Supplement 1: Statistical code

The model is a full random effects model, based on that of Dias et al. (15) Adjustment for multi-arm trials is included. As some comparisons involve zero or very low counts, semi-informative priors are used to constrain event rates and odds ratios to sensible bounds where necessary; otherwise both tend towards zero, up to the bounds of the prior. This mainly concerns rifabutin (RFB), which was found to have an unrealistically high and precise estimate of efficacy, despite its sparse data (2 events vs. 0), with unconstrained priors.

model{

  for(i in 1:NS){
    w[i,1] <- 0
    delta[i,t[i,1]] <- 0
    mu_prec[i] <- 1/mu_var[i]
    mu[i] ~ dnorm(mu_b, mu_prec[i])  # vague priors for trial baselines
    ## shouldn't be *too* vague as causes problems with low counts
    ## specified per-study and only less vague where needed
    for (k in 1:na[i]){  
      r[i,k] ~ dbin(p[i,k],n[i,k])   # binomial likelihood
      logit(p[i,k]) <- mu[i] + delta[i,t[i,k]]
      rhat[i,k] <- p[i,k] * n[i,k]  # expected value of the numerators
      # Deviance contribution:
      dev[i,k] <- 2 * (r[i,k] * (log(r[i,k]) - log(rhat[i,k])) + (n[i,k] - r[i,k]) * (log(n[i,k] - r[i,k]) - log(n[i,k] - rhat[i,k])))
    }
    for (k in 2:na[i]) {
      # trial-specific LOR distributions
      delta[i,t[i,k]] ~ dnorm(md[i,t[i,k]],taud[i,t[i,k]])
      # mean of LOR distributions
      md[i,t[i,k]] <- d[t[i,k]] - d[t[i,1]] + sw[i,k]
      # precision of LOR distributions
      taud[i,t[i,k]] <- tau *2*(k-1)/k
      # adjustment, multi-arm RCTs
      w[i,k] <- (delta[i,t[i,k]] - d[t[i,k]] + d[t[i,1]])
    }
  }
}
# cumulative adjustment for multi-arm trials

\[
sw[i,k] <- \text{sum}(w[i,1:k\cdot1])/(k\cdot1)
\]

# summed residual deviance contribution for this trial

\[
\text{resdev}[i] <- \text{sum}(\text{dev}[i,1:\text{na}[i]])
\]

\[
\text{totresdev}<-\text{sum(\text{resdev}[\])} \# \text{Total Residual Deviance}
\]

### INH 12m \(d[6]\) as base

### again, use more informative priors for treatments with
### low data to prevent estimation problems

\[
\text{for } (k \text{ in } 1:5)()
\]

\[
\begin{aligned}
\quad & \quad d[k] \sim \text{dnorm}(0,dprec[k]) \\
\end{aligned}
\]

\]

\[
d[6]<0
\]

\[
\text{for } (k \text{ in } 7:NT)()
\]

\[
\begin{aligned}
\quad & \quad d[k] \sim \text{dnorm}(0,dprec[k]) \\
\end{aligned}
\]

\]

\[
\text{sd$\sim$dunif}(0,5) \quad \# \text{vague prior for random effects standard deviation}
\]

\[
\text{tau}<1/pow(sd,2)
\]

\]