*Age-specific pathogen transmissibility*

Here we consider three scenarios: , where and are proportional to child and adult pathogen transmissibility at time *t*, respectively. Equation (1) can then be rewritten as:

,

where k is the multiplicative factor, . The host types are assumed to have the same discrete serial interval distributions, i.e.,  *=* .

The effective contact matrix is as before: *.*

Having tested the one-host and the two-host models for the three scenarios with data being simulated by the two-host model, we have discovered that, even though the true values of stayed within the 95% credible intervals for the one-host model, the two-host model was slightly more accurate early on in the outbreak as the difference between and increased.

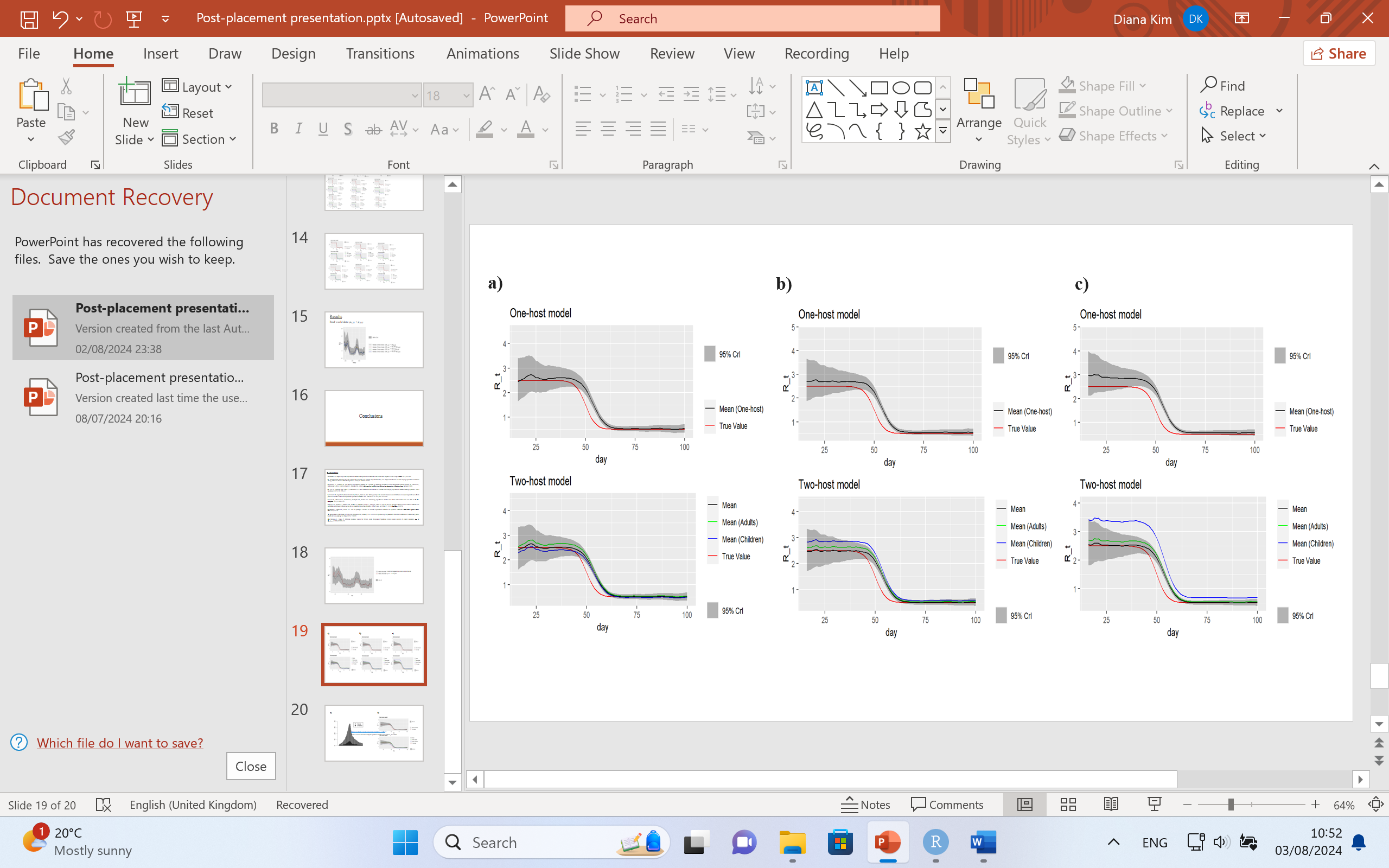
We can also notice that the time-dependent reproduction numbers, and , are now reversed with for *k = 1.5* and *k=1.75*. This is because, since , the next generation matrix can be written as

, i.e., , where is the dominant eigenvalue of .

This gives

.

The results are presented in Figure S1.

**

***Figure S1:*** *Estimates of the time-dependent reproduction numbers (Rt, Rc,t , Ra,t) by the one-host and the two-host models with 95% credible intervals for Rt estimates:* ***a)*** *= 1.25 ,* ***b)*** *= 1.5 ,* ***c)*** *= 1.75 .*