Inferring Risks of Coronavirus Transmission from Community Household Data: Tranche 10 Update

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Headline results

This document presents an updated analysis for the following time period:

- **Tranche 10:** 4 December 2021 to 6 January 2022; high prevalence; schools open; Omicron variant became dominant; over 51 million first, 47 million second and 35 million third doses distributed by end of time period.

Properties of this Tranche are given in Table 1; the histogram and age density plots are in Figure 1; the pair and residual plots are in Figure 2; and the output from the fitted model is shown in Figure 3, Figure 4 and Table 2.

These results show that for the first time, PCR gene positivity patterns are not associated with transmission. Primary age children are seen to be more infectious, and secondary age more susceptible, while both are associated with higher external risk.

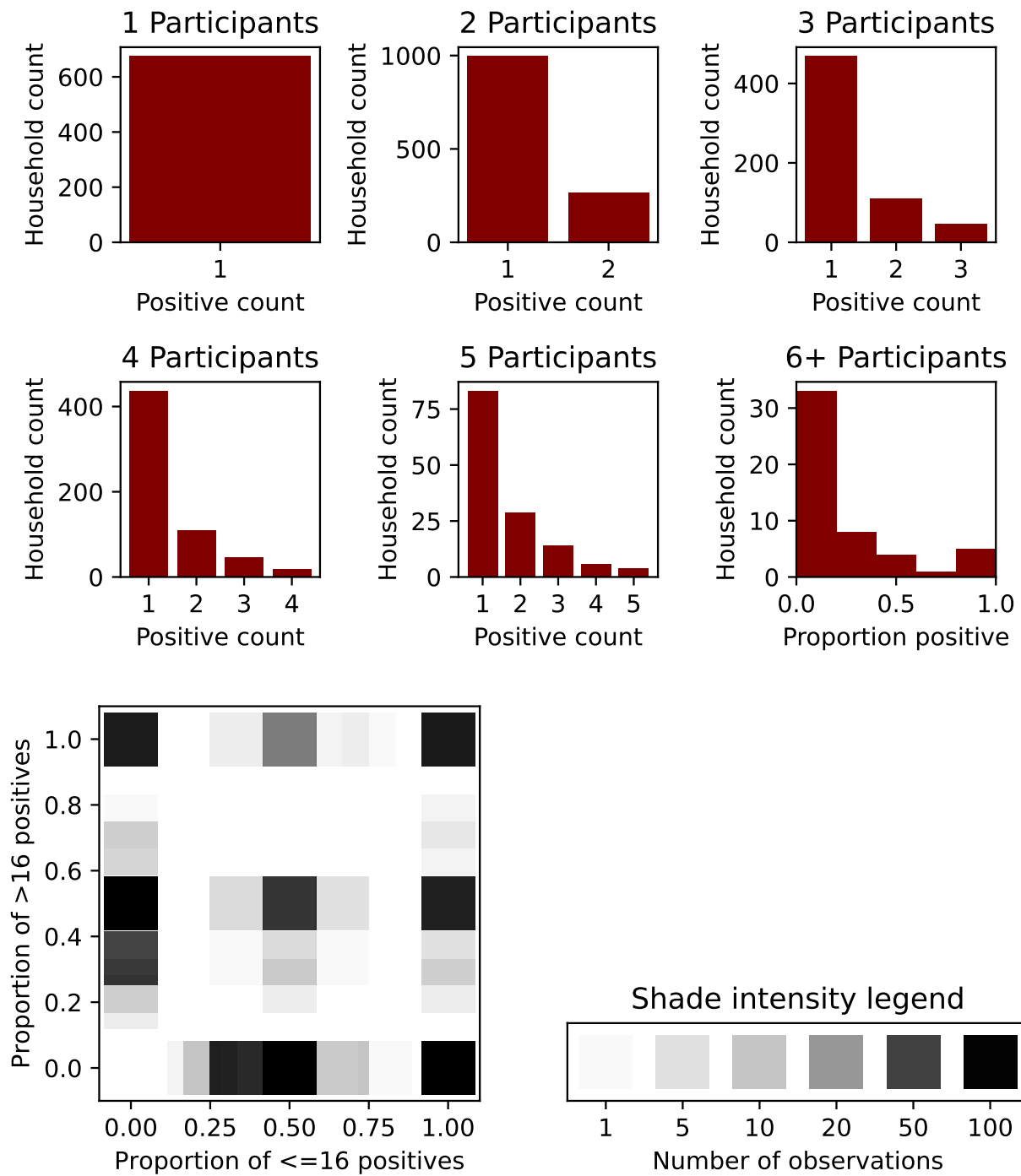|	Tranche 10	All
Number of participants	234643	450045
Number of households	125715	222224
Number of positive individuals	4223	46635
Households with 1+ positive	3358	33634
Children <12	14911	35422
Children 12–16	12870	24779
OR+N+S positives	2070	26849
OR+N positives	2014	13710
Patient-facing participants	7418	17459

Table 1: Tranche 10 sample properties.

Figure 1: Top: histogram and Bottom: density plot for Tranche 10 data
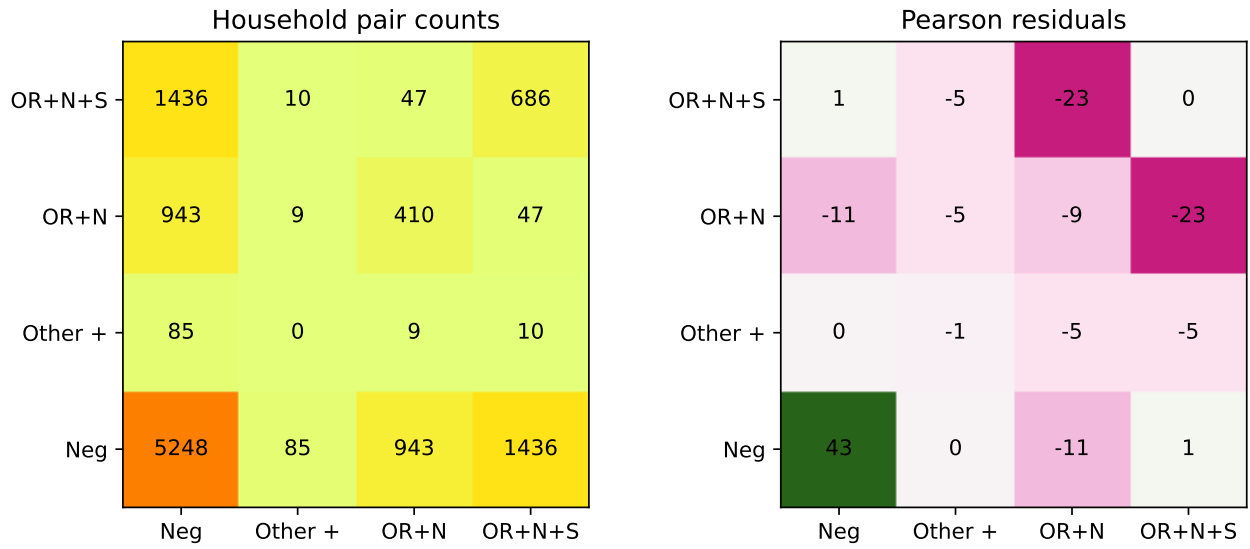
Figure 2: Left: pair count and Right: Pearson residual plots for Tranche 10 data
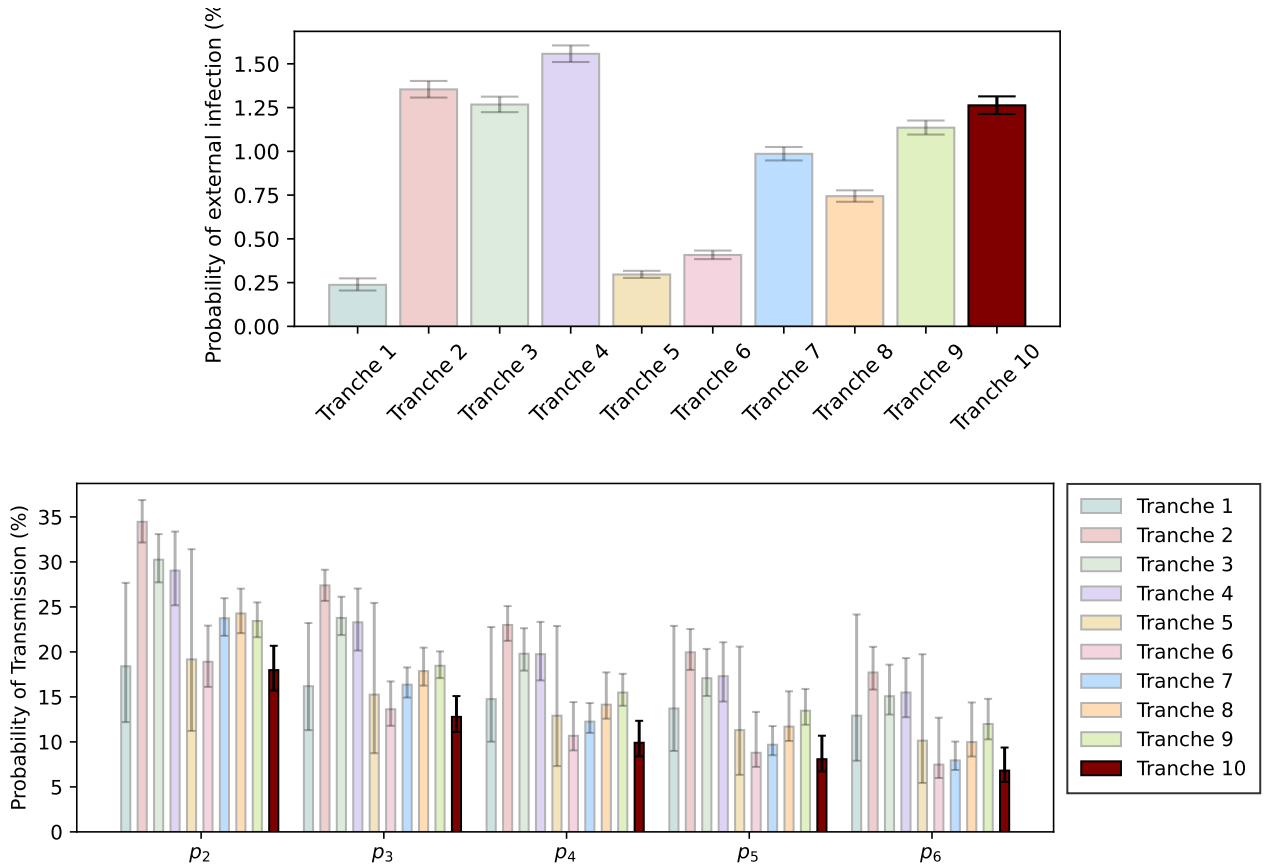

Figure 3: Visualisation of the fitted model. Top: Baseline probability of infection from outside. Bottom: Per-pair baseline probabilities of secondary transmission within the household, not including tertiary transmission effects.
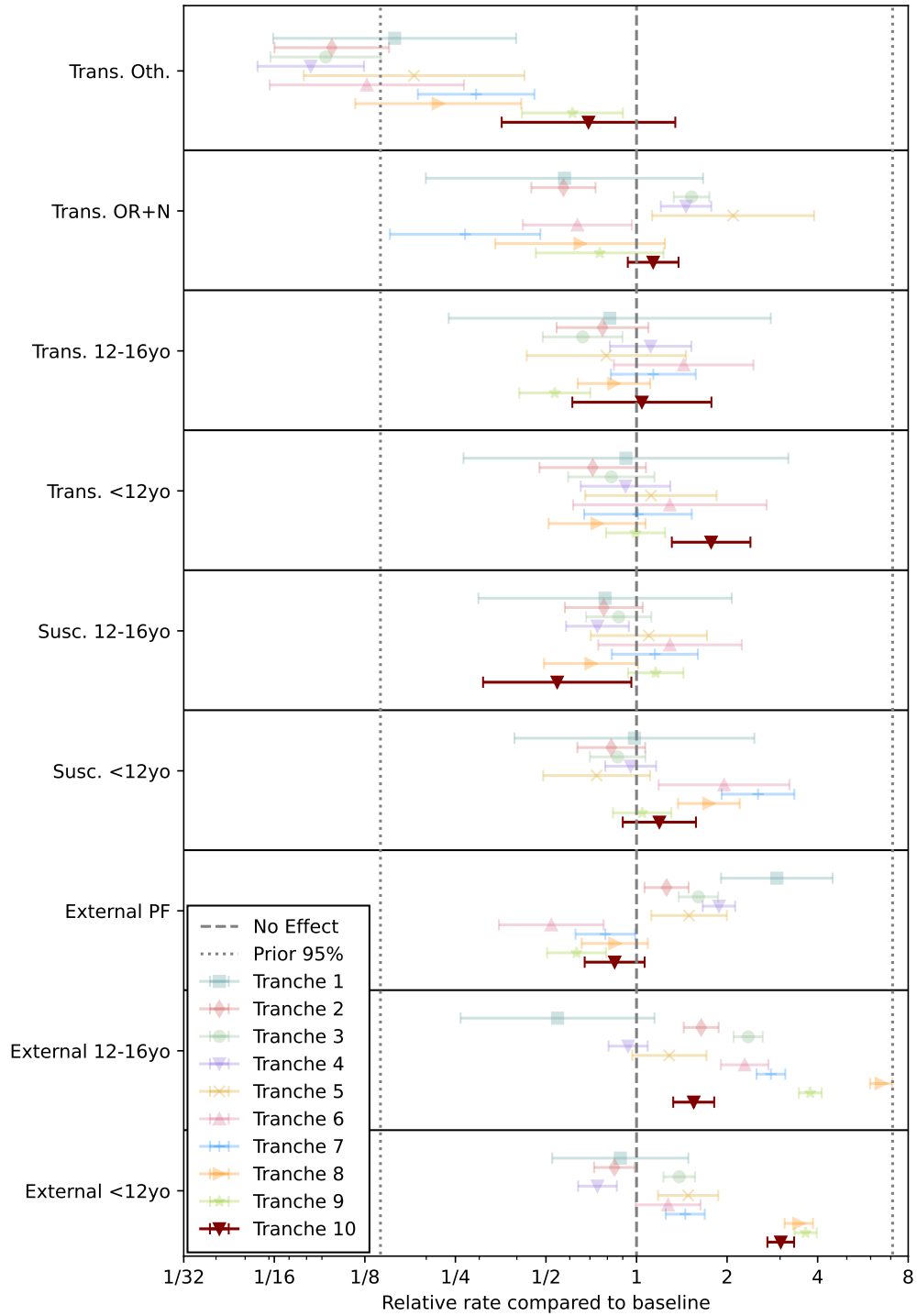
Figure 4: Visualisation of the fitted model. Relative effects on transmission, susceptibility and external exposure compared to baseline of an adult not working in a patient-facing role with OR+N+S maximal PCR gene positivity pattern if positive. 'Trans.' stands for relative transmissibility, 'Susc.' for relative susceptibility, and 'External' for relative external exposure.

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	Tranche 10
$1 - q$	1.26 (1.21,1.31) %
p_2	18.0 (15.7,20.7) %
p_3	12.8 (11.1,15.1) %
p_4	9.9 (8.39,12.3) %
p_5	8.08 (6.72,10.7) %
p_6	6.81 (5.56,9.37) %
$\exp(\alpha_{\text{2-11}})$	3.02 (2.72,3.34)
$\exp(\alpha_{\text{12-16}})$	1.55 (1.32,1.81)
$\exp(\alpha_{\text{PF}})$	0.846 (0.672,1.06)
$\exp(\beta_{\text{2-11}})$	1.19 (0.9,1.58)
$\exp(\beta_{\text{12-16}})$	0.545 (0.309,0.961)
$\exp(\gamma_{\text{2-11}})$	1.77 (1.31,2.39)
$\exp(\gamma_{\text{12-16}})$	1.04 (0.612,1.77)
$\exp(\gamma_{\text{OR+N}})$	1.14 (0.935,1.38)
$\exp(\gamma_{\text{CT-oth}})$	0.692 (0.356,1.35)

Table 2: Tranche 10 parameter point estimates and CIs.