**Supplemental tables and figures**
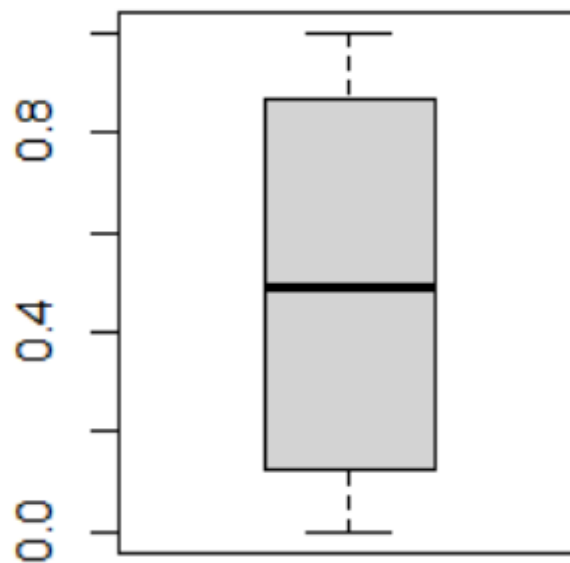


**FIGURE 1** Graphical depiction of the uinformative priors used for p, $\phi$ and $\psi$.

| | Posterior estimates | | | | $\hat{R}$ | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | 25th | 50th | 75th | Min. | 25th | 50th | 75th | Max. |
| $p$ | 0.311 | 0.153 | 0.323 | 0.431 | 1 | 1.006 | 1.016 | 1.075 | 1.477 |
| $\phi$ | 0.619 | 0.451 | 0.613 | 0.837 | 1 | 1.004 | 1.013 | 1.068 | 1.514 |
| $\psi$ | 0.012 | 0.001 | 0.002 | 0.011 | 1 | 1.062 | 1.272 | 1.412 | 16.497 |

**TABLE 1** Estimated adherence and mis-reporting parameters and convergence criteria from Cape Town data when priors for $k_{20}$, $k_{24}$ and $k_{40}$ are half the values given in table 3 in the main text. $\hat{R}$ is a measure of convergence with values close to 1.0 being optimal.

| | | | 95% Credible Interval | | $\hat{R}$ | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Posterior Mean | Posterior Median | lower | upper | Min. | 25th | 50th | 75th | Max. |
| $k_a$ | 9.736 | 9.736 | 9.674 | 9.799 | – | – | 1.099 | – | – |
| $k_{23}$ | 0.643 | 0.629 | 0.453 | 0.873 | – | – | 1.038 | – | – |
| $k_{32}$ | 0.359 | 0.359 | 0.221 | 0.512 | – | – | 2.174 | – | – |
| $k_{40}$ | 0.008 | 0.008 | 0.007 | 0.009 | – | – | 1.034 | – | – |
| $k_{24}$ mean | 0.013 | 0.011 | 0.004 | 0.030 | 1.002 | 1.024 | 1.094 | 1.250 | 14.523 |
| $k_{24}$ SD | 0.007 | 0.001 | 0.007 | 0.015 | – | – | – | – | – |
| $k_{20}$ mean | 0.090 | 0.088 | 0.060 | 0.134 | 1.010 | 1.084 | 1.268 | 1.748 | 8.425 |
| $k_{20}$ SD | 0.019 | 0.015 | 0.018 | 0.029 | – | – | – | – | – |
| $a_0$ mean | 509.102 | 412.754 | 122.810 | 1430.213 | 1.003 | 1.079 | 1.167 | 1.675 | 17.497 |
| $a_0$ SD | 360.806 | 174.367 | 287.752 | 739.388 | – | – | – | – | – |
| $a_1$ | -3.280 | -3.370 | -5.440 | -0.913 | – | – | 4.700 | – | – |

**TABLE 2** Estimated PK parameters and convergence criteria from Cape Town data when priors for $k_{20}$, $k_{24}$ and $k_{40}$ are half the values given in table 3 in the main text. $\hat{R}$ is a measure of convergence with values close to 1.0 being optimal. For population parameters only a single value of R exists and is given as the "median" R; for individual-level parameters quantiles of the distribution of the values of R are shown.