Flu Scenario Modeling Hub Report

13 December, 2022
Scenario Modeling Hub Team[1]

Key Takeaways

In Round 2, we assessed the impact of reduced residual immunity coming into the 2022-2023 influenza season as a result of reduced transmission during the last two influenza seasons because of the COVID-19 pandemic. We also assessed the impact of low versus high vaccine effectiveness. Ensemble projections are based on contributions from 11 teams (9 nationally) and cover the period from Nov 13, 2022 to June 3, 2023. Full scenario specifications can be found here.

Key Takeaways from the Second Round

- Under the assumption of 50% reduced immunity at the start of the season, and as compared to the typical level of immunity pre-COVID-19 pandemic, a 40-50% higher hospitalization and death burden is expected based on median national projections.
- Increased vaccine effectiveness is expected to substantially decrease both the peak and cumulative hospitalizations regardless of existing population immunity, reducing hospitalization by 19.5% in low immunity scenarios and by 30.4% in high immunity scenarios.
- In the worst case scenario, with low vaccine effectiveness and low existing immunity, weekly hospitalizations are projected to peak at 38,000 hospitalizations nationally (50% 33,000-46,500). In this scenario, peak hospitalizations have a substantial likelihood to exceed the peak of the severe 2017-18 season. Observed hospitalizations and deaths are most closely tracking with the worst case scenario at the time of this report, though other scenarios remain plausible.
- Irrespective of scenario, ensemble hospitalizations are projected to peak in mid- to late-December, 2022. The worst case scenario of low prior immunity and low VE projects a peak in the week of December 24 nationally (50% PI December 10 - December 31), though there is substantial variability between states.
- There is substantial agreement in the trajectory of individual models in this round.

A few caveats are worth noting:

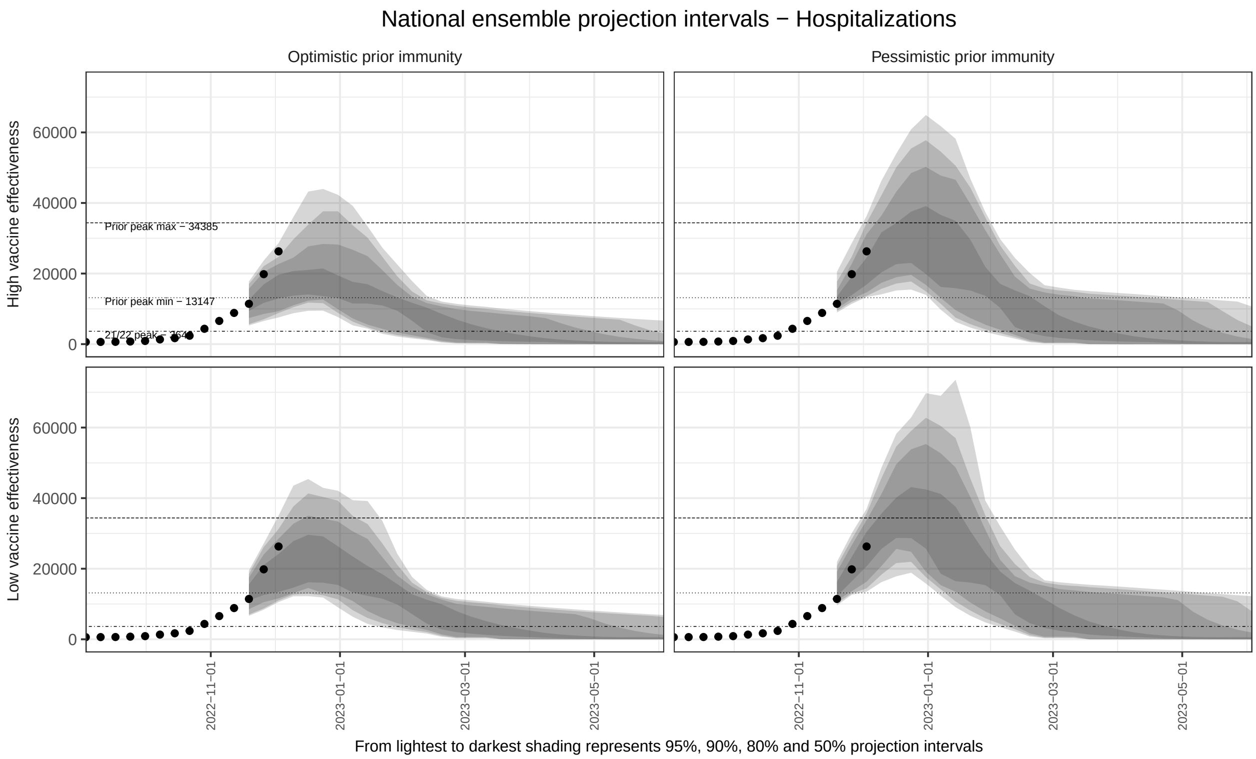
- Some teams had issues calibrating the average pre-season immunity scenarios (A and C), sometimes leading to unrealistically high values of R0 to be consistent with the fast and early rise of the epidemic in the South-East. Further, some teams had trouble making projections for some of the smaller states that had a later epidemic start and lacked informative data for calibration. Recent observations indicate a sharp rise in these states in weeks 46-48. This led us to initiate a third round of influenza projections that will include calibration data until week 48 and will be released later in December.
- The amount of calibration data available for the new HHS influenza dataset remains limited, and testing practices could change between and within seasons. Similarly, the amount of death data available for calibration is limited.

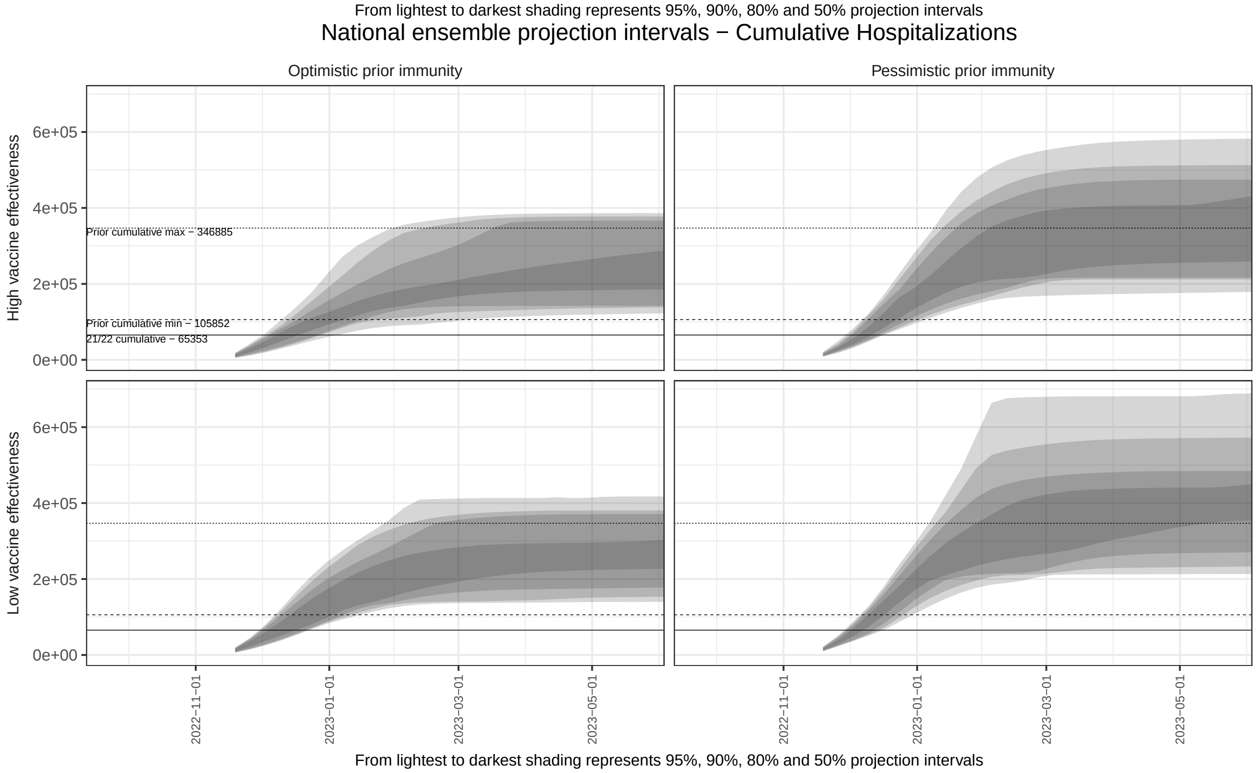
[1] Compiled by Sara Loo, Shaun Truelove, Cecile Viboud, Lucie Contamin.

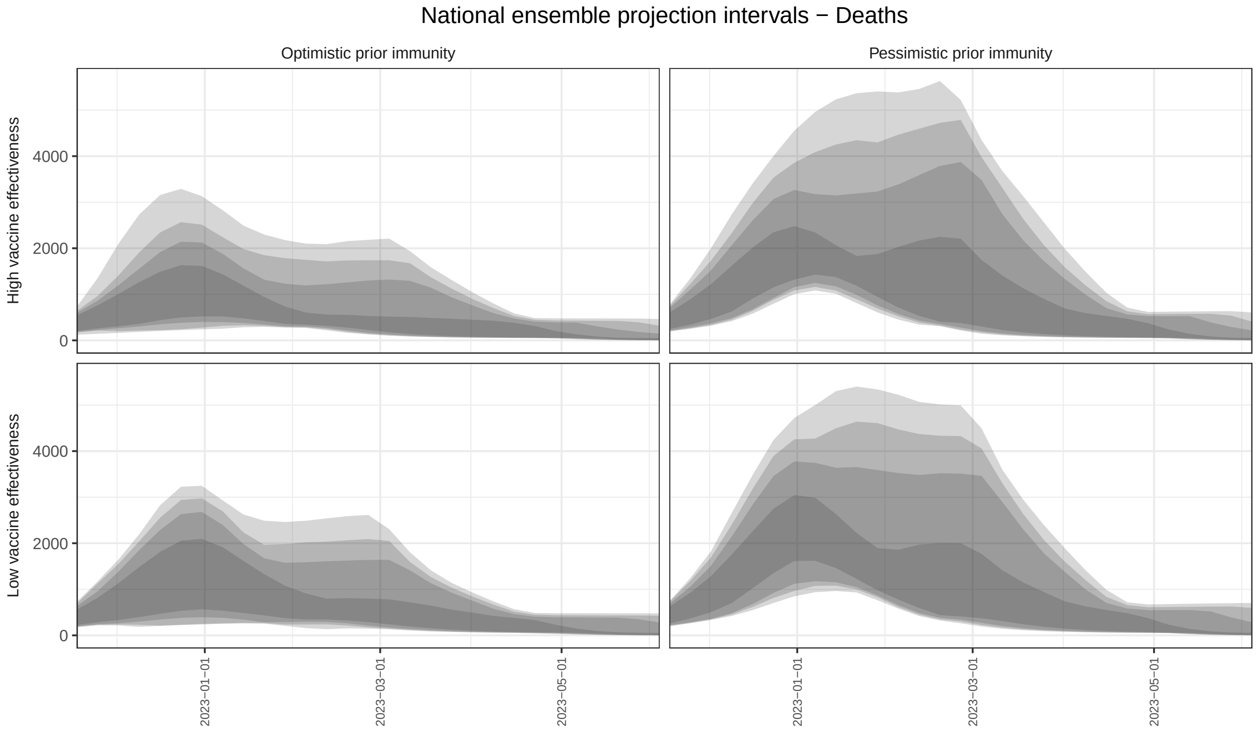
Round 2 Scenario Specifications

	Optimistic flu prior immunity No impact of missed flu seasons due to the COVID-19 pandemic on prior immunity.* ***Same amount of prior immunity as in a typical, pre-COVID19 pandemic prior season***	**Pessimistic flu prior immunity** Substantial impact of missed flu seasons due to the COVID-19 pandemic on prior immunity.* ***50% lower immunity than a typical, pre-COVID19 pandemic season***
High Vaccine Effectiveness ● VE = 50% against medically attended influenza illnesses and hospitalizations (comparable to 2015-16 season)	**Scenario A**	**Scenario B**
Low Vaccine Effectiveness ● VE = 30% against medically attended influenza illnesses and hospitalizations (comparable to 2018-19 season)	**Scenario C**	**Scenario D**

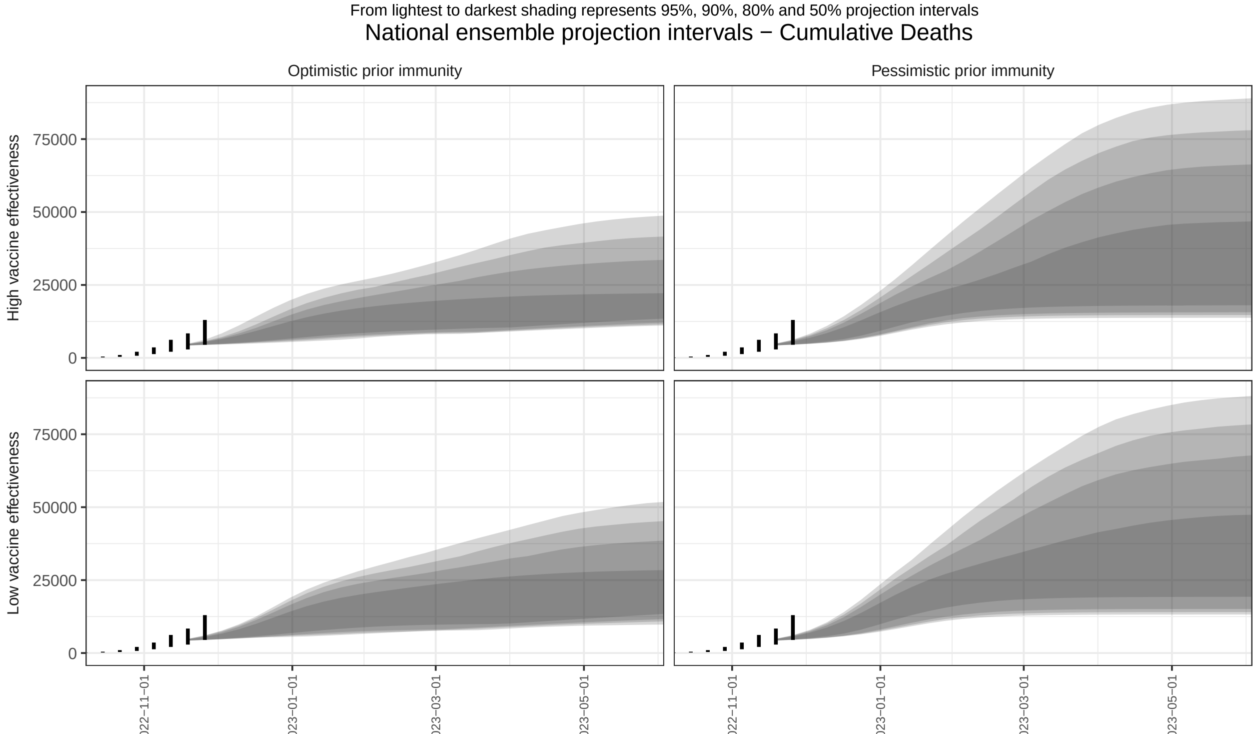
Ensemble projection intervals







From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals



From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals

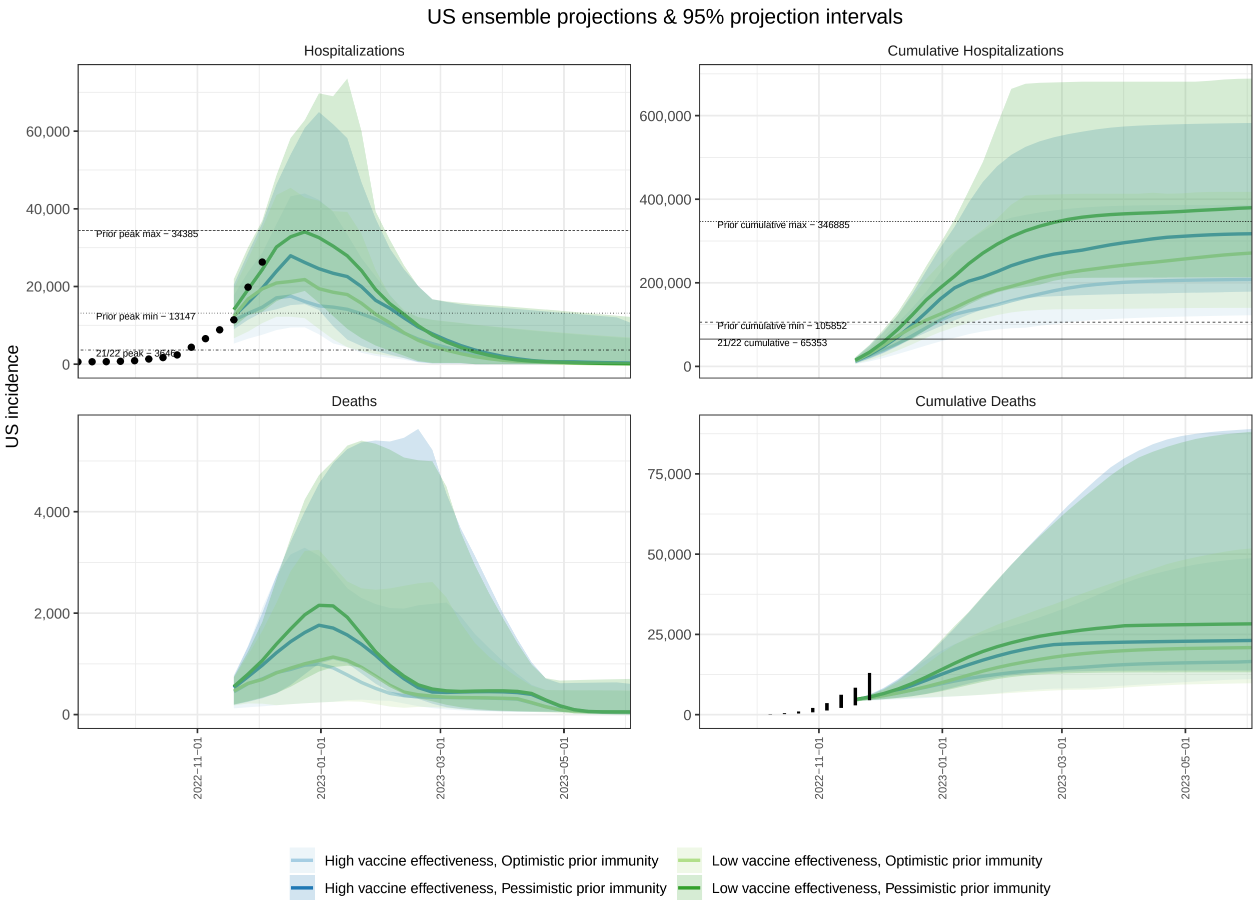
Horizontal lines are given for prior peak incident and cumulative hospitalizations, from seasons from 2012-13 to 2019-20. The minimum and maximum peaks across these seasons are taken from FluSurv-NET (which is used as a proxy for hospitalizations). Nationally, the highest value is from the 2017-18 season, and the lowest from 2015-16. The 2021-22 flu season based on HHS data is also included to mark a small season.

Cumulative death observations are visualized as vertical bars, and are based on in-season death estimates provided by the CDC multiplier approach, which takes into account in-hospital flu deaths reported to

FluSurv-NET, propensity to test for flu in the hospital, and risk of dying of flu outside of the hospital. Bars represent 95% uncertainty intervals. Cumulative estimates are shown since the start of the flu season on Oct 1, 2022.

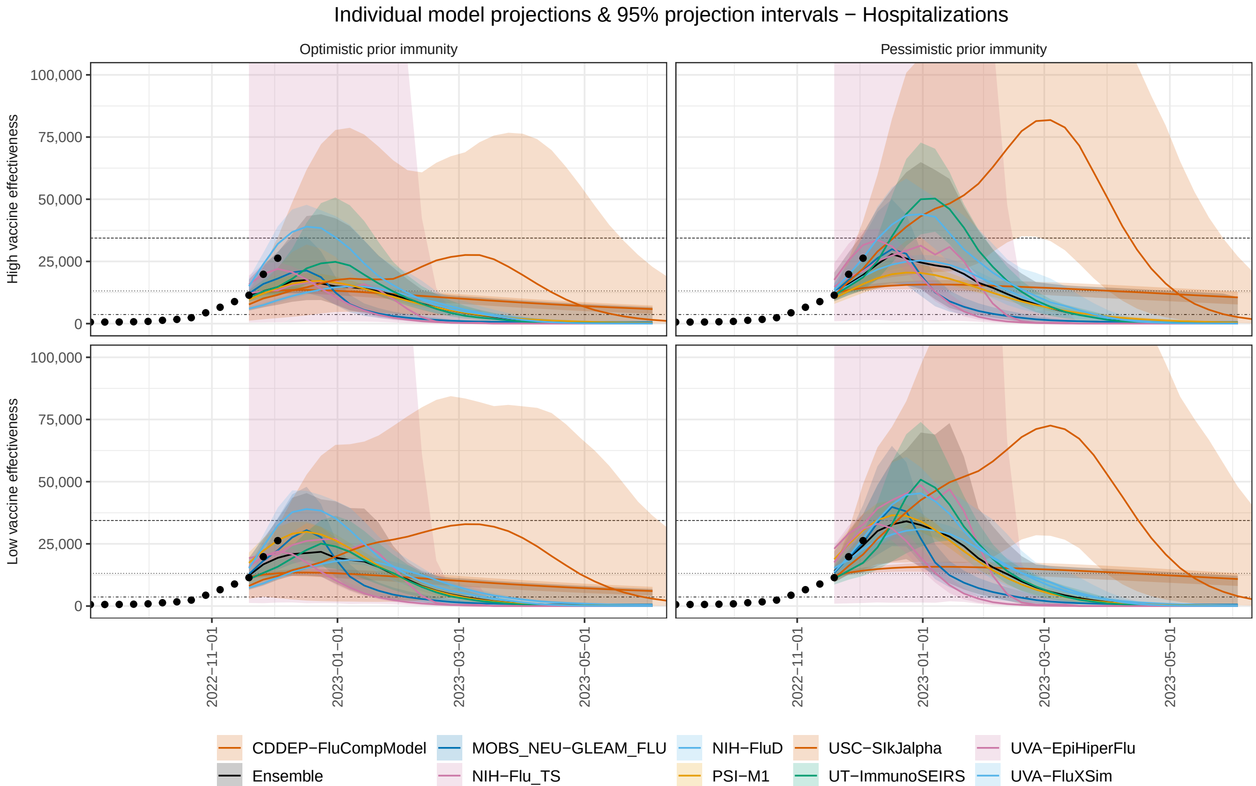
National ensemble projections

Ensemble projections for national incident and cumulative hospitalizations and deaths separated by scenario.

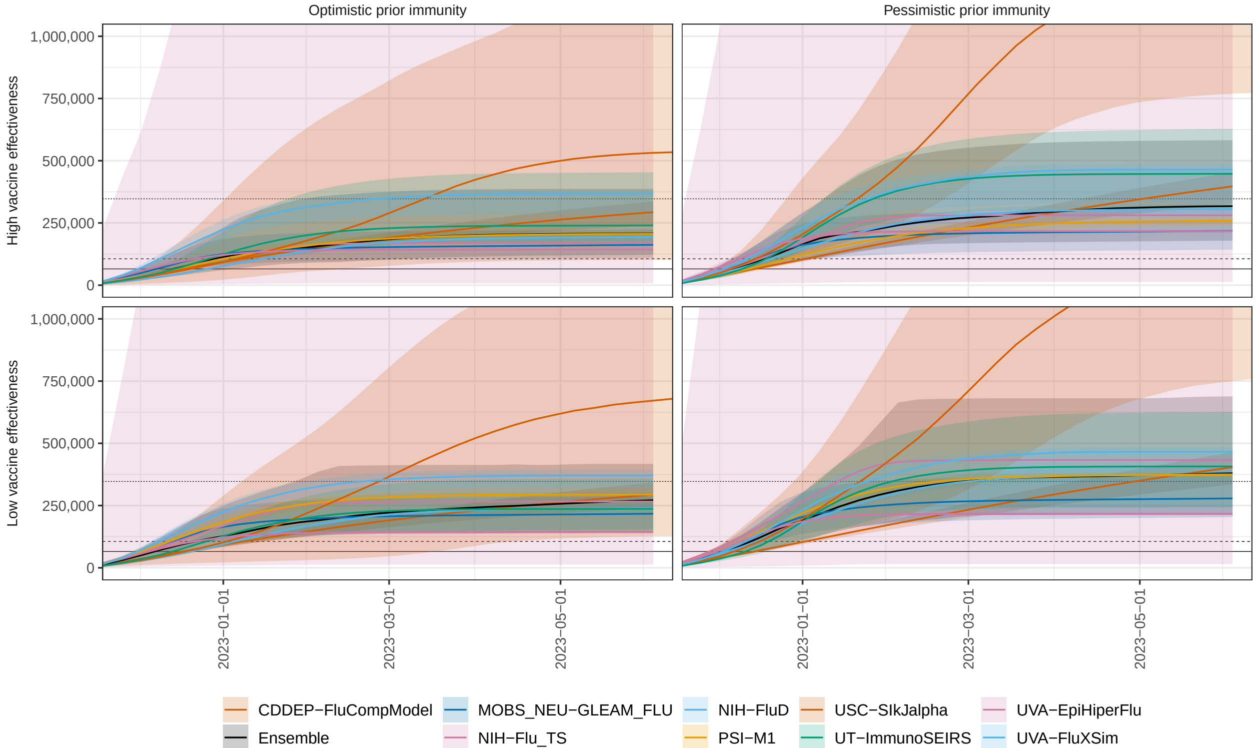


National individual model projections

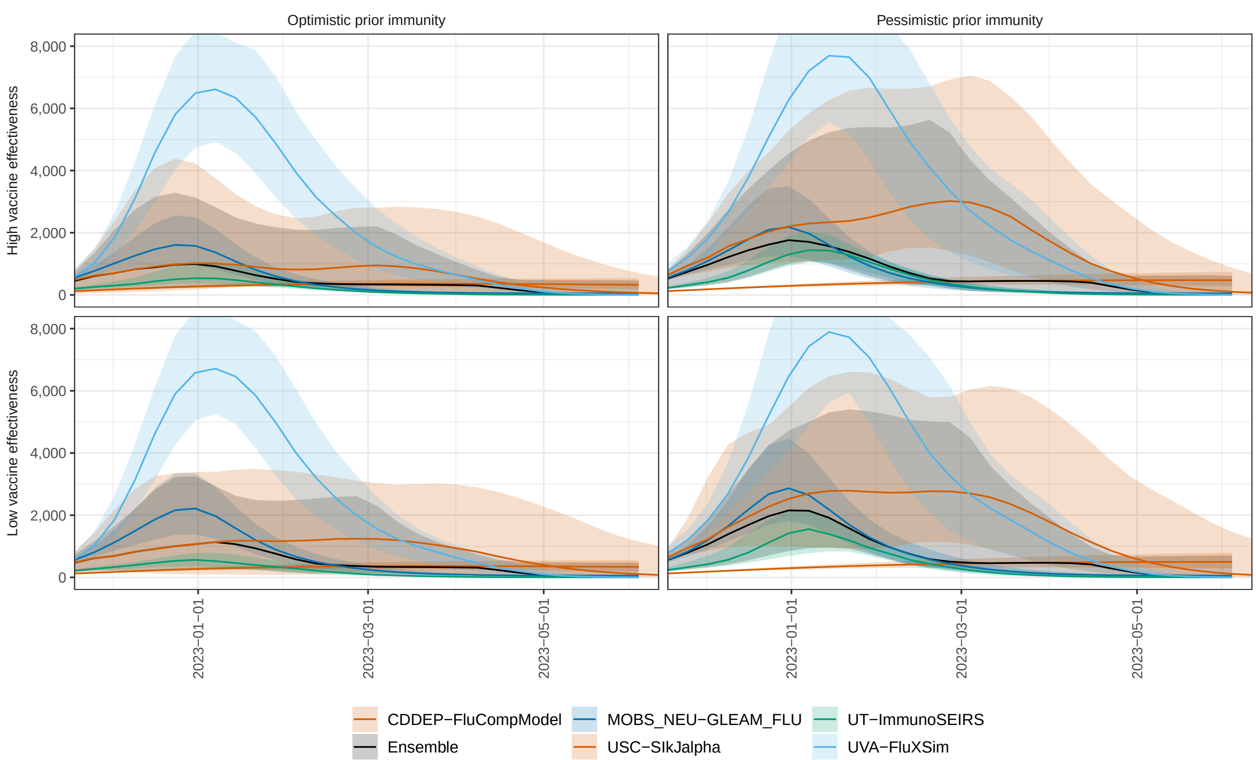
Individual model projections and ensemble by scenario for national hospitalizations, deaths and cumulative hospitalizations. For visualization we set axes limits; full confidence intervals are shown as a supplemental plot on page 17-18.

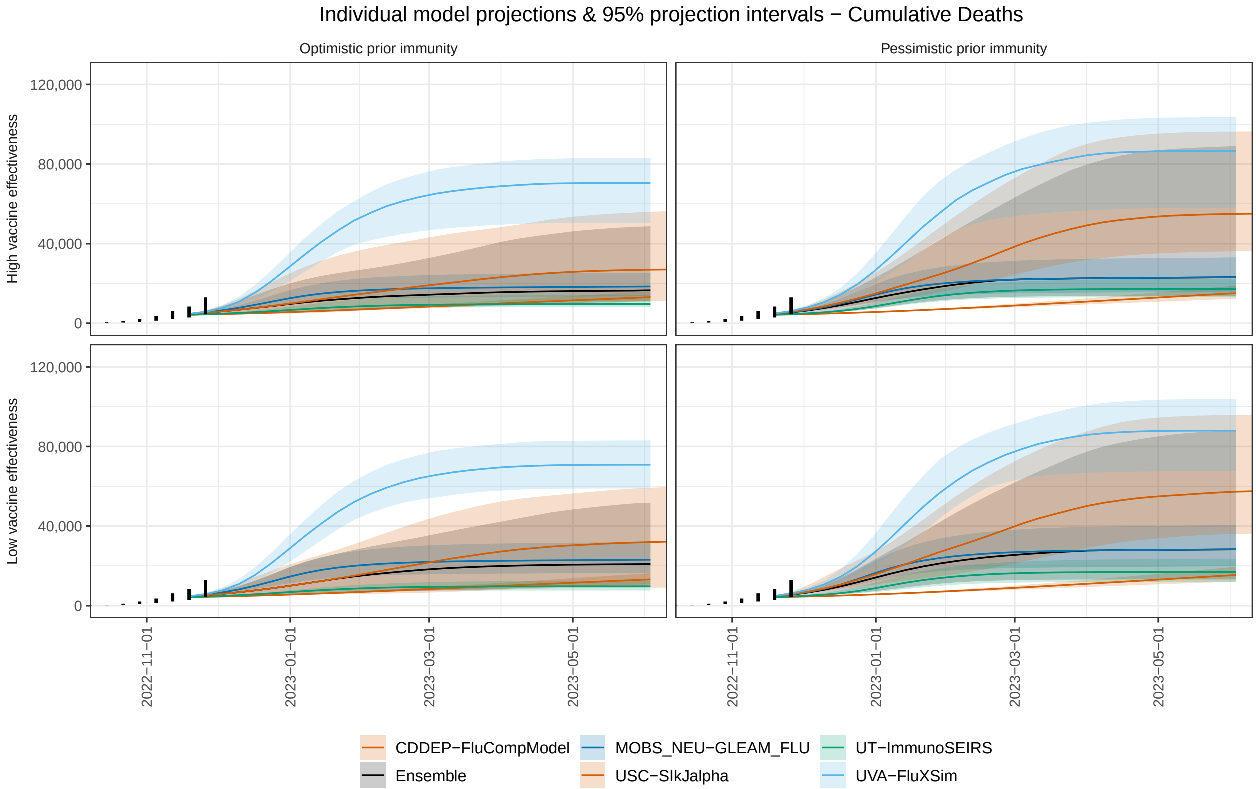


Individual model projections & 95% projection intervals − Cumulative Hospitalizations



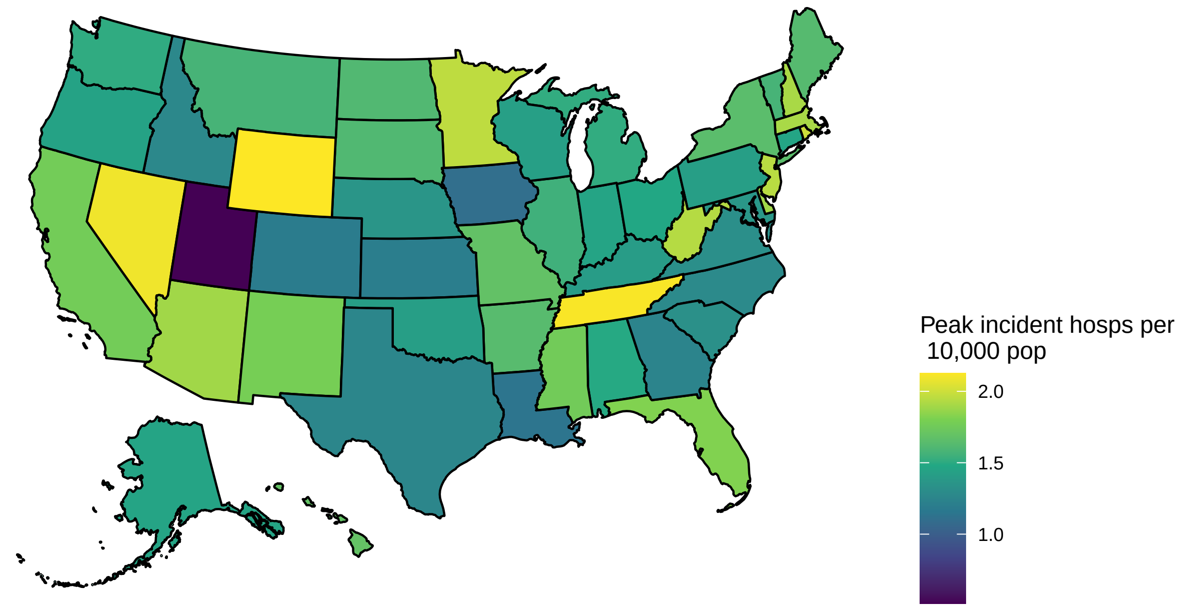
Individual model projections & 95% projection intervals − Deaths



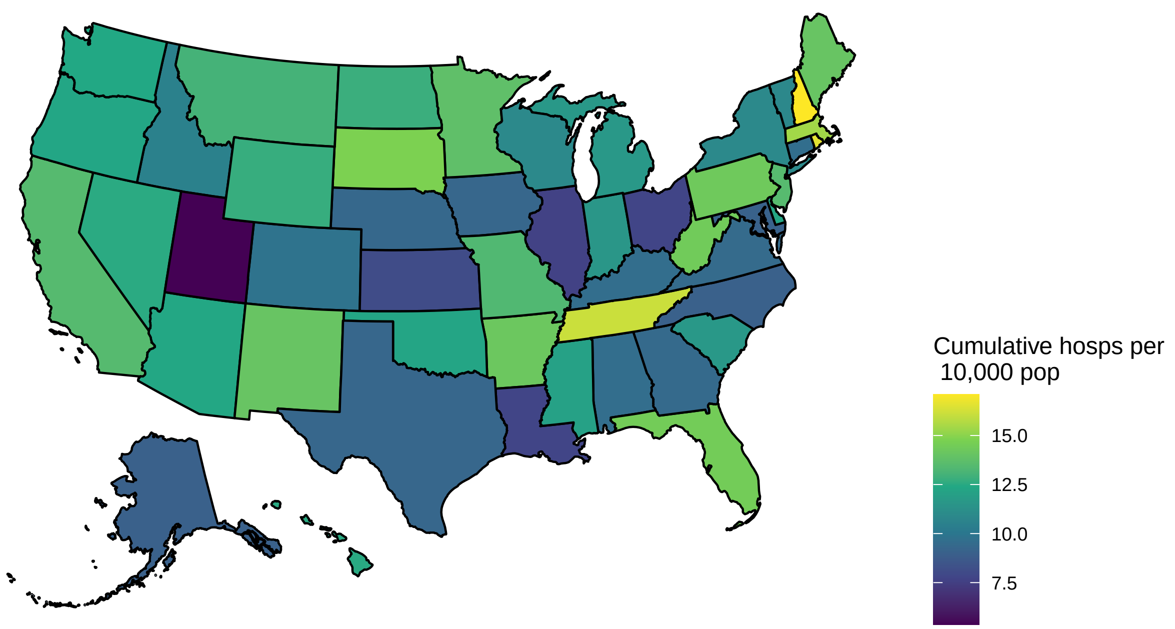

Individual model projections & 95% projection intervals − Cumulative Deaths
Optimistic prior immunity
Pessimistic prior immunity
High vaccine effectiveness
Low vaccine effectiveness
120,000
80,000
40,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
CDDEP−FluCompModel
Ensemble
MOBS_NEU−GLEAM_FLU
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−FluXSim

Risk maps

Peak incident reported hospitalizations per 10,000 population in scenario with low vaccination, and pessimistic immunity: November 13, 2022 to June 03, 2023

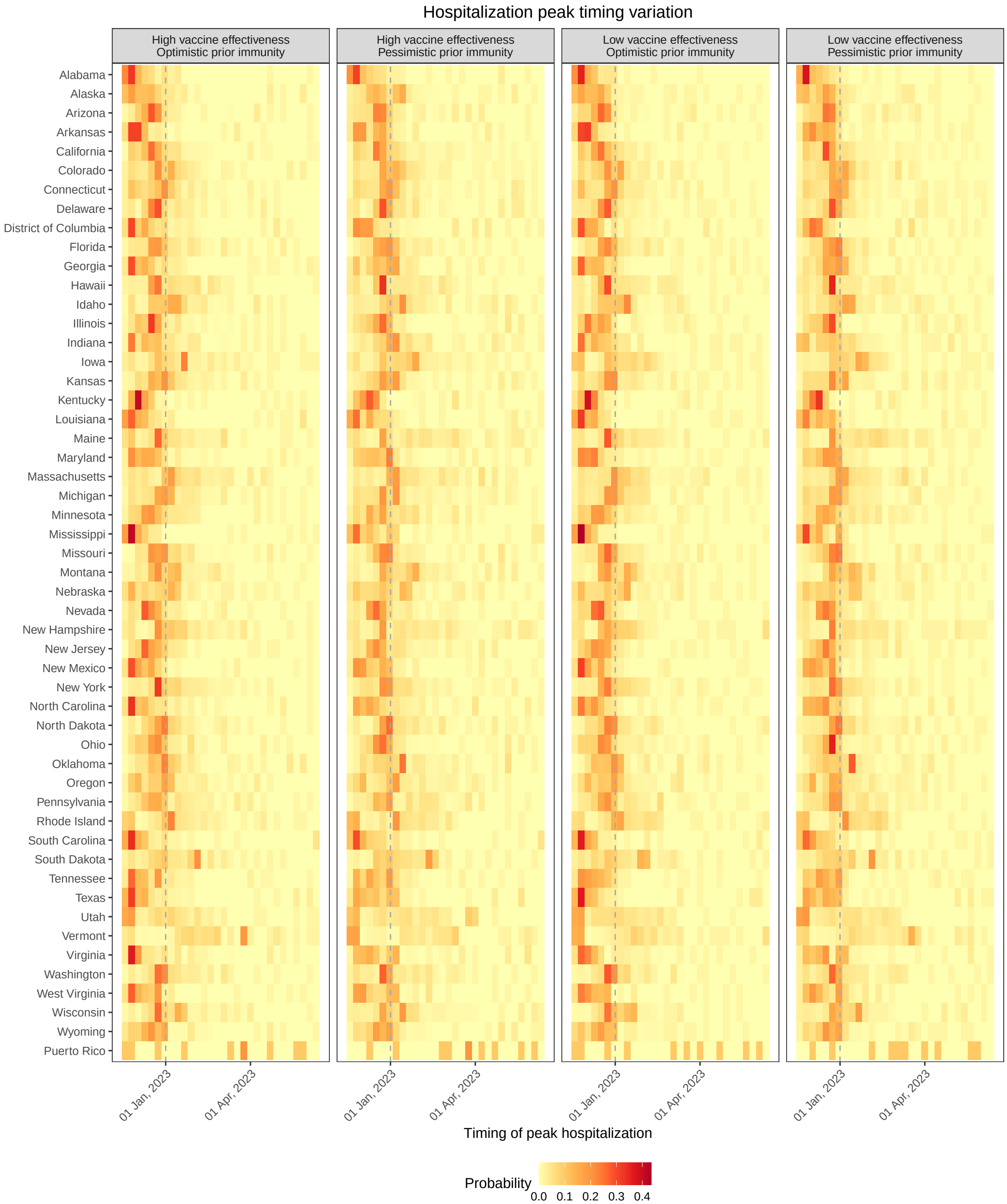


Cumulative reported hospitalizations per 10,000 population in scenario with low vaccination, and pessimistic immunity: November 13, 2022 to June 03, 2023



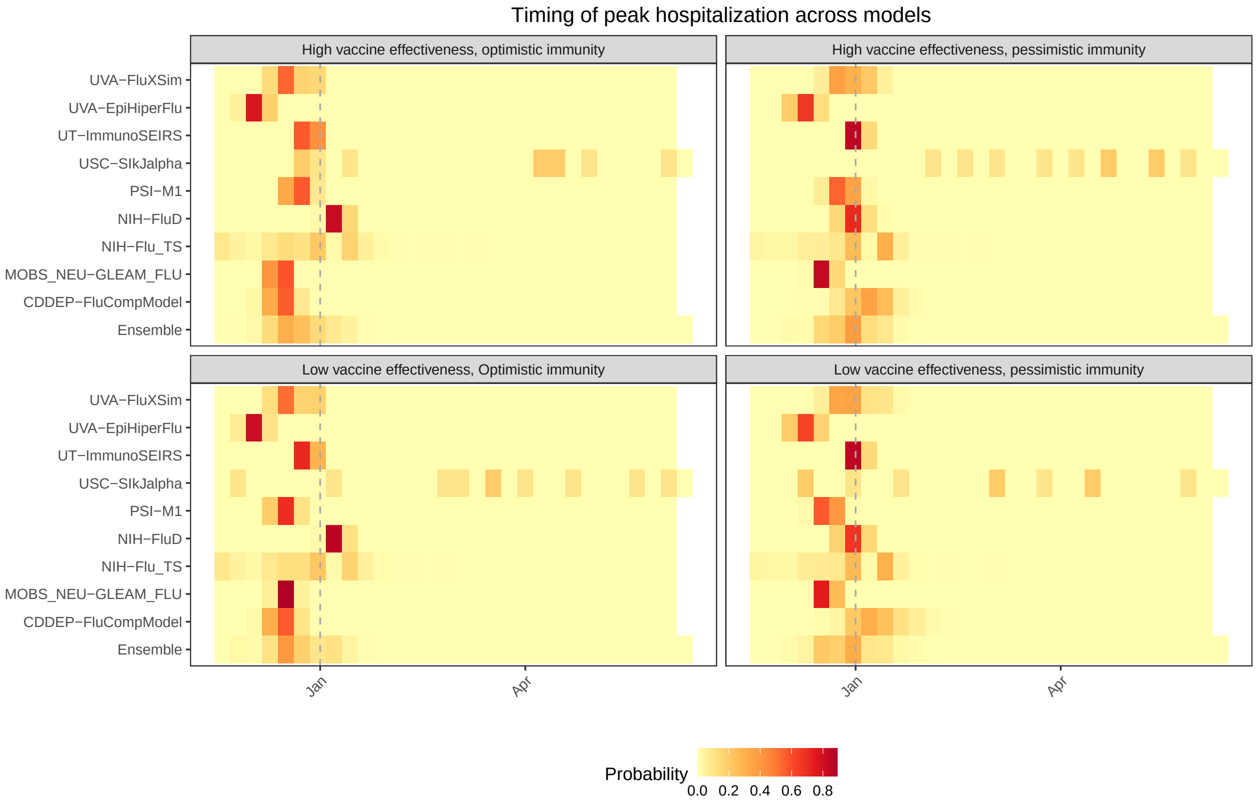
State variability in peak timing

Ensembles projections for state-level timing of peak hospitalization incidence.



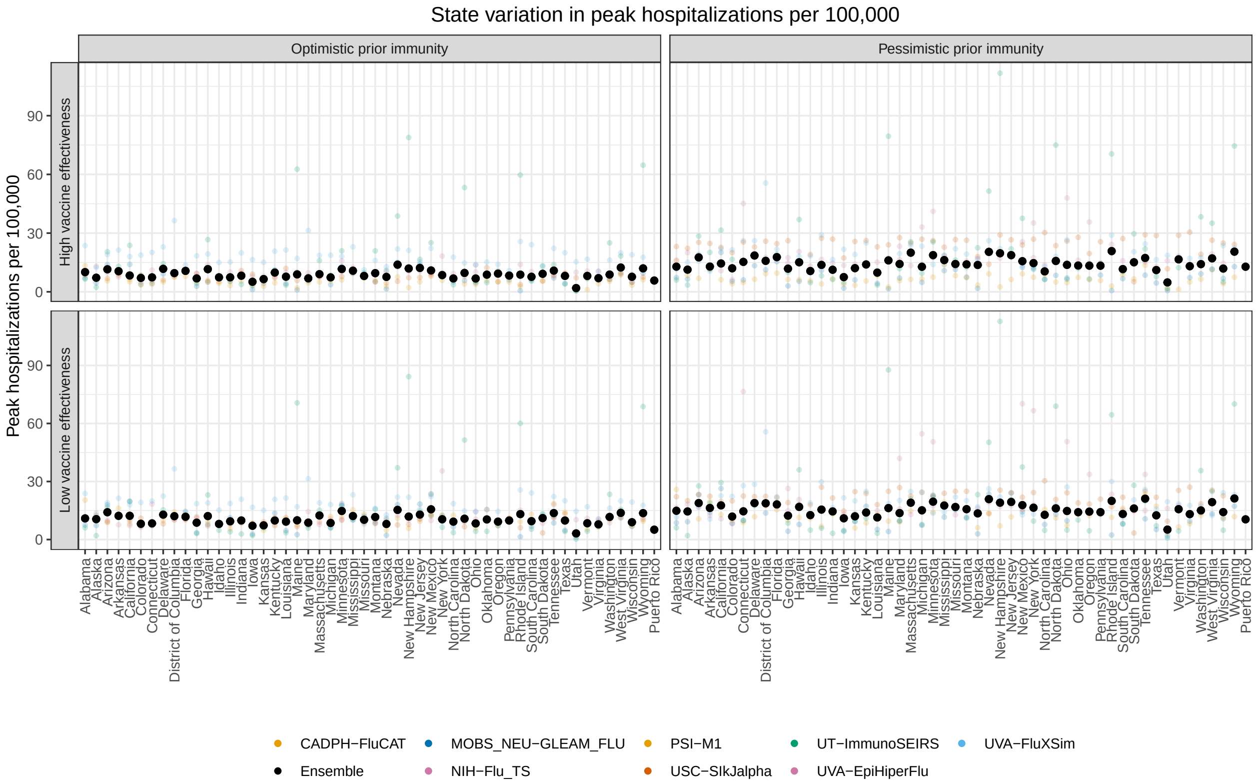
Peak hospitalizations timing

Individual model probabilities for national timing of peak hospitalizations.

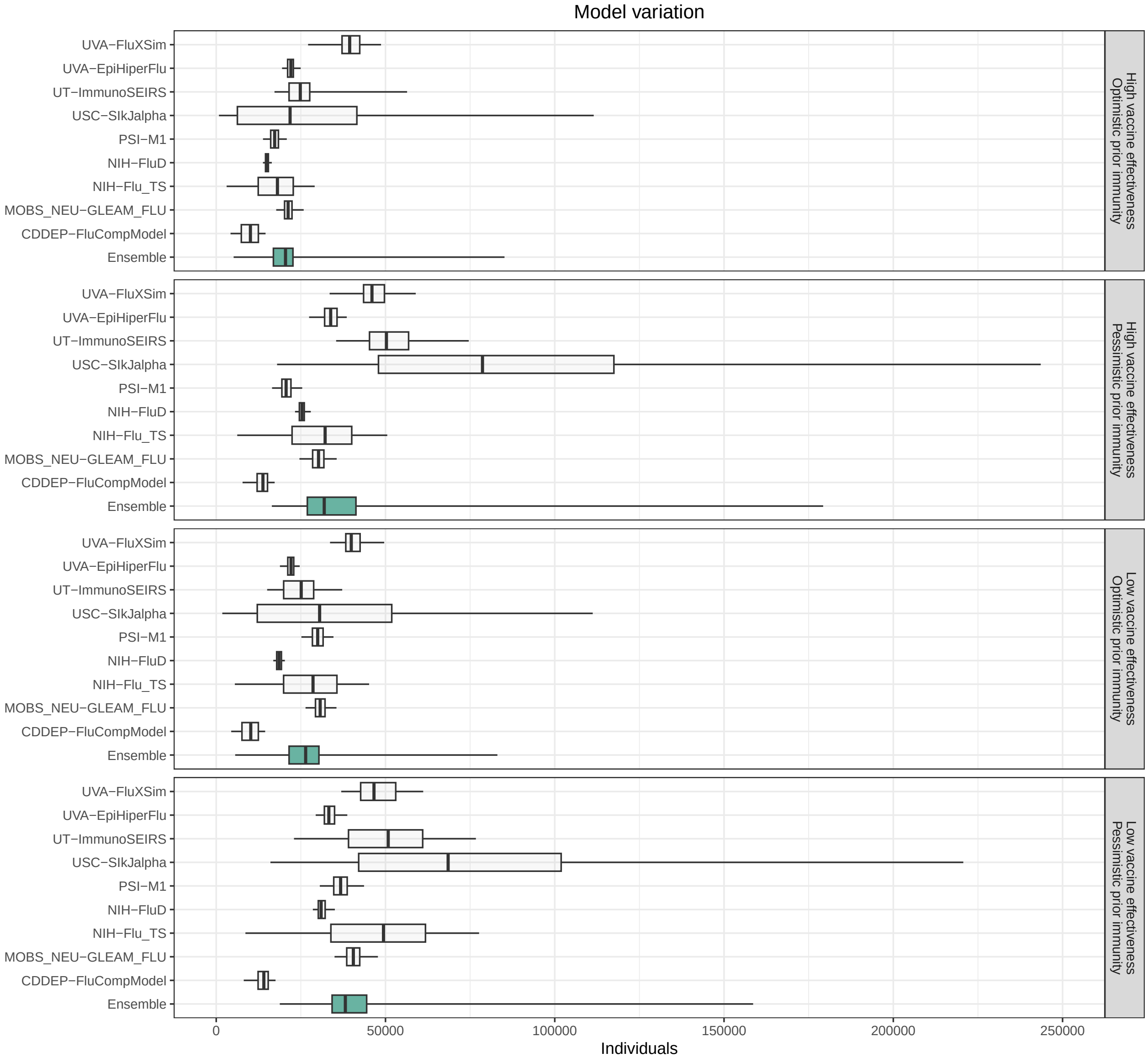


State-level deviation in hospitalization incidence

Individual model and ensembles projections for state-level peak hospitalization incidence.

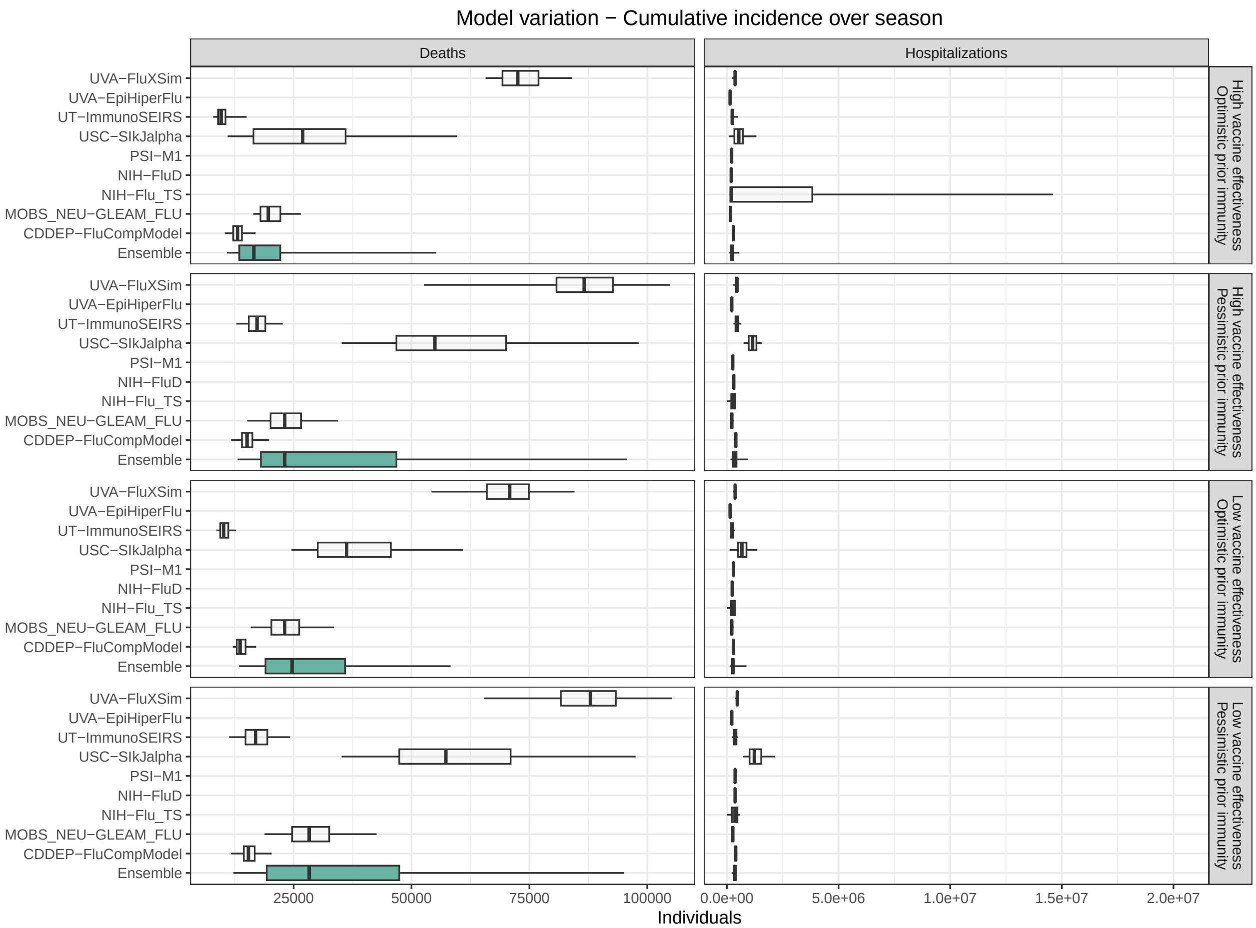


Model Variation in National Peak Size

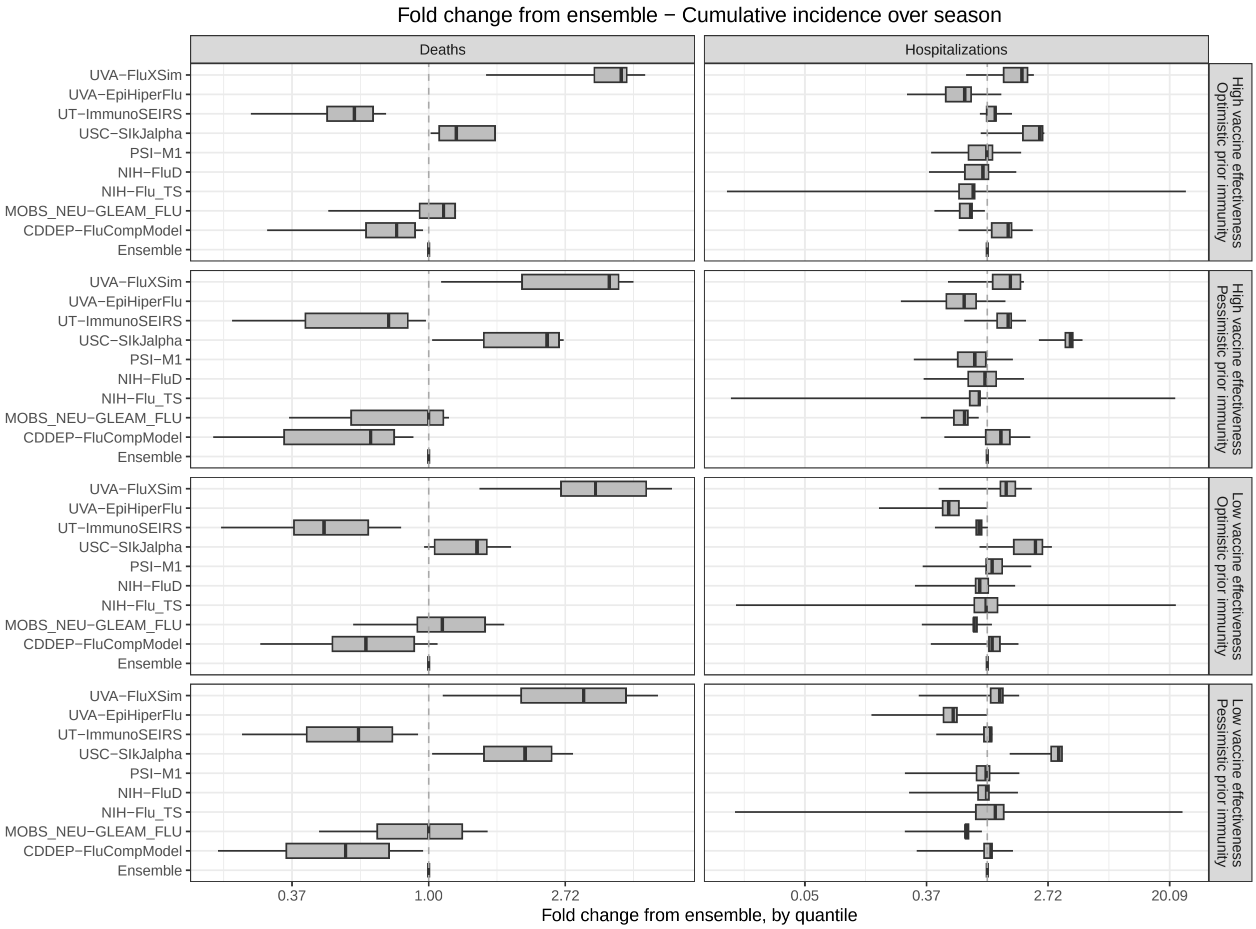


Outliers are removed from boxplots for visualization.

Cumulative incidence over season by model

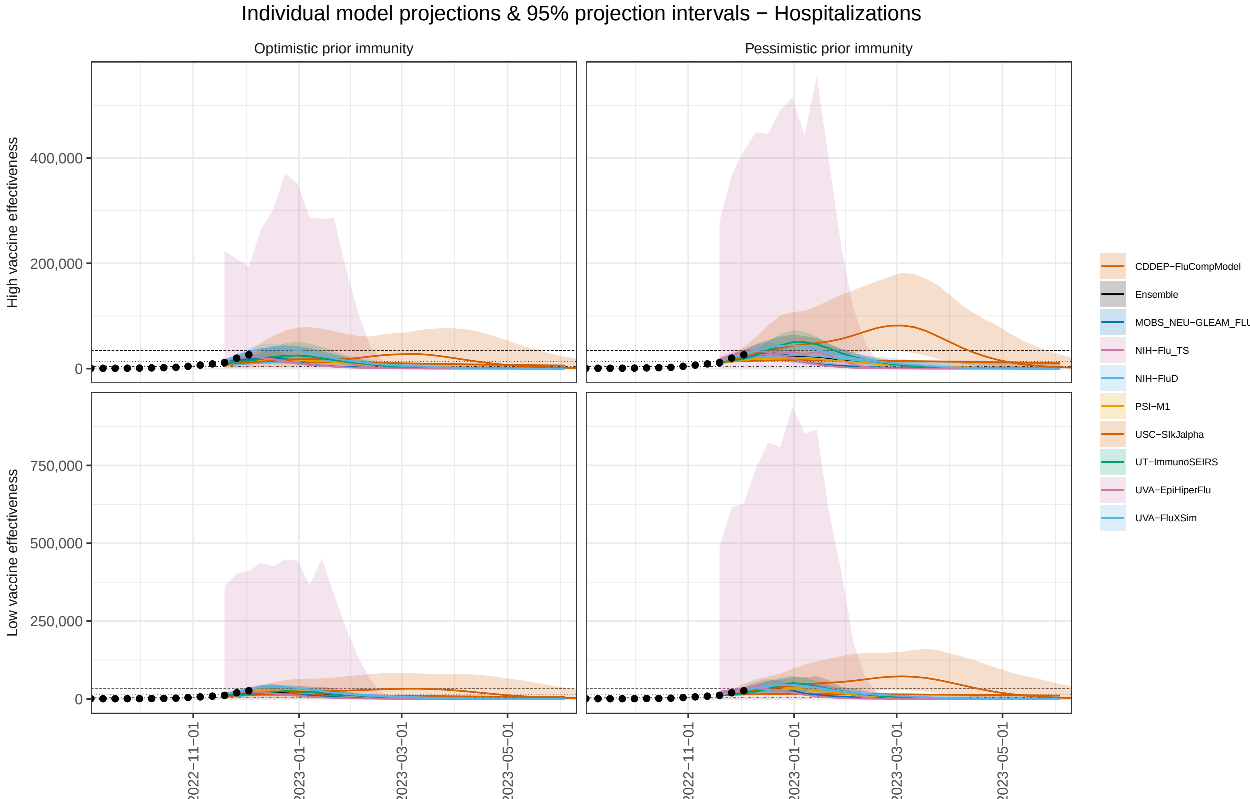


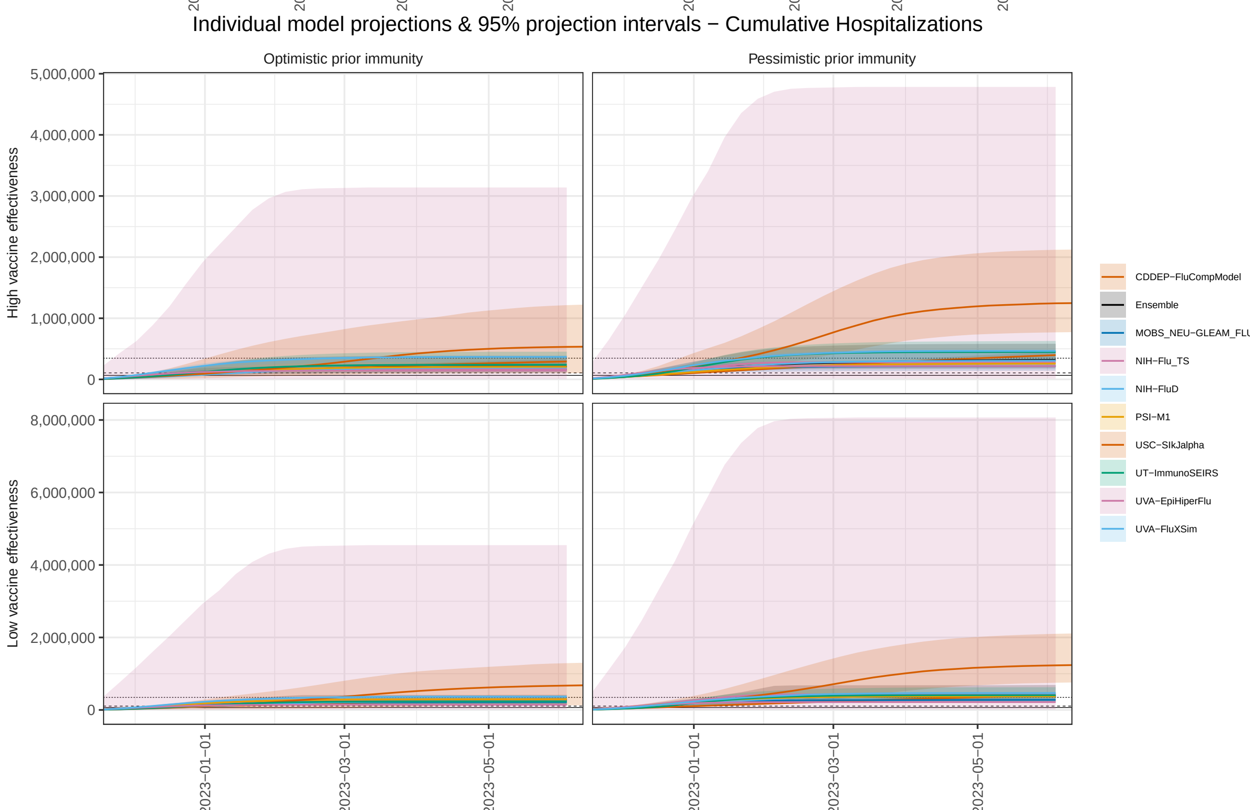
Difference between model and ensemble distributions

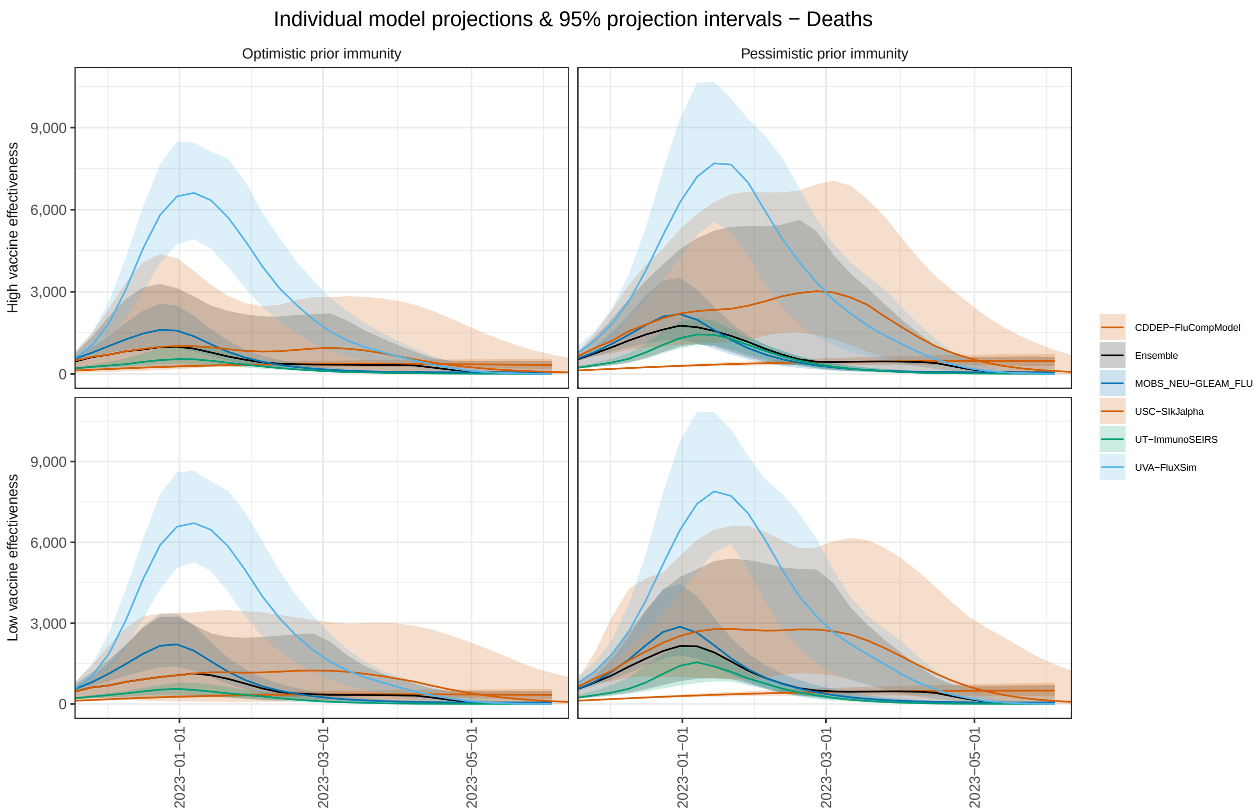


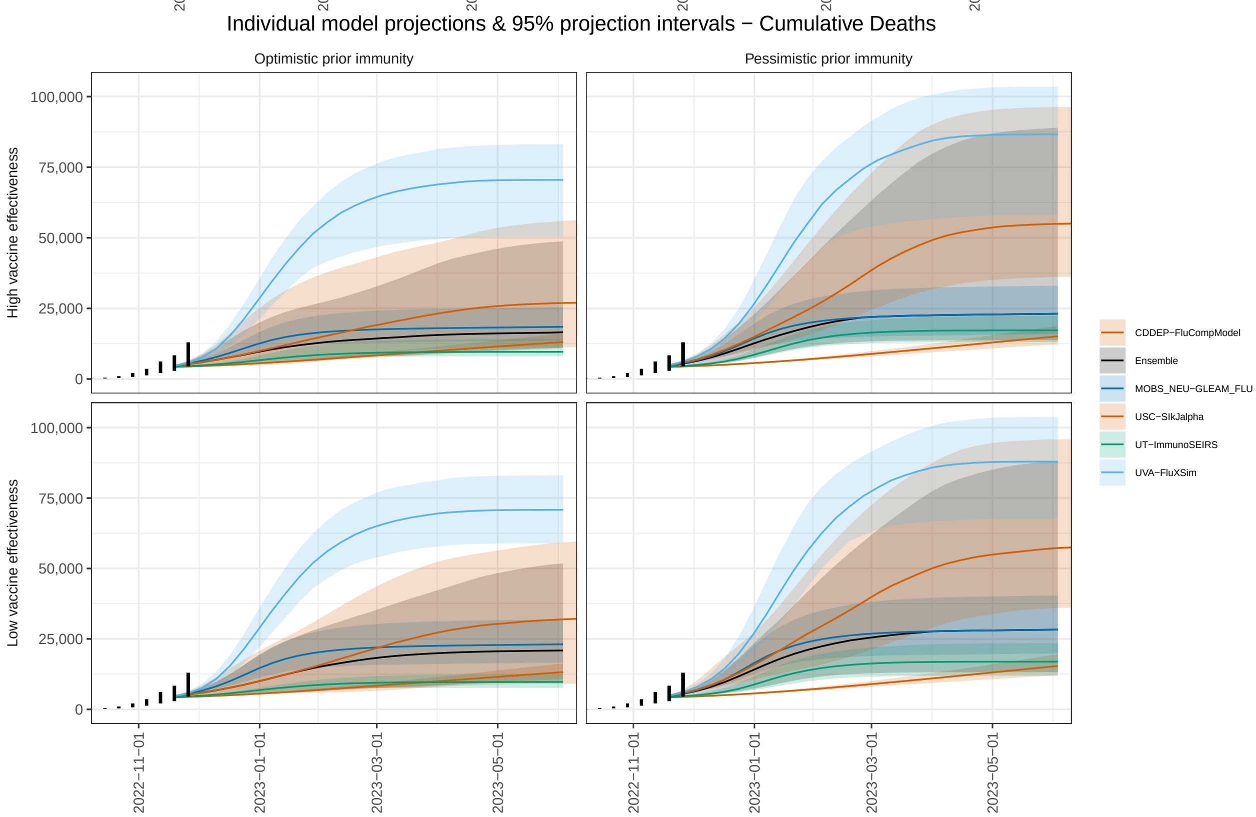
Supplemental Plots

National individual model projections - full confidence intervals



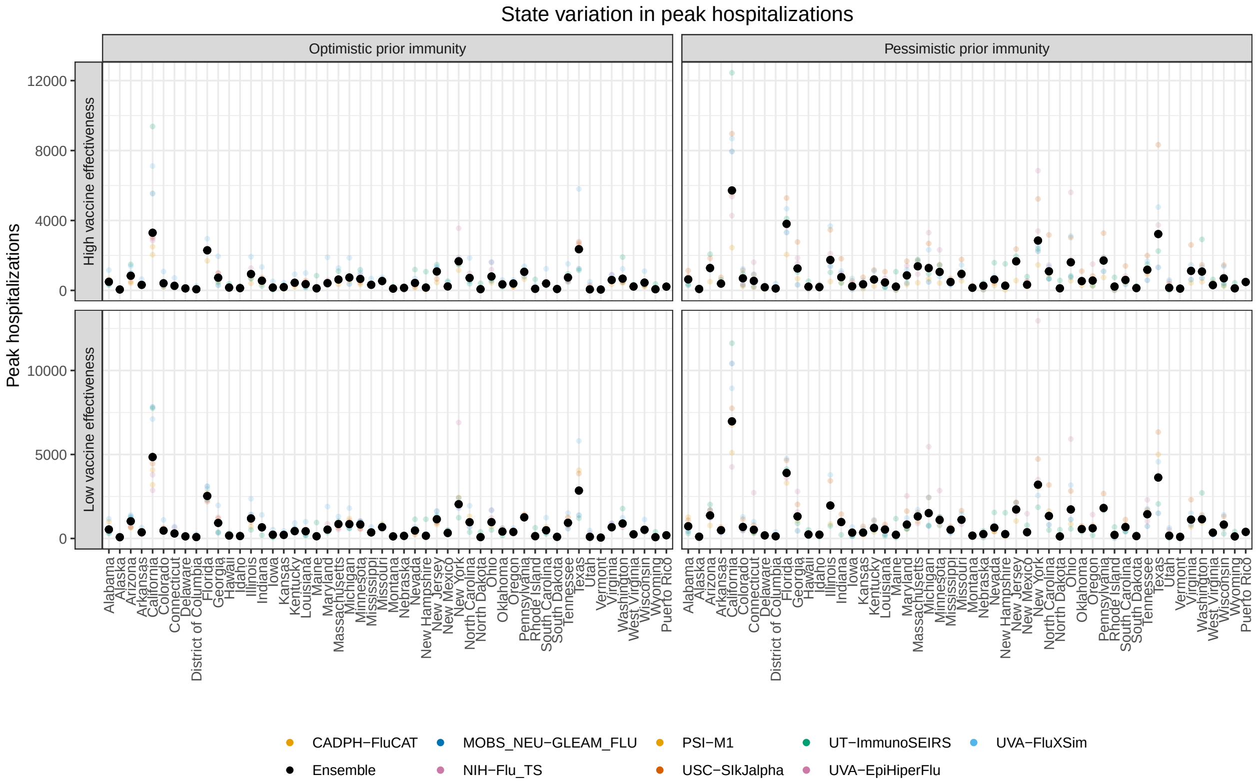




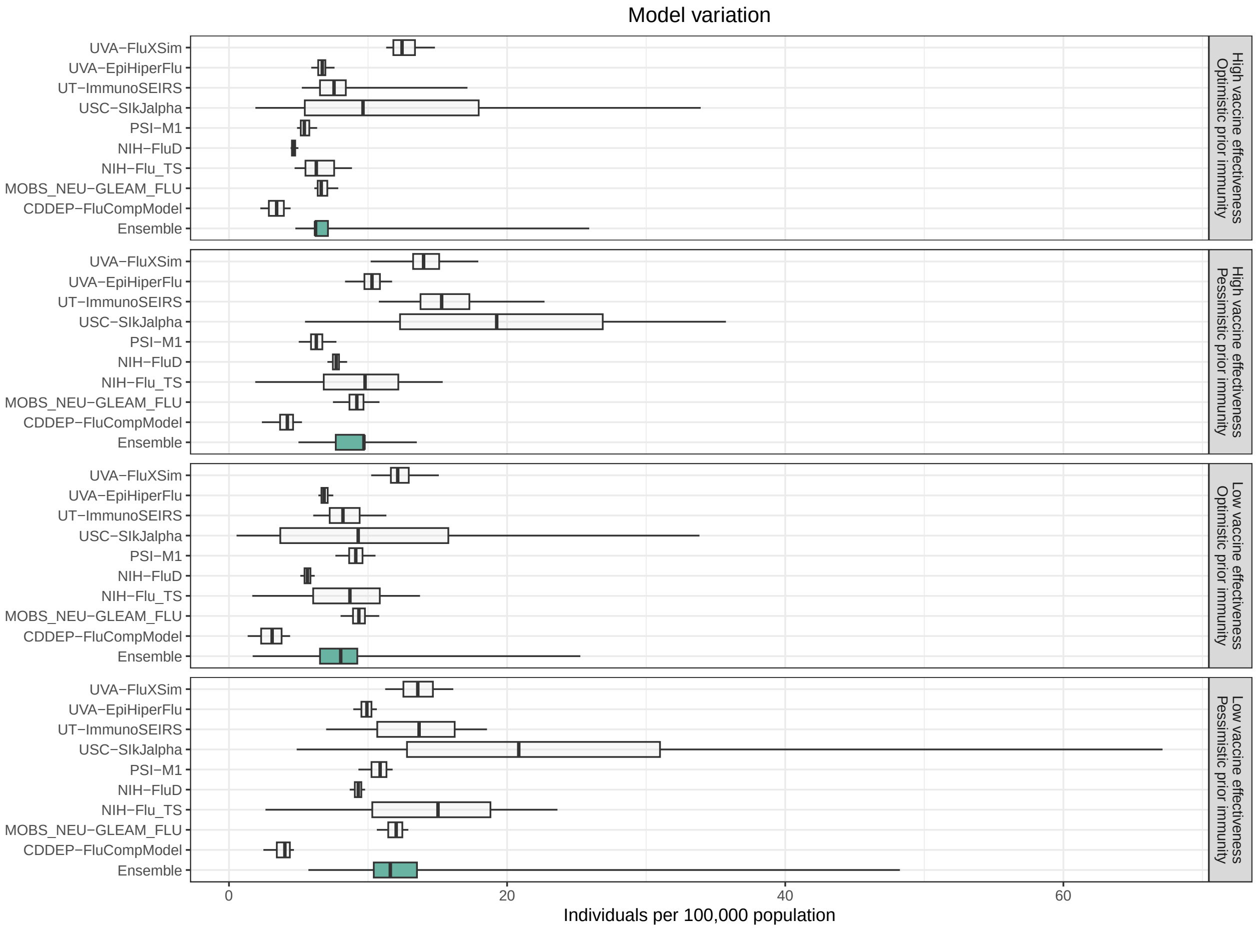


State-level deviation in hospitalization incidence

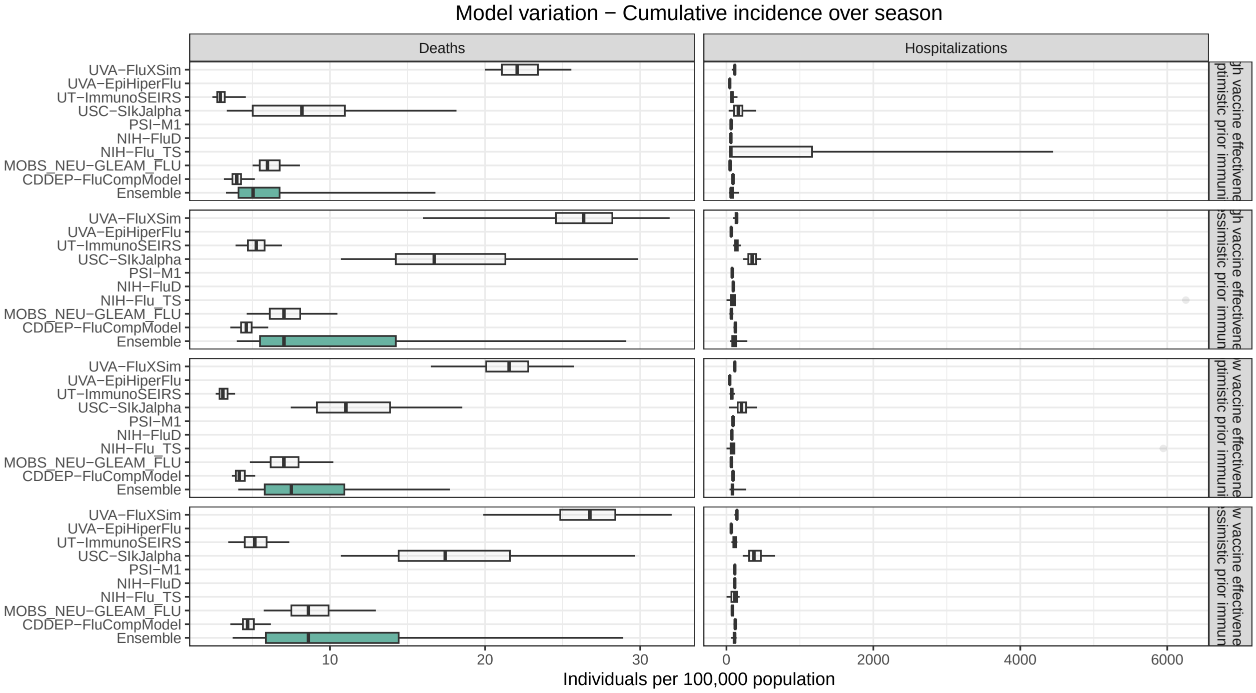
Individual model and ensembles projections for state-level peak hospitalization incidence.


State variation in peak hospitalizations
Optimistic prior immunity
Pessimistic prior immunity
High vaccine effectiveness
Low vaccine effectiveness
Peak hospitalizations
CADPH−FluCAT
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

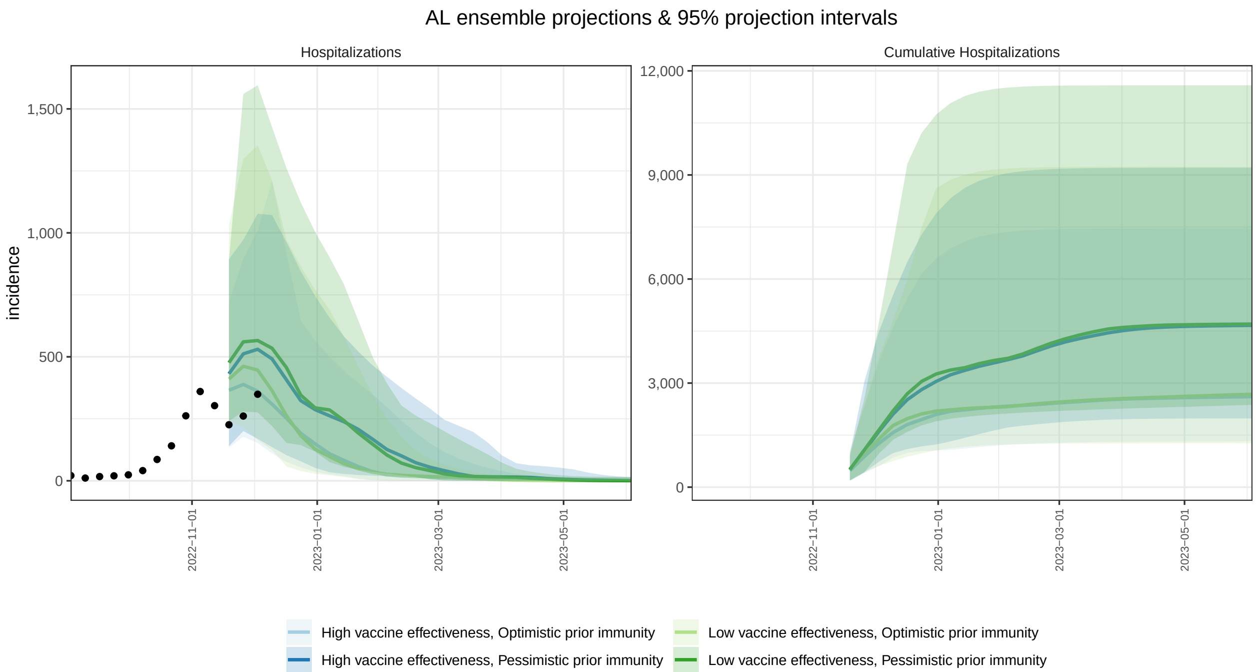
Model Variation in National Peak Size - rates per 100,000 population

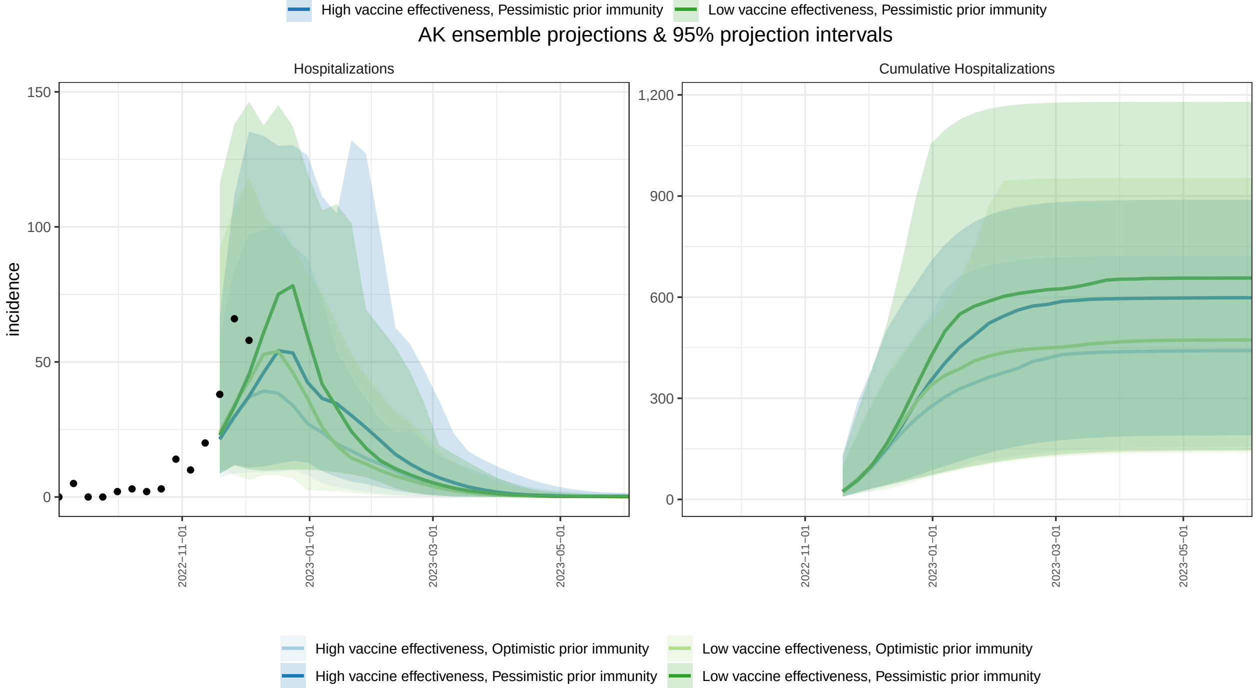


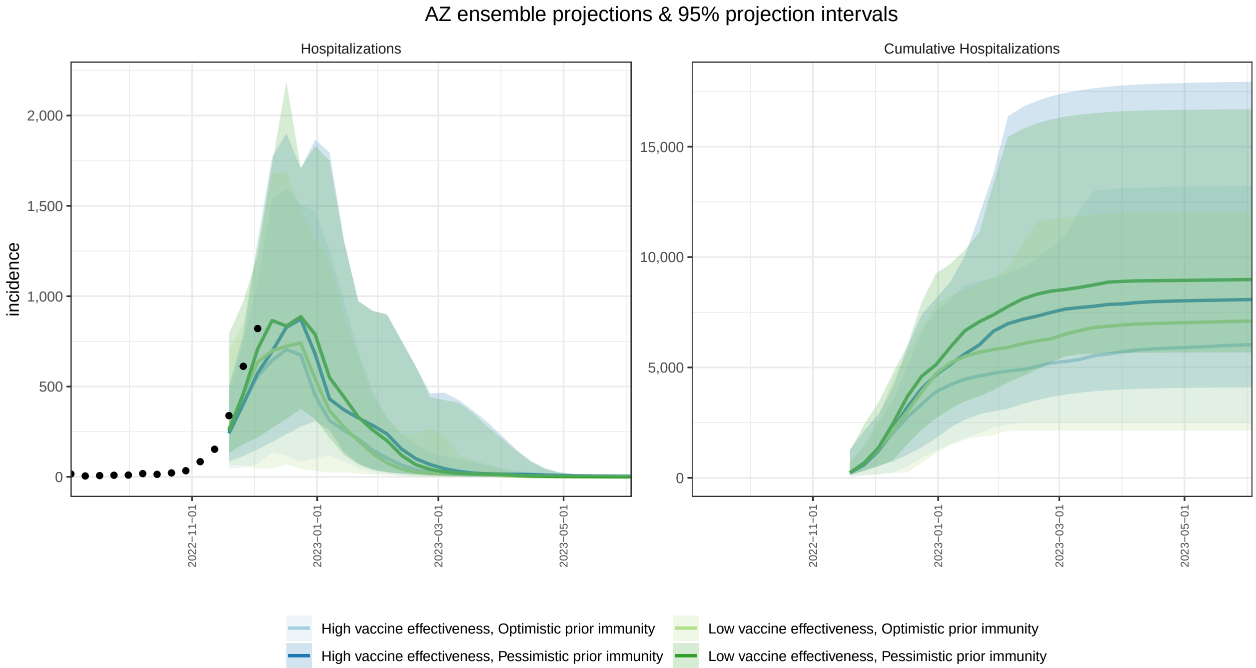
Cumulative incidence over season - rates per 100,000 population



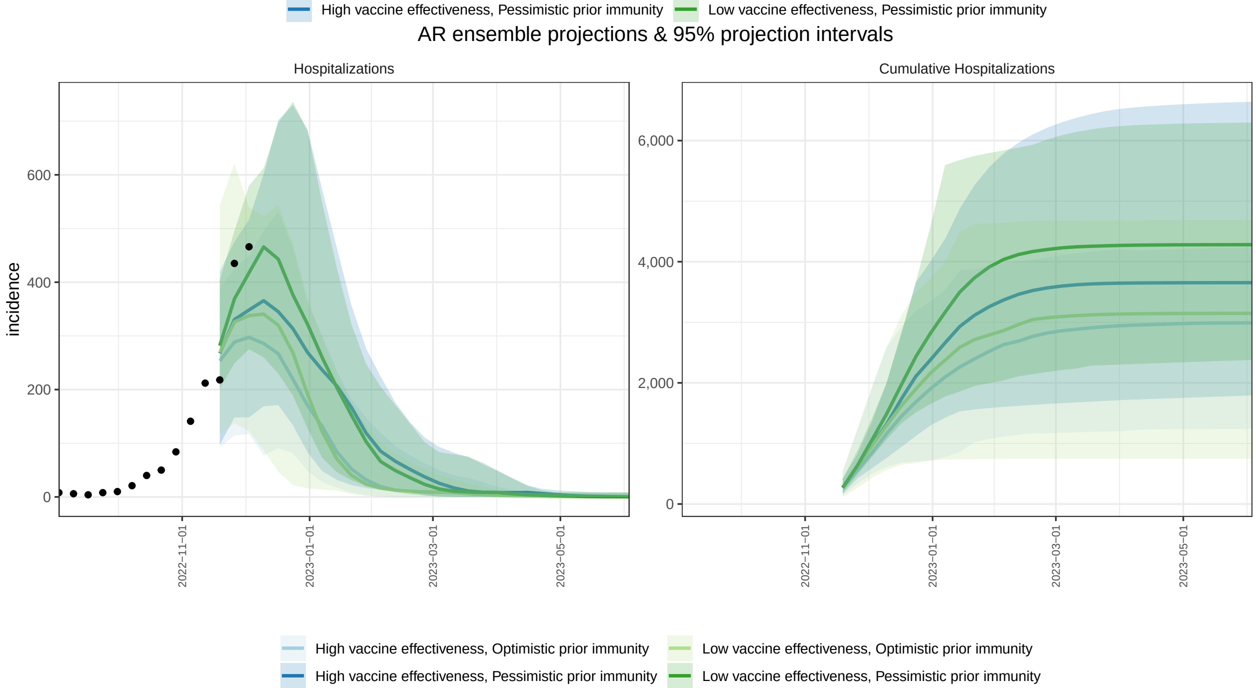
State-level ensemble plots



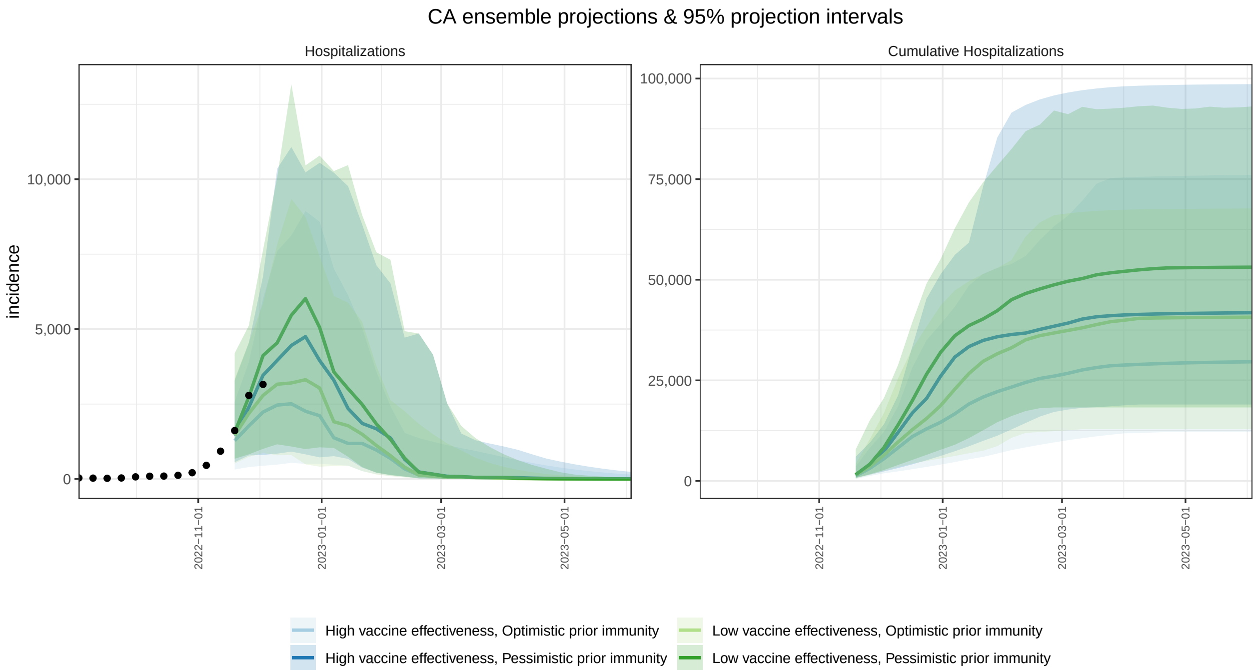


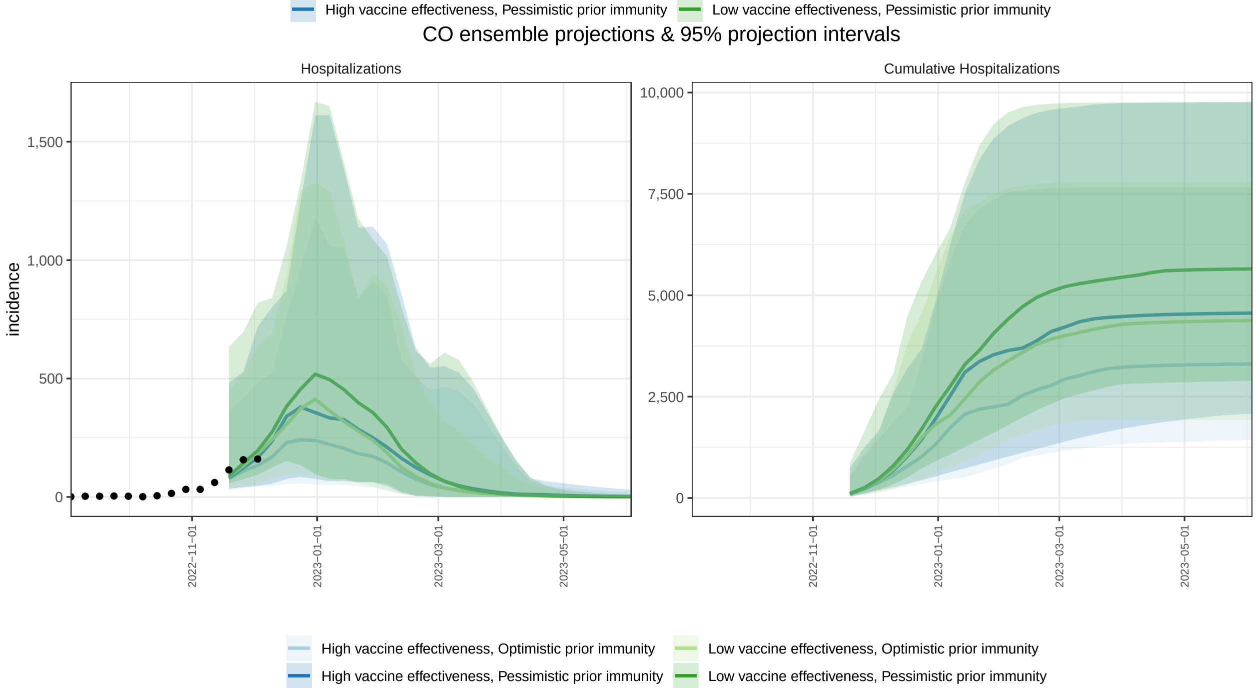


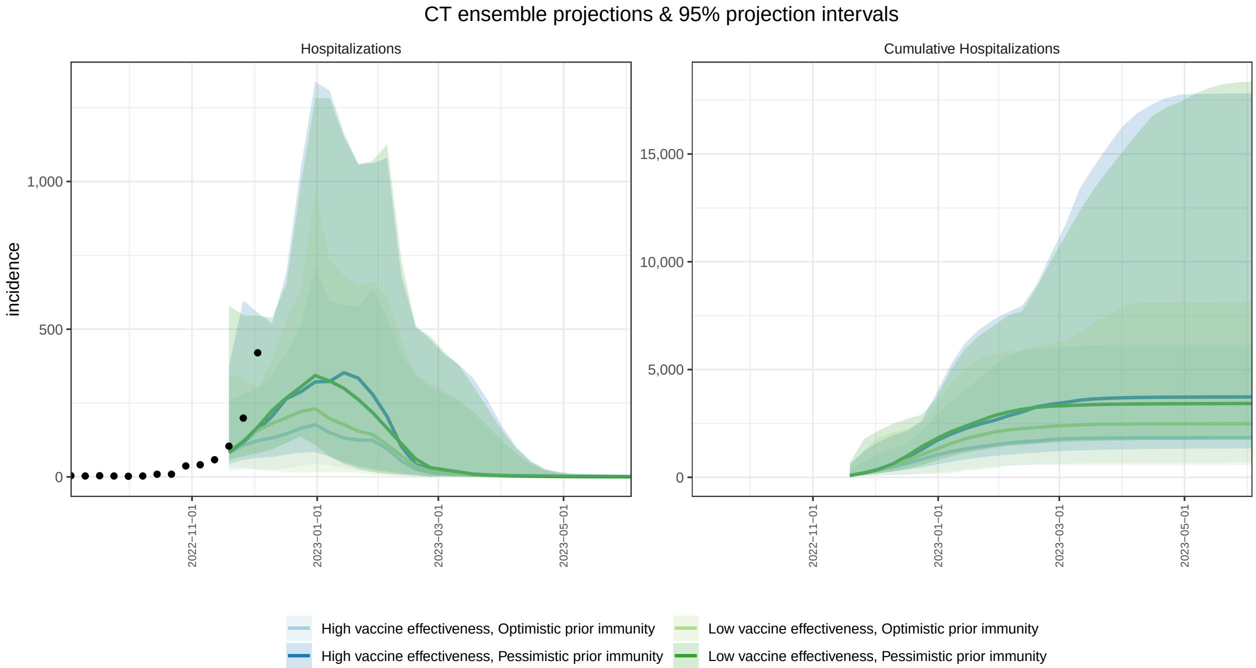
AZ ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
2,000
1,500
1,000
500
0
15,000
10,000
5,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

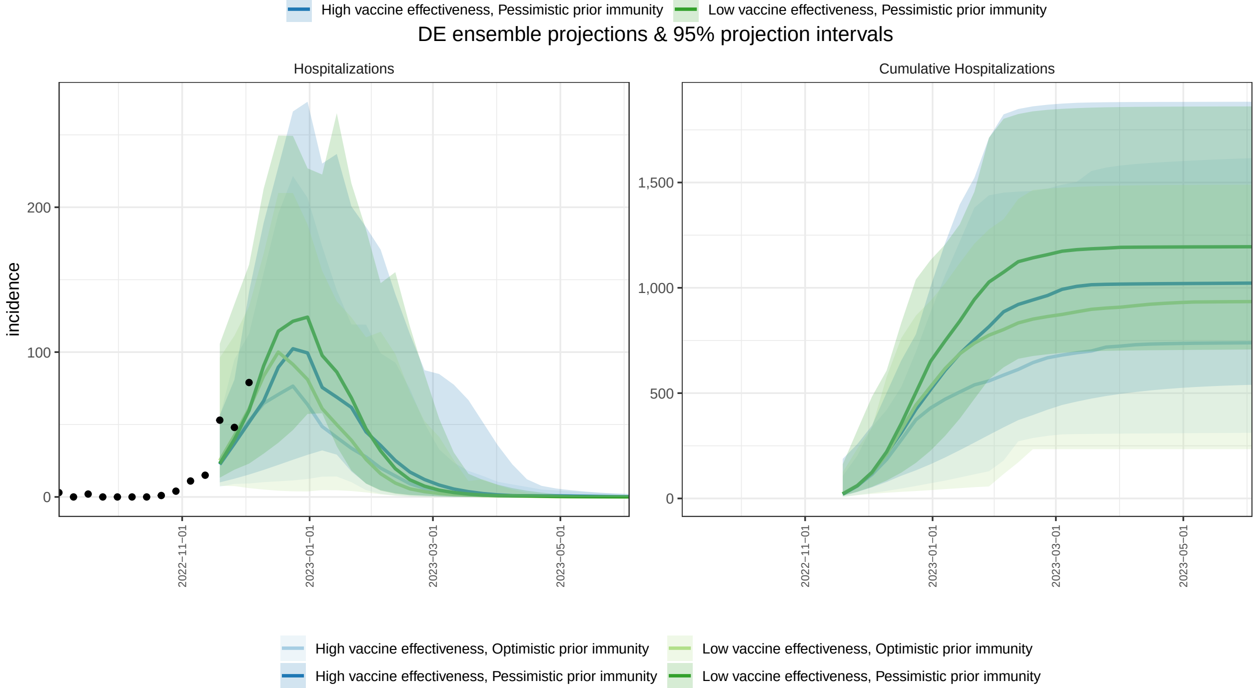


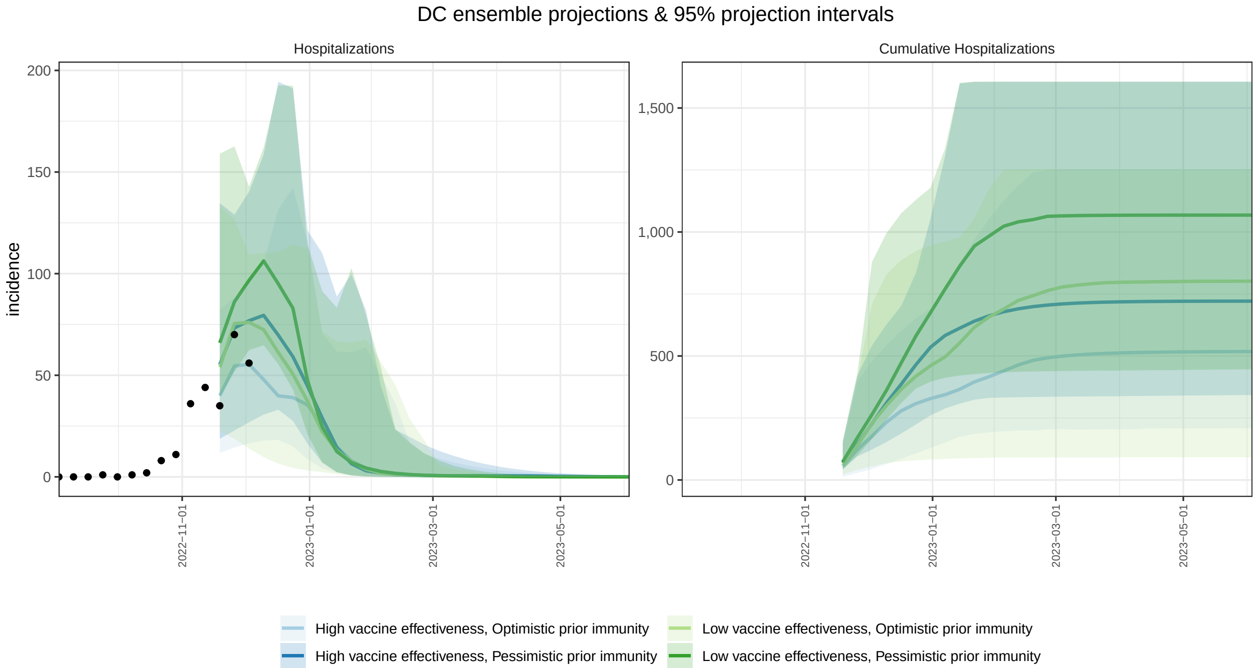
AR ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
600
400
200
0
6,000
4,000
2,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

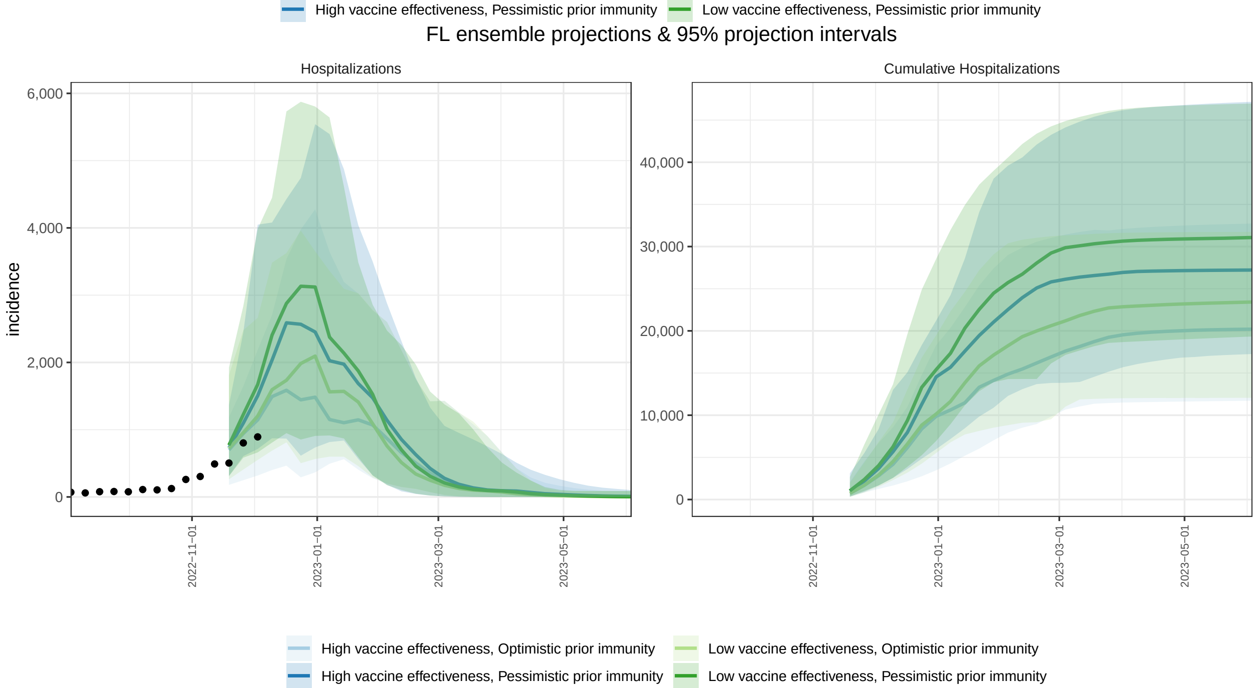

CA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
5,000
10,000
25,000
50,000
75,000
100,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

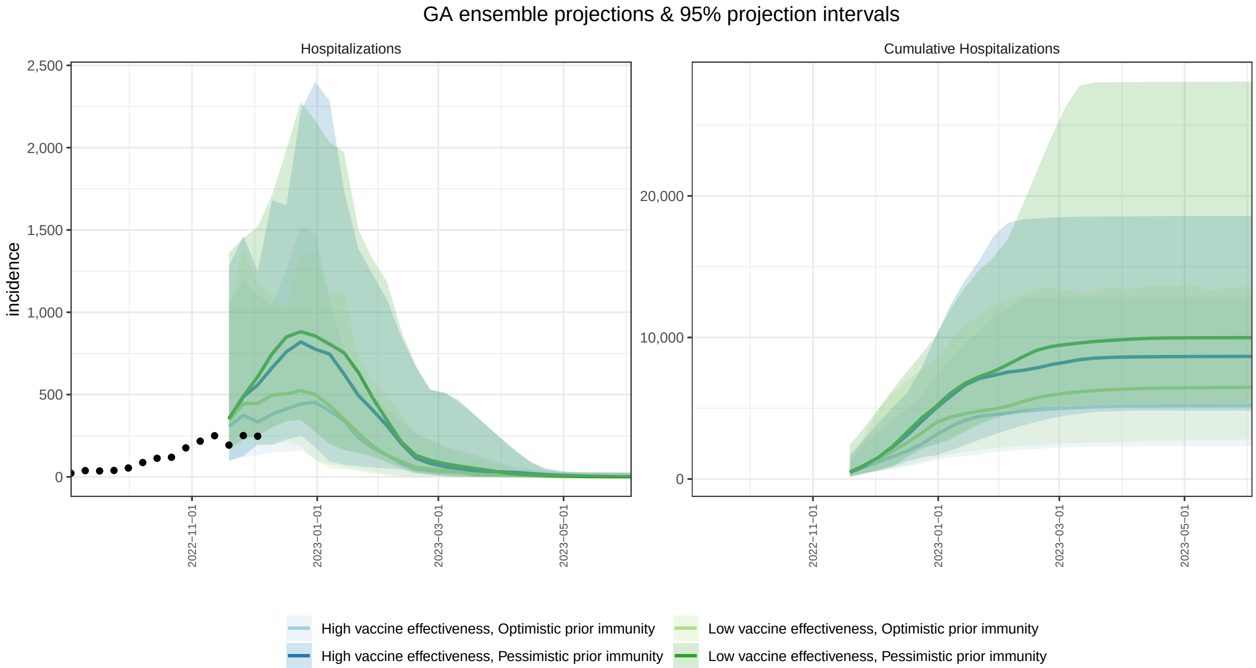

CO ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
2,500
5,000
7,500
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

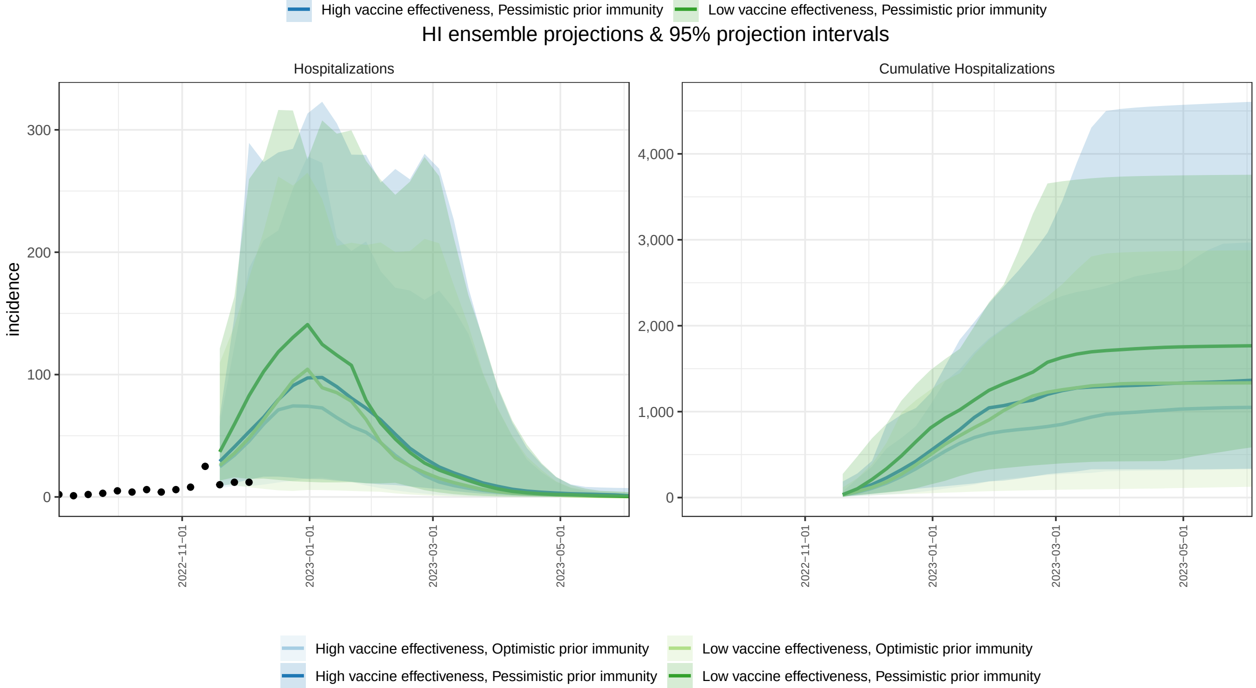

CT ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
1,000
500
0
15,000
10,000
5,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

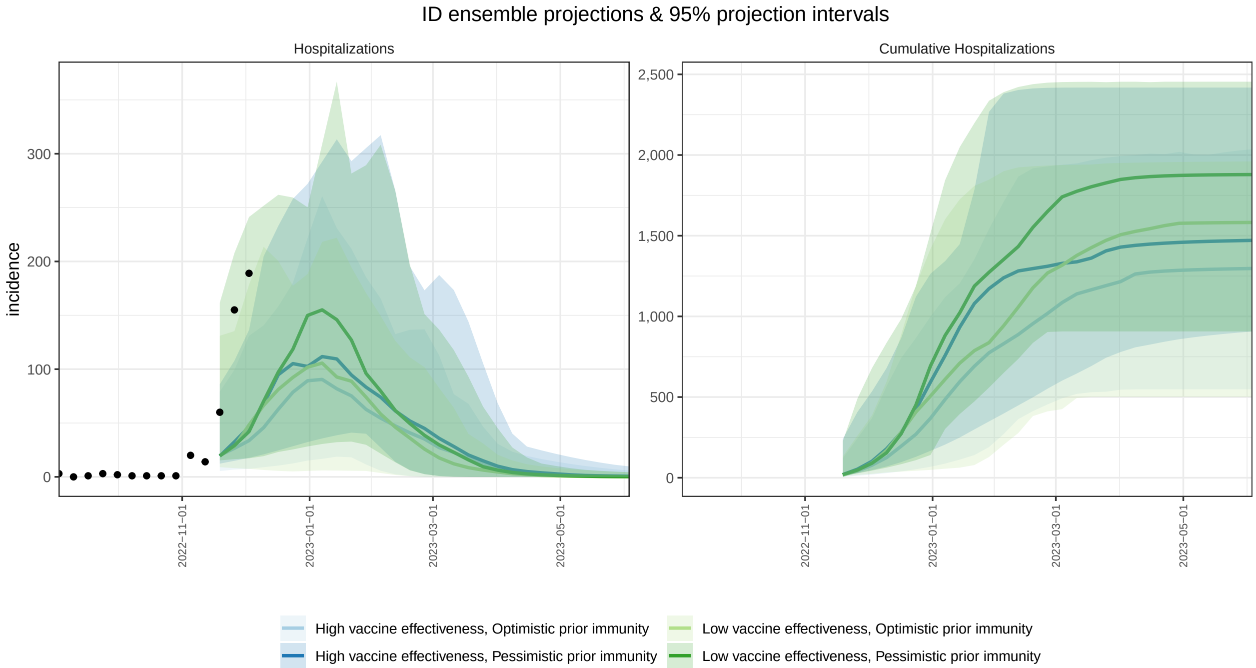

DE ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
200
100
0
1,500
1,000
500
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

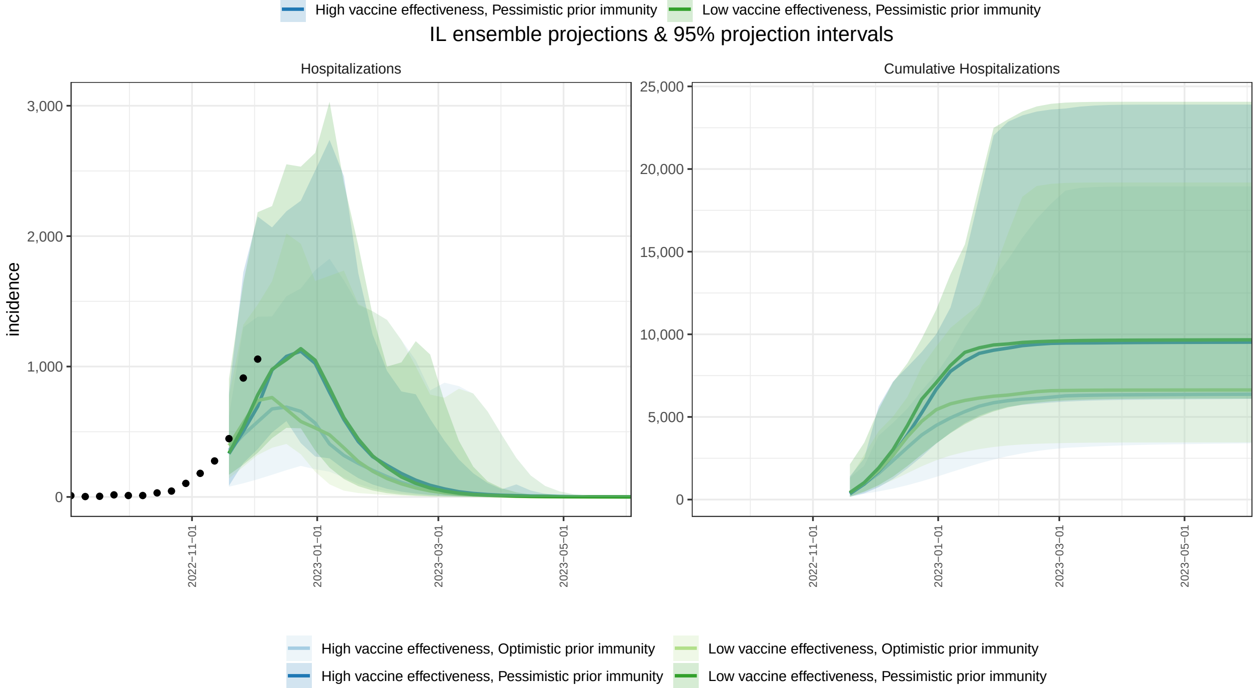

DC ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

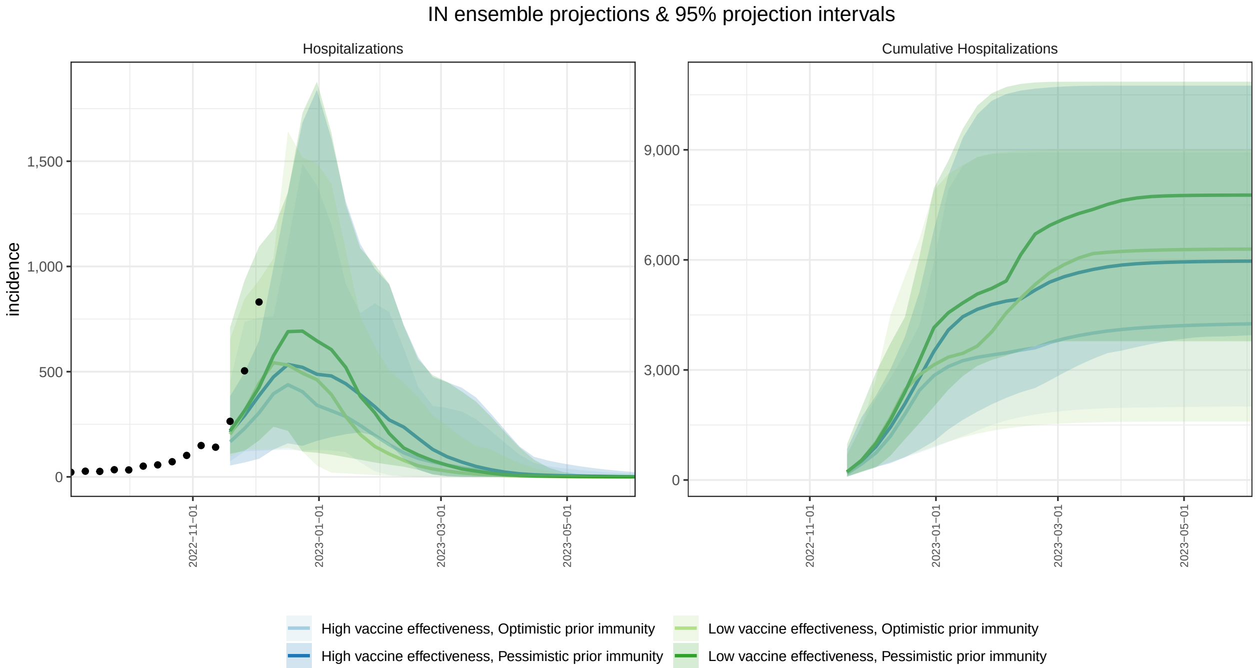

FL ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

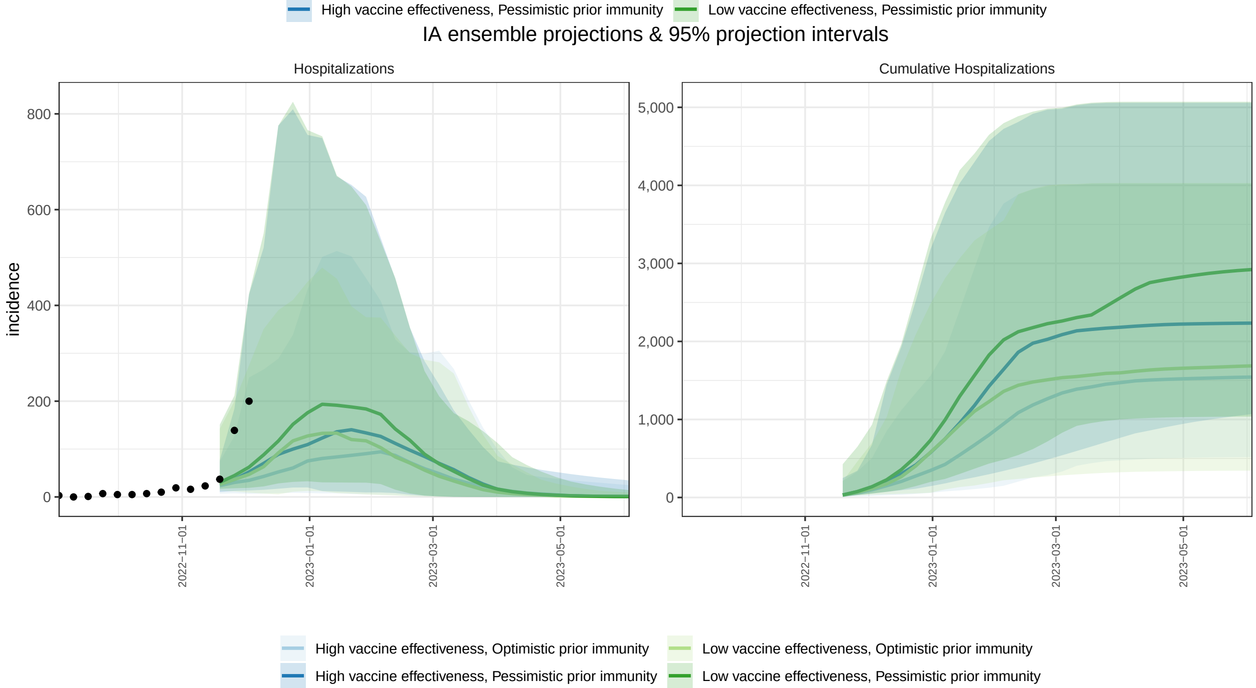

GA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

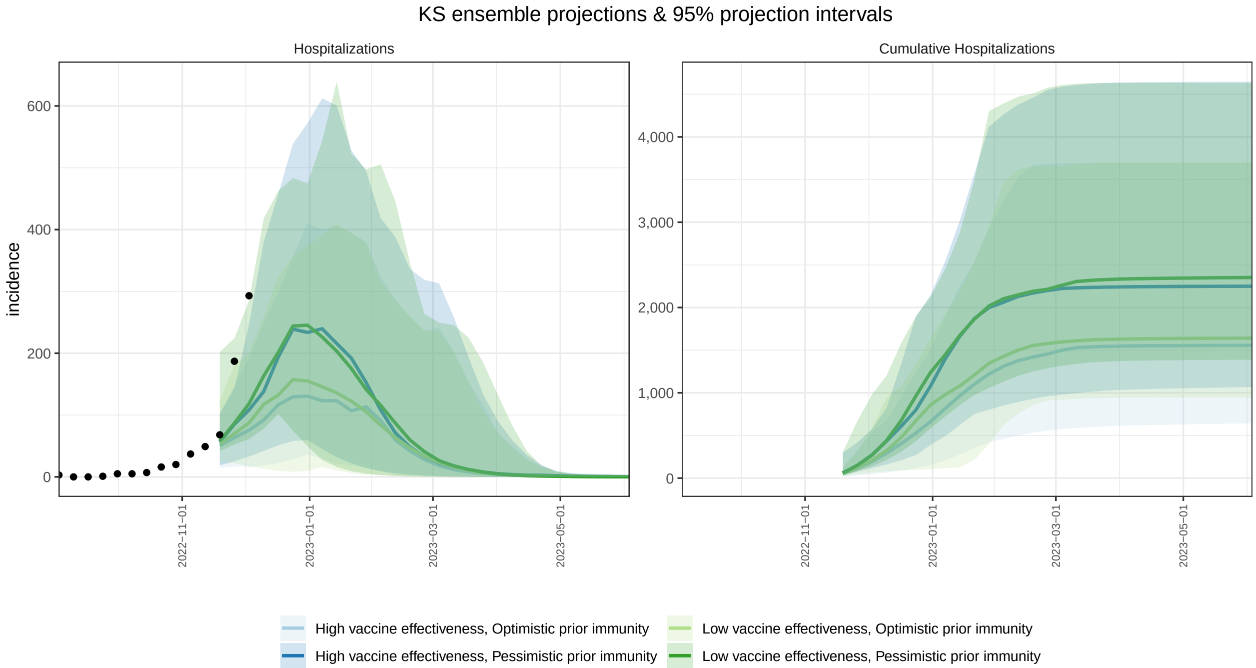

HI ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

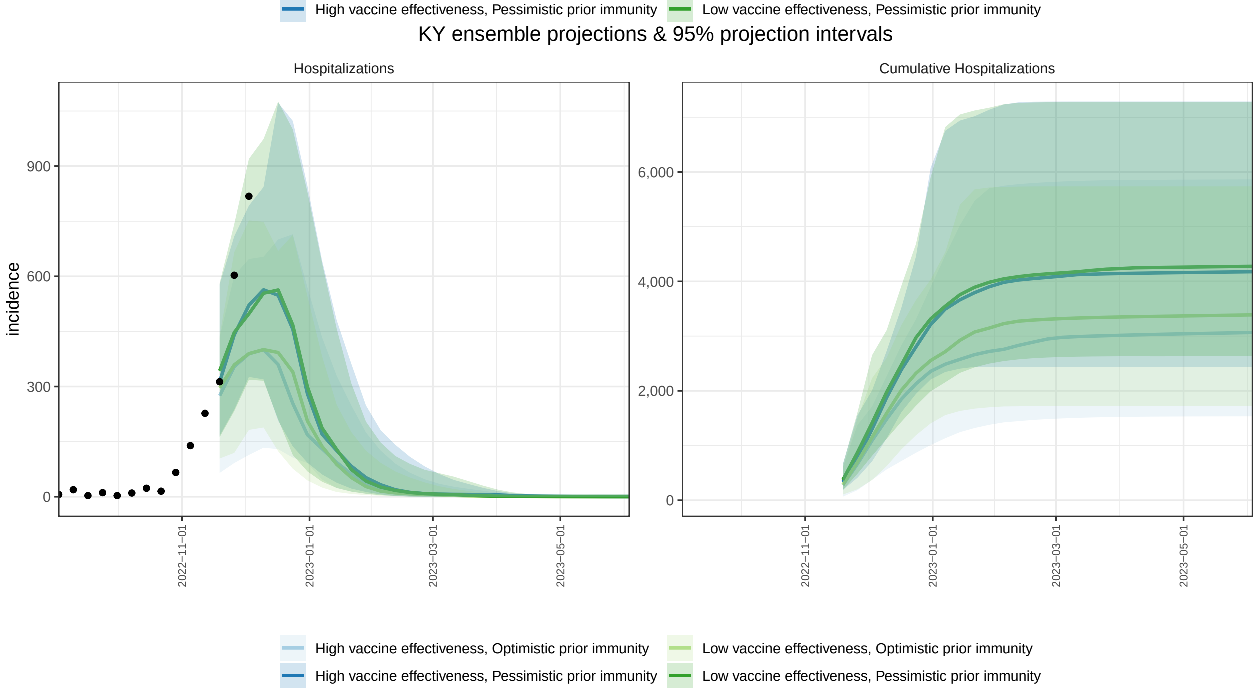

ID ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
300
200
100
0
2,500
2,000
1,500
1,000
500
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

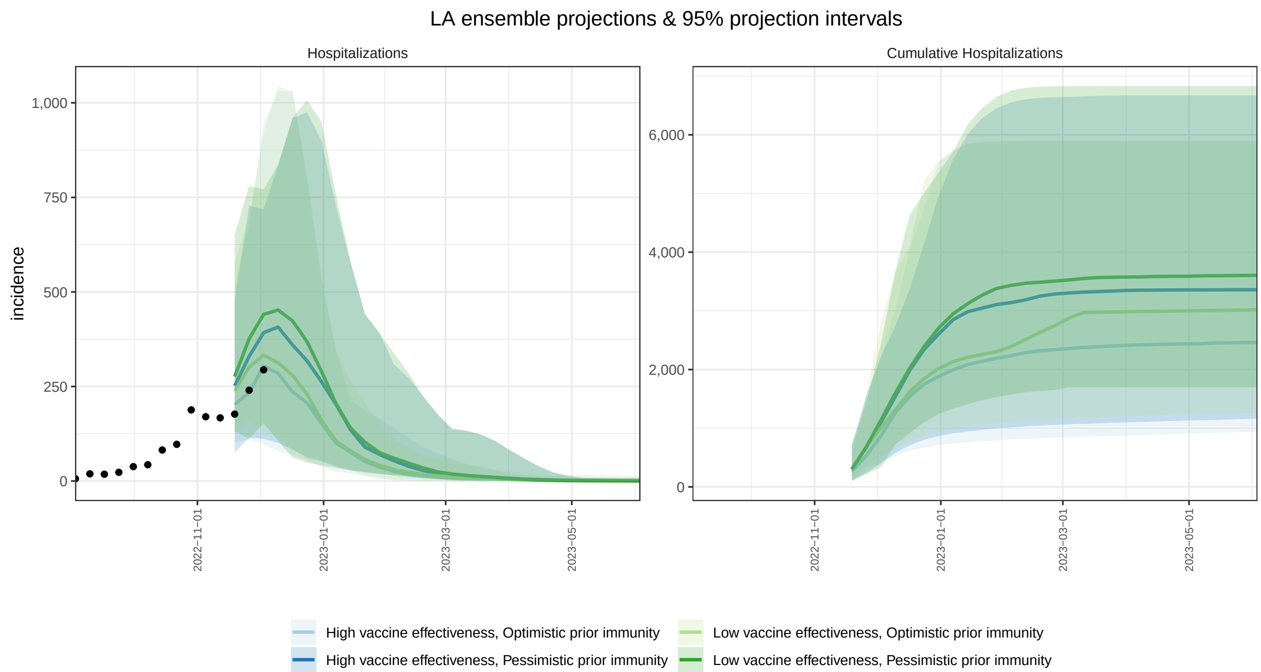

IL ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
3,000
2,000
1,000
0
25,000
20,000
15,000
10,000
5,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

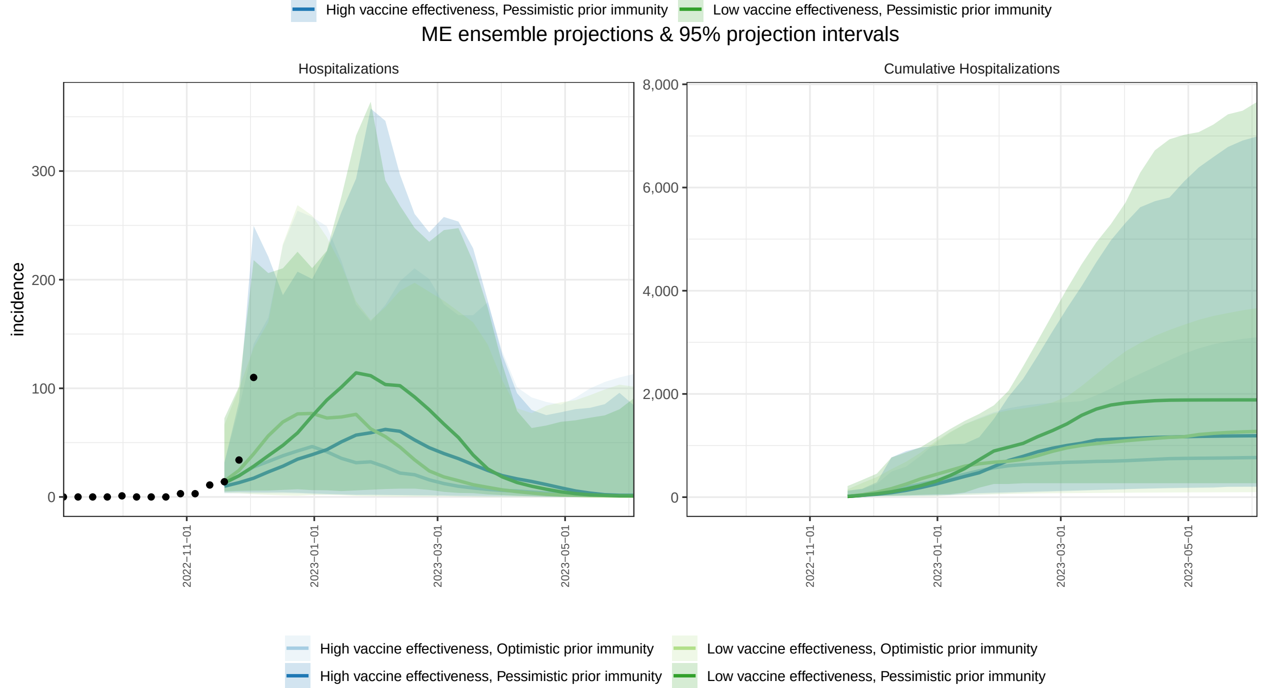

IN ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
3,000
6,000
9,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

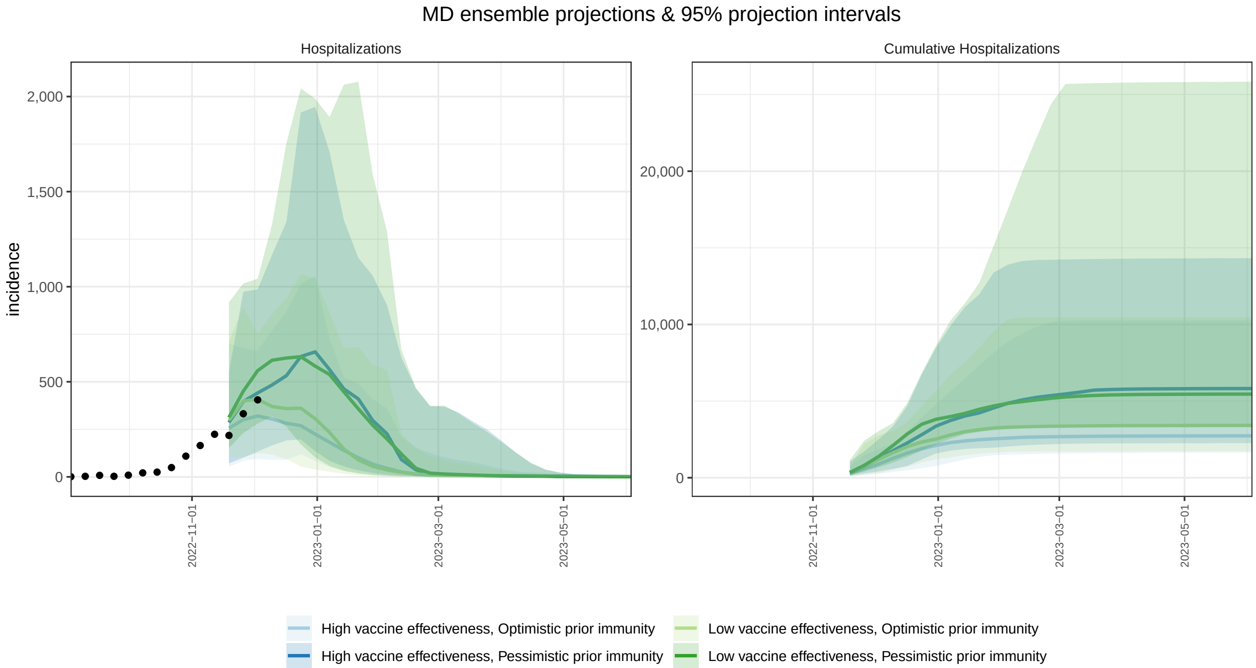

IA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
200
400
600
800
1,000
2,000
3,000
4,000
5,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

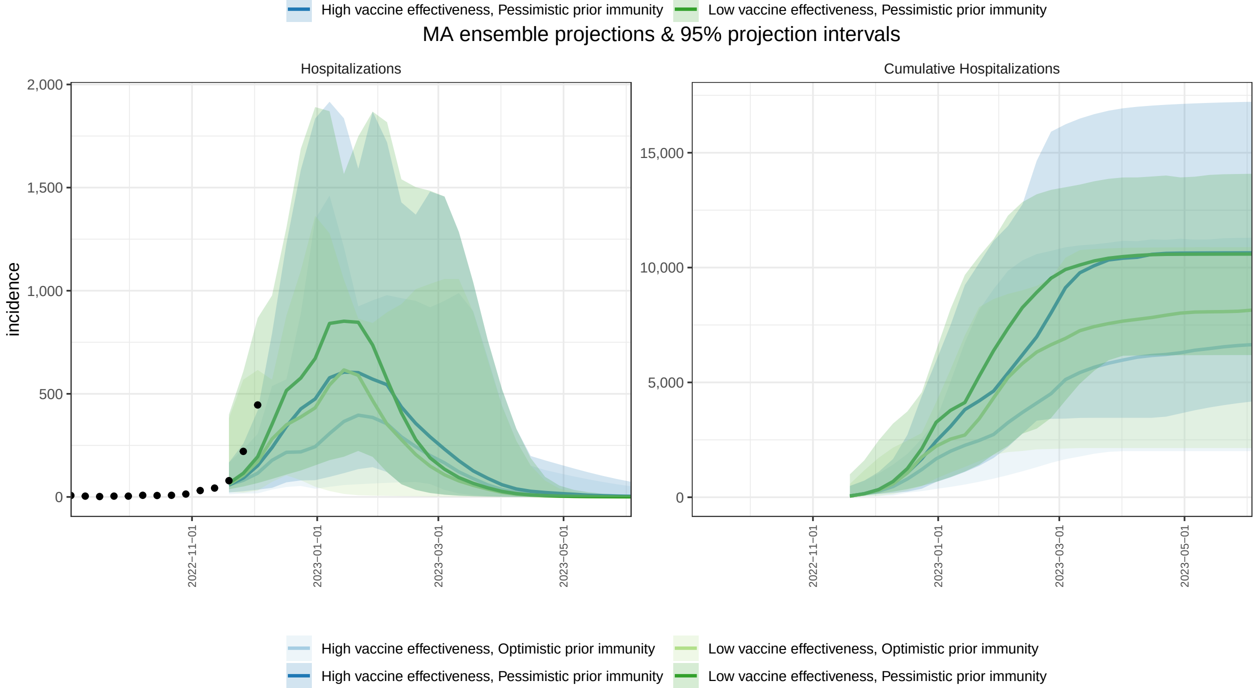

KS ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
200
400
600
0
1,000
2,000
3,000
4,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

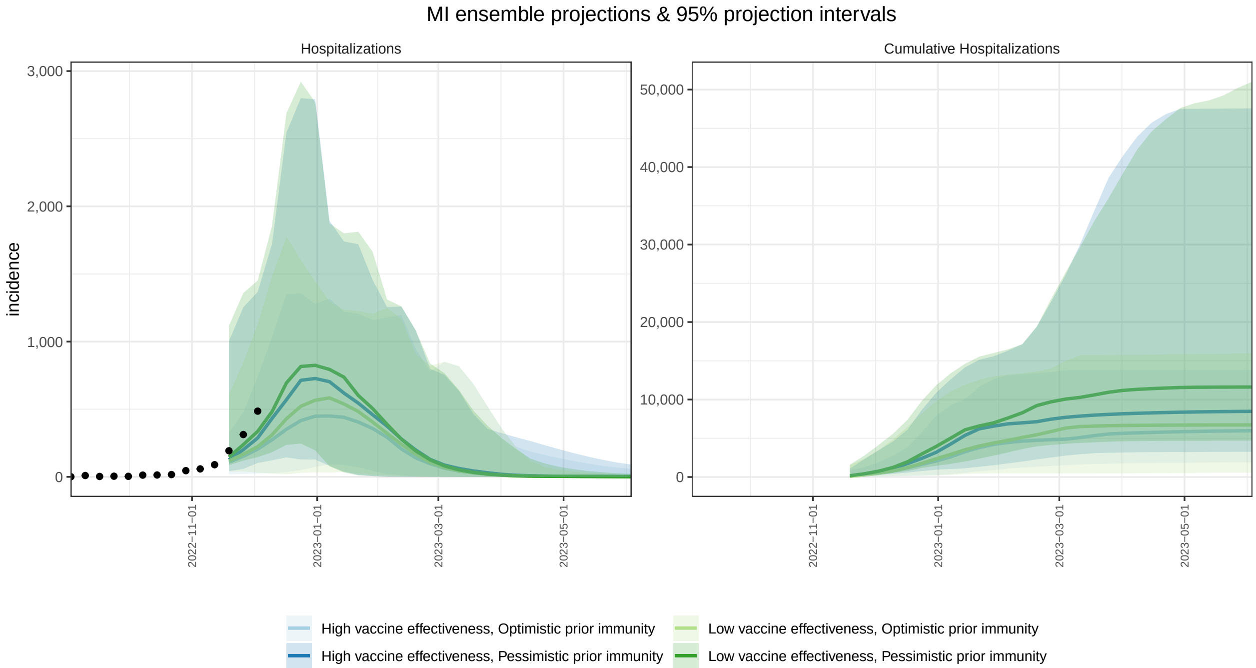

KY ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
300
600
900
0
2,000
4,000
6,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

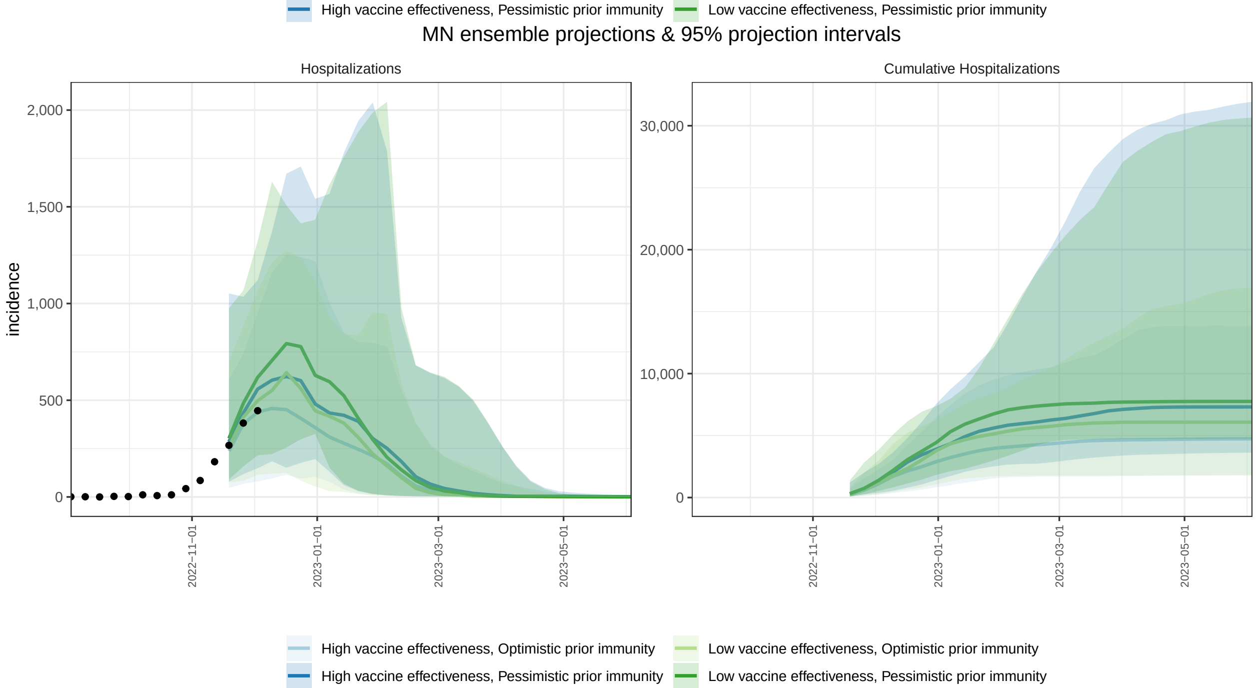

LA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

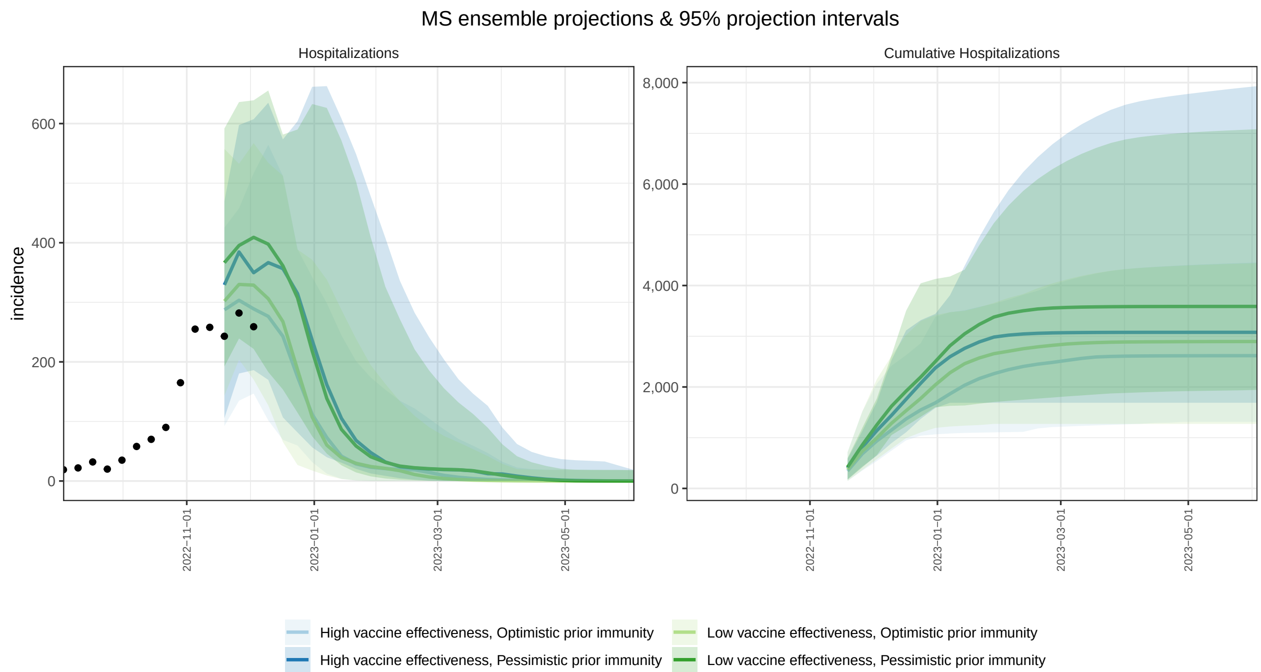

ME ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

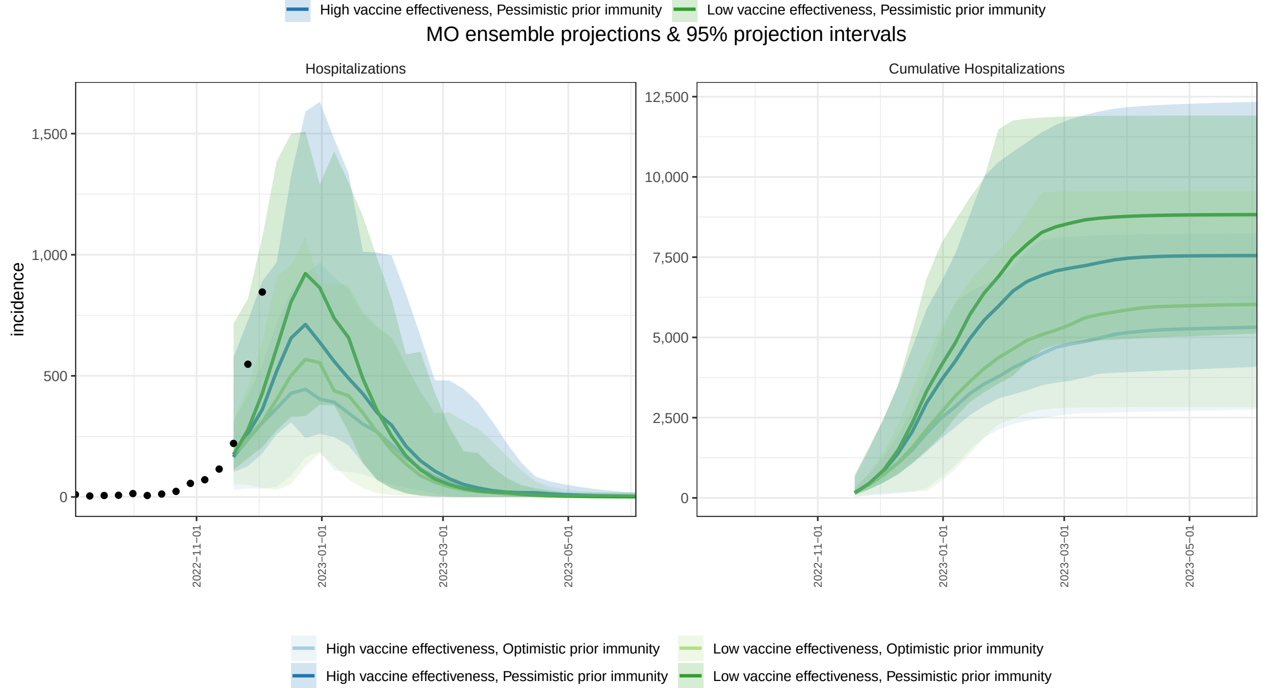

MD ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
2,000
1,500
1,000
500
0
20,000
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

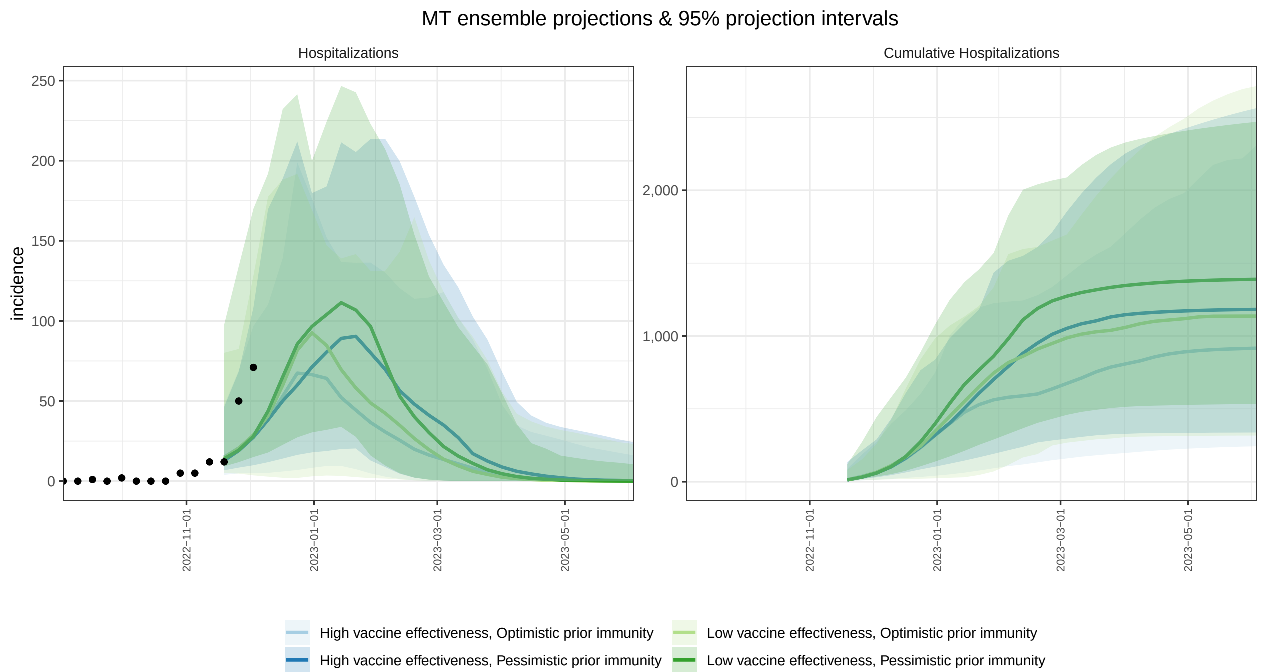

MA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
2,000
1,500
1,000
500
0
15,000
10,000
5,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

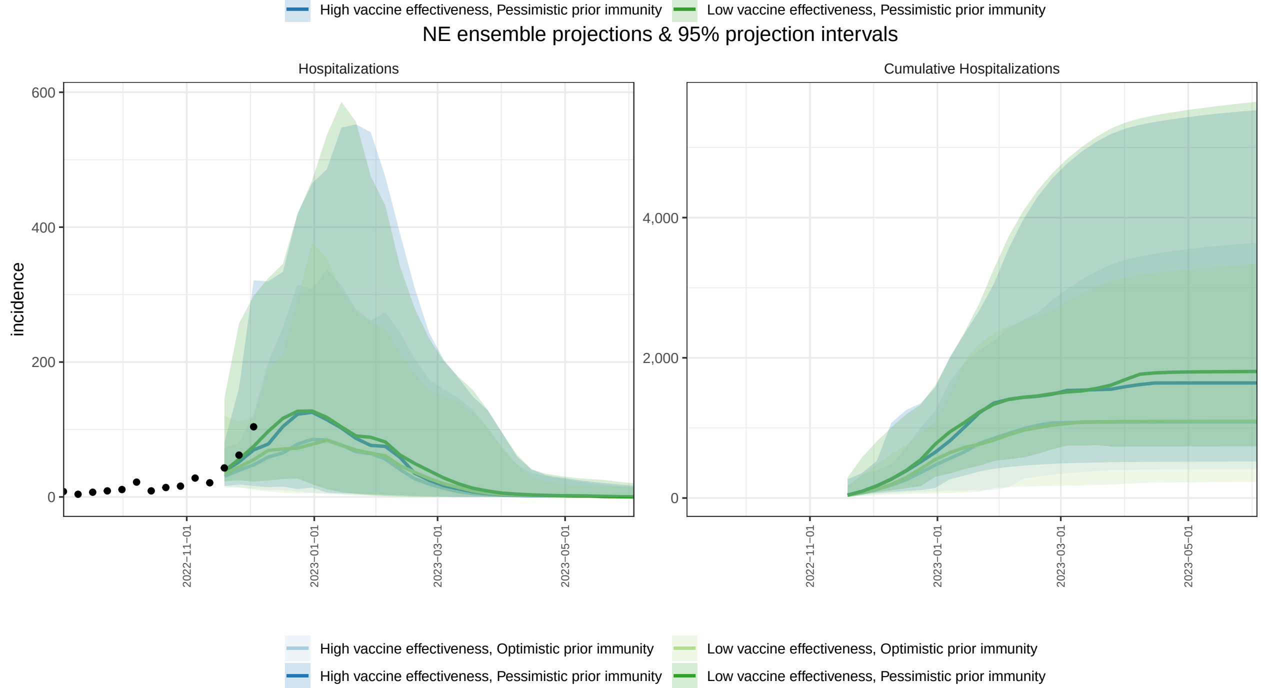

MI ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
1,000
2,000
3,000
0
10,000
20,000
30,000
40,000
50,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

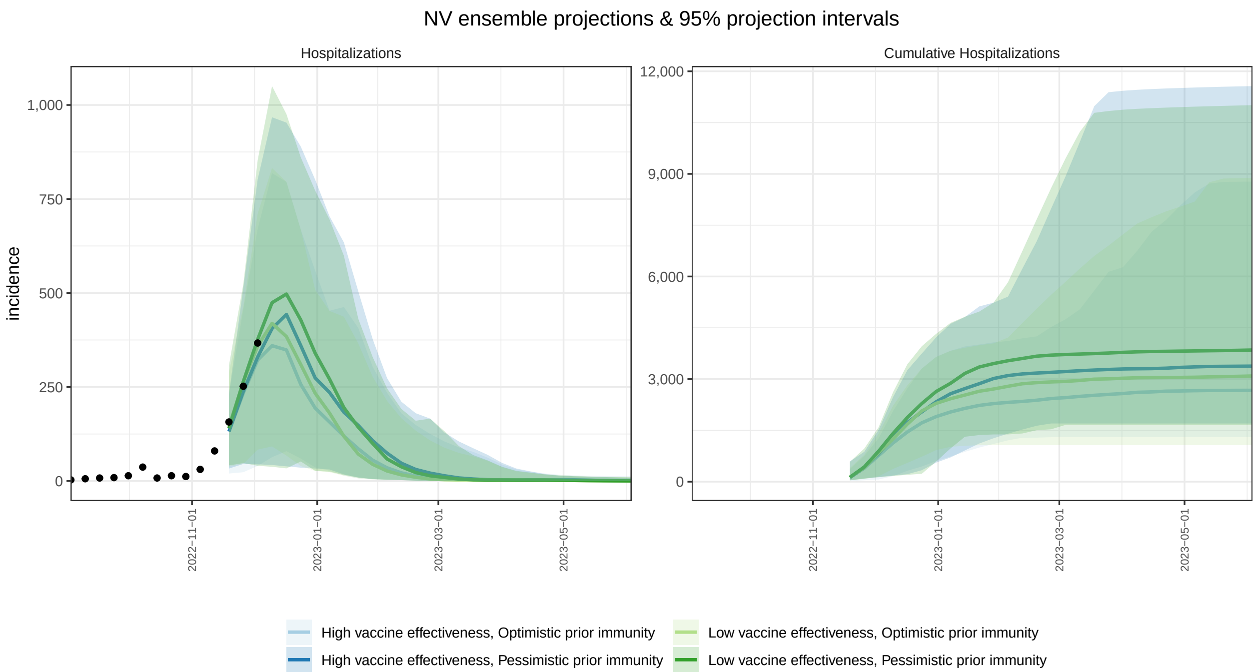

MN ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
2,000
0
10,000
20,000
30,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

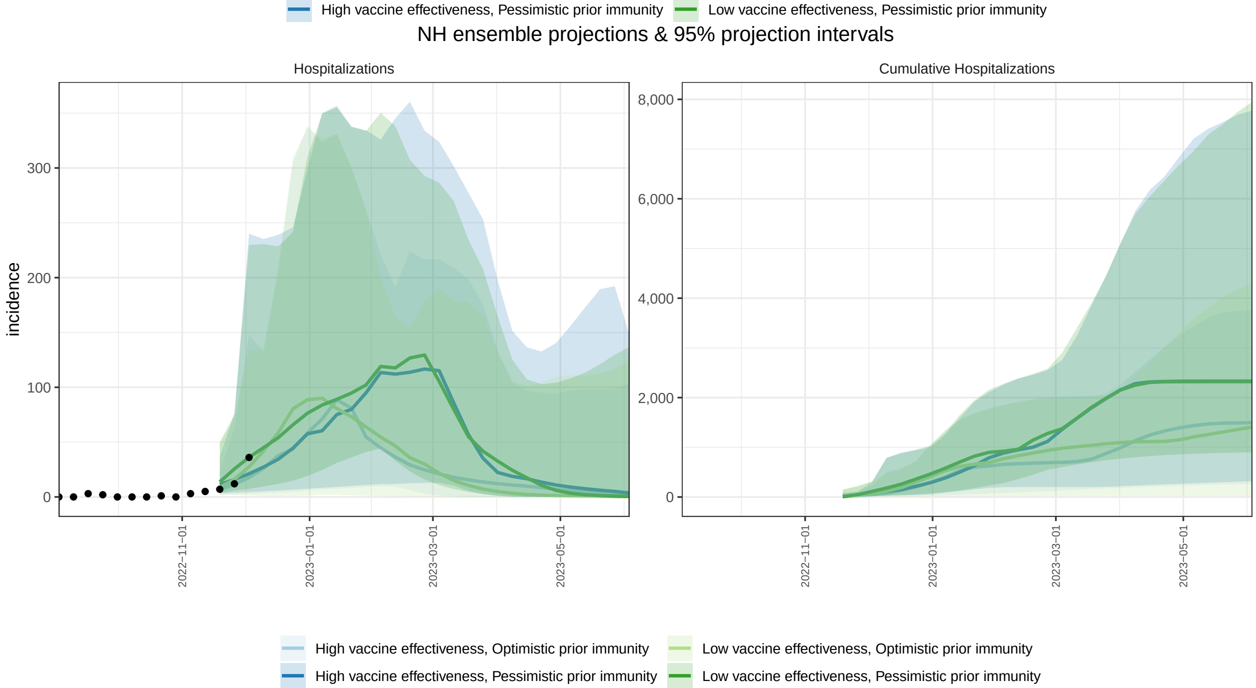

MS ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
200
400
600
0
2,000
4,000
6,000
8,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

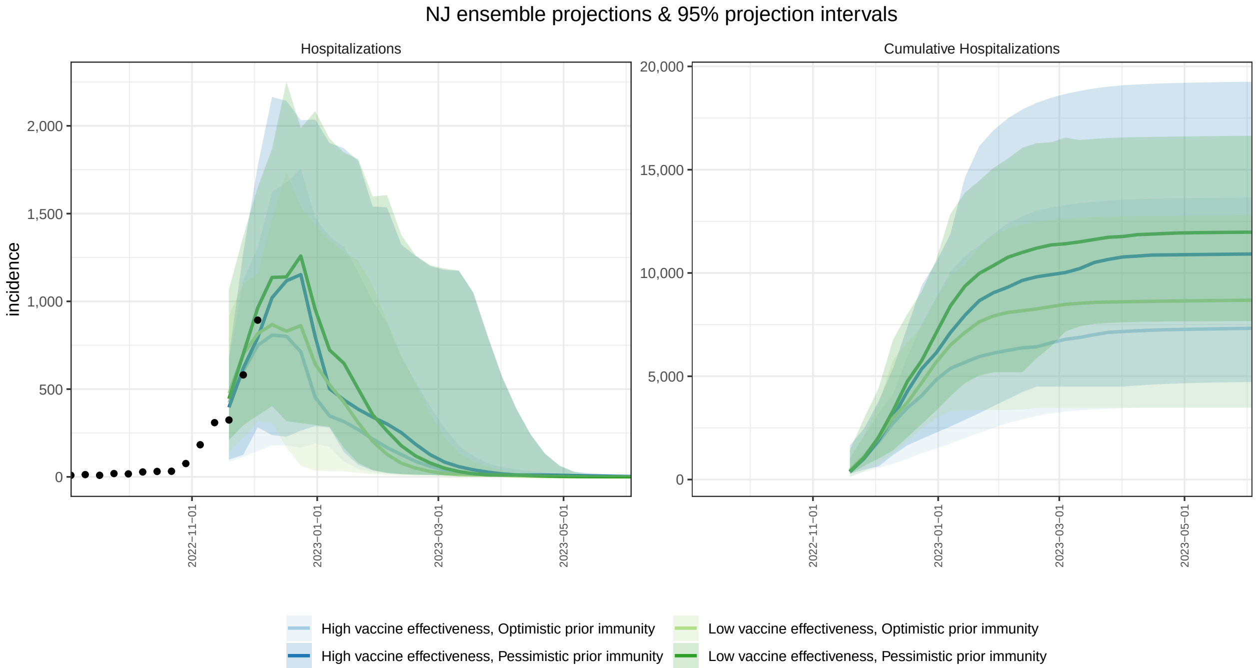

MO ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
0
2,500
5,000
7,500
10,000
12,500
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

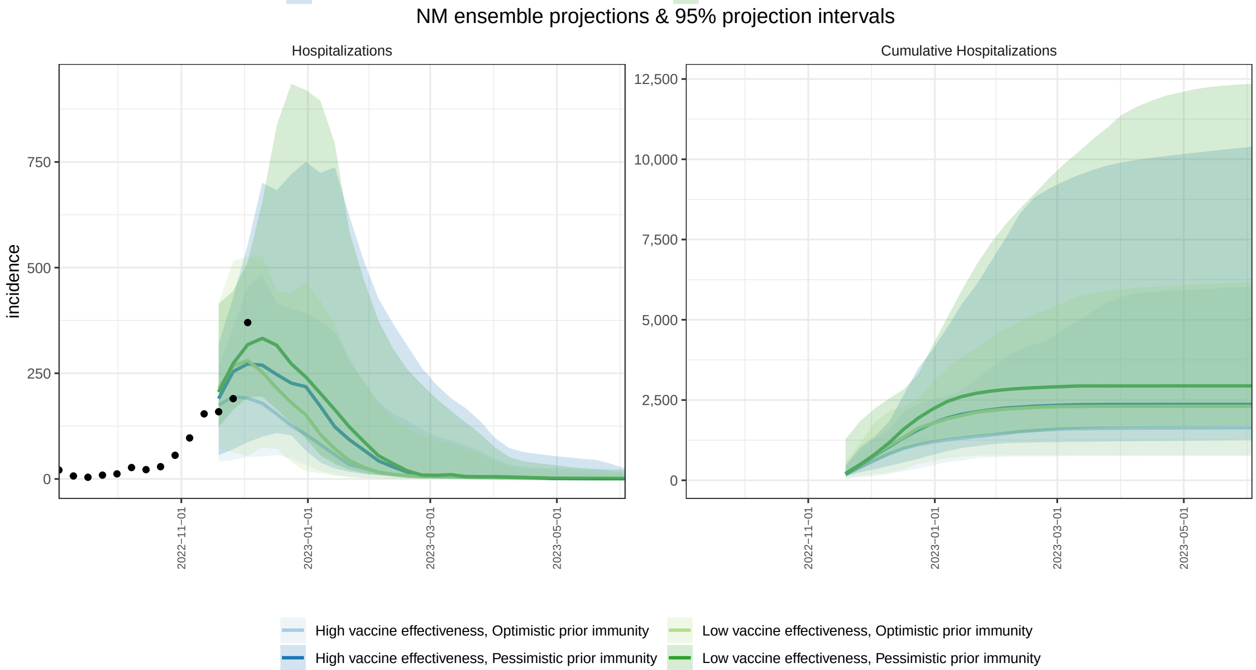

MT ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
250
200
150
100
50
0
2,000
1,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

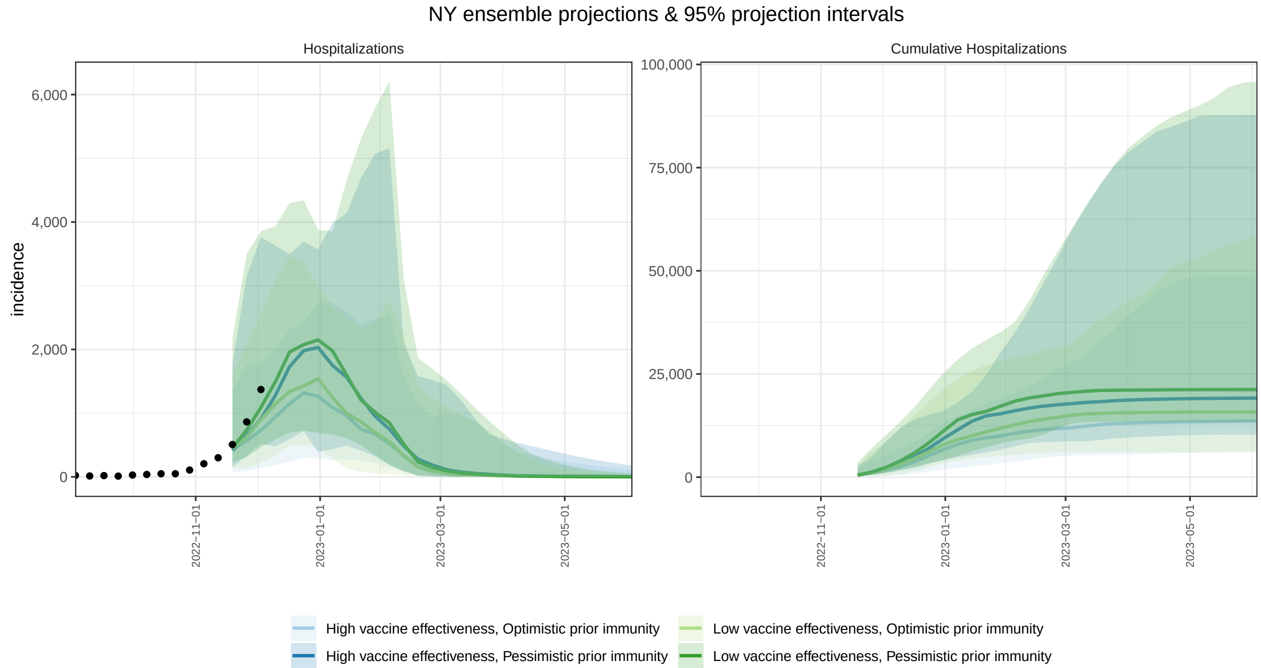

NE ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
600
400
200
0
4,000
2,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


NV ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

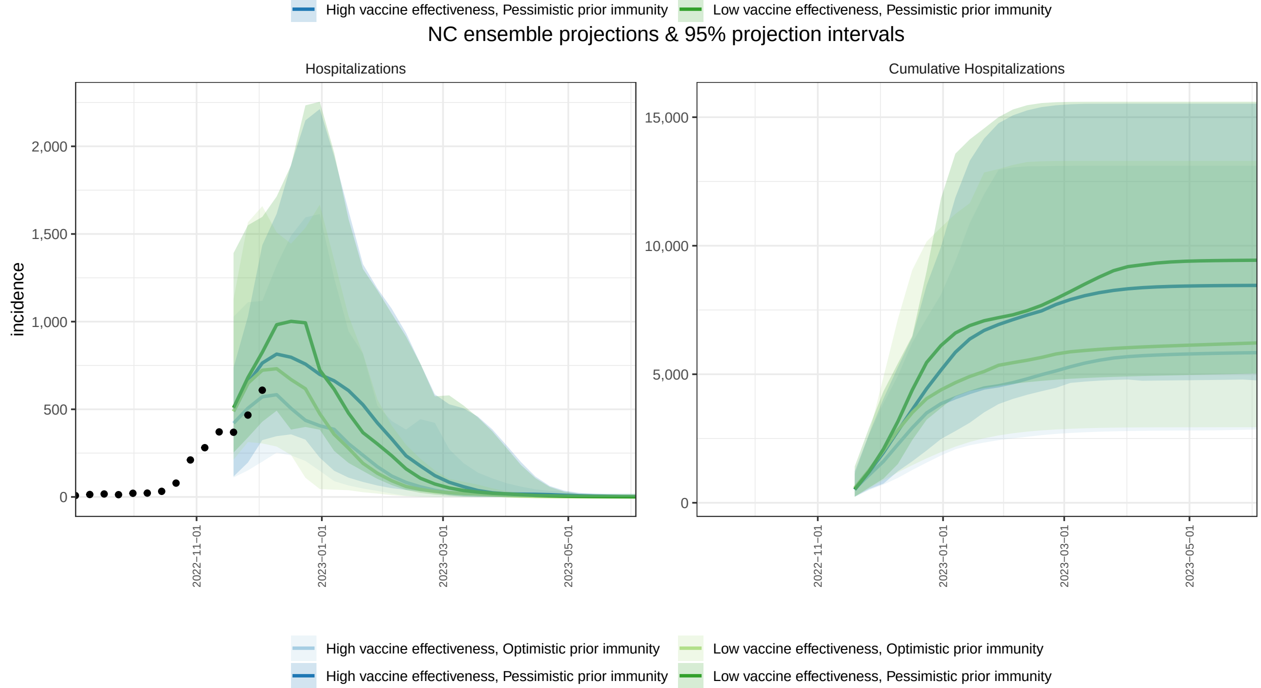

NH ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


NJ ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
2,000
5,000
10,000
15,000
20,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


NM ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
250
500
750
2,500
5,000
7,500
10,000
12,500
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

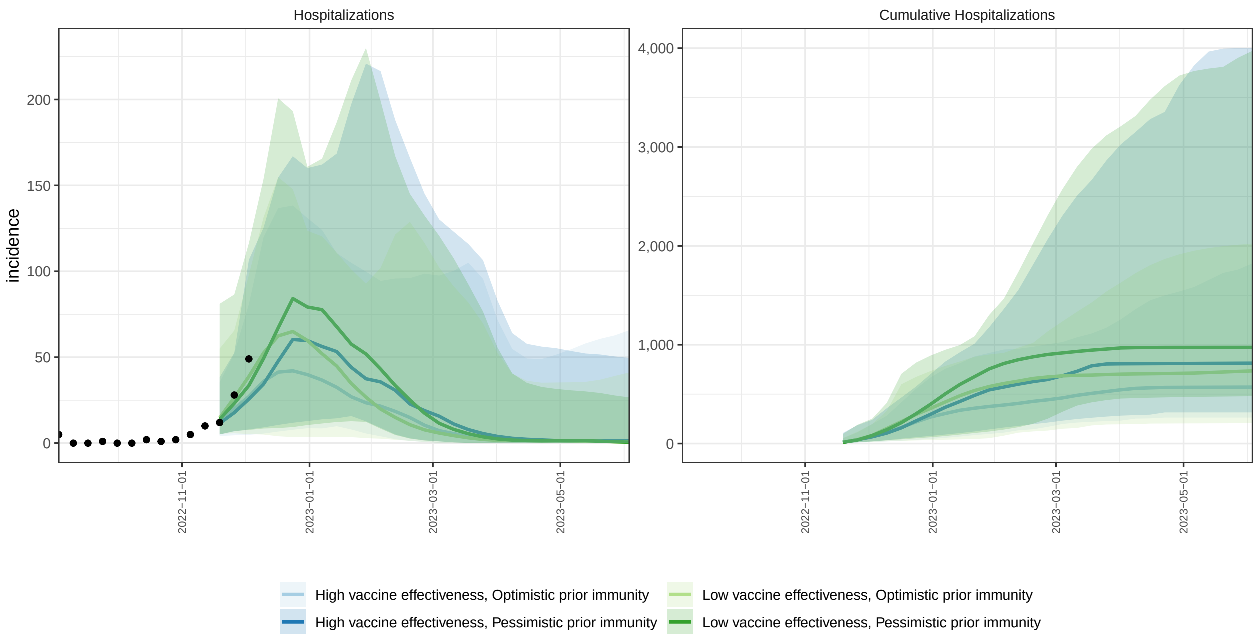


NY ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

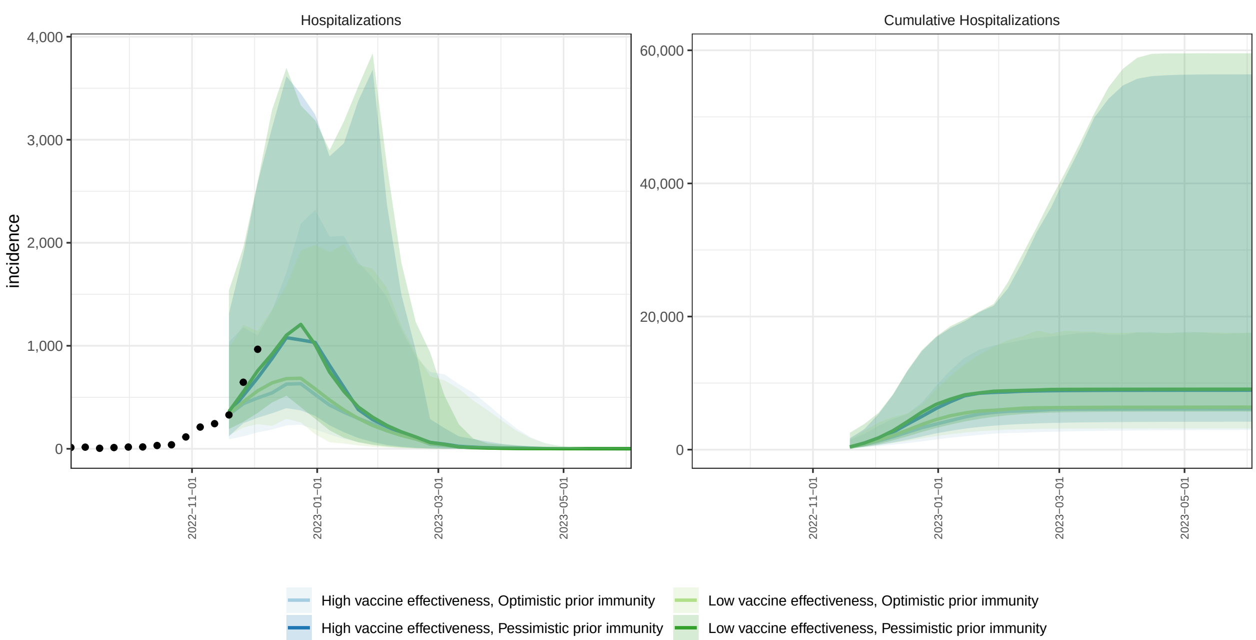


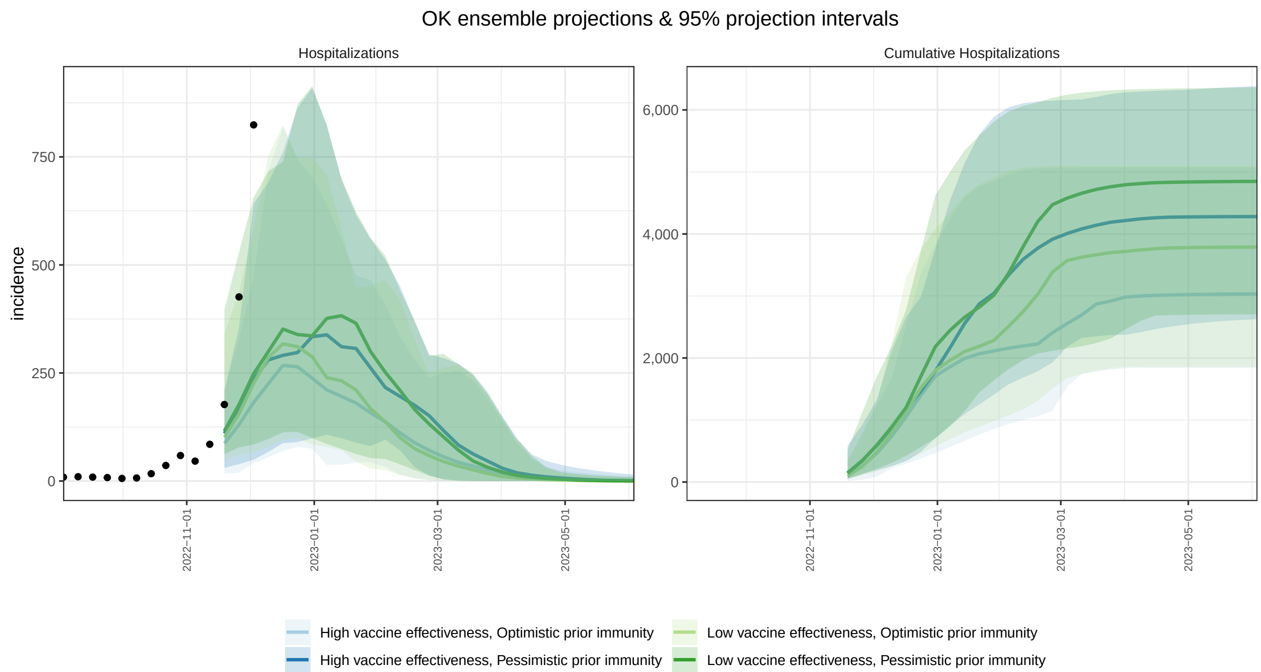
NC ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

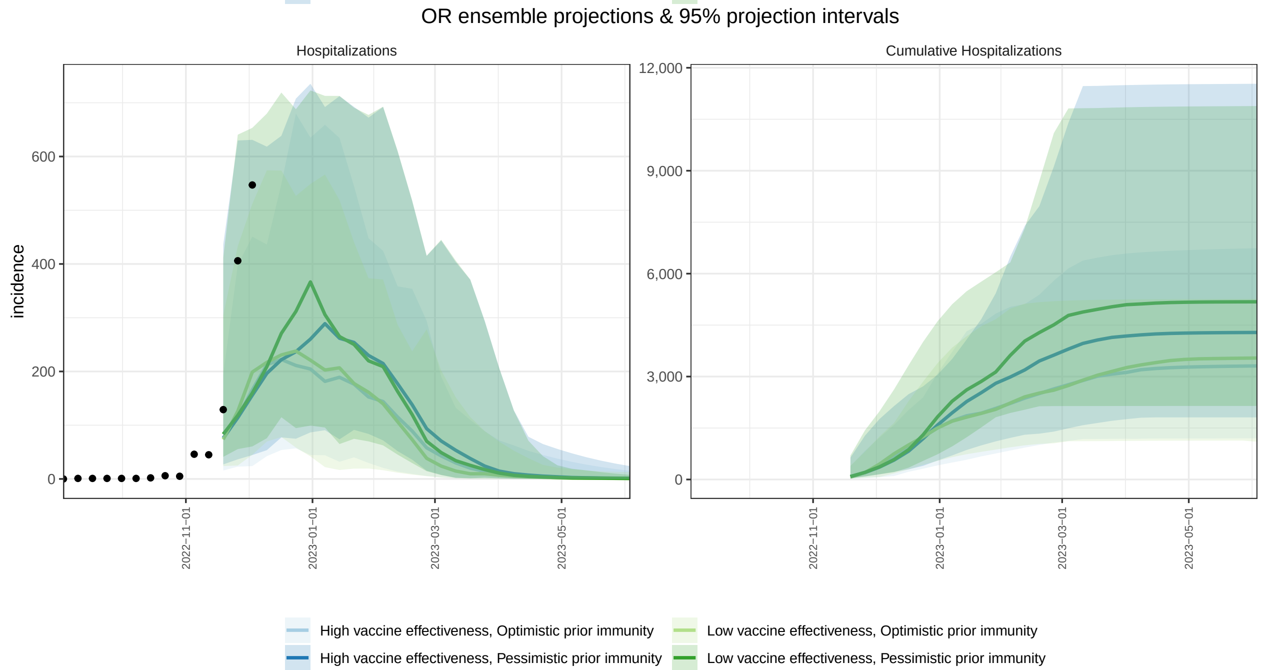
ND ensemble projections & 95% projection intervals

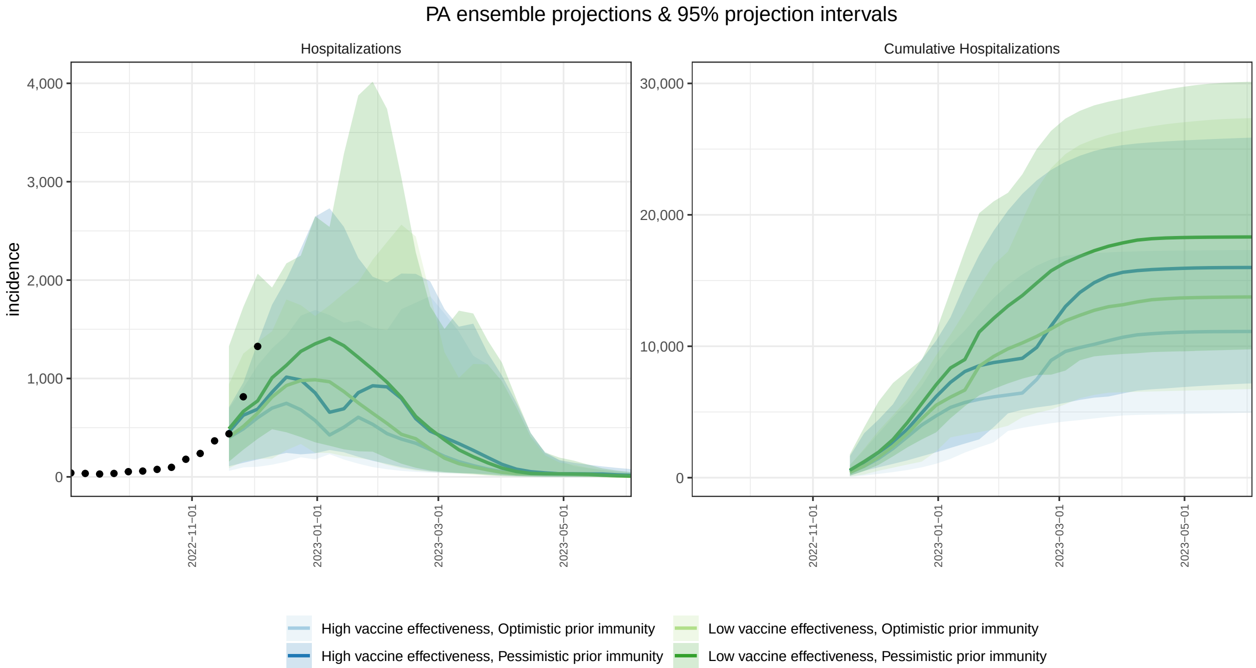


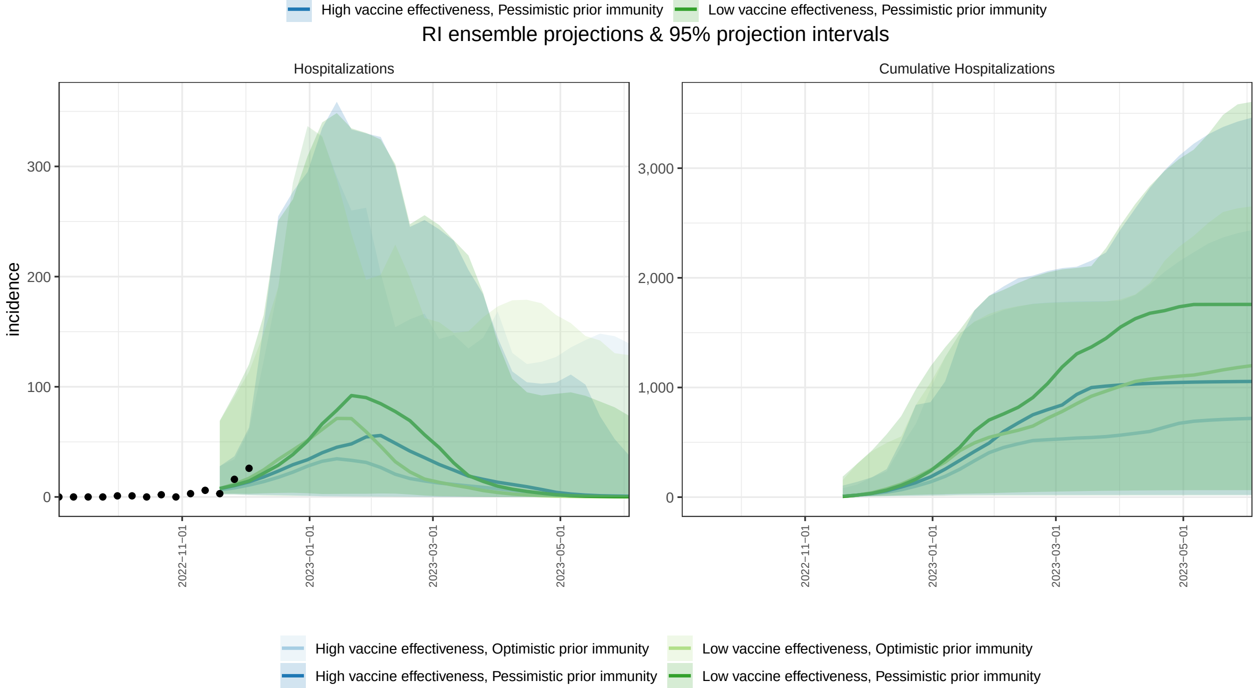
OH ensemble projections & 95% projection intervals

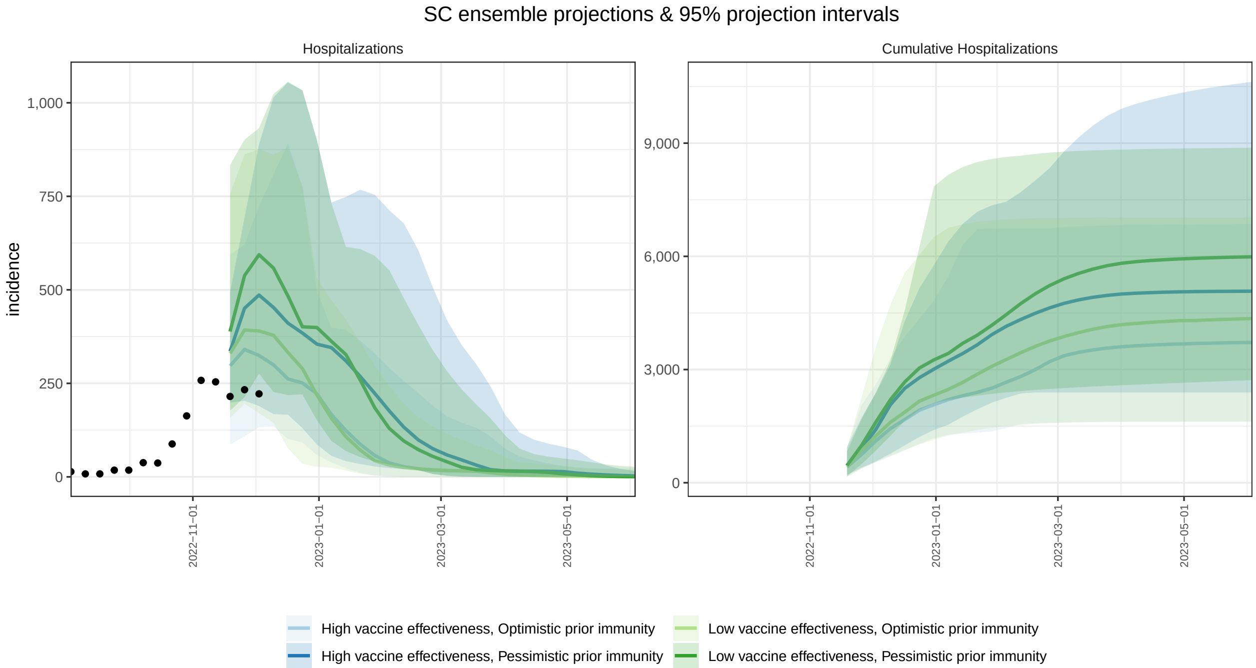


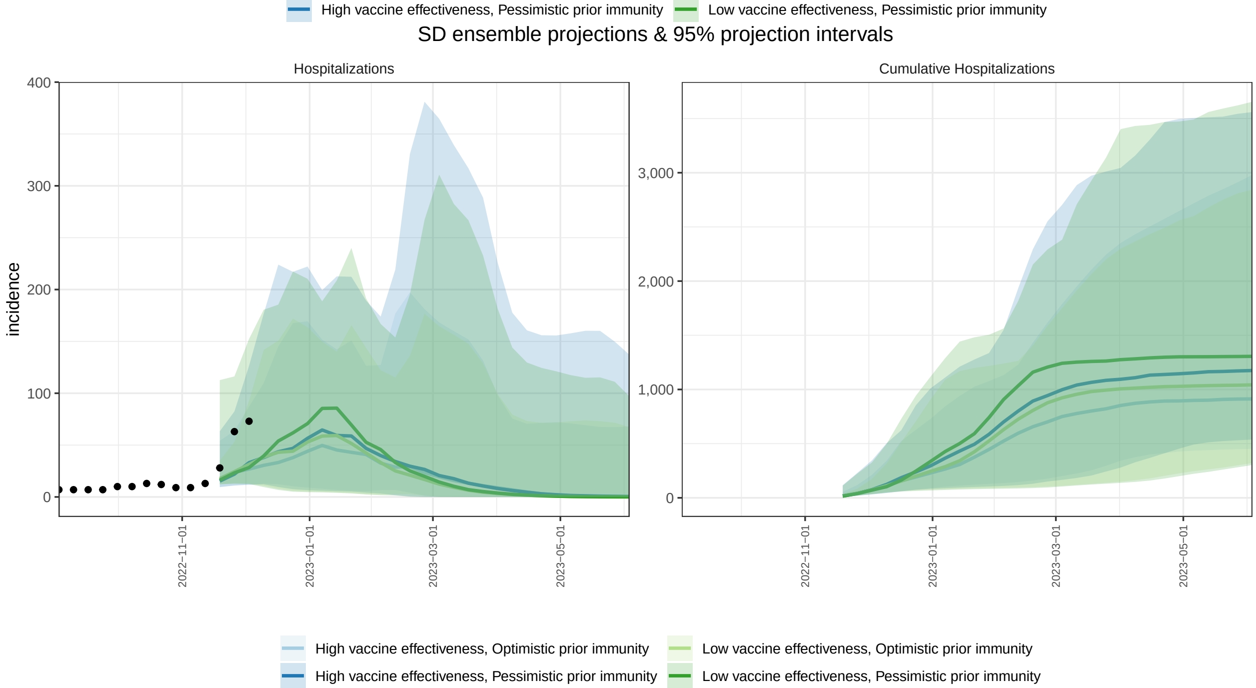

OK ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
250
500
750
0
2,000
4,000
6,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

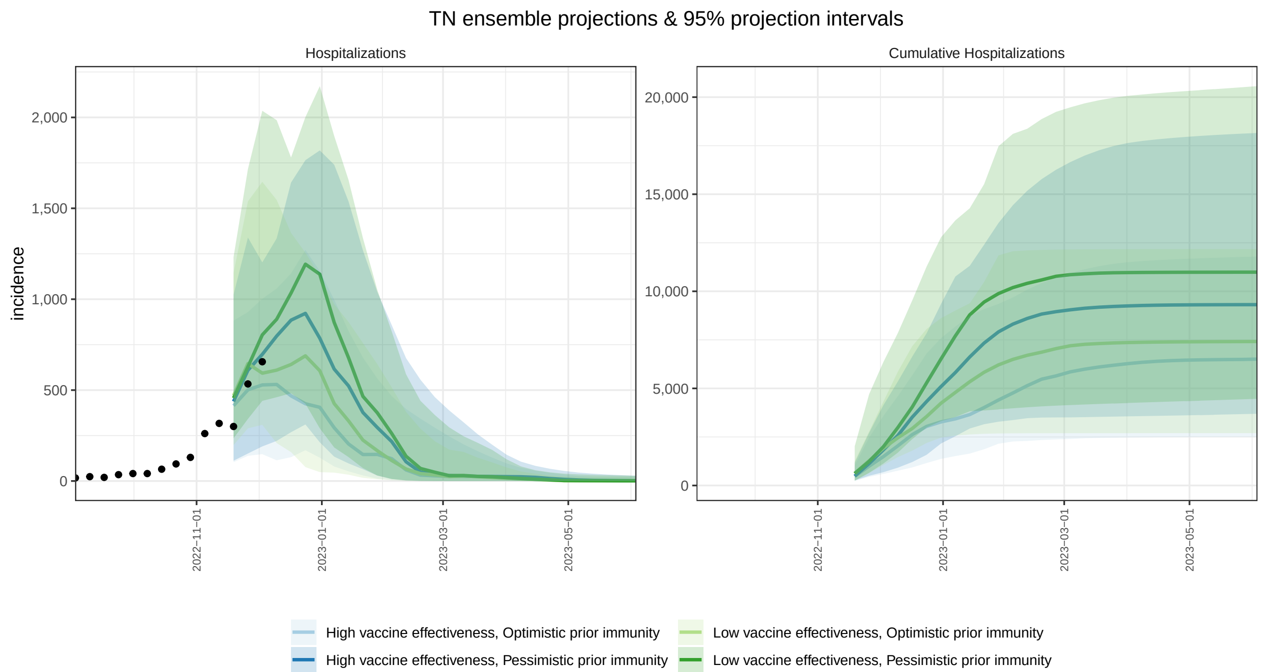

OR ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
200
400
600
0
3,000
6,000
9,000
12,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


PA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
4,000
3,000
2,000
1,000
0
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

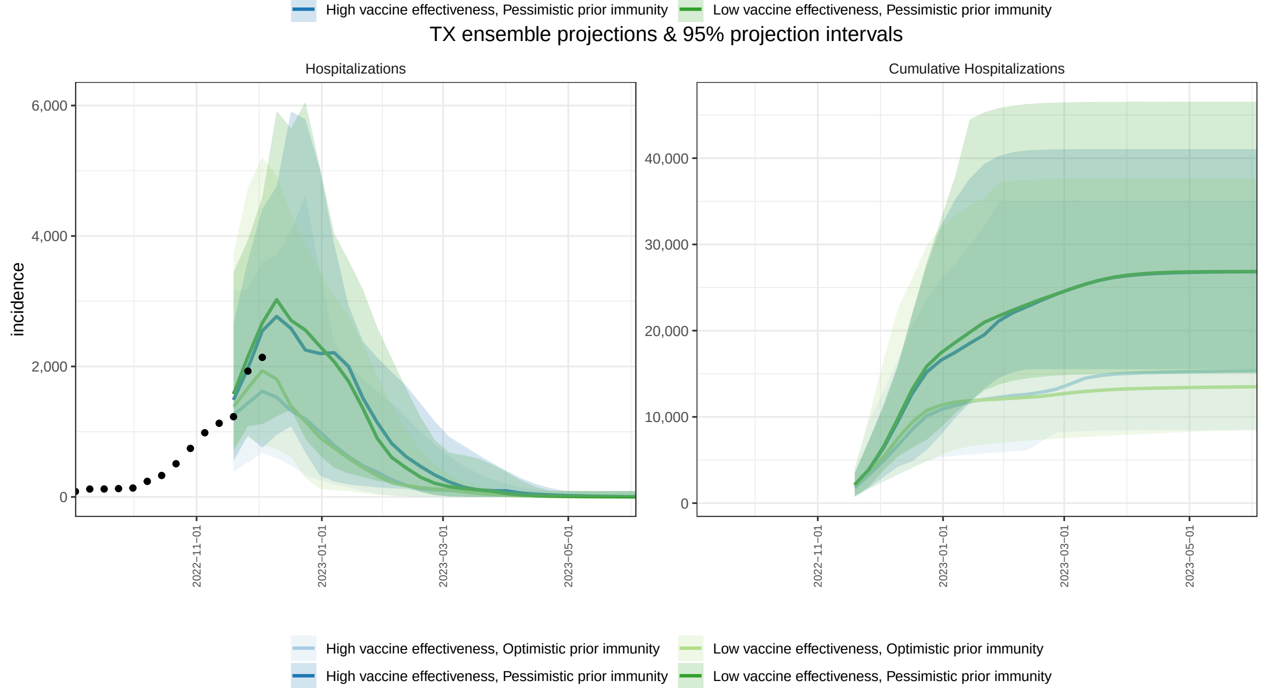

RI ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
300
200
100
0
3,000
2,000
1,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


SC ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
1,000
750
500
250
0
9,000
6,000
3,000
0
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

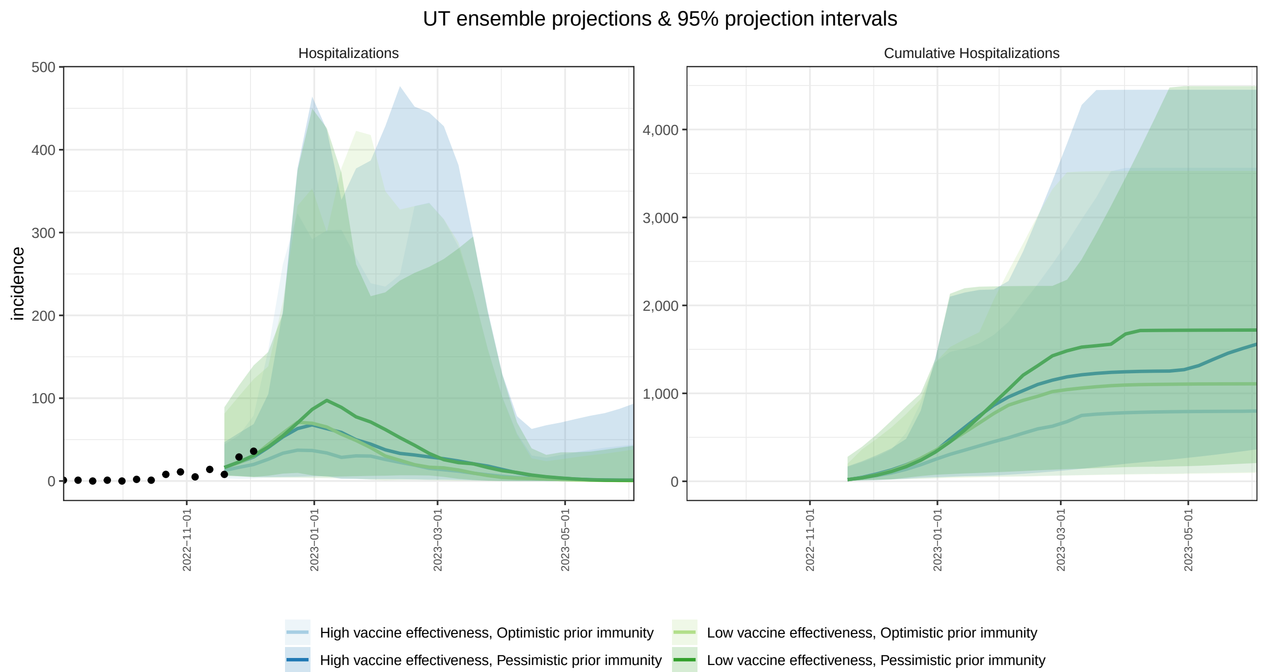

SD ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
400
300
200
100
0
3,000
2,000
1,000
0
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

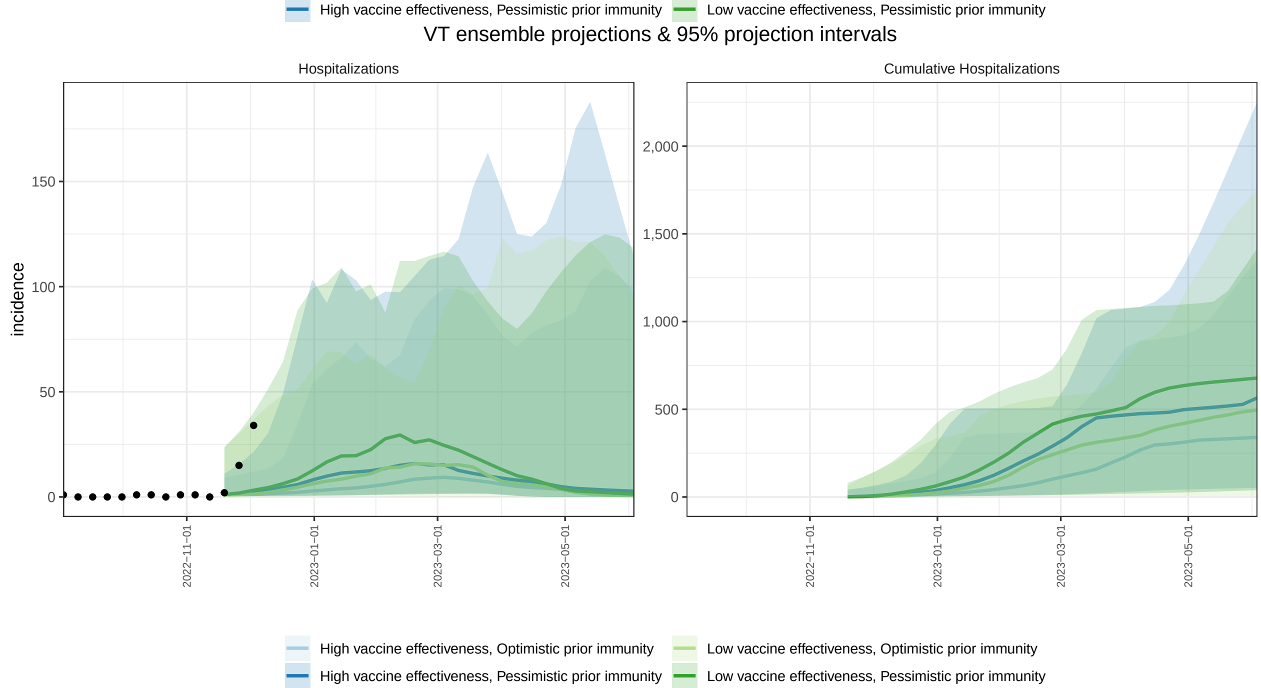


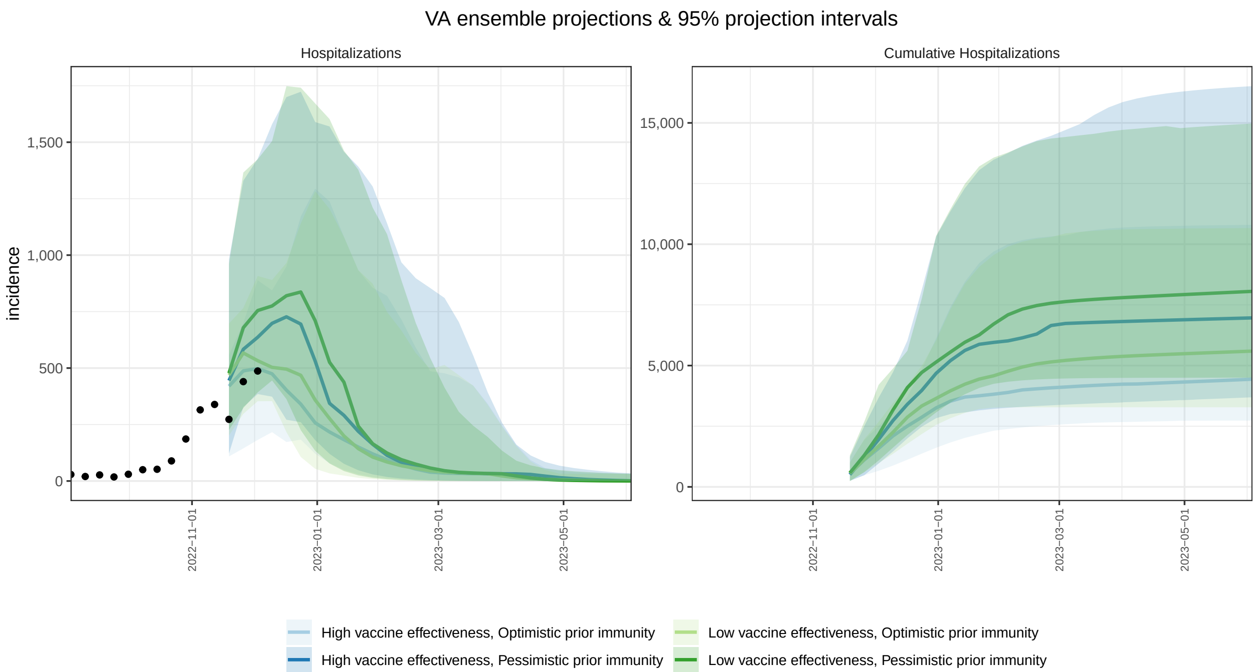
TN ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
1,500
2,000
5,000
10,000
15,000
20,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

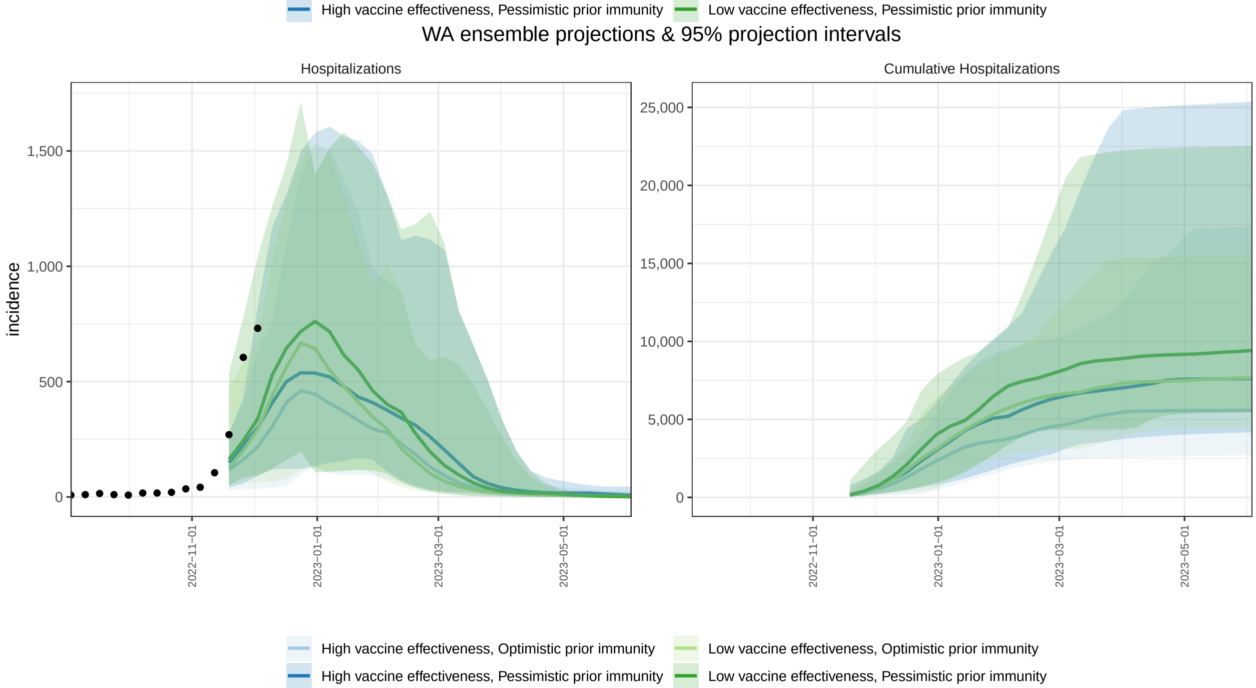


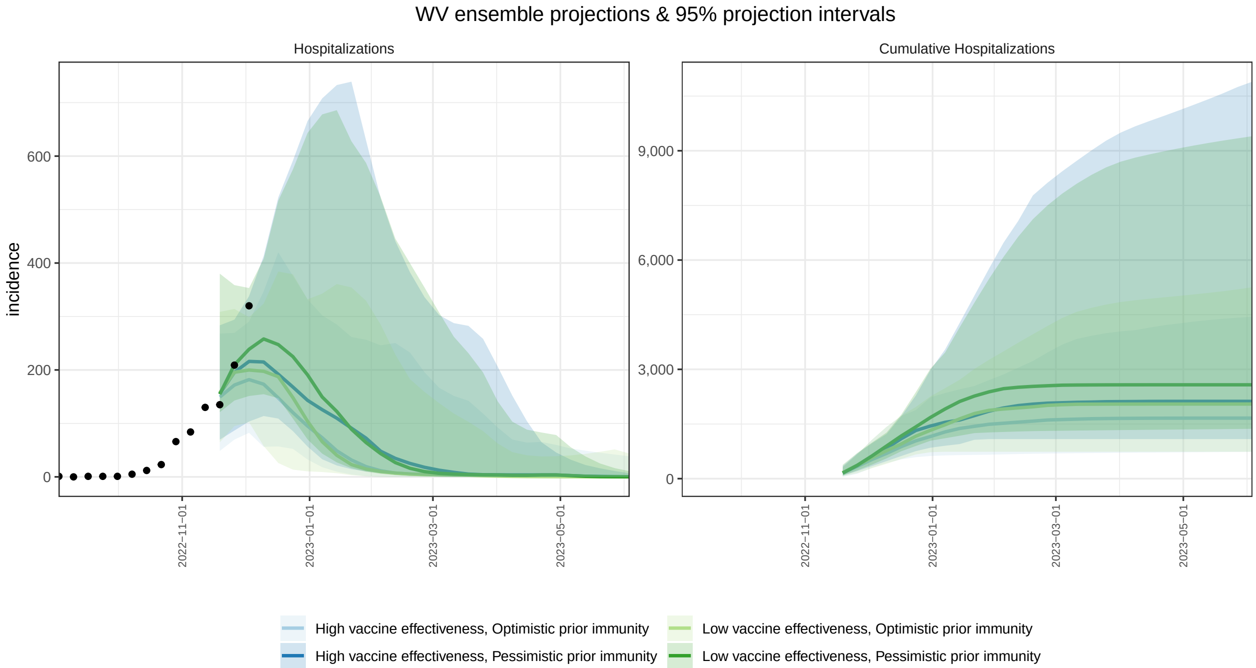
TX ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
2,000
4,000
6,000
10,000
20,000
30,000
40,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

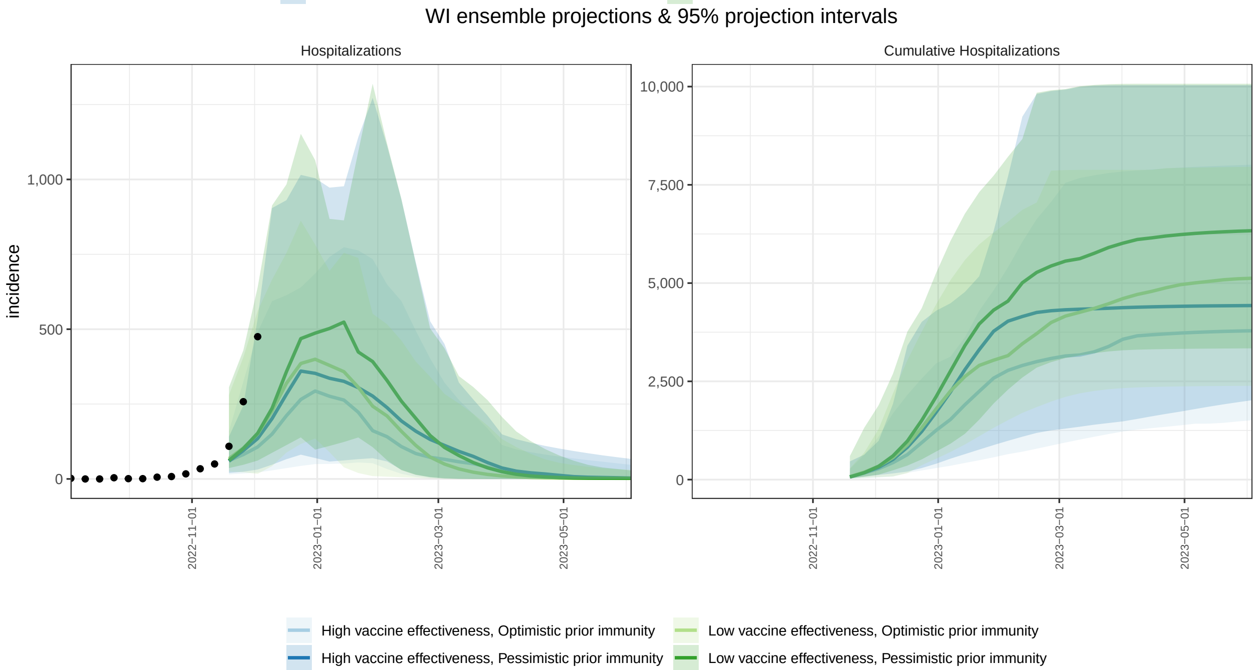

UT ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
500
400
300
200
100
0
4,000
3,000
2,000
1,000
0
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

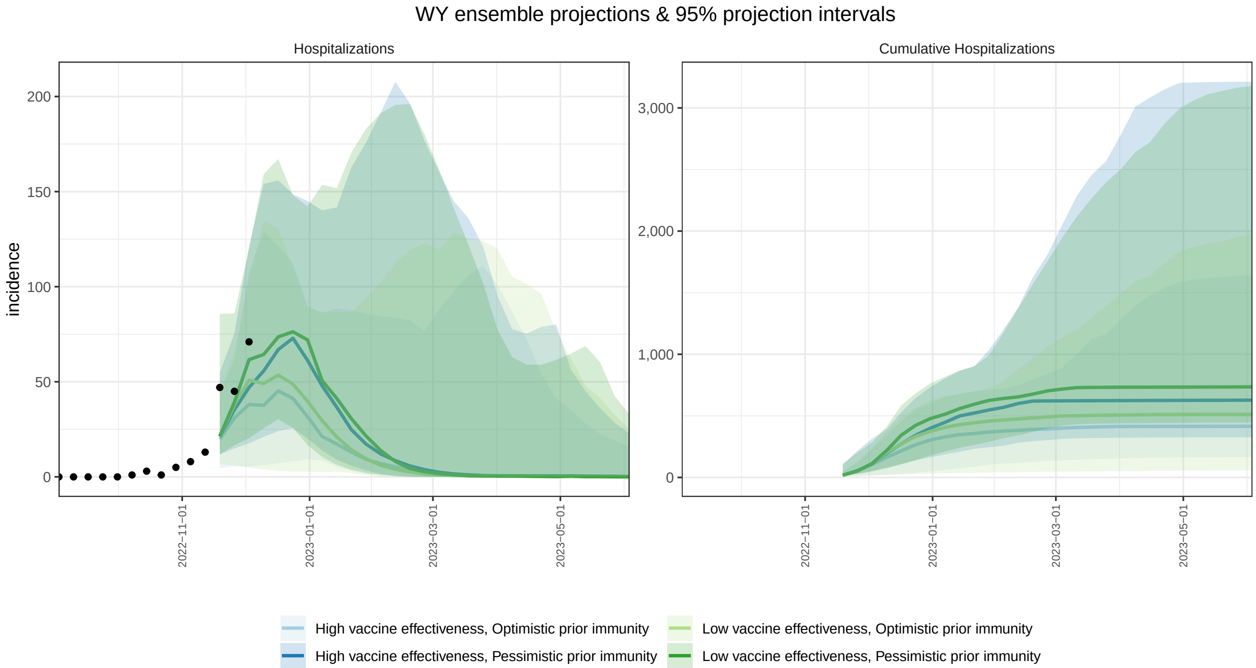

VT ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
150
100
50
0
2,000
1,500
1,000
500
0
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

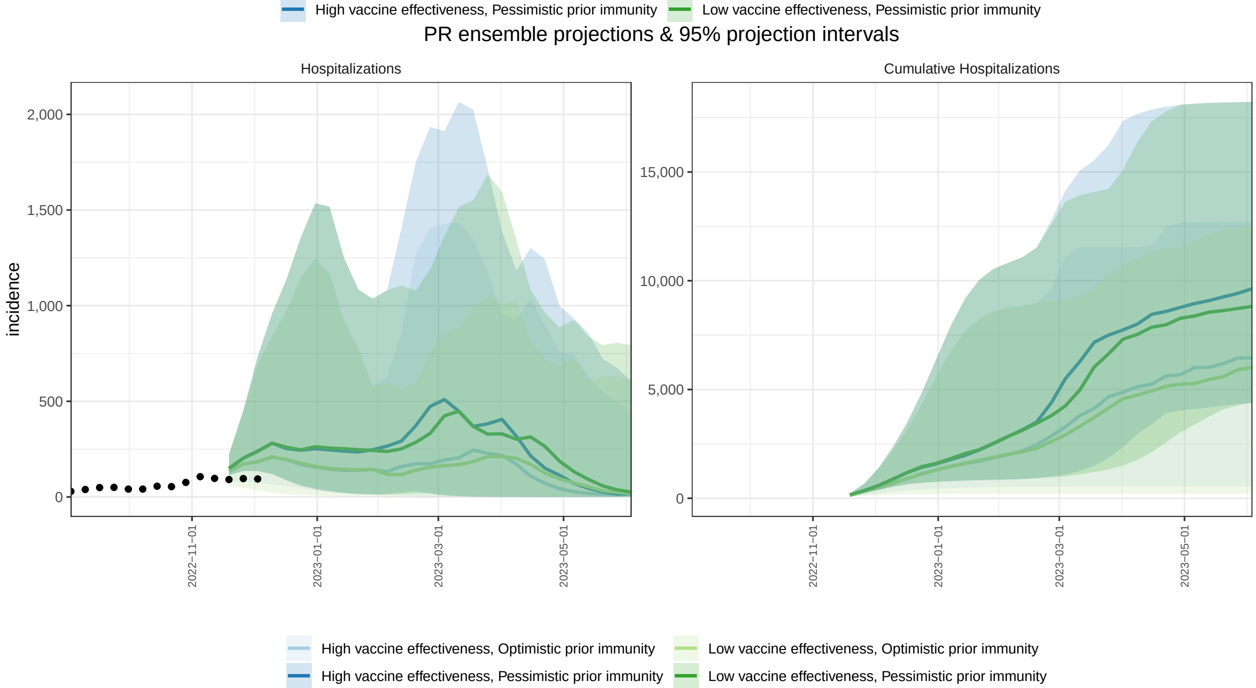

VA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


WA ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity


WV ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
200
400
600
0
3,000
6,000
9,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

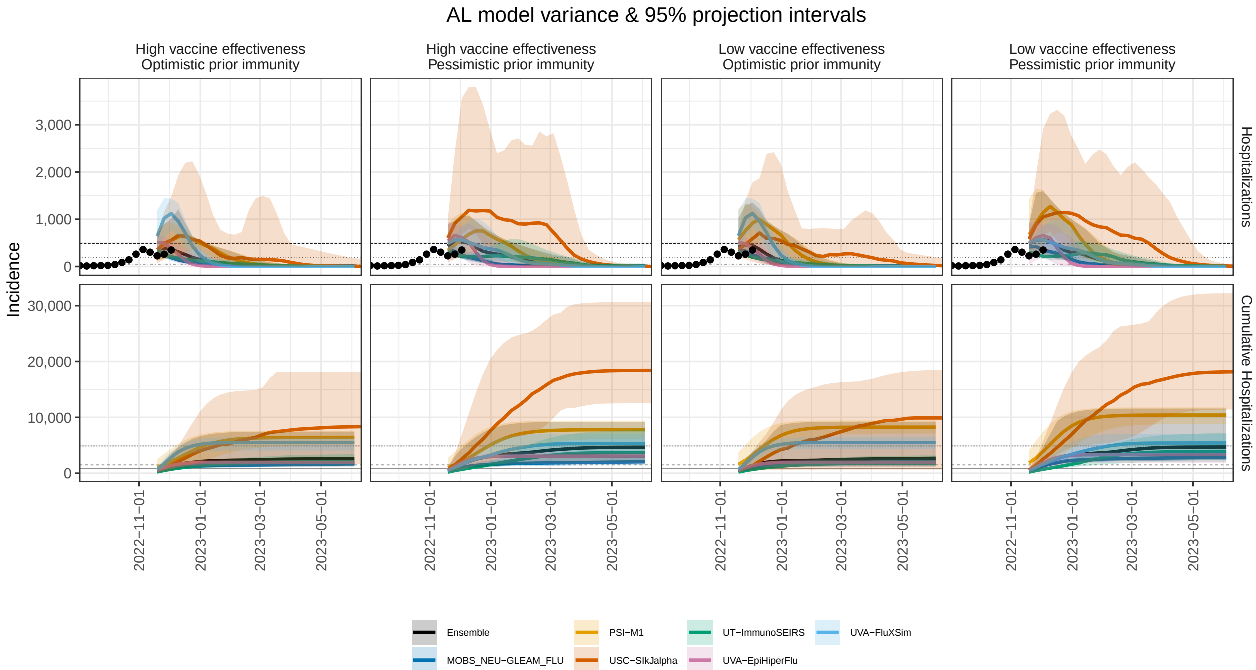

WI ensemble projections & 95% projection intervals
Hospitalizations
Cumulative Hospitalizations
incidence
0
500
1,000
0
2,500
5,000
7,500
10,000
2022-11-01
2023-01-01
2023-03-01
2023-05-01
High vaccine effectiveness, Optimistic prior immunity
High vaccine effectiveness, Pessimistic prior immunity
Low vaccine effectiveness, Optimistic prior immunity
Low vaccine effectiveness, Pessimistic prior immunity

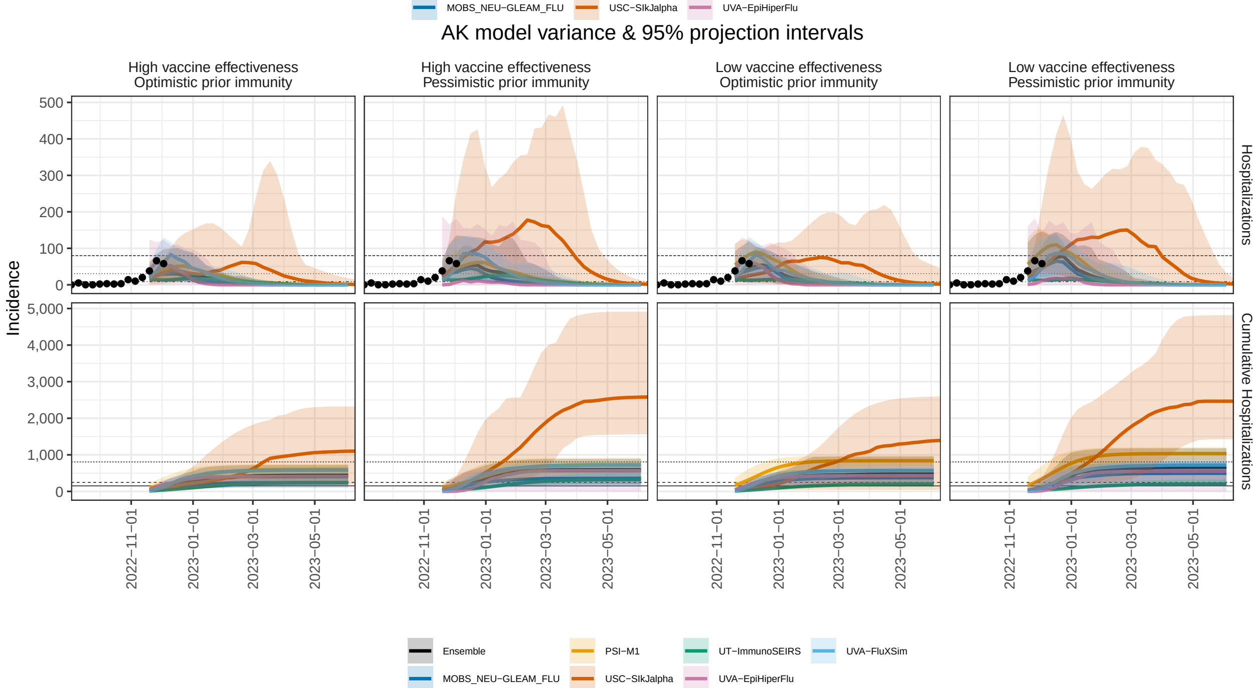


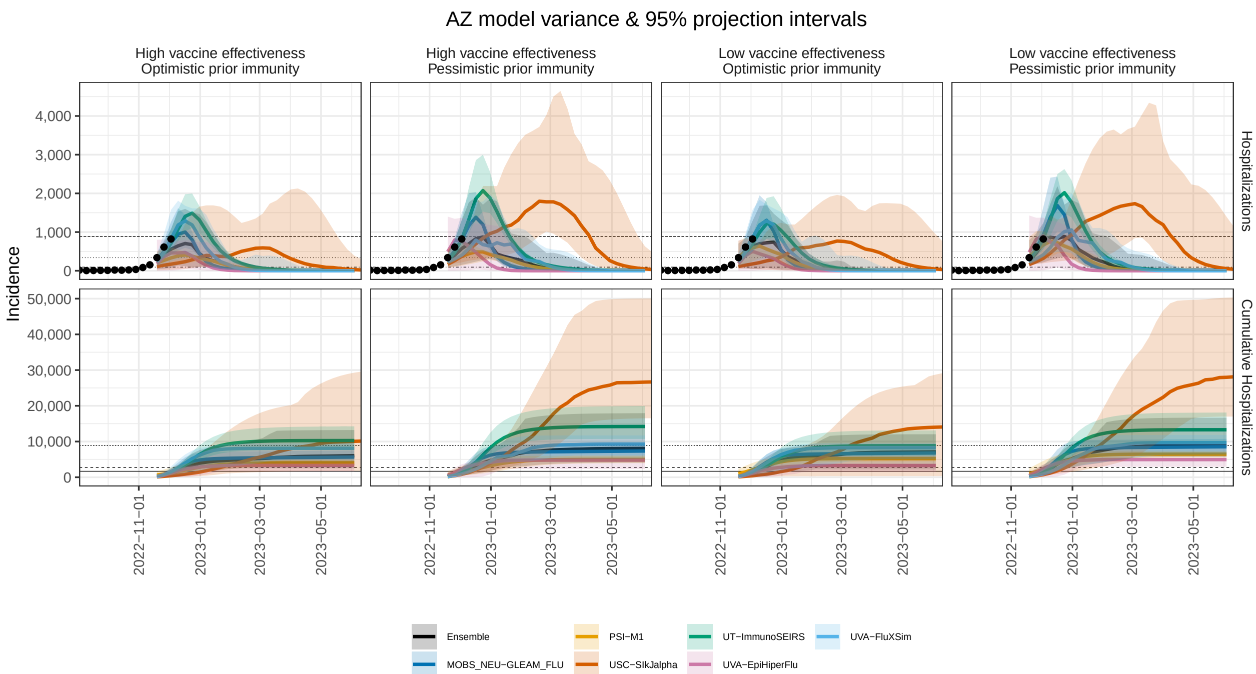


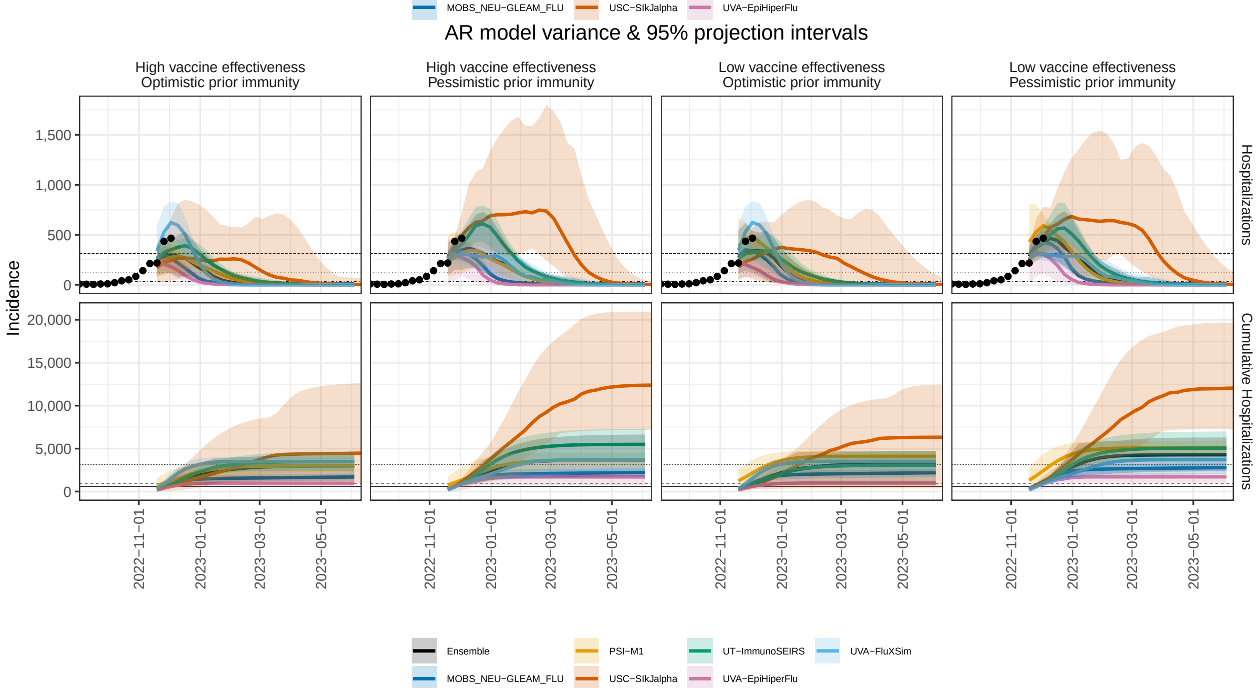
State-level model variation

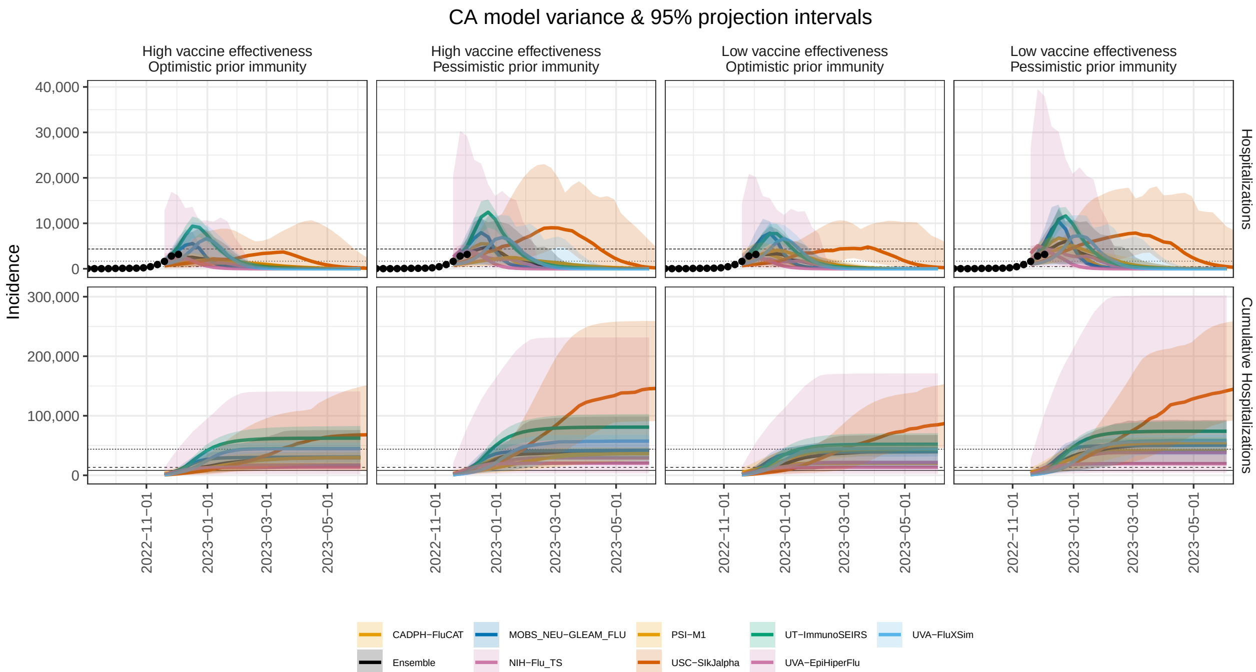
National model variation for all scenarios.


AL model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
3,000
2,000
1,000
0
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

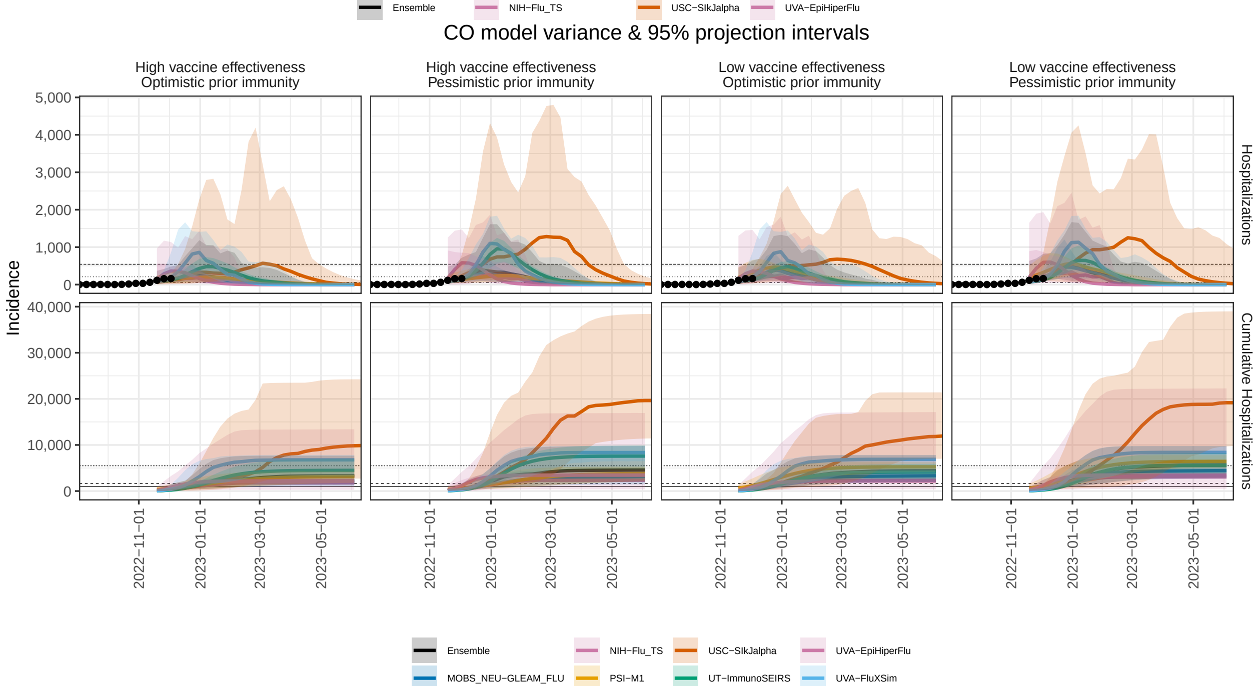

AK model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
500
400
300
200
100
0
5,000
4,000
3,000
2,000
1,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


AZ model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
4,000
3,000
2,000
1,000
0
50,000
40,000
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

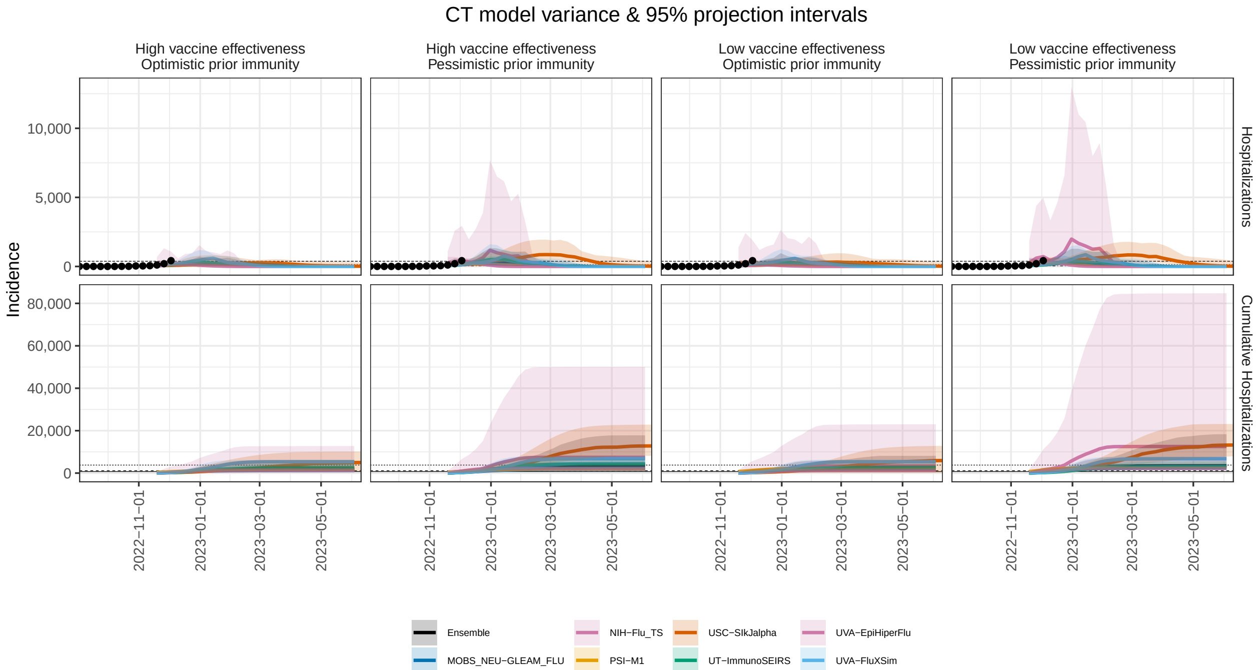

AR model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
1,500
1,000
500
0
20,000
15,000
10,000
5,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

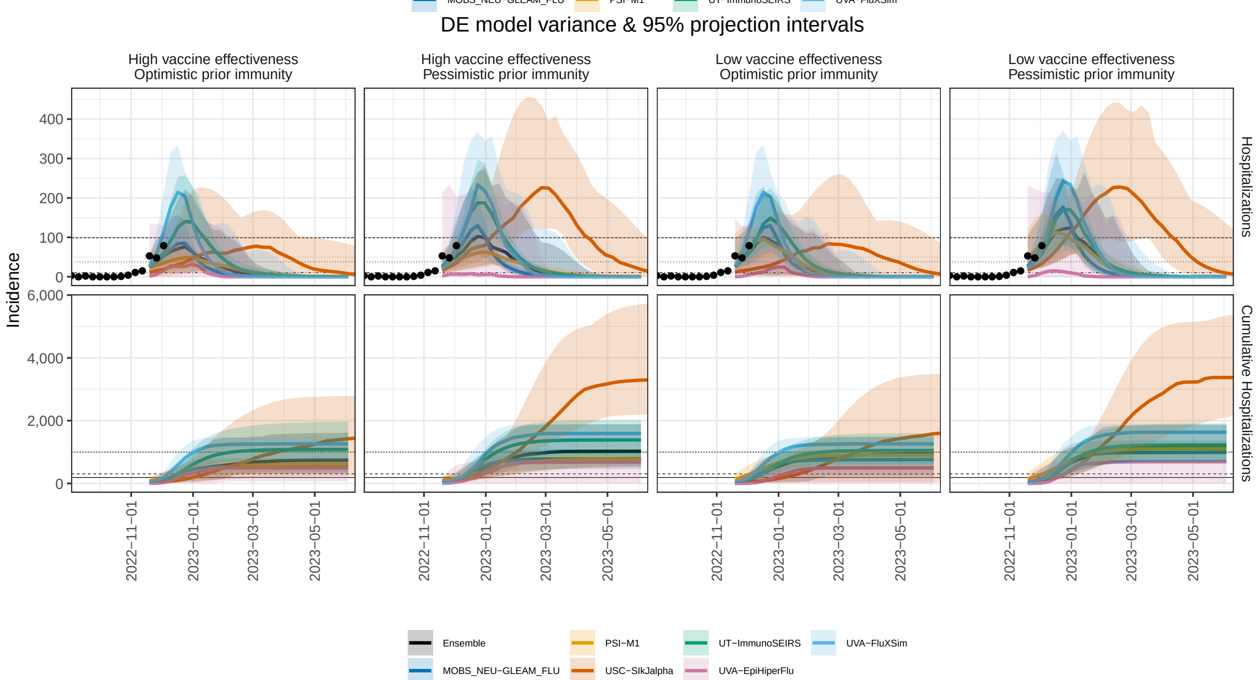


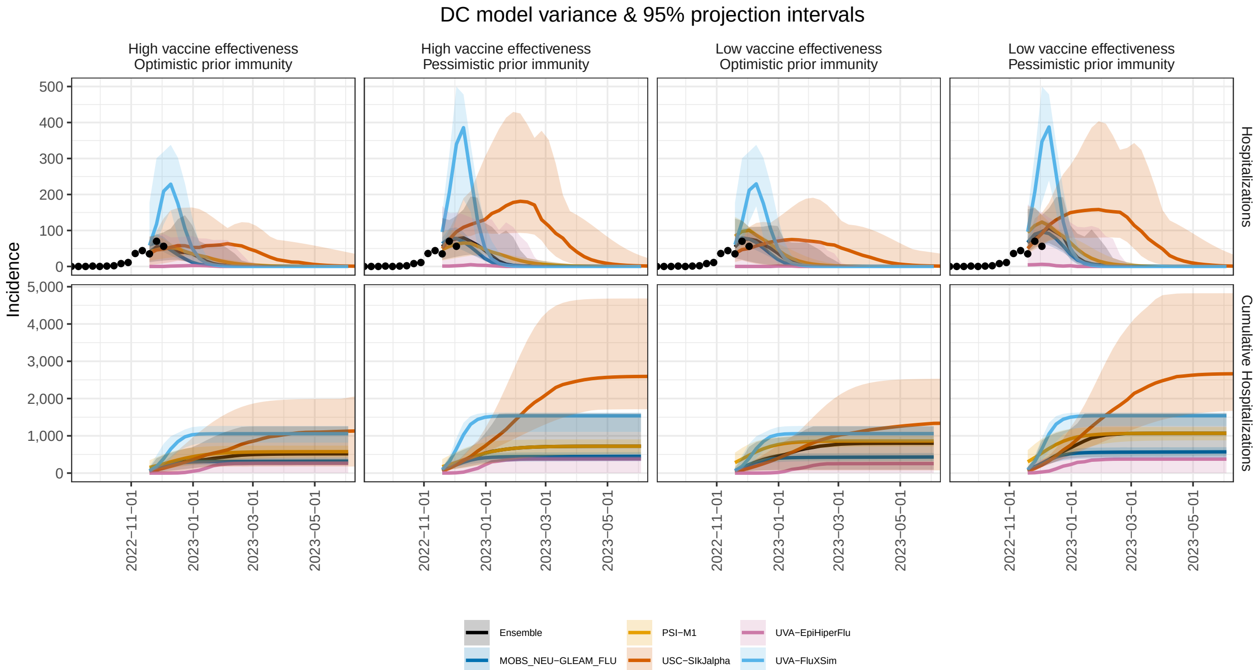
CA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
40,000
30,000
20,000
10,000
0
300,000
200,000
100,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
CADPH−FluCAT
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

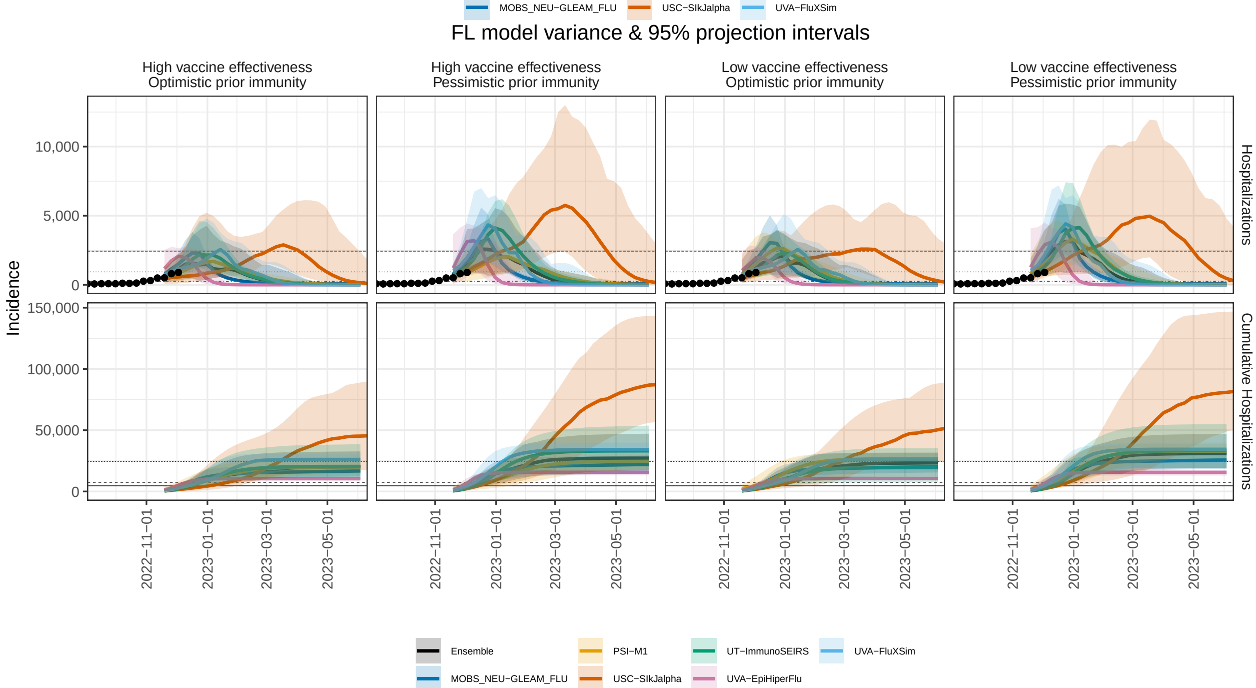


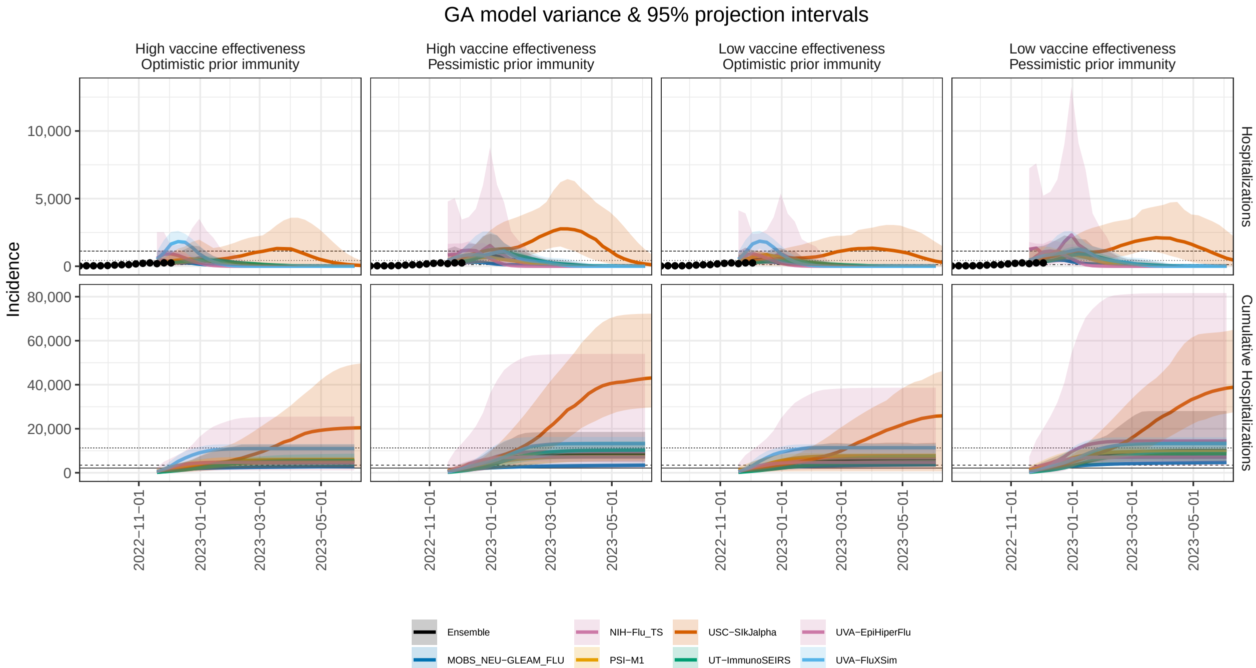
CO model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
5,000
4,000
3,000
2,000
1,000
0
40,000
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


CT model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
10,000
5,000
0
80,000
60,000
40,000
20,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

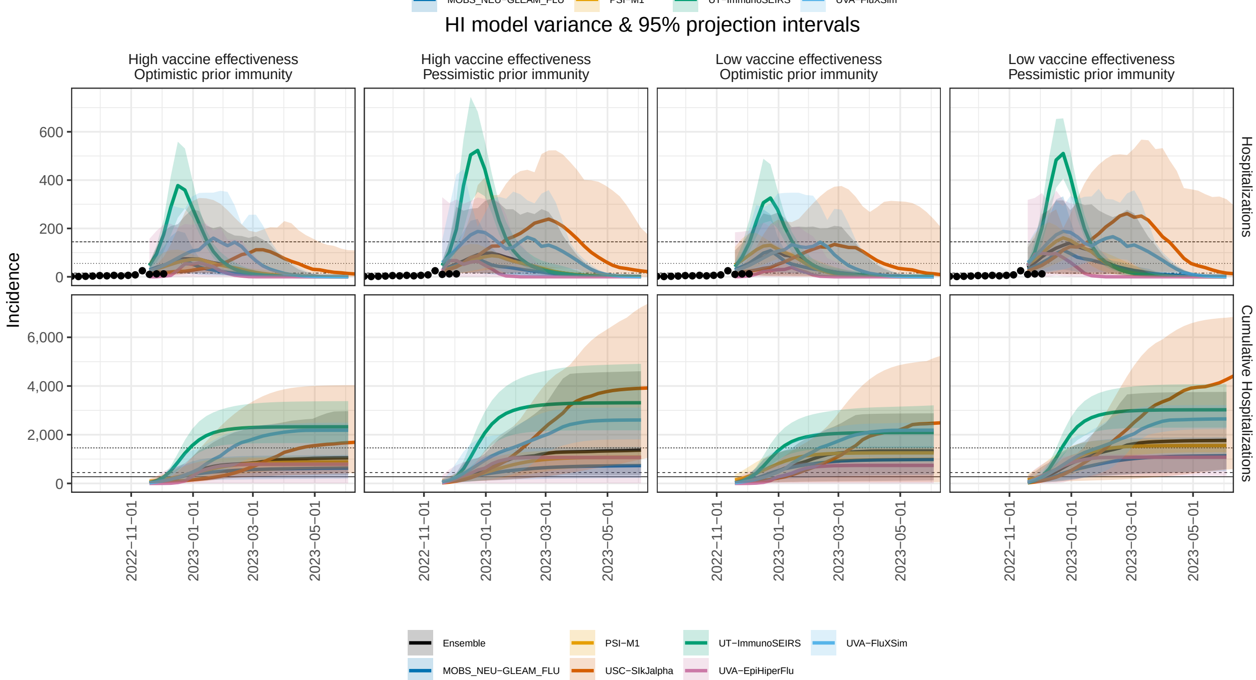

DE model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
400
300
200
100
0
6,000
4,000
2,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


DC model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UVA−EpiHiperFlu
UVA−FluXSim

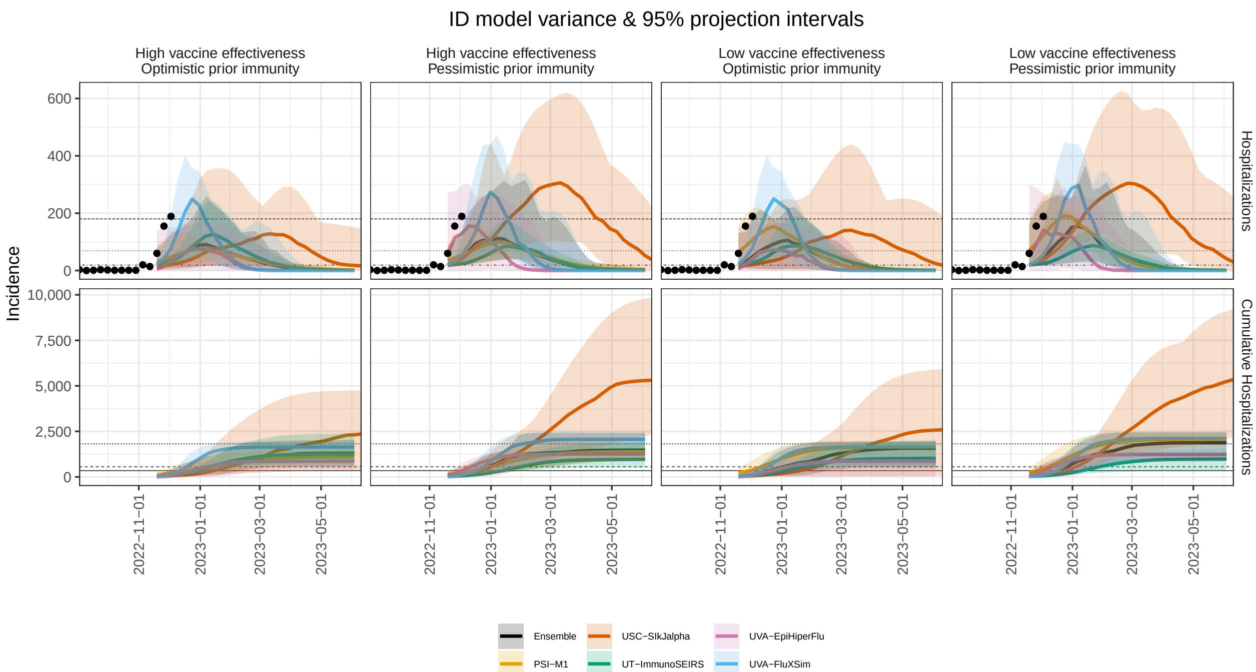

FL model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

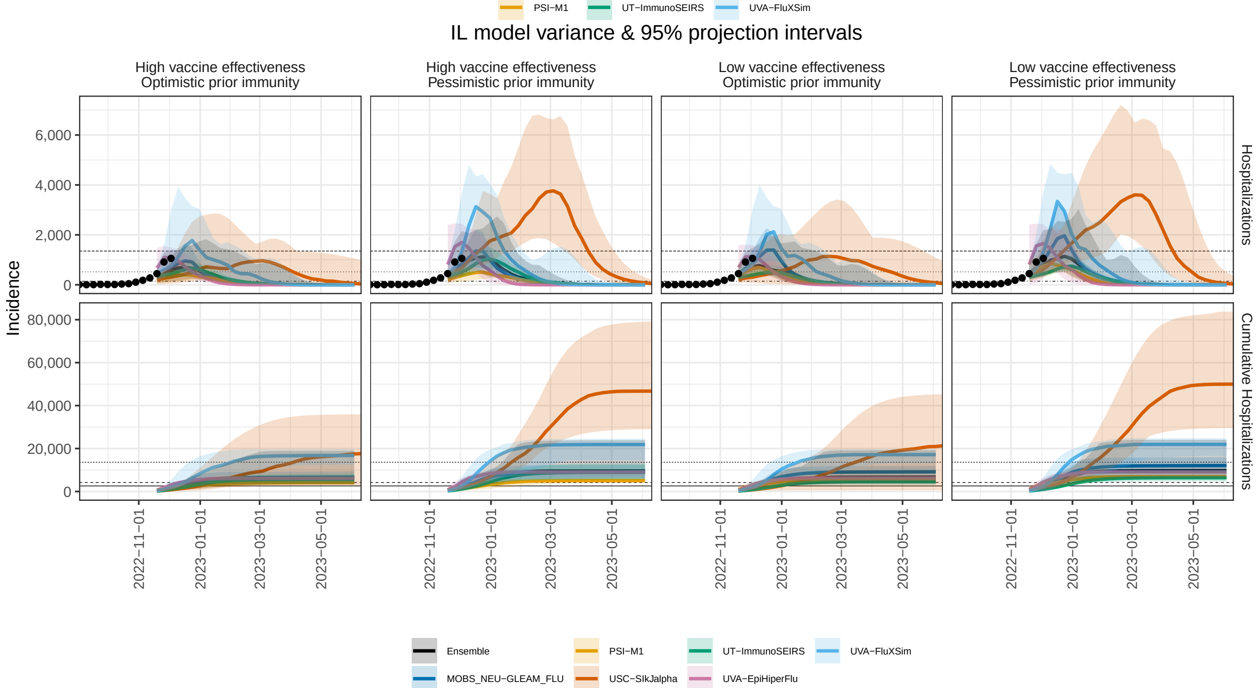


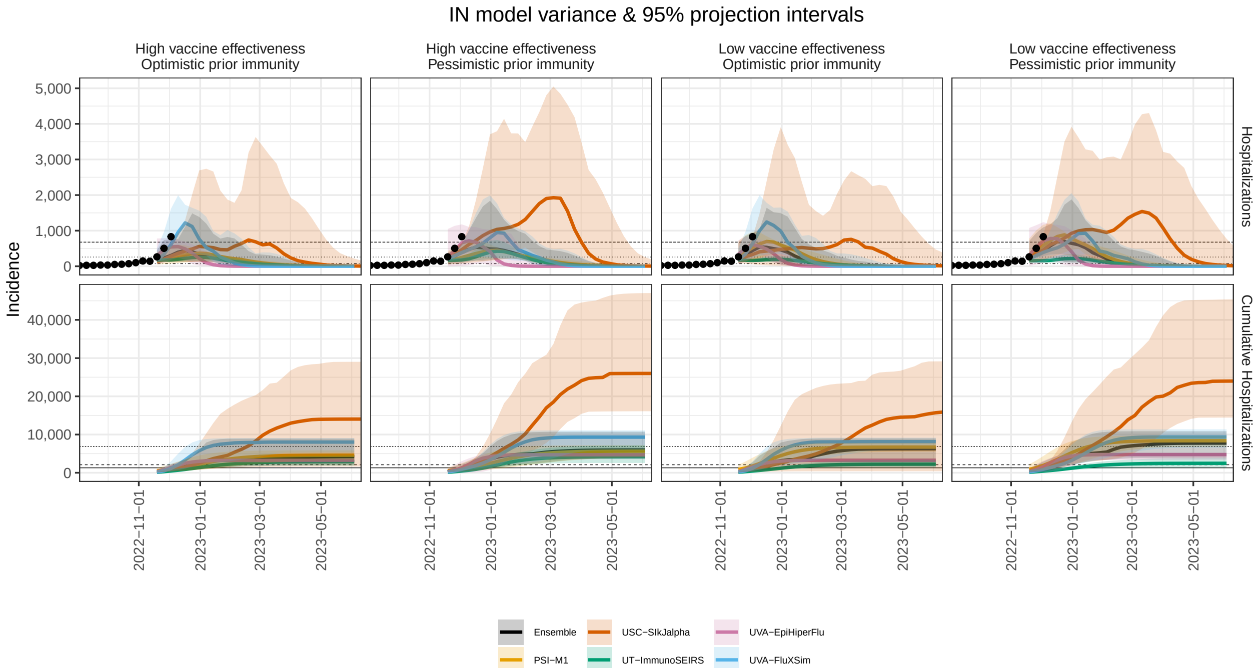
GA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

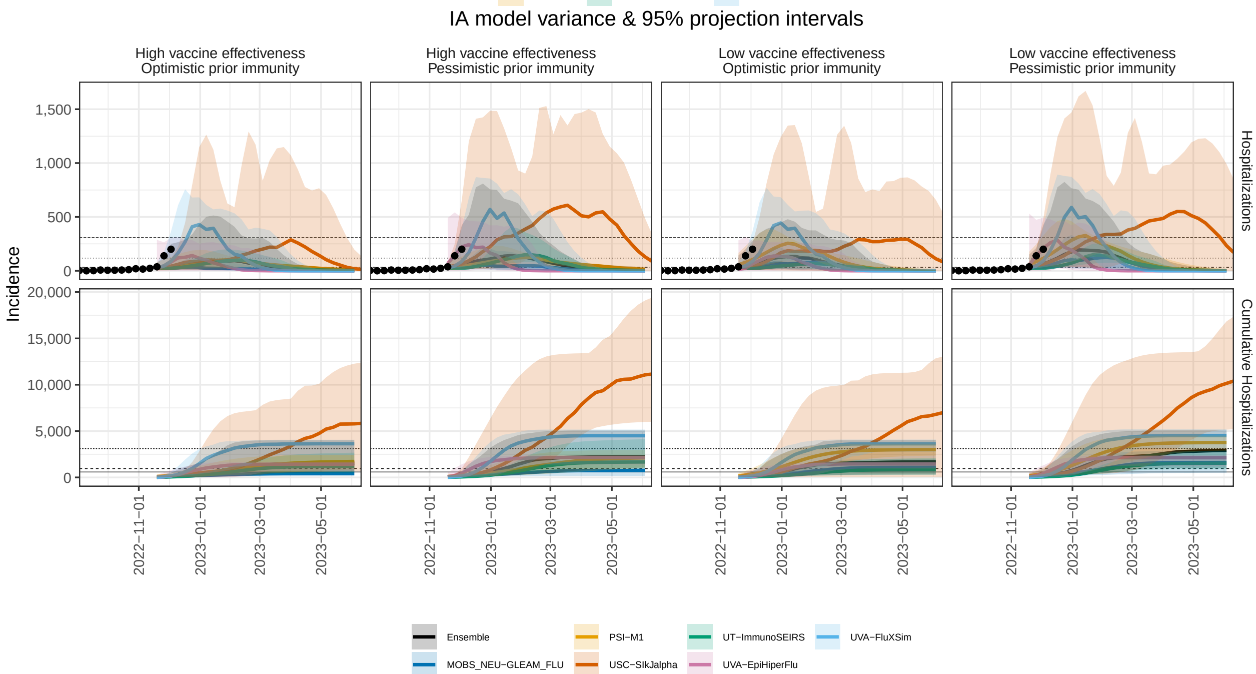


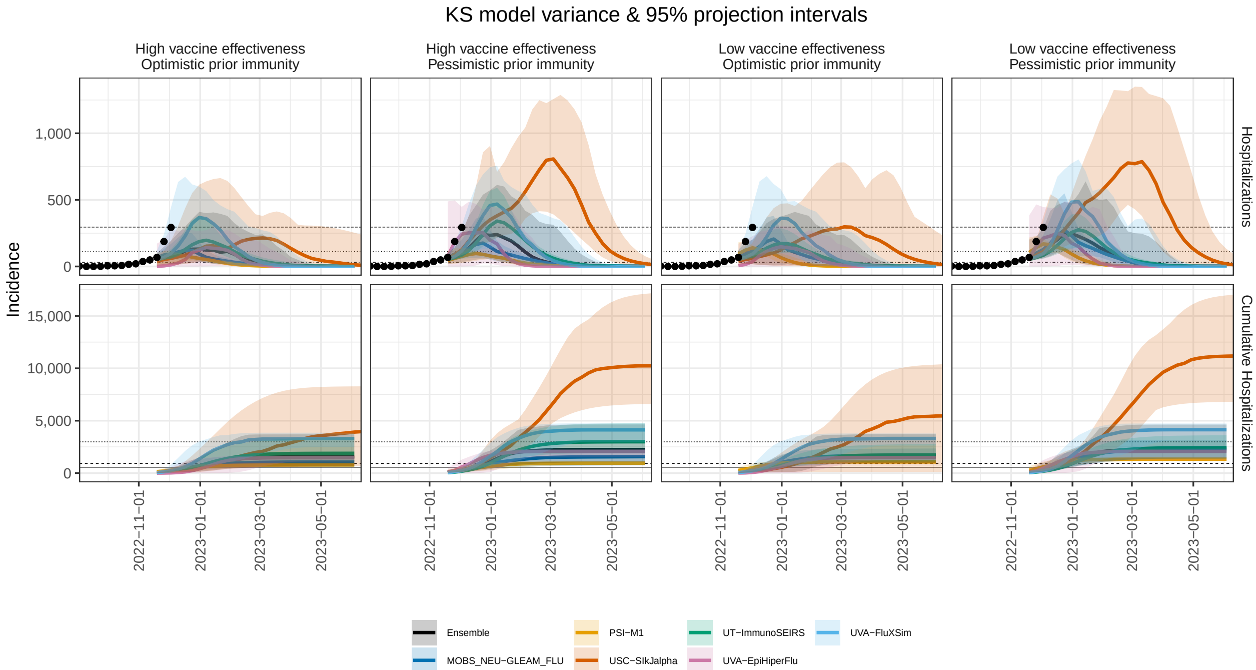
HI model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

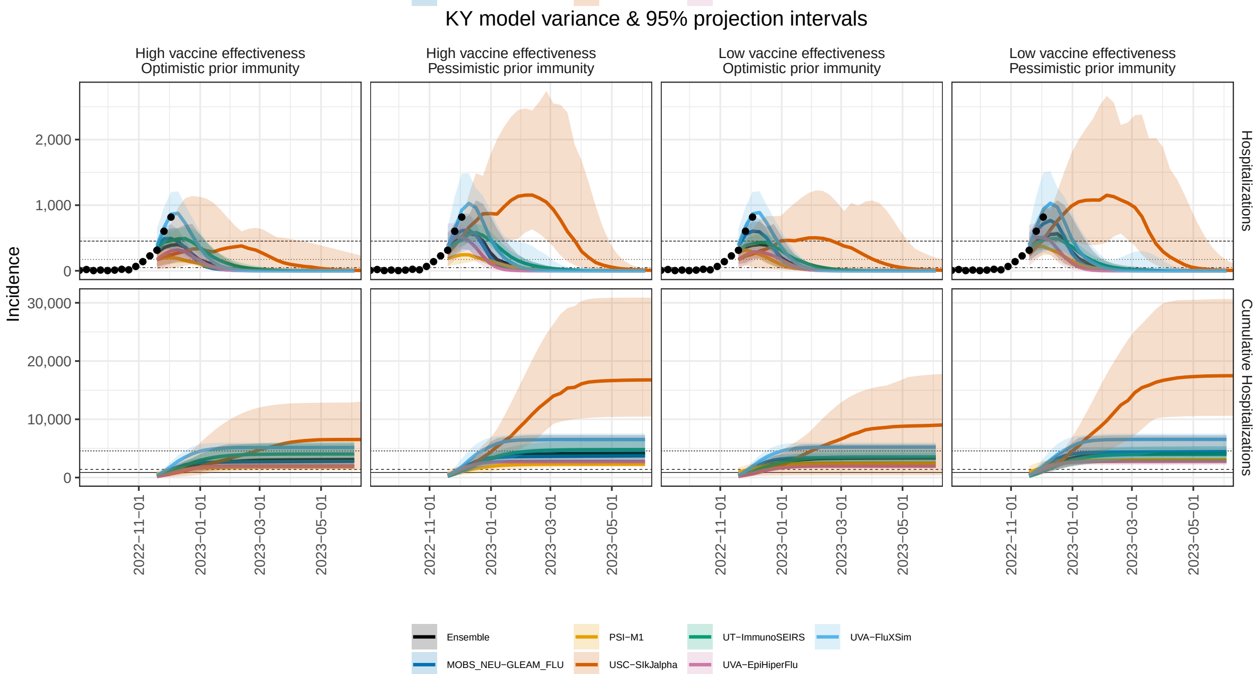

ID model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
200
400
600
2,500
5,000
7,500
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
USC−SIkJalpha
UVA−EpiHiperFlu
PSI−M1
UT−ImmunoSEIRS
UVA−FluXSim

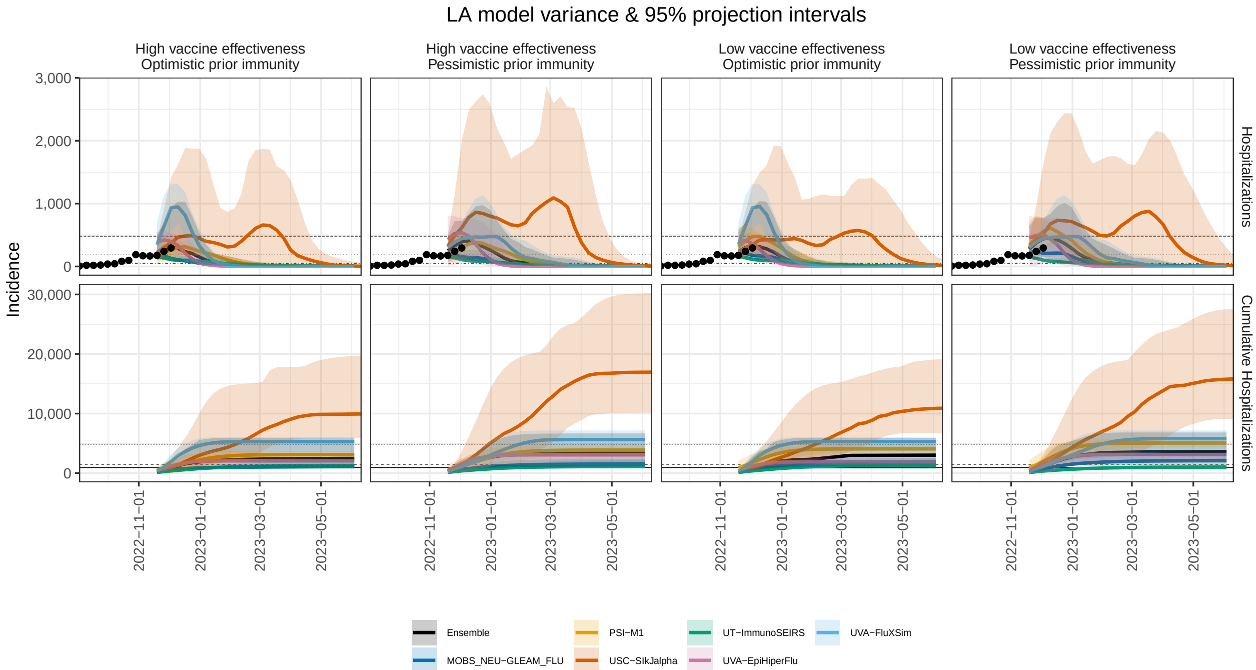

IL model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
2,000
4,000
6,000
20,000
40,000
60,000
80,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
PSI−M1
UT−ImmunoSEIRS
UVA−FluXSim
MOBS_NEU−GLEAM_FLU
USC−SIkJalpha
UVA−EpiHiperFlu


IN model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

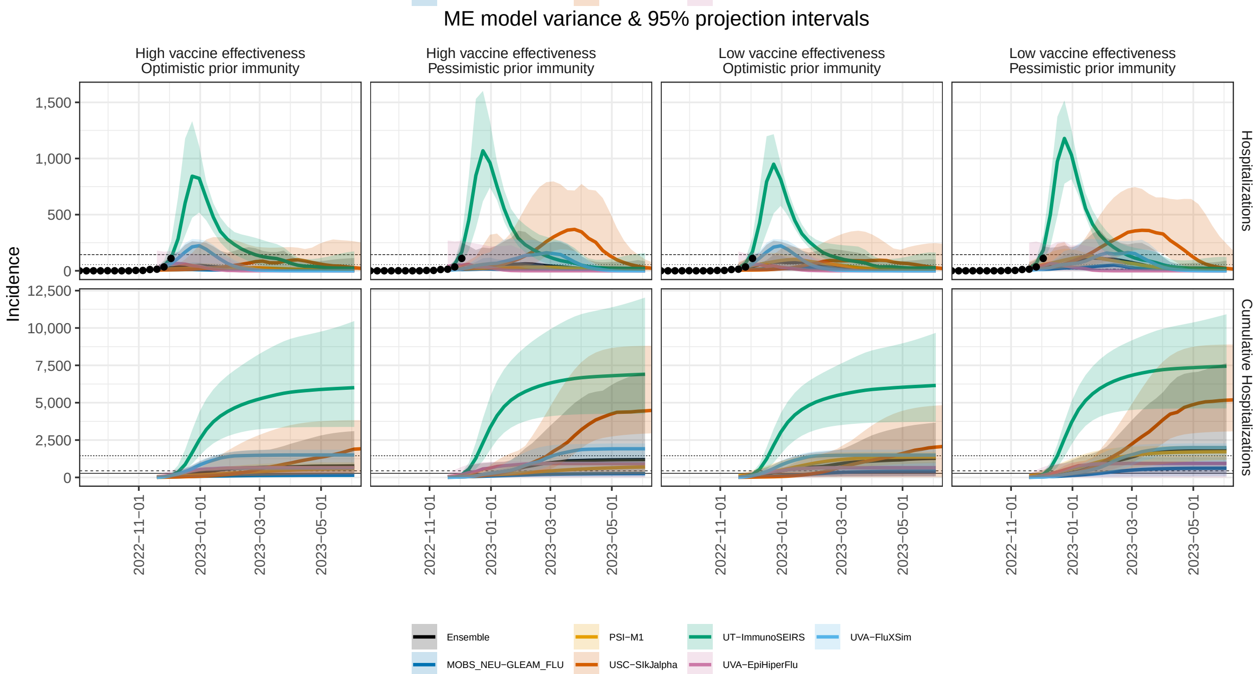

IA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


KS model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
0
500
1,000
5,000
10,000
15,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

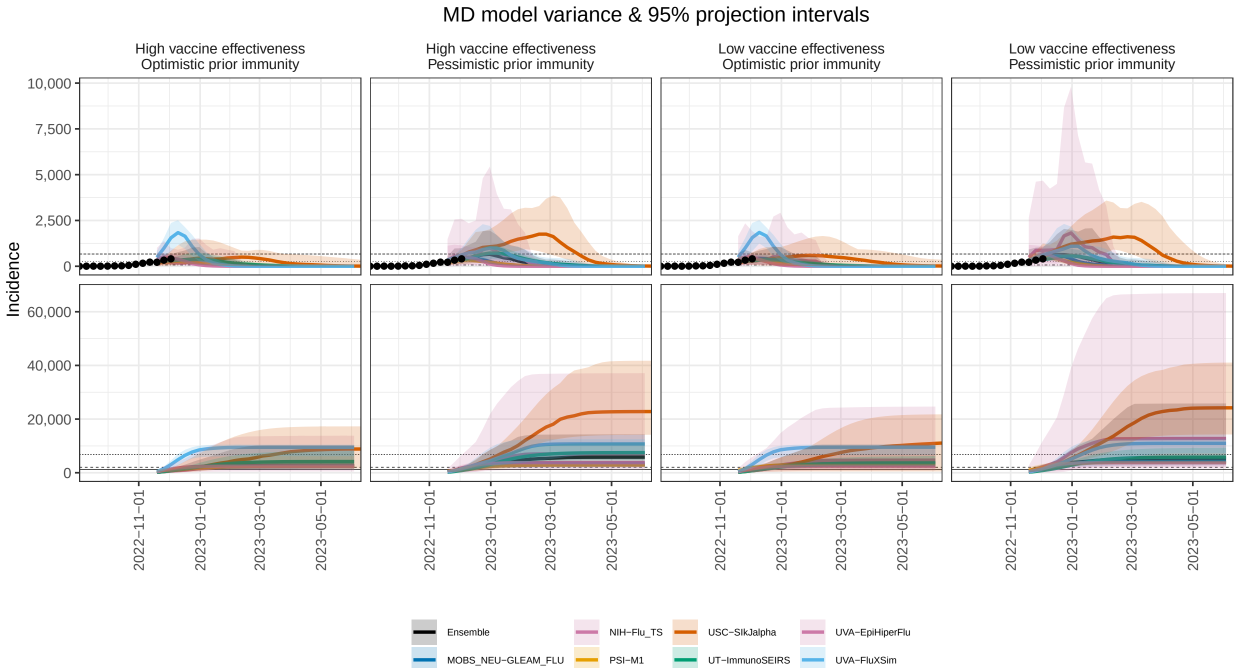

KY model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
0
1,000
2,000
10,000
20,000
30,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

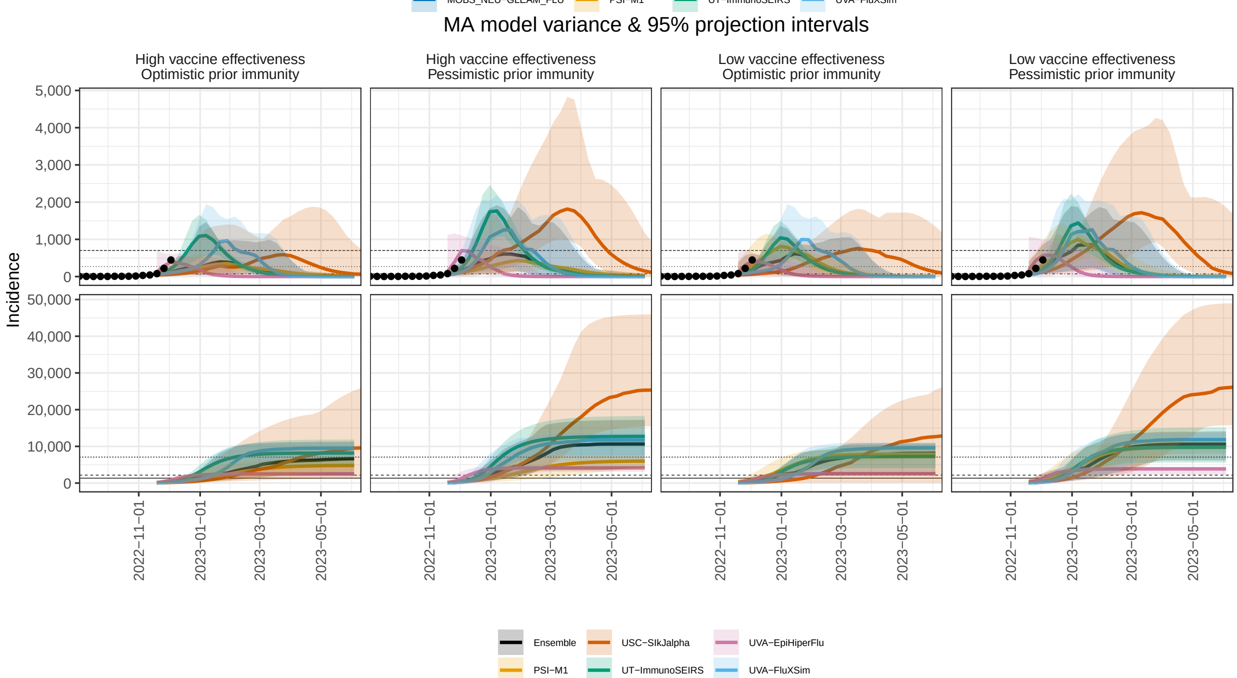


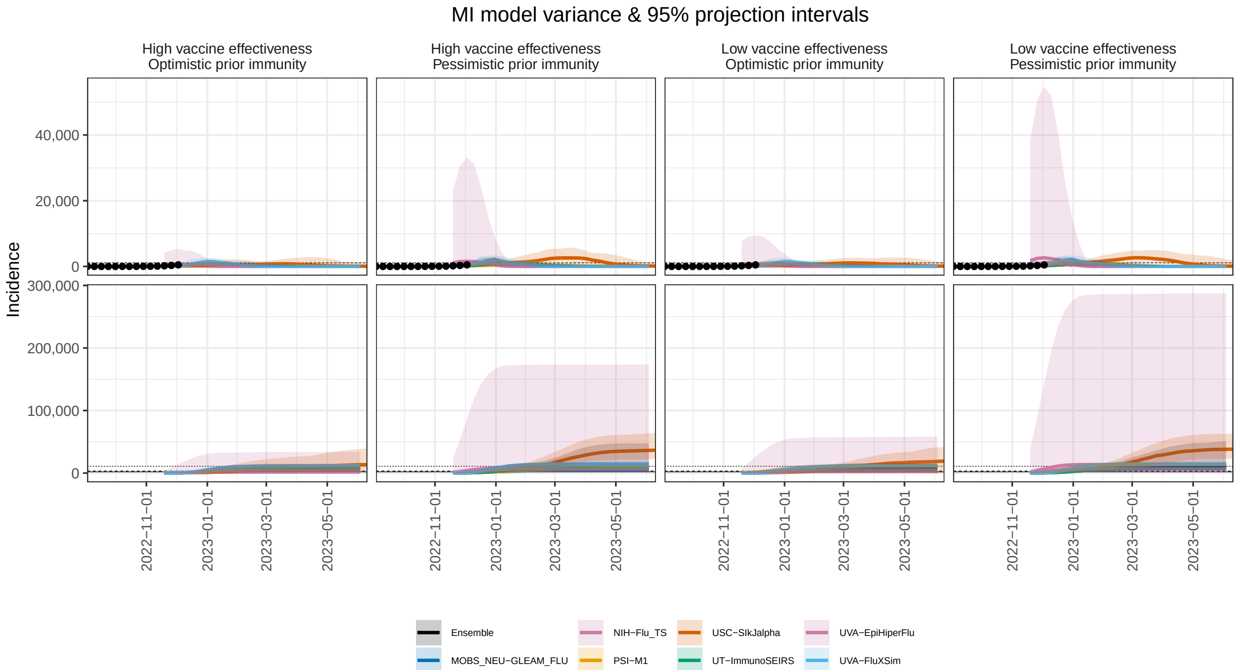
LA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
3,000
2,000
1,000
0
30,000
20,000
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

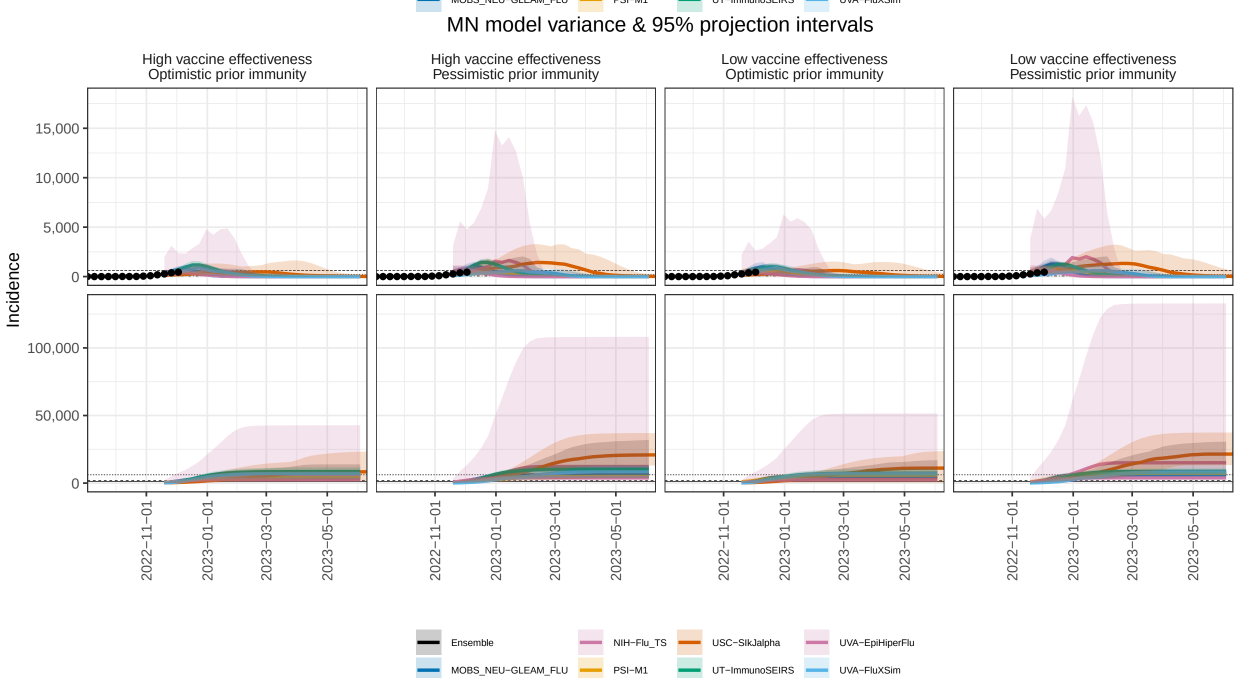


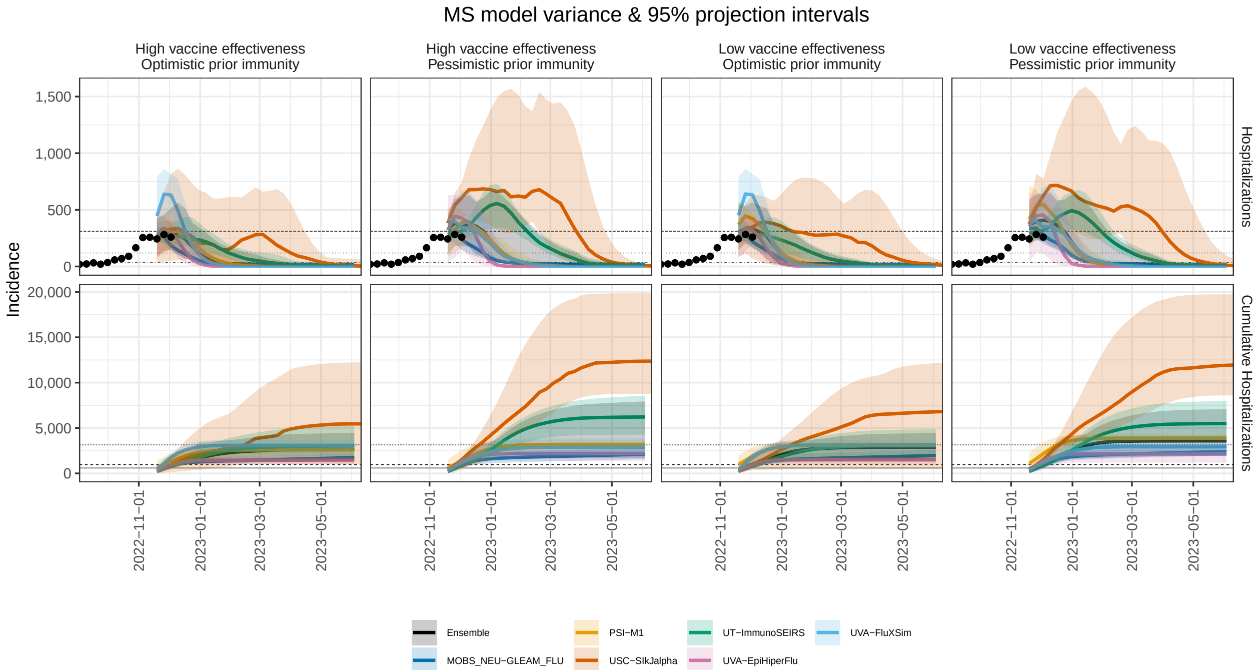
ME model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
1,500
1,000
500
0
12,500
10,000
7,500
5,000
2,500
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

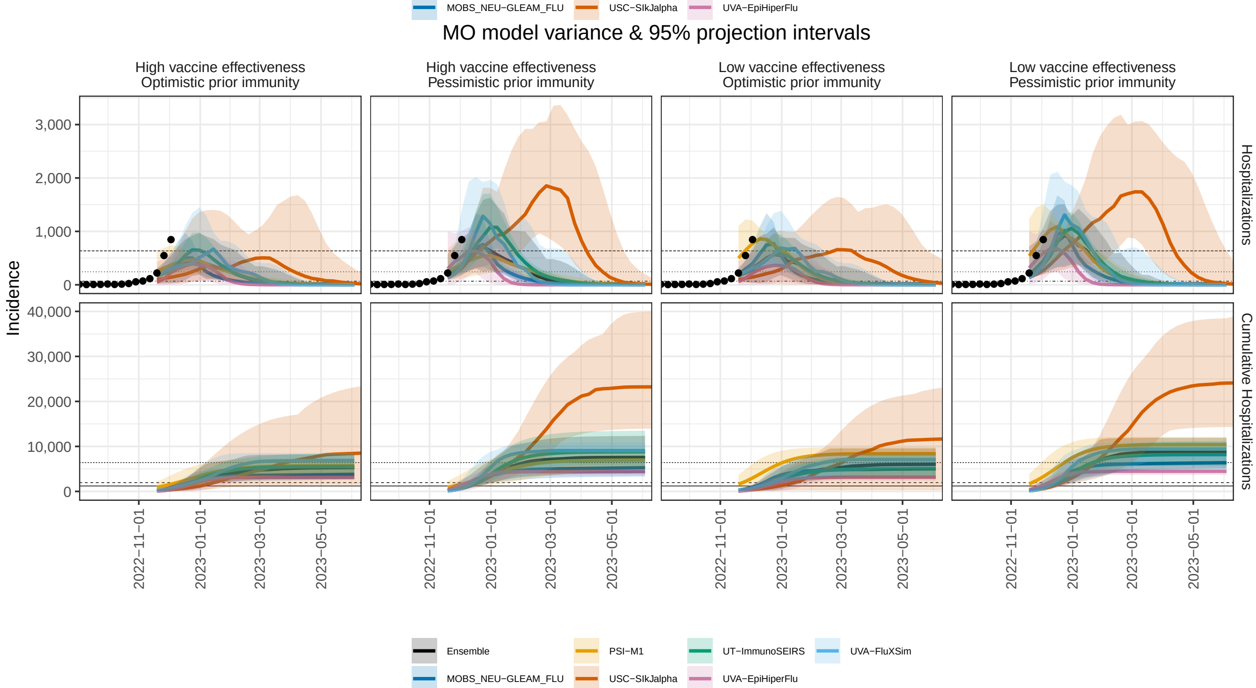

MD model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

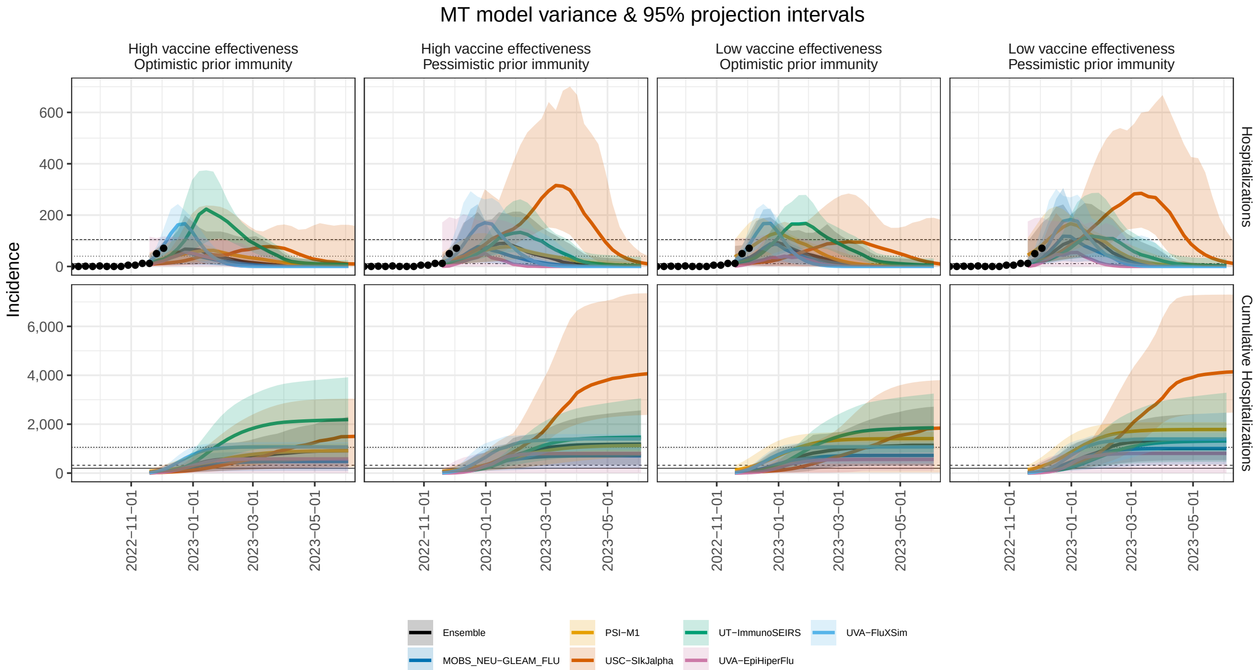

MA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

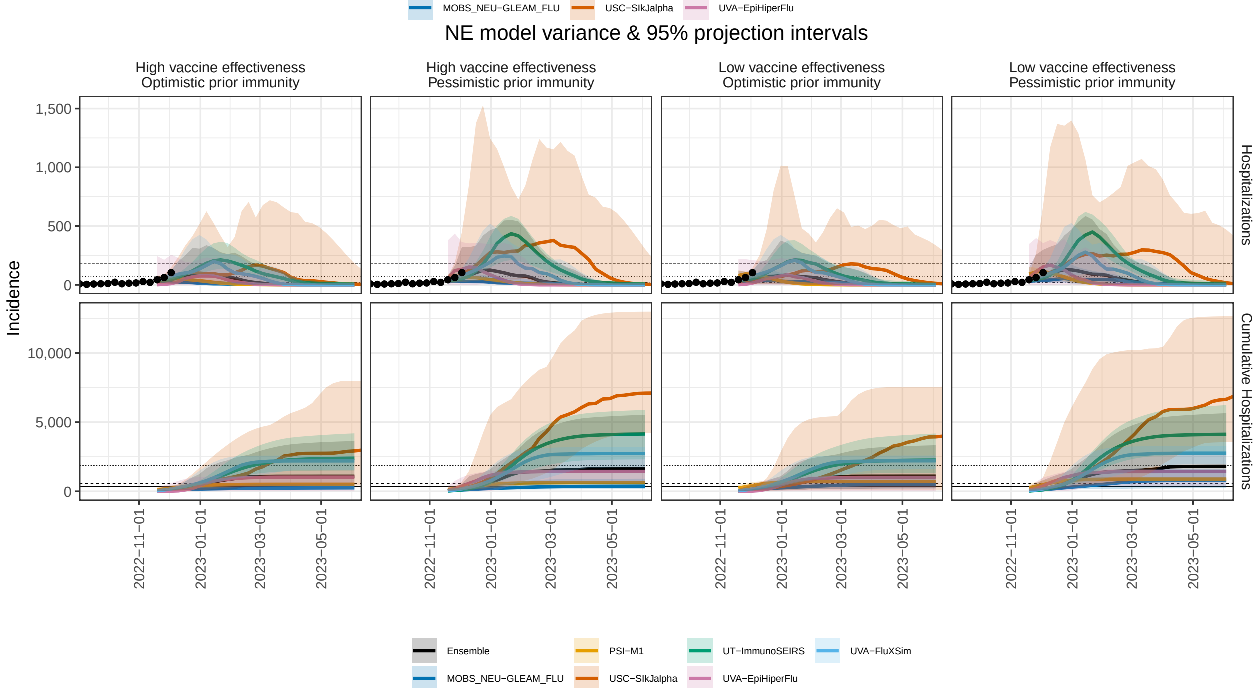

MI model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
40,000
20,000
0
300,000
200,000
100,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

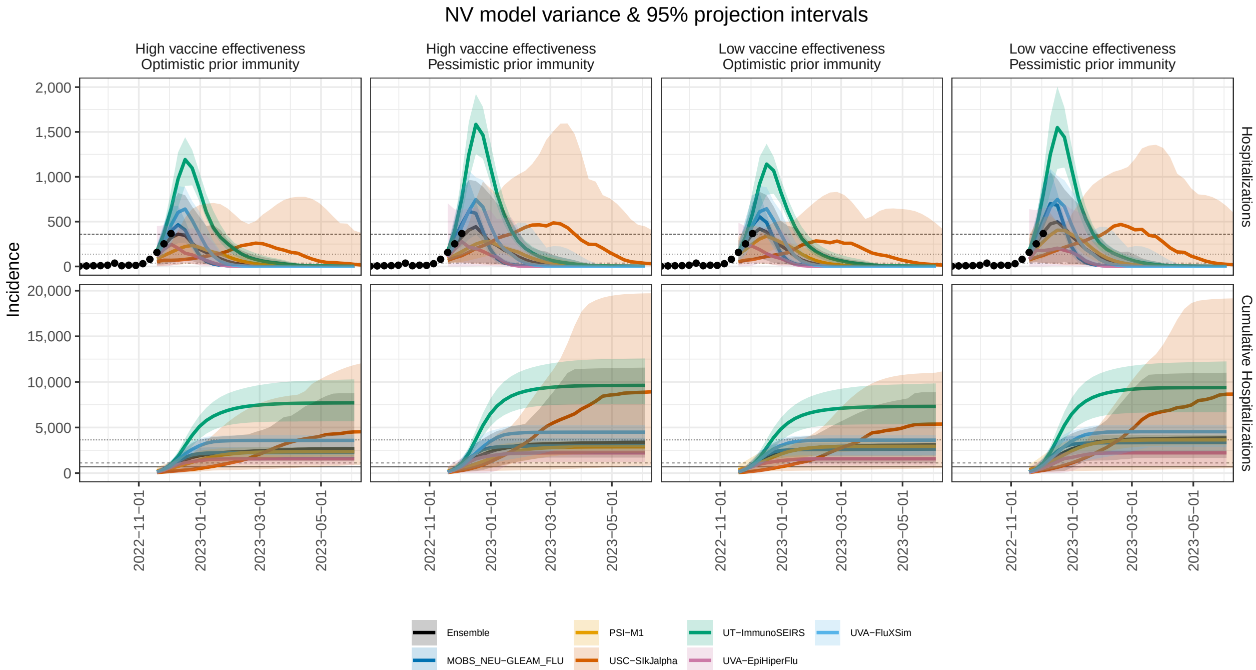

MN model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
15,000
10,000
5,000
0
100,000
50,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

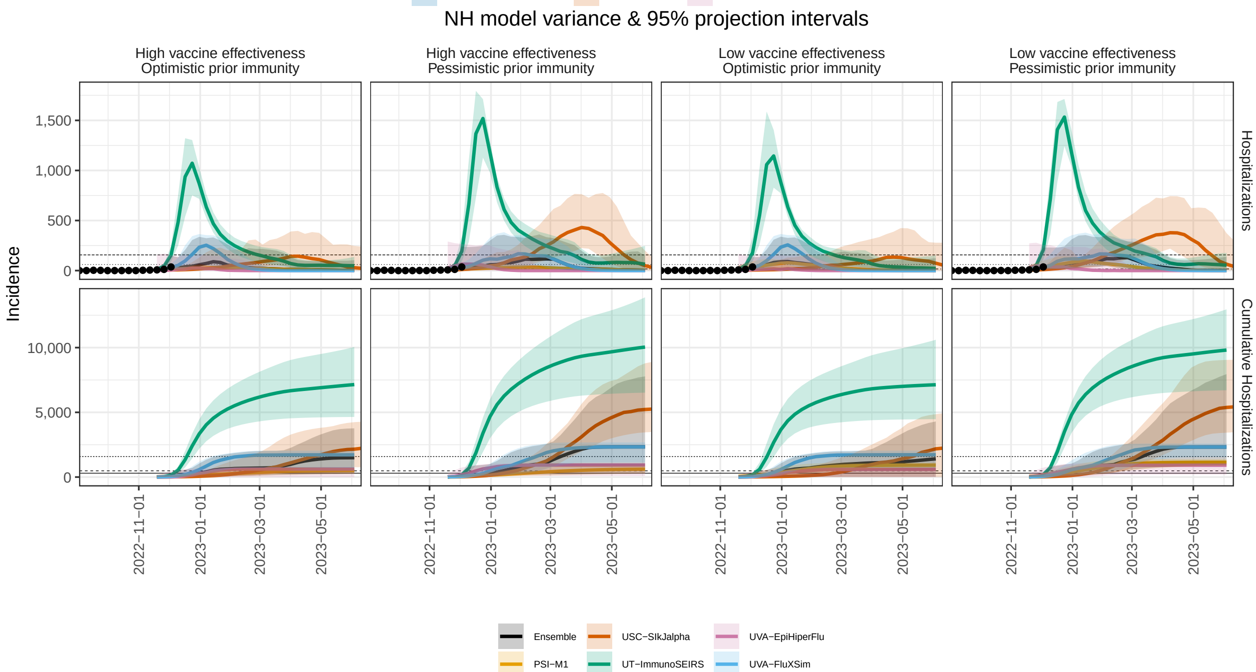

MS model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
1,500
1,000
500
0
20,000
15,000
10,000
5,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

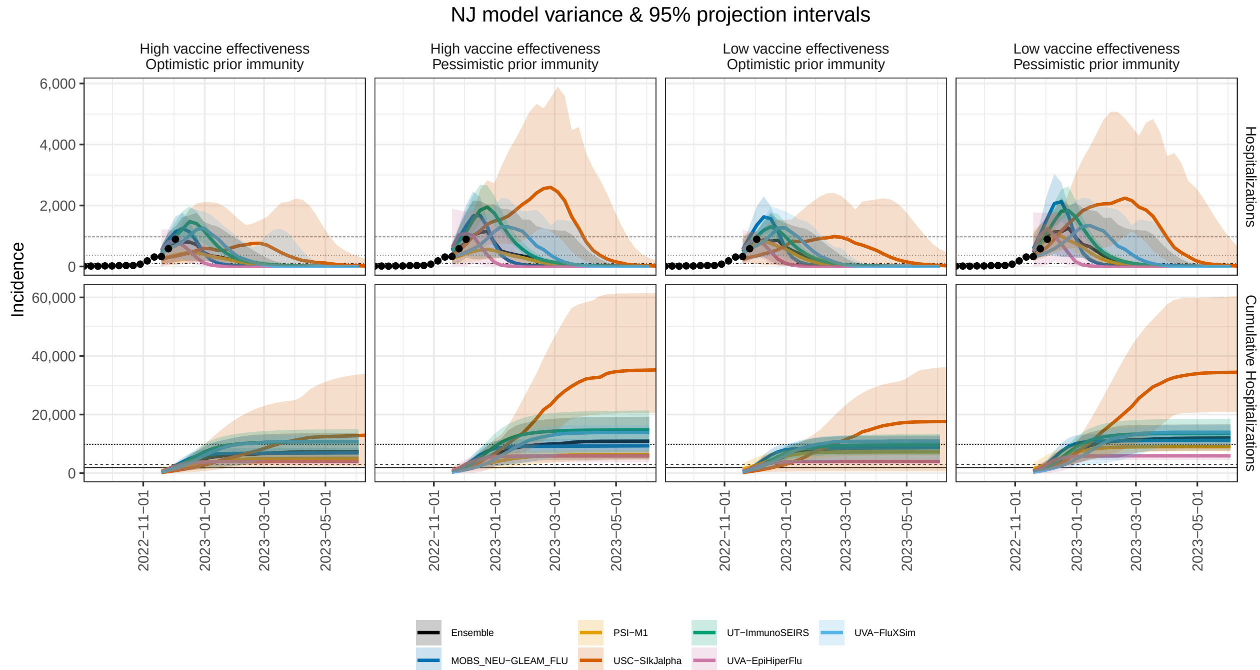

MO model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
3,000
2,000
1,000
0
40,000
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

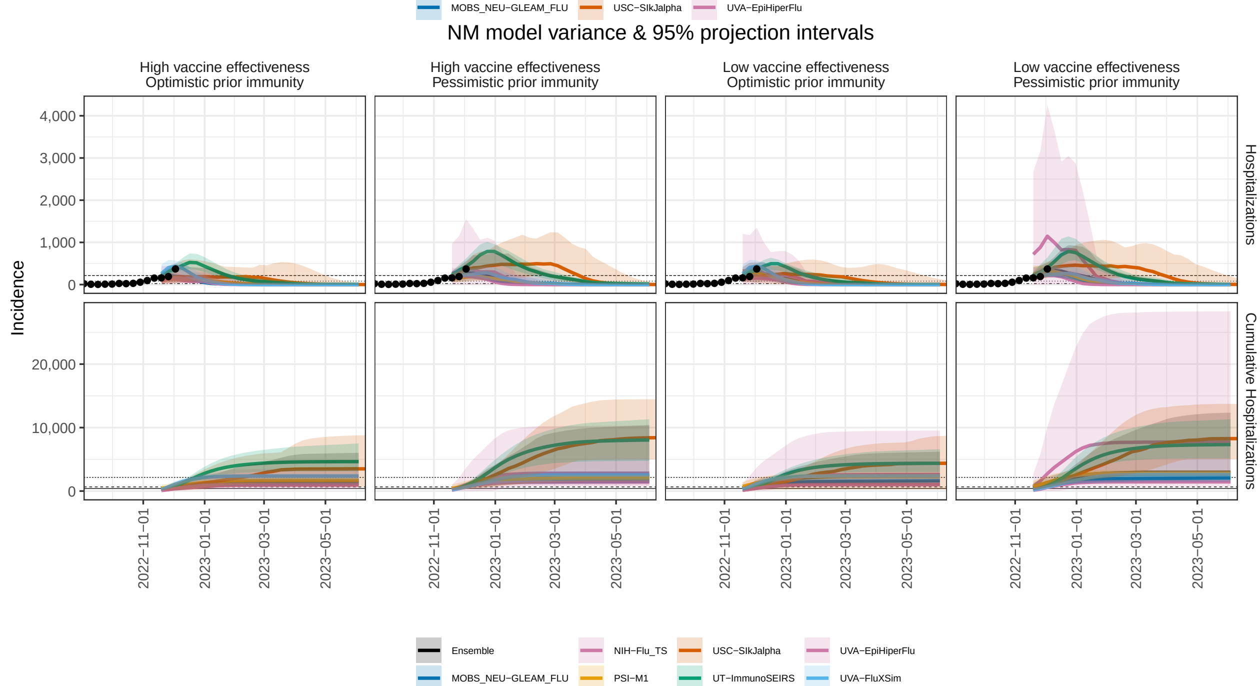

MT model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
200
400
600
2,000
4,000
6,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


NE model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
500
1,000
1,500
5,000
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

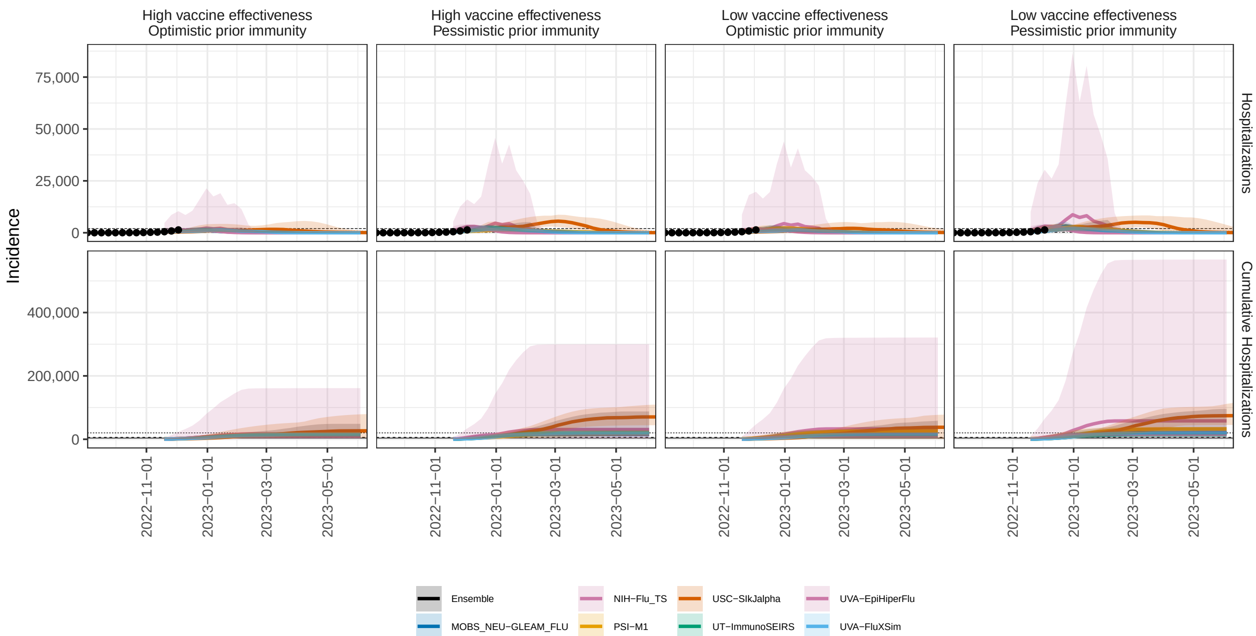

NV model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
500
1,000
1,500
2,000
5,000
10,000
15,000
20,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


NH model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
500
1,000
1,500
5,000
10,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

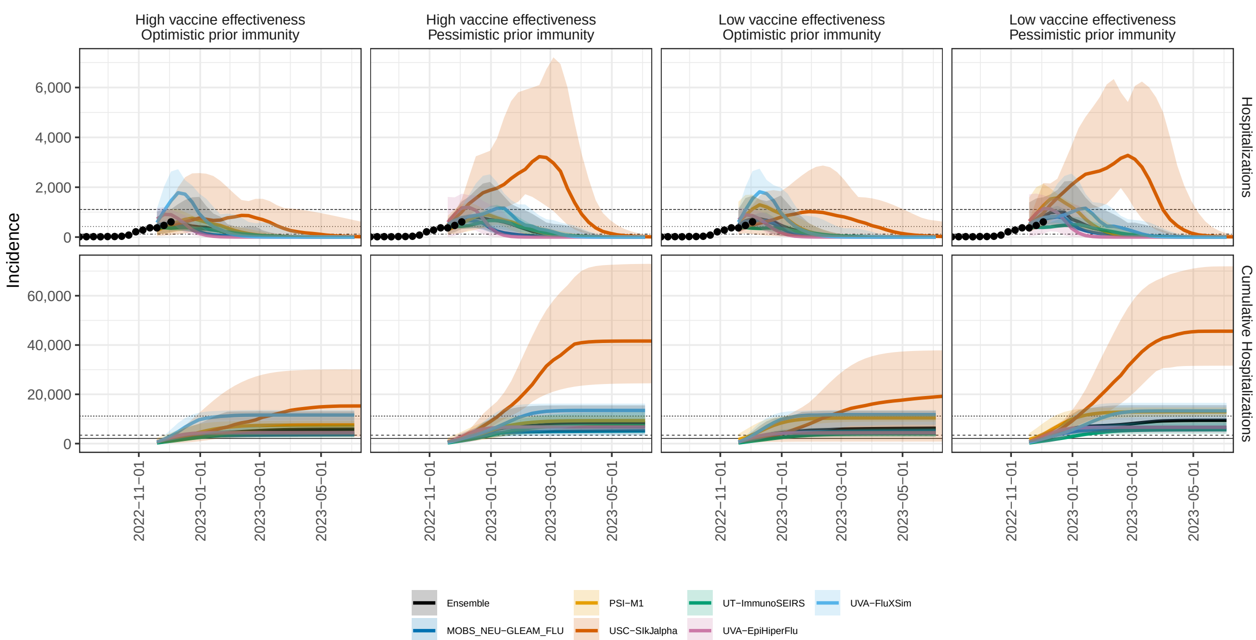

NJ model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
6,000
4,000
2,000
0
60,000
40,000
20,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

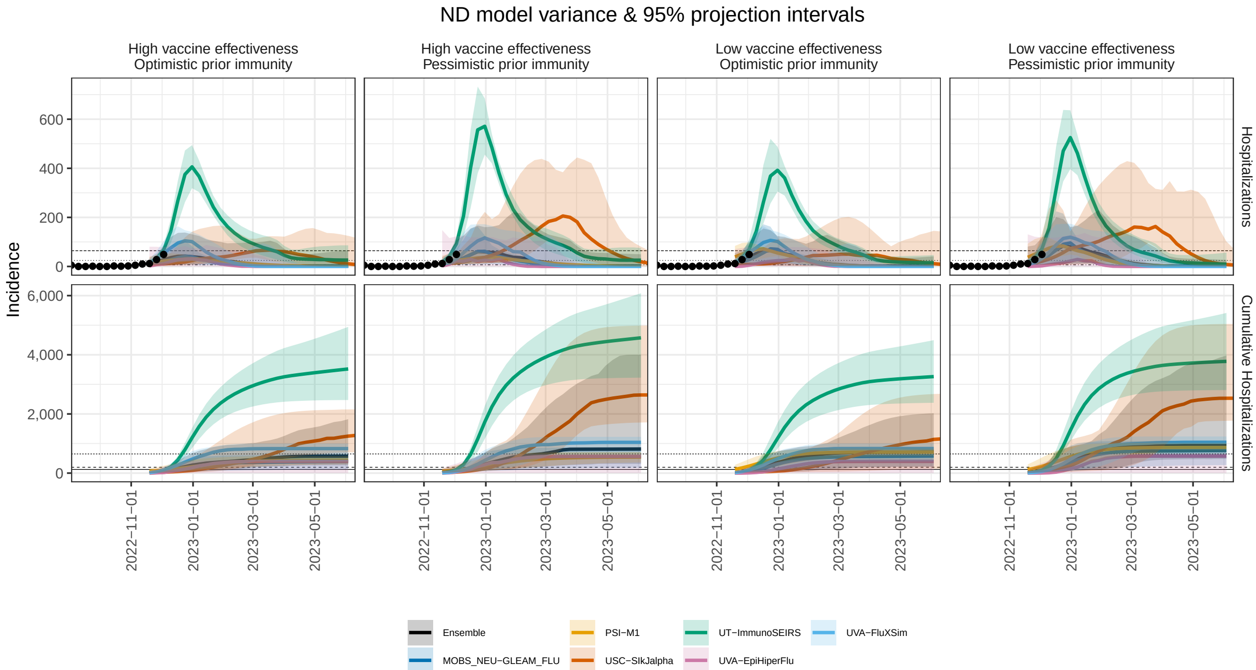

NM model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
4,000
3,000
2,000
1,000
0
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

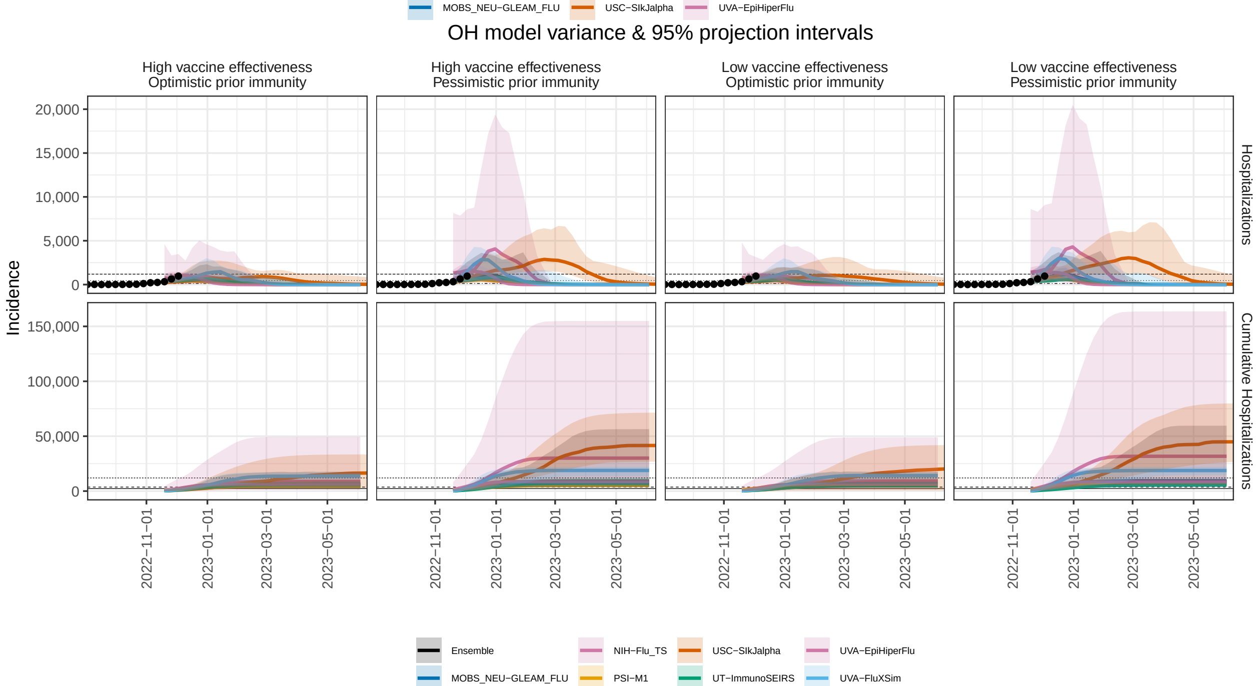
NY model variance & 95% projection intervals

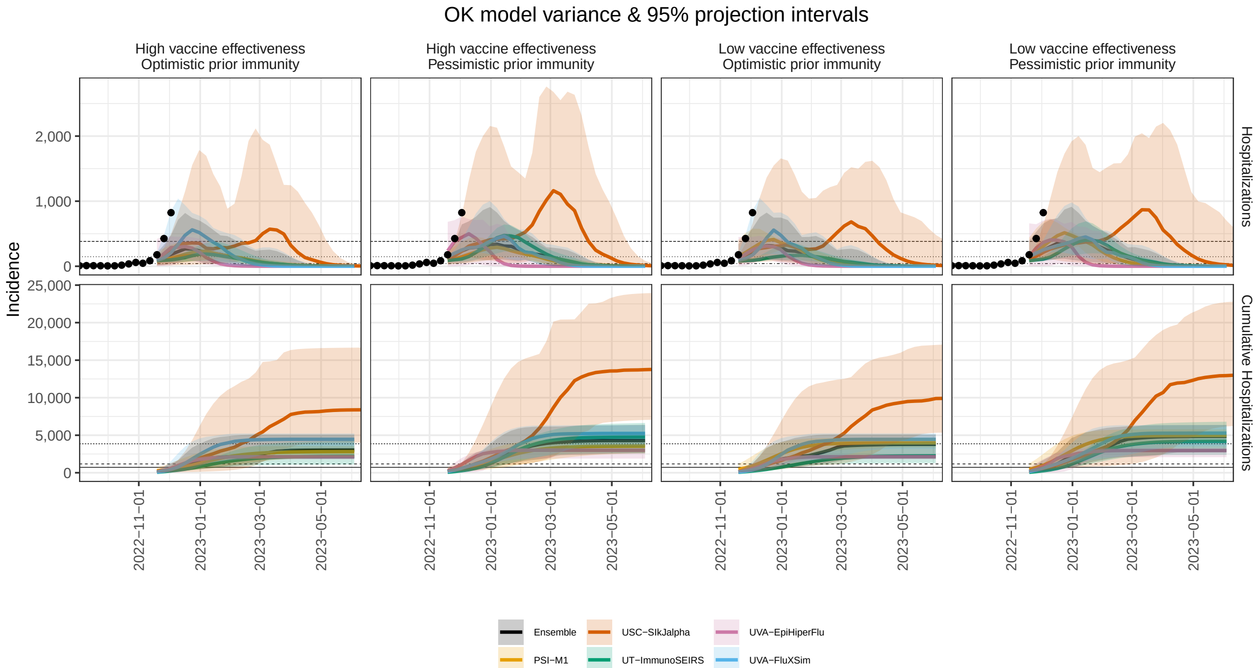


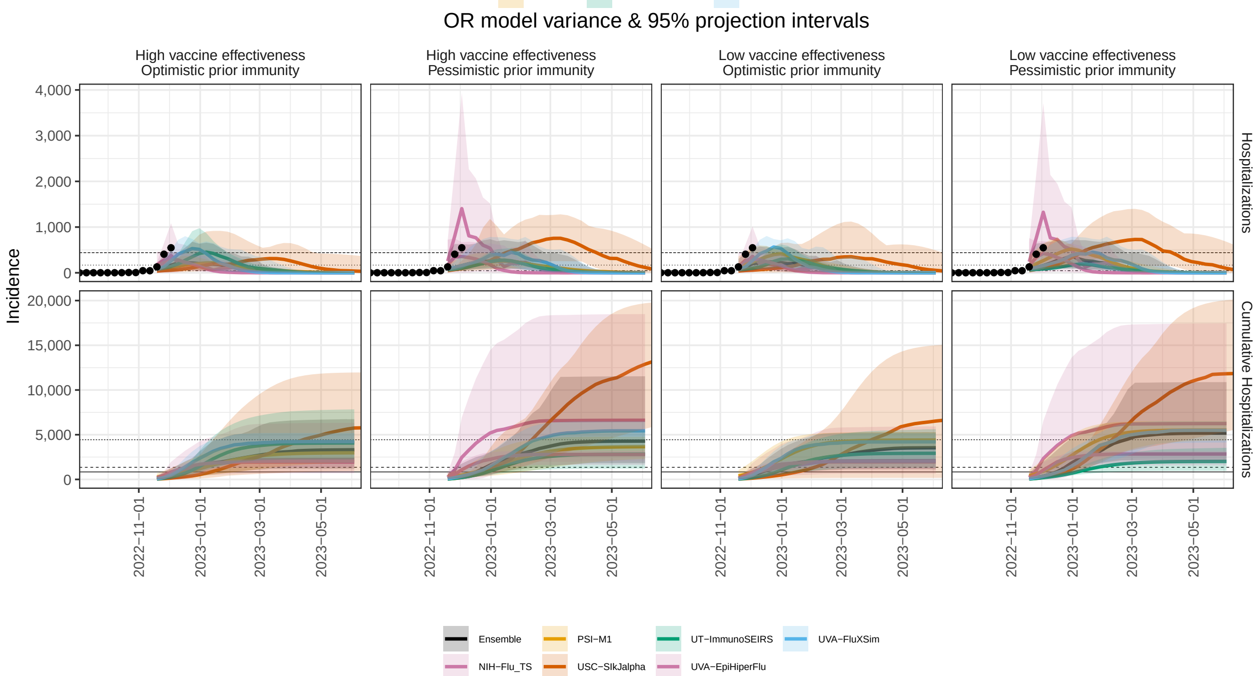
NC model variance & 95% projection intervals

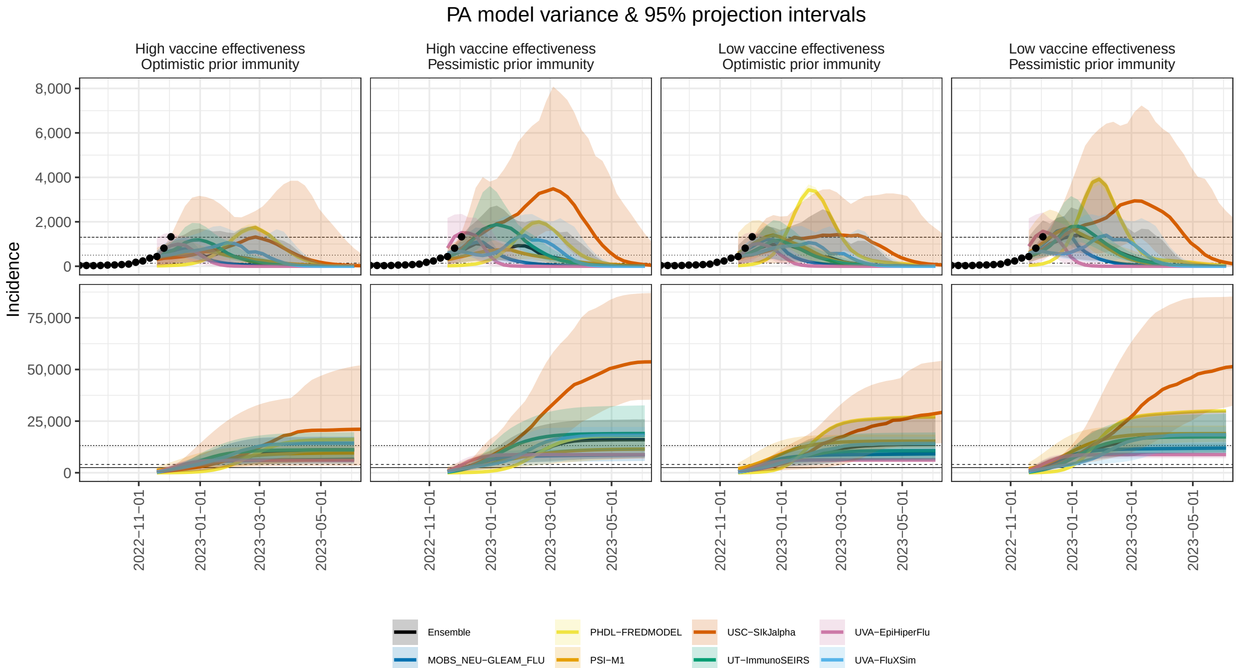


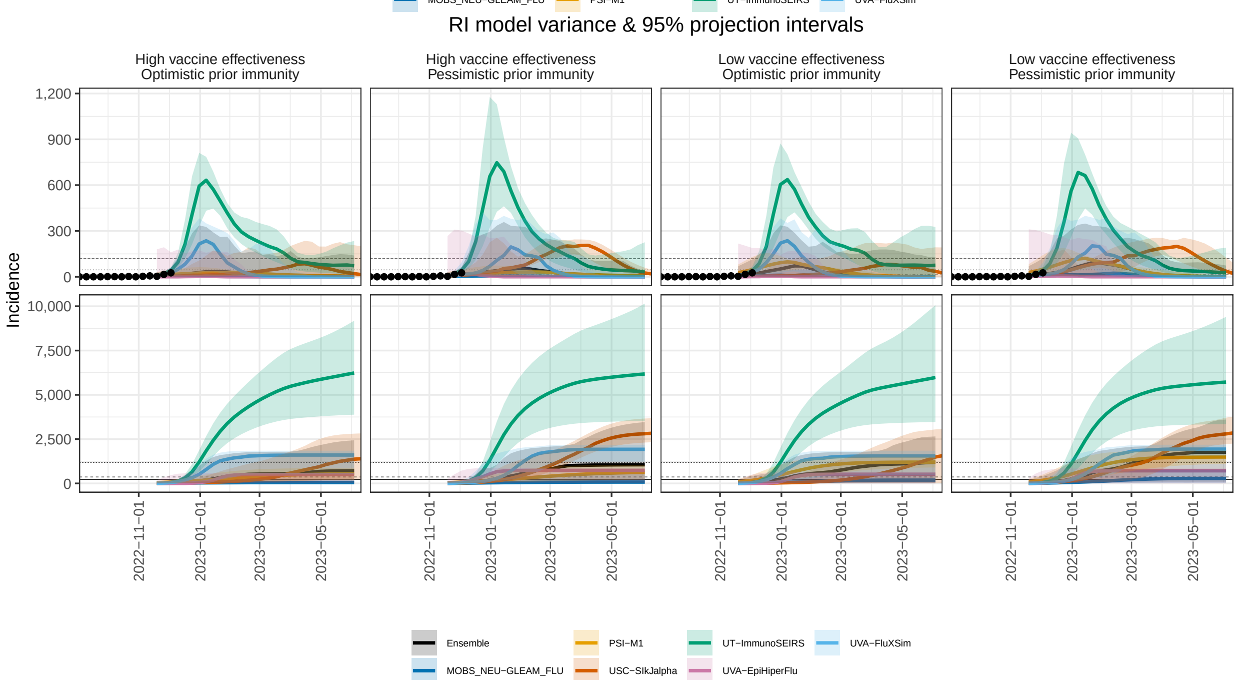

ND model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

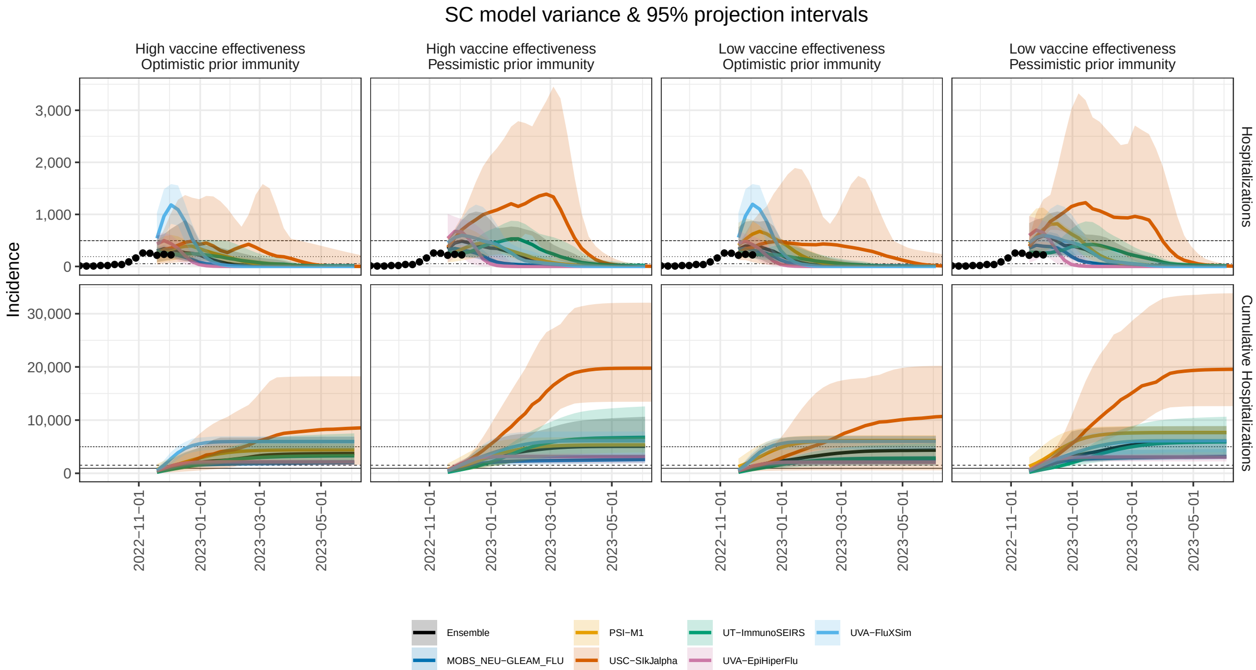

OH model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

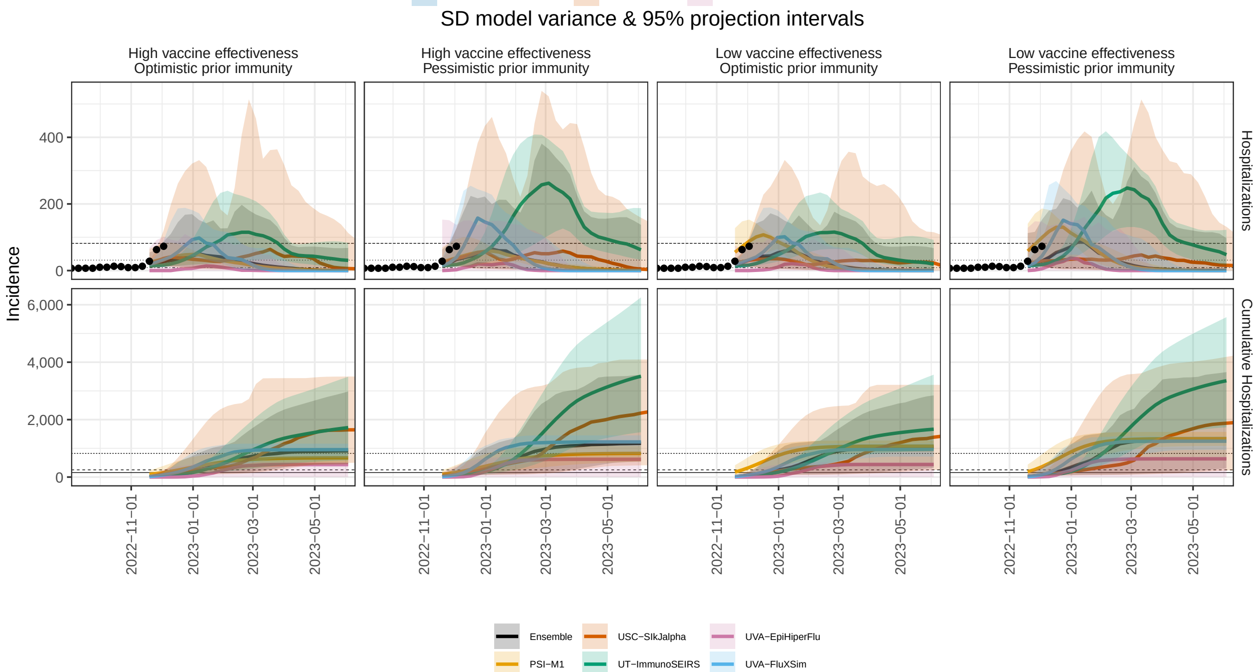

OK model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

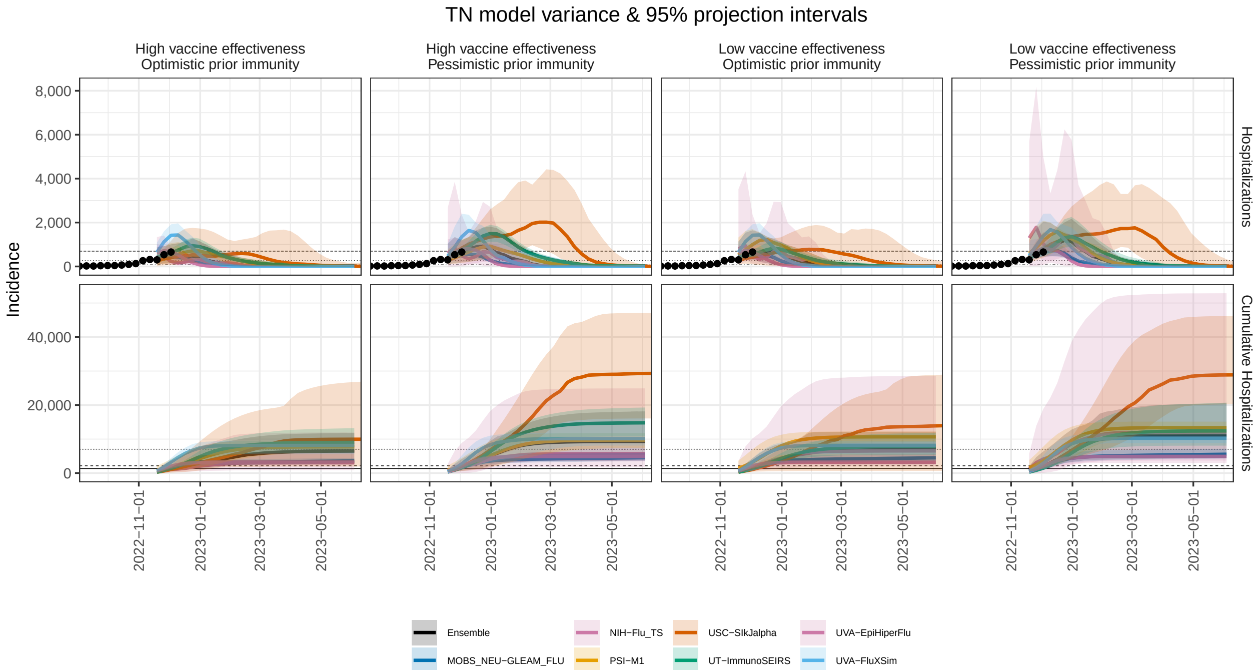

OR model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

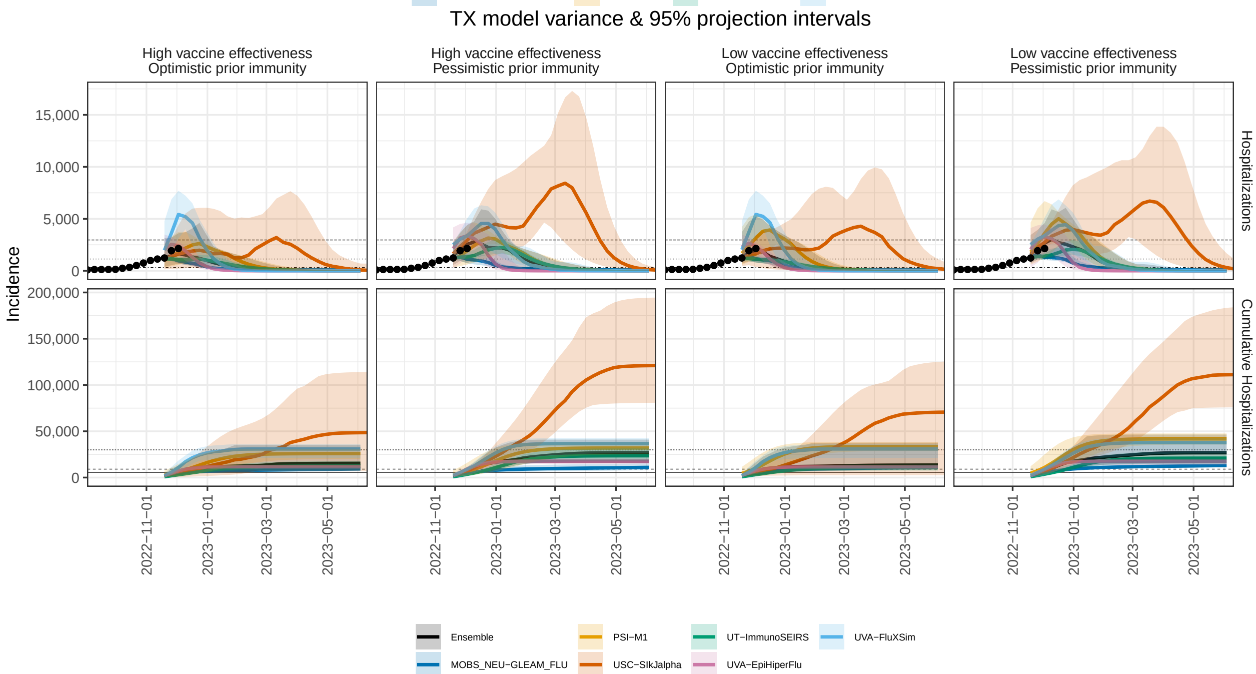

PA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PHDL−FREDMODEL
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

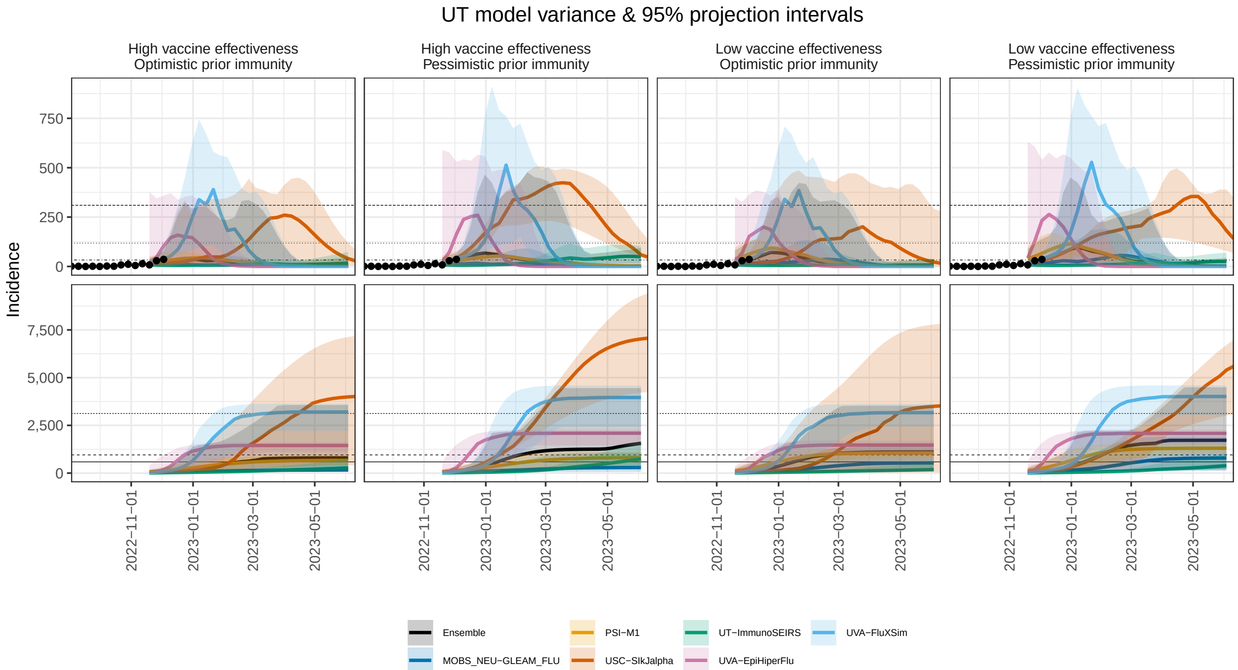

RI model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


SC model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
3,000
2,000
1,000
0
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

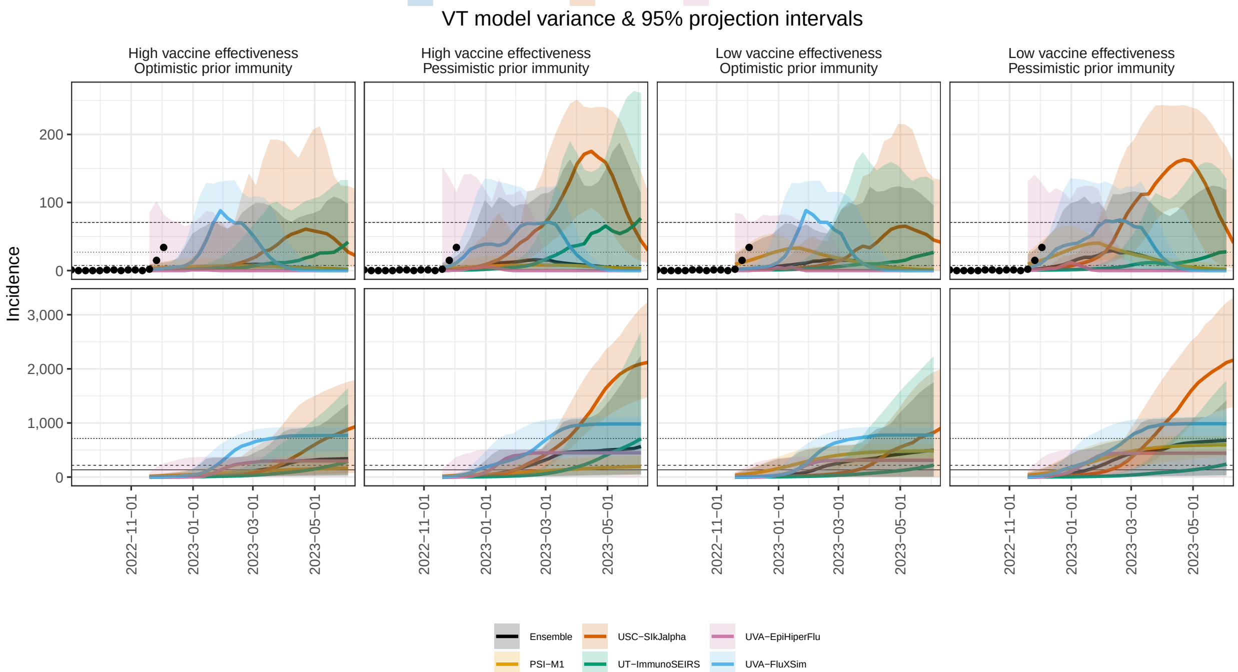

SD model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
400
200
0
6,000
4,000
2,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


TN model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
8,000
6,000
4,000
2,000
0
40,000
20,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
NIH−Flu_TS
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

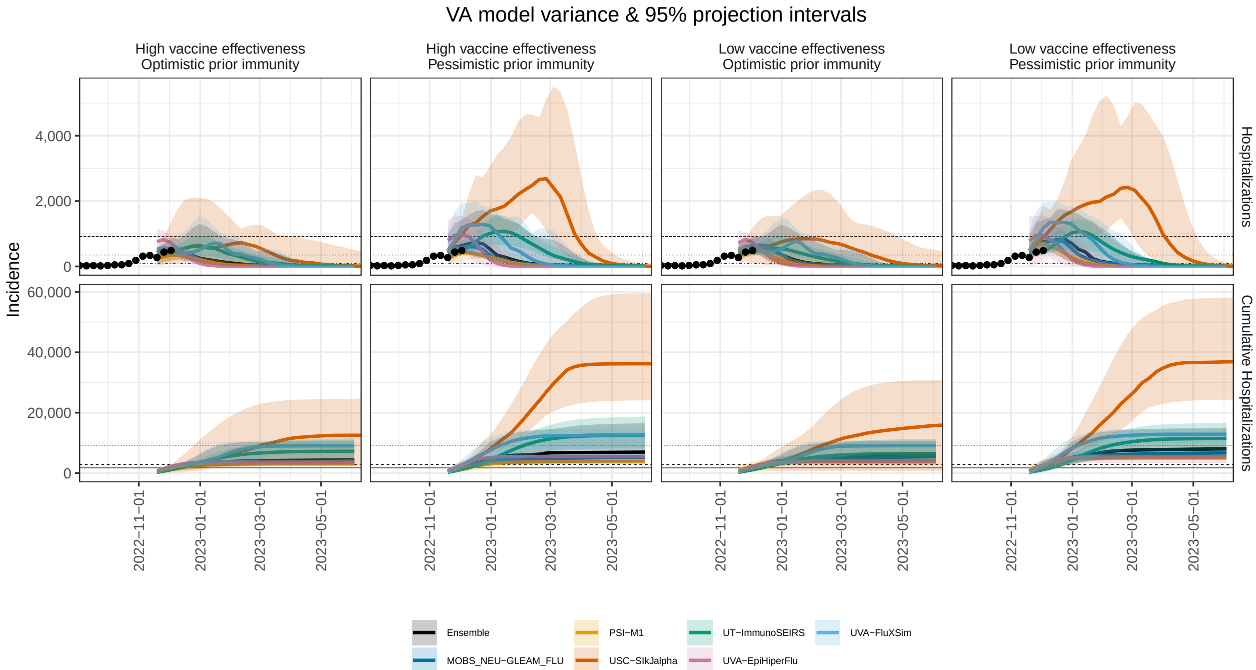

TX model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
15,000
10,000
5,000
0
200,000
150,000
100,000
50,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

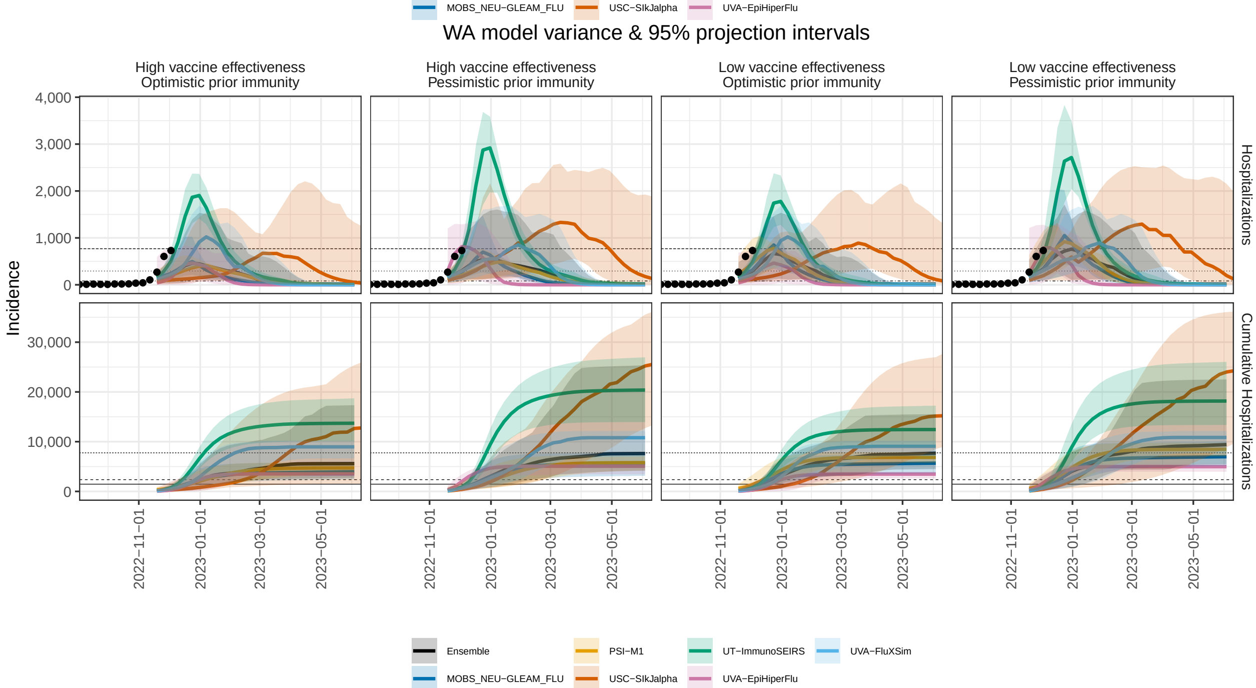


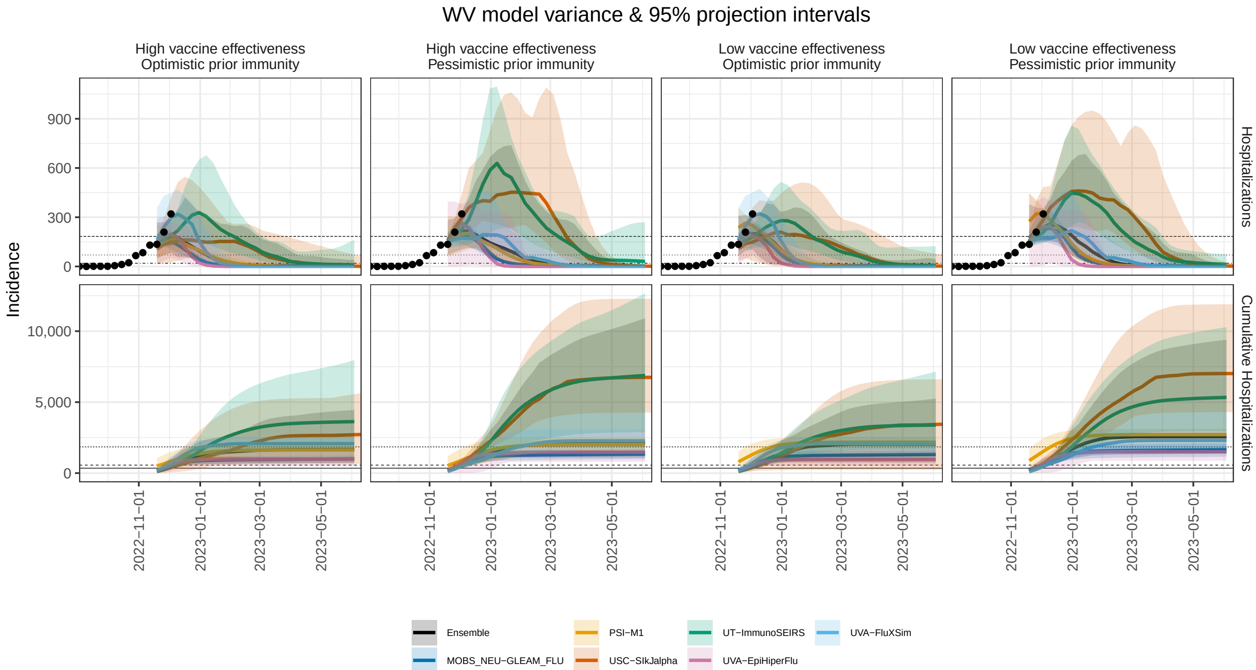
UT model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

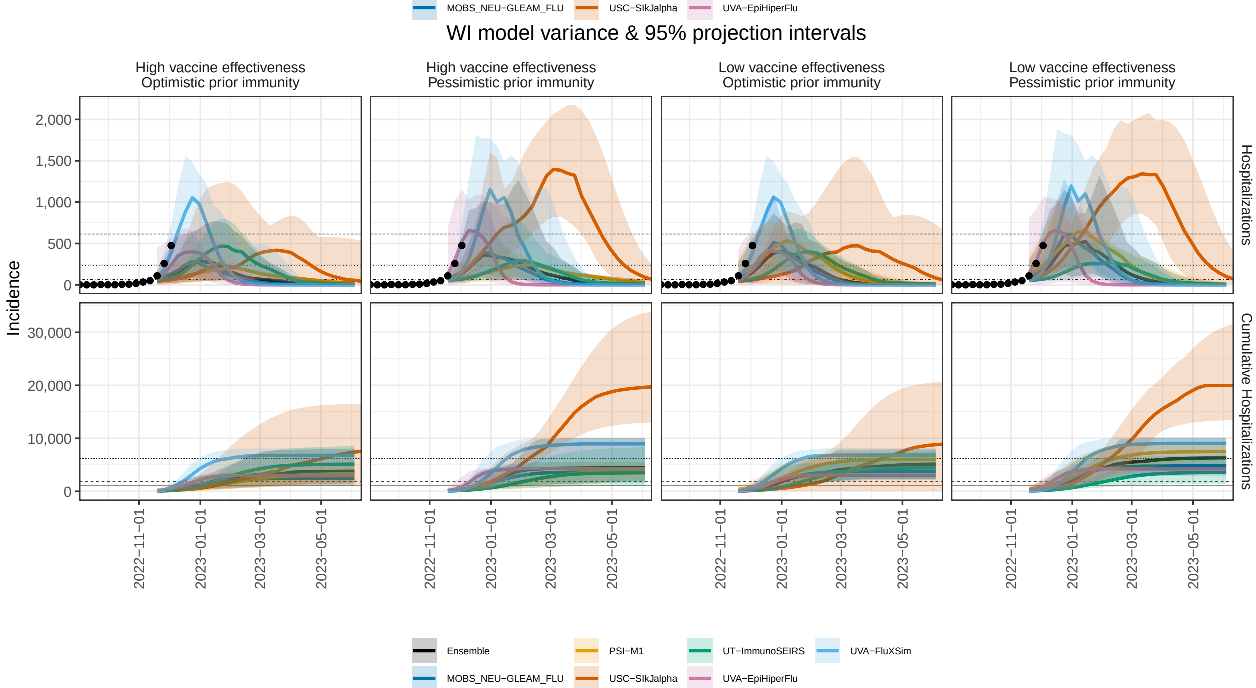


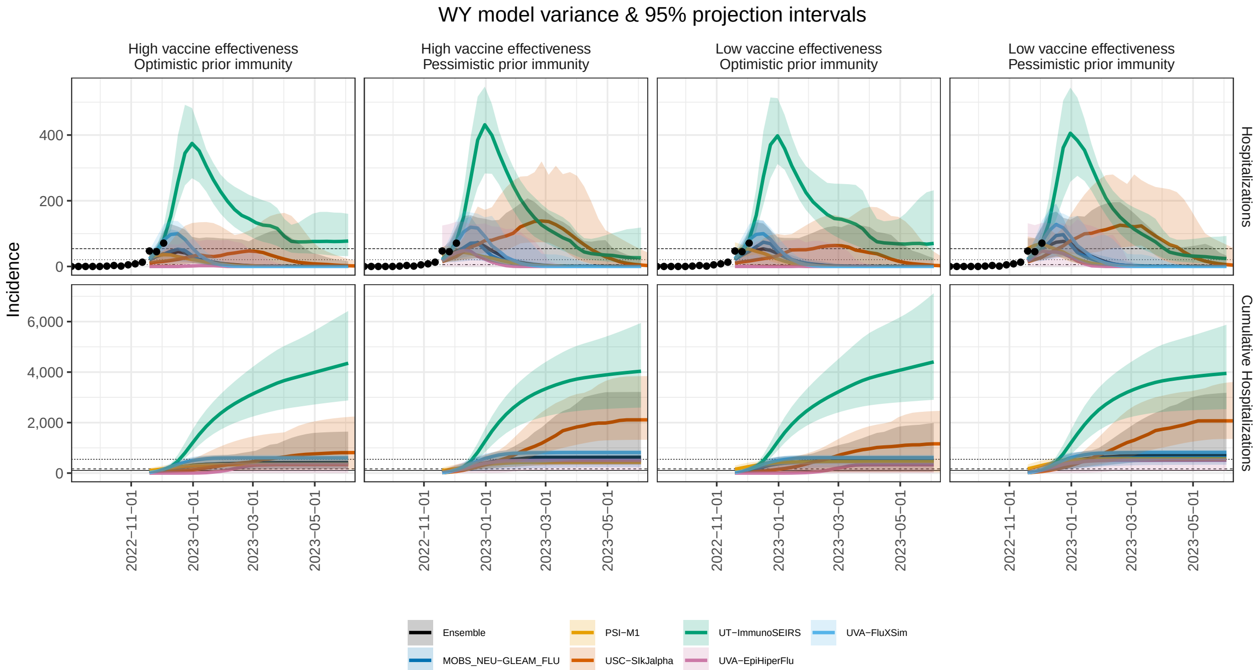
VT model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
Ensemble
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim

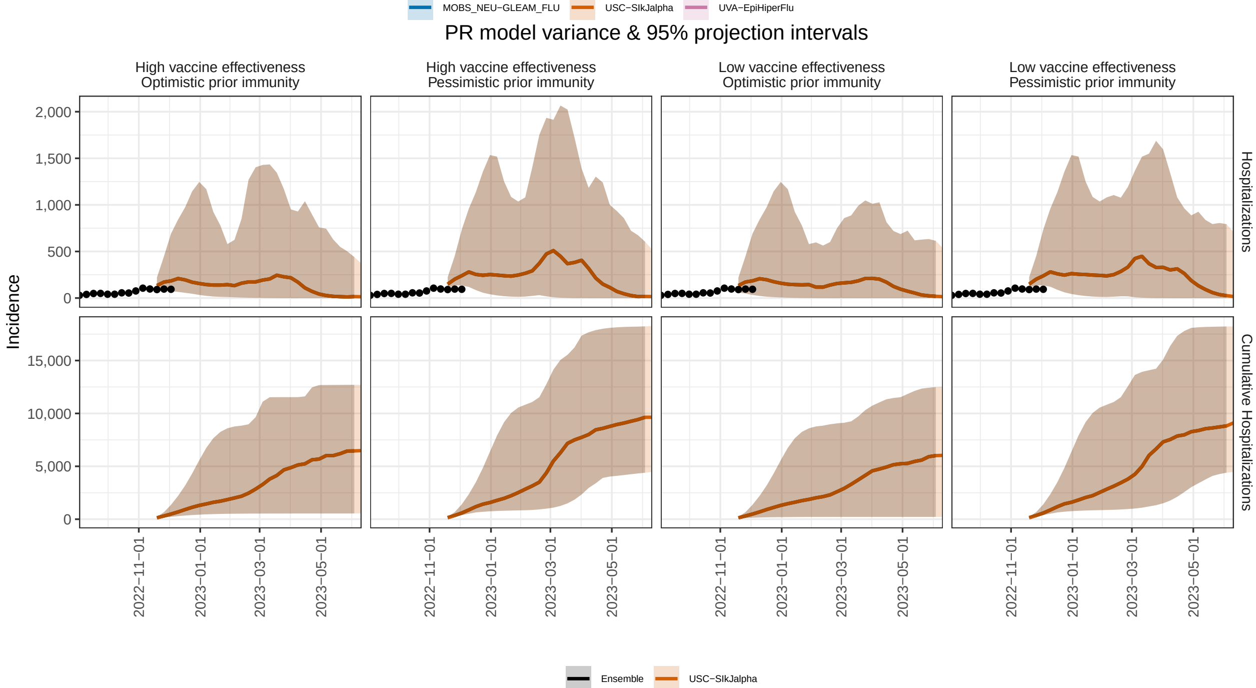

VA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
2,000
4,000
20,000
40,000
60,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


WA model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
0
1,000
2,000
3,000
4,000
10,000
20,000
30,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


WV model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
900
600
300
0
10,000
5,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


WI model variance & 95% projection intervals
High vaccine effectiveness Optimistic prior immunity
High vaccine effectiveness Pessimistic prior immunity
Low vaccine effectiveness Optimistic prior immunity
Low vaccine effectiveness Pessimistic prior immunity
Hospitalizations
Cumulative Hospitalizations
Incidence
2,000
1,500
1,000
500
0
30,000
20,000
10,000
0
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


WY model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
0
200
400
2,000
4,000
6,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
MOBS_NEU−GLEAM_FLU
PSI−M1
USC−SIkJalpha
UT−ImmunoSEIRS
UVA−EpiHiperFlu
UVA−FluXSim


PR model variance & 95% projection intervals
High vaccine effectiveness
Optimistic prior immunity
High vaccine effectiveness
Pessimistic prior immunity
Low vaccine effectiveness
Optimistic prior immunity
Low vaccine effectiveness
Pessimistic prior immunity
Incidence
Hospitalizations
Cumulative Hospitalizations
0
500
1,000
1,500
2,000
5,000
10,000
15,000
2022−11−01
2023−01−01
2023−03−01
2023−05−01
Ensemble
USC−SIkJalpha

Teams and models

- California Department of Public Health — FluCAT
  - White, L.A. (CADPH), Murray, E. (CADPH), Leon, T.M. (CADPH)
- Center For Disease Dynamics, Economics & Policy — FluCompModel
  - Fardad Haghpanah, Eili Klein
- Northeastern University MOBS Lab — GLEAM FLU
  - Matteo Chinazzi (Northeastern University, Boston, MA), Jessica T. Davis (Northeastern University, Boston, MA), Kunpeng Mu (Northeastern University, Boston, MA), Alessandro Vespignani (Northeastern University, Boston, MA)
- Fogarty International Center, National Institutes of Health (NIH) — Flu_TS
  - Amanda Perofsky (NIH), Cécile Viboud (NIH)
- University of Notre Dame — FRED
  - Guido Espana, Sean Moore, Alex Perkins
- University of Southern California — SIkJalpha
  - Ajitesh Srivastava, Majd Al Aawar
- University of Texas — ImmunoSEIRS
  - Kaiming Bi (The University of Texas at Austin), Anass Bouchnita (The University of Texas at El Paso), Spencer J. Fox (The University of Georgia), Lauren Ancel Meyers (The University of Texas at Austin), UT COVID-19 Modeling Consortium.
- University of Virginia Biocomplexity Institute — EpiHiper
  - Jiangzhuo Chen (UVA), Stefan Hoops (UVA), Parantapa Bhattacharya (UVA), Dustin Machi (UVA), Bryan Lewis (UVA), Madhav Marathe (UVA)
- University of Virginia Biocomplexity Institute — FluXSim
  - Srini Venkatramanan, Aniruddha Adiga, Przemek Porebski, Brian Klahn, Benjamin Hurt, Bryan Lewis (UVA), Madhav Marathe (UVA)
- Fogarty International Center, National Institutes of Health (NIH) — FluD
  - Samantha Bents (NIH), Cécile Viboud (NIH)
- Public Health Dynamics Laboratory — FREDMODEL
  - Mary G Krauland
- Predictive Science — M1
  - Ben-Nun M (Predictive Science), Turtle J (Predictive Science), Riley P (Predictive Science)

The Flu Scenario Modeling Hub Coordination Team

- Shaun Truelove, Johns Hopkins University
- Cécile Viboud, NIH Fogarty
- Justin Lessler, University of North Carolina
- Sara Loo, Johns Hopkins University
- Lucie Contamin, University of Pittsburgh
- Emily Howerton, Penn State University
- Rebecca Borchering, Penn State University
- Claire Smith, Johns Hopkins University
- Harry Hochheiser, University of Pittsburgh
- Katriona Shea, Penn State University
- Michael Runge, USGS
- Erica Carcelen, Johns Hopkins University
- Sung-mok Jung, University of North Carolina
- J Espino, University of Pittsburgh
- John Levander, University of Pittsburgh