Bayesian network

<https://www.who.int/bulletin/volumes/90/6/11-086009.pdf>

Key Points:

* Modelled each district as either influencing or influenced
  + To calculate the conditional probabilities – either modeled as an outbreak or no outbreak (based on the recommended thresholds set by the WHO (10 per 100,000 inhabitants or 5 cases per 100,000 for smaller villages; alert threshold are 5 and 2 per 100,000 for larger and smaller villages respectively)
* Statistical tools allow us to determine unknown patterns that mathematical relationships which model the transmission of the disease don’t express
* Bayesian network made no allowance for time needed for inter-district influences to reveal themselves as changes in meningitis incidence
* Is it better to develop a Bayesian network for each year?
* How can we use re-sampling simulation techniques to simulate and replicate observations
  + Allows lack of large longitudinal records – can create and model as such

SCIR Model for Meningitis

<https://core.ac.uk/download/pdf/51291793.pdf>

* Typical SIR model = susceptible infected recovered

A screenshot of a cell phone

Description automatically generated

* R and alpha represent a rates – they’re positive
* I, S, and R represent populations

Mathematical model for the transmission of meningitis

<https://www.hindawi.com/journals/cmmm/2018/2657461/>

SIR model for meningitis

<https://dergipark.org.tr/en/download/article-file/814793>

SIS models

<https://institutefordiseasemodeling.github.io/Documentation/general/model-si.html>

<https://www.nature.com/articles/s41598-019-52351-x>

SIR model

<http://mathworld.wolfram.com/SIRModel.html>

SEIR Model

<https://institutefordiseasemodeling.github.io/Documentation/general/model-seir.html>

Specific Meningitis

<https://www.researchgate.net/publication/263741627_Climate_Change_and_Cerebrospinal_Meningitis_in_the_Ghanaian_Meningitis_Belt>

<http://bayesiandeeplearning.org/2018/papers/151.pdf>