

PRING 2020
EPID 550 - Syllabus
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Readings listed in the syllabus other than the chapters from Glick et al., *Economic Evaluation in Clinical Trials*, Second Edition, can be found on the "Course Readings" web page under the "Pages" tab at the EPI 550 Canvas site.

Readings are identified as "required," "strongly recommended," or "recommended." "Required" indicates that you need to read the material before class to participate in a discussion during class. "Strongly recommended" indicates we think that you need to read this material to learn the basic information we expect you to get from the course. For example, the material in a "strongly recommended" assignment could show up on a quiz or an exam, even though it is not in a handout and was not discussed in class. We have indicated when we think you would benefit more from reading this material before class or after class. "Recommended" indicates we think that you should read this material because it contains information you will need to understand published articles, and we do not plan to cover all this information in class handouts and discussions. You may choose to read this material now or in the future when you encounter the issue.

1/17 Diagnostic Tests with Dichotomous Results

Decision thresholds, the 2x2 Table, sensitivity, specificity, predictive value, likelihood ratios.

Strongly recommended (after class):

- Glick, Sonnad, and Williams. "Evaluation of Tests with Dichotomous outcomes: the 2x2 Table and Likelihood Ratios Positive and Negative."

1/22 Diagnostic Tests with Dichotomous Results, Continued

The costs of mistakes, the distinction between LR and OR, sample size.

Strongly recommended (after class):

- Glick, Sonnad, and Williams. "Statistical Properties of Sensitivity, Specificity, and Likelihood Ratios Positive and Negative"

Recommended (after class):

- Flowchart and checklist from Bossuyt et al. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative."
- Jaeschke et al. "Users Guides to the Medical Literature. III. How to Use an Article about a Diagnostic Test." Parts A and B.

1/24 Diagnostic Tests with Continuously Scaled Results

Receiver operating characteristic (ROC) curves and selecting optimal sensitivity and specificity

Strongly recommended (after class):

- Glick, Sonnad, and Williams. "Evaluation of Tests with Continuously Scaled Results: Receiver Operating Characteristic Curves and Choice of an Optimal 2x2 Table."

Recommended (after class):

- Glick, Sonnad, and Williams. "The Area Under the Receiver Operating Characteristic (ROC) Curve and Sample Size for ROC Curves"

- 1/29 Diagnostic Tests with Continuously Scaled Results, Continued**
 Critical Appraisal Exercise for Diagnostic Tests, Stratum-specific likelihood ratios (SSLRs), computer software for doing ROC analyses
Required (before class): article for critical appraisal exercise (to be assigned)
Strongly recommended (after class):
- Glick, Sonnad, and Williams. "Evaluation of Tests with Continuously Scaled Results: Stratum Specific Likelihood Ratios."
- 1/31 Prediction Rules**
 Developing a rule and evaluating test characteristics, including discrimination and calibration
Strongly recommended (before class):
- Laupacis, Sekar, Stiell. "Clinical Prediction Rules. A Review and Suggested Modifications of Methodological Standards."
 - TRIPOD reporting standards
- Recommended (after class):**
- Toll et al. "Validation, Updating and Impact of Clinical Prediction Rules: a Review."
- 2/5 Prediction Rules, Continued**
Required (after class):
- Vickers and Elkin. "Decision Curve Analysis: a Novel Method for Evaluating Prediction Models."
- 2/7 Critical Appraisal Exercise for Prediction Rules and Verification Bias.**
Required (before class):
- Stiell, Greenberg, Wells. "Derivation of a Decision Rule for the Use of Radiography in Acute Knee Injuries."
 - Stiell, Greenberg, Wells. "Prospective Validation of a Decision Rule for the Use of Radiography in Acute Knee Injuries."
 - Stiell, Wells, Hoag, et al. "Implementation of the Ottawa Knee Rule for the Use of Radiography in Acute Knee Injuries."
- Recommended (after class):**
- Greenes, Begg. "Assessment of Diagnostic Technologies: Methodology for Unbiased Estimation from Samples of Selectively Verified Patients."
- 2/12 Comparison of 2x2 and Stratum-Specific Likelihood Ratio (SSLR) Approaches**
- 2/14 Graphing Results of Optimal Test Selection**
Reading: TBA
- 2/19 Choice Among Tests and Stability of Test Results**
Recommended (after class):
- Sox. "A Triage Algorithm for Inhalation Anthrax."
- 2/21 Quiz 1 followed by Economic Analysis of Medical Practice**
 Types of economic analyses, the importance of perspective, what to include and exclude
Strongly recommended (before class):
- Eisenberg. "Clinical Economics: a Guide to the Economic Analysis Of Clinical Practices.
 OR
 - Drummond, Sculpher, Claxton, Stoddart, and Torrance. Methods for the Economic

2/26 Economic Analysis of Medical Practice, Continued followed by Cost-Effectiveness Analysis (CEA)

Choice criteria for CEA, the cost-effectiveness frontier, net monetary benefits

Strongly recommended (before class):

- Glick, Doshi, Sonnad, and Polsky. Economic Evaluation in Clinical Trials, Second Edition, Chapter 7.

2/28 Cost-Effectiveness Analysis, Continued

Recommended (after class):

- Drummond, Richardson, O'Brien, et al. "User's Guide to the Medical Literature, XIII: How to Use an Article on Economic Analysis Of Clinical Practice, A: Are the Results of the Study Valid?"
- O'Brien, Heyland, Richardson, et al. "Users' Guide to the Medical Literature, XIII: How to Use an Article on Economic Analysis of Clinical Practice, B: What are the Results and Will They Help Me in Caring for My Patients?"

3/4 Decision Trees

How to create the tree, identify probabilities and outcomes, and analyze the tree.

Recommended (after class):

- Detsky et al. "Primer on Medical Decision Analysis: Parts 1-2."
- Gold, Siegel, Russell, Weinstein, Cost-Effectiveness in Health and Medicine, Chapter 5.

3/6 Decision Tree Software (computer workshop).

3/7-15 Spring Break

3/18 Decision Trees and Sampling Uncertainty

P-values and confidence intervals for cost-effectiveness ratios, net monetary benefits, and acceptability curves.

Stongly Recommended (before class):

- Altman and Bland. "Standard Deviations and Standard Errors."

Recommended (after class):

- Briggs, Claxton, and Schulpher. Decision Modeling For Health Economic Evaluation. Chapter 4.

3/20 Critical Appraisal Exercise for Decision Trees followed by Quiz Review

Regiured (before class): Article for critical appraisal exercise (to be assigned)

Recommended (before class)

- Richardson and Detsky. "Users' Guides to the Medical Literature, VII. How to Use a Clinical Decision Analysis. A. Are the Results on the Study Valid?"
- Richardson and Detsky. "Users' Guides to the Medical Literature, VII. How to Use a Clinical Decision Analysis. B. What are the results and will they help me in caring for my patients?" Evidence Based Medicine Working Group.

3/25 Quiz

- 3/27 Practical Costing**
 Readily available sources of cost data
Strongly recommended (before class):
- Glick, Doshi, Sonnad, and Polsky. Economic Evaluation in Clinical Trials, Second Edition, Chapter 3
- Recommended (after class):**
- Drummond, Sculpher, Claxton, Stoddart, and Torrance. Methods for the Economic Evaluation of Health Care Programmes. 4th Edition, Chapter 7.
OR
 - Gold, Siegel, Russell, Weinstein, Cost-Effectiveness in Health and Medicine, Chapter 6.
- Discounting and Inflation**
 Discounting, analysis of patient-level data, time preference vs inflation, choosing a discount rate, discounting nonmonetary outcomes
- 4/1 Analysis of Cost**
 Univariate and multivariable approaches to evaluating patient data
Strongly recommended (before class):
- Glick, Doshi, Sonnad, and Polsky. Economic Evaluation in Clinical Trials, Second Edition, Chapter 5
- Markov and Other Simulation Models.**
 How to create a model, identify probabilities and outcomes, and analyze the model.
- Naimark et al. "Primer on Medical Decision Analysis: Part 5."
- 4/3 Markov and Other Simulation Models , Continued .**
- 4/8 Markov and Other Simulation Models, Continued and Markov Model Software (computer workshop).**
Required (before class): article for critical appraisal exercise (to be assigned)
- 4/10 Critical Appraisal and In-Class, Hands-On Treeage Session Building Markov Model**
- 4/15 Direct Preference Assessment**
 Methods for translating multiple outcomes, for example, length and quality of survival, into a single measure of preference
Recommended (after class):
- Gold, Siegel, Russell, Weinstein, Cost-Effectiveness in Health and Medicine, Chapter 4
OR
 - Drummond, Sculpher, Claxton, Stoddart, and Torrance. Methods for the Economic Evaluation of Health Care Programmes. 4th Edition, Chapter 5.
- 4/17 Indirect Preference Assessment, Continued.**
 Off-the-shelf preference assessment instruments, risky vs riskless preferences, preferences for duration of morbidity
Strongly recommended (before class):
- Glick, Doshi, Sonnad, and Polsky. Economic Evaluation in Clinical Trials, Second Edition, Chapter 4.

4/22 Sampling Uncertainty in Cost-Effectiveness Analysis.
Confidence intervals for cost-effectiveness ratios; acceptability curves; confidence intervals for net monetary benefits.

Strongly recommended (after class):

- Glick, Doshi, Sonnad, and Polsky. Economic Evaluation in Clinical Trials, Second Edition, Chapter 8.

4/24 Sampling Uncertainty in Cost-Effectiveness Analysis, Continued.
Sample Size

Recommended (before class):

- Glick. Sample Size and Power for Cost-Effectiveness Analysis (Part 1).

4/29 Economic Assessment and Policy Analysis; Wrap-Up and Review for Final Exam
Recommended (before class):

- Cressey D. "Life in the Balance."

Take Home Final