Overview

The overall goal of this course is to introduce you to the key concepts of health technology assessment, with a focus on cost-effectiveness analysis. This field is multidisciplinary and policy-oriented: this means that there are many possible angles from which to teach the material, and a fair deal of context (and pretext) behind it. It also means, quite simply, that there is a lot of challenging material and many different ways to do basically the same thing and substantial disagreement about what is the “best” way. It is impossible to cover every interesting topic (much less every important one!) from every angle in a single course. Upon completing this course, you should have enough understanding of the methods and practice of technology assessment to be able to critically assess technology appraisals and their related academic literature. Beyond that, you should also become equipped with the tools necessary to begin to do your own technology assessment research and to be able to find further information and reach out to collaborators (and perhaps most importantly, to know when it is necessary to find further information and reach out to collaborators!).

Learning Objectives

More specifically, at the conclusion of this course, you should be able to:

- Apply basic concepts of economic analysis to the assessment of medical technologies and healthcare interventions more broadly;

- Conceptualize health outcomes on a range from objective measures of physical systems to subjective preference-based measures of health utility and describe the benefits and limitations of using quality-adjusted life years (QALYs) as a health outcome measure;

- Explain why we seek to obtain estimates of the “opportunity cost” of using health care resources, describe the process of “costing” in economic assessments of medical technologies and identify useful sources of information for obtaining cost information (and their limitations);

- Describe how primary data from randomized controlled trials and observational studies can be designed to assess medical technologies and explain the advantages and disadvantages of different designs in terms of their internal and external validity and decision-relevance;

- Describe how evidence from secondary data can be integrated using systematic reviews, meta-analysis and decision-analytic modeling methods can be used to assess medical technologies and demonstrate basic ability to design and execute simple decision tree and Markov models for cost-effectiveness analysis.
Expectations and Assessments

Readings and Videos. You are expected to read all core readings and discussion papers and to watch all required video presentations prior to coming to class (see schedule on last page of syllabus). On all class days (except on which take-home exams are due), you will be expected to submit via email to dvanness@wisc.edu a set of five to ten discussion questions before 9am. There should be at least one question for each assigned discussion paper or video, and at least one answer of the following 3 types: 1) What is the most important concept in the paper/video and why? 2) What important concept in the paper did you find confusing / needs clarification and why? 3) How does this paper help you understand either of the technology appraisal case studies. Submitted questions will be graded on a scale of 0-2 points based on quality. Discussion questions submitted between 9am and class time on the date due will be docked 1 point; questions not received by class time on the due date will receive 0 points.

Technology Appraisal Case Studies. The following two technology appraisals will serve as case studies throughout the course. You should explore them as soon as possible and then re-read sections in greater detail as you learn more about the underlying concepts and methods.

- NICE Technology Appraisal: Trastuzumab emtansine for treating HER2-positive, unresectable locally advanced or metastatic breast cancer after treatment with trastuzumab and a taxane [http://www.nice.org.uk/guidance/ta371](http://www.nice.org.uk/guidance/ta371)

On the final day of class, we will hold a panel discussion of the USPSTF Breast Cancer Screening recommendations. A final report relating to the recommendations will be due one week following the last class.

Take Home Exams. There will be three take home exams, one each assigned after the conclusion of modules 2, 4 and 6. Exams must be submitted via email to dvanness@wisc.edu before class on the due date. Late take-home exams will be docked 2 points per day. In general, minor errors will receive a 0.5 point deduction and major errors will receive a 1-2 point deduction. You may discuss your answers with your classmates, but you are expected to complete your own work in accordance with UW academic honesty policies ([http://pubs.wisc.edu/home/archives/gopher/special93/00000136.html](http://pubs.wisc.edu/home/archives/gopher/special93/00000136.html)).

Final Report. You will be expected to prepare a final report using principles of health technology assessment to critique the draft USPSTF Breast Cancer Guidelines. Details will be provided in a final assignment. The final report must be submitted via email to dvanness@wisc.edu before noon Thursday May 12. Late submissions will be docked 0.5 points per hour.

Grading Policy

Points will be allocated to the discussion questions, take-home exams and final report according to the schedule on the last page of the syllabus. Final grades will be assigned according to the following scheme:

- 90 – 100+ points : A
- 85 – 89 points: AB
- 80 – 84 points: B
- <80 points: BC
- Any missing take-home exam or final report: F

Textbooks

None required. All readings are available via links provided in syllabus. You may need to use an internet connection on campus to access them online.
Module 1: Introduction and Overview of the Assessment of Medical Technologies

Core Readings:
- Goodman C. HTA 101: I. Introduction
- Goodman C. HTA 101: II. Fundamental Concepts
- Goodman C. HTA 101: VI. Determine Topics

Discussion Papers:

Video:

Useful Resources:
- University of York Centre for Reviews and Dissemination: http://www.crd.york.ac.uk/CRDWeb/
Module 2: Principles of Economic Evaluation in Healthcare

Core Reading:

Discussion Papers:

Videos:
- Cost Effectiveness in Medicine is not a Dirty Word: Aaron Carroll, MD, MS, Indiana University School of Medicine, March 2, 2015. <https://www.youtube.com/watch?v=R5BaEz10sQk>
Module 3: Measuring Health Outcomes, Health-Related Quality of Life and Health Utility

Core Readings:


Discussion Papers:


Videos:

- Assessing Utilities: How Much Risk Are You Willing to Take? Aaron Carroll, MD MS, Indiana University School of Medicine, Feb. 23, 2015. https://www.youtube.com/watch?v=UeKQ7kBc33w
- Integrating patient reported outcomes data - real time information for research and clinical care. Amy Abernethy, MD PhD, Director of Center for Learning Health Care, Duke Clinical Research Institute, July 26, 2013. https://www.youtube.com/watch?v=5hZTwVmJRA0
- What is PROMIS? Nan Rothrock, PhD, Northwestern University, January 24, 2013 https://www.youtube.com/watch?v=PokSt7NCsEw
Module 4: Measuring Healthcare Costs

Core Readings:

Discussion Papers:

Videos:
- Health Care Database Shows INSANE Differences in Prices! John Idarola, May 16, 2013. https://www.youtube.com/watch?v=6l91oxYwLF0
- The True Cost of Health Care, David Belk, MD. http://truecostofhealthcare.org February 15, 2013. https://www.youtube.com/watch?v=r9q1Id41wGo

Useful Resources:
- The main methodological issues in costing health care services. A literature review. https://www.york.ac.uk/che/pdf/rp7.pdf
Module 5: Primary Data Methods

Core Reading:

Discussion Papers:

Videos:
- Randomized Controlled Trials vs. Observational Studies https://www.youtube.com/watch?v=CDXKTrjFqdI May 22, 2011 Dr. Michael Lauer, director of the Division of Cardiovascular Studies at the National Heart, Lung and Blood Institute at NIH.
- Randomized Controlled Trials & CER https://www.youtube.com/watch?v=7Eg14Yp0TMY May 22, 2011 Dr. Robert Dubois, chief science officer at the National Pharmaceutical Council.
- The Value of Observational data in CER https://www.youtube.com/watch?v=4oOmA64Itj4 August 28, 2012 Bill Marder, PhD, Executive Director, Center for Comparative Effectiveness Research, Senior Vice President and General Manager at Truven Health Analytics.
- Is It Time to Retire the Randomized Controlled Trial? David Sackett, OC, FRSC, MD, MSc, FRCP, Professor Emeritus, Clinical Epidemiology & Biostatistics, McMaster University, Hamilton, ON, Canada http://www.ispor.org/EducationalVideos/RCT/RCT.htm

Useful Tools:
Module 6: Integrative Methods and Modeling

Core Readings:

- Goodman C. HTA 101: IV. INTEGRATIVE METHODS
  - Chapter 8 – Decision analytic modelling: decision trees
  - Chapter 9 – Decision analytic modelling: Markov models
  - Chapter 10 – Representing uncertainty in decision analytic models

Discussion Papers:


Videos:

- Decision Trees for CEA. Phillip R. Lee Institute for Health Policy Studies. October 15, 2014. https://www.youtube.com/watch?v=EJ6HCne-dCY&index=9&list=PLPdSQGGMt89e4_ObAbU8F8ZASfAgNVH9
- Intro to Systematic Review and Meta-Analysis. June 1, 2014. Rahul Patwari https://www.youtube.com/watch?v=WB9pbHqUs5c

Useful Tools:

Module 6 Useful Tools (Continued):


Module 7: Consensus Panel: Evaluation of Proposed USPSTF Guidance on Breast Cancer Screening

Core Reading:


Discussion Paper:

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