Practical 10. Missing data

Wednesday, 22 June 2022

Lecture 10   PDF version

Missing data

The file `missing_data.rds` contains a dataset with individual level data on two competing treatments. The data include $n_1 = 75$ and $n_2 = 84$ records for suitable measures of effectiveness (QALYs, e_i) and total costs (c_i) for each individual. In addition, data on the baseline utility u_i are also recorded for each individual. The data are stored in the `list` format. The file `MissingData.R` is an `R` script to guide you through the analysis.

- Following the script, load the data and inspect the list; for instance, you can use the command `hist` to produce a histogram of the relevant variables, e.g. `hist(data$c[[1]])` (notice that you need to subset the elements of the object `data`, because they are part of a `list`.
- Inspect the file `Normal_Normal.txt`, which codes up the bivariate Normal model. Make sure you can follow the code and match it with the slides from Lecture 10.
- Following the script, run the model assuming a marginal Normal model for the effectiveness (controlling for the baseline utility) and a conditional Normal model for the costs (given the effectiveness~variable).
- Following the script, feed the output from the Bayesian model run in BUGS to BCEA, to perform the economic analysis.
- Following the script, check the distribution of the imputed values — for example, you can consider the first individual with missing data and the variable of effectiveness as in the script, but you can explore other variables too.
- Now inspect the file `Beta_Gamma.txt`, which encodes a Beta marginal model for the QALYs and a Gamma conditional model for the costs, given the effectiveness. Make sure you can follow the code and match it with the slides in the lecture.
- Following the script, replicate the analysis using this second model and then perform the economic evaluation in BCEA. Check that in this case, the imputed values are within the natural range of the underlying variables (specifically, for the QALYs).