David W. Brown. An Overview of Cardiovascular Disease Burden in the United States. Posted 01/16/2007; Health Affairs, 2007: 26(1): 38–48. Kaiser Family Foundation. www.Statehealthfacts.org

indirect costs is greater for diabetes. Arthritis has low direct costs because the cost of treatment is much lower than for the other illnesses shown in the graph.

Cost-of-illness studies can provide valuable information that can be used in budgeting decisions and in cost-effectiveness studies. Cost-of-illness studies focus on the economic component of trends in disease and consequently are useful for policymakers. It is important for policymakers to have a notion of the impact of disease changes on expenditures. Much debate and misunderstanding has surrounded this topic. It should be understood that cost-of-illness studies are descriptive studies. One should not use the results of these studies by themselves to make policy recommendations. For these studies to be useful for evaluation purposes, the investigator must add additional information. Put another way, cost-of-illness studies describe what has happened. This can be most useful. But decision making requires more information—we must know why costs are what they are and what our objectives are.

## EXERCISES

1. What is the difference between an insurance premium and a deductible?

2. Through what mechanism do most people in the United States purchase private health insurance?

3. What population does the Medicare program cover? What is Part A Medicare? Is there a premium, deductible, or coinsurance for Part A Medicare?

4. What is Part B Medicare insurance? Is there a premium, deductible, or coinsurance for Part B?

5. What is Part C Medicare insurance? Is there a premium, deductible, or coinsurance for Part C?

6. What is Part D Medicare insurance? Is there a premium, deductible, or coinsurance for Part D?

7. What populations does Medicaid cover? In general, is there a deductible or coinsurance for Medicaid? Why is there no premium?

8. On what basis is an HMO reimbursed? What is the relationship between the insurer and the provider in the HMO?

9. What distinguishes a preferred provider organization from a traditional health maintenance organization?

10. What is "managed" in managed care?

11. When would it be preferable to use opportunity costs rather than money costs?

12. What are direct and indirect costs?

13. What is a cost-of-illness study? What is the difference between measuring the cost of illness using the prevalence and incidence approaches?

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