Lab Exercise 4

Load the data `lab_data.csv` and the following packages in R by running the code below.

```
chikwawa <- read.csv("lab_data.csv")
load(PrevMap)
load(lme4)
```

Let Y_{ij} denote a binary outcome which takes value 1 the j-th child at location x_j has tested positive for *Plasmodium falciparum* and 0 otherwise.

1. Write down a geostatistical model for Y_{ij} where $p_j(x_i)$, the probability of testing positive for *P. falciparun*, is a logit linear function of the age of the child.
2. Do the data show evidence of residual spatial correlation?
3. Fit a binomial geostatistical model to the data using Monte Carlo maximum likleihood.
4. Carry out spatial prediction for *P. falciparum* prevalence showing a map for the estimates and one for the standard errors.