

Practical 9 Markov models in health economic evaluations

Wednesday, 22 June 2022

[Lecture 9](#)[PDF version](#)

1. Introduction

The actual practical considers the example shown in [class](#) and it considers a more complex (and perhaps realistic/useful) analysis based on individual level data for the complete “event history”, which we can use to derive the full set of transition probabilities to feed into the Markov model.

There is also a [tutorial](#) using the example discussed in section 5.4 of [Bayesian methods in health economics](#). This is an example of a “cohort discrete time state transition model” (based on [this](#) paper). This example is fairly simple and it is described in all the details (including the distributional assumptions) in BMHE.

Both problems share the features of being specified as a “Markov structure”, the need to estimate the relevant transition probabilities and then to use the matrix algebra to “run” the actual economic evaluation using the “Markov model engine”.

2. Individual level data on event history and Markov models

The data contained in the file [data.txt](#) have been recorded on a sample of individuals in a cancer trial. There are two treatment arms (standard of care and innovative treatment) and for each individual, the progression and death indicators as well as the observed times for the two events (or censoring) are recorded.

The script [MarkovModel12.R](#) will guide you through the analysis; first by formatting the dataset in the format seen in [Lecture 09](#), then running the survival analysis and then creating the approximation to the transition probabilities and, finally, running the Markov model. The script [survHE_utils.R](#) contains a few functions that can be used to compute the transition probabilities and then run the Markov model. You should inspect the functions saved in [survHE_utils.R](#) and try and understand how they work.

Make sure you understand the output produced by the various functions and that you can map it out onto the results shown in class.

