1. **Introduction**
   1. **Describe the data (descriptive statistics)**
   2. **What are the research questions**
2. **Which of the grub worms’ survival distributions, lognormal and Weibull distributions, best fits the data?**

* DIC, pseudo Bayes factor and posterior predictive checks (PPC)
  + This does not mean that one model is better, see Gelman
  + See also random effects impact

**2. Which of the EPN species acts the fastest in killing the white grubs?**

* The second one is faster (median check, group covariates effects, random effects)

**3. Does the grubs’ size predict the survival of the worm?**

* Check the models parameter, we don’t see a signififcant linear effect and the relevance seems not too big.

NOT-INTERVAL CENSORED

1. **look at the median death time per EPN species to assess which of the two EPN species acts the fastest in killing the white grubs.**
   1. See Valentin, add figure
2. **evaluate the effect of the covariate grubs’ size**
   1. Set up models without random effects (lognormal weibull),
      1. Write the explicit formulation of the models used
      2. Motivate priors
      3. Do sensitivity analysis, for different priors and especially for different starting values for the chains (necessary for a good grade !!!!!!11!)
      4. Describe chain number, how many iteration, thinning, how strongly autocorrelated (real number of observations), burnin
      5. check convergence using classical diagnostics
      6. Marginal Posterior Predictive Distributions
      7. State the montecarlo standard error, and use the effective sample size (should be somewhere in the output)
      8. Perform posterior predictive checks to evaluate the chosen model
      9. give interpretations for the parameter(s) of interest.
      10. Compare Weibull lognormal (lognormal is better)
          1. Use DIC, pseudo bayes factor
          2. Gap is not that huge (but bigger for the random effects)
   2. Look at the effect of grubs size bayesian p-value, credibility intervalls
      1. Less than 0, (but not significant(better say credibility intervals don’t overlap 0) ) is also counterintuitive
   3. Also consider the random effect modells, since we see the influence of including random intercepts seems to be relevant
3. **consider the clustering by including a random effect, i.e., the variation of location parameters across replicate plates. What does the random effect’s variance component estimate suggest about the “clustering” of responses?** 
   1. Set up lognormal and Weibull with normal random effects
      1. Write again again the model formulation
      2. Motivate priors
      3. Do sensitivity analysis, for different priors and especially for different starting values for the chains
      4. Describe chain number, how many iteration, thinning, how strongly autocorrelated (real number of observations), burn-in
      5. check convergence using classical diagnostics
      6. State the montecarlo standard error, and use the effective sample size (should be somewhere in the output)
      7. Marginal Posterior Predictive Distributions
      8. Perform posterior predictive checks to evaluate the chosen model
         1. PPCs for the random effects (already coded in Valentin file)
         2. And how good ist it else like for the question 2
      9. give interpretations for the parameter(s) of interest.
   2. Variance component. What does it estimate?
      1. Estimate the bo variance
      2. Estimate the intraclass correlation (sigma\_b0 / sigma + sigma\_bo) and comment
   3. Suggest about clustering
      1. Plates seem to be a factor, since DIC is better
4. **check whether there are outlying/influential observation(s). If so, give possible reasons for the outlying observation(s)** 
   1. Set up PPO and CPO for all the Modells
      1. Compare the otuliers higher than 40
         1. You will see most of the times it is 105, 91, 126
         2. What do they share
   2. Reasons
      1. Modell does not fit well
      2. Biological reasons (may be some are immune???, different Grubs)
5. **check the distribution of the random effect and propose a robust distribution for the random effect** 
   1. Plot a Histogram
   2. QQ-Plot
   3. Bit of therefore use one with more outlier potential (Student-t)
   4. Fit the random effect model with student t and different amount of degrees of freedom (4 was used in a paper of Lessafre)

INTERVAL CENSORED

Little introduction (319 in survival is a good start (286))

1. **Which of the EPN species acts the fastest in killing the white grubs?**
   1. Do the same as for the non interval censored
2. …
3. …
4. …