Disease Mapping

Why Disease mapping?

- Can be simple descriptive stats
- Can have hypothesis
- Background variability (RR)
- Data comparability is difficult
- Mortality is more sure
- Morbidity is more interesting

Whats the scale

- small scale means you risk bias and migration problems
- large scale means you are smoothing over small scale variability
- whatever the scale consider presenation
  - cloropleth or isopleth
  - color
  - what are the cut points?

Smoothing models

- estimates of SMR are often highly variable
- how can we use all our geographical data to smooth out these estimates
- the basic poisson model has no smoothing
- RE effects model
  - Poisson-Gamma
  - Poisson-lognormal
  - Poisson-lognormal-spatial

- all of these models take the form of
  $Y_i\theta_i \approx Poisson(E_i\theta_i)$
  $\theta_i = exp(\beta \times X)\delta_i\eta_i$
- sprinkle in covariates

- what are the estimation techniques

- remember that smoothing introduces bias