# **Summary of simulation results provided in tables of main manuscript**

**Scenario 1**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 12:43:03 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.043 & 0.794 & 0.794 & 86.600 & 91.900 & 2.400 & 2.850 \\

SD & -0.039 & 0.533 & 0.534 & 74.900 & 79.500 & 1.393 & 1.637 \\

q05 & 0.066 & 1.493 & 1.494 & 64.200 & 65.100 & 2.500 & 2.833 \\

q25 & 0.000 & 0.954 & 0.954 & 83.900 & 88.800 & 2.961 & 3.341 \\

q50 & 0.017 & 0.892 & 0.892 & 86.900 & 93.400 & 2.750 & 3.401 \\

q75 & 0.081 & 0.944 & 0.947 & 87.200 & 91.300 & 3.120 & 3.502 \\

q95 & 0.073 & 1.420 & 1.421 & 57.300 & 59.100 & 2.667 & 2.906 \\

\hline

\end{tabular}

\label{Scenario-1-Omicron-n10}

\end{table}

**Scenario 2**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 12:41:55 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.016 & 0.562 & 0.562 & 88.000 & 93.100 & 1.800 & 2.126 \\

SD & 0.050 & 0.390 & 0.393 & 83.500 & 87.900 & 1.097 & 1.298 \\

q05 & -0.210 & 1.060 & 1.080 & 82.700 & 84.600 & 2.333 & 2.619 \\

q25 & -0.056 & 0.677 & 0.679 & 88.800 & 93.100 & 2.199 & 2.600 \\

q50 & 0.001 & 0.646 & 0.645 & 88.600 & 94.400 & 2.033 & 2.442 \\

q75 & 0.098 & 0.715 & 0.721 & 87.100 & 92.400 & 2.155 & 2.615 \\

q95 & 0.103 & 0.981 & 0.986 & 78.600 & 81.000 & 2.333 & 2.667 \\

\hline

\end{tabular}

\label{Scenario-2-Omicron-n20}

\end{table}

**Scenario 3**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 13:01:56 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.005 & 0.348 & 0.348 & 89.100 & 93.500 & 1.150 & 1.375 \\

SD & 0.086 & 0.251 & 0.265 & 87.300 & 93.500 & 0.748 & 0.890 \\

q05 & -0.174 & 0.645 & 0.668 & 88.400 & 92.800 & 1.963 & 2.240 \\

q25 & -0.075 & 0.431 & 0.437 & 89.000 & 94.500 & 1.395 & 1.684 \\

q50 & 0.002 & 0.404 & 0.404 & 89.700 & 94.300 & 1.303 & 1.552 \\

q75 & 0.070 & 0.434 & 0.439 & 89.000 & 94.500 & 1.389 & 1.656 \\

q95 & 0.152 & 0.673 & 0.690 & 84.300 & 89.000 & 1.875 & 2.151 \\

\hline

\end{tabular}

\label{Scenario-3-Omicron-n50}

\end{table}

**Scenario 4**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 13:25:33 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.013 & 0.254 & 0.254 & 89.600 & 94.800 & 0.835 & 0.990 \\

SD & 0.114 & 0.168 & 0.203 & 86.500 & 93.500 & 0.550 & 0.653 \\

q05 & -0.175 & 0.453 & 0.486 & 87.100 & 93.200 & 1.408 & 1.701 \\

q25 & -0.076 & 0.316 & 0.325 & 89.000 & 93.900 & 1.005 & 1.198 \\

q50 & 0.015 & 0.296 & 0.296 & 89.900 & 94.600 & 0.941 & 1.125 \\

q75 & 0.099 & 0.309 & 0.325 & 87.900 & 94.000 & 1.005 & 1.195 \\

q95 & 0.214 & 0.465 & 0.512 & 85.800 & 93.400 & 1.413 & 1.704 \\

\hline

\end{tabular}

\label{Scenario-4-Omicron-n100}

\end{table}

**Scenario 5**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 12:45:47 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.025 & 1.065 & 1.065 & 85.900 & 90.500 & 3.150 & 3.701 \\

SD & -0.137 & 0.713 & 0.726 & 72.100 & 77.100 & 1.849 & 2.175 \\

q05 & 0.163 & 1.913 & 1.919 & 48.200 & 51.000 & 3.167 & 3.667 \\

q25 & -0.054 & 1.313 & 1.314 & 86.400 & 90.500 & 4.204 & 4.663 \\

q50 & -0.043 & 1.253 & 1.253 & 86.000 & 92.900 & 3.600 & 4.592 \\

q75 & -0.005 & 1.352 & 1.351 & 86.500 & 88.800 & 4.250 & 4.655 \\

q95 & -0.187 & 1.866 & 1.875 & 54.500 & 55.300 & 3.167 & 3.667 \\

\hline

\end{tabular}

\label{Scenario-5-Smallpox-n10}

\end{table}

**Scenario 6**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 12:52:07 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.011 & 0.750 & 0.750 & 87.600 & 93.300 & 2.325 & 2.775 \\

SD & -0.035 & 0.495 & 0.496 & 80.500 & 85.200 & 1.447 & 1.714 \\

q05 & -0.212 & 1.483 & 1.497 & 67.600 & 70.100 & 2.969 & 3.381 \\

q25 & -0.019 & 0.905 & 0.904 & 90.200 & 94.300 & 2.911 & 3.500 \\

q50 & 0.022 & 0.867 & 0.866 & 88.800 & 94.200 & 2.667 & 3.227 \\

q75 & 0.039 & 0.951 & 0.952 & 86.900 & 92.200 & 2.863 & 3.447 \\

q95 & -0.067 & 1.337 & 1.338 & 75.400 & 76.600 & 3.200 & 3.538 \\

\hline

\end{tabular}

\label{Scenario-6-Smallpox-n20}

\end{table}

**Scenario 7**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 12:55:41 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.003 & 0.476 & 0.475 & 89.000 & 94.200 & 1.520 & 1.810 \\

SD & 0.036 & 0.326 & 0.328 & 88.100 & 92.000 & 0.990 & 1.173 \\

q05 & -0.085 & 0.890 & 0.893 & 85.000 & 89.500 & 2.641 & 3.000 \\

q25 & -0.062 & 0.601 & 0.604 & 89.300 & 95.300 & 1.865 & 2.227 \\

q50 & 0.001 & 0.531 & 0.531 & 89.100 & 94.300 & 1.742 & 2.088 \\

q75 & 0.034 & 0.587 & 0.588 & 88.100 & 93.600 & 1.876 & 2.246 \\

q95 & 0.096 & 0.896 & 0.901 & 86.200 & 89.000 & 2.732 & 3.061 \\

\hline

\end{tabular}

\label{Scenario-7-Smallpox-n50}

\end{table}

**Scenario 8**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 13:27:27 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.008 & 0.329 & 0.329 & 89.900 & 95.200 & 1.088 & 1.290 \\

SD & 0.076 & 0.226 & 0.238 & 89.400 & 94.400 & 0.734 & 0.869 \\

q05 & -0.146 & 0.612 & 0.629 & 88.600 & 94.300 & 1.933 & 2.291 \\

q25 & -0.065 & 0.412 & 0.417 & 89.700 & 94.900 & 1.345 & 1.602 \\

q50 & -0.009 & 0.379 & 0.379 & 89.800 & 95.400 & 1.239 & 1.473 \\

q75 & 0.045 & 0.410 & 0.412 & 89.700 & 95.800 & 1.338 & 1.603 \\

q95 & 0.148 & 0.638 & 0.655 & 88.500 & 93.800 & 1.992 & 2.353 \\

\hline

\end{tabular}

\label{Scenario-8-Smallpox-n100}

\end{table}

**Scenario 9**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 13:55:31 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.008 & 0.413 & 0.413 & 85.500 & 90.900 & 1.200 & 1.450 \\

SD & 0.171 & 0.261 & 0.313 & 84.400 & 90.000 & 0.629 & 0.737 \\

q05 & -0.329 & 0.681 & 0.756 & 65.800 & 72.800 & 1.350 & 1.667 \\

q25 & -0.150 & 0.463 & 0.487 & 83.300 & 90.000 & 1.333 & 1.595 \\

q50 & -0.006 & 0.432 & 0.432 & 86.000 & 91.400 & 1.297 & 1.546 \\

q75 & 0.141 & 0.470 & 0.490 & 84.200 & 90.400 & 1.333 & 1.575 \\

q95 & 0.292 & 0.693 & 0.751 & 75.800 & 80.200 & 1.250 & 1.667 \\

\hline

\end{tabular}

\label{Scenario-9-Influenza-n10}

\end{table}

**Scenario 10**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:04:29 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.006 & 0.282 & 0.282 & 89.600 & 94.300 & 0.925 & 1.100 \\

SD & 0.223 & 0.184 & 0.289 & 73.300 & 83.700 & 0.514 & 0.609 \\

q05 & -0.383 & 0.485 & 0.618 & 79.300 & 86.000 & 1.178 & 1.371 \\

q25 & -0.160 & 0.323 & 0.360 & 85.800 & 91.900 & 1.023 & 1.222 \\

q50 & 0.010 & 0.298 & 0.298 & 90.000 & 94.300 & 0.975 & 1.159 \\

q75 & 0.169 & 0.324 & 0.365 & 87.700 & 92.800 & 1.006 & 1.205 \\

q95 & 0.380 & 0.492 & 0.622 & 84.200 & 89.500 & 1.215 & 1.400 \\

\hline

\end{tabular}

\label{Scenario-10-Influenza-n20}

\end{table}

**Scenario 11**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:18:17 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.003 & 0.186 & 0.186 & 89.200 & 93.800 & 0.590 & 0.710 \\

SD & 0.242 & 0.113 & 0.267 & 31.400 & 43.300 & 0.350 & 0.415 \\

q05 & -0.401 & 0.315 & 0.509 & 65.100 & 77.200 & 0.886 & 1.028 \\

q25 & -0.165 & 0.195 & 0.255 & 79.300 & 87.800 & 0.658 & 0.789 \\

q50 & -0.003 & 0.203 & 0.203 & 89.100 & 93.100 & 0.637 & 0.757 \\

q75 & 0.159 & 0.224 & 0.275 & 81.100 & 89.400 & 0.677 & 0.801 \\

q95 & 0.412 & 0.319 & 0.521 & 70.400 & 81.400 & 0.892 & 1.027 \\

\hline

\end{tabular}

\label{Scenario-11-Influenza-n50}

\end{table}

**Scenario 12**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:34:45 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.008 & 0.134 & 0.134 & 87.700 & 93.600 & 0.420 & 0.500 \\

SD & 0.250 & 0.077 & 0.262 & 3.900 & 8.100 & 0.259 & 0.308 \\

q05 & -0.408 & 0.242 & 0.474 & 41.600 & 54.900 & 0.707 & 0.820 \\

q25 & -0.149 & 0.140 & 0.204 & 71.700 & 79.500 & 0.462 & 0.559 \\

q50 & 0.016 & 0.148 & 0.149 & 87.100 & 92.800 & 0.458 & 0.541 \\

q75 & 0.166 & 0.164 & 0.233 & 72.000 & 81.400 & 0.498 & 0.587 \\

q95 & 0.438 & 0.222 & 0.491 & 51.400 & 64.600 & 0.703 & 0.828 \\

\hline

\end{tabular}

\label{Scenario-12-Influenza-n100}

\end{table}

**Scenario 13**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 13:58:27 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.011 & 0.389 & 0.389 & 84.100 & 88.900 & 1.120 & 1.333 \\

SD & -0.111 & 0.270 & 0.292 & 63.900 & 69.300 & 0.667 & 0.793 \\

q05 & 0.159 & 0.704 & 0.721 & 38.000 & 38.500 & 0.915 & 1.192 \\

q25 & 0.013 & 0.496 & 0.496 & 90.700 & 92.200 & 1.807 & 1.875 \\

q50 & -0.152 & 0.462 & 0.486 & 81.900 & 93.500 & 1.249 & 1.902 \\

q75 & -0.035 & 0.519 & 0.520 & 89.200 & 90.400 & 1.810 & 1.874 \\

q95 & -0.166 & 0.743 & 0.761 & 37.900 & 38.700 & 0.933 & 1.204 \\

\hline

\end{tabular}

\label{Scenario-13-Influenza-n10-smallcoarse}

\end{table}

**Scenario 14**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:01:43 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.001 & 0.276 & 0.276 & 86.300 & 91.700 & 0.845 & 1.007 \\

SD & -0.045 & 0.188 & 0.193 & 78.300 & 82.500 & 0.536 & 0.637 \\

q05 & -0.245 & 0.609 & 0.656 & 59.800 & 65.000 & 0.793 & 1.047 \\

q25 & -0.081 & 0.371 & 0.379 & 83.100 & 92.800 & 1.034 & 1.428 \\

q50 & -0.071 & 0.343 & 0.350 & 88.400 & 92.300 & 1.066 & 1.226 \\

q75 & -0.091 & 0.364 & 0.375 & 88.500 & 89.200 & 1.217 & 1.263 \\

q95 & -0.268 & 0.486 & 0.555 & 65.200 & 65.500 & 1.302 & 1.365 \\

\hline

\end{tabular}

\label{Scenario-14-Influenza-n20-smallcoarse}

\end{table}

**Scenario 15**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:21:49 2025

\begin{table}[ht]

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\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & -0.003 & 0.169 & 0.169 & 88.500 & 94.200 & 0.549 & 0.653 \\

SD & -0.018 & 0.116 & 0.118 & 85.200 & 90.800 & 0.368 & 0.434 \\

q05 & 0.018 & 0.338 & 0.338 & 90.900 & 92.200 & 1.260 & 1.345 \\

q25 & 0.001 & 0.234 & 0.234 & 87.500 & 92.800 & 0.711 & 0.860 \\

q50 & -0.022 & 0.208 & 0.209 & 90.800 & 94.600 & 0.695 & 0.823 \\

q75 & -0.007 & 0.228 & 0.228 & 88.700 & 94.000 & 0.702 & 0.854 \\

q95 & -0.024 & 0.345 & 0.346 & 89.800 & 90.900 & 1.208 & 1.282 \\

\hline

\end{tabular}

\label{Scenario-15-Influenza-n50-smallcoarse}

\end{table}

**Scenario 16**

% latex table generated in R 4.4.2 by xtable 1.8-4 package

% Wed Apr 23 14:45:43 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

& Bias & ESE & RMSE & 90\%CP & 95\%CP & 90\%CIw & 95\%CIw \\

\hline

Mean & 0.002 & 0.122 & 0.122 & 88.600 & 94.000 & 0.392 & 0.466 \\

SD & -0.006 & 0.083 & 0.083 & 87.000 & 91.900 & 0.267 & 0.317 \\

q05 & -0.047 & 0.257 & 0.262 & 88.600 & 94.200 & 0.802 & 0.984 \\

q25 & -0.018 & 0.168 & 0.169 & 88.200 & 94.200 & 0.523 & 0.635 \\

q50 & -0.013 & 0.152 & 0.152 & 89.300 & 95.000 & 0.484 & 0.582 \\

q75 & -0.010 & 0.166 & 0.166 & 89.000 & 93.800 & 0.530 & 0.625 \\

q95 & -0.050 & 0.245 & 0.250 & 87.100 & 88.500 & 0.794 & 0.870 \\

\hline

\end{tabular}

\label{Scenario-16-Influenza-n100-smallcoarse}

\end{table}