

Cost-Effectiveness Analysis in Health Care

PubH 5862

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SYLLABUS

Revision 2

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- Guest
Instructors: Melissa S. Martinson, Ph.D., Regulatory and Clinical Research Institute
Paul C. Langley, Ph.D., 3M
- Time: Class: T,Th 4:00 - 5:15 PM
Computer Lab (beginning T, March 25, 2003): **Lab 3:10 - 4:25 PM**
- Classrooms: Class: A270 Mayo Building
Computer Lab: A268/9 Mayo Building
- Office Hours: W 1:15-2:15; F 3:00-4:00; and by appt.
- Texts: (1) Gold, Marthe R., Joanna E. Siegel, Louise B. Russell, and Milton C. Weinstein. *Cost-Effectiveness in Health and Medicine*. New York: Oxford U Press, 1996.
(2) Reading packet, available Health Science Bookstore, 2-554 Moos.
(3) *DATA 4.0 for Healthcare User's Manual*. Williamstown, MA: TreeAge Software, Inc., 2002.
- Disability: It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have documented disability conditions (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services for a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak St. Staff can be reached at 612/626-1333 voice or TTY. The website is <http://disserv3.stu.umn.edu/index2.html>

Date Topic Readings (* = optional)

1/21 History and Theoretical Basis

Stokey, Edith and Richard Zeckhauser. "Public Choice: To What Ends?" *A Primer for Policy Analysis*. New York: W. W. Norton, 1978, Chapter 13, pp. 257-290.

*Misham, E. J. *Cost-Benefit Analysis: An Introduction*. New York: Praeger, 1971.

Date Topic Readings (* = optional)

1/23 Evaluation of Benefits from Demand Theory

Misham, E. J. *Introduction to Normative Economics*. New York: Oxford University Press, 1981, Chapters 19, 20, 21 and 23, pp 145-167 and 175-183.

Persky, Joseph. "Retrospectives: Cost-Benefit Analysis and the Classical Creed," Journal of Economic Perspectives vol. 15, no. 4, Fall 2001, pp. 199-208.

*O'Connell, John F. *Welfare Economic Theory*. Boston: Auburn House Publishing, 1982, Chapter 4, pp. 41-54.

1/28 Overview of CEA

QUIZ #1

Gold et al., Ch. 1 and 2, pp. 3-53.

*Drummond, Michael. "Allocating Resources," *International Journal of Technology Assessment in Health Care* vol. 6, no. 1, 1990, pp. 77-92.

*Eisenberg, John M. "Clinical Economics: A Guide to the Economic Analysis of Clinical Practices," *Journal of the American Medical Association* vol. 262, no. 20, November 24, 1989, pp. 2879-2886.

*Doubilet, Peter, Milton C. Weinstein, Barbara J. McNeil. "Use and Misuse of the Term 'Cost Effective' in Medicine," *New England Journal of Medicine* vol. 314, no. 4, January 23, 1986, pp. 253-256.

*Detsky, Allan S., and I. Gary Naglie. A Clinician's Guide to Cost-Effectiveness Analysis, *Annals of Internal Medicine* vol. 113, no. 2, 15 July 1990, pp. 147-154.

1/30 Measuring Costs

Gold et al., Ch. 6, pp. 176-213.

Finkler, S. "The Distinction Between Cost and Charges," *Annals of Internal Medicine* vol. 96, 1982, pp. 102-109.

Date Topic Readings (* = optional)

2/4 Cost Issues

Meltzer, David. "Accounting for Future Costs in Medical Cost-Effectiveness Analysis," *Journal of Health Economics* vol. 16, no. 1, February 1997, pp. 33-64.

Nyman, John A. "Should the Consumption of Survivors Be Included as a Cost in Cost-Utility Analysis?" University of Minnesota, August 23, 2002.

Baltussen, Rob, Reiner Leidl, and André Ament. "The Impact of Age on Cost-Effectiveness Ratios and Its Control In Decision Making," *Health Economics* vol.5, no. 3, May-Jun 1996, pp. 228-239.

*Garber, Alan M. and Charles E. Phelps. "Economic Foundations of Cost-Effectiveness Analysis," *Journal of Health Economics* vol. 16, no. 1, February 1997, pp. 1-32.

*Weinstein, Milton C. and Willard G. Manning, Jr. "Theoretical Issues in Cost-Effectiveness Analysis," *Journal of Health Economics* vol. 16, no. 1, February 1997, pp. 121-128.

2/6 Measuring Outcomes

QUIZ #2

Gold et al., Ch. 4, pp. 82-134.

Johannesson, Magnus, Bengt Jönsson, Göran Karlsson. "Outcome Measurement in Economic Evaluation," *Health Economics* vol. 5, no. 4, Jul-Aug 1996, pp. 279-296.

2/11 Assessing Effectiveness in Cost-Effectiveness Analysis

Gold et al., Ch. 5, pp. 135-175.

*Detsky, Allan S. "Evidence of Effectiveness: Evaluating Its Quality," chapter 2 in *Valuing Health Care: Costs, Benefits and Effectiveness of Pharmaceuticals and Other Medical Technologies*, Frank A. Sloan, ed. Cambridge: Cambridge University Press, 1996, pp. 15-30.

2/13 Important Measures of General Health Status and Quality of Life

McDowell, Ian and Claire Newell. *Measuring Health: A Guide to Rating Scales and Questionnaires, Second Edition*. New York: Oxford, 1996. "General Health Status and Quality of Life," Chapter 9, pp. 380-492.

Date Topic Readings (* = optional)

Feeney, David et al. "Multi-Attribute Health Status Classification Systems: Health Utilities Index," *PharmacoEconomics* vol. 7, no. 6, 1995, pp. 490-502.

*Kaplan, Robert M. and John P. Anderson. "The General Health Policy Model: An Integrated Approach," chapter 32 in *Quality of Life and Pharmacoeconomics in Clinical Trials, Second Edition*, B. Spiker, ed. Philadelphia: Lippincott-Raven, 1996, pp. 309-322.

2/18 Measuring Quality of Life through SG, TTO and VAS

Hornberger, J., D. Redelmeier and J. Petersen. "Variability among Methods to Assess Patients' Well-Being and Consequent Effect on a Cost-Effectiveness Analysis," *Journal of Clinical Epidemiology* vol. 45, no. 5, 1992, pp. 505-512.

Dolan, Paul, Claire Gudex, Paul Kind, and Alan Williams. The Time Trade-off Method: Results from a General Population Study, *Health Economics* vol. 5, no. 2, Mar-Apr 1996, pp. 141-154.

Bleichrodt, Hans. "A New Explanation for the Difference Between Time Trade-Off Utilities and Standard Gamble Utilities," *Health Economics* vol. 11, no. 5, July 2002, pp. 447-456.

2/20 Linking Quality of Life to the SF-36

QUIZ #3

Fryback, Dennis G. et al. "Predicting Quality of Well-being Scores from the SF-36: Results from the Beaver Dam Health Outcomes Study," *Medical Decision Making* vol. 17, no. 1, January-March, 1997, pp. 1-9.

Nichol, Michael B., Nishan Sengupta, Denise R. Globe. "Evaluating Quality-Adjusted Life Years: Estimation of the Health Utility Index (HUI2) from the SF-36," *Medical Decision Making* vol. 21, no. 1, March/April 2001, pp. 105-112.

Brazier, John, Tim Usherwood, Rosemary Harper, and Kate Thomas. "Deriving a Preference-Based Single Index from the UK SF-36 Health Survey," *Journal of Clinical Epidemiology* vol. 51, no. 11, 1998, pp. 1115-1128.

*Bult, Roelf, Maria G. M Hunink, Joel Tsevat, and Milton C. Weinstein. Heterogeneity in the Relationship Between the Time Tradeoff and Short Form-36 for HIV-Infected and Primary Care Patients, *Medical Care* vol. 36, no. 4, April 1998, pp. 523-532.

*Busschback, Jan J. V., Joseph McDonnell, Marie-Louise Essink-Bot, Ben A. van Hout. "Estimating Parametric Relationships between Health Description and Health Valuation with an

Date Topic Readings (* = optional)

Application to the EuroQol EQ-5D,” *Journal of Health Economics* vol. 18, no. 5, 1999, pp. 551-571.

2/25 QALYs and Cost-Utility Analysis

Drummond, Michael F., Bernie O’Brien, Greg L. Stoddart, and George W. Torrance. *Methods for the Economic Evaluation of Health Care Programmes, Second Edition*. Oxford: Oxford University Press, 1997. Chapter 6, “Cost-utility Analysis,” pp. 139-204.

Tengs, Tammy O. and Amy Wallace. “One Thousand Health-Related Quality-of-Life Measures,” *Medical Care* vol. 36, no. 6, June 2000, pp. 583-637.

*Gold, Marthe R., Peter Franks, Kristine I. McCoy, and Dennis G. Fryback. “Toward Consistency in Cost-Utility Analysis: Using National Measures to Create Condition-Specific Values,” *Medical Care* vol. 36, no. 6, June 1998, pp. 778-792.

2/27 Assigning Monetary Values to Outcomes

QUIZ #4

Drummond, Michel, Bernie O’Brien, Greg L. Stoddart, George W. Torrance. “Cost-Benefit Analysis,” Chapter 7 in *Methods for the Economic Evaluation of Health Care Programmes, Second Edition*. Oxford: Oxford University Press, 1997, pp. 205-231.

O’Brien, B. and J. Viramontes. “Willingness to Pay: A Valid and Reliable Measure of Health State Preference?” *Medical Decision Making* vol. 14, no. 3, July/September, 1994, pp. 290-297.

*Pauly, Mark V. “Valuing Health Care Benefits in Money Terms,” in Frank Sloan, editor, *Valuing Health Care*. New York: Cambridge University Press, 1995, pp. 99-124.

*Berger, Mark, Glenn Blomquist, Donald Kenkel and George Tolley. “Framework for Valuing Health Risks,” Chapter 2 in *Valuing Health For Policy: An Economic Approach*. George Tolley, Donald Kenkel, and Robert Fabian, editors. Chicago: University of Chicago Press, 1994, pp. 23-41.

*Kenkel, Donald, Mark Berger and Glenn Blomquist. “Contingent Valuation of Health,” Chapter 4 in *Valuing Health For Policy: An Economic Approach*. George Tolley, Donald Kenkel, and Robert Fabian, editors. Chicago: University of Chicago Press, 1994, pp. 72-104.

3/4 Assigning Monetary Values to Human Life and Quality Adjusted Years of Life

Date Topic Readings (* = optional)

Viscusi, W. Kip. "The Value of Risks to Life and Health," *Journal of Economic Literature* vol. 31, no. 4, December 1993, pp. 1912-1946.

Hirth, Richard A, Michael E. Chernew, Edward Miller, A. Mark Fendrick, William G. Weissert. "Willingness to Pay for a Quality-adjusted Life Year: In Search of a Standard," *Medical Decision Making* vol. 20, no. 3, Jul-Sep 2000, pp. 332-342.

*Fabian, Robert. "The Quality Approach," Chapter 6 in *Valuing Health For Policy: An Economic Approach*. George Tolley, Donald Kenkel, and Robert Fabian, editors. Chicago: University of Chicago Press, 1994, pp. 118-136.

*Johannesson, Magnus and David Meltzer. "Some Reflections on Cost-Effectiveness Analysis," *Health Economics* vol. 7, no. 1, Feb 1998, pp. 1-7.

*Tolley, George, Donald Kenkel, and Robert Fabian. "State-of-the-Art Health Values," Chapter 15 in *Valuing Health For Policy: An Economic Approach*.

*George Tolley, Donald Kenkel, and Robert Fabian, editors. Chicago: University of Chicago Press, 1994, pp. 323-344.

*Berwick, D. and M. Weinstein. "What Do Patients Value? Willingness to Pay for Ultrasound in Normal Pregnancy," *Medical Care* vol. 23, no. 7, July 1985, pp. 881-893.

*Thompson, M. "Willingness to Pay and Accept Risks to Cure Chronic Disease," *American Journal of Public Health* vol. 76, no. 4, April 1986, pp. 392-396.

3/6 Discounting Debate

QUIZ #5

Gold et al. "Time Preference," Chapter 7, pp. 214-246.

Keeler, Emmett B. and Shawn Cretin. "Discounting of Life-Saving and Other Nonmonetary Effects," *Management Science* vol. 29, 1983, pp. 300-306.

*Weinstein, Milton C. and William B. Stason. "Foundations of Cost-Effectiveness Analysis for Health and Medical Practices," *New England Journal of Medicine* vol. 296, no. 13, March 31, 1977, pp. 716-721.

3/11 DATA 4.0 (Nyman) **Lab. Room: A269 Mayo, 3:10-5:15 (Note special time).**

DATA 4.0 for Healthcare Users' Manual. Chapters 2, 3, 5, 7, 9 and 26.

Date Topic Readings (* = optional)

Decision-Analytic Models

Detsky, Allan, Gary Naglie, Murray D. Krahn, David Naimark, and Donald A. Redelmeier. "Primer on Medical Decision Making," *Medical Decision Making* vol. 17, no. 2, Apr-Jun 1997, pp. 123-159.

*Sonnenberg, Frank A. "Decision Analysis in Disease Management." *DMCO*, vol. 1, no.1, 1997, pp. 20-34.

3/13 Discounting Debate

Gravelle, Hugh, and Dave Smith. "Discounting for Health Effects in Cost-Benefit and Cost-Effectiveness Analysis," *Health Economics* vol. 10, no. 7, October 2001, pp. 587-599.

Parsonage, Michael and Henry Neuburger. "Discounting and Health Benefits," *Health Economics* vol. 1, no. 1, April 1992, pp. 71-76.

Cairns, John. "Discounting and Health Benefits: Another Perspective," *Health Economics* vol. 1, no. 1, April 1992, pp. 76-79.

Van Hout, Ben A. "Discounting Costs and Effects: A Reconsideration," *Health Economics* vol. 7, no. 7, November 1998, pp. 581-594.

*Revesz, Richard L. "Environmental Regulation, Cost-Benefit Analysis and Discounting of Human Lives," mimeo, 1999.

3/25 **No class**

3/27 **MIDTERM**

4/1 DATA 4.0 (Martinson) **Lab. Room: A269 Mayo, 3:10-4:25.**

ASSIGNMENT #1 DUE

DATA 4.0 for Healthcare Users' Manual. Chapters 6 (to p. 58) 19, 20, 21 (to p. 187).

4/3 Decision-Analytic Models: Markov models

Sonnenberg, Frank A. and J. Robert Beck. "Markov Models in Medical Decision Making: A Practical Guide," *Medical Decision Making* vol. 13, no. 4, Oct-Dec

Date Topic Readings (* = optional)

1993, pp. 322-338.

*Beck, J. Robert and Stephen G. Pauker. "The Markov Process in Medical Prognosis." *Medical Decision Making* vol. 3, no. 4, 1983, pp. 419-458.

*Morris, Stephen. "A Comparison of Economic Modeling and Clinical Trials in the Economic Evaluation of Cholesterol-Modifying Pharmacotherapy" *Health Economics* vol 6, 1997, pp. 589-601.

4/8 DATA 4.0 (Martinson) **Lab. Room: A269 Mayo, 3:10-4:25.**

ASSIGNMENT #2 DUE

DATA 4.0 for Healthcare Users' Manual. Chapters 25, 27 (to p. 255).

Johannesson, Magnus, Bengt Jonsson, John Kjekshus, Anders G. Olsson, Terje R. Pederson, Hans Wedel. "Cost Effectiveness of Simvastatin Treatment to Lower Cholesterol Levels in Patients with Coronary Heart Disease," *New England Journal of Medicine* vol. 336, no. 5, January 30, 1997, pp. 332-336

4/10 Reflecting Uncertainty in CEAs

Gold, et al., Chapter 8, "Reflecting Uncertainty in Cost-Effectiveness Analysis," pp. 247-275.

Briggs, A., M. Sculpher, and M. Buxton. "Uncertainty in the economic evaluation of health care technologies: the role of sensitivity analysis." *Health Economics*, vol. 3, 1994, pp. 95-104.

*Doubilet, Peter, Colin B. Begg, Milton C. Weinstein, Peter Braun, and Barbara J. McNeil. "Probabilistic Sensitivity Analysis Using Monte Carlo Simulation." *Medical Decision Making*, vol. 5, no. 2, 1985, pp. 157-177.

*Castillo, Paul A., Cynthia S. Palmer, Michael T. Halpern, Evi J. Hatziaandreu, and Bernard J. Gersh. "Cost-Effectiveness of Thrombolytic Therapy for Acute Myocardial Infarction." *Annals of Pharmacotherapy* vol. 31, 1997, pp. 596-603.

*Briggs, Andrew and Mark Sculpher. "Sensitivity Analysis in Economic Evaluation: A Review of Published Studies," *Health Economics* vol. 4, 1995, pp. 355-371.

*Taylor, Jennifer L., Martin Zagari, Karen Murphy, and James W. Freston. "Pharmacoeconomic Comparison of Treatments for the Eradication of *Helicobacter pylori*." *Archives of Internal Medicine* vol. 157, 1997, pp. 87-97.

4/15 DATA 4.0 (Martinson) **Lab. Room: A269 Mayo, 3:10-4:25.**

Date Topic Readings (* = optional)

ASSIGNMENT #3 DUE

DATA 4.0 for Healthcare Users' Manual. Chapters 6 (p. 58 on), 22.

4/17 Targets and Budgets in Cost-Effectiveness Modeling (Langley)

Langley, PC, SK Tying and MH Smith. "The cost-effectiveness of patient-applied versus provider-administered intervention strategies in the treatment of external genital warts," *American Journal of Managed Care*, 1999; 5:69-77.

Langley. PC, GA Richwald and MH Smith. "Modeling the Impact of treatment options in genital warts: Patient-applied versus physician-administered therapies," *Clinical Therapeutics*, 1999; 21(12):2143-2155.

Locate the United Kingdom's National Institute for Clinical Excellence (NICE) on the web. NICE is part of their National Health Service (NHS). Then download *Guidance for Manufacturers and Sponsors*, which is title No. 5 (Reference number N0014) in their Technology Appraisals Process Series.

4/22 DATA 4.0 (Martinson) **Lab. Room: A269 Mayo, 3:10-4:25.**

ASSIGNMENT #4 DUE

DATA 4.0 for Healthcare Users' Manual. Chapters 21 (p. 187 on), 28 (to p. 273).

4/24 Reporting Standards for Cost-Effectiveness Studies

Gold et al., Chapter 9, "Reporting Cost-Effectiveness Studies and Results," pp. 276-311.

Gold et al. "Appendix A: Summary Recommendations," pp. 304-311.

*Drummond, Michael F., Bernie O'Brien, Greg L. Stoddart, and George W. Torrance. *Methods for the Economic Evaluation of Health Care Programmes*. New York: Oxford University Press, 1997. Chapter 9, "Presentation and Use of Economic Evaluation Results," pp. 265-292.

*Siegel, Joanna E., Milton C. Weinstein, Louise B. Russell, and Marthe R. Gold. 1996. "Recommendations for Reporting Cost-Effectiveness Analyses." *JAMA*, vol. 276, no. 16, 1996, pp. 1339-1341.

4/29 Stochastic CEAs (Martinson) **Lab. Room: A269 Mayo, 3:10-4:25.**

Date Topic Readings (* = optional)

Chaudhary, Mohammad A. and Sally C. Stearns. "Estimating Confidence Intervals for Cost-Effectiveness Ratios: An Example From a Randomized Trial." *Statistics in Medicine* vol. 15, 1996, pp.1447-1458.

Briggs, Andrew H., David E. Wonderling, and Christopher Z. Mooney. "Pulling Cost-Effectiveness Analysis up by its Bootstraps: A Non-Parametric Approach to Confidence Interval Estimation." *Health Economics* vol. 6, 1997, pp. 327-340.

*Campbell, Marion and David Torgerson. "Confidence intervals for cost-effectiveness ratios: the use of 'bootstrapping'." *Journal of Health Services Research and Policy* vol. 2, no. 4, 1997, pp. 253-255.

*Obenchain, Robert L., Catherine A. Melfi, Thomas W. Croghan and Don P. Beusching. "Bootstrap Analyses of Cost Effectiveness in Antidepressant Pharmacotherapy." *Pharmacoeconomics*, vol. 11, no. 5, 1997, pp. 464-472.

*O'Brien, Bernie J., Michael F. Drummond, Roberta J. LaBelle, and Andrew Willan. 1994. "In Search of Power and Significance: Issues in the Design and Analysis of Stochastic Cost-Effectiveness Studies in Health Care." *Medical Care* vol. 32, no. 2, 1994, pp.150-163.

*Davey, P., B. Lynch, M. Malek, et al. "Cost-effectiveness of Single Dose Cefotaxime Plus Metronidazole Compared with Three Doses Each of Cefuroxime Plus Metronidazole for the Prevention of Wound Infection after Colorectal Surgery." *Journal of Antimicrobial Chemotherapy* vol. 30, no. 6, 1992, pp. 855-864.

5/1 Applications

Gold et al. "Appendix B: Cost-Effectiveness of Strategies to Prevent Neural Tube Defects," pp. 313-348.

Gold et al., "Appendix C: The Cost-Effectiveness of Dietary and Pharmacologic Therapy for Cholesterol Reduction in Adults," pp. 349-391.

*Nyman, John A., Melissa Martinson, et al., "Cost Effectiveness of Gemfibrozil for Coronary Patient with Low Levels of High Density Lipoprotein Cholesterol: The VA-HDL Intervention Trial," *Archives of Internal Medicine*, January 2002.

*White, Craig C. Jeffrey P. Koplan, and Walter A. Orenstein. "Benefits, Risks, and Costs of Immunization for Measles, Mumps and Rubella," *American Journal of Public Health* vol. 75, no. 7, Spring 1995, pp. 739-744.

*Centerwall, Brandon S. and Maichale H. Criqui. "Prevention of the Wernicke-Korsakoff Syndrome: A Cost-Benefit Analysis," *New England Journal of Medicine* vol. 299, no. 6, Aug. 10, 1978, pp. 285-189.

Date Topic Readings (* = optional)

5/6 Presenting Results and Classic Applications

ASSIGNMENT #5 DUE

3/11 Overview of Design of Cost-Effectiveness Analysis

Gold et al., Chapter 3, “Framing and Designing the Cost-Effectiveness Analysis,” pp. 54-81.

Stason, W. and M. Weinstein. “Allocation of Resources to Manage Hypertension,” *New England Journal of Medicine* vol. 296, no. 13, March 31, 1977, pp. 732-739.

Brown, Kaye and Colin Burrows. “The Sixth Stool Guaiac Test: \$47 Million that Never Was,” *Journal of Health Economics* vol. 9, no. 4, 1990, pp. 375-512.

Eddy, David M. “The Economics of Cancer Prevention and Detection: Getting More for Less,” *Cancer* vol. 47, 1981, pp. 1200-1209.

*Johannesson, Magnus, and Milton C. Weinstein. 1993. “On the decision rules of cost-effectiveness analysis.” *Journal of Health Economics* vol.12, 1993, pp. 459-467.

*Mullahy, John PhD. “What You Don’t Know Can’t Hurt You? Statistical Issues and Standards for Medical Technology Evaluation.” *Medical Care* vol. 34, no. 12, 1996, pp. DS124-DS135.

5/8 More Classic Applications

Hillner, B., T. Smith and C. Desch. “Efficiency and Cost-Effectiveness of Autologous Bone Marrow Transplantation in Metastatic Breast Cancer,” *Journal of the American Medical Association* vol. 267, no. 15, April 15, 1992, pp. 2055-2061.

van Hout, B., et al. “Heart Transplantation in the Netherlands: Costs, Effects and Scenarios,” *Journal of Health Economics* vol. 12, no. 1, 1993, pp. 73-93.

Berwick, D. and A. Komaroff. “Cost-Effectiveness of Lead Screening,” *New England Journal of Medicine* vol. 306, no. 23, June 10, 1992, pp. 1392-1398.

5/13 **FINAL EXAM 4:00 - 6:00 pm, A270 Mayo**