# **Summary of results provided in supplementary information file**

**Scenario S1**

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

% Thu Apr 24 11:55:51 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & -0.016 & 0.363 & 0.364 & 90.100 & 94.300 & 1.180 & 1.400 \\

SD & 0.176 & 0.245 & 0.301 & 84.600 & 91.000 & 0.743 & 0.886 \\

q05 & -0.332 & 0.659 & 0.738 & 86.400 & 91.100 & 1.916 & 2.212 \\

q25 & -0.145 & 0.440 & 0.463 & 88.300 & 93.900 & 1.417 & 1.687 \\

q50 & -0.013 & 0.414 & 0.414 & 88.800 & 94.000 & 1.307 & 1.563 \\

q75 & 0.113 & 0.436 & 0.450 & 87.800 & 94.700 & 1.404 & 1.680 \\

q95 & 0.299 & 0.655 & 0.720 & 84.500 & 91.200 & 1.903 & 2.202 \\

\hline

\end{tabular}

\label{Scenario-S1-Omicron-n50}

\end{table}

**Scenario S2**

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

% Thu Apr 24 12:05:40 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & -0.014 & 0.473 & 0.473 & 88.800 & 94.300 & 1.540 & 1.825 \\

SD & 0.108 & 0.333 & 0.350 & 86.400 & 91.800 & 1.001 & 1.186 \\

q05 & -0.195 & 0.902 & 0.922 & 84.800 & 89.100 & 2.628 & 2.976 \\

q25 & -0.110 & 0.586 & 0.596 & 87.900 & 93.500 & 1.857 & 2.235 \\

q50 & -0.016 & 0.547 & 0.547 & 88.300 & 93.400 & 1.735 & 2.083 \\

q75 & 0.069 & 0.576 & 0.580 & 89.700 & 94.500 & 1.855 & 2.224 \\

q95 & 0.194 & 0.865 & 0.886 & 87.000 & 90.500 & 2.665 & 3.000 \\

\hline

\end{tabular}

\label{Scenario-S2-Smallpox-n50}

\end{table}

**Scenario S3**

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

% Thu Apr 24 12:07:15 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & 0.004 & 0.193 & 0.193 & 89.200 & 94.900 & 0.620 & 0.730 \\

SD & 0.370 & 0.124 & 0.391 & 5.000 & 8.400 & 0.371 & 0.440 \\

q05 & -0.609 & 0.327 & 0.692 & 40.500 & 53.700 & 0.950 & 1.104 \\

q25 & -0.221 & 0.214 & 0.307 & 70.000 & 81.000 & 0.680 & 0.811 \\

q50 & 0.002 & 0.211 & 0.211 & 86.800 & 93.900 & 0.646 & 0.764 \\

q75 & 0.230 & 0.233 & 0.327 & 72.900 & 82.800 & 0.701 & 0.828 \\

q95 & 0.623 & 0.306 & 0.694 & 46.900 & 60.100 & 0.964 & 1.141 \\

\hline

\end{tabular}

\label{Scenario-S3-Influenza-n50}

\end{table}

**Scenario S4**

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

% Thu Apr 24 11:49:05 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & 0.005 & 0.768 & 0.768 & 84.600 & 90.900 & 2.300 & 2.701 \\

SD & -0.037 & 0.547 & 0.548 & 72.600 & 78.100 & 1.308 & 1.546 \\

q05 & -0.053 & 1.016 & 1.017 & 63.300 & 66.100 & 2.000 & 2.333 \\

q25 & -0.007 & 0.827 & 0.827 & 84.800 & 88.900 & 2.580 & 2.966 \\

q50 & 0.056 & 0.855 & 0.856 & 87.200 & 92.900 & 2.576 & 3.192 \\

q75 & 0.098 & 1.027 & 1.031 & 85.400 & 88.400 & 3.269 & 3.600 \\

q95 & -0.005 & 1.763 & 1.762 & 59.900 & 60.600 & 2.667 & 3.067 \\

\hline

\end{tabular}

\label{Scenario-S4-Measles-n10}

\end{table}

**Scenario S5**

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

% Thu Apr 24 11:53:38 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & -0.024 & 0.549 & 0.549 & 87.800 & 93.400 & 1.725 & 2.050 \\

SD & 0.056 & 0.394 & 0.398 & 82.500 & 87.400 & 1.039 & 1.238 \\

q05 & -0.206 & 0.731 & 0.759 & 79.100 & 82.200 & 1.758 & 2.000 \\

q25 & -0.082 & 0.585 & 0.591 & 88.500 & 93.500 & 1.820 & 2.167 \\

q50 & 0.003 & 0.602 & 0.602 & 90.300 & 94.200 & 1.921 & 2.307 \\

q75 & 0.084 & 0.734 & 0.738 & 87.400 & 93.000 & 2.267 & 2.740 \\

q95 & 0.026 & 1.212 & 1.212 & 78.300 & 79.100 & 2.631 & 3.000 \\

\hline

\end{tabular}

\label{Scenario-S5-Measles-n20}

\end{table}

**Scenario S6**

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

% Thu Apr 24 12:06:03 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & -0.004 & 0.346 & 0.346 & 89.400 & 94.300 & 1.120 & 1.340 \\

SD & 0.110 & 0.262 & 0.284 & 86.000 & 92.600 & 0.741 & 0.877 \\

q05 & -0.247 & 0.473 & 0.533 & 83.700 & 90.100 & 1.367 & 1.600 \\

q25 & -0.072 & 0.373 & 0.379 & 89.400 & 94.600 & 1.186 & 1.416 \\

q50 & 0.025 & 0.387 & 0.387 & 90.500 & 95.200 & 1.243 & 1.476 \\

q75 & 0.095 & 0.463 & 0.472 & 88.700 & 93.700 & 1.455 & 1.749 \\

q95 & 0.196 & 0.812 & 0.835 & 86.200 & 90.100 & 2.500 & 2.773 \\

\hline

\end{tabular}

\label{Scenario-S6-Measles-n50}

\end{table}

**Scenario S7**

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

% Thu Apr 24 12:29:32 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & 0.014 & 0.240 & 0.240 & 90.000 & 95.100 & 0.800 & 0.955 \\

SD & 0.131 & 0.180 & 0.223 & 84.300 & 91.700 & 0.558 & 0.661 \\

q05 & -0.249 & 0.318 & 0.404 & 81.400 & 88.600 & 1.003 & 1.198 \\

q25 & -0.064 & 0.257 & 0.265 & 88.900 & 94.300 & 0.855 & 1.022 \\

q50 & 0.042 & 0.273 & 0.276 & 90.000 & 94.500 & 0.890 & 1.058 \\

q75 & 0.127 & 0.321 & 0.345 & 89.000 & 93.500 & 1.049 & 1.258 \\

q95 & 0.204 & 0.576 & 0.610 & 89.700 & 93.900 & 1.767 & 2.125 \\

\hline

\end{tabular}

\label{Scenario-S7-Measles-n100}

\end{table}

**Scenario S8**

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

% Fri Apr 25 20:50:34 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & -0.006 & 0.112 & 0.112 & 90.500 & 94.700 & 0.373 & 0.444 \\

SD & 0.128 & 0.076 & 0.149 & 51.500 & 64.200 & 0.254 & 0.303 \\

q05 & -0.230 & 0.202 & 0.306 & 71.400 & 82.400 & 0.679 & 0.814 \\

q25 & -0.084 & 0.134 & 0.158 & 86.000 & 92.200 & 0.454 & 0.540 \\

q50 & -0.005 & 0.130 & 0.130 & 91.300 & 95.400 & 0.425 & 0.506 \\

q75 & 0.088 & 0.138 & 0.163 & 80.900 & 89.700 & 0.447 & 0.536 \\

q95 & 0.195 & 0.216 & 0.291 & 80.700 & 88.300 & 0.686 & 0.807 \\

\hline

\end{tabular}

\label{Scenario-S8-Omicron-n500}

\end{table}

**Scenario S9**

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

% Fri Apr 25 19:40:01 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & 0.012 & 0.147 & 0.147 & 90.000 & 96.000 & 0.489 & 0.582 \\

SD & 0.097 & 0.103 & 0.141 & 78.100 & 85.900 & 0.336 & 0.401 \\

q05 & -0.150 & 0.273 & 0.311 & 84.800 & 91.800 & 0.905 & 1.083 \\

q25 & -0.057 & 0.175 & 0.184 & 89.900 & 93.800 & 0.606 & 0.723 \\

q50 & 0.013 & 0.168 & 0.168 & 91.000 & 95.100 & 0.565 & 0.673 \\

q75 & 0.074 & 0.184 & 0.198 & 89.400 & 95.100 & 0.609 & 0.725 \\

q95 & 0.175 & 0.301 & 0.348 & 84.200 & 92.700 & 0.903 & 1.069 \\

\hline

\end{tabular}

\label{Scenario-S9-Smallpox-n500}

\end{table}

**Scenario S10**

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

% Fri Apr 25 21:23:37 2025

\begin{table}[ht]

\centering

\begin{tabular}{rrrrrrrr}

\hline

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

\hline

Mean & 0.001 & 0.057 & 0.057 & 89.500 & 94.800 & 0.190 & 0.226 \\

SD & 0.256 & 0.038 & 0.259 & 0.000 & 0.000 & 0.120 & 0.143 \\

q05 & -0.422 & 0.124 & 0.440 & 0.300 & 0.600 & 0.404 & 0.473 \\

q25 & -0.154 & 0.059 & 0.165 & 13.900 & 22.800 & 0.190 & 0.228 \\

q50 & 0.007 & 0.065 & 0.065 & 90.300 & 94.100 & 0.212 & 0.252 \\

q75 & 0.151 & 0.077 & 0.169 & 26.000 & 37.800 & 0.247 & 0.290 \\

q95 & 0.465 & 0.096 & 0.474 & 1.700 & 2.500 & 0.318 & 0.381 \\

\hline

\end{tabular}

\label{Scenario-S10-Influenza-n500}

\end{table}