require(DPpackage)

require(jagsUI)

require(rube)

Sys.setenv(BUGSDIR="C:\\Users\\P Congdon\\Documents\\WINBUGS14")

setwd("C:/R files BHMRA")

**# DGTTC meta-analysis data (mortality outcome)**

attach("DS\_4\_10.Rdata")

**#**

**# DPMmeta**

**#**

y <- cbind(DS\_4\_10$y,DS\_4\_10$s2)

colnames(y) <- c("logOR","varlogOR")

**# Prior settings, alpha preset or assigned Gamma(a0,b0) prior**

alpha.set=10

# prior <- list(a0=2,b0=4,tau01=2,tau02=0.02,tau11=2,tau12=0.02,mb=0,Sb=10)

prior <- list(alpha=alpha.set,tau01=2,tau02=0.02,tau11=2,tau12=0.02,mb=0,Sb=10)

# MCMC parameters

mcmc <- list(nburn=1000,nsave=10000,nskip=5,ndisplay=100)

# Fit the model: First run

fit1 <- DPMmeta(formula=y~1,prior=prior,mcmc=mcmc,state=state,status=T)

fit1

**#**

**# Truncated DP**

**#**

DS\_4\_10$M=14

DS\_4\_10$alpha.set=alpha.set

model2= "model {for (i in 1:n) { y[i] ~ dnorm(b[i],inv.s2[i])

inv.s2[i] <- 1/s2[i]

yrep[i] ~ dnorm(b.rep[i],inv.s2[i])

# mixed predictive check

exc[i] <- step(yrep[i]-y[i])

# subgroup indicator

S[i] ~ dcat(p[1:M])

# realised second stage random trial effect

b[i] <- psi[S[i]];

b.rep[i] <- psi.rep[S[i]];

# log-likelihood

LL[i] <- 0.5\*log(inv.s2[i]/6.28)-0.5\*inv.s2[i]\*pow(y[i]-b[i],2)

for (m in 1:M) {memb[i,m] <- equals(S[i],m)}}

TLL <- sum(LL[])

# base prior G0

for (m in 1:M) { psi[m] ~ dnorm(mu[m],inv.tau2)

psi.rep[m] ~ dnorm(mu[m],inv.tau2)

# indicator for non-empty clusters

realclus[m] <- step(sum(memb[,m])-1)

mu[m] ~ dnorm(m.mu,inv.tau2.mu)}

# other priors

inv.tau2 ~ dgamma(1,0.01)

m.mu ~ dnorm(0,0.01)

inv.tau2.mu ~ dgamma(1,0.01)

tau2 <- 1/inv.tau2

tau2.mu <- 1/inv.tau2.mu

# treatment benefit

mean.b <- mean(b[])

p.ben[1] <- 1-step(m.mu)

p.ben[2] <- 1-step(mean.b)

# truncated Dirichlet process, alpha preset

alpha <- alpha.set

V[M] <- 1

p[1] <- V[1]

for (m in 1:M-1){c[m] <- 1+alpha/M

d[m] <- alpha\*(1-m/M)

V[m] ~ dbeta(c[m],d[m]);

p[m+1] <- V[m+1]\*(1-V[m])\*p[m]/V[m]}

# total non-empty clusters

K <- sum(realclus[1:M])}

"

**# initial values and parameters for alpha preset**

inits <- function(){list(inv.tau2=rexp(1,1), inv.tau2.mu=rexp(1,1),mu=rnorm(14,0,0.1),

m.mu=rnorm(1,0,0.1))}

pars <- c("K","exc","b","p.ben","mean.b","m.mu","tau2.mu","tau2")

**# estimation**

summary(rube(model2, DS\_4\_10, inits))

R = rube(model2, DS\_4\_10, inits, pars, n.burn=500, n.thin=1, n.chains=2,n.iter=5000)

summary(R,limit=14)

**# estimated 2nd stage random effects**

b.pmn=apply(R$sims.list$b,2,mean)

hist(b.pmn,breaks=10,prob=T,xlim=c(-0.25,-0.1),ylim=c(0,25),xlab="Posterior mean b",main=NULL)

curve(dnorm(x, mean=mean(b.pmn), sd=sd(b.pmn)), col="blue", add=T)