Day 3

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Which values for a prior beta distribution?

- Based on expert opinion
  - Betabuster https://shiny.vet.unimelb.edu.au/epi/beta.buster/
  - R package PriorGen 'Based on the available literature the mean value for the sensitivity of a test is expected to be 0.90 and we can be 95% sure that it is higher than 0.80.'

```
library(PriorGen)
findbeta(themean=0.90, percentile=0.95,
         lower.v=FALSE, percentile.value=0.80)
```

Beta(27.79, 3.09)

Model selection: inclusion of conditional dependencies between se and sp of different tests

- Pragmatic approach:
  - Look at 95% credibility intervals and histograms of posterior covariances: do they include a zero?
  - Are the other posteriors affected when including a covariance?
  - If either se or sp equal 1 (is perfect), then it will always be conditionally independent of the se or sp of the other test(s)
- Analytical approach:
  - DIC: deviance information criterion (Spiegelhalter, 2002)

Ex 8 Covariates

- Explore the data set 'echinococcus.xlsx' PCR for either E. multilocularis or E. granulosus, ELISA for both, eggs found by arecoline purgation, Taenia co-infection, age and sex
- Run classical 'risk factor analysis': is sex, Taenia co-infection or age a risk factor for echinococcus (PCR-prevalence, seroprevalence or purges)? Obtain p-values and ORs with confidence intervals.

Ex 9 Covariates

- Prepare the data set in the correct format (dump, add ones) for BLCM
- Run a model for three tests (assume a very high sensitivity for arecoline purgation)
- Try different priors
- Evidence of conditional dependencies?
- obtain dics
- Run models with covariates included
  - 'runjags_version_cestode_update.R','model.cestode.bug', 'model_without_cestode.bug'
- Is there evidence for a covariate effect on the prevalence?
- Compare your findings with Ex.8