CREATING A HEALTH ECONOMIC DECISION MODEL



4

6

8

10

12

By: Grace E. Ratcliff, MPH

3

5

7

g

11

UNDERSTAND YOUR CONDITION

It is important to understand the condition being modeled. Consider seeking clinical assistance to understand treatments, costs, progression, and typically side effects.

DETERMINE MODEL FACTORS

To create a model you need to determine a population to model on, which perspective to take (typically healthcare or societal), and the strategies. For each strategy, you need to map out the variable differences.

Build Out Model Framework

For many models, a bubble diagram is a great starting place. Determine how long each cycle should be (typically annual) and how long the model should run (often lifetime).Create a framework without parameters true to your condition

ADD PROBABILITIES

Starting with probabilities is a good way to do a quick internal validation of the model. You can check life expectancy by assigning a utility of 1 for being alive and 0 for being dead.

VALIDATE THE MODEL

Complete an internal validation to ensure that the model is matching expected outputs. If you can, complete an external validation to further prove the validity of your findings.

ADDITIONAL ANALYSIS

Run a one way sensitivity analysis to determine uncertainty in the model. Depending on your research question you may also need other analysis like two-way sensitivity, probabilistic sensitivity, or expected value of perfect information

COMPLETE A LITERATURE REVIEW

Spending time now to understand how other models were created on your specific condition will help save time on future steps. It also will help you understand common assumptions and where research on the topic is missing.

DETERMINE MODEL TYPE

Based on your literature review and your research question determine which model is the best fit. Some options include: decision trees, Markov models, Microsimulation.

START COLLECTING DATA

Start collecting the data needed for the model (probabilities, costs, and utility) but be prepared to collect more as you see what is missing. Keep really good records of data sources, data points, and key assumptions.

ADD ALL PARAMETERS

Add remaining output parameters, discounting, and cycle correction. When adding costs, ensure that all parameters are converted to one currency and year (example: 2024 USD). If using software, it is easiest to complete the status quo then copy it for all strategies and edit where strategies vary.

RUN A COST-EFFECTIVENESS ANALYSIS

This can be run throughout the building process but this should be the point where you have a CEA that is accurate to your model and validation.

*Please note that there is often a need to revisit and refine earlier steps while building a model.

FORMALIZE RESULTS

Compile all your results, assumptions, and parameter list to present findings as a policy brief or publication. Consider the CHEERS checklist for publication to ensure all information is included.