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|  | W06 Ex. 4 | W06 Ex. 3 | W05 Ex.1 |
| Framework | Bayesian | Bayesian | Bayesian |
| Purpose | Meta Analysis for studies with proportion/rates as an outcome | Meta Analysis for studies with proportion/rates as an outcome | Meta Analysis for studies with proportion/rates as an outcome |
| Data | accommodates treatment and placebo data | accommodates treatment and placebo data | does not accommodate treatment data, only placebo |
| Transformation of data | models number of responders as binomially distributed with study-specific pj and nj | models log-odds as normally distributed | models log-odds as normally distributed centered around study-specific θj with study-specific precision prec\_s |
| Priors | uniform priors for µ, β, and τ | - normal prior for µ  - halfnormal prior for τ | - normal prior for µ  - gamma prior for prec\_tau |
| Random effects | study-specific pj are transformed into log-odds and modeled as a linear regression µ + β\*cj + ηj , study-specific error terms ηj are modelled as normally distributed around 0 with precision τ.prec | - study-specific effects are normally distributed around µ | random effects θj are normally distributed, centered around the global effect µ with precision prec\_ τ |
| PPC | included | not included | not included |
| Output | - predictive distributions of placebo response rate p1.star and treatment response rate p2.star; which are the log-odds back-transformed onto probability scale  - posterior distributions of µ, β and τ | - posterior distributions of τ, µ and θ | predictive distribution of θ (log-odds) which is normally distributed, centered around the global effect µ with precision prec\_ τ, and back-transformed into a response rate on probability scale |
| Normal parameterization | mean, precision | mean, standard deviation | mean, precision |
| Ease of use | requires more coding | easier to apply | requires more coding |

Model in 06worksheet\_JAGSextension.r:

- models the study-specific number of responders as a binomial random variable

- the parameter p of this study-specific binomial is modeled as a logistic regression with mu (overall mean) + treatment effect or 0 if placebo + eta (study-specific random effect)

- eta is drawn from a normal distribution to capture the study-specific variation

- includes a prediction for posterior predictive checks

- uses uniform priors for mu, beta and tau (variance of error term eta)

- On a global population level, the response rates for placebo and treatment are the inverse-logit-transformed predicted log-odds from the logistic regression

- For the predictive distribution of the response rate in a new study it adds a normal error term to the population response for the random effect of the studies