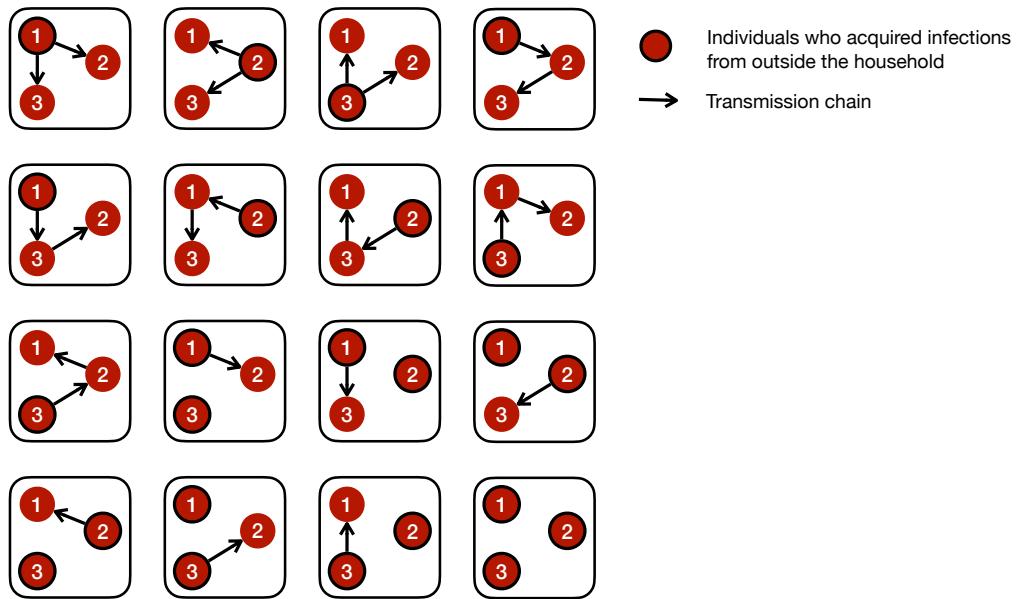


## 1 Supplementary Information

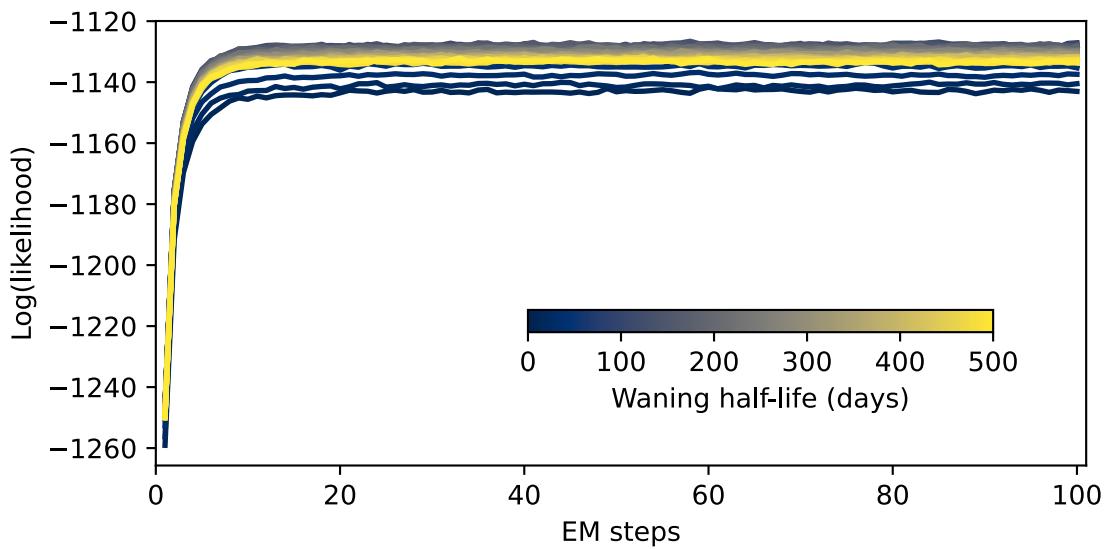


2

3 **Supplementary Fig. 1:** Visualization of all 16 possible transmission chains within a household of 3 infected individuals.

4

5

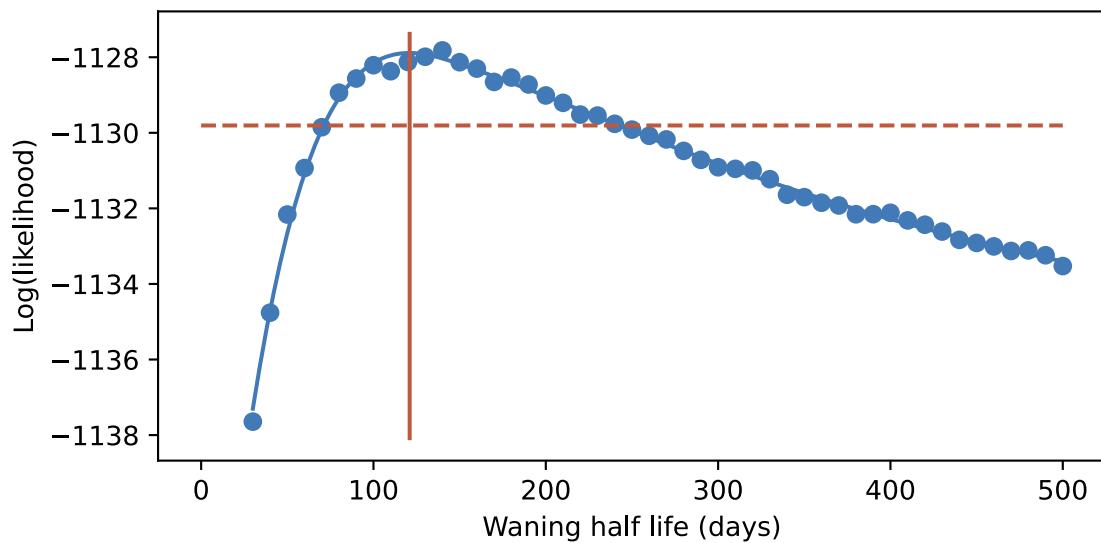


6

7 **Supplementary Fig. 2: The log-likelihood of the transmission model fit, as a function of the EM steps.**

8

9



10

11 **Supplementary Fig. 3: The profile log-likelihood of the transmission model over hyper-parameter of waning**  
12 **half-life.** Solid vertical line indicates the waning half-life corresponding to maximum of the profile likelihood. Dashed  
13 horizontal line represent 1.92 below the maximum profile likelihood.