BMTRY 763

Fitting CAR Models (BRugs or OpenBUGS)

CAR models are those that include a CAR component ie *Conditional Autoregressive* component. This component can be used to model the spatial correlation in the dataset. An example of this kind of model is:

```
model
{
for (i in 1:m)
{
        # Poisson likelihood for observed counts
        y[i]~dpois(mu[i])
        log(mu[i])<-log(e[i])+alpha+u[i]+v[i]
        # Relative Risk
        theta[i]<-exp(alpha+u[i]+v[i])
        # Posterior probability of RR[i]>1
        PP[i]<-step(theta[i]-1+eps)
        # Prior distribution for the uncorrelated heterogeneity
        v[i]~dnorm(0,tau.v)
}

eps<-1.0E-6

# CAR prior distribution for spatial correlated heterogeneity
u[1:m]~car.normal(adj[],weights[],num[],tau.u)

# Weights
for(k in 1:sumNumNeig)
{
        weights[k]<-1
}

# Improper prior distribution for the mean relative risk in the study region
alpha~dflat()
mean<-exp(alpha)

# Hyperprior distributions on inverse variance parameter of random effects
tau.u~dgamma(0.5,0.0005)
tau.v~dgamma(0.5,0.0005)

}
```

On Homeroom
Correlated Heterogeneity in WinBUGS.pdf is available for you to read.

There are a range of files (WinBUGS ODCs) on Homeroom for you to examine and run

Log_linear_UH_SC_congen_abnor.odc
Congen_abnor_SC_gamma_poisson.odc
CAR_normal_congen_abnor_SC.odc

They are in correlated_Hfiles.zip