SOLUTIONS MANUAL

Fourth Edition

HEALTH ECONOMICS

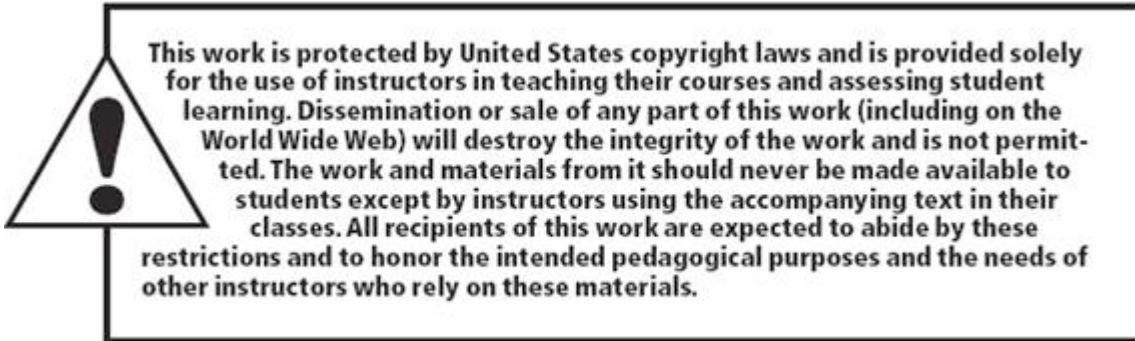CHARLES E. PHELPS

Instructor's Manual

to accompany

Health Economics
Fourth Edition

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www.pearsonhighered.com

ISBN-13: 978-0-321-61327-1
ISBN-10: 0-321-61327-9

CHAPTER 1

WHY HEALTH ECONOMICS

Chapter Outline

Why Health Economics

Important (if not Unique) Aspects of Health Economics
 Government Intervention
 Uncertainty
 Asymmetric Information
 Externalities
How Markets Interrelate in Medical Care and Health Insurance
 Fixed Technology (Figure 1.1)
 Dynamic Issues (changes through Time
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  Aging
  Technological Change
  Price changes and their meaning (quality and consumer surplus)
  Spending Patterns over time
Summary
Related Chapters in Handbook of Health Economics
Problems

Teaching Tips from the Author

First of all, have fun teaching the class! It's a really interesting topic. Thank you for adopting my textbook. It's a labor of love, and I hope it helps you and your teaching. I try to make it better with each edition so if you have suggestions, I welcome them.

The second point to make here is that if you have used any of the previous three editions of *Health Economics,* you will find a significant reorganization of the material that had been in Chapters 1 and 2 before. Chapter 1 now focuses on "why" health economics and goes through some time series data showing how the health care sector has grown through the last half century. Chapter 2 now focuses more on "how" health economics, with (as the next section of this *Instructor's Manual* details more) a major new emphasis on life style and its effects on health outcomes.

As a general rule for the entire Health Economics Course, I tend to emphasize the roles of uncertainty and information throughout the course. Indeed, I proposed a title for the book to my first editor of "Uncertainty and the Economics of Health Care," He thought it sounded too specialized, and I now agree with him, but you will find an emphasis on

uncertainty throughout the book. I always look for ways to bring uncertainty into the discussion, and point out whenever possible how uncertainty rests as the basis for much of what we know in health economics as different and interesting compared with (say) the market for sugar or salt. While I will not point out these opportunities everywhere, I urge you to take this task on (for me, if you will): help your students recognize the role of uncertainty, information asymmetry, and the social rules and institutions that have emerged as a result of the uncertainty that's omnipresent in health care.

When I teach a course using this book (ECO 236, an upper division undergraduate course at the University of Rochester), I go through Chapter 1 fairly rapidly, without detailed reference to specific items in the text. I use a lot of questions to the class here: it's a great way to get the class used to answering questions I pose when the questions have no "right" answer.

The "important (if not unique) aspects of health care section in Chapter 1 sets the stage for what comes later, so it's worth a bit of time to emphasize these issues. None of them are wholly distinctive to health care markets, but the extent to which they matter exceeds that found in almost any other sector of the economy.

Government intervention of course enters other areas of the economy – airline safety (in more ways than when I wrote the first edition!), food safety, traffic safety, and (an issue more prominent in recent times!) safety of money you have entrusted to the banking system. Of course the government takes primary responsibility for safety from foreign invasion (the military), as well as air and water quality. Note the common thread of much of this government intervention – safety. The logic for government intervention there is similar to the logic in health care – possible harm or death to humans that is irreparable if it occurs, coupled with either major informational problems for individual consumers in achieving the same level of safety or obvious economics of scale in producing the safety (public goods).

This leads naturally into two other areas that demand constant attention in health care – uncertainty and informational asymmetry (which are obviously first cousins intellectually). In few other areas of the economy can you find such an overriding emphasis on uncertainty. The institutions we have in modern societies to deal with uncertainty span a huge array of topics – health insurance and managed care, malpractice insurance, FDA regulation of drugs, enormous regional variation in medical treatment rates for specific therapies (diagnostic and therapeutic uncertainty by providers), and now, "clinical outcomes assessment" activities. These all are manifestations of uncertainty.

Asymmetric information also turns up commonly, most often in doctor-patient interaction, but also in the knotty problem of possible market failure in health insurance. The emphasis on professional ethics (e.g., as in Arrow 1963) emphasizes the importance of informational asymmetry, and the societal norms and rules we have ("professionalization," licensure) are societal responses to these issues.

I like to use these discussions to involve the students in answering questions I pose. This works particularly well in the "important aspects of health care economics," where the students' own experiences in life help to illuminate some of the key ideas. How many have been to a doctor in the last year? What was the first thing they were asked by the receptionist? (It's usually something about insurance coverage!) Some questions can be deliberately whimsical: How many of you have worked on your own car, or do repairs around the home? OK, how many of you have done surgery on yourselves or removed a tooth? (This emphasizes the information gap between providers and consumers of health care.)

The material on technological change and prices is essential for later discussions about the future health care system. I view it as *vitally important* that students of health economics learn to parse out the implications of increasing prices. First, the measures of prices are crummy, often omitting quality improvements. Second, and more important, it is quite possible (as the chapter shows) to have a welfare-enhancing price increase if comes with sufficient quality improvement. This comes back full-force in Chapter 16 when the discussion turns to universal health insurance and questions of "how much can we afford to spend" in health care? Box 1.1 provides the key discussion.

There's a simple way to work through the tables at the end of Chapter 1 showing spending patterns through time. The tables "nest" in a very specific way that you can illuminate by focusing on the numbers at the lower left corner of the table. Look at Table 1.5 to start out. The annual total spending in 1960 was $23 billion, and grew to $2435 billion in 2010 (projected). The ratio of those two years is 104.0, the number in the lower left hand corner of the table. The same ratios are calculated for components of health care spending as well as the "total" figure.

Now look at Table 1.6. This corrects for general inflation, so the ratio of 104.0 becomes 14.0. In other words, almost 7/8ths of the increase in spending is just simple inflation over the past half century. The "real" increase of 14-fold is still important, however.

Table 1.7 takes the next step, correcting for changes in population levels. The "real per capita" increase is now down to "merely" a factor of 8.2.   Table 1.8 takes a more specious step by correcting not only for general inflation but for relative price increases (using the "medical CPI" component). This step is fraught with difficulty because of the imprecision in adjusting for quality in the Medical CPI, but this brings the ratio down to 2.8.

Tables 1.9 and 1.10 set the stage for another important calculation – adjusting for the average age in the population. This, of course, sets up a discussion about the possible effects of the retiring "baby boomer" (post-WW II birth) cohort and its effects on health care spending. The correction for an aging population between 1960 and 2010 yields a surprisingly small adjustment in the total-spending ratio. The ratio of 2.8 in Table 1.8 declines merely to 2.6 after the age adjustment process. In other words, a relatively small fraction of the real per capita spending increase over the last half century in the US has come from the aging of the population. As the baby boomers (present author included)

move into retirement, of course, the effect will accelerate, but the calculation is important because it shows how much of the "real" increase is related to something else.

What is that "something else?" I (and many of my colleagues in health economics) think the answer is mostly "technological change," which raises the importance of regulation of and payment for new technologies (chapter 15) and their use in a universal health insurance system (chapter 16).

Classroom Projects:

In this instructor's resource, you'll find class or individual "projects" that relate to specific chapters in the textbook. These can mostly be done outside of class, but will often involve in-class reporting time. These projects may well be done in groups, per the previous discussion of group learning and "workshops" as an adjunct teaching method to augment classroom lectures.

I welcome your comments (charles.phelps@rochester.edu) about how these projects work out and any suggestions of projects you've used that add to the class. (I will add these to the project list through time with attribution to the individual first proposing them to me.) This way, all the users of *Health Economics* can help each other become more effective teachers.

Chapter 1 projects:

A. Technological change over time – the costs of treating a specific illness:

Divide the class into appropriate numbers of groups (about half a dozen per team as a suggestion) and have them investigate the technology for treating a specific illness 25 years ago vs. current technology. If possible, have them find out the typical costs of treatment, but that will be harder. The key idea is to understand the extent of technological change in treating illnesses and efficacy of those treatments. In some cases, simple average length of stay (ALOS) in the hospital for treatment will be very illuminating. Some examples of interesting illnesses to consider: heart attack (involvement of intensive care units both now and quarter century ago, but new drugs to eliminate blood clots, new diagnostic methods such as testing for enzymes that signal damage to the heart muscles, etc.); normal delivery (ALOS was over a week in 1975; it's now about a day or day and a half); allergies (antihistamine drugs in both cases, but now far fewer side effects; also nasal sprays available such as sodium cromalyn, spray cortisone drugs that were not available then). Mental illness (immense change, shifting from long term hospitalization to treatment with drugs). Good reading on this issue, even if old, is Anne Scitovsky's 1967 article in AER. A series of new studies on cardiac treatment (David Cutler and others) and mental illness (Richard Frank and others) have illuminated these issues in more recent times.

B. Sectoral Shifts in Treatments:

This project looks at the different growth rates through time in the various "sectors" of health care – inpatient hospital care, physician care, prescription drugs, "other" and nursing homes. This project probably should avoid the step to Table 1.8 and concentrate on 1.7 and earlier tables (because of the problems with the medical CPI components). Look at Table 1.7. Which parts of the health sector have increased most rapidly, and why? Most notably, of course, is "nursing homes" but also prescription drugs. Have the students list why they think these patterns emerged, and ask what they expect in the coming 20 years or so. I suggest that you have them re-calculate the ratios using 1995 as the base year rather than 1960. The picture changes considerably. For example, the 2010/1995 increase for drugs is 3.3. The nursing home ratio is only 1.3. The hospital ratio using 1995 as a base is 1.6. The big bursts in the early years came in hospital, physician and nursing home expenses. (Hmmmm, when did Medicare and Medicaid come in and what did they insure?)

Sample Exam Questions with Suggested (Cryptic) Answers

1. (15 points total) Major uncertainty looms as a key issue in many aspects of the health care system. Identify the key social or economic institution or arrangement that seems to be established primarily to deal with the uncertainty described in each area (1 point each):
        a) Financial risks arising from random illness _____
        b) Variable competence by doctors and other medical providers _____
        c) Demand inducement for major surgery _____
        d) Incomplete information about the effectiveness of medical treatments _____
        e) Risks of dangerous or ineffective drugs _____

Now, for 10 points, pick one of these items and discuss how the risks arise, and how the social institution deals with the risks. (If you think the institution is ineffective in doing so, discuss.)

Answers: health insurance; licensure; second opinions; prior authorization and similar demand-management strategies of managed care insurance; FDA drug regulations.

2. [This is a variant on the first question.] (20 points) Uncertainty enters into the maintenance and production of health in numerous ways, including (a) Whether and when individuals will get sick; (b) Whether a given treatment will work for a given patient; (c) Whether *on average* a treatment will work for a whole class of patients; (d) whether a specific doctor is competent to deliver treatment. Pick *any two* of these and describe the major mechanisms (institutional arrangements) that our society has created to deal with the uncertainty.

Answer: (a) insurance and related social programs; (b) expert panels such as NIH, and managed care processes for approving treatments in advance and retrospectively; (c) insurance plans listing procedures in advance that they will (not) approve; (d) licensure.

3. (10 points) "Health care is so different that we can't possibly use standard economic theory to think about it." Discuss intelligently.

Disagree; although the basic tools of microeconomics require revision (e.g., treating health, not medical care as the normal good, and understanding the not for profit hospital as different than for-profit organizations), we can still use economic approaches fruitfully to study health care.

Answers to End-of-Chapter Questions
Starred answers appear on the Companion Website.

1.   a) Demand for insurance
    b) Provider decisions about treatment (e.g., medical practice variations)
    c) Quality of care inference by patients
    d) FDA regulation of drugs and medical devices
    e) In insurance markets, insurers sometimes know less about the health conditions of their potential customers than those potential customers know.

*2. While medical care is "different," standard economic analysis still offers much useful insight and analytic structuring. On the demand side, for example, the "human capital" approach offers a way to move from the demand for "health" to the demand for medical care. On the supply side, we must account for the incentives and motives of not for profit suppliers in some cases. And in the demand for insurance, we must account for the effect of insurance on medical care use in a specific way. But these are all modifications of standard theory, not rejections.

*3. Illness event; insurance coverage; income; price of medical care; education; sex; life style choices and age all affect individual demand for care. The single most important of these for an individual is the individual's illness event (if it can be observed). In groups, if you cannot observe individual illness events, age is the strongest predictor of medical care use.

*4. Income, education, *expected* illnesses, aversion to risk, price of insurance (loading fee) all affect demand for insurance. In particular, expected medical events that drive demand for medical care, not actual events, since the insurance is chosen before the actual event is realized.

5. Example: For total care, the table 1.7 number is 8.2 and the "relative price adjusted" number in table 1.8 is 2.8. This implies a relative price increase of 2.93 (the ratio of 8.2 to 2.8). For hospital care, the same type of calculation yields 2.96, almost identical to the

total. Drugs had a ratio of 2.90. For physicians, it was 2.87.   The big surprise is that there isn't much difference across these sectors over this half century.

*6. The quality of care in a medical sense has surely improved a lot over this time. The safety and treatment standards, for example, include more reliable standby services (for medical emergencies) and the like. The typical two-person hospital room now also includes much better communication services (tv, phones), and probably (although some would dispute this) better meals. Since the CPI does not reflect the increase in value, it overstates the price increase. In effect, it compares a 1960 "apple" with a 2005 "orange" rather than comparing two identical apples.