Teaching Pack: Building Decision Trees

Glossary of Terms

Averaging and folding back. The process for analyzing a decision tree once probabilities have been assigned at chance nodes. It enables the decision maker to compare in quantitative terms the expected outcome or expected value of alternative courses of action. (Weinstein, 1980)

Baseline. A baseline describes an initial, status quo scenario that is used for comparison with one or more alternative scenarios. (EPA, 2010)

Chance node. Denotes a point in time at which one of several possible events beyond the control of the decision maker may take place. It is represented in a decision tree as a small circle. (Weinstein, 1980)

Collectively exhaustive. A set of events is collectively exhaustive if it encompasses all possible choices. For example, when rolling a ten-sided die, the outcomes 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 are collectively exhaustive, because they encompass the entire range of possible outcomes, but when rolling a 4 sided die, 1, 2 and 3 would not be collectively exhaustive, as rolling a 4 is also a possibility.

Conditional probability. The probability that event E occurs, given that event F is known to occur, is called the conditional probability of event E given event F. It is denoted by P [E|F]. (Weinstein, 1980)

Consequence. The positive or negative outcome of a disease or intervention, expressed qualitatively or quantitatively. (HTA Glossary)

Decision node. A decision node denotes a point in time at which the decision maker can elect one of several alternative courses of action. It is represented in a decision tree as a small square. (Weinstein, 1980)

Decision tree. A graphical representation of a decision, incorporating alternative choices, uncertain events (and their probabilities), and outcomes. (Gold, 1996)

Expected value. The probabilistic weighted average of a series of numbers. (Muennig, 2016)

Expected value of clinical information (Net). The net expected value of clinical information obtained from a test is the difference between the averaged-out outcome value with the test and the averaged-out outcome value without the test when the risks of the test itself are taken into consideration. (Weinstein, 1980)

Expected value of clinical information (Gross). The gross expected value of clinical information obtained from a test is the difference between the averaged-out outcome value with the test and the averaged-out outcome value without the test when the risks of the test itself are not taken into consideration. (Weinstein, 1980)

Independent. Two events, A and B, are independent of one another if the probability of one event happening does not influence the probability of another event happening. (Muennig, 2016)

Joint probability. The probability of the concomitant occurrence of any number of events is called the joint probability of those events. The joint probability of two events, E and F, is written in probability notation as P [E and F] or as P [E, F]. Since the event E and F is the same as the event F and E, it is always true that P [E, F] = P [F, E]. (Weinstein, 1980)

Multiplication rule. When two events, A and B, are independent, the probability of both occurring is: [P(A and B) = P(A) x P(B)] When two events, A and B, are dependent, the probability of both occurring is: [P(A and B) = P(A) x P(B|A)].

Mutually exclusive. When two events are mutually exclusive, it means that one event cannot occur at the same time as the other event. (Muennig, 2016)

Outcome. A measurable component observed after an intervention has been applied. (HTA Glossary)

Parameter uncertainty. Uncertainty about the true numerical values of the parameters used as inputs. (Gold, 1996)

Pathway. In a decision tree is a particular sequence of actions and events beginning with a particular choice at the initial choice node and following a particular event or choice at each subsequent chance or choice node from left to right. (Weinstein, 1980)

Percentage. A fraction, or ratio, in which the denominator is assumed to be 100. The symbol % is used for percent.

Prevalence. The proportion of individuals in a population who have a disease or condition at a specific point in time. (Gold, 1996)

Prior probability. The prior probability of disease is the probability of the presence of the target disease conditional on the available information prior to performing the test under consideration. (Hunink, 2014)

Posterior probability. The posterior probability of disease is the probability of the presence of the target disease conditional on the pre-test information and the test result. (Hunink, 2014)

Probability. An expression of the degree of certainty that an event will occur, on a sale from 0 (certainty that the event will not occur) to 1 (certainty that the event will occur). (Gold, 1996)

Sensitivity analysis. An analysis that varies model inputs over their plausible range of real-world value in order to examine how they might influence model outputs. (Muennig, 2016)

Subjective probability. Suppose that a person believes that an event E is just as likely to occur as another event whose probability of occurrence is defined objectively as P*. Then P* is the person's subjective probability that event E will occur. (Weinstein, 1980)

Terminal node. Terminal nodes are the endpoints of a decision tree, represented by a triangle. (Weinstein, 1980)

Threshold analysis. A type of analysis in which the analyst varies the parameter over a range to determine the values of the parameter that would lead to major changes in conclusions. (Gold, 1996)

Bibliography Key

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