setwd("C:/R files BHMRA")

attach("DS\_10\_9.Rdata")

library(jagsUI)

library(loo)

cat(" data { for (i in 1:N) {y[subj[i],rep[i]] <- chol[i]/100}}

model { for (i in 1:N) {years[subj[i],rep[i]] <- yr[i]

LL[i] <- 0.5\*log(tau/6.28)-0.5\*tau\*pow(y[subj[i],rep[i]]-mu[subj[i],rep[i]],2)}

for (i in 1:n) {b[i,1:2] ~ dmnorm(nought[1:2],invD[1:2,1:2])

z1[i] ~ dnorm(0,1) I(0,);

z2[i] ~ dnorm(0,1) I(0,)

age.c[i] <- age[i]-mean(age[]);

for (t in 1:T[i]) {y[i,t] ~ dnorm(mu[i,t],tau)

a[i,t] <- (years[i,t]-5)/10;

mu[i,t] <- beta[1]+beta[2]\*sex[i]+beta[3]\*age.c[i]+beta[4]\*a[i,t]

+b[i,1]+gamma[1]\*z1[i]+(b[i,2]+gamma[2]\*z2[i])\*a[i,t]}}

for (j in 1:4) {beta[j] ~ dnorm(0,0.01)}

for (j in 1:2) {gamma[j] ~ dnorm(0,0.01)}

sig ~ dunif(0,10)

tau <- 1/(sig^2)

D[1:2,1:2] <- inverse(invD[,])

invD[1:2,1:2] ~ dwish(ScD[,],2)}

", file="chol1.jag")

# initial values and estimation

b0 <- matrix(0,200,2)

init1 <- list(beta=c(0,0,0,0),gamma=c(0,0),sig=1,invD=diag(1,2),b=b0)

init2 <- list(beta=c(0,0,0,0),gamma=c(0,0),sig=.1,invD=diag(5,2),b=b0)

inits <- list(init1,init2)

pars <- c("gamma","sig","beta","D","LL")

R1 = autojags(DS\_10\_9, inits, pars,model.file="chol1.jag",2,iter.increment=2500, n.burnin=500, Rhat.limit=1.1, max.iter=10000, seed=1234,codaOnly=c("LL"))

R1$summary

loo(as.matrix(R1$sims.list$LL))

# Model 2

cat(" data { for (i in 1:N) {y[subj[i],rep[i]] <- chol[i]/100}}

model { for (i in 1:N) { years[subj[i],rep[i]] <- yr[i]

LL[i] <- 0.5\*log(tau/6.28)-0.5\*tau\*pow(y[subj[i],rep[i]]-mu[subj[i],rep[i]],2)}

for (i in 1:n) {b[i,1:2] ~ dmnorm(nought[1:2],invD[1:2,1:2])

age.c[i] <- age[i]-mean(age[])

for (t in 1:T[i]) {y[i,t] ~ dnorm(mu[i,t],tau)

a[i,t] <- (years[i,t]-5)/10;

# skewness effects

w[i,t] ~ dnorm(0,1) I(0,)

mu[i,t] <- beta[1]+beta[2]\*sex[i]+beta[3]\*age.c[i]

+beta[4]\*a[i,t]+b[i,1]+b[i,2]\*a[i,t] +delta[t]\*w[i,t]}}

for (j in 1:4) {beta[j] ~ dnorm(0,0.01)}

for (j in 1:6) {delta[j] ~ dnorm(0,0.01)}

sig ~ dunif(0,10)

tau <- 1/(sig^2)

D[1:2,1:2] <- inverse(invD[,])

invD[1:2,1:2] ~ dwish(ScD[,],2)}

", file="chol2.jag")

# initial values and estimation

b0 <- matrix(0,200,2)

init1 <- list(beta=c(0,0,0,0),sig=1,invD=diag(1,2),b=b0,delta=rep(0.1,6))

init2 <- list(beta=c(0,0,0,0),sig=.1,invD=diag(5,2),b=b0,delta=rep(0.2,6))

inits <- list(init1,init2)

pars <- c("delta","sig","beta","D","LL")

R2 = autojags(DS\_10\_9, inits, pars,model.file="chol2.jag",2,iter.increment=5000, n.burnin=500, Rhat.limit=1.05, max.iter=20000, seed=1234,codaOnly=c("LL"))

R2$summary

loo(as.matrix(R2$sims.list$LL))