



*The*  
*Economics*  
— OF —  
*Health*  
— AND —  
*Health Care*

THIRD EDITION

FOLLAND  
GOODMAN  
STANO

Third Edition



# The Economics of Health and Health Care

**Sherman Folland**

*Associate Professor of Economics  
Oakland University*

**Allen C. Goodman**

*Professor of Economics  
Wayne State University*

**Miron Stano**

*Professor of Economics and Management  
Oakland University*



Upper Saddle River, NJ 07458

**Library of Congress Cataloging-in-Publication Data**

Folland, Sherman.

The economics of health and health care / Sherman Folland, Allen C. Goodman,  
Miron Stano.—3rd ed.

p. cm.

Includes bibliographical references and index.

**ISBN 0-13-012215-7**

1. Medical economics. I. Goodman, Allen C. II. Stano, Miron. III. Title.  
RA410.F65 2001  
338.4'33621—dc21

00-037472

**Vice President/Editorial Director:** James Boyd

**Editor-in-Chief:** PJ Boardman

**Senior Editor:** Rod Banister

**Managing Editor (Editorial):** Gladys Soto

**Editorial Assistant:** Marie McHale

**Assistant Editor:** Holly Brown

**Senior Marketing Manager:** Lori Braumberger

**Media Project Manager:** Bill Minick

**Production/Manufacturing Manager:** Gail Steier de Acevedo

**Production Coordinator:** Maureen Wilson

**Manufacturing Buyer:** Natacha St. Hill Moore

**Senior Prepress/Manufacturing Manager:** Vincent Scelta

**Cover Design:** Bruce Kenselaar

**Cover Art/Photo:** PhotoDisc

**Composition:** BookMasters, Inc.

---

**Copyright ©2001 by Prentice-Hall, Inc., Upper Saddle River, New Jersey 07458.** All rights reserved. Printed in the United States of America. This publication is protected by Copyright and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. For information regarding permission(s), write to: Rights and Permissions Department.



10 9 8 7 6 5 4 3 2 1  
ISBN 0-13-012215-7



# Preface

This is the third edition of a book that was conceived in 1990 and first published in 1993. To indicate how much the world of health economics has changed, the first edition made a single reference to “managed care,” and that was in the context of monopoly power in the provision of health care. In addition, the debate on the Clinton health plan illuminated a large set of issues that invigorated the discipline of health economics.

This book was first written to assist health economics instructors in developing a clear, step-by-step understanding of health economics for their students. We also believe that it is important for instructors to show what health economics researchers are doing in theory and in empirical work. The book synthesizes contemporary developments around a set of basic economic principles, including maximization of consumer utility (or well-being) and economic profit, wishing to make these principles accessible to undergraduate students, as well as to graduate students. Rather than organizing the book around the institutions specific to the health care economy, we have used core economics themes as basic as supply and demand, as venerable as technology or labor issues, and as modern as the economics of information. Moreover, we have sought to improve accessibility to the book for the wide range of health services students and practitioners whose knowledge of economics may be more limited.

We have followed the philosophy that students must have a working knowledge of the analytical tools of economics and econometrics to appreciate the field of health economics. Some students may be ready to plunge directly into Cost-Benefit Analysis (chapter 4) or The Production of Health (chapter 5) upon completion of the introductory chapter 1. However, chapters 2 (Microeconomic Tools) and 3 (Statistical Tools) allow the students and their teachers to develop or to review the needed analytical concepts before tackling the core subject matter. In chapters 2 and 3, students with as little as one semester of microeconomics may review and study how economists analyze problems, using examples that are relevant to health economics. No calculus is needed.

Consistent with an emphasis on clarity of exposition, this book makes extensive use of graphs, tables, and charts. Discussion questions and exercises are provided to help students master the basics and to prompt them to think about the issues. Features on up-to-date applications of theory and policy developments are also included, as well as the occasional tidbit containing purely background information.

Finally, we caution that some of the chapters, such as those on insurance, although devoid of advanced mathematics, may still require considerable effort. No painless way

is available to appreciate the scope of the contributions that scholars have made in recent years. Sections or subsections that are more demanding and/or peripheral to the core material have been identified. These sections can be omitted without detracting from the flow of the book. More advanced students of the health care economy who wish to be challenged further can utilize a comprehensive references section, with more than 750 sources, so that their (and our) work can be enriched through referral to the original sources.

## What's Changed in the Third Edition?

It is critical that this textbook contain the most current knowledge and address the needs of our readers. As with the second edition, almost every chapter is revised to incorporate significant developments in the field.

In response to the instructors and students who use this book, we have moved the chapter on cost-benefit analysis forward, so that it is now chapter 4. We have made major changes in the treatment of insurance and managed care. Also in response to user demand, we have broken up a single health insurance chapter into two components. Insurance (chapter 7), which looks at the individual determinants of insurance, now precedes Consumer Choice (chapter 8), as well as a set of chapters on important, related economic topics. The Organization of Health Insurance Markets (chapter 11), which looks at the development of health insurance markets (and asks the question “who pays?”), precedes the entirely rewritten and greatly expanded chapter on Managed Care (chapter 12). In this chapter, we make a major effort to link theoretical models and empirical findings.

The section on governmental actions regarding the health economy has been reorganized. Chapter 20 looks at conceptual issues regarding government intervention in health care markets; chapter 21 investigates the principal regulatory mechanisms, including antitrust policy. These are followed by an updated chapter 22, which includes information about the 1997 changes to Medicare and Medicaid.

Finally, we finish the book with two new chapters. Chapter 25 looks at economic “bads.” Economists like to look at things that are good for us, but some things such as cigarettes are not. Chapter 26 is an entirely new chapter on pharmaceuticals. Rather than a simple “industry study,” we look at those portions of the pharmaceutical industry with particularly novel economic contents. These include questions as to the optimal combinations of drug therapies and other economic technologies, the appropriate amount of patent protection that an industry (in this case the pharmaceutical industry) should enjoy, and price discrimination by pharmaceutical firms (or why drugs are cheaper in Mexico than in the United States).

Another change involves the emergence of Internet resources for students and scholars. Tables and charts that were once available only in book form, and then only after several years, are now available much more quickly, and are often available on the Internet long before they are available (if at all) in print. The downside to this explosion of information involves editorial oversight (not all sources are good ones) and frustrating tendencies for Internet sites to disappear. We have chosen to focus on governmental sites such as the following for references that we believe to be both long lasting and reliable.

National Institutes of Health (<http://www.nih.gov/>),  
Health Care Financing Administration (<http://www.hcfa.gov/>),  
Social Security Administration (<http://www.ssa.gov/>), and  
Bureau of the Census (<http://www.census.gov/>).

## Alternative Course Designs

As a developing field, the economics of health and health care has an evolving body of literature, and there is no single “correct” order for the course design. Economists (particularly U.S. economists) typically organize topics through markets, with government roles coming much later. Students and scholars of public health assign the governmental sector far more importance; it is “public” health. Unfortunately, a text is necessarily linear in that one chapter has to follow another.

*The Economics of Health and Health Care* offers instructors considerable flexibility. We have divided the 26 chapters into nine parts:

1. Basic Economic Tools (chapters 1–4)
2. Supply and Demand (chapters 5–8)
3. Information (chapters 9–10)
4. Insurance and Organization of Health Providers (chapters 11–12)
5. Technology (chapters 13–14)
6. Labor (chapters 15–16)
7. Hospitals and Nursing Homes (chapters 17–18)
8. Social Insurance (chapters 19–23)
9. Policy Issues and Analyses (chapters 24–26)

The categories are not entirely exclusive. Chapter 7, looking at the demand and supply of insurance, is as important to part 4 on insurance as it is to part 2 on demand and supply of goods.

From front to back, the organization follows an “economics” model in which consumers and firms are first analyzed in a world without government and governmental policies. As a result, explicit discussions of government policies do not come until chapter 19, although regulation, licensing, mandates, and the like are discussed in reference to other topics much earlier. Many economics instructors may wish to follow the chapters in the order of the book.

Other instructors, particularly those who are interested in public health and in governmental policies, may wish to “tool up” on some of the earlier analyses, and then skip directly to parts 8 and 9, in which we look at social insurance, health care regulation, and health care reform. After that, they may wish to browse selected topics. Although some analyses build on each other within chapters, we have sought to minimize cross-referencing among chapters.

## New Instructional Materials

We are pleased to provide our users with two new features. Instructors and students will be able to log on to <http://www.prenhall.com/folland> where they will find occasional timely features, as well as links to useful health-related locations elsewhere on the Web. In addition, our new Instructor’s Manual will provide instructors with teaching hints,

suggestions for discussion, and additional questions (with answers). With the increased use of our book for professional, as well as distance education, the manual will prove invaluable for teachers in both traditional and nontraditional settings. Instructors should contact their Prentice Hall sales representative for the user identification number and password to access the faculty resources.

## Acknowledgments

Because this book emerges from years of classroom and professional interaction, we thank those students and colleagues who have discussed the economics of health and health care with us, and who have challenged our ideas. Perhaps our most significant debts go to Annie Todd, who suggested the endeavor and introduced us to each other, and to Tom McGuire, whose intellectual and collegial support convinced us that we could succeed. We have been blessed with outstanding editors—Jill Leckta edited the first edition, Leah Jewell edited the second, and Rod Banister and Gladys Soto have edited this third edition.

The staff at Prentice Hall has been outstanding in their support. Maureen Wilson has most capably managed production for this edition as she did for our second edition.

We have been helped all along by capable research assistants, including Kimberly Klett, Kalyani Velagapudi, and Daniel Armijo.

We are most grateful to instructors at more than 200 universities in the United States, Canada, and abroad, who have provided the market test for our work by adopting the book. Numerous professional colleagues were generous in offering their time and energy to read and critique various chapters. We thank:

- Carson Bays, East Carolina University
- James Burgess, Veterans Administration
- Frank Chaloupka, University of Illinois—Chicago
- Hope Corman, Rider College
- Merton Finkler, Lawrence University
- Andrew D. Foster, Brown University
- H. E. Frech, III, University of California—Santa Barbara
- Martin Gaynor, Carnegie Mellon University
- John Goddeeris, Michigan State University
- Warren Greenberg, George Washington University
- Michael Grossman, City University of New York
- Jack Hadley, Center for Health Policy Studies
- James Hamilton, Wayne State University
- Janet Hankin, Wayne State University
- Govind Hariharan, State University of New York—Buffalo
- Ronald Horwitz, Oakland University
- Harold Hotelling, Lawrence Technological University
- Paul Langley, University of Colorado
- William Low, University of Northern British Columbia
- Timothy McBride, University of Missouri—St. Louis
- Tom McCarthy, National Economic Research Associates
- Catherine McLaughlin, University of Michigan

- Eleanor Nishiura, Wayne State University
- Albert A. Okunde, University of Memphis
- Martin Pernick, University of Michigan
- Joann Richards, Oakland University
- John Rizzo, Yale University
- Ya-chen Tina Shih, University of North Carolina
- John M. Tilford, University of Arkansas
- Scott Vander Linde, Calvin College
- Rob Verner, Kent State University
- Kenneth Warner, University of Michigan
- Gerard Wedig, University of Pennsylvania
- Burton Weisbrod, Northwestern University
- William White, Yale University
- Barbara Wolfe, University of Wisconsin—Madison
- Michael Woolley, University of Southern California

We also thank the following colleagues who, with their classes, test-taught and test-learned parts of the text:

- Randall Ellis, Boston University
- Gail Jensen, Wayne State University
- Thomas McGuire, Boston University
- Lee Mobley, Oakland University
- Kathleen Possai, Wayne State University
- Richard Scheffler, University of California—Berkeley
- Nancy Wolf, Rutgers University

Yet again, we thank our wives and daughters who have patiently watched and supported their husbands and fathers in learning about health economics.

**S. F.**  
*Rochester, Michigan*

**A. C. G.**  
*Detroit, Michigan*

**M. S.**  
*Rochester, Michigan*





# Brief Contents

Preface xv

## **PART I: BASIC ECONOMIC TOOLS**

- Chapter 1 Introduction 1
- Chapter 2 Microeconomic Tools for Health Economics 20
- Chapter 3 Statistical Tools for Health Economics 53
- Chapter 4 Cost-Benefit Analysis and Other Tools of Economic Evaluation 74

## **PART II: SUPPLY AND DEMAND**

- Chapter 5 The Production of Health 97
- Chapter 6 Demand for Health Capital 120
- Chapter 7 Demand and Supply of Health Insurance 141
- Chapter 8 Consumer Choice and Demand 164

## **PART III: INFORMATION**

- Chapter 9 Asymmetric Information and Agency 187
- Chapter 10 Imperfect Information: Supplier-Induced Demand and Small Area Variations 204

## **PART IV: INSURANCE AND ORGANIZATION OF HEALTH PROVIDERS**

- Chapter 11 The Organization of Health Insurance Markets 227
- Chapter 12 Managed Care 248

## **PART V: TECHNOLOGY**

- Chapter 13 The Production and Cost of Health Care 281
- Chapter 14 Technology 309

**PART VI: LABOR**

- Chapter 15 Labor Markets and Professional Training 323
- Chapter 16 The Training and Practice of Physicians 347

**PART VII: HOSPITALS AND NURSING HOMES**

- Chapter 17 The Role of Nonprofit Firms 373
- Chapter 18 Hospitals and Long-Term Care 399

**PART VIII: SOCIAL INSURANCE**

- Chapter 19 Equity, Efficiency, and Need 419
- Chapter 20 Government Intervention in Health Care Markets 445
- Chapter 21 Government Regulation—Principal Regulatory Mechanisms 470
- Chapter 22 Social Insurance 502
- Chapter 23 Comparative Health Care Systems 528

**PART IX: POLICY ISSUES AND ANALYSES**

- Chapter 24 Health Systems Reform 555
- Chapter 25 The Health Economics of Bads 571
- Chapter 26 The Pharmaceutical Industry 583



# Contents

**PREFACE**      xv

**PART I: BASIC ECONOMIC TOOLS**

**CHAPTER 1 Introduction**      1

The Relevance of Health Economics	1
Economic Methods and Examples of Analysis	8
Does Economics Apply to Health and Health Care?	10
Is Health Care Different?	12
New Challenges to Health Economists—Managed Care and Health Care Costs	15
Conclusions	17

**CHAPTER 2 Microeconomic Tools for Health Economics**      20

Scarcity and the Production Possibilities Frontier	21
Practice with Supply and Demand	24
Functions and Curves	28
Derived Demand	29
Consumer Behavior Theory: Ideas Behind the Demand Curve	30
Individual and Market Demands	34
Elasticities	36
Production and Market Supply	37
The Firm Supply Curve under Perfect Competition	43
Monopoly and Other Market Structures	46
Welfare Losses	47
The Edgeworth Box	48
Conclusions	50

<b>CHAPTER 3 Statistical Tools for Health Economics</b>	<b>53</b>
Hypothesis Testing	54
Difference of Means	55
Regression Analysis	59
Feature: No Link Between Childhood Cancer and Electromagnetic Fields	60
Multiple Regression Analysis	64
The Identification Problem	66
Discrete Choice Analysis	68
Statistical Inference in the Sciences and Social Sciences	69
Conclusions	70

**CHAPTER 4 Cost-Benefit Analysis and Other Tools of Economic Evaluation 74**

Cost-Benefit Analysis: Basic Principles	75
Feature: The Cost of Saving Lives	76
The Valuation of Benefits and Costs	82
Cost-Benefit Analysis in Health Care	85
Cost-Effectiveness Analysis	89
Cost-Utility Analysis and QALYs	91
Conclusions	92

**PART II: SUPPLY AND DEMAND**

**CHAPTER 5 The Production of Health 97**

The Production Function of Health	97
On the Historical Role of Medicine and Health Care	100
Feature: Tuberculosis and the Magic Mountain	103
The Production of Health in the Modern Day	106
Feature: The Length of Life Is Fixed	111
On the Role of Schooling	115
Conclusions	117

**CHAPTER 6 Demand for Health Capital 120**

The Demand for Health	120
Labor-Leisure Trade-Offs	122
The Investment/Consumption Aspects of Health	124
Investment Over Time	126
The Demand for Health Capital	127
Changes in Equilibrium: Age, Wage, Education, and Uncertainty	128
Empirical Analyses Using Grossman's Model	131

Feature: Rational Addiction—An Adaptation of the Demand for Health	132
An Integrated Framework for the Grossman Model	133
Conclusions	138

**CHAPTER 7 Demand and Supply of Health Insurance 141**

Risk and Insurance	143
The Demand for Insurance	146
The Supply of Insurance	150
The Case of Moral Hazard	152
Feature: “Viatical” Life Insurance Deals Get Tougher	153
Health Insurance and the Efficient Allocation of Resources	156
Conclusions	161

**CHAPTER 8 Consumer Choice and Demand 164**

Applying the Standard Budget Constraint Model	165
Two Additional Demand Shifters—Time and Coinsurance	169
Issues in Measuring Health Care Demand	174
Empirical Measurements of Demand Elasticities	176
Impacts of Insurance on Aggregate Expenditures	183
Conclusions	184

**PART III: INFORMATION**

**CHAPTER 9 Asymmetric Information and Agency 187**

Overview of Information Issues	188
Asymmetric Information	188
Application of the Lemons Principle: Health Insurance	193
The Agency Relationship	195
Consumer Information, Prices, and Quality	196
Feature: Contingency Fees and Medical Malpractice	197
Conclusions	200
Feature: Health Plan Report Cards	201

**CHAPTER 10 Imperfect Information: Supplier-Induced Demand and Small Area Variations 204**

Supplier-Induced Demand (SID)	205
Models of SID	207
The Identification Problem	213
Evaluation of SID	215
Small Area Variations (SAV)	216

The Physician Practice Style Hypothesis	217
SAV and the Social Cost of Inappropriate Utilization	221
Feature: Clinical Decision Making and Patient Preferences	223
Evaluation of SAV	223

**PART IV: INSURANCE AND ORGANIZATION OF HEALTH PROVIDERS**

**CHAPTER 11 The Organization of Health Insurance Markets 227**

Loading Costs and the Behavior of Insurance Firms	228
Employer Provision of Health Insurance and the Tax System	230
Who Pays for Health Insurance?	230
Feature: Who Pays for Health Insurance?	232
Employer-Based Health Insurance and Job Mobility	235
The Market for Insurance	237
The Uninsured—An Analytical Framework	240
Conclusions	245

**CHAPTER 12 Managed Care 248**

What Is the Organizational Structure?	250
What Are the Economic Characteristics?	252
The Emergence of Managed Care Plans	253
Development and Growth of Managed Care—	
Why Has It Taken So Long?	257
Modeling Managed Care	261
Are Managed Care Costs Lower?	267
Quality of Care	269
Growth in Spending	271
Competitive Effects	273
Conclusions	276
Feature: Drive Through Deliveries—Managed Care and Mandates	277

**PART V: TECHNOLOGY**

**CHAPTER 13 The Production and Cost of Health Care 281**

Substitution between Health Care Inputs	282
The Cost Function and Economies of Scale and Scope	286
Empirical Cost Function Studies	292
The Survival Analysis Approach	296
Technical and Allocative Inefficiency	299
Conclusions	304

**CHAPTER 14 Technology 309**

Technological Change and Costs	309
Insurance and the Bias Toward Cost-Increasing Technological Change	314
On the Diffusion of New Health Care Technologies	318
Conclusions	321

**PART VI: LABOR**

**CHAPTER 15 Labor Markets and Professional Training 323**

The Importance of Labor in the Health Care Sector	324
The Demand for and Supply of Health Care Labor	324
The Human Capital Theory of Investment in Education	328
Factor Productivity and Substitution among Factors	332
Health Manpower Availability	334
Manpower Planning and the Meaning of Shortages	335
Feature: Workforce Planning Versus the Power of Markets	339
Feature: Are Nursing Markets Monopsonistic?	344
Conclusions	344

**CHAPTER 16 The Training and Practice of Physicians 347**

Medical Education Issues and the Question of Control	348
Licensure and Monopoly Rents	354
Feature: Market Conditions and Choices Facing New Physicians	355
Physician Supply Decisions	358
Feature: Price Discrimination by Physicians under a Charity Hypothesis	364
Geographic Location of Physicians	365
Conclusions	369

**PART VII: HOSPITALS AND NURSING HOMES**

**CHAPTER 17 The Role of Nonprofit Firms 373**

An Introduction to Nonprofits	373
Why Nonprofits Exist and Why They are Prevalent in Health Care	374
Models of Nonprofit Hospital Behavior	381
The Relative Efficiency of Nonprofits versus For-Profits	391
Feature: Why are RNs' Wages Higher in Nonprofit Nursing Homes?	395
Conclusions	396

**CHAPTER 18 Hospitals and Long-Term Care 399**

Background and Overview of Hospitals	399
Hospital Utilization and Costs	403

Feature: Game Theory and the Medical Arms Race (MAR)	405
Nursing Homes	409
Hospice and Home Health	415
Conclusions	416

**PART VIII: SOCIAL INSURANCE**

**CHAPTER 19 Equity, Efficiency, and Need 419**

Efficiency and Competitive Markets	420
Deviations From the Competitive Model in the Health Care Sector	425
Promoting Competition in the Health Care Sector	427
An Economic Efficiency Rationale for Social Programs in Health Care Based on Externalities	428
Feature: The Rice Critique	429
Need and Need-Based Distributions	431
Economic Criticisms of Need-Based Distributions	435
Horizontal Equity and Need	436
Theories of Social Justice	438
Conclusions	441

**CHAPTER 20 Government Intervention in Health Care Markets 445**

Economic Rationale for Government Intervention	446
Forms of Government Intervention	451
Government Involvement in Health Care Markets	454
Government Failure	459
Competitive Strategies	461
Conclusions	467

**CHAPTER 21 Government Regulation—Principal Regulatory Mechanisms 470**

Do the Laws of Supply and Demand Apply?	470
Monopoly and Regulation	471
Objectives of Regulation	472
Regulation of the Hospital Sector	474
Prospective Payment	479
The Theory of Yardstick Competition and DRGs	480
Prospective Payment—Recent Evidence	486
Who Does the Regulator Represent?	489
Antitrust	491
Conclusions	498



<b>CHAPTER 22 Social Insurance</b>	<b>502</b>
Social Insurance Policies and Social Programs	502
Historical Roots of Social Insurance	505
Medicare and Medicaid in the United States	508
Feature: Oregon Medicaid's Doctor-Assisted Suicide	512
The Effects of Medicare and Medicaid	513
National Health Insurance	521
Conclusions	525

<b>CHAPTER 23 Comparative Health Care Systems</b>	<b>528</b>
Criticisms of the American Health Care System	528
Contemporary Health Care Systems	530
Feature: OECD Data and Opportunity Costs	532
National Health Programs: Three Examples	533
The Canadian Health Care System	541
Feature: How is Health Care "Rationed" in Canada?	546
Differences in Health Care Spending Across Countries	548
Conclusions	551

## **PART IX: POLICY ISSUES AND ANALYSES**

<b>CHAPTER 24 Health Systems Reform</b>	<b>555</b>
Health System Reform in International Perspective	556
Assuring Access to Care	558
Feature: Are People Everywhere in the World Basically the Same?	559
Providing Care at Lower Cost	564
Conclusions	569

<b>CHAPTER 25 The Health Economics of Bads</b>	<b>571</b>
The Health Economics of Bads: An Introduction	572
Rationales for Public Intervention	573
Advertising Restrictions on Cigarettes and Alcohol	574
Excise Taxes and Consumption: Cigarettes and Alcohol	577
Feature: "Mind If I Smoke?"	579
Conclusions	581

<b>CHAPTER 26 The Pharmaceutical Industry</b>	<b>583</b>
Structure and Regulation	584
The Production of Health and Substitutability	589