**Text S1**

**Estimator for Tau statistic**

The tau statistic used here calculates the probability of a pair of cases from the same month being of the same serotype given they live distance *d* apart, relative to the probability that any two individuals sick in that month are sick with the same serotype:

where *Ωi(d1, d2)* is the set of cases occurring during the same month and within distances *d1* and *d2* of case *i; Ωi(.)* is the set of all cases occurring in the same month, and *zi* is the serotype of case *i*.

The estimator we used for the tau statistic was as follows:

where ***I1*** and ***I2*** are two indicator variables, *sij* is the distance between cases *i* and *j*, *tij* is the time between when the *i* and *j* got sick, *zi* is the serotype of case *i* and N is the total number of cases.