Introduction to Modeling

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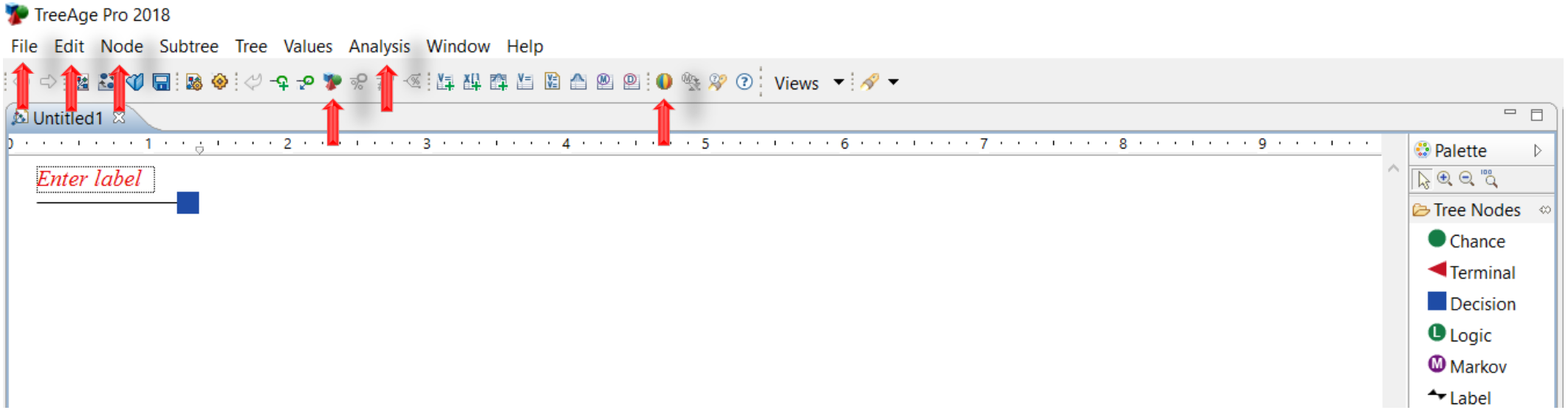
PH 3915

Session Objectives

The TreeAge Lab sessions are designed for students with limited or no previous experience of TreeAge. Students are expected to gain basic knowledge in using the TreeAge software to conduct economic evaluations. Upon completion of the sessions, the student should:

- Be familiar with the basic functions in TreeAge.
- Be able to construct a simple decision tree.
- Learn to use TreeAge to perform cost-effectiveness analyses.
- Learn to conduct sensitivity analyses.

Initiating a tree

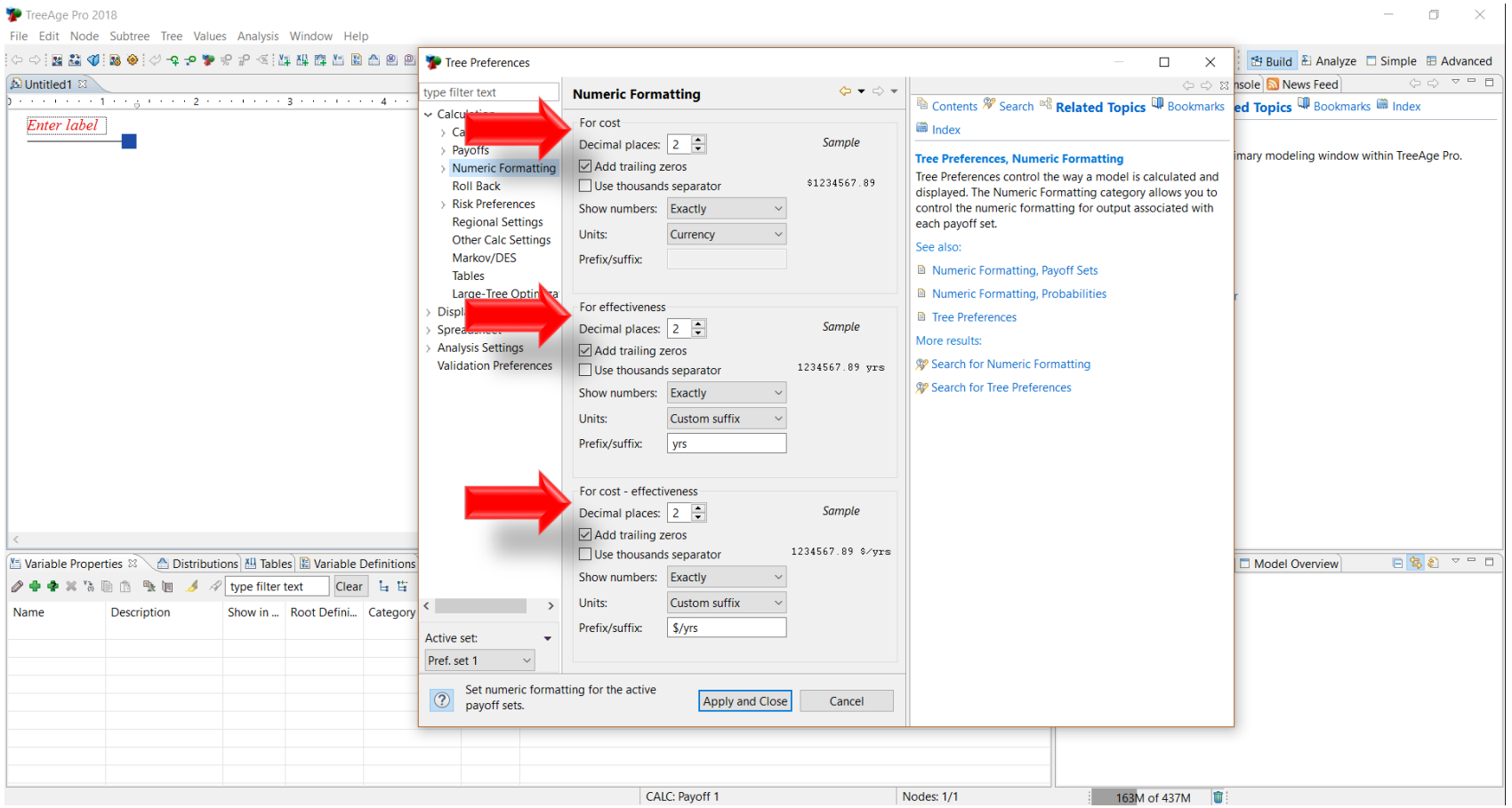


Initiating a tree

- Treeage will open up a blank page with a decision node (root node)
  - This is called the Tree diagram editor
- You see a blank box where you can enter the label
- What is the difference between:
  - Decision node
  - Chance node
- To add branches to a node (use any of the methods below):
  - Double click on the node
  - Use Control + A
  - Use add braches menu on top (under the “Node” menu)
  - You can repeat the above three options multiple times to add more branches to a node

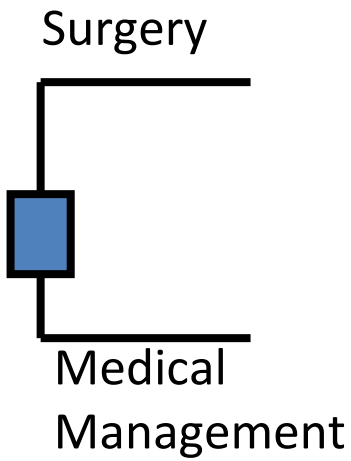
Initiating a tree – Tree preferences

(F11 or option under “Edit” or “Tree” menu)



Tree Nodes

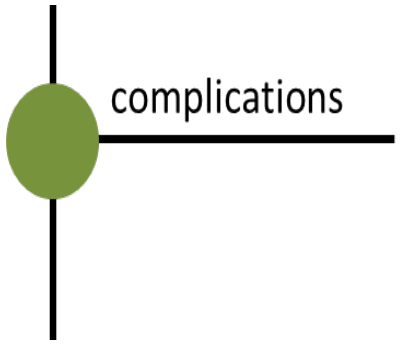
Decision Node



- The first one is called root node.
- Represents choice between several strategies.
- Strategies are under control of the stakeholders/interventionists/researchers.
- Each branch after a decision node is a **mutually exclusive** intervention/strategy.
- We can have branches that are combinations of two interventions/strategies.

Tree Nodes

Chance Node



- Represents various “uncertain” outcomes that can occur after a path has been picked.
- Occurrences are not under control of the stakeholders/ interventionists/researchers.
- When we create a particular occurrence after a chance node we are required to enter a probability for the occurrence.
- Branches/occurrences originating from the same chance node need to have probabilities that add up to one.

Tree Nodes

Terminal Node

- Final node after a path of choices or chances.
- This is the node where the final payoffs are computed/analyzed for each pathway.
- When terminal node is picked a dialogue box pops up where we can enter costs, QALYs, effectiveness, other payoffs.
- We can align all the terminal nodes, if that is visually easier to examine the outcomes – each pathway can be of varying lengths, so the alignment readjusts arm lengths to make the terminal nodes line up.

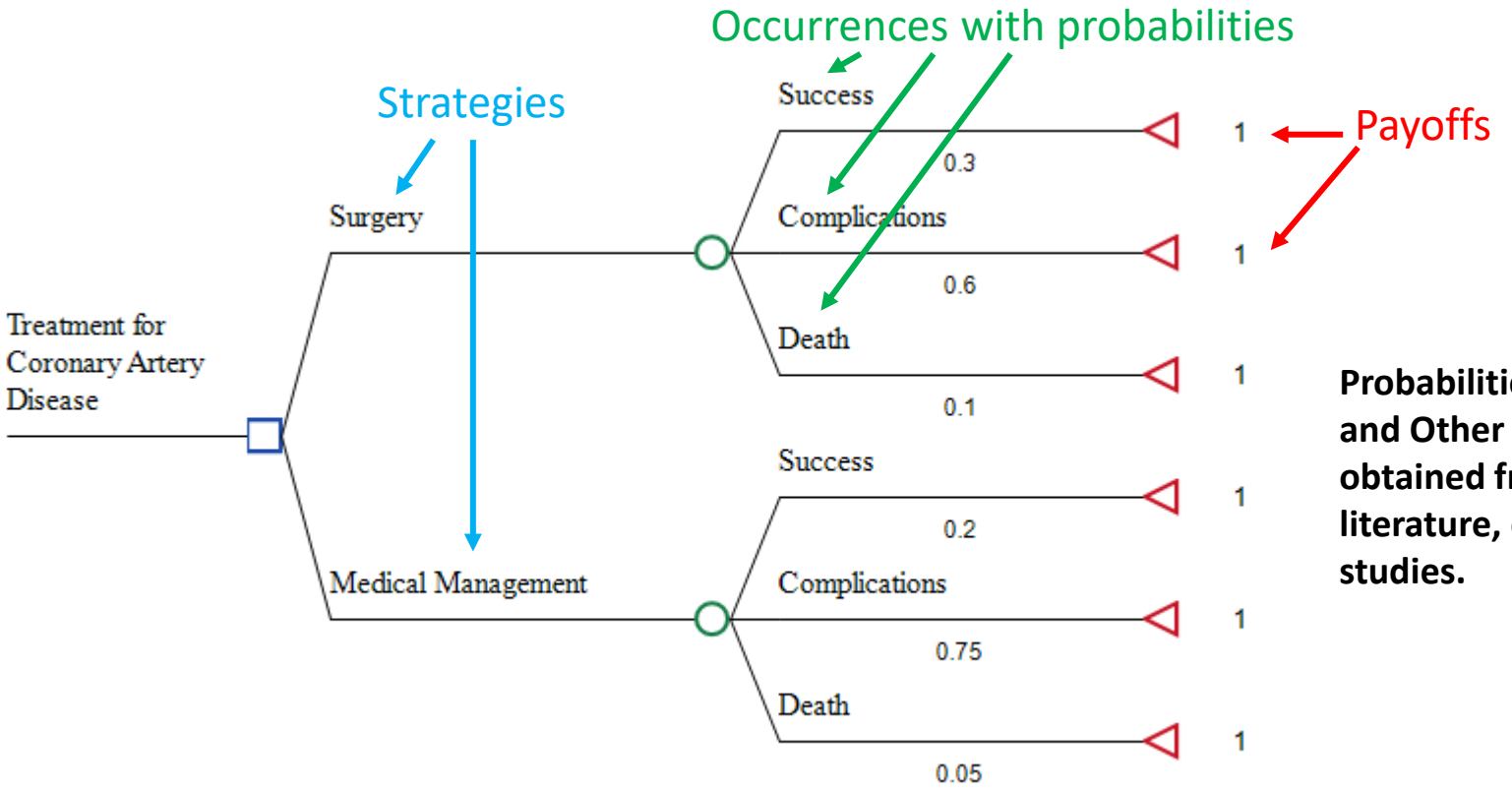
Tree Nodes

- Logic Node
  - Like a chance node but with logical expressions (true/false) instead of probabilities.
  - Given the options only one of the branches can be “True” after a chain of events, and this can change based on changes in past information.

- Label Node
  - Chance node with probability 100%

- Markov Node
  - Start of a Markov model

Example Tree



Probabilities, Costs, QALYs, and Other Payoffs are obtained from the literature, or from ongoing studies.

Right Click Options for a Node
(Options also under the “Node” menu)

- Defining (Entering) Variables
- Edit Payoffs
  - Entering costs, QALYs, other outcomes/payoffs
  - Use custom payoff names
- Insert Node
  - Inserting a branch in any direction
- Change (Node) Type
- Edit Probabilities
  - Purpose of #

Tree design

- Change angles of the branches
  - “Edit” Menu – Tree Preferences – Display – Tree editing/layout
- Branches can be moved up or down using a mouse or touchscreen
- Copying sets of branches
  - Use shift or control to click on all end nodes of branches to be copied; Right click and copy or Control+C; Click on the node from where the set of branches should originate; Right click and paste or Control+P

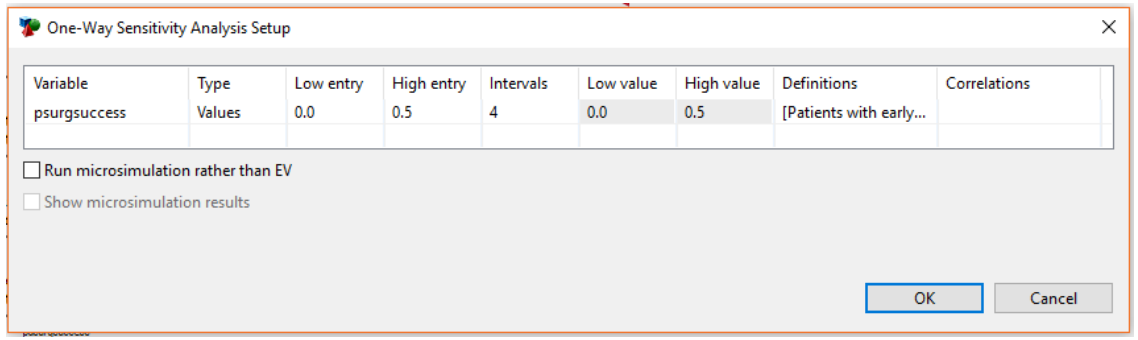
Analysis

(All analyses are listed under the “Analysis” menu/tab)

- Roll Back (we can undo the rollback and edit the tree further)
  - Set Willingness-To-Pay under Tree Preferences
  - “Edit” (or “Tree”) Menu – Tree Preferences – Calculation – Calculation Method – Cost-Effectiveness – Cost-Eff Params (WTP)
- Cost Effectiveness Analysis Graph
- Net Monetary Benefit versus Willingness-To-Pay Graph
- Sensitivity Analysis

Sensitivity Analysis

- One-way Sensitivity Analysis



- Two-way and Three-way Sensitivity Analyses
- Threshold Analysis

Questions?