Economics of Health Care and Pharmaceuticals

Course Description

The health care system involves the interaction of three main types of agents:

- Consumers/patients
- Health insurers/managed care organizations (public & private)
- Providers of medical goods and services, including
  - Physicians
  - Pharmaceutical & medical device companies
  - Hospitals

We will provide a framework for understanding the economic factors underlying the health care system and the interaction of its agents. For several reasons, standard economic models are not adequate to understand markets for health care. For example, it is difficult for the consumer/patient to evaluate the quality of the services received. Costs are uncertain, and insurance reduces the incentive of the consumer/patient or physician to seek the most economical means of treatment.

We will focus primarily on the structure and economics of health insurance and the demand for health care, pricing of drugs and hospital services, cost-benefit analyses employed by payers and consumers of health care products and services, mechanisms used for paying physicians and its impact on the provision of care, and the role of information in the selection and provision of medical goods and services.

Course Outline

I. Introduction

Fundamental economic relationships concerning health
- Utility function
- Health production function
- Production possibilities frontier
- Medical care demand function

Health is both a consumption good and an investment good

Major questions addressed by health economists
- How sensitive is demand for (utilization of) medical services to changes in their net price?
- How sensitive is health status to utilization of medical services?
- Hence, how sensitive is health status to changes in the net price of medical services?
II. **Health insurance**

Questions about health insurance
- Why do people have health insurance?
- Why don’t people have health insurance?
- How much health insurance should people have?
- What are the benefits and costs of health insurance?
- How does secondary insurance coverage (e.g., Medigap) affect primary insurers?
- Why will some risks be insured, while others aren’t?
- Do insurance companies tend to earn higher profits on some customers than they do on others?
- How is health insurance different from other kinds of insurance (property & life insurance)?
- How is the market for Rx coverage different from the market for hospitalization coverage?
- Does choice among health plans make people better off?

Benefits of health insurance
- Risk aversion
- Expected income vs. certainty-equivalent income
- Loading costs & optimal insurance coverage
  - When load = 0, optimum is to be fully insured (regardless of degree of risk aversion)
  - When load > 0, optimum is to be less than fully insured; the lower the degree of risk aversion, the lower the optimal insurance

Efficiency cost of health insurance
- Moral hazard
- Consumer surplus, deadweight loss
- Insurance has two effects on demand
  - Insurance increases quantity demanded (Q)
  - Insurance reduces sensitivity of Q to P changes
- Evidence on price elasticity of demand for medical care
  - RAND Health Insurance Study
  - Medicare Part D
  - Oregon Study Shows Benefits, and Price, for Newly Insured
  - Optimal Drug Benefit Design: The Case of Cholesterol-Lowering Therapy
- Role of patient’s time in demand for medical services

Asymmetric information and adverse selection
- The market for lemons
- Should Rx expenditures be covered by insurance?
- Plan choice and adverse selection

III. **Measuring the output and productivity of health care**

Longevity: the quantity of life years
- Life tables and life expectancy
- Cancer survival rates and lead-time bias
- The Role of Public Health Improvements in Health Advances: The 20th Century United States

The value (“price”) of a life-year (or a life)
- Human capital approach
• “Full income” approach
• “Compensating wage differential” approach
  o In view of evidence about compensating wage differentials, should the government regulate job health and safety?

Measuring the quality of life (or life-years)
• The Global Burden of Disease project's Approach to Measuring Health Status
• Is average quality of life likely to be improved by advances in medicine?

IV. Comparative effectiveness, cost effectiveness, and health technology assessment

Cost-effectiveness analysis (health technology assessment)

Incremental cost-effectiveness ratio

Case study: The effect of Medicare’s assessment of the comparative effectiveness of two drugs (EPOETIN and DARBEPOETIN) on their prices

HTA at the macro level: Instead of comparing drug A to drug B, compare “new drugs” (as a whole) to “old drugs”
  • Cancer
  • Cardiovascular disease
  • HIV
  • Hospital procedure innovation
V. The pharmaceutical industry

Simple model of drug development and pricing decisions

Dynamic vs. static efficiency

Effect of market size on drug development; orphan drugs

Multiple markets, price discrimination

Patents: benefits and risks
- In the absence of patents, there may be inadequate investment in R&D, since firms attempt to “free ride” on other firms’ investments
- Patents can solve the problem of under-investment.
- However, since patents create a “winner-take-all” competition, patents can cause over-investment.

Impact of patent expiration on U.S. drug prices, marketing, and utilization

Why Are Drugs More Profitable Than Vaccines?

VI. Physician behavior

- Incentive contracting: a mathematical example (From appendix to Chapter 6 of Economics, Organization, and Management, by Paul Milgrom and John Roberts.
- Incentives in HMOs: a case study
- Do doctors practice defensive medicine?
- Physician volume and intensity response

VII. Information in health care

- Information about patient medical conditions
  - Value of information (statistical decision theory)
  - Prospective vs. retrospective payment
  - Medicare upcoding and market structure
- Information about quality of providers
  - CABG report cards in New York state
  - Is more information better? The effects of report cards on health care providers
- Information about prices of medical goods and services
CONNECTION WITH THE CORE

The learning in this course will utilize, build on and extend concepts covered in the following core courses:

| MANAGERIAL ECONOMICS | • Maximization and thinking on the margin  
|                       | • Analyzing complex decision-making under uncertainty  
|                       | • Pricing with market power  
|                       | • Market segmentation and other advanced pricing strategies  
|                       | • Understanding market competition and equilibrium thinking (in the short run)  
|                       | • Market equilibrium thinking (in the long-run) and barriers to entry  
|                       | • Strategic interaction among firms  
| CORPORATE FINANCE     | • Risk (health insurance)  
|                       | • Incremental cost/benefit (of medical expenditure)  
| DECISION MODELS       | • Decision Making under Uncertainty and Risk (Expected utility maximization)  
| GLOBAL ECONOMIC       | • GDP (as an incomplete measure of economic prosperity)  
| ENVIRONMENT I         |  

Students will be expected to have mastered these concepts and be able to apply them in the course.
Preliminary list of topics and readings

Introduction

I recommend that you take a look at (but don't read every word of):

- pp. 148-212 of textbook (Folland et al, 7th ed.)

Economics of health insurance

- The Impact Of Medicare Part D On Prescription Drug Use By The Elderly
- The Anatomy of Health Insurance (especially the introduction and pp. 42-50)
- Asymmetric information and adverse selection
- The Massachusetts mandate
- Should Rx expenditures be covered by insurance?
- Plan choice and adverse selection
- Bankruptcy as implicit health insurance
- Primary and secondary insurance

Measuring the output and productivity of health care

- Longevity: the “quantity of life-years”
- The value (price) of a life-year
  - Safety at any price?
  - The value of a statistical life
  - Valuing mortality reductions in India
- The quality of life (or life-years)
- Is average quality of life likely to be improved by advances in medicine?
- Are we winning the war against cancer?
- The Role of Public Health Improvements in Health Advances: The 20th Century United States

Comparative effectiveness, cost effectiveness, and health technology assessment

- Incremental cost-effectiveness ratio
- Potential pitfalls of HTA
- HTA at the macro level
  - Cancer drugs
  - Cardiovascular drugs
- Case study: The effect of Medicare’s assessment of the comparative effectiveness of two drugs on their prices
- Roles of public and private sectors in pharmaceutical innovation
- The impact of pharmaceutical innovation on longevity and medical expenditure
  - Elderly Americans: analysis based on patient-level data
  - French population: analysis based on longitudinal disease-level data
The pharmaceutical industry

- Simple model of drug development and pricing decisions
- Multiple markets, price discrimination
- Patents: benefits and risks
- Does patent protection restrict U.S. drug use? The impact of patent expiration on U.S. drug prices, marketing, and utilization
- Do fixed patent terms distort innovation?
- Does Misery Love Company? Evidence from Pharmaceutical Markets before and after the Orphan Drug Act
- Vaccines

Physician behavior

- Incentive contracting: a mathematical example
- Incentives in HMOs: a case study
- Do doctors practice defensive medicine?
- Physician volume and intensity response

The Role of HCIT in Creating New Delivery Models

- The As-Yet-Unfulfilled Promises Of Health Information Technology
- Health Information Technology and Patient Outcomes