

Health Economics: A Modern Approach

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Introduction

Chapter 1: Why Health Economics?

A natural question to begin a textbook on health economics is to ask why it is interesting and important to examine the economics of health and health care. After all, relatively few courses are offered at most colleges and universities on the economics of food, clothing, or housing even though one could argue that these goods and their markets are equally important to people's wellbeing as health or health care. To be specific, it is interesting to ask why you are currently reading a textbook on health economics rather than a book on the economics of fruit, shoes, or housing. What makes this topic different and of such widespread interest to both students and researchers?

I develop an argument in the rest of this textbook which suggests that health and health care markets are different from goods and services, such as food, clothing or housing, in the importance of the following seven themes, which I present in list form before discussing in more detail.

1.1 Fundamental Themes of Health Economics

- Asymmetric information
- Services are non-storable and non-transferrable
- Uncertainty
- Heterogeneity
- Equity and altruism
- Externalities and public goods
- Imperfection decision-making

Asymmetric information

Most of the interesting problems in health economics are related to the problem that not all economic decision-makers – often called simply “agents” by economists – have the same information. If patients and doctors have the same information when health-related decisions are being made, or consumers and health plans have the same information (and can use it) when insurance is being purchased, this would make decision-making enormously easier and greatly simplify the field of health economics. Instead, often doctors have better information about medical risks than their patients; consumers know more about their health and lifestyle risks than doctors; consumers know more than the insurer is allowed to use when setting premiums or deciding who to insure; and employers often know less than

employees when deciding who to hire or insure. Most of the interesting models we develop in this text examine situations where one agent has to make a decision before full information is known. Asymmetric information is the central problem of health economics.

Services are non-storable and non-transferrable

Health care services differ from many other goods in that they are for the most part non-storable and non-transferrable. Among other things, this means that prices can vary over time and across users, and that the demand and utility of these services are inherently time dependent. Health care is not the only service, but in combination with the other attributes, it introduces new challenges worthy of modeling.

Uncertainty

The second most central theme in the study of health economics is the presence of substantial uncertainty at the time that important decisions are made. As we elaborate on later, uncertainty implies an agent does not know which “state of nature” will occur. Will the consumer get sick this year or next or never? Will a medical treatment work? Many of the important models that health economists develop place a central role on this uncertainty. Or the models focus on the institutions that are created to work around the problem of uncertainty, notably health insurance and risk-sharing. Of course there are many other markets in which uncertainty plays an important role – weather related demands for heating fuels and air-conditioning, fire insurance, and automobile insurance – to name a few. But these markets are different both in that total spending on these forms of insurance is much smaller than for health care, and the decisions that agents make in response to these risks are simpler than in the case of health care.

Equity and Altruism

Health and health care markets are often the subject of strong feelings about equity, which is to say that the fairness or evenness of health and health care goods across people is often viewed as important. Economists sometimes call health care a “merit good” since many people care about the health or use of health-related services of other people and take this as grounds for government involvement. While it is true that many people also care about the distribution of food or clothing across individuals, because these goods are for the most part purchased and sold in well-functioning private markets, issues of altruism or equity play a less direct role in the structure of these markets, with more of a focus on ensuring the bottom end of the distribution is adequately served.

While the vast majority of research by economists focuses on issues of efficiency, which is to say how to produce and/or consume goods and services with the minimum waste, economists also spend time modeling and considering issues of equity. Issues of equity matter, particularly in many European countries or elsewhere when social insurance programs for health care are dominant. We will bring up issues of equity regularly in the text and devote considerable attention to it in the later part of the text.

Heterogeneity

All of the agents involved in health care markets, including consumers, health care providers, and health plans that intermediate between health care consumers and providers, vary enormously in multiple dimensions. We will examine later in this text the dimensions in which each class of agents vary. For example, consumers vary importantly in their health, income, and preferences. The interplay between heterogeneity and the other themes in this list gives rise to many of the most interesting questions examined in health economics.

One could of course point out that consumers and suppliers in other markets are also enormously heterogeneous, and we would hurry to concur. After all, individuals vary by a factor of at least 100 in their income or spending on restaurant food, housing, or clothing. But these variations are not widely perceived as creating significant problems for the markets in which these goods are traded. This is in part because the first three themes on our list – asymmetric information, uncertainty, and altruism – make it a concern that consumers and suppliers are so heterogeneous. As we examine in depth later, if every consumer paid the full cost of their own health related spending, then we would not mind enormous variations in tastes, income and preferences and hence the resulting spending on health related goods. But because of asymmetric information, uncertainty and altruism, consumers do not pay the full cost of their own health related spending. Hence it is appropriate that we place great importance on modeling and understanding the causes and consequences of this heterogeneity.

Externalities and Public Goods

In economics an externality occurs when one agent's activities or decisions affect another agent's opportunities or outcomes in a way that is not reflected through prices. In health care markets externalities are especially important for infectious diseases, such as where one person having the flu or tuberculosis increases the chance of other people getting that same disease. Efforts to treat or reduce the infectiousness of disease often cause positive externalities to other consumers, in contrast with the negative externalities of the disease itself. Because infectious diseases play a less central role in many high quality health care systems, externalities, while still important, are arguably less important in these systems than in settings with higher rates of infectious disease. We examine externalities and public health activities where externalities are large in chapter XXX.

Closely related to the concept of externalities is the concept of public goods. Public goods are goods for which one person's consumption of a good or service is not easily excludable and does not reduce the value or availability of that same good. One reason that externalities and public goods are related is that a simplified view of a public good is that spending on a public good for one person makes that same good available to others – a strong positive externality. Public health activities such as mosquito spraying to reduce malaria or internet information about illnesses are examples of health-related public goods. A growing literature is reexamining the role of public goods in health care.

Imperfect Decisionmaking

This topic is intended to capture all of the aspects of behavioral economics and insights that arise from adding human and physician imperfect decisionmaking into the study of health economics.

Other themes for health economics?

Several other themes are sometimes discussed as central for health economics. We mention them here to clarify how they fit into our plan of analysis.

Insurance plays a much greater role in health care markets than in other markets. We agree with the central role of insurance, but view this as a market response to the first three themes above, not a fundamental feature of health care *per se*. Insurance plays an important role in other markets (automobile, home, liability, commodities) but is of much less complexity and widespread interest. Behavioral economics also adds important insights that seem particularly relevant to health insurance.

Health and health care is more important than other goods and services. Economists generally let markets decide what is more important, although equity considerations may apply more to health than some other goods. Food, water, and housing are arguably even more important than health, and special models and attention to them is warranted. We consider the implications of health being important in our discussions of equity and altruism topic.

Health care production is subject to substantial economics of scale. While economies of scale do exist in certain health care markets, and are worth modeling, health care does not have notably larger economies of scale compared to many other industries.

Health care is experiencing unusually rapid technological change. Technological change in the health care industry is nothing compared to that in electronics and manufacturing. Chapter XXX focuses on the role of technological change in health care and how insurance in particular makes it differ from other sectors. Insurance, asymmetrical information, and the multi-period nature of health care prevention and treatment combine to foster high rates of technological change, but not necessarily in a cost saving direction.

Spending on health care is growing more rapidly than other goods and services. It is true that spending on health care is growing faster than personal income in almost every country around the globe, so that health care is consuming an ever increasing percentage of total spending.

The real world is complex, good models are simple

One of the reasons why I have just provided a whirlwind overview of the main themes of health economics is that in much of what follows, I will often choose to focus attention on only one or two (sometimes three) of these themes, so as to better understand their implications and interactions. There is a purpose to this. The most important reason is that models that are the most useful to economists, or tables of empirical findings that are the most interesting, are generally those which are clear and simple. Just like a physicist's models of frictionless motion underlying Newtonian physics, the strongest

assumptions and cleanest economics models are often the most informative. I ask the reader for patience if at times we ignore real world complexity in order to better understand a few features of health markets. I find it generally advisable to develop a simplified model before adding on layers of realism and complexity, and will strive to keep the analysis simple before examining extensions and complexity, which often come at the cost of indeterminate results.

1.2 Agents and Decision Makers in Health Care Markets.

Now that we have introduced the five fundamental themes of health economics and talked briefly about how these themes affect the decisions of various agents involved in health and health care markets. Let us describe these relevant agents in more detail and discuss how decisions are made more fully.

Conventional private markets for private goods

In most markets consumers purchase goods directly from suppliers by exchanging money for goods. Under the conditions of “perfect competition,” in which all suppliers are small, prices are set by competitively by suppliers, and consumers act as price takers, this bilateral exchange of money for goods, shown in Figure 1.1, allows for prices to adjust so as to clear the market, and guarantees that the quantity supplied, X^S , is equal to the quantity demanded, X^D . In an economist’s short hand, supply equals demand. Even in markets that are not perfectly competitive (which is almost all of them) it is meaningful that the demand price P^D will be directly related to the supply price, P^S .

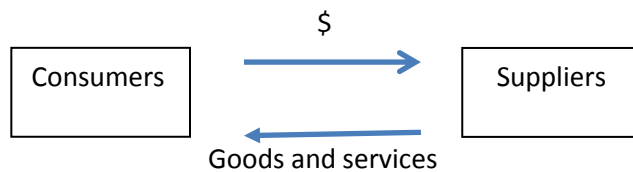


Figure 1.1 Private markets without insurance: direct exchange of services and goods for money

Private markets for health care goods were widespread historically before 1900, and still exist today in some countries and regions where there is incomplete or no health insurance. Private markets are also still used for certain health goods or services not widely covered by insurance such as eyeglasses, massage and vitamins. But uninsured spending on health goods in most countries is less than ten (?) percent of total health care spending: most health care services are no longer traded in this simple way. Instead, most health care is fully or partially covered by health care insurance. Exhibit 1 illustrates some of the terminology used in insurance markets to capture the fact that payments are not made at the time that health care services are received.

With direct purchase in a private market, a simple supply and demand model provides a natural framework for analysis. The conventional approach leads to an equilibrium condition that supply = Demand, which has two implications: $P^D = P^S$ and $X^S = X^D$.

Traditional insurance framework

We will see in Chapter XXX that health insurance is desired because most consumers do not wish to bear the uncertainty in spending that occurs when consumers have to pay for health care at the time of treatment. A second reason for insurance can be equity and altruism: many people feel that it is unfair for individuals with predictably high health spending (the elderly and the chronically sick, for instance) to pay substantially more for their health care costs. This altruism rationale can hold even in the absence of uncertainty. Therefore for both uncertainty and altruistic reasons, insurance is the dominant way that health care services are paid for.

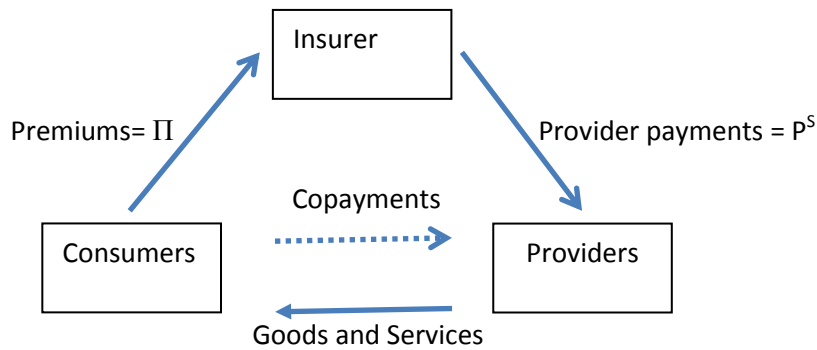


Figure 1.2 Conventional Insurance: consumers pay premiums to an insurer, insurer pays providers, providers give services to consumers. Partial copayments are possible.

The payment and contracting relationships between the three agents of consumers, insurers and providers shown in Figure 1.2 characterizes markets for automobile and life insurance, in which consumers typically pay premiums for health insurance directly out of pocket. And we will use this framework for much of the analysis in this textbook, as many others have done before. But even Figure 1.2 does not fully capture the relevant complexity of health insurance in almost every country. A critical fourth class of agents is still missing from this picture.

In almost every health care market, there is a fourth agent involved, which is called the sponsor (van de Ven and Ellis, 2000). The sponsor collects revenue directly or indirectly from consumers and makes payments to the insurer. In the US, the US government is the sponsor for the Medicare program, private employers are the sponsor of the privately insured, and insurance companies (“health plans”) are the sponsor of the self-insured. In many other countries the government is the sponsor, directly or indirectly for most people.

Sponsored Health Insurance

We will see in chapter XXX that there are a wide variety of mechanisms for collecting revenue from consumers by sponsors. But the critical role of the sponsor is to allow for subsidies across individuals

and over time, so that the premiums charged by health plans do not vary fifteen-fold by age, and 50-fold by health status, as they would in a privately unregulated insurance market. In many countries, the sponsor plays an important role of facilitating redistribution, so that higher income households contribute more to paying for health insurance than low income households. Another important role for the sponsor in some countries is to act as the insurer, taking on the risk of the insurance companies. To allow for this possibility, we highlight the more fundamental role of insurers and call them health plans, reflecting common terminology in the United States. In much of Europe, health plans would be called Sickness Funds.

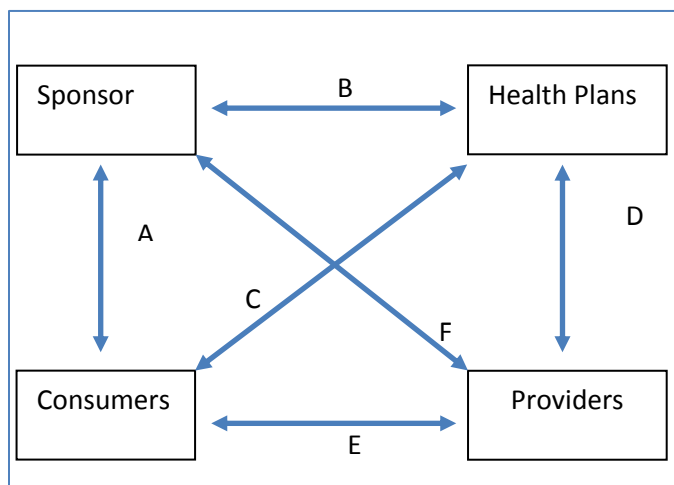


Figure 1.3 Sponsored health insurance: Four agents and six fundamental contracting relationships.

Corresponding to Figure 1.3 each of the relationships can be viewed as a means of organizing and creating incentives within a health care system.

Fundamental Contracting Relationships in Sponsored Health Insurance Markets

- A. **Health Financing Nexus** – How does the sponsor collect funds to pay health plan(s)
- B. **Plan Payment Nexus** – What formula or process does the sponsor use to pay health plans? How are health plans selected?
- C. **Insurance Nexus** – How does the consumer choose health plans? Can health plans select enrollees? What are health plan coverage features? What is the consumer’s premium?
- D. **Provider Payment Nexus** - How are providers selected and paid for providing care?
- E. **Consumer-Provider Nexus** – How does the quantity and quality of care get determined?
- F. **Regulatory Nexus** – What regulations does the regulator establish for providers?

Figure 1.4 Fundamental Contracting Relationships in Sponsored Health Insurance Markets

Although institution names and their organization vary across countries, the four types of agents are present in every health care system. Every market has consumers and suppliers, but where health care deviates from other markets is in the presence of special contracts so that in general consumers do not pay directly for the care they receive from health care providers: the role of paying providers is given to one or more health plans. Moreover, in almost every country some sponsor plays the role of managing the health plan selection process and ensure fair and/or feasible financial allocation of financial burdens on consumers with high health costs relative to their income. A key distinguishing feature of health care markets is the presence of four broad types of agents: consumers, providers, health plans and sponsors.

The crucial role of the sponsor is that the payment received by a health plan for a given consumer need not be the same as the payment made by that same consumer. For example, the sponsor may charge consumers in proportion to their income, but pay health plans according to the expected cost of their enrollees. Or the sponsor may contribute a fixed amount to each health plan, and regulate the premiums that the health plans are able to charge to individuals and families. Many possibilities exist, but it remains true that consumers rarely just pay a premium directly to the health plan for their insurance.

A fifth class of agents in every health care system is the **insurer**. The insurer is one or more entities who bear the financial risk of spending an extra dollar on health care. In some cases the sponsor is the insurer, and in other cases it is the health plan. Or, as we will see later, in some situations the consumer is encouraged (or forced) to save and largely self-insure. In other settings providers are taking on the role of insurer, bearing financial risk. To separately distinguish the role of insurer (i.e., bearing risk) from the health plan (paying providers) we will make distinctions between the health plan and the insurer whenever the difference seems important. Nonetheless, we will often follow custom in the literature and call the agent an insurer when the two roles are combined and one agent is both the health plan and the insurer.

A sixth and final agent is the **regulator** that sets the terms for competition, defining possible choice options, and restricting possible actions by all of the other agents. We discuss alternative roles for the regulator in Chapter XXX.

1.3 Specialized terminology for health care markets

In the rest of this textbook we will often use specialized words to describe features of health care

Health Insurance Terminology

Premium = fixed payment per unit of time (e.g., per year) for a defined set of health care services

Copayment = Fixed money amount paid per day or unit of service. Hence a consumer might have to pay \$10 per day for all office based care.

Coinsurance = proportion of health care cost paid by the consumer, for example 20%

Deductible = amount up to which the consumer pays the full price for health care. Hence with a \$500 deductible, the consumer might pay the first \$500 without any copayment.

Stoploss = limit on the amount of payment by an agent, such as a consumer or health plan.

Ceiling = limit on the coverage paid by a health plan.

markets, particularly as they relate to insurance markets. The attached box defines some of the terms that we will use, particularly as they relate to health insurance.

1.4 Two Examples

The above characterization of the health care delivery and financing system, which includes the various agents, contracting relationships, and insurance terminology, can be made more concrete by giving two specific examples. The first example given is for private health insurance in the US, which differs substantially from the second example which is for the public insurance program in the UK. The significance of some of these features will only become clear after reading more of the book.

Private US health insurance

The author of this book works at Boston University (BU) and purchases private health insurance through BU to cover his families. BU is the employee sponsor, who ensures that we pay the same family premium as do young employees with no children or with lower or higher expected health costs. Our sponsor contributes 75 percent of the total premium for each plan, regardless of our income, and deducts the remainder of the premium from our monthly paychecks using before-tax dollars (health financing nexus). BU selected from among hundreds of possible health plans to offer only three health plan options to its employees for 2012, and pays them an experience rated premium (the plan payment nexus). All employees choose from among the same health plan options, including the option to not purchase insurance through BU (the insurance nexus). Both of us choose the (nonprofit organization) Blue-Cross Blue-Shield of Massachusetts Preferred Provider Organization (BCBSMA PPO) health plan, which has two tiers of providers, in- and out-of-network. BCBSMA negotiates different fees for services from different providers (provider payment nexus). Our copayments when seeking treatment are a flat \$20 per visit to in-network providers and 20% of charges for out-of-network care (consumer provider nexus). Both of us put money in a health savings accounts that covers all out of pocket costs, so almost all of our spending is paid with before tax income. The only regulatory role BU plays directly with providers in our plan is to insist that we identify a specific primary care physician (PCP) for each family member even though we are free to go to any doctor we choose (regulatory nexus). Because experience rated premiums adjust to reflect actual spending by the plan, BU serves as the primary insurer or bearer of risk.

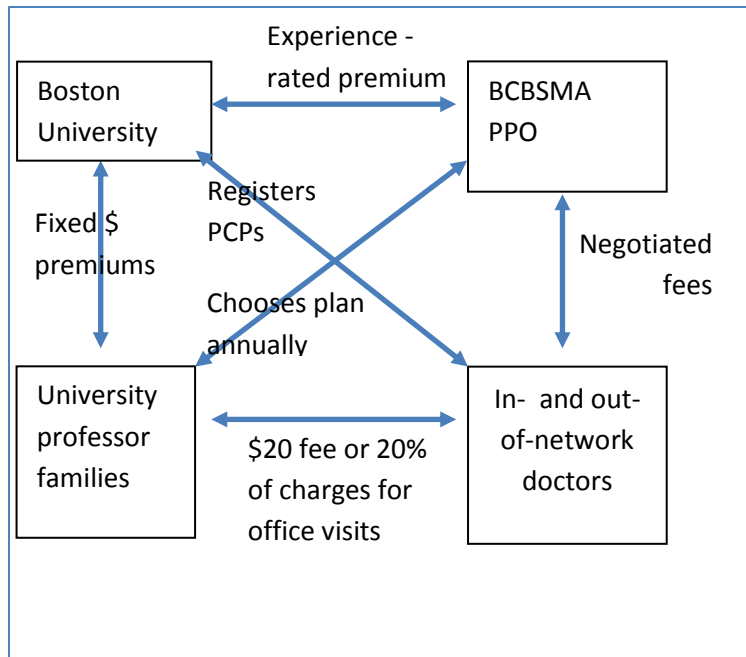


Figure 1.4 An example of the US private health insurance system: Boston University (2018)

Public Canadian health insurance

Figure 1.5 shows the agents and contractual relationships for the “single payer” system in Alberta, Canada. All citizens are in the same insurance program, and since 2009 all health revenue is generated through general tax revenue (*health financing nexus*). Payments to doctors are based on a provincial wide fee schedule (*provider payment nexus*), administered by the nonprofit organization, Alberta Blue Cross, which is reimbursed for its spending (including overhead) by the Alberta government (*plan payment nexus*). Physician and hospital care for most services is free although consumers are required to select a primary care physician (PCP) (*consumer-provider nexus*). The government regulates doctors and hospitals, including the restriction that private doctors (charging fees) are not allowed (*regulatory nexus*). Consumers have no direct connection to the one health plan for the statutory coverage, although they are free to choose from a variety of supplementary benefit plans offered, such as drug coverage (*insurance nexus*).

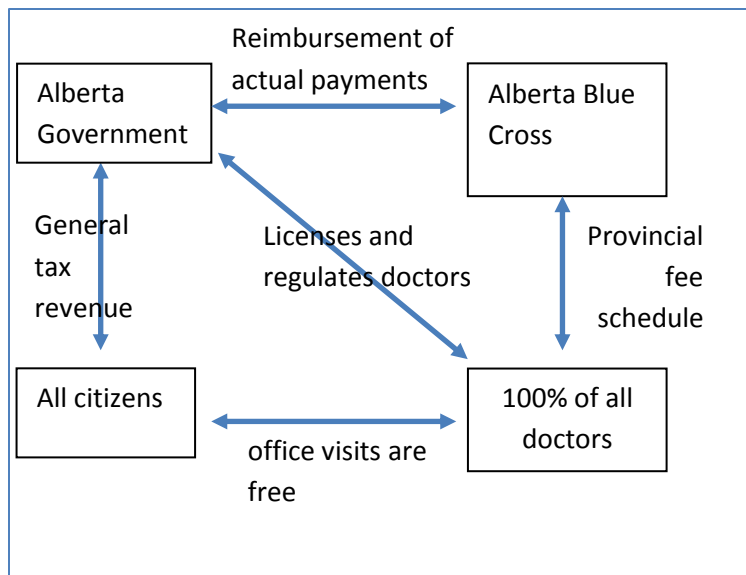


Figure 1.5 A public health insurance system: Alberta Canada (2018)

Hopefully the sharp contrast between Alberta Canada and the US private health insurance systems raise a lot of interesting questions about each of the linkages. How do various health financing strategies change incentives? What are the effects of restricting choices of plans, and providers, and using alternative provider payment systems? How do consumer fees affect behavior? What do economic models suggest about effects of licensing and regulations? By the end of the text although we will certainly not have answered all of these questions, we hope to have at least created a framework for thinking about them.

1.6 Concluding thoughts

In this chapter we started by describing the five fundamental themes of health economics which drive most specialized models and empirical studies: asymmetric information, uncertainty, heterogeneity, equity and altruism, and externalities and public goods. Largely because of these fundamental themes, health care markets differ from most other markets in that consumers rarely purchase health care directly from providers, and hence the supply price need not equal the demand price. Largely to reduce financial risk due to uncertainty, or promote equity, most health care services are purchased indirectly, so that consumers make lump-sum payments for their health care - either as a premium or as an income-based tax - both of which separate health care payments from the specific services received. This introduces agency problems in that the consumer no longer has the same incentives to worry about costs or benefits relative to costs. The presence of the sponsor facilitates achievement of equity and altruistic goals, but also enables complications of plan-level selection and profits

We have also defined six broad classes of agents present in every market, which are summarized below.

Consumers: the agent receiving health care, and in some cases choosing health plans or sponsors.

Providers: agents actually supplying health care services.

Health plans: Agents responsible for paying and contracting with health care providers.

Sponsors: intermediaries between consumers and health plans who are able to redistribute the *ex ante* expected financial cost of health care across consumers and among health plans.

Insurers: agents who bear risk (insure), who can be any combination of the above four agents

Regulators: agents who set the rules for the health care system characterized by the above classes of agents.

We have also identified but not discussed in any depth the six contracting possibilities between these four agents. Much of the remainder of this book is organized around studying these contractual relationships, not only highlighting the payment flows that result, but also examining the choices available and the implications of those choices for how well health care markets work. Also to be considered is evidence for when these decisions are poorly made.

Discussion topics

D1.1 Compare health care to universities: How do consumers pay for professor services? Why don't they just pay professors directly, as they do for haircuts?

D1.2 Think of the market for shoes. Which of the five primary themes introduced in this chapter are relevant to this market? Is there anything that you could do to make a textbook on the demand for shoes interesting?

D1.3 In some parts of the world spending on air conditioning is very seasonal, varies from year to year, and can account for a significant fraction of a consumer's annual income. All this implies significant uncertainty facing consumers. Why do you think insurance policies to protect consumers against this uncertainty are very rare?

Problems

p1.1 For each of the contractual pairs shown in Figure 1.3, think of an example in which each agent may have better information than the other (e.g., in which there is asymmetric information.) This should result in twelve examples in total, three for each of the four agents.

p1.2. Choose any country other than the US, and use the internet to identify the sponsor, the set of health plans available to an employed 30-year old single female and the decision-making unit for purchasing insurance by consumers: do they choose as individuals or as households? Draw a figure similar to Figure 1.4, identifying the agents and contractual relationships. Write up your description of this country on one or two pages using terminology from this chapter.

p1.3 Imagine that your local supermarket offered a "food insurance plan" so that by paying \$100 per month you could reduce the cost of your food purchases to 50% of their posted price. Describe in a few words how you expect joining this food plan would change each of the following.

- a. Quantity of food purchased
- b. Quality of food purchased
- c. Choice between perishable and storable foods
- d. Willingness to go to other stores
- e. Prices at the supermarket
- f. Variety of goods offered by the supermarket
- g. Market innovation of low cost foods if many stores offer food insurance plans
- h. Market innovation of expensive foods if many stores offer food insurance plans

p1.4 Parallel to health care markets, in many countries publicly-funded universities also have four classes of agents: students, professors, public universities, and governments. Create a diagram similar to Figure 1.3 showing how these four agents interact in a country of your choice. Do consumers pay suppliers in this market directly for their services? Why or why not? How are payment flows made?