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Figure R1. **Marginal posterior parameter estimates across different importation rate levels.** In both **A)** and **B)** the estimated mean and 95% CI are shown with dots and error bars around the mean. The importation rate is shown on the y-axis and is also color-coded with shades of green. Darker colors present higher values of while lighter colors have lower values as indicated in the legend. In all plots, the dashed lines show the previous parameter range introduced in the main text, the Highest and Lowest values found in the literature review presented in the Supplementary Material **Prevalence estimates**. Bacterial pathogens are sorted from upper to lower proportional to the reported abundance and match the order presented in SM Figure S13.

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Figure R2. **Relationship between the parameter estimates and the importation rate γ.** Marginal parameter estimates **A**) the nosocomial transmission rate β and te **B)** the effective sensitivity ρ.In each subplot, we present the mean parameter estimate and the 95% CI using error bars. We used the same color scheme introduced in Figure R1, darker colors indicate a higher importation rate while lighter colors a lower one. The size of the dots corresponds to the effective sensitivity (Figure R3). A linear regression is shown as a dashed black line and the coefficient of determination is presented inside each subplot red. The bacterial pathogens are sorted from left to right and upper to lower plots according to their reported abundance.

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*Figure R3****.* Identifiability, parameter estimates on simulated data.** Each figure present the joint parameter estimates for a importation rate of **A)** γ=5, **B)** γ=10 and **C)** γ=15%. The posterior estimate is highlighted with a density plot (darker means more probable). In each subplot the true value is highlighted in the title of each scenario and with a yellow cross at the intersection of the two black dashed lines. The x-axis shows the effective sensitivity ρ (%) and the y-axis the nosocomial transmission rate β. Note that in all subplots the prior range is the limits of each axis, ρ increments from left to right and β from upper to lower plots.

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Figure R4. **Convergence plots of inferences for synthetic data with low and .** Marginal posterior parameter estimates for importation rate of **A)** 5 **B)** 10 and **C)** 15%.In each panel the left subplots present the convergence for the effective sensitivity , and the right subplots for the nosocomial transmission rate . In each row of each panel the truth value is indicated in an inset text, the truths are also highlighted as dashed red lines in each subplot as indicated in the legend. The convergence of the marginal posterior distribution is presented for the mean (black line) and the 95 and 50% credible intervals as indicated in the legend.

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Figure R6. **Posterior parameter estimates**