**Supplementary file 2.** Model parameters for viral dynamics in both the nasopharynx and the trachea estimated by the model adjusted for groups of intervention.

|  |  |  |  |
| --- | --- | --- | --- |
| **Param.** | **Meaning** | **Value [95% CI]** | **Unit** |
| **β** | Viral infectivity in the naive group (x10-6) | 0.95 [0.18 ; 4.94] | (copies/ml)-1 day-1 |
|  | Fold change in the convalescent group | 0.18 [0.04 ; 0.88]\*\* |  |
|  | Fold change in the Conv-CD40 group | 0.004 [0.001 ; 0.029]\*\*\* |  |
| **δ** | Loss rate of infected cells in the naive group | 1.04 [0.79 ; 1.37] | day-1 |
|  | Fold change in the convalescent group | 1.79 [1.21 ; 2.66]\*\* |  |
|  | Fold change in the Conv-CD40 group | 1.80 [1.17 ; 2.75]\*\* |  |
| **PN** | Viral production rate in the naso. (x103) | 12.1 [3.15 ; 46.5] | virions.(cell.day)-1 |
| **PT** | Viral production rate in the trachea (x103) | 0.92 [0.39 ; 2.13] | virions.(cell.day)-1 |
| **αvlsg** | Infected cells and sgRNA viral load ratio | 1.39 [1.01 ; 1.76] | Virions.cell-1 |
| **k** | Eclipse rate | 3 | day-1 |
| **c** | Clearance of *de novo* produced viruses | 3 | day-1 |
| **cI** | Clearance of inoculum | 20 | day-1 |
| **µ** | Percentage of infectious viruses | 10-3 |  |
|  | Initial number of target cells | 1.25x105 (Naso.)  2.25x104 (Trachea) | cells |
|  | Number of virions inoculated | 2.19x1010 | virions |
| **ωβ** | SD of random effect on log10 β | 0.366 [0.160 ; 0.571] |  |
| **ωδ** | SD of random effect on δ | 0.170 [-0.089 ; 0.429] |  |
| **σVLn** | SD of error model gRNA in naso. | 1.27 [1.01 ; 1.53] |  |
| **σVLt** | SD of error model gRNA in trachea | 1.09 [0.90 ; 1.28] |  |
| **σsgVLn** | SD of error model sgRNA in naso | 1.41 [0.97 ; 1.85] |  |
| **σsgVLt** | SD of error model sgRNA in trachea | 1.62 [1.11 ; 2.13] |  |