

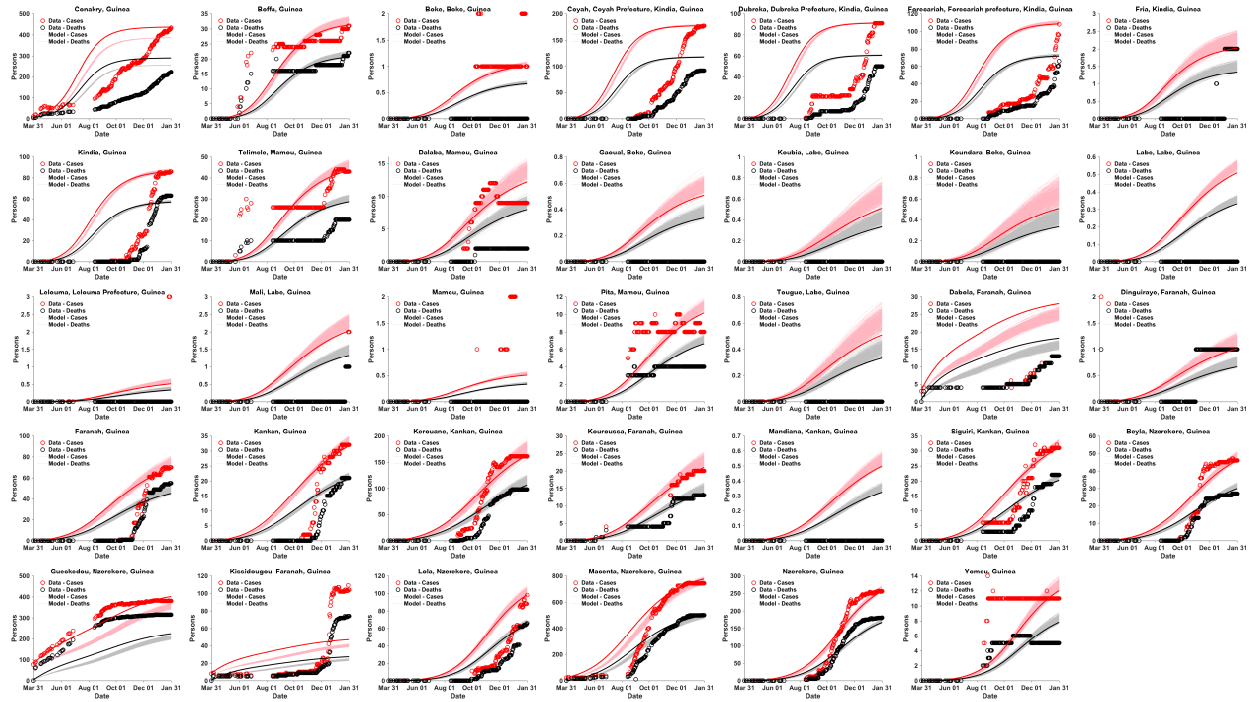
## District-level Model Stochastic Simulations

Figures showing simulation results using the stochastic district-level model, assuming a range of values for reporting rate ( $r$ ) and fraction of the population at risk ( $f$ ) (where  $k_{norm} = rf$  in the deterministic model, and noting that the total population at risk is  $f\rho_n$ ).

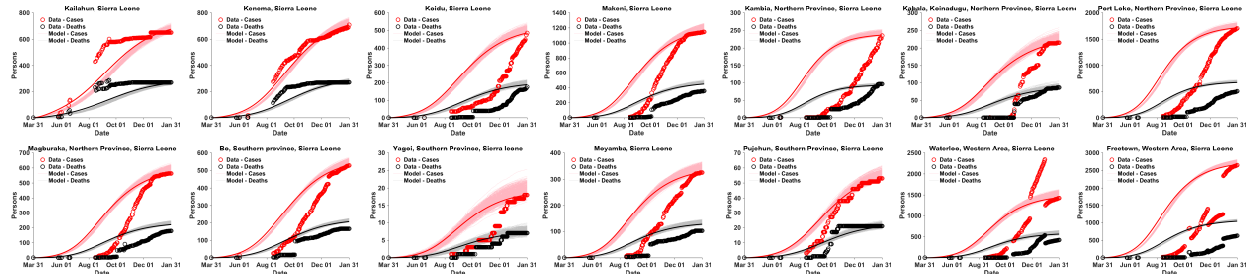


$$f = \frac{2}{3}, r = \frac{3}{2}k_{norm}$$

## Guinea



## Sierra Leone



## Liberia

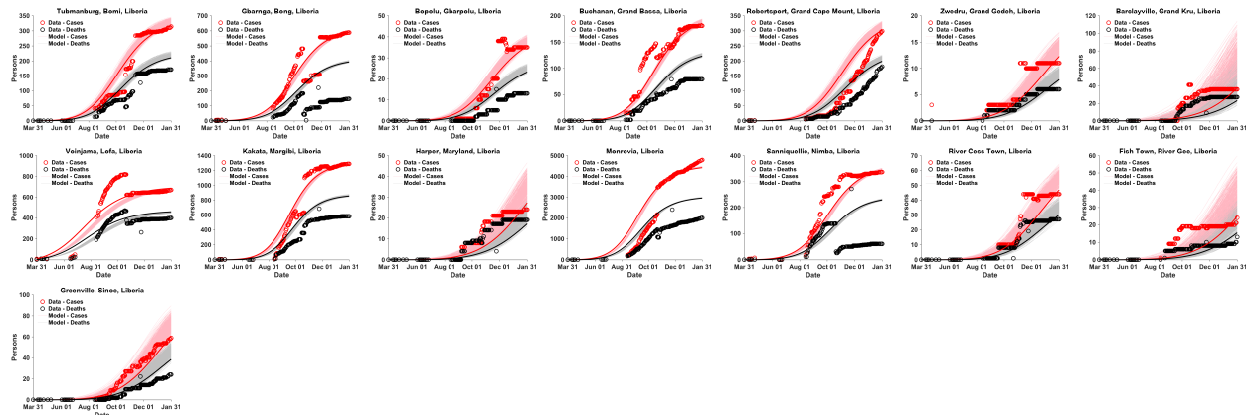
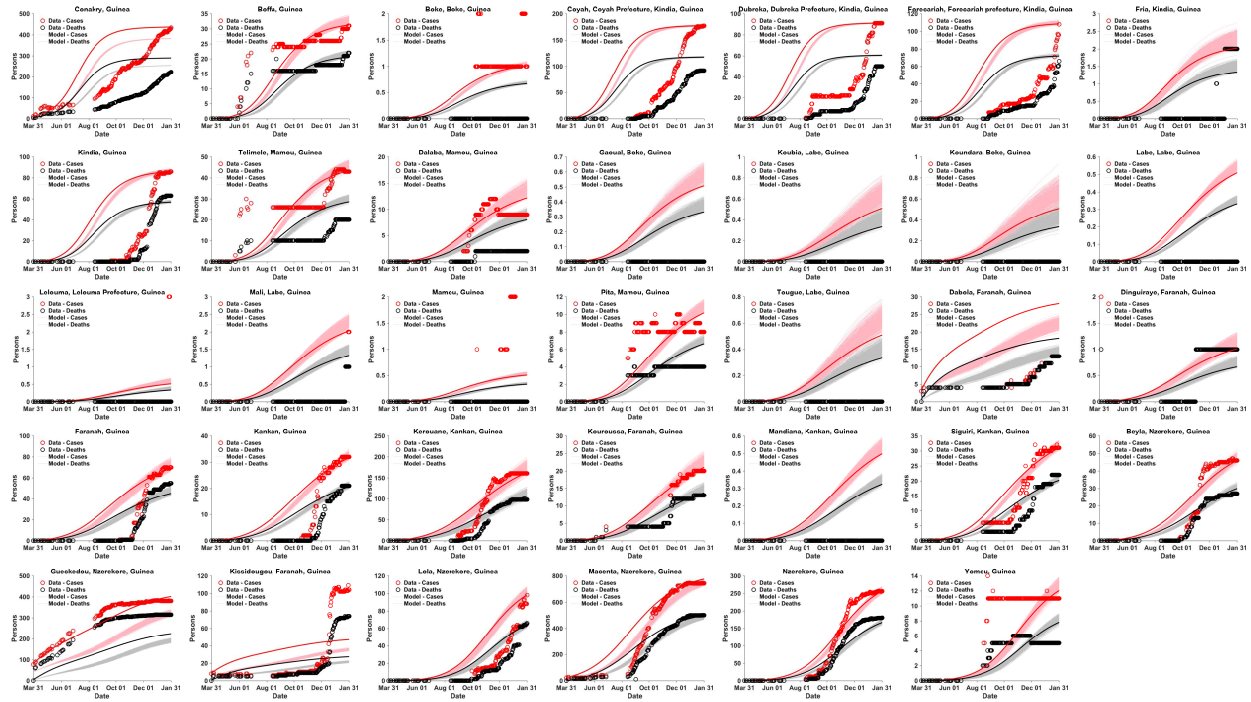


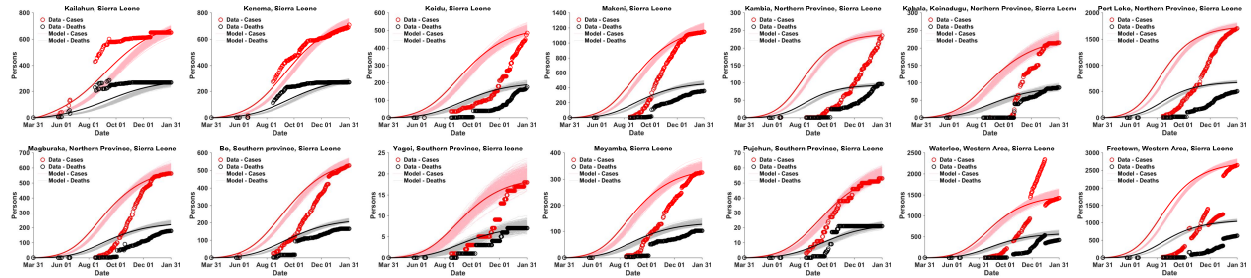
Figure S2: Cumulative cases and deaths for each district. Red and black circles represent data for cases and deaths, respectively. Thick red and black lines represent cumulative cases and deaths (respectively) in the deterministic model; thin pink and grey lines represent cases and deaths (respectively) trajectories sampled from the stochastic model with  $2/3$  of the population at risk (reporting rate is  $(3/2)k_{norm}$ ) for each patch). Model projections are from March 30, 2014 to January 31, 2015.

$$f = \frac{1}{2}, r = 2k_{norm}$$

## Guinea



## Sierra Leone



## Liberia

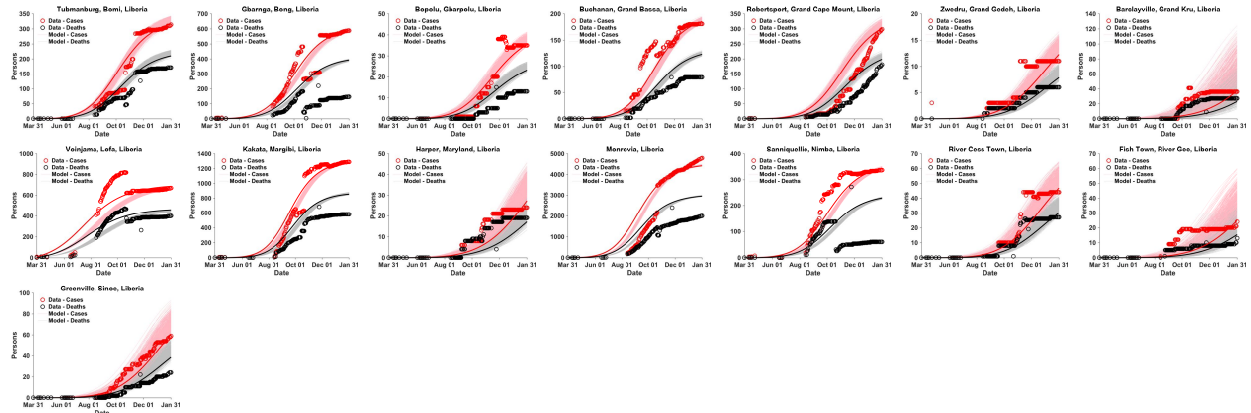
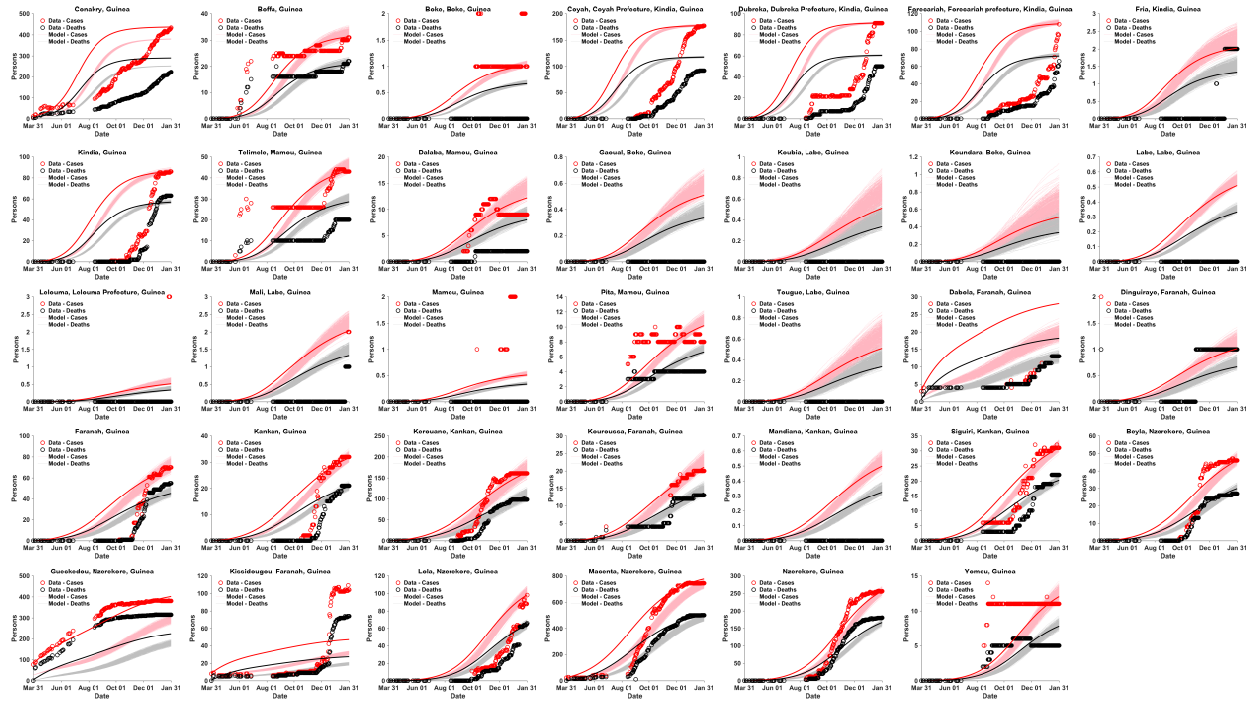


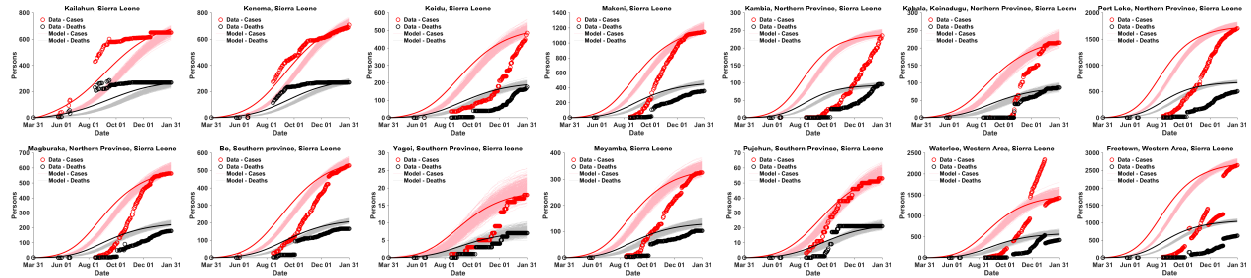
Figure S3: Cumulative cases and deaths for each district. Red and black circles represent data for cases and deaths, respectively. Thick red and black lines represent cumulative cases and deaths (respectively) in the deterministic model; thin pink and grey lines represent cases and deaths (respectively) trajectories sampled from the stochastic model with  $1/2$  of the population at risk (reporting rate is  $2k_{norm}$  for each patch). Model projections are from March 30, 2014 to January 31, 2015.

$$f = \frac{1}{3}, r = 3k_{norm}$$

## Guinea



## Sierra Leone



## Liberia

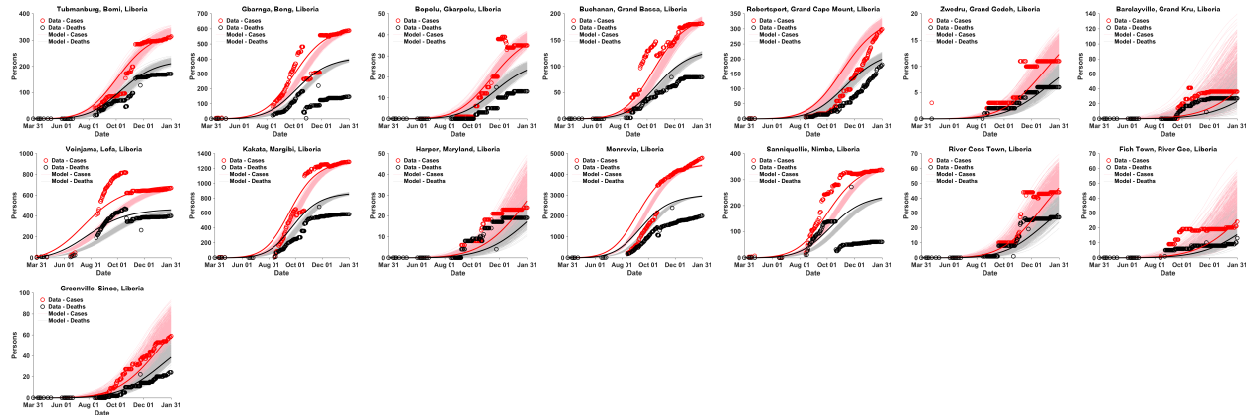
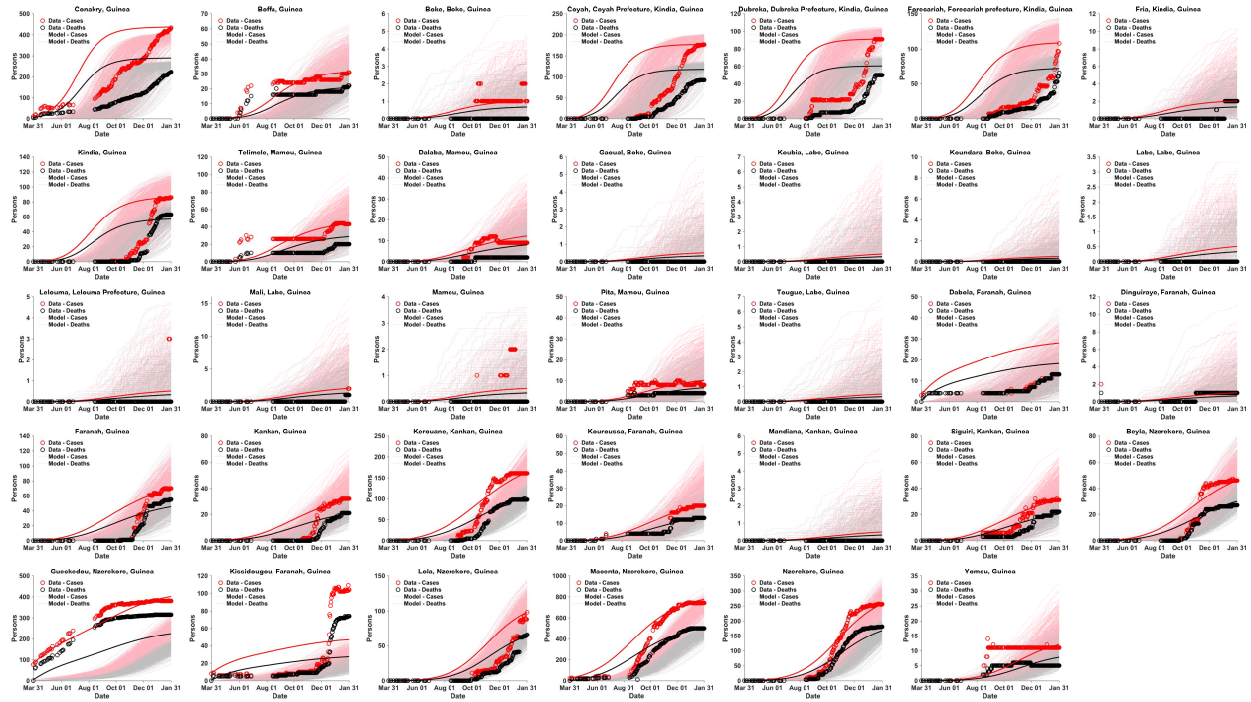


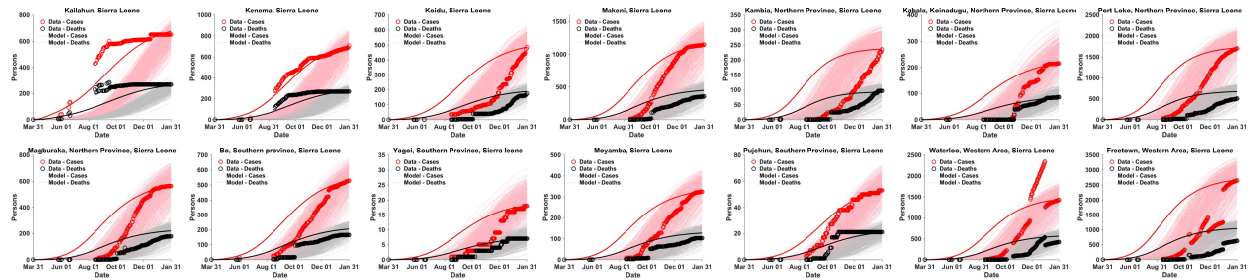
Figure S4: Cumulative cases and deaths for each district. Red and black circles represent data for cases and deaths, respectively. Thick red and black lines represent cumulative cases and deaths (respectively) in the deterministic model; thin pink and grey lines represent cases and deaths (respectively) trajectories sampled from the stochastic model with  $1/3$  of the population at risk (reporting rate is  $3k_{norm}$  for each patch). Model projections are from March 30, 2014 to January 31, 2015.

$$f = 10k_{norm}, r = \frac{1}{10}$$

## Guinea



## Sierra Leone



## Liberia

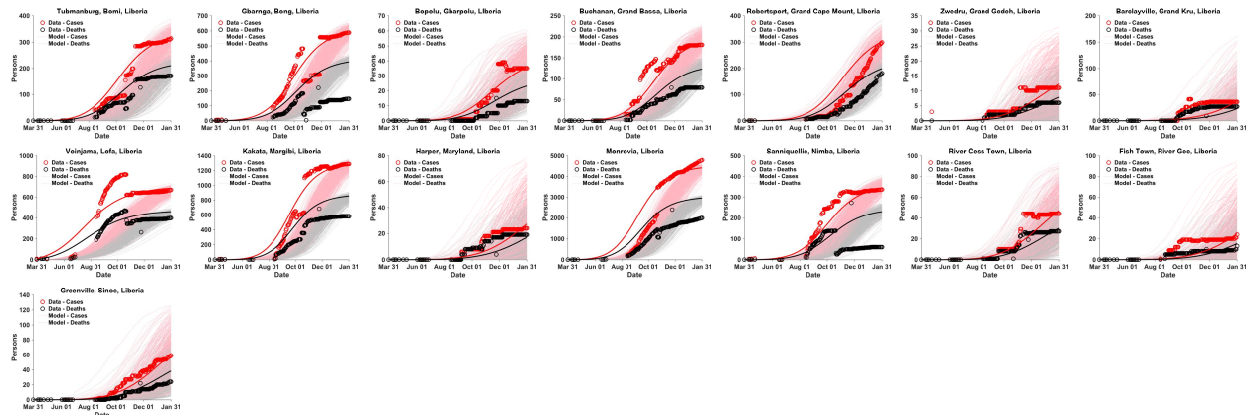


Figure S5: Cumulative cases and deaths for each district. Red and black circles represent data for cases and deaths, respectively. Thick red and black lines represent cumulative cases and deaths (respectively) in the deterministic model; thin pink and grey lines represent cases and deaths (respectively) trajectories sampled from the stochastic model with reporting rate of  $1/10$  (10 actual cases per reported case) for each patch (yielding  $10k_{norm}\rho_n$  as the population at risk in each patch). Model projections are from March 30, 2014 to January 31, 2015.

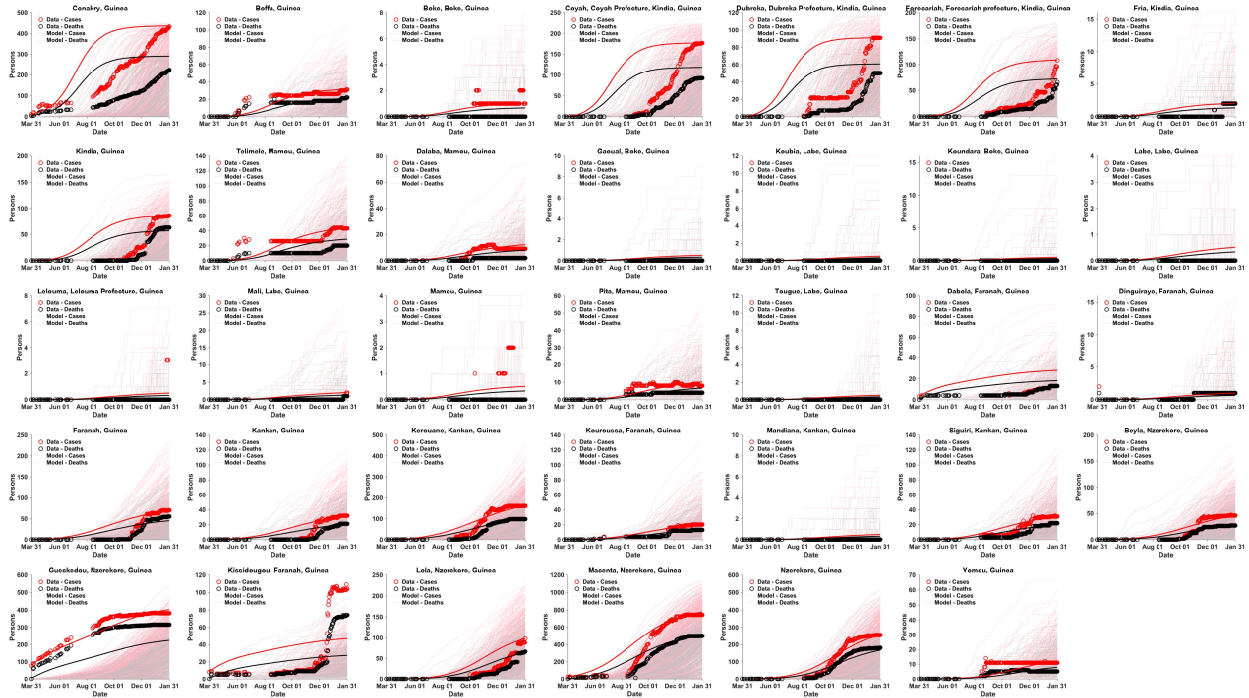




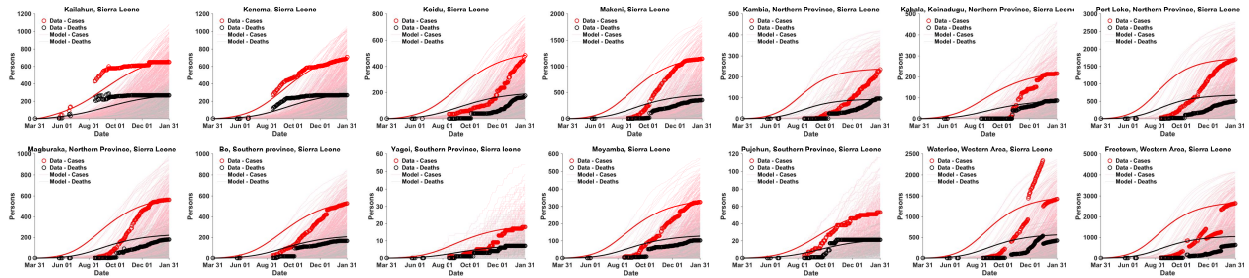


$$f = k_{norm}, r = 1$$

## Guinea



## Sierra Leone



## Liberia

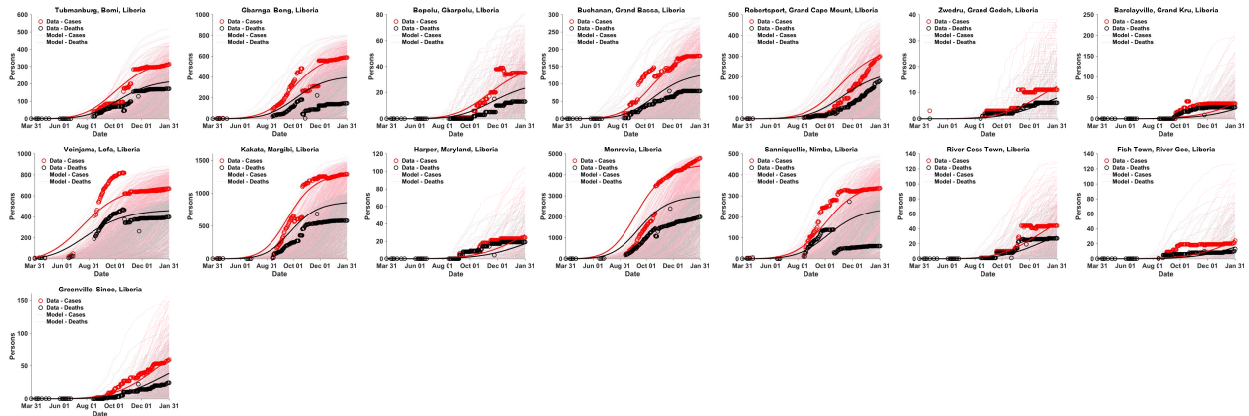


Figure S8: Cumulative cases and deaths for each district. Red and black circles represent data for cases and deaths, respectively. Thick red and black lines represent cumulative cases and deaths (respectively) in the deterministic model; thin pink and grey lines represent cases and deaths (respectively) trajectories sampled from the stochastic model with perfect reporting (1 actual case per reported case) for each path (yielding  $k_{norm}\rho_n$  as the population at risk in each path). Model projections are from March 30, 2014 to January 31, 2015.