The demand and cost of health services is steadily increasing due to population growth, rising income and expectations, higher demand for care, and new technologies. Due to limited resources available, expenditures in health must be balanced against other needs such as infrastructure, education, and social welfare. We face decisions about allocation of funds to different population segments (e.g. young versus elderly) or different types of programs (e.g. prevention versus treatment, acute versus chronic disease), and programs with great benefit for a few versus modest benefit for many (e.g. organ transplant versus cataract surgery).

Course Description

This course will enable students to have a solid introduction to the theory, methods, and application of economic evaluation in health care with a specific focus on decision analysis and cost-effectiveness analysis. Approaches include calculation of costs and effectiveness measures using standard modeling methods. Compares outputs as a result of decision tree and Markov modeling and introduces sensitivity analysis.

Required Readings


Recommended Readings


Session 1: Overview of Decision Analysis and Cost-Effectiveness (1 Hour)

Learning Objectives:

1. Define Basic Concepts of Economic Evaluation
2. Understand different Methods and Tools of Economic Evaluation
COMPONENTS:

i. Understanding “Value”
ii. Discuss importance of economic evaluation of vaccines in low-resource context (policy uses of CEA for new vaccine introduction)
   a. Historical perspective
   b. Current perspective
iii. Measures of Value
   a. Costs
   b. Endpoints
   c. Outcomes
iv. Defining Methods of Value Analysis
   a. Cost Finding
   b. Cost-minimization
   c. Cost/Burden of Illness – Infectious/Deleterious Diseases
   d. Cost-Consequence
   e. Cost-Effectiveness
   f. Cost-Benefit
v. Why perform an economic evaluation of a vaccine or immunization program
vi. What is an “ICER”?
   a. Cost-effectiveness plane
   b. Interpreting the ICER
vii. Defining Uncertainty of Value
   a. Sensitivity Analysis
   b. Value of Information
viii. Translating Value into Resource Allocation
   a. Introduction to Budget Impact Analysis (BIA)
   b. Introduction to Return on Investment (ROI)

Session 2: Defining the Scope of a Cost-effectiveness Analysis I (1 Hour)

Learning Objectives:
1. To define the scope of an economic evaluation
2. To understand how to frame comparators for your audience based on a target population
3. What are the alternatives to a vaccine program?

COMPONENTS:

i. Formulating Study Objectives
ii. Specifying Comparators
iii. Defining Cohorts/Patients

EXERCISES
• Quiz: “Economic Evaluation Study Design”

Session 3: Defining the Scope of a Cost-effectiveness Analysis II (1 Hour)
Learning Objectives:
1. To define the perspectives impacted by a vaccine program
2. To understand how to frame the time horizon of a vaccine program
3. To consider the impact of vaccines on different stakeholders at different time points

COMPONENTS
i. Perspectives / Stakeholders
   a. Patient
   b. Providers, Hospitals, Healthcare Delivery Systems
   c. Payers: Commercial/Private and Public
   e. NGOs
   f. Second Panel CEA complete Perspectives
      1. “Health Sector” – Patient, Payer and Provider
      2. Societal – Patient, Payer, Provider, Caregiver, Government and indirects

ii. Time
   a. Time Horizon
      1. Annual/Cyclical
      2. Short-term (e.g. episode of care; episode of disease)
      3. Long-term (e.g. 5-year survival)
      4. Lifetime
   b. Incremental Units of Time

Session 4: Study Design Components of Economic Evaluation (1 hour)

Learning Objectives:
1. To differentiate between uses of decision tree and Markov model
2. To identify study designs that contribute to better cost, effectiveness and probability parameter estimates
3. To understand the process of probability extraction from high-quality sources

COMPONENTS:

i. Decision Analysis
   a. Decision tree
   b. Markov Model

ii. Probabilities and Rates
   a. Are all probabilities the same?
   b. Probability and Rate Extraction
   c. Probabilities for Decision Analysis
   d. Converting rates to probabilities

iii. Clinical Study Designs
   a. RCT
   b. Observational
c. Case-control
d. Quasi-experimental
e. Other

Session 5: Measuring and Valuing Costs (4 Hours)

COMPONENTS:

i. Costs - theory and definitions
   a. Economist’s definition
   b. Types of costs
ii. Costs in cost-effectiveness analysis
   a. General approach
   b. Which costs to include?
   c. Perspective of the analysis
iii. Cost of vaccine programs
   a. General approach
   b. Which costs to include?
iv. Adjustments to costs
   a. Inflation
   b. Discounting
   c. Currency

Session 6: Measuring and Valuing Health Outcomes (1 Hour)

Learning Objectives: To describe measurement of health gains in terms of health state preference & natural units

COMPONENTS:

i. Defining Patient Preferences
   a. Measuring health
   b. Valuing health
ii. Instruments of Effectiveness Measurement
   a. VAS
   b. TTO
   c. SG
iii. Health Utility Measures
iv. Applying to Economic Evaluation
   a. DALYs
   b. QALYs
   c. Discounting Outcomes

Session 7: Reporting and Interpreting Results of Economic Evaluation (2 Hours)
Learning Objectives:

i. To provide background on the rationale and importance of Decision Analysis (DA) and Cost-effectiveness Analysis (CEA)
ii. To explain the theoretical foundations DA/CEA

COMPONENTS:

i. Understanding a CEA Plane
ii. Willingness-to-Pay Threshold
iii. ICER calculation, incremental ratios and dominance
iv. Interpreting ICER/ICUR
   a. Perspective
   b. Time Horizon
v. Reporting Quality of Analysis
   a. Impact Inventory (Second Panel)
   b. CHEERS Checklist
   c. QHES Assessment Instrument

Session 8: Introduction to Decision Tree Modeling (4 Hours)

Materials: Decision Tree Exercise and Video

COMPONENTS

i. Review Reference Case Decision Trees
ii. Develop a Decision Model in Microsoft Excel
   a. Construct Tree
   b. Input Parameters
   c. Calculating Weighted Outcomes
   d. Interpreting Results
   e. Univariate Sensitivity Analyses