|  |  |  |
| --- | --- | --- |
|  | **cij = 0** | **cij = 1** |
| **Transmission** | (1- χ)\*ε | χ\*ε |
| **No transmission** |  | χ\*ξ\*ε |

ξ = 0 | ratio of CTDuninfec / CTDinfec | if = 0, contact = transmission | if > 1, CTD is not informative about infection | a way of measuring false positives

we want ξ to determine the relative rates of CTDin and CTDun

Do we want to define it as a probability?

un/in = ξ

p(cij | no transmission) = ξ / (ξ + 1)

p(cij | transmission) = 1 - ξ / (ξ + 1) -> this is the positive predictive value!!!

χ\*ε is the probability of reporting a

Ksi becomes a function of chi, and is simply a scaling factor

False positive rate is a function of ksi (between 0 and 1)

F1 statistic to look at specifity and sensitivity

χ = 1 | relevance of contact tracing method to transmission | if < 1, you will not observe a contact even if you have transmission p(cij = 1| CTDinfec) | sensitivity?

**χ is the sensitivity of our test**

ε = 1 | coverage of contacts | if < 1, we are simply not seeing

Given my model, we simply define the average number of contacts an individual has, and then model the number of “false positives” by defining the fixed population size

**Questions for Thibaut**

* make.fast.rand?
  + How is this faster than the standard runif?