

# CONTENTS OF THE HANDBOOK

## VOLUME 1A

### *Introduction*

The State and Scope of Health Economics

ANTHONY J. CULYER and JOSEPH P. NEWHOUSE

## PART 1 – OVERVIEWS AND PARADIGMS

### *Chapter 1*

International Comparisons of Health Expenditure

ULF-G. GERDTHAM and BENGT JÓNSSON

### *Chapter 2*

An Overview of the Normative Economics of the Health Sector

JEREMIAH HURLEY

### *Chapter 3*

Medical Care Prices and Output

ERNST R. BERNDT, DAVID M. CUTLER, RICHARD G. FRANK, ZVI GRILICHES,

JOSEPH P. NEWHOUSE and JACK E. TRIPLETT

### *Chapter 4*

Advances in CE Analysis

ALAN M. GARBER

### *Chapter 5*

Information Diffusion and Best Practice Adoption

CHARLES E. PHELPS

### *Chapter 6*

Health Econometrics

ANDREW M. JONES

## PART 2 – DEMAND AND REIMBURSEMENT FOR MEDICAL SERVICES

### *Chapter 7*

The Human Capital Model

MICHAEL GROSSMAN

### *Chapter 8*

Moral Hazard and Consumer Incentives in Health Care

PETER ZWEIFEL and WILLARD G. MANNING

*Chapter 9*

Physician Agency

THOMAS G. McGUIRE

*Chapter 10*

Insurance Reimbursement

MARK V. PAULY

**PART 3 – INSURANCE MARKETS, MANAGED CARE, AND CONTRACTING***Chapter 11*

The Anatomy of Health Insurance

DAVID M. CUTLER and RICHARD J. ZECKHAUSER

*Chapter 12*

Health Insurance and the Labor Market

JONATHAN GRUBER

*Chapter 13*

Managed Care

SHERRY GLIED

*Chapter 14*

Risk Adjustment in Competitive Health Plan Markets

WYNAND P.M.M. VAN DE VEN and RANDALL P. ELLIS

*Chapter 15*

Government Purchasing of Health Services

MARTIN CHALKLEY and JAMES M. MALCOMSON

**VOLUME 1B****PART 4 – SPECIFIC POPULATIONS***Chapter 16*

Economics and Mental Health

RICHARD G. FRANK and THOMAS G. McGUIRE

*Chapter 17*

Long-Term Care

EDWARD C. NORTON

*Chapter 18*

The Economics of Disability and Disability Policy

ROBERT HAVEMAN and BARBARA WOLFE

*Chapter 19*

Child Health in Developed Countries

JANET CURRIE

## PART 5 – THE MEDICAL CARE MARKET

### *Chapter 20*

The Industrial Organization of Health Care Markets

DAVID DRANOVE and MARK A. SATTERTHWAITE

### *Chapter 21*

Not-For-Profit Ownership and Hospital Behavior

FRANK A. SLOAN

### *Chapter 22*

Economics of General Practice

ANTHONY SCOTT

### *Chapter 23*

Waiting Lists and Medical Treatment

JOHN G. CULLIS, PHILIP R. JONES and CAROL PROPPER

### *Chapter 24*

Economics of Dental Services

HARRI SINTONEN and ISMO LINNOSMAA

### *Chapter 25*

The Pharmaceutical Industry

F.M. SCHERER

## PART 6 – LAW AND REGULATION

### *Chapter 26*

Liability for Medical Malpractice

PATRICIA M. DANZON

### *Chapter 27*

Antitrust and Competition in Health Care Markets

MARTIN GAYNOR and WILLIAM B. VOGT

### *Chapter 28*

Regulation of Prices and Investment in Hospitals in the U.S.

DAVID S. SALKEVER

## PART 7 – HEALTH HABITS

### *Chapter 29*

The Economics of Smoking

FRANK J. CHALOUPKA and KENNETH E. WARNER

### *Chapter 30*

Alcohol

PHILIP J. COOK and MICHAEL J. MOORE

*Chapter 31*

Prevention

DONALD S. KENKEL

**PART 8 – HEALTH***Chapter 32*

The Measurement of Health-Related Quality of Life

PAUL DOLAN

*Chapter 33*

Economic Epidemiology and Infectious Diseases

TOMAS PHILIPSON

**PART 9 – EQUITY***Chapter 34*

Equity in Health Care Finance and Delivery

ADAM WAGSTAFF and EDDY VAN DOORSLAER

*Chapter 35*

Equity in Health

ALAN WILLIAMS and RICHARD COOKSON

# CONTENTS OF VOLUME 1A

Introduction to the Series	v
Contents of the Handbook	vii
Acknowledgments	xi
Introduction: The State and Scope of Health Economics	
ANTHONY J. CULYER and JOSEPH P. NEWHOUSE	1
The health of health economics	1
The scope of health economics	3
The scope of the Handbook	6
References	7

## PART 1 – OVERVIEWS AND PARADIGMS

### *Chapter 1*

International Comparisons of Health Expenditure	
ULF-G. GERDTHAM and BENGT JÖNSSON	11
Abstract	12
Keywords	12
1. Background and overview	13
1.1. Why international comparisons?	16
1.2. Methodological problems	19
1.3. Organization of the chapter	21
2. First-generation studies	21
2.1. Cross-section bivariate regressions	21
2.2. Cross-section multivariate regressions	25
3. Second-generation studies	29
3.1. Panel data analyses	29
3.2. Unit root and cointegration analyses	40
4. Summary and concluding remarks	45
4.1. Summary of empirical results	45
4.2. Issues for the future	48
References	49

*Chapter 2*

## An Overview of the Normative Economics of the Health Sector

JEREMIAH HURLEY	55
Abstract	56
Keywords	56
1. Introduction	57
2. Efficiency and normative frameworks	59
2.1. Neo-classical welfare economic framework	60
2.2. Critiques of welfare economics within the health sector and extra-welfarism	62
3. Health care as an economic commodity	67
3.1. Derived demand for health care	68
3.2. Externalities	70
3.3. Informational asymmetry	73
3.4. Uncertainty	79
4. Equity in the health sector	87
4.1. Equality of access	89
4.2. Allocation according to need	90
4.3. Equality of health	92
4.4. Rival notions of equity	95
5. Evaluation of programs and interventions	96
5.1. Equity and the methods of economic evaluation	104
6. Concluding observations: health economists as policy advisors	107
References	110

*Chapter 3*

## Medical Care Prices and Output

ERNST R. BERNDT, DAVID M. CUTLER, RICHARD G. FRANK, ZVI

GRILICHES, JOSEPH P. NEWHOUSE and JACK E. TRIPLETT 119

Abstract 120

Keywords 121

1. Introduction	122
2. The market environment underlying medical care CPIs and PPIs	124
2.1. Distinguishing features of the US medical care marketplace	124
2.2. Pricing medical care services	129
2.3. Forming a price index	133
3. Construction of medical care CPIs and PPIs at the BLS	135
3.1. A brief summary of the CPI	136
3.2. A brief summary of the PPI	138
3.3. PPIs for medical-related goods and services	141
3.4. Medical care products and services in the CPI and MCPI	153
4. Related research on medical care price indexes	162
5. A new medical care expenditure price index based on episode treatment costs	163
6. Medical care price indexes in the national income and product accounts	166

6.1. Medical expenditures in national accounts	166
6.2. The US context	168
6.3. National accounts issues outside the US	171
6.4. National health accounts	174
References	175

### Chapter 4

#### Advances in CE Analysis

ALAN M. GARBER

Abstract	182
Keywords	182
1. Introduction	183
2. Cost-effectiveness analysis for decision making	187
2.1. Time horizon	191
2.2. Average CE ratio	192
2.3. Incremental CE ratio for multiple alternatives	193
2.4. Sensitivity analysis	196
2.5. Interpretation for medical decision making and health policy	197
3. When does CE analysis lead to optimal decisions?	198
4. Perspective and cost measurement	204
4.1. Should the societal perspective be the default?	205
4.2. The challenge of fixed costs	207
4.3. Distributional considerations	211
4.4. Summary: costs and perspective	211
5. Measuring outcomes	211
5.1. Steps to measuring QALYs	212
5.2. Estimating survival and probabilities of health states	214
5.3. Preference assessment	215
5.4. Preference heterogeneity and its consequences for CE analysis	216
5.5. QALY measurement and the application of CE analysis	217
6. Recommendations	218
References	219

### Chapter 5

#### Information Diffusion and Best Practice Adoption

CHARLES E. PHELPS

Abstract	224
Keywords	224
1. Introduction	225
2. Market equilibrium and price variability	228
2.1. Search and market equilibrium	228
2.2. Search in health care markets	228
2.3. Incomplete information models	230

3. Disagreement about the production function	237
3.1. The healer's dilemma	237
3.2. Regional variations	239
3.3. Physician-specific variations	248
3.4. What relationships between regional and individual practice variations exists?	251
3.5. Welfare loss from variations	252
4. Production and dissemination of information	257
4.1. Property rights to drugs, devices, and ideas	257
4.2. Costs of production of information	258
References	261

## Chapter 6

### Health Econometrics

ANDREW M. JONES

Abstract	265
1. Introduction	267
2. Identification and estimation	268
2.1. The evaluation problem	268
2.2. Estimation strategies	269
3. Qualitative dependent variables	275
3.1. Binary responses	275
3.2. Multinomial and ordered responses	276
3.3. Bivariate models	283
4. Limited dependent variables	285
4.1. Two-part, selectivity, and hurdle models	285
4.2. Two-part models and retransformation: developments and applications	289
4.3. Selectivity models: developments and applications	292
4.4. Hurdle models: developments and applications	297
5. Unobservable heterogeneity and simultaneous equations	299
5.1. Linear models	299
5.2. Nonlinear models	301
6. Longitudinal and hierarchical data	305
6.1. Multilevel models	305
6.2. Random versus fixed effects	308
6.3. Individual effects in panel data	309
7. Count data regressions	315
7.1. Count data	315
7.2. The basic model: counts and durations	316
7.3. Overdispersion and excess zeros	318
7.4. Unobservable heterogeneity and simultaneity biases	323
8. Duration analysis	325
8.1. Survival and duration data	325
8.2. Methods	326



8.3. Competing risks and multiple spells	330
9. Stochastic frontiers	331
9.1. Cost function studies	331
9.2. Frontier models	332
10. Conclusion	335
References	336

## PART 2 – DEMAND AND REIMBURSEMENT FOR MEDICAL SERVICES

### *Chapter 7*

#### The Human Capital Model

MICHAEL GROSSMAN

#### Abstract

1. Introduction	347
2. Basic model	348
2.1. Assumptions	349
2.2. Equilibrium conditions	352
2.3. Optimal length of life	352
2.4. “Bang-bang” equilibrium	356
2.5. Special cases	363
3. Pure investment model	366
3.1. Depreciation rate effects	367
3.2. Market and nonmarket efficiency	369
4. Pure consumption model	371
5. Empirical testing	374
5.1. Structure and reduced form	377
5.2. Data and results	378
6. Extensions	381
6.1. Empirical extensions with cross-sectional data	383
6.2. Empirical extensions with longitudinal data	388
6.3. Theoretical extensions	392
7. Health and schooling	395
8. Conclusions	399
References	404

### *Chapter 8*

#### Moral Hazard and Consumer Incentives in Health Care

PETER ZWEIFEL and WILLARD G. MANNING

#### Abstract

1. Introduction and overview	409
2. Dimensions of consumer incentives in health care	410
3. The amount of delegation of authority to the physician	411
4. Incentives and ex ante moral hazard	412
	414
	415

4.1. Theoretical background	415
4.2. Empirical evidence	418
5. Incentives and static ex post moral hazard	420
5.1. Theoretical background	420
5.2. Empirical evidence	429
5.3. Full price effects	444
5.4. Effect of rationing by the physician	449
6. Dynamic ex post moral hazard	451
6.1. Theoretical background	451
6.2. Empirical evidence	453
7. Concluding remarks	453
References	455

## Chapter 9

### Physician Agency

THOMAS G. McGUIRE

Abstract	462
Keywords	462
1. Introduction	463
2. Demand and supply for physician services	468
2.1. Prices and quantities	469
2.2. Entry conditions and monopoly profits	469
2.3. Competition among physicians	473
3. Physician behavior with complete information	475
3.1. A monopolistically competitive firm selling a service	475
3.2. A third-party payer and administered demand and supply prices	481
3.3. Noncontractible "quality," supply-side cost sharing in managed care contracts, and competition for patients	487
3.4. Network incentives in managed care	492
3.5. Efficient production of physicians' services	494
3.6. Summary	496
4. Uncertainty about treatment effects and asymmetric information	496
4.1. Irreducible uncertainty	497
4.2. Unobservable physician actions	498
4.3. Unobservable physician characteristics	502
4.4. Summary	503
5. Physician-induced demand	503
5.1. Theory of demand inducement	507
5.2. Physician-to-population ratios, income effects, and inducement	509
5.3. Fees and inducement	513
5.4. Other evidence bearing on PID	516
5.5. Summary comments on PID	517
6. Other physician objectives	520

6.1. Medical ethics as a constraint on choices	520
6.2. Utility and the patient's best interest	521
6.3. Target incomes	522
7. Conclusion	526
References	528

### Chapter 10

#### Insurance Reimbursement

MARK V. PAULY

537

#### Abstract

538

1. Introduction	539
2. Reimbursement in the theory of insurance	539
3. Medical services are different	540
4. Indemnity insurance and the theory of health insurance benefits	541
5. Optimal reimbursement in price-taking markets with and without moral hazard	542
6. Service benefit insurance	545
7. Balance billing	547
8. Substitutes and complements	548
9. Alternatives to reimbursing market-level fee for service	548
10. Monopsony and provider market power	551
11. Reimbursement and productive efficiency	553
12. Heterogeneity in non-competitive markets	554
13. Empirical results on reimbursement	556
14. Bidding models	557
15. Conclusion	558
References	558

## PART 3 – INSURANCE MARKETS, MANAGED CARE, AND CONTRACTING

### Chapter 11

#### The Anatomy of Health Insurance

DAVID M. CUTLER and RICHARD J. ZECKHAUSER

563

#### Abstract

564

#### Keywords

565

1. Health insurance structures in developed nations	568
1.1. Health insurance in the United States	569
2. The principles of insurance	571
2.1. Insurance with fixed spending	572
3. Moral hazard and principal-agent problems	576
3.1. Moral hazard	576
3.2. Patients, doctors, and insurers as principals and agents	588
3.3. Transactions costs	590
4. Relationships between insurers and providers	590

4.1. Equilibrium treatment decisions in managed care	594
4.2. Evidence on supply-side payment and medical treatment	596
5. Optimal mix of demand- and supply-side controls	604
6. Markets for health insurance: plan choice and adverse selection	606
6.1. Equilibrium with adverse selection – the basics	608
6.2. Equilibria with multiple individuals in a risk group	612
6.3. Continuous risk groups	614
6.4. Evidence on the importance of biased enrollment	616
6.5. Evidence on the importance of plan manipulation	623
6.6. The tradeoff between competition and selection	624
6.7. Risk adjustment	624
7. Person-specific pricing, contract length, and premium uncertainty	626
8. Insurance and health outcomes	629
9. Conclusions and implications	631
Appendix	634
References	637

## Chapter 12

### Health Insurance and the Labor Market

JONATHAN GRUBER 645

Abstract 646

Keywords 646

1. Background on health insurance and the labor market	648
1.1. Health insurance coverage	648
1.2. Features of private health insurance policies	650
1.3. The role of the workplace	651
2. Health insurance and labor market equilibrium – theory	654
2.1. Employer-provided health insurance and mobility	654
2.2. Health insurance costs and labor market equilibrium	658
2.3. Health insurance mandates	663
3. Evidence on health insurance and job-job mobility	664
3.1. Health insurance and job mobility: empirical considerations	665
3.2. Solution: variation in the value of health insurance	666
3.3. Self-employment decisions	672
3.4. Welfare implications	673
4. Health insurance and participation in the labor force and public assistance programs	674
4.1. Health insurance and retirement	674
4.2. Health insurance and public assistance participation	681
4.3. Health insurance and labor force participation and hours worked of prime age workers	687
5. Evidence on health insurance and wages, hours, and employment	689
5.1. Time series patterns	689
5.2. Health insurance and wages	690

5.3. Health insurance, employment, and hours	695
5.4. Unanswered questions	696
6. Conclusions	699
References	700

*Chapter 13*

Managed Care

SHERRY GLIED

Abstract	708
Keywords	708
1. Introduction	709
2. What is managed care?	711
2.1. Covered benefits	712
2.2. Consumer cost-sharing	712
2.3. Provider selection and organization	713
2.4. Paying providers	714
2.5. Monitoring service utilization	716
3. History of managed care	717
4. Managed care and market failure	721
4.1. Asymmetric information about health risks	721
4.2. Moral hazard	723
4.3. Information	725
4.4. Industry competitiveness	726
5. Empirical research on managed care	727
5.1. Selection	728
5.2. Utilization	731
5.3. Quality	739
5.4. Spillover effects of managed care	740
5.5. Cost growth	740
6. Economic issues related to the growth of managed care	743
6.1. Competition among managed care plans	743
6.2. Malpractice	744
6.3. Risk adjustment	744
7. Conclusions	745
References	745

*Chapter 14*

Risk Adjustment in Competitive Health Plan Markets

WYNAND P.M.M. VAN DE VEN and RANDALL P. ELLIS

Abstract	757
1. Introduction	758
1.1. Efficiency and fairness	758
1.2. The supply price and demand price of insurance	760

1.3. The role of the sponsor	761
1.4. Policy relevance	762
1.5. Outline	763
2. Conceptual aspects of risk adjustment	764
2.1. Payment flows	764
2.2. Subsidy formula	767
2.3. Regulation	769
2.4. Selection	771
2.5. Effects of selection	774
2.6. How can we prevent selection?	776
3. Risk adjustment models	779
3.1. Criteria for choosing among risk adjustment models	780
3.2. Preliminary issues in designing or implementing risk adjustment	785
3.3. Alternative risk adjustment models	794
3.4. Predictive power	807
3.5. Directions of ongoing development	813
4. Risk sharing	817
4.1. Forms of risk sharing	819
4.2. Empirical results	823
4.3. Discussion	826
5. The practice of risk adjustment and risk sharing	829
5.1. International comparison	829
5.2. Problems in practice	834
6. Directions for future research	836
References	837

### *Chapter 15*

#### Government Purchasing of Health Services

MARTIN CHALKLEY and JAMES M. MALCOMSON 847

Abstract 848

Keywords 848

1. Introduction 849

2. Quality and costs 853

2.1. The framework 853

2.2. Quality and effort 855

3. Quality, demand and fixed price contracts 857

3.1. Efficiency with fixed price contracts 858

3.2. Quality and effort: perceptions and dimensions 859

3.3. Efficient treatment numbers 860

3.4. Uncertainty 861

4. Empirical findings 862

4.1. Prospective payment, cost and quality 862

4.2. Payment mechanisms in practice 866

5. Asymmetric information on costs and case-mix	867
5.1. The mechanism design approach	868
5.2. Particular payment mechanisms	870
5.3. Competitive bidding	872
5.4. Asymmetric information: conclusion	873
6. Commitment, hold-up, and the ratchet effect	874
6.1. Supply assurance	874
6.2. Investment and hold-up	875
6.3. The ratchet effect	877
7. Reputations	878
7.1. Reputation for characteristics	879
7.2. Reputation for past behavior	880
8. Conclusion	884
Appendix: The framework with a private market	885
References	887
Author Index	I-1
Subject Index	I-45