Supplemental 2 JAGS CODE

Fixed effect JAGS models

Fixed effect JAGS models with priors set on a risk of the control group (pcj) with j=1, 2, …, n

1. pcj ~ Beta (0.5, 0.5)
2. pcj ~ Beta (1, 1)

 model {

 for (j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # log(OR)

 theta[j] <- mu

 ## a.

 # 1. prior for risk of the control group using Beta (0.5,0.5)

 pc[j] ~ dbeta(0.5,0.5)

 or

 # 2. prior for risk of the control group using Beta(1,1)

 pc[j] ~ dbeta(1,1)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 }

1. logit(pcj) ~ unif (-10, 10)
2. logit(pcj) ~ normal (0, 10)
3. logit(pcj) ~ normal (0, 100)

 model{

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # log(OR)

 theta[j] <- mu

 ## b.

 # 1. prior for control events using uniform distribution

 logit(pc[j]) <- phi[j]

 phi[j] ~ dunif(-10,10)

 Or

 # 2. prior for control events using normal distribution

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(0, 0.01)

 Or

 # 3. prior for control events using normal distribution

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(0, 0.0001)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 }

1. hierarchical structure for logit(pcj)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # log(OR)

 theta[j] <- mu

 ## c. prior for control events with heirrarchical setting on logit(pcj)

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(baselogit, precbaselogit)

 }

 # prior for baselogit : bounded away from zero

 ## Lowerbound=exp(-6)/(exp(-6)+1)=0.0025

 ## Upperbound=exp(-3)/1+exp(-3)=0.048

 baselogit ~ dunif(-6,-3)

 # Prior for the variance

 sdbaselogit ~ dunif(0,1)

 precbaselogit <- 1/(sdbaselogit \* sdbaselogit)

 # prior for mu

 mu ~ dnorm(0, 0.01)

 }

Random effects JAGS models

Random effects JAGS models with priors set on heterogeneity ($τ$) and baseline risk (pcj) where j=1, 2, …, n

1. For heterogeneity: $τ$ ~ halfnorm(0.5)
2. logit(pcj) ~ normal (0, 10)
3. logit(pcj) ~ normal (0, 100)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 }

 for(k in 1:nstudies) {

 # 1. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.01)

 # 2. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.0001)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # a. Prior for heterogeneity

 tau ~ dnorm(0,2.55)T(0,)

 inv.tausq <- 1/(tau \* tau)

 }

1. hierarchical structure for logit(pcj)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 # prior for control events using a random effect on logit pc

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(baselogit,precbaselogit)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # prior for baselogit : bounded away from zero

 ## Lowerbound=exp(-6)/(exp(-6)+1)=0.0025

 ## Upperbound=exp(-3)/1+exp(-3)=0.048

 baselogit ~ dunif(-6,-3)

 # Prior for random effect variance

 sdbaselogit ~ dunif(0,1)

 precbaselogit <- 1/(sdbaselogit \* sdbaselogit)

 # a. Prior for heterogeneity

 tau ~ dnorm(0,2.55)T(0,)

 inv.tausq <- 1/(tau \* tau)

 }

1. For heterogeneity $τ$ ~ exp(2)
2. logit(pcj) ~ normal (0, 10)
3. logit(pcj) ~ normal (0, 100)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 }

 for(k in 1:nstudies) {

 # 1. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.01)

 # 2. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.0001)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # b. Prior for heterogeneity

 tau ~ dexp(2)

 inv.tausq <- 1/(tau \* tau)

 }

1. hierarchical structure for logit(pcj)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 # prior for control events using a random effect on logit pc

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(baselogit,precbaselogit)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # prior for baselogit : bounded away from zero

 ## Lowerbound=exp(-6)/(exp(-6)+1)=0.0025

 ## Upperbound=exp(-3)/1+exp(-3)=0.048

 baselogit ~ dunif(-6,-3)

 # Prior for random effect variance

 sdbaselogit ~ dunif(0,1)

 precbaselogit <- 1/(sdbaselogit \* sdbaselogit)

 # b. Prior for heterogeneity

 tau ~ dexp(2)

 inv.tausq <- 1/(tau \* tau)

 }

1. For heterogeneity: $τ$ ~ unif(0, 2)
2. logit(pcj) ~ normal (0, 10)
3. logit(pcj) ~ normal (0, 100)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 }

 for(k in 1:nstudies) {

 # 1. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.01)

 # 2. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.0001)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # c. Prior for heterogeneity

 tau ~ dunif(0,2)

 inv.tausq <- 1/(tau \* tau)

 }

1. hierarchical structure for logit(pcj)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 # prior for control events using a random effect on logit pc

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(baselogit,precbaselogit)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # prior for baselogit : bounded away from zero

 ## Lowerbound=exp(-6)/(exp(-6)+1)=0.0025

 ## Upperbound=exp(-3)/1+exp(-3)=0.048

 baselogit ~ dunif(-6,-3)

 # Prior for random effect variance

 sdbaselogit ~ dunif(0,1)

 precbaselogit <- 1/(sdbaselogit \* sdbaselogit)

 # c. Prior for heterogeneity

 tau ~ dunif(0,2)

 inv.tausq <- 1/(tau \* tau)

 }

1. For heterogeneity: $τ^{2}$ ~ lognormal(-4.06, $1.45^{2}$)
2. logit(pcj) ~ normal (0, 10)
3. logit(pcj) ~ normal (0, 100)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 }

 for(k in 1:nstudies) {

 # 1. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.01)

 # 2. normal(0,10) prior for pc in logit scale

 logit(pc[k]) <- phi[k]

 phi[k] ~ dnorm(0, 0.0001)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # c. Prior for heterogeneity

 tausq ~ dlnorm(-4.06, 0,476)

 inv.tausq <- 1/ tausq

 }

1. hierarchical structure for logit(pcj)

 model {

 for(j in 1:nstudies) {

 # binomial dist. for events in treatment group

 ev\_exp[j] ~ dbin(pt[j],n\_exp[j])

 # binomial dist. for events in control group

 ev\_con[j] ~ dbin(pc[j],n\_con[j])

 logit(pt[j]) <- theta[j] + logit(pc[j])

 # Random effect on log(OR)

 theta[j] ~ dnorm(mu,inv.tausq)

 # prior for control events using a random effect on logit pc

 logit(pc[j]) <- phi[j]

 phi[j] ~ dnorm(baselogit,precbaselogit)

 }

 # prior for mu

 mu ~ dnorm(0, 0.01)

 # prior for baselogit : bounded away from zero

 ## Lowerbound=exp(-6)/(exp(-6)+1)=0.0025

 ## Upperbound=exp(-3)/1+exp(-3)=0.048

 baselogit ~ dunif(-6,-3)

 # Prior for random effect variance

 sdbaselogit ~ dunif(0,1)

 precbaselogit <- 1/(sdbaselogit \* sdbaselogit)

 # c. Prior for heterogeneity

 tausq ~ dlnorm(-4.06, 0,476)

 inv.tausq <- 1/ tausq

 }