COVID-19 Scenario Modeling Hub Report

21 June, 2023
Scenario Modeling Hub Team[1]

Executive Summary

In a new round of projections, the Scenario Modeling Hub evaluated the trajectory of COVID-19 during April 16, 2023 to April 19, 2025 (104-week horizon), under 6 scenarios about the annual uptake of reformulated boosters (minimal uptake, uptake in 65+ corresponding to 2021 booster levels, or uptake in all ages corresponding to 2021 levels) and extent of immune escape of circulating variants (50% vs 20% annually). Seven teams contributed both national and state-specific projections, and one team generated projections for a subset of states. Our ensemble results are based on the trimmed LOP approach. Detailed scenario descriptions and setting assumptions are provided here.

Key Takeaways from the Seventeenth Round

- Based on the national ensemble, the main period of COVID19 activity is expected to occur in late fall and early winter over the next 2 years, with median peak incidence between November and mid January. Lowest incidences are projected to occur in August of each year.
- For the range of scenarios considered, weekly hospitalizations and deaths are likely to stay within last year's range, and unlikely to hit Delta or Omicron peaks. Further, weekly hospitalizations are likely to remain at low or medium community transmission levels and unlikely to reach high transmission levels (>20 weekly hospitalizations per 100,000), as defined by the CDC.
- In the most pessimistic scenario (no booster, high immune escape) we project 2.2 million hospitalizations (1.4 million-4.7 million) and 201,000 deaths (137,000-507,000) over the 2-year projection period, with 886,000 hospitalizations and 82,000 deaths in the first cold month season (Sep 2023-Apr 2024). In the most optimistic scenario (boosters for all ages, low immune escape) this reduces to 1.3 million hospitalizations (804,000-2 million) and 122,000 deaths (55,000-201,000) over 2 years, with 450,000 hospitalizations and 42,000 deaths occurring in the first cold month season. The Sep 2024-Apr 2025 season is projected to be slightly (5-22%) more severe than the coming season.
- Vaccination of 65+ and of all ages would significantly reduce disease burden compared to no vaccination scenarios, irrespective of immune escape assumptions. Under low and high immune escape scenarios vaccination of 65+ reduces hospitalizations by 10% and 12%, and reduces deaths by 18% and 14%; targeting all ages reduces hospitalizations by 25% and 18%, and deaths by 29% and 22%, compared to no vaccination. In absolute numbers vaccinating 65+ would result in 226,000 (139,000-313,000) fewer hospitalizations and 32,000 (14,000-49,000) fewer deaths nationally over the two year projection period in low immune escape scenarios, compared to no vaccination. Expanding vaccination to all ages increases these reductions to 460,000 (302,000-617,000) hospitalizations and 49,000 (29,000-69,000) deaths under low immune escape assumptions. Reductions in numbers of deaths and hospitalizations are similar, but slightly higher, in high immune escape scenarios.
- A few caveats are worth noting:
  - We assumed the VE of reformulated boosters would be 65% against symptomatic disease at the time of reformulation in June of each year. The effectiveness of reformulated boosters against existing and new variants remains unclear, as does the pace of waning after multiple booster shots and repeat infections.
  - We assumed continuous immune escape rather than discrete variants, mirroring observations of evolutionary changes in the last year. We did not consider the impact of a significant new variant that would have accumulated a large amount of antigenic changes, transmissibility advantage

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over a very short period, akin to Delta or Omicron. We also assumed that the intrinsic severity (severity in naive populations) of future circulating strains would remain similar to that of Omicron lineages.

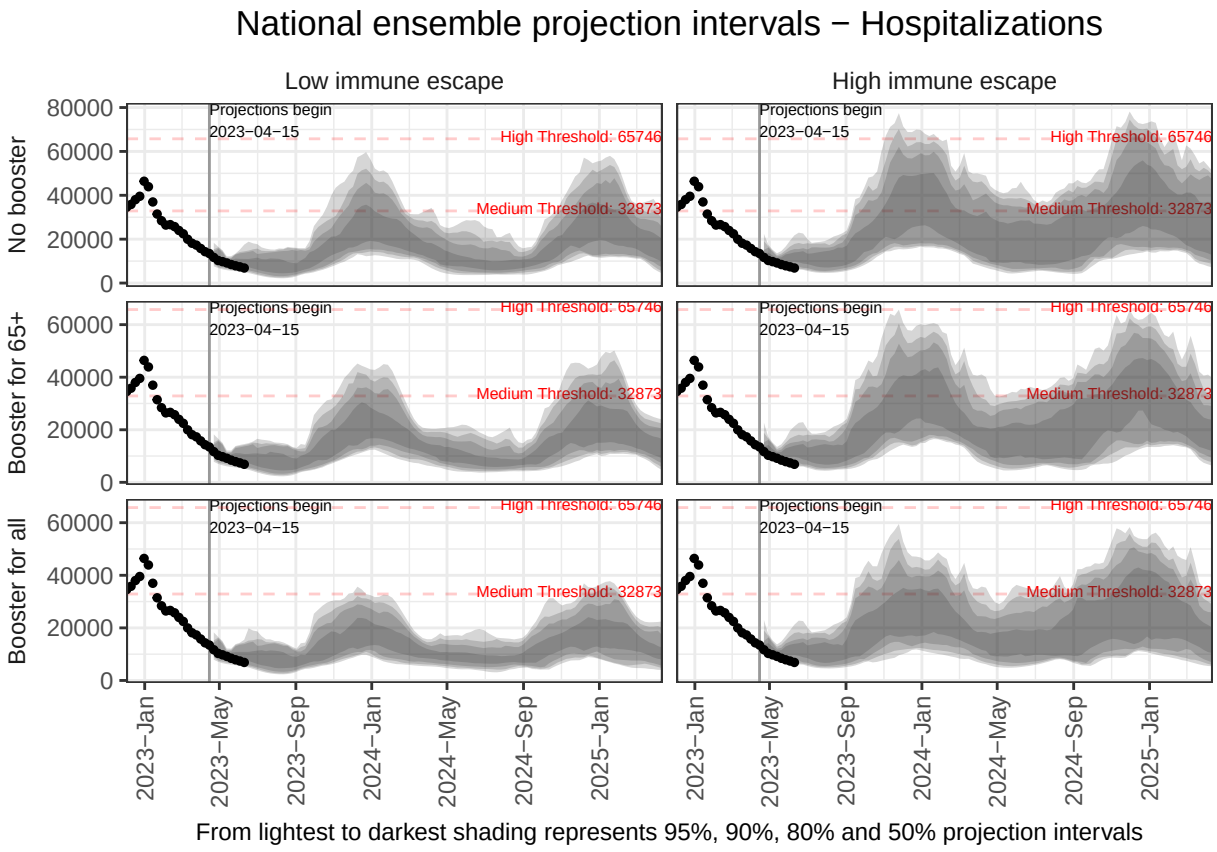
- There is considerable heterogeneity between states and between individual models. In particular, in the high immune escape scenarios some models project a second smaller peak in late Spring.
- We switched calibration of death data to a different dataset (NCHS) following the end of the CSSE surveillance system, which may introduce small differences when comparing RD17 death projections with those of past rounds. Further, we no longer project case trajectories. Hospitalizations from HHS protect continue to be a stable outcome, although reporting to this system remains unclear over the full 2 year projection period.
- These are results based on projections from 8 teams, of which 7 provided national estimates for hospitalizations and 6 provided national estimates for deaths. Results will be updated as projections from additional models become available.

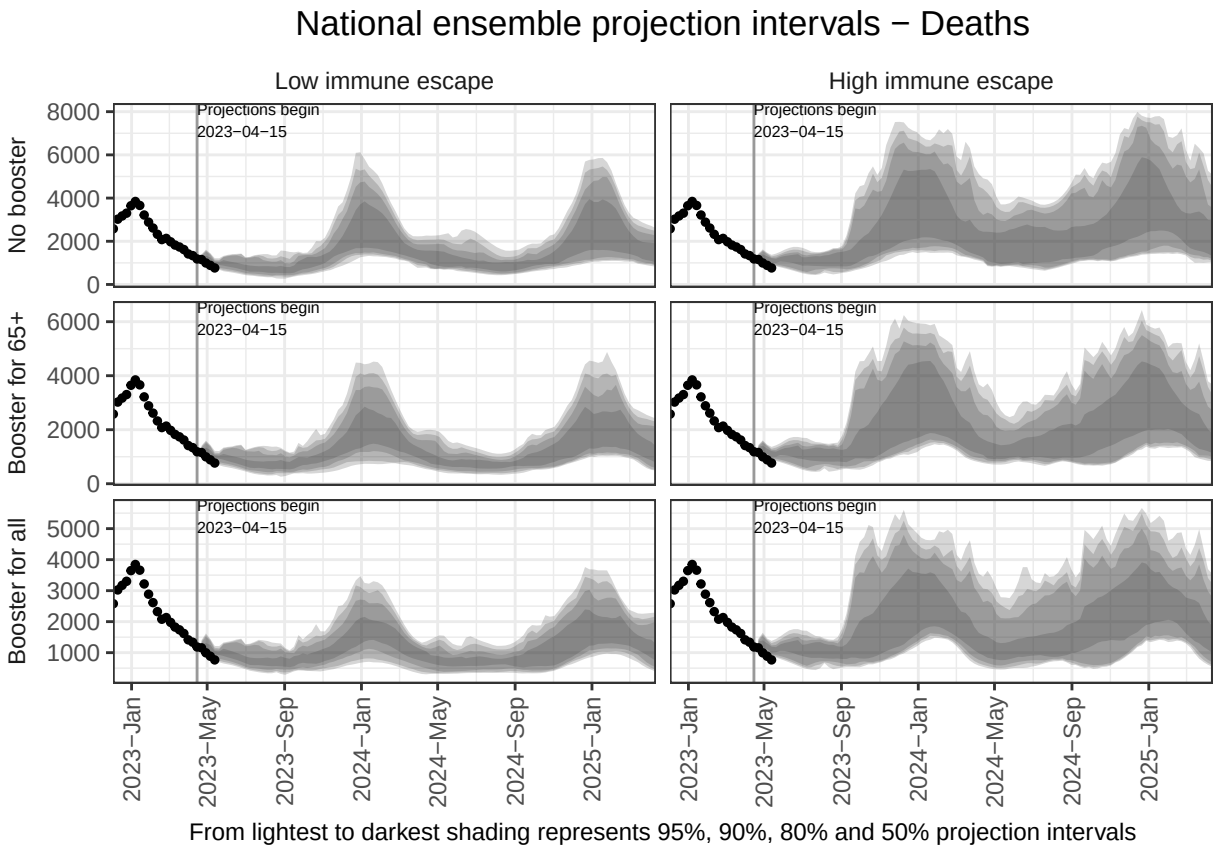
Round 17 Scenario Specifications

	Low immune escape • Immune escape occurs at a constant rate of **20% per year**	**High immune escape** • Immune escape occurs at a constant rate of **50% per year**
No vaccine recommendation • Uptake negligible or continues at very slow levels based on existing 2022 booster trends	Scenario A	Scenario B
Reformulated annual vaccination recommended for 65+ and immunocompromised • Reformulated vaccine has **65% VE against variants circulating on June 15** • Vaccine becomes **available September 1** • Uptake in 65+ same as first booster dose recommended in September 2021 • Uptake in individuals under 65 negligible or continues to trickle based on 2022 booster trends	Scenario C	Scenario D
Reformulated annual vaccination recommended for all currently eligible groups • Reformulated vaccine has **65% VE against variants circulating on June 15** • Vaccine becomes **available September 1** • 65+ uptake same as first booster dose recommended in September 2021 • Coverage in individuals under 65+ saturates at levels of the 2021 booster (approximately 34% nationally)	Scenario E	Scenario F

Ensemble projection intervals

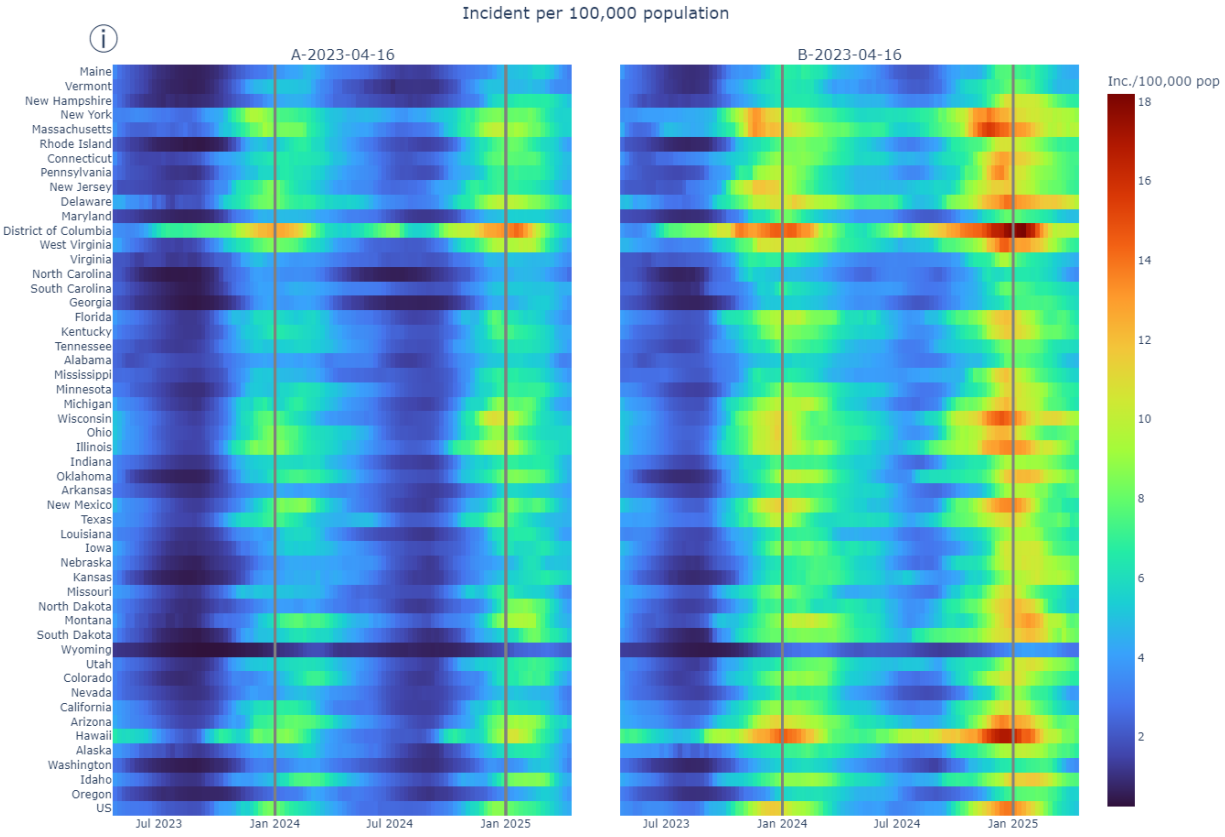
Incident hospitalizations and deaths in the national ensemble. Hospitalization thresholds were calculated based on the CDC COVID-19 community levels indicators.

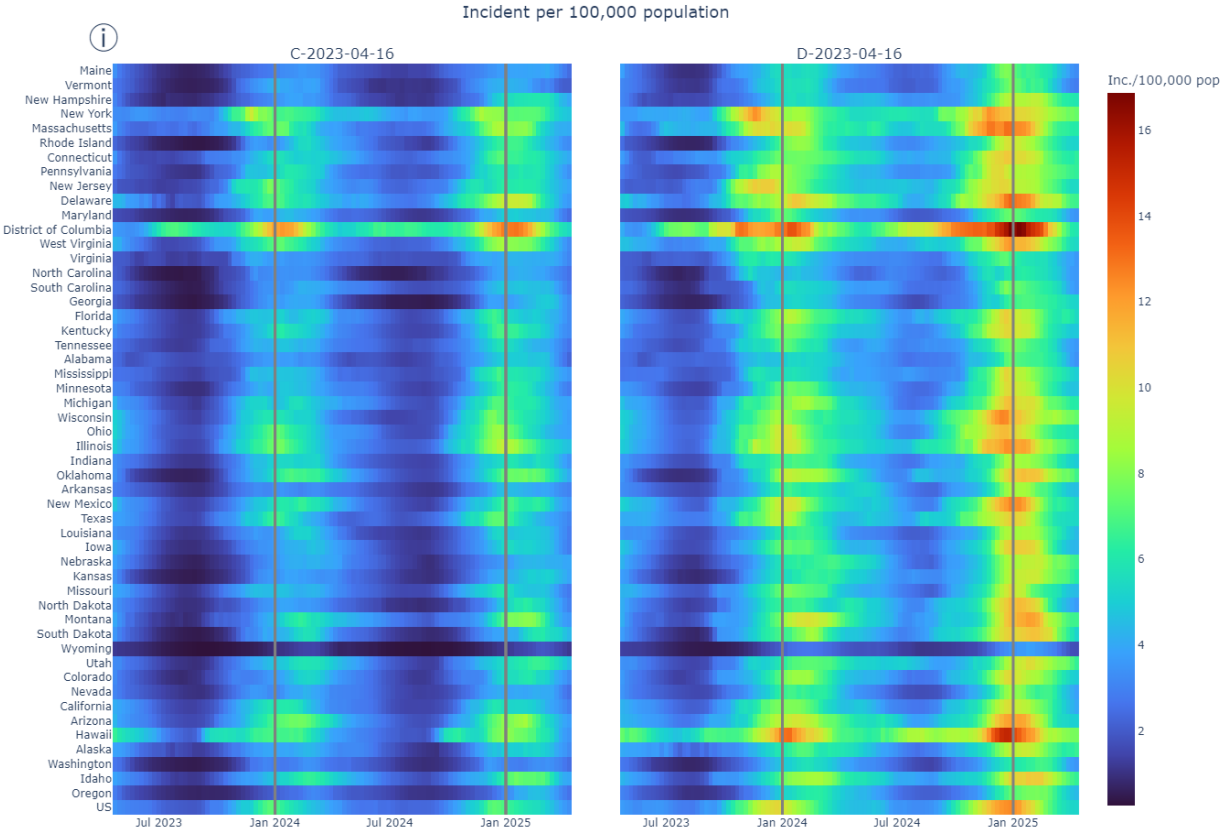


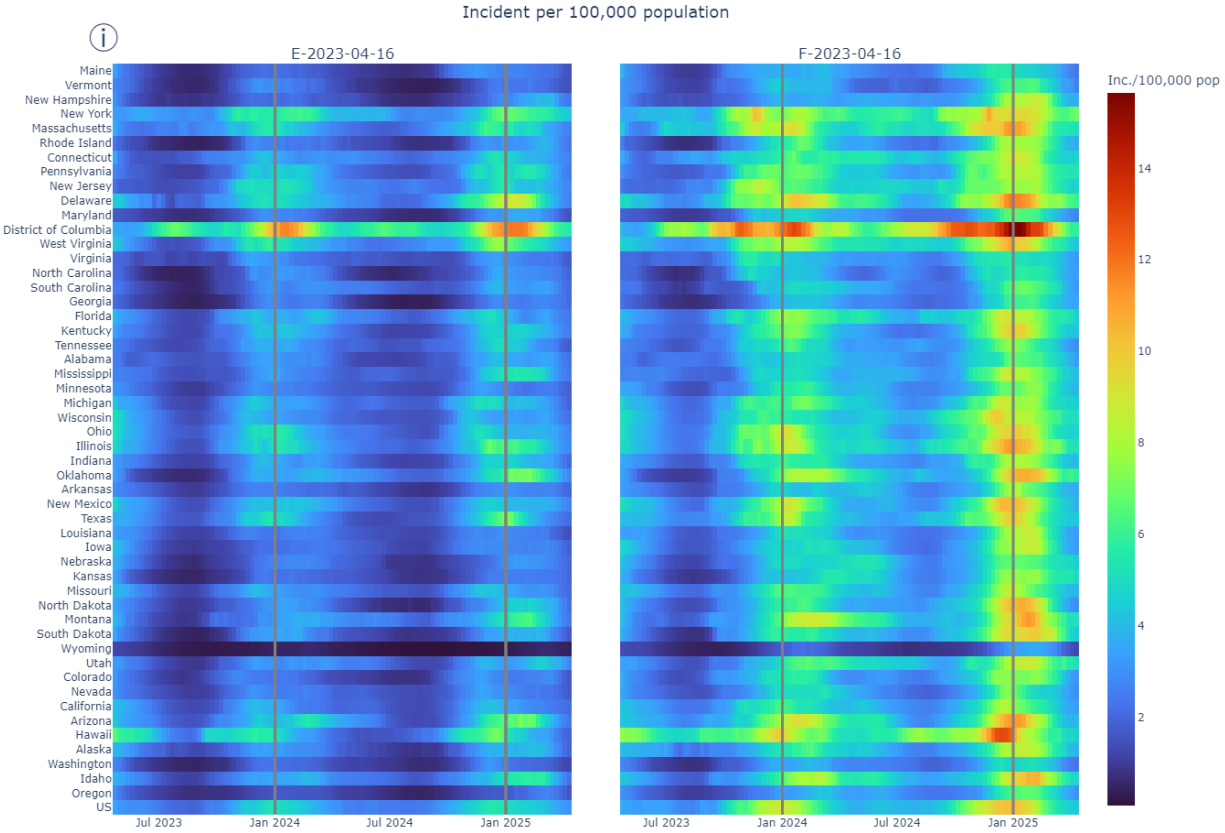

National ensemble projection intervals − Deaths
Low immune escape
High immune escape
No booster
Booster for 65+
Booster for all
Projections begin
2023−04−15
8000
6000
4000
2000
0
5000
3000
1000
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals

Spatiotemporal waves

These plots represent weekly incidences over time (x-axis) and geography (y-axis) and provide a snapshot of how the epidemic progresses over time and space. A specific quantile is represented by the median. Metrics displayed represent incidence per population each week and in each state that are projected to occur in a given week and state. Please note that more populous states will tend to have higher values. Geographically synchronous epidemic waves will appear as red vertical lines.

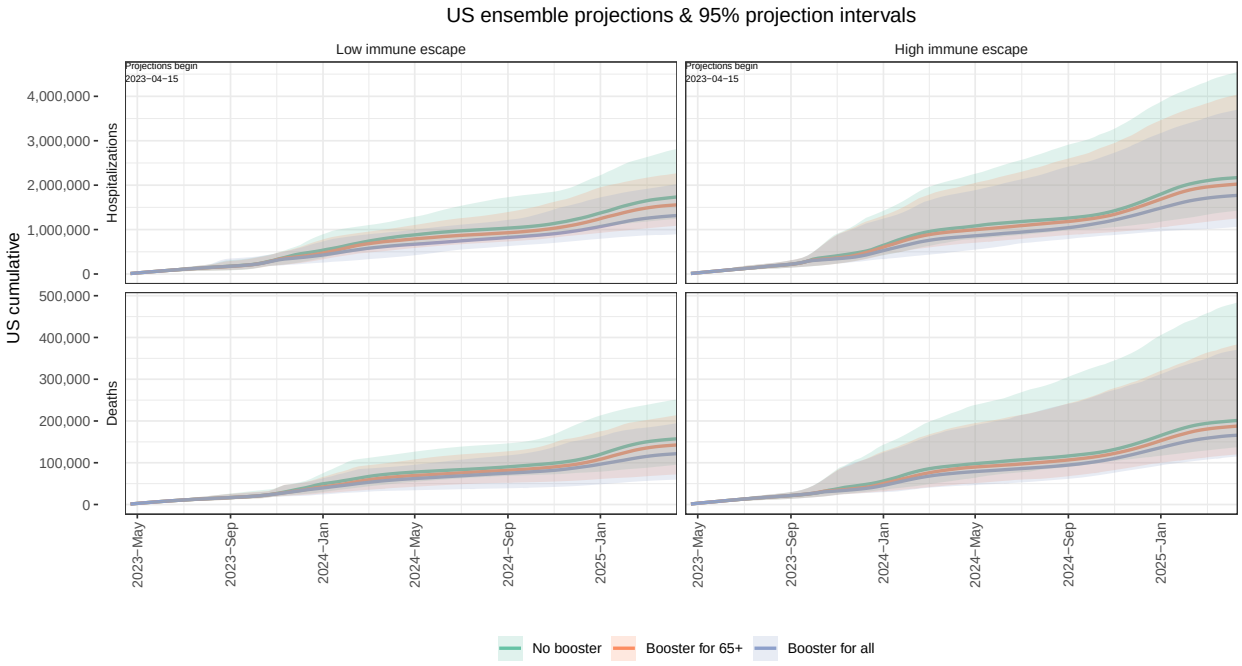



Incident per 100,000 population
C-2023-04-16
D-2023-04-16
Inc./100,000 pop
16
14
12
10
8
6
4
2
Maine
Vermont
New Hampshire
New York
Massachusetts
Rhode Island
Connecticut
Pennsylvania
New Jersey
Delaware
Maryland
District of Columbia
West Virginia
Virginia
North Carolina
South Carolina
Georgia
Florida
Kentucky
Tennessee
Alabama
Mississippi
Minnesota
Michigan
Wisconsin
Ohio
Illinois
Indiana
Oklahoma
Arkansas
New Mexico
Texas
Louisiana
Iowa
Nebraska
Kansas
Missouri
North Dakota
Montana
South Dakota
Wyoming
Utah
Colorado
Nevada
California
Arizona
Hawaii
Alaska
Washington
Idaho
Oregon
US
Jul 2023
Jan 2024
Jul 2024
Jan 2025
Jul 2023
Jan 2024
Jul 2024
Jan 2025


Incident per 100,000 population
E-2023-04-16
F-2023-04-16
Inc./100,000 pop
14
12
10
8
6
4
2
Maine
Vermont
New Hampshire
New York
Massachusetts
Rhode Island
Connecticut
Pennsylvania
New Jersey
Delaware
Maryland
District of Columbia
West Virginia
Virginia
North Carolina
South Carolina
Georgia
Florida
Kentucky
Tennessee
Alabama
Mississippi
Minnesota
Michigan
Wisconsin
Ohio
Illinois
Indiana
Oklahoma
Arkansas
New Mexico
Texas
Louisiana
Iowa
Nebraska
Kansas
Missouri
North Dakota
Montana
South Dakota
Wyoming
Utah
Colorado
Nevada
California
Arizona
Hawaii
Alaska
Washington
Idaho
Oregon
US
Jul 2023
Jan 2024
Jul 2024
Jan 2025
Jul 2023
Jan 2024
Jul 2024
Jan 2025

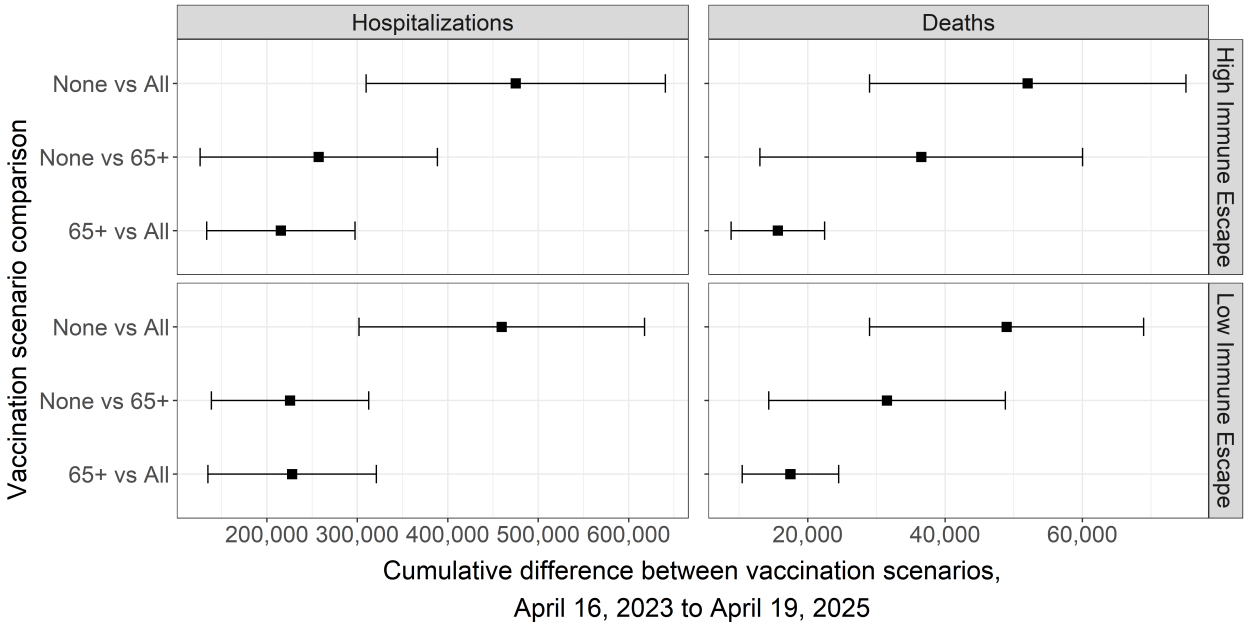
National ensemble projections

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

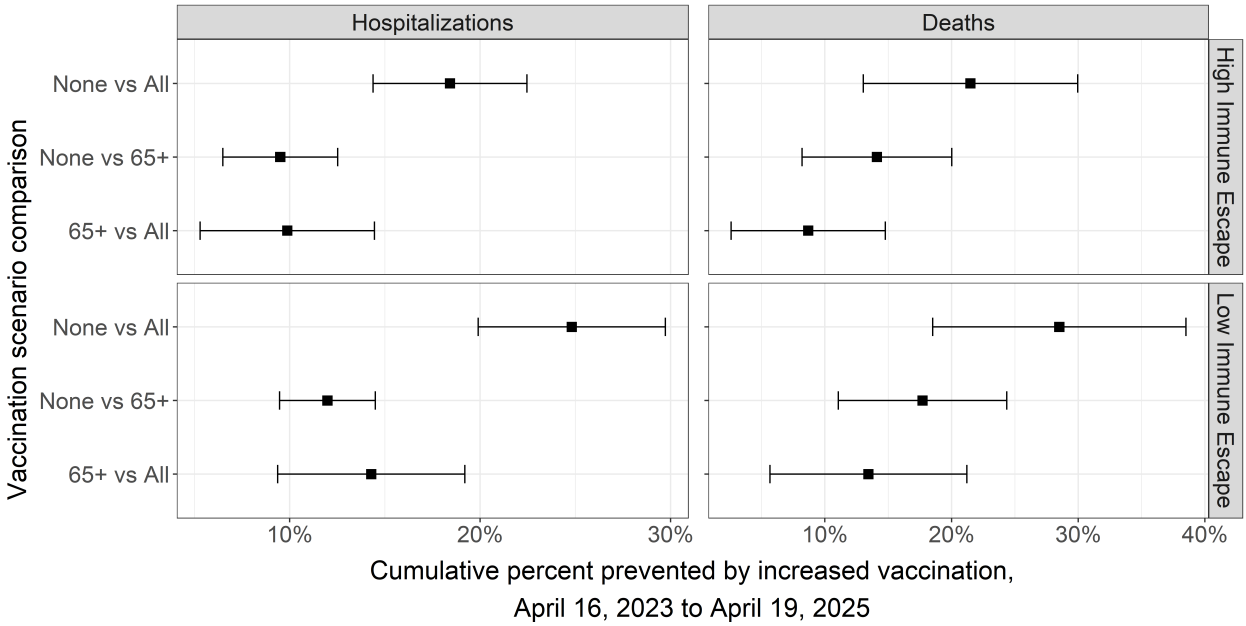


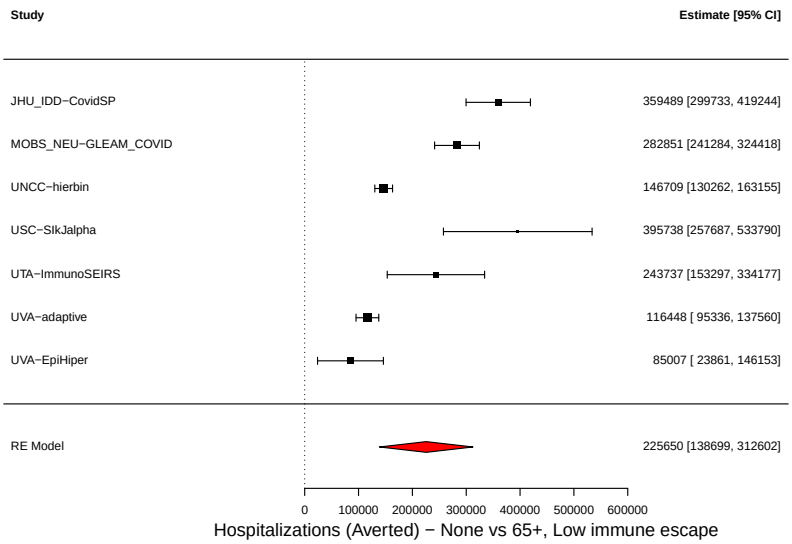
Differences between scenarios

Cumulative pooled differences between vaccination scenarios from April 16, 2023 to April 19, 2025, absolute differences.

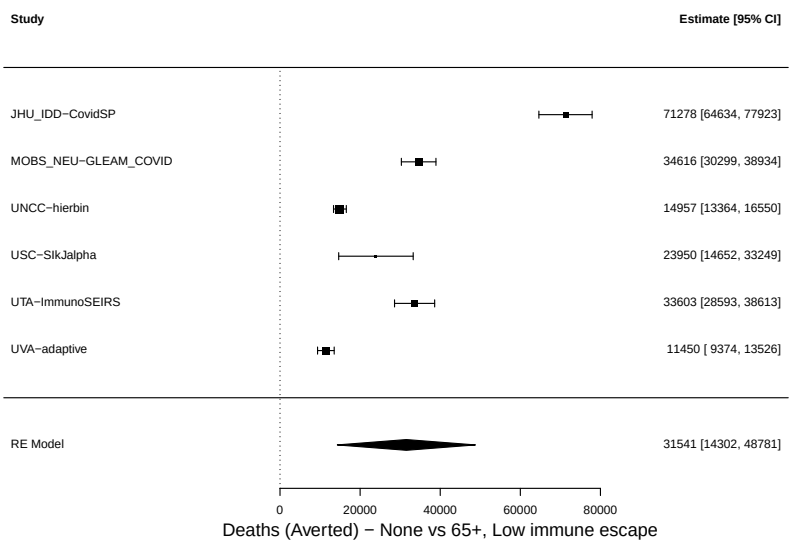


Cumulative pooled differences between vaccination scenarios from April 16, 2023 to April 19, 2025, relative differences.

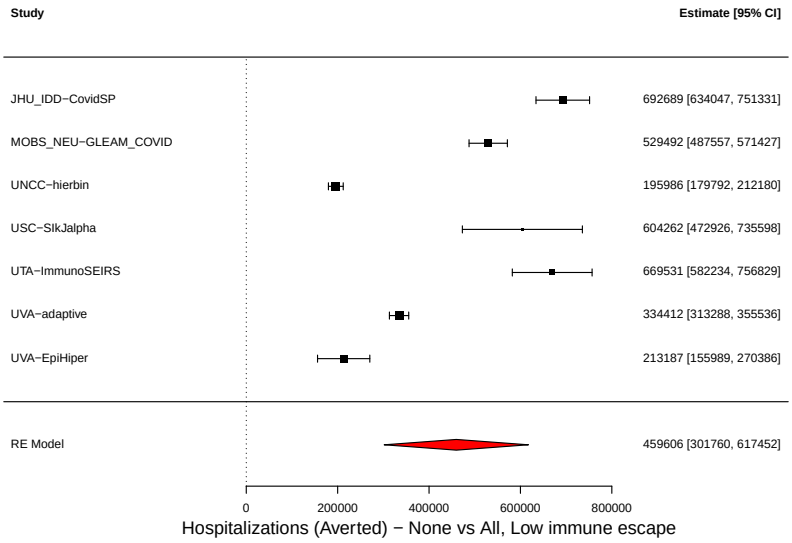




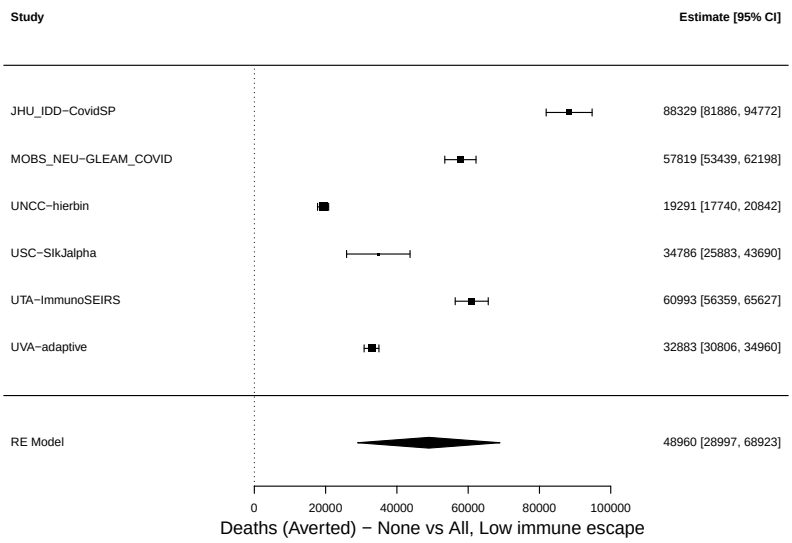
Hospitalizations (Averted) − None vs 65+, Low immune escape



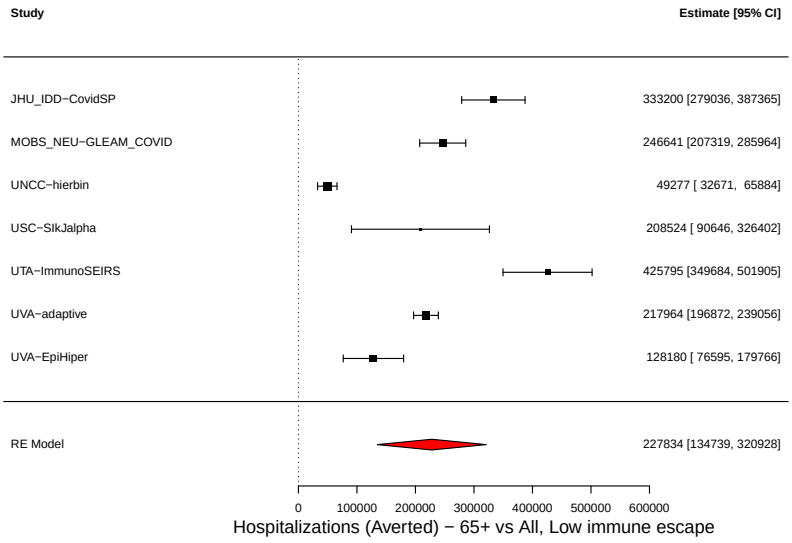
Deaths (Averted) − None vs 65+, Low immune escape



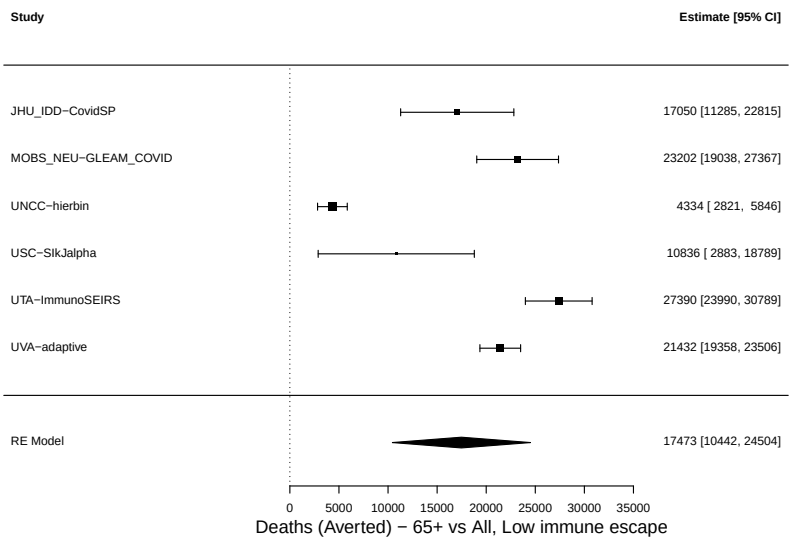
Hospitalizations (Averted) − None vs All, Low immune escape



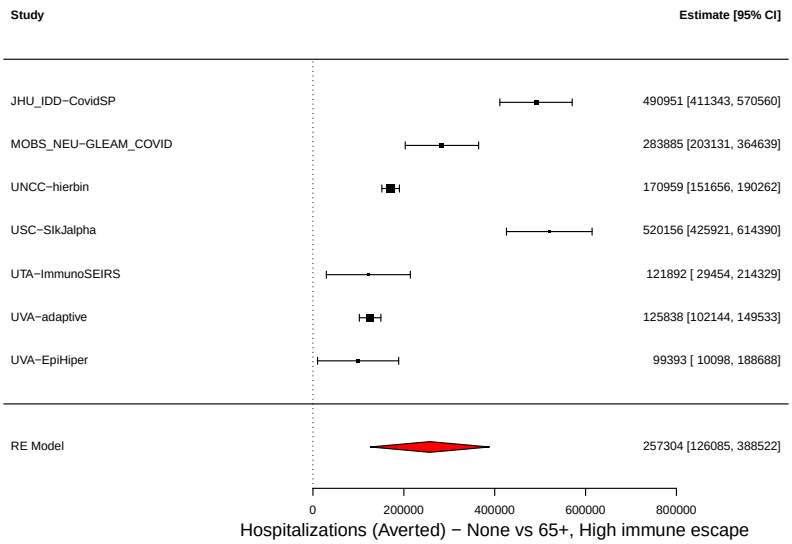
Deaths (Averted) − None vs All, Low immune escape



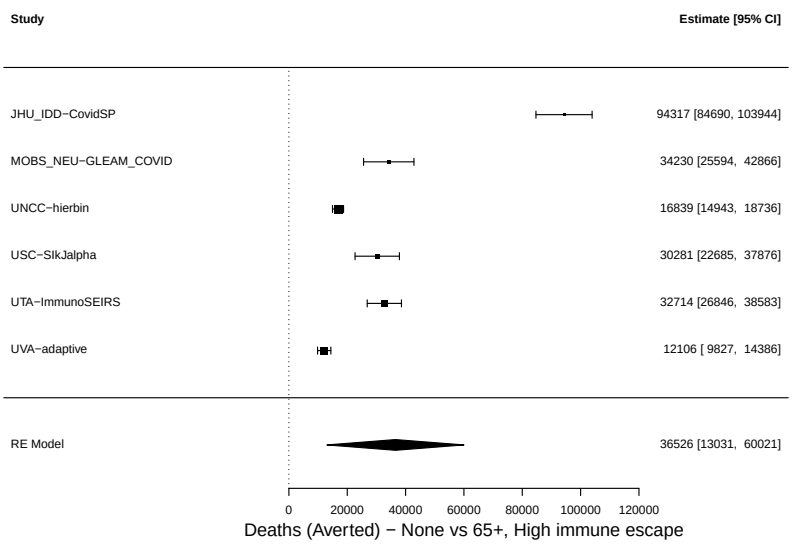
Hospitalizations (Averted) − 65+ vs All, Low immune escape



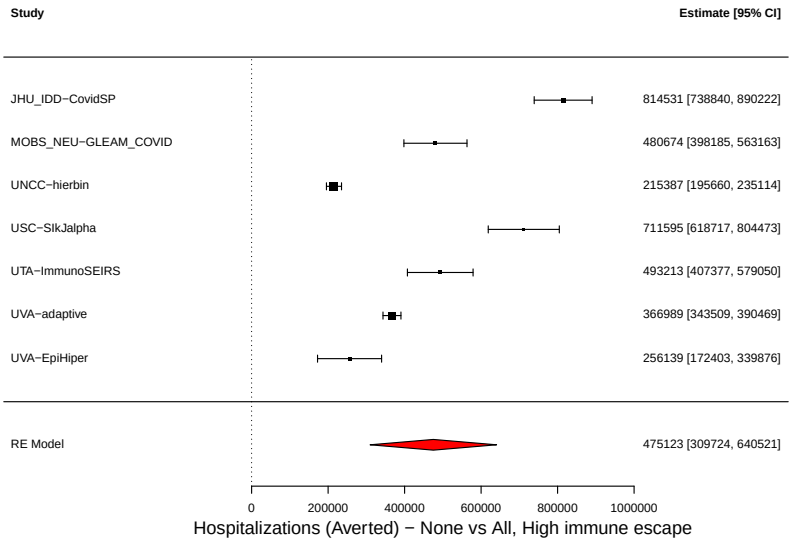
Deaths (Averted) − 65+ vs All, Low immune escape



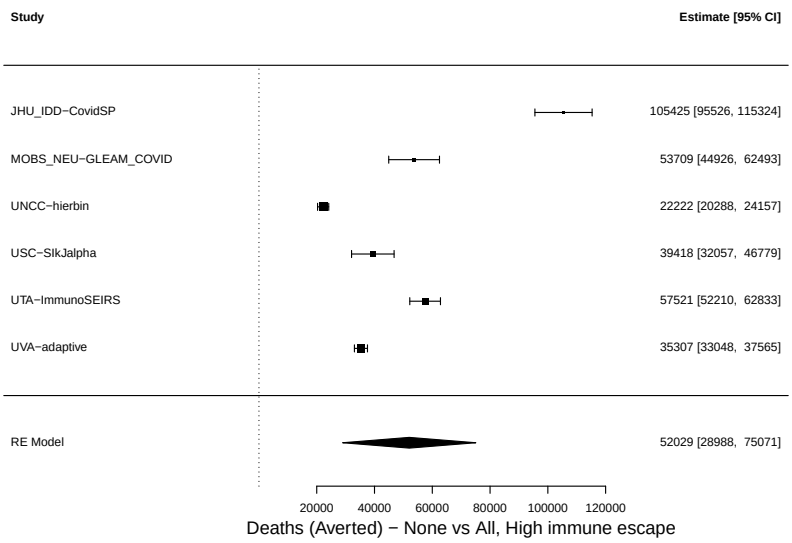
Hospitalizations (Averted) − None vs 65+, High immune escape



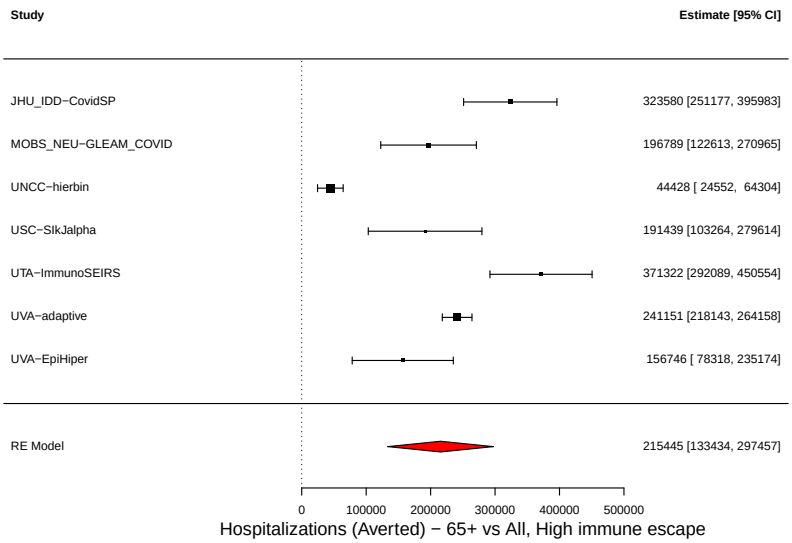
Deaths (Averted) − None vs 65+, High immune escape



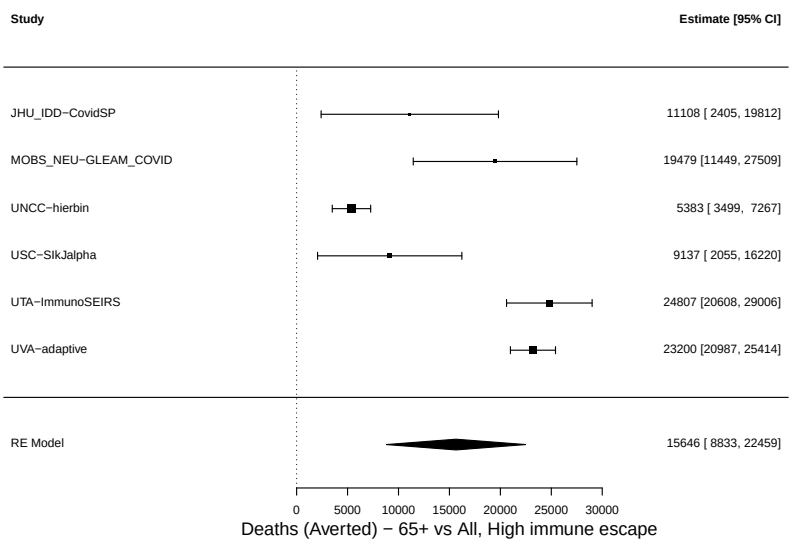
Hospitalizations (Averted) − None vs All, High immune escape



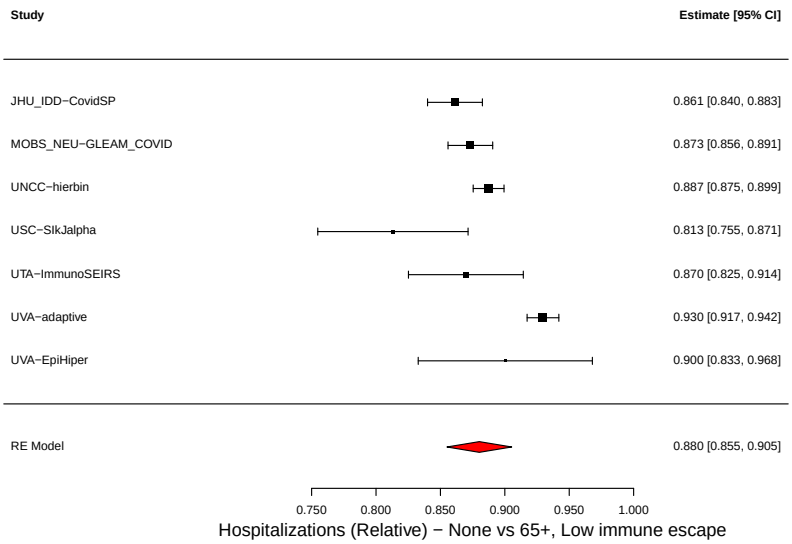
Deaths (Averted) − None vs All, High immune escape



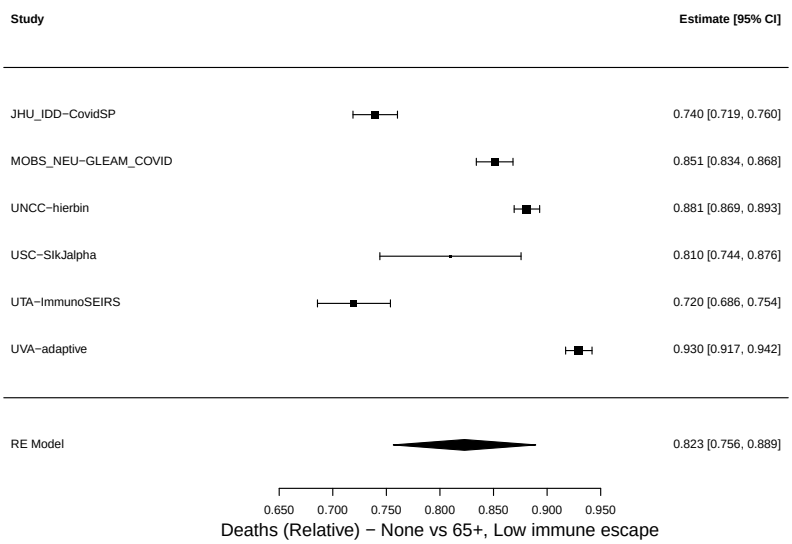
Hospitalizations (Averted) − 65+ vs All, High immune escape



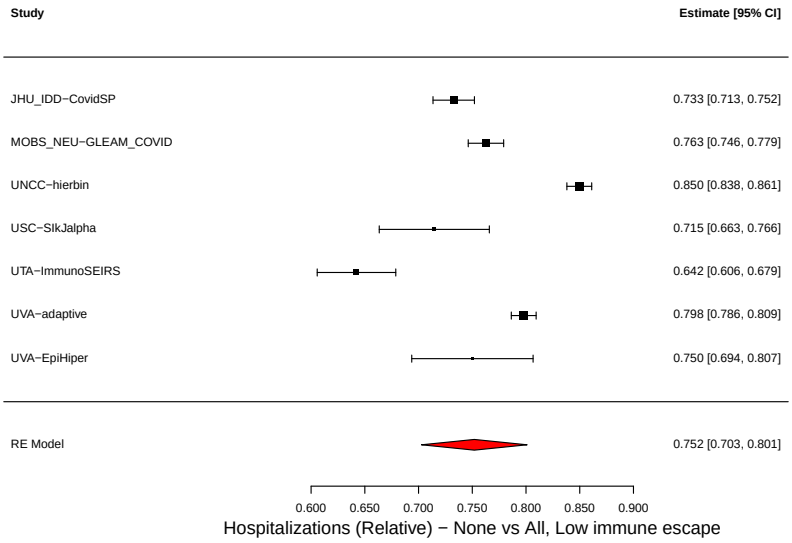
Deaths (Averted) − 65+ vs All, High immune escape



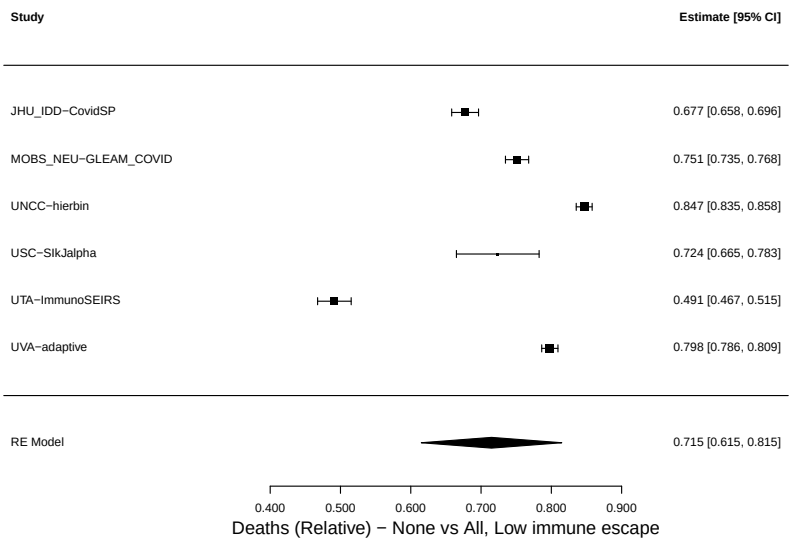
Hospitalizations (Relative) − None vs 65+, Low immune escape



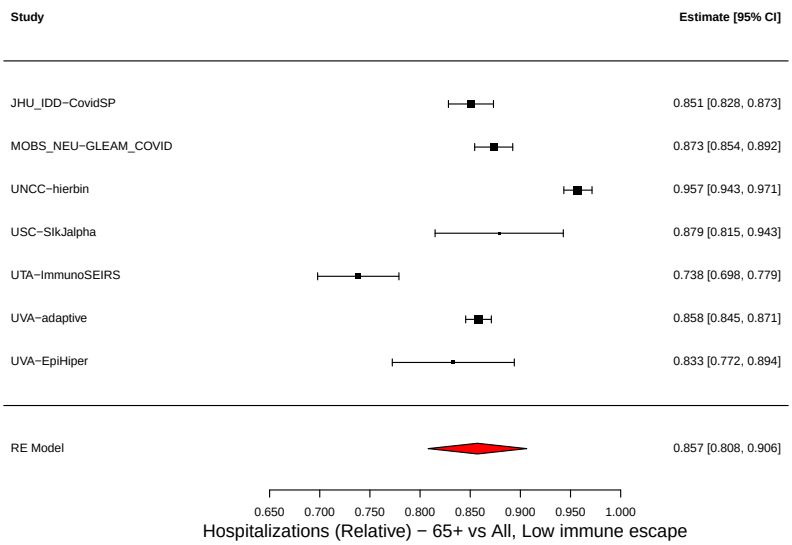
Deaths (Relative) − None vs 65+, Low immune escape



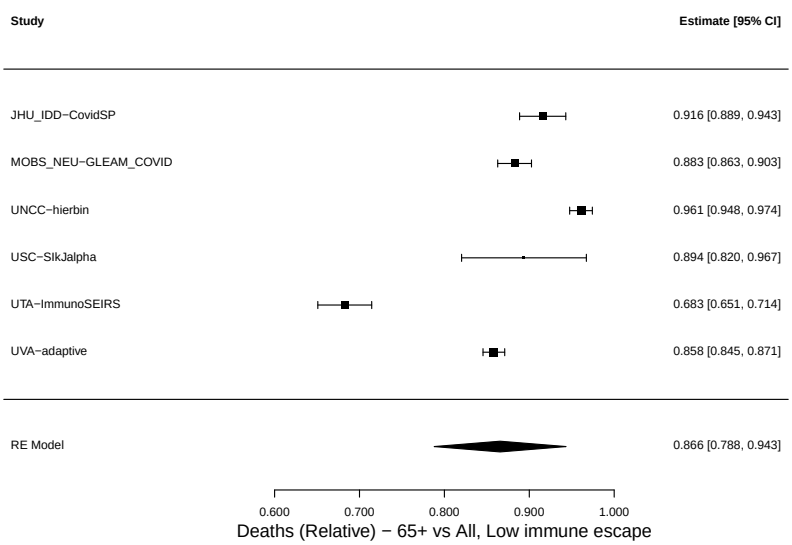
Hospitalizations (Relative) − None vs All, Low immune escape



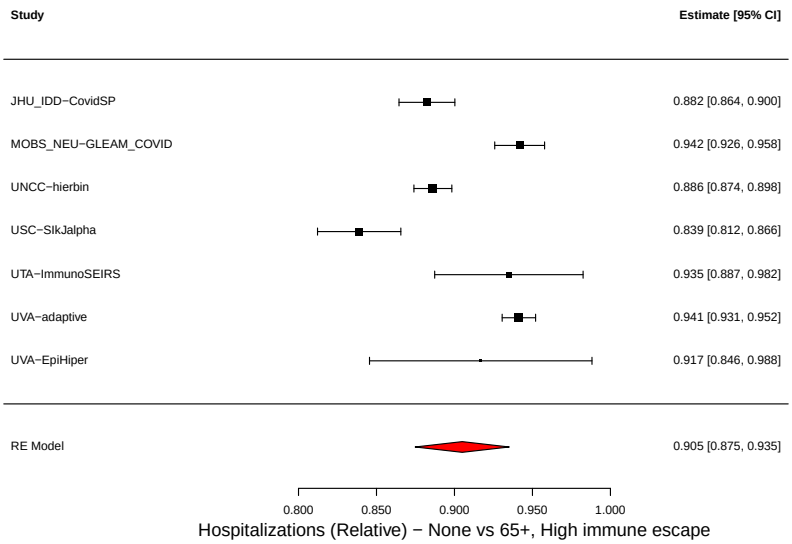
Deaths (Relative) − None vs All, Low immune escape

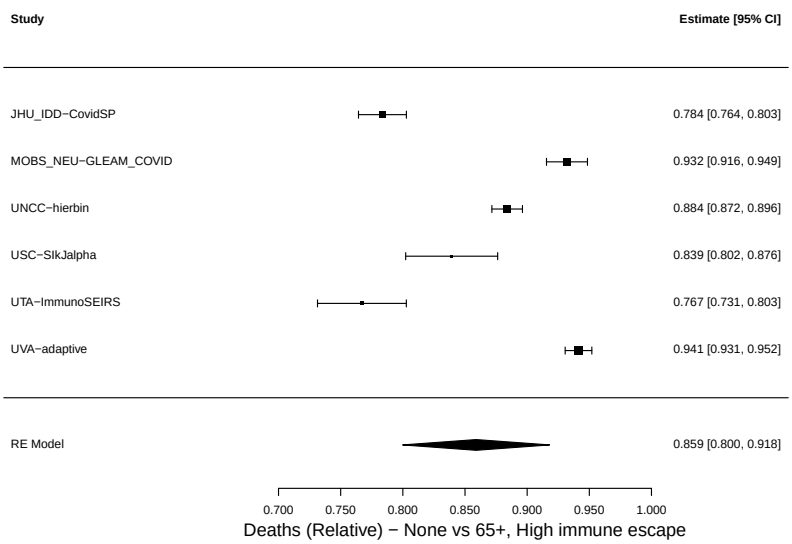


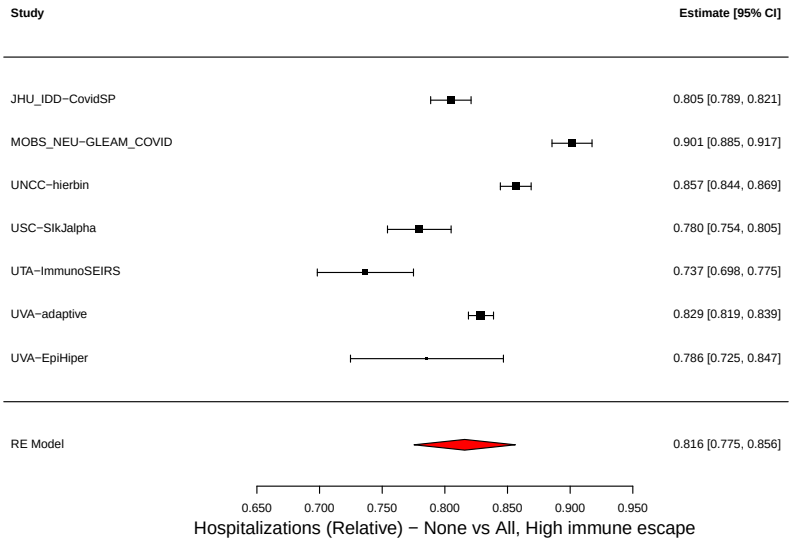
Hospitalizations (Relative) − 65+ vs All, Low immune escape

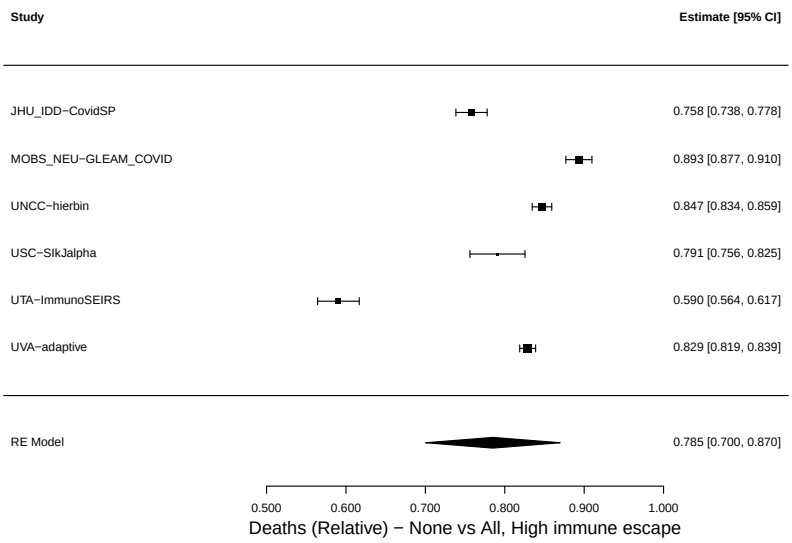


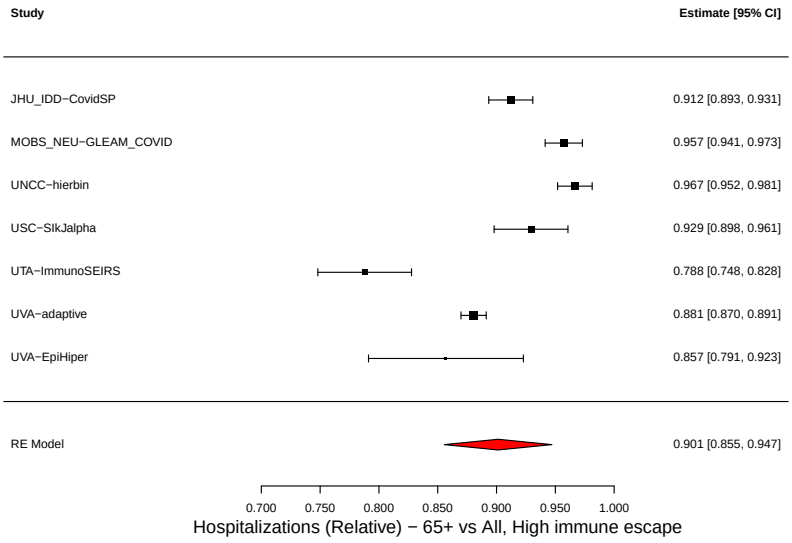
Deaths (Relative) − 65+ vs All, Low immune escape

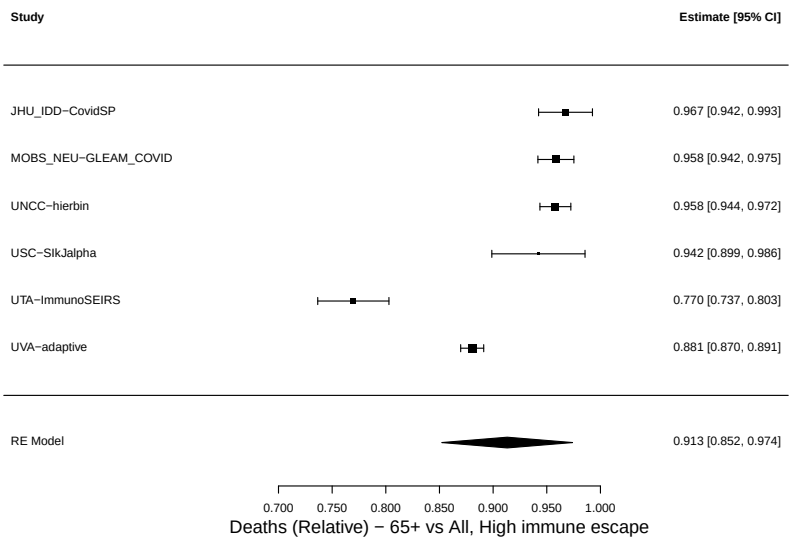

Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.882 [0.864, 0.900]
MOBS_NEU−GLEAM_COVID
0.942 [0.926, 0.958]
UNCC−hierbin
0.886 [0.874, 0.898]
USC−SIkJalpha
0.839 [0.812, 0.866]
UTA−ImmunoSEIRS
0.935 [0.887, 0.982]
UVA−adaptive
0.941 [0.931, 0.952]
UVA−EpiHiper
0.917 [0.846, 0.988]
RE Model
0.905 [0.875, 0.935]
0.800
0.850
0.900
0.950
1.000
Hospitalizations (Relative) − None vs 65+, High immune escape


Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.784 [0.764, 0.803]
MOBS_NEU−GLEAM_COVID
0.932 [0.916, 0.949]
UNCC−hierbin
0.884 [0.872, 0.896]
USC−SIkJalpha
0.839 [0.802, 0.876]
UTA−ImmunoSEIRS
0.767 [0.731, 0.803]
UVA−adaptive
0.941 [0.931, 0.952]
RE Model
0.859 [0.800, 0.918]
0.700
0.750
0.800
0.850
0.900
0.950
1.000
Deaths (Relative) − None vs 65+, High immune escape

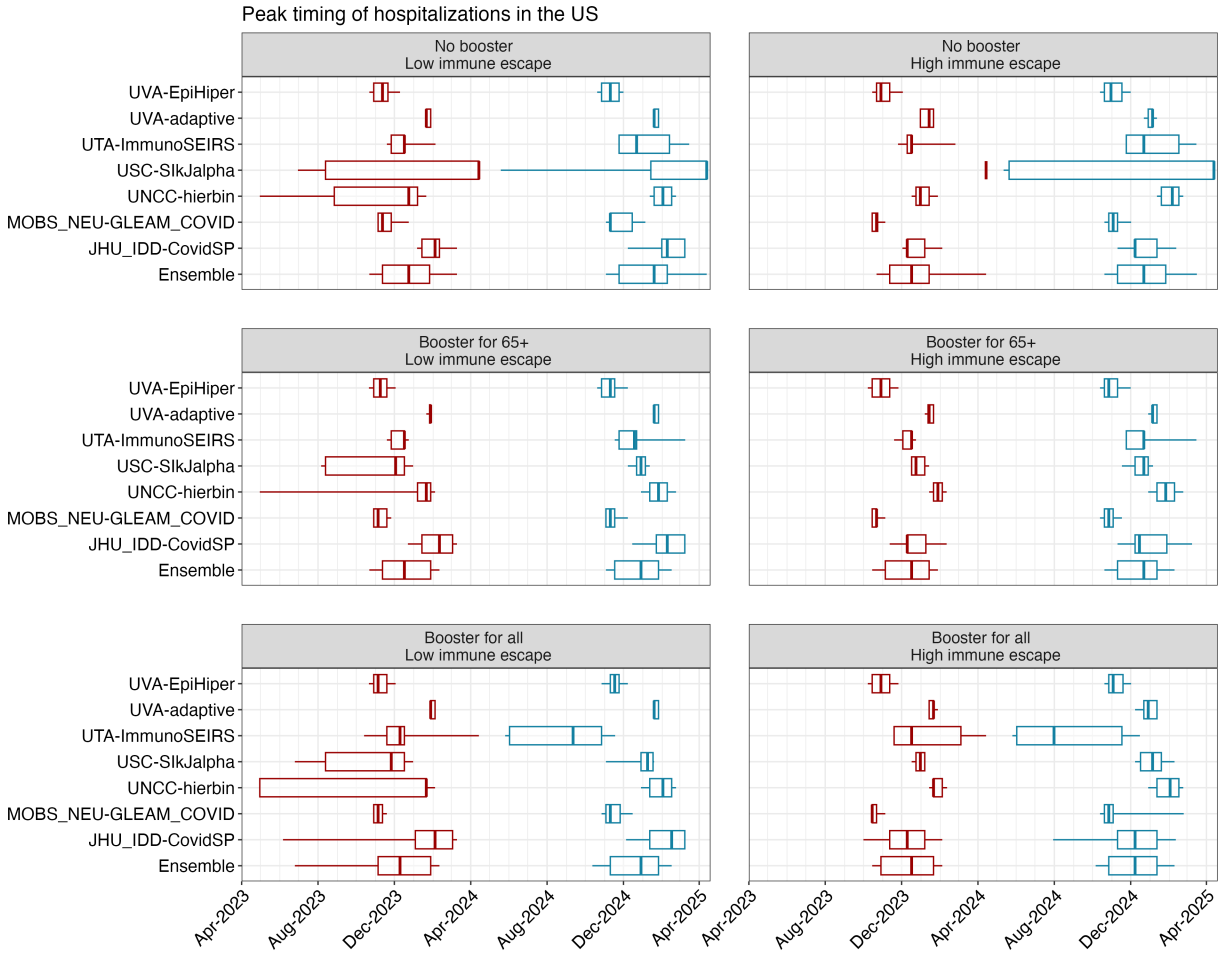

Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.805 [0.789, 0.821]
MOBS_NEU−GLEAM_COVID
0.901 [0.885, 0.917]
UNCC−hierbin
0.857 [0.844, 0.869]
USC−SIkJalpha
0.780 [0.754, 0.805]
UTA−ImmunoSEIRS
0.737 [0.698, 0.775]
UVA−adaptive
0.829 [0.819, 0.839]
UVA−EpiHiper
0.786 [0.725, 0.847]
RE Model
0.816 [0.775, 0.856]
0.650
0.700
0.750
0.800
0.850
0.900
0.950
Hospitalizations (Relative) − None vs All, High immune escape

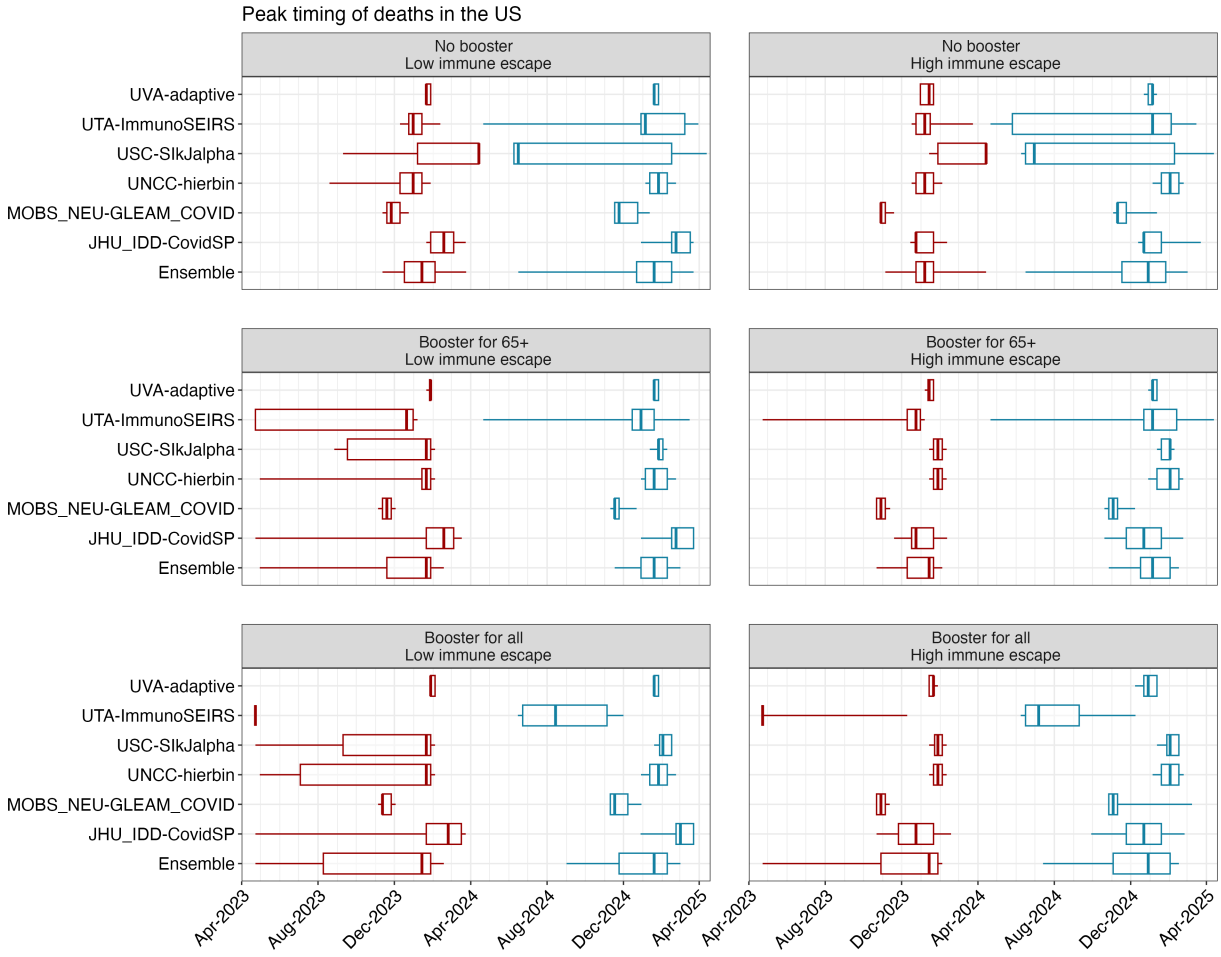

Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.758 [0.738, 0.778]
MOBS_NEU−GLEAM_COVID
0.893 [0.877, 0.910]
UNCC−hierbin
0.847 [0.834, 0.859]
USC−SIkJalpha
0.791 [0.756, 0.825]
UTA−ImmunoSEIRS
0.590 [0.564, 0.617]
UVA−adaptive
0.829 [0.819, 0.839]
RE Model
0.785 [0.700, 0.870]
0.500
0.600
0.700
0.800
0.900
1.000
Deaths (Relative) − None vs All, High immune escape


Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.912 [0.893, 0.931]
MOBS_NEU−GLEAM_COVID
0.957 [0.941, 0.973]
UNCC−hierbin
0.967 [0.952, 0.981]
USC−SIkJalpha
0.929 [0.898, 0.961]
UTA−ImmunoSEIRS
0.788 [0.748, 0.828]
UVA−adaptive
0.881 [0.870, 0.891]
UVA−EpiHiper
0.857 [0.791, 0.923]
RE Model
0.901 [0.855, 0.947]
0.700
0.750
0.800
0.850
0.900
0.950
1.000
Hospitalizations (Relative) − 65+ vs All, High immune escape

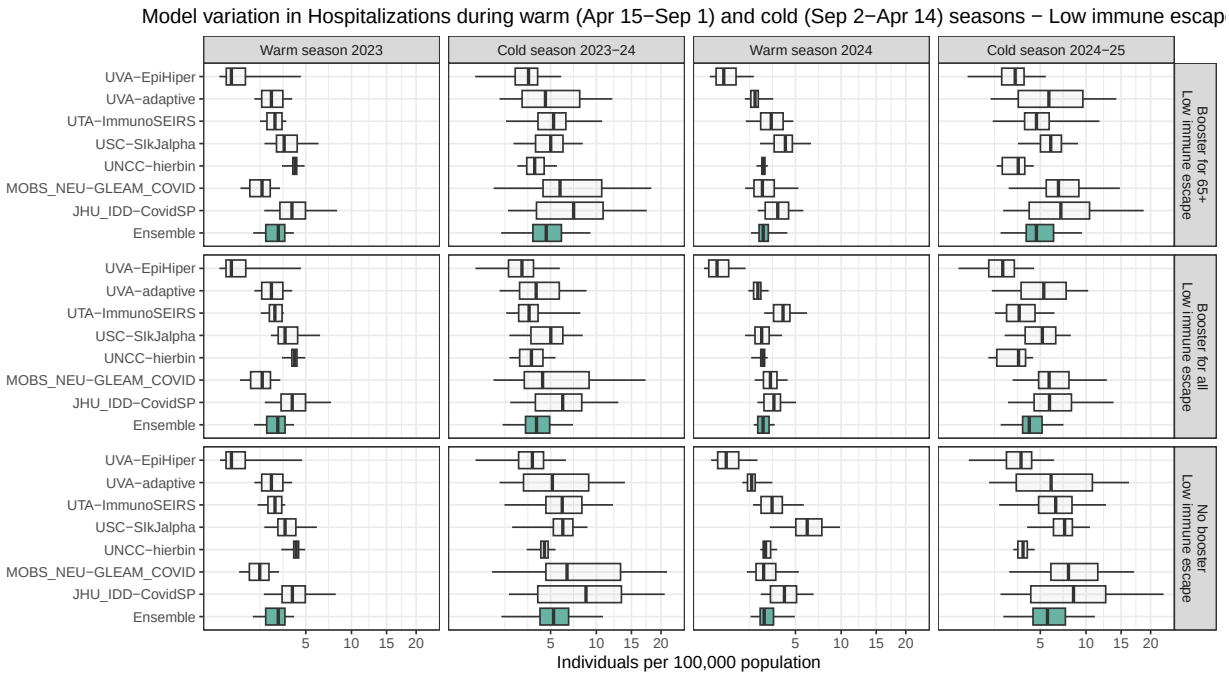

Study
Estimate [95% CI]
JHU_IDD−CovidSP
0.967 [0.942, 0.993]
MOBS_NEU−GLEAM_COVID
0.958 [0.942, 0.975]
UNCC−hierbin
0.958 [0.944, 0.972]
USC−SIkJalpha
0.942 [0.899, 0.986]
UTA−ImmunoSEIRS
0.770 [0.737, 0.803]
UVA−adaptive
0.881 [0.870, 0.891]
RE Model
0.913 [0.852, 0.974]
0.700
0.750
0.800
0.850
0.900
0.950
1.000
Deaths (Relative) − 65+ vs All, High immune escape

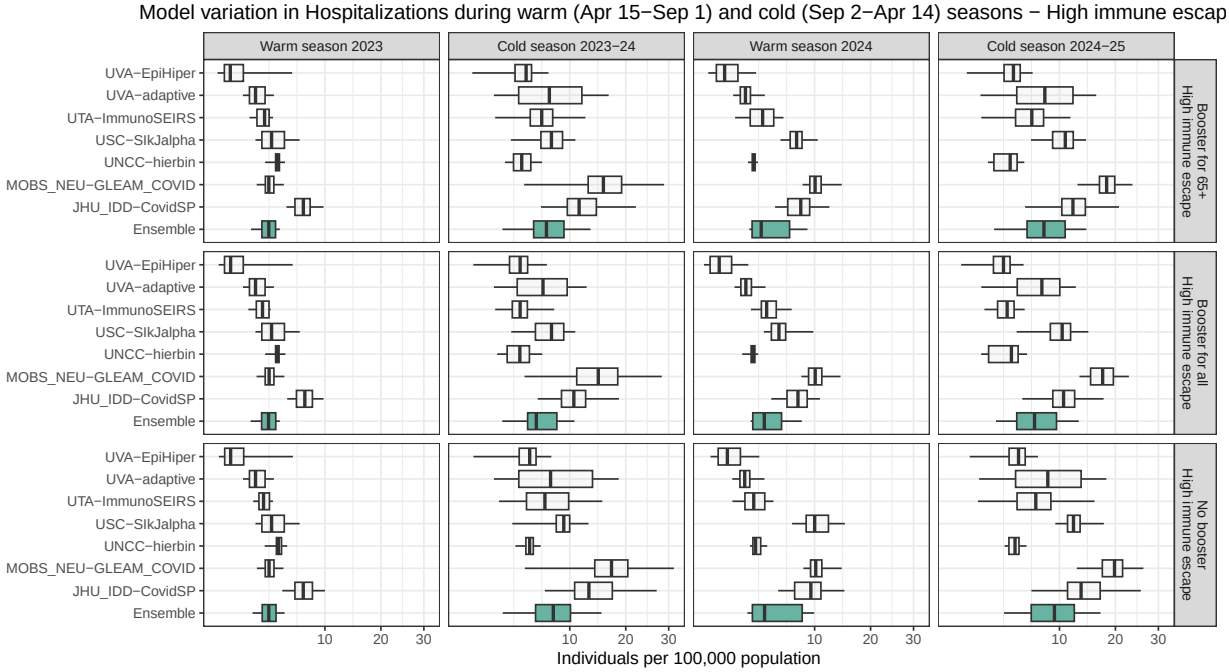
Probability of peak timing



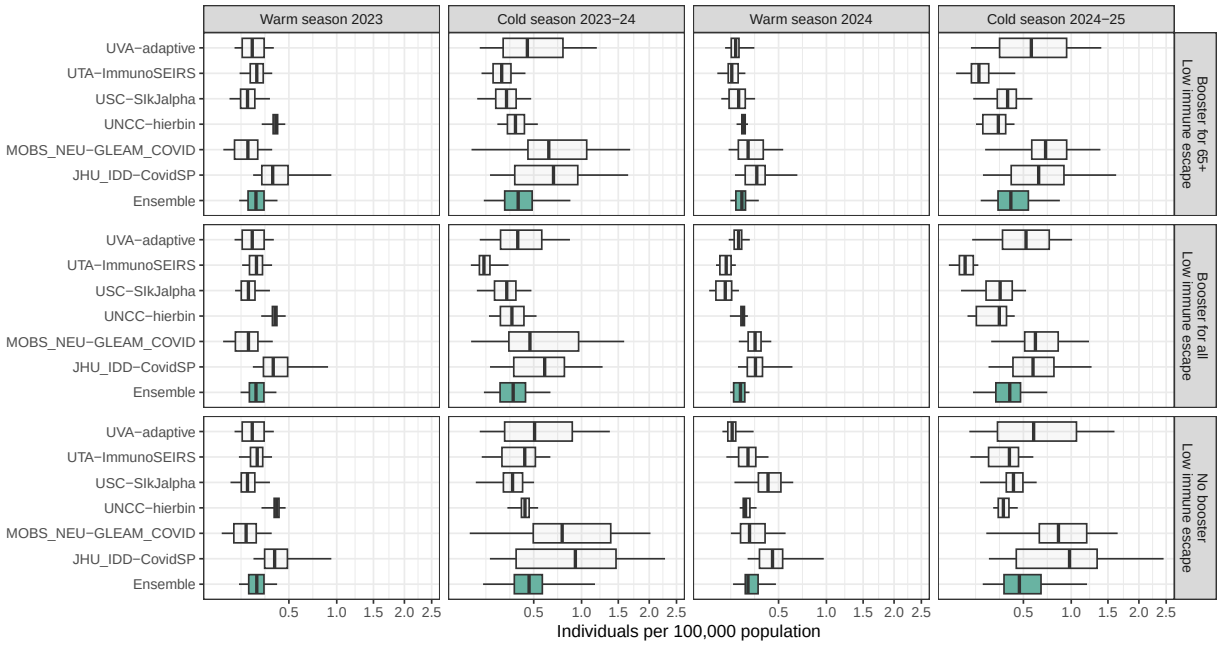

Peak timing of deaths in the US
No booster
Low immune escape
No booster
High immune escape
Booster for 65+
Low immune escape
Booster for 65+
High immune escape
Booster for all
Low immune escape
Booster for all
High immune escape
UVA-adaptive
UTA-ImmunoSEIRS
USC-SIkJalpha
UNCC-hierbin
MOBS_NEU-GLEAM_COVID
JHU_IDD-CovidSP
Ensemble
Apr-2023
Aug-2023
Dec-2023
Apr-2024
Aug-2024
Dec-2024
Apr-2025

Model variation by season

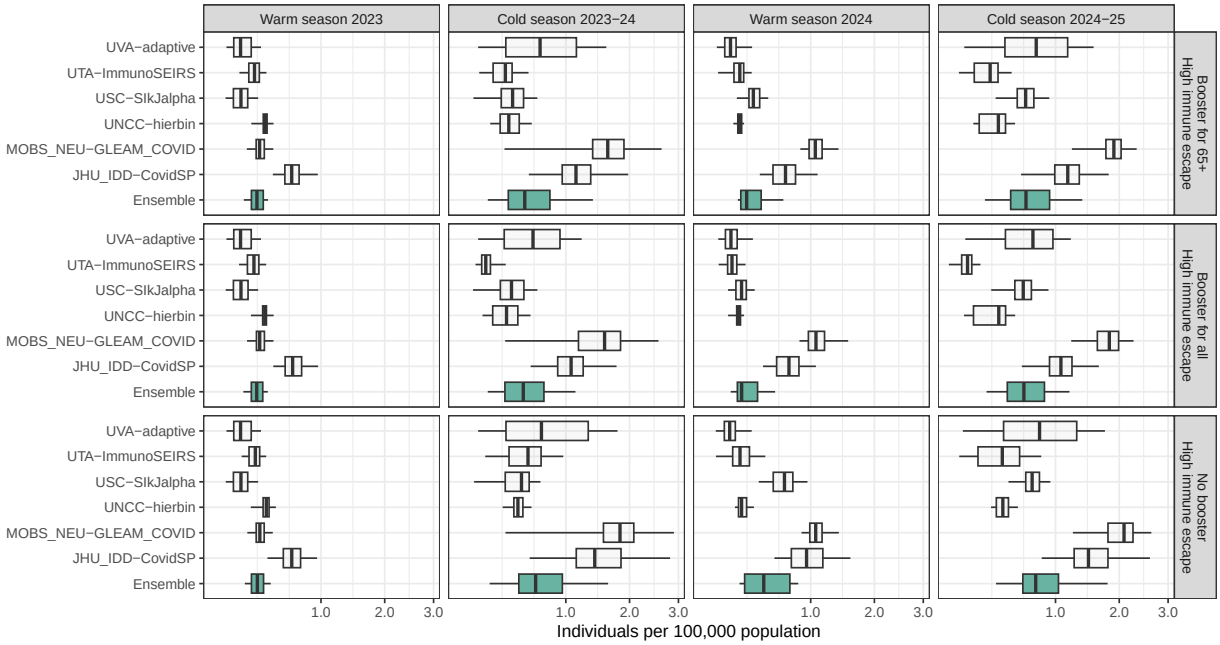




Model variation in Deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons − Low immune escape

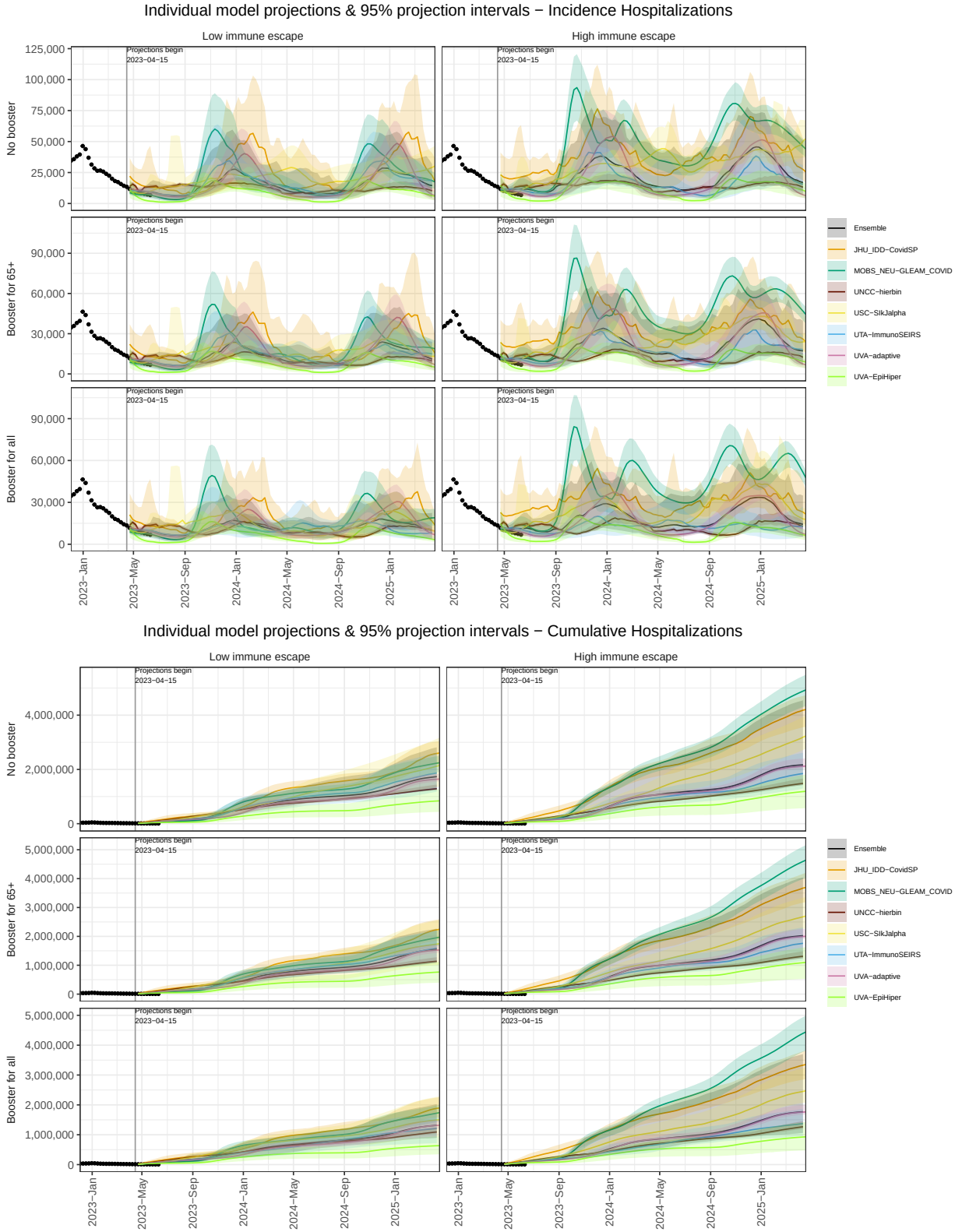


Model variation in Deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons − High immune escape

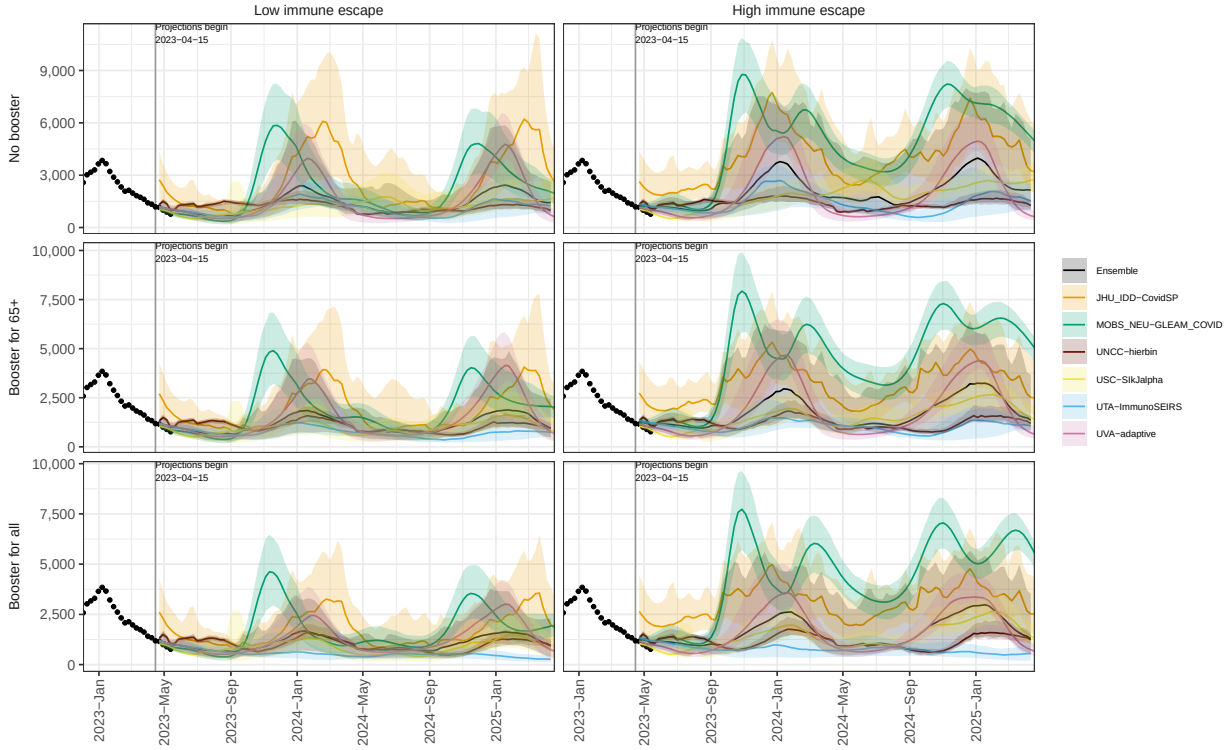


National individual model projections

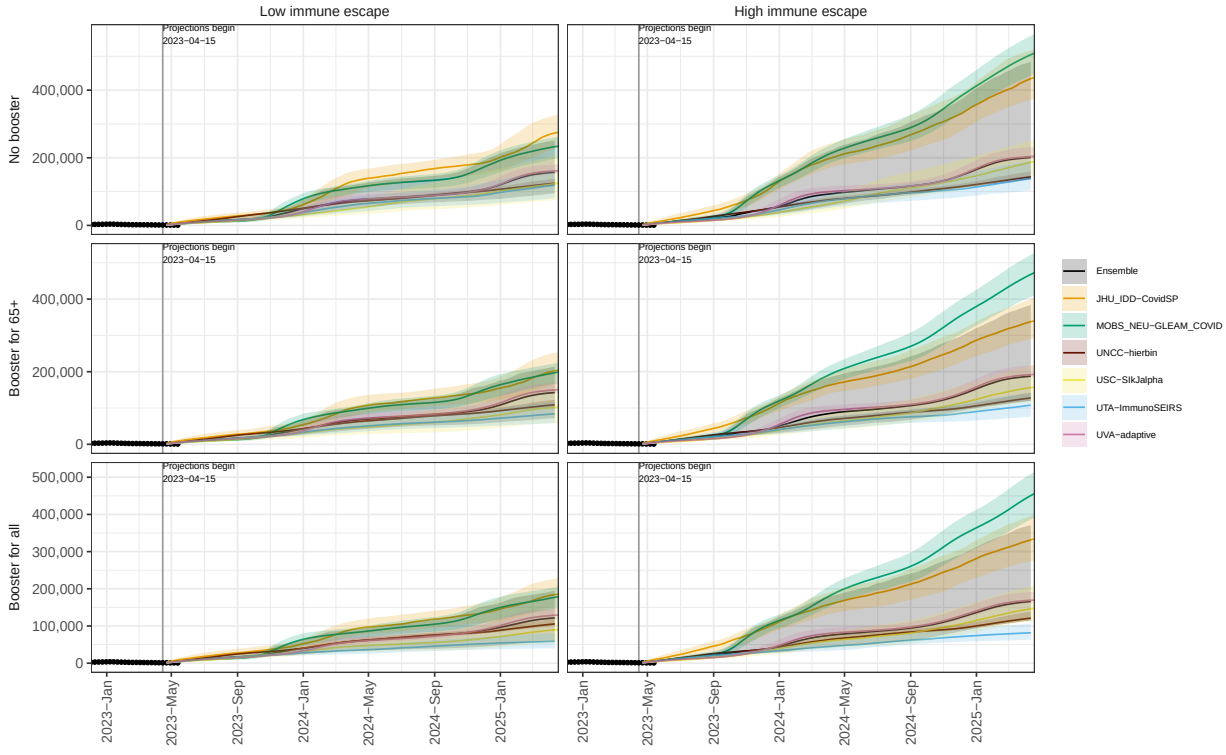
Individual model projections and ensemble by scenario for national hospitalizations and deaths.



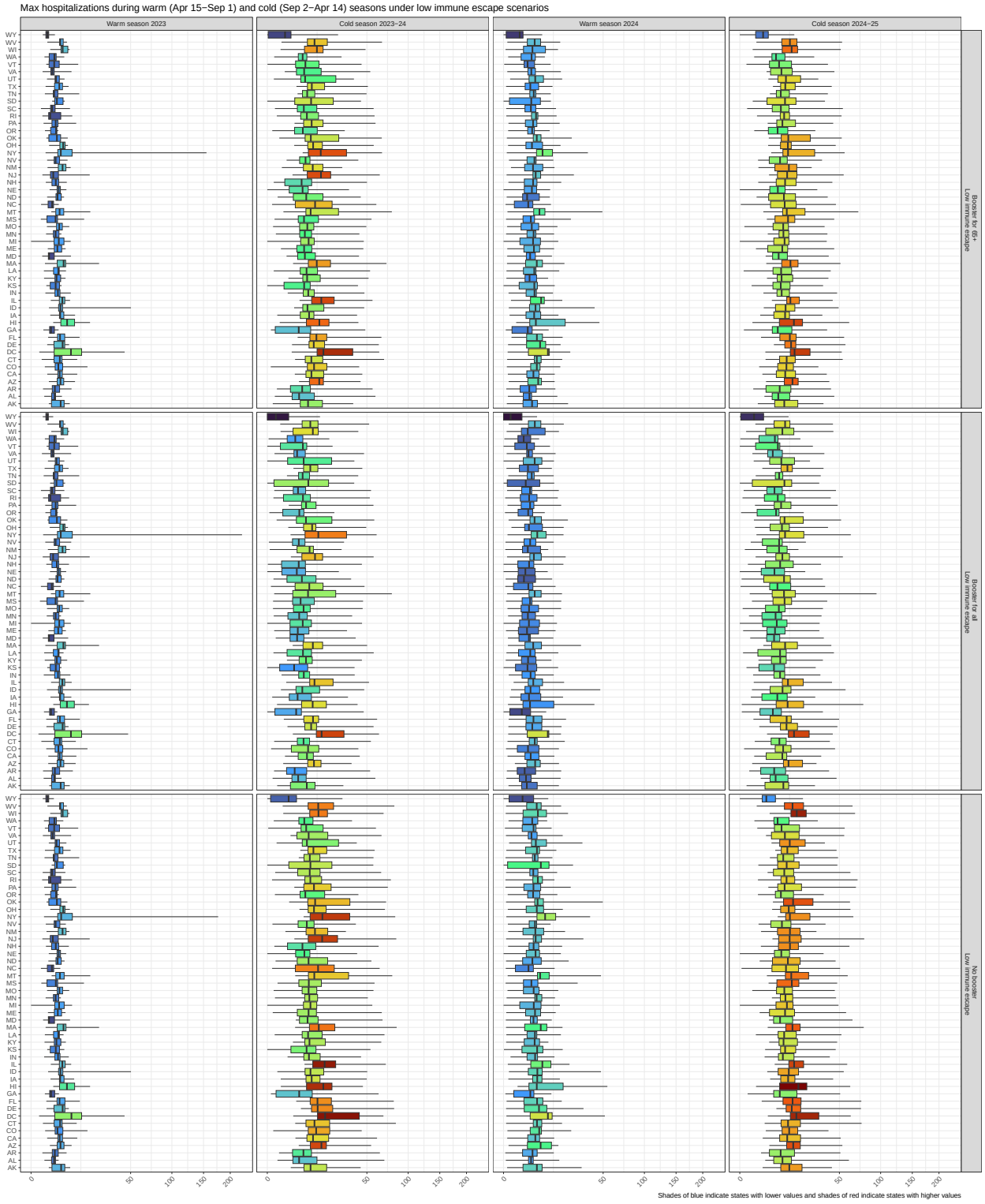
Individual model projections & 95% projection intervals − Incidence Deaths

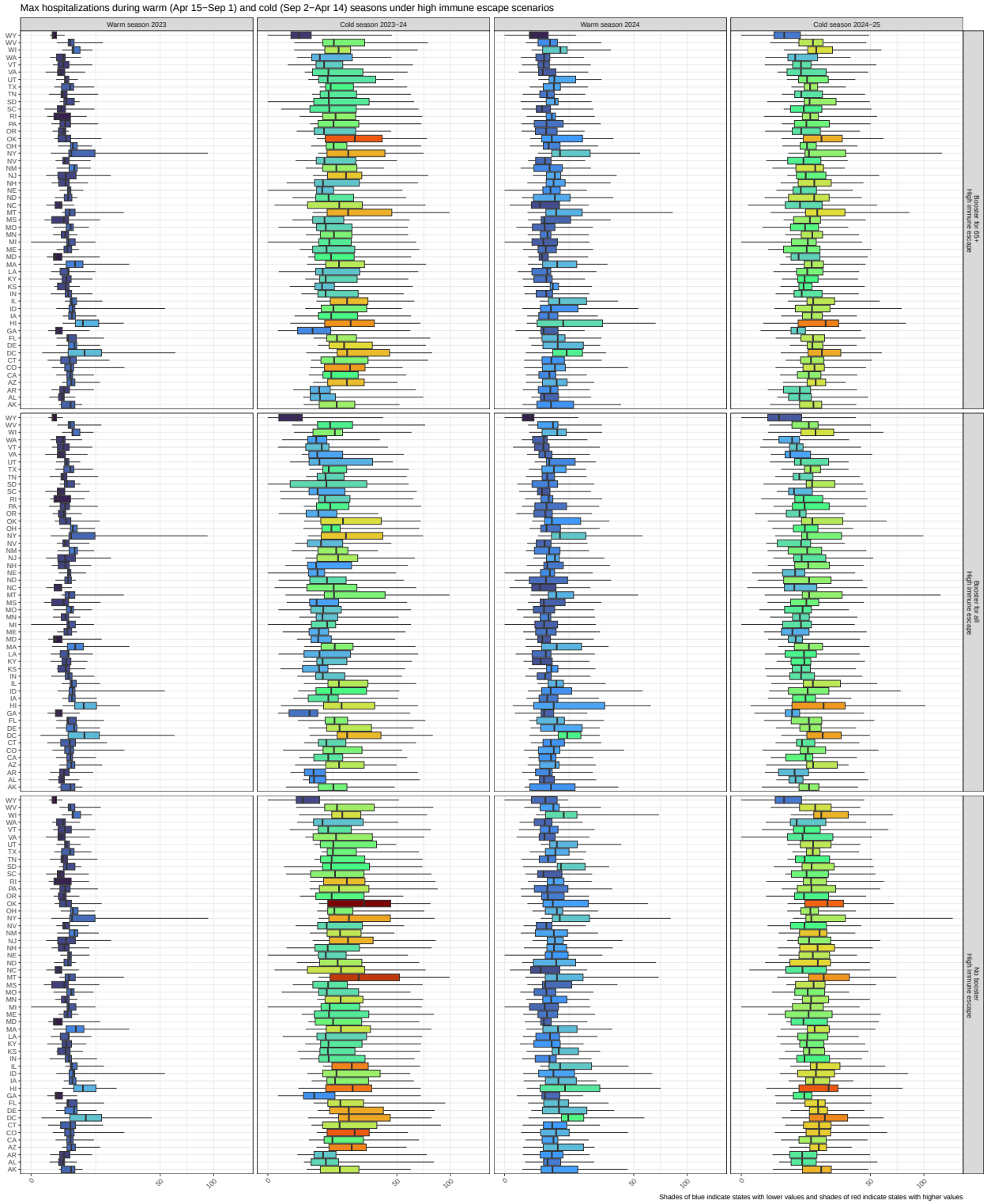


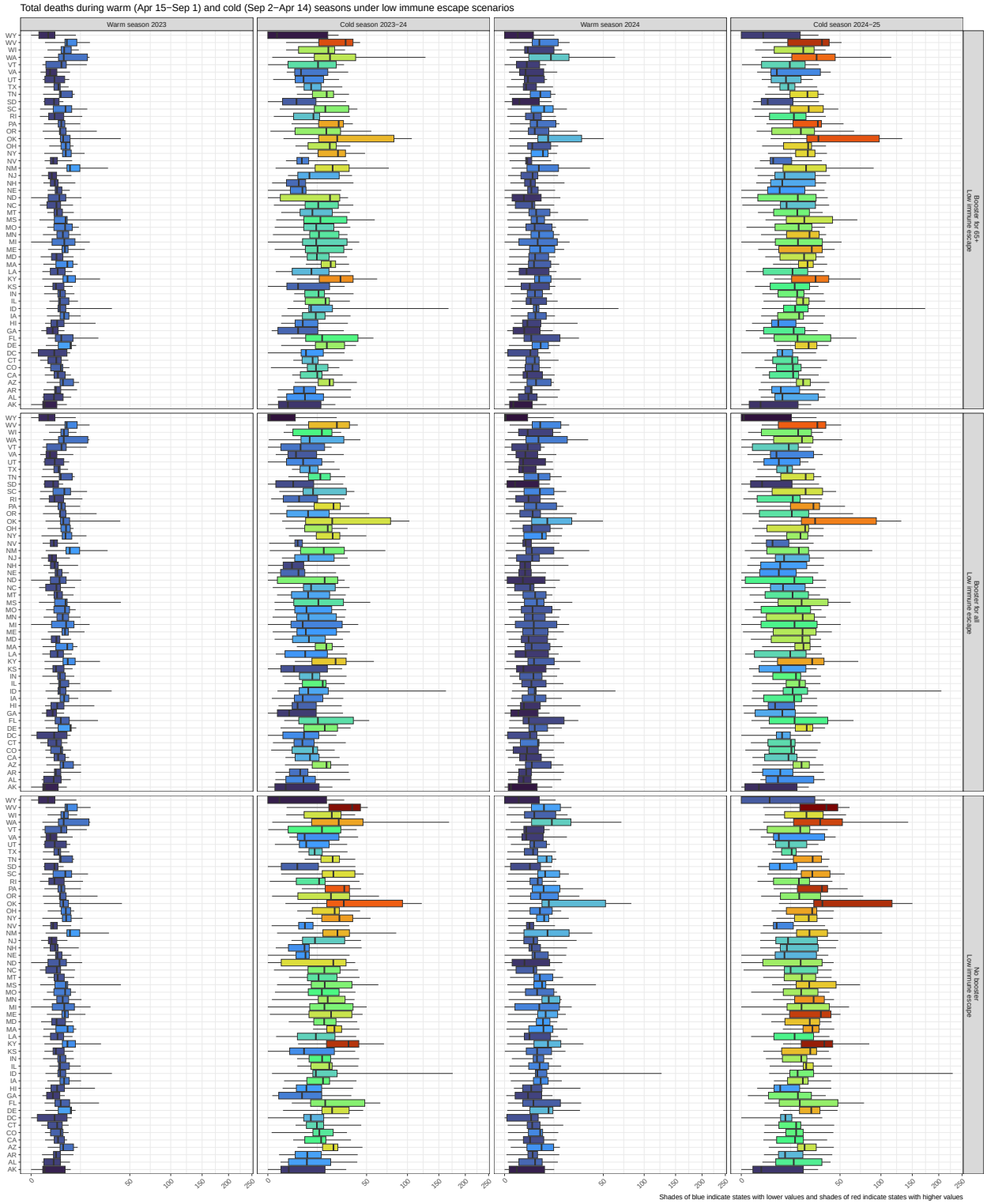
Individual model projections & 95% projection intervals − Cumulative Deaths

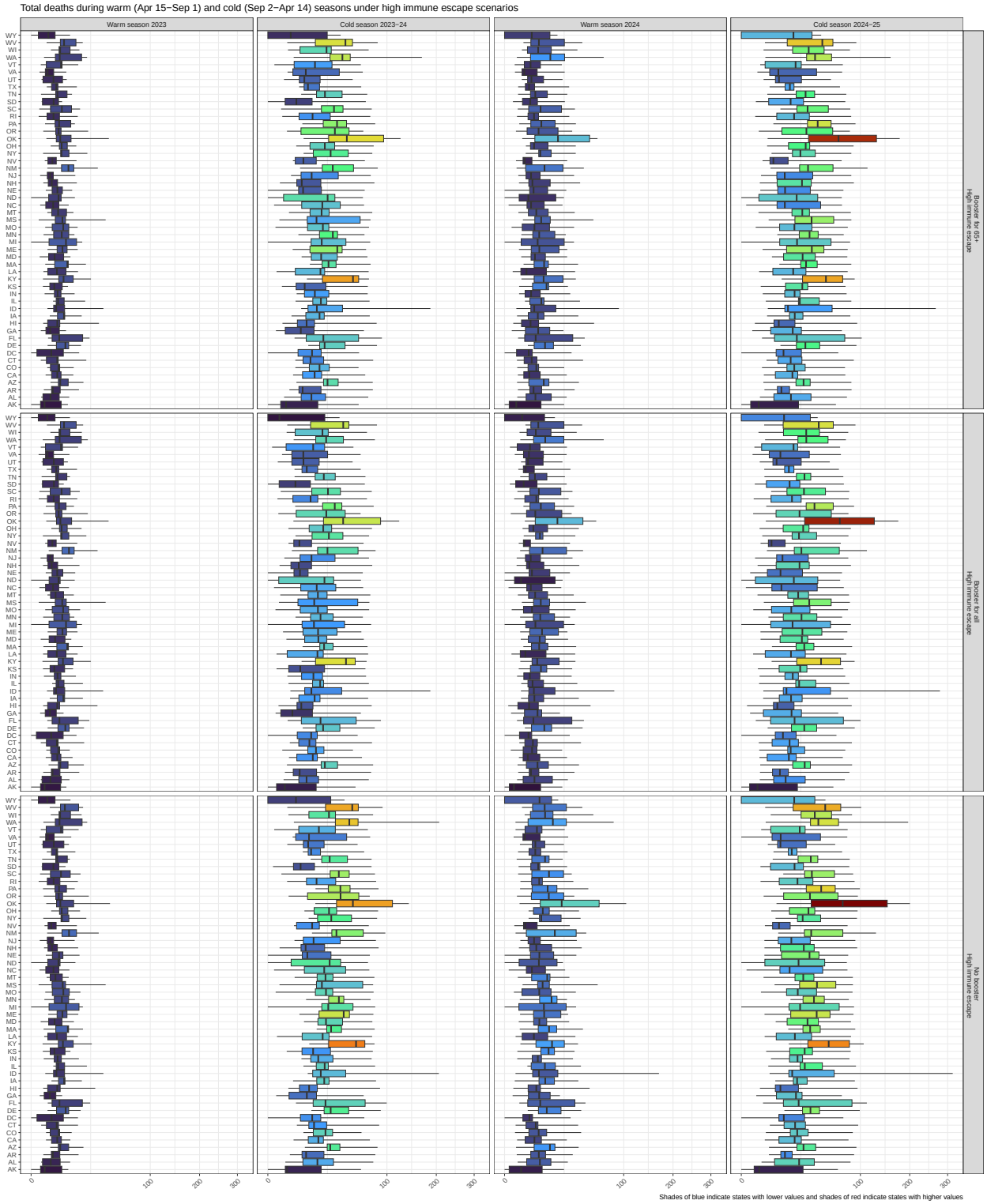


State-level seasonal plots for the national ensemble



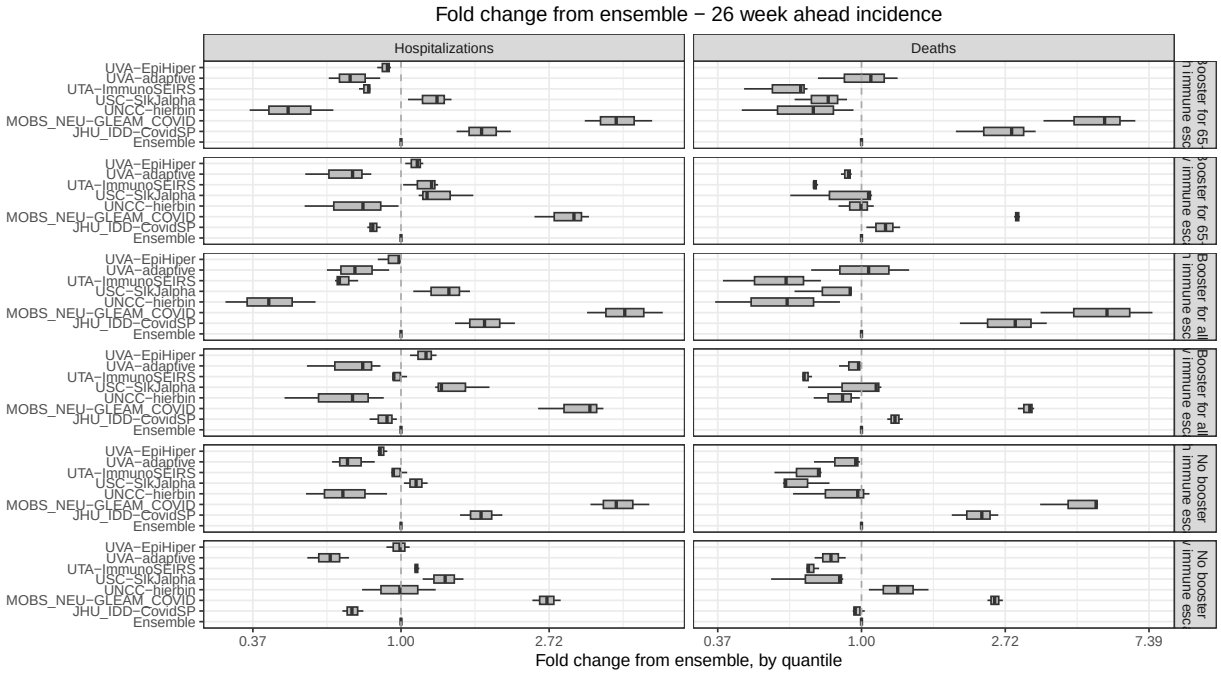

Max hospitalizations during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under high immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Booster 6/15
High immune escape
Booster 1/8
High immune escape
No booster
High immune escape
0
50
100
Shades of blue indicate states with lower values and shades of red indicate states with higher values

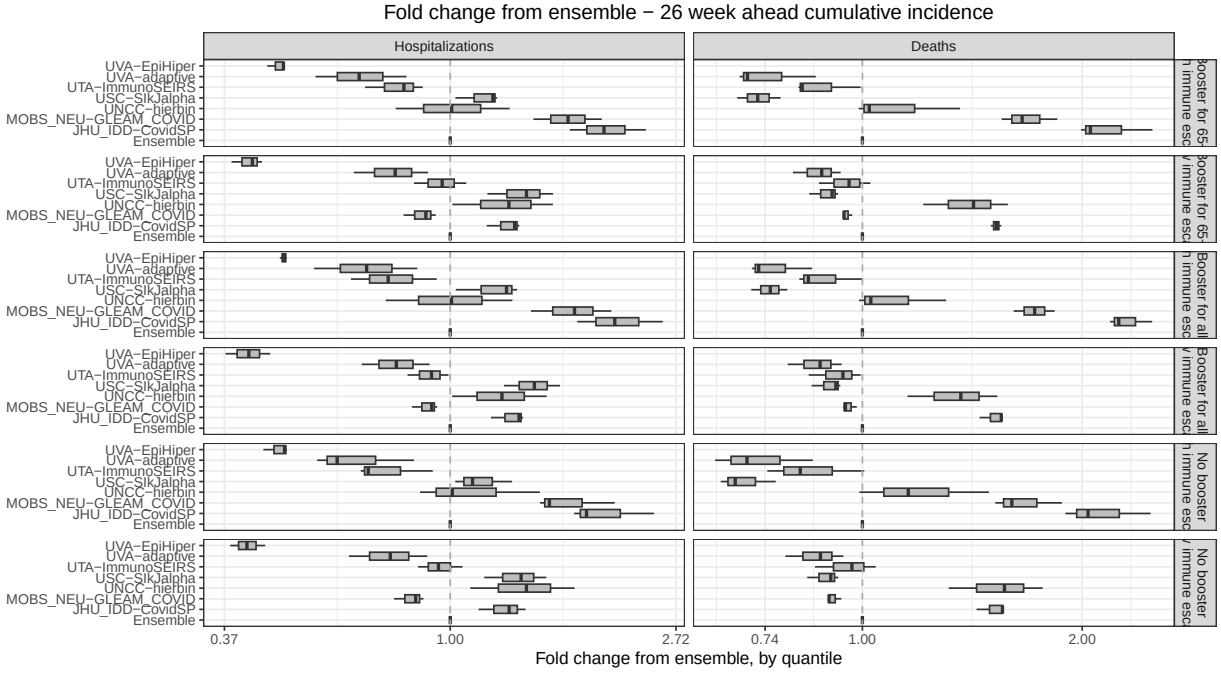

Total deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under low immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Baseline low immune escape
Low immune escape
Very low immune escape
0
50
100
150
200
250
Shades of blue indicate states with lower values and shades of red indicate states with higher values

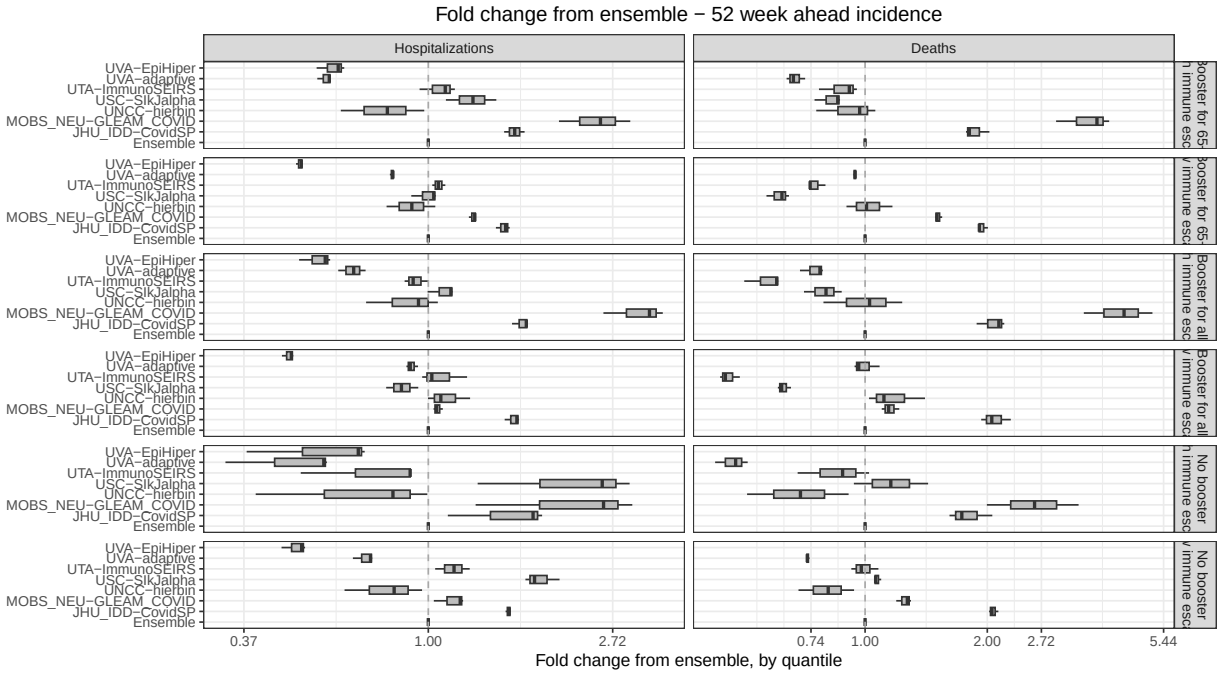

Total deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under high immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Booster 6/15
High immune escape
Booster 9/1
High immune escape
No booster
High immune escape
0
100
200
300
Shades of blue indicate states with lower values and shades of red indicate states with higher values

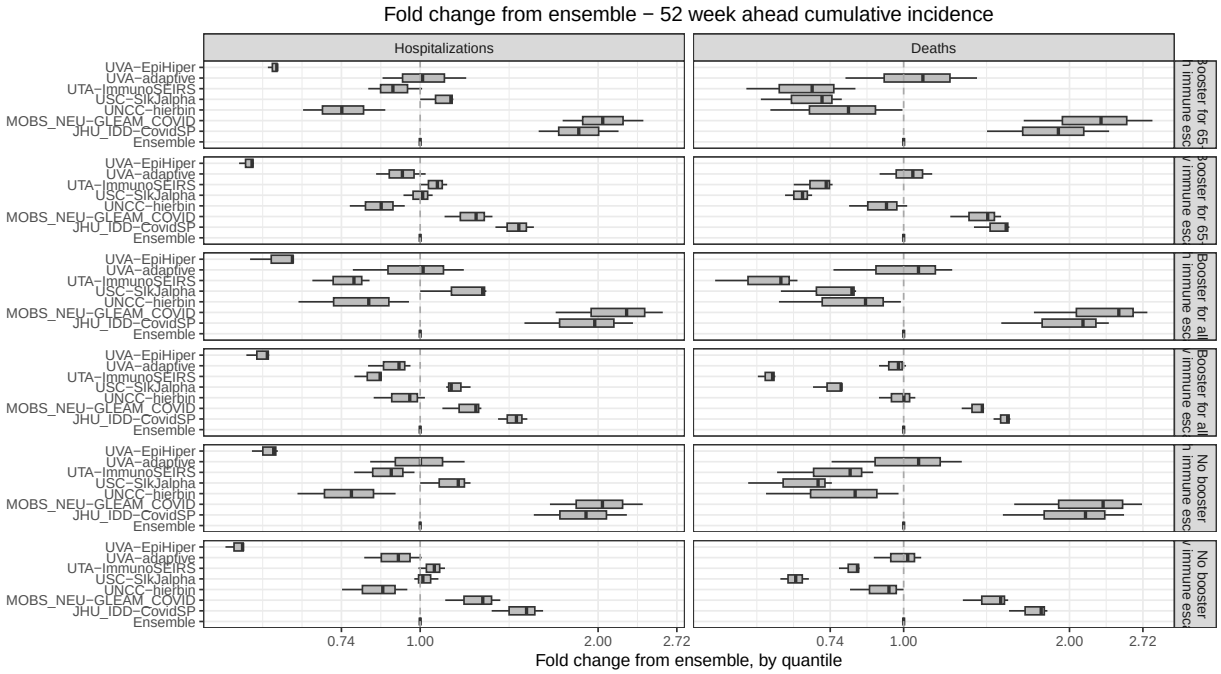
Supplemental Plots and Tables

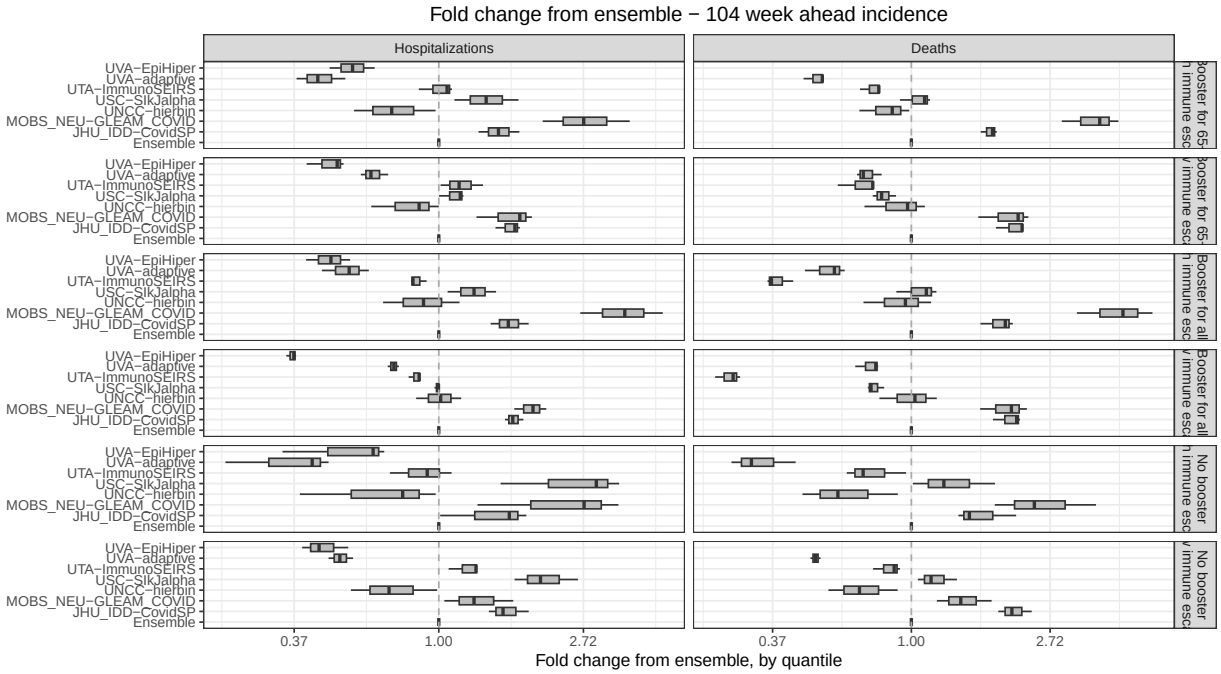
Difference between model and ensemble distributions

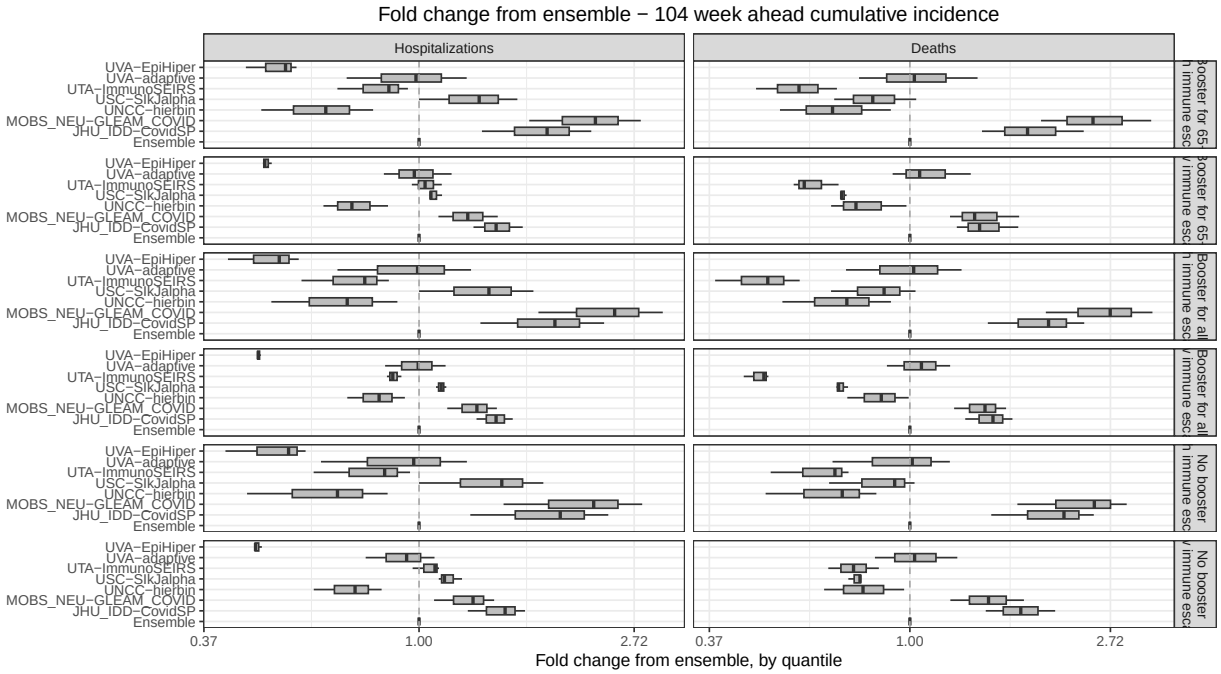




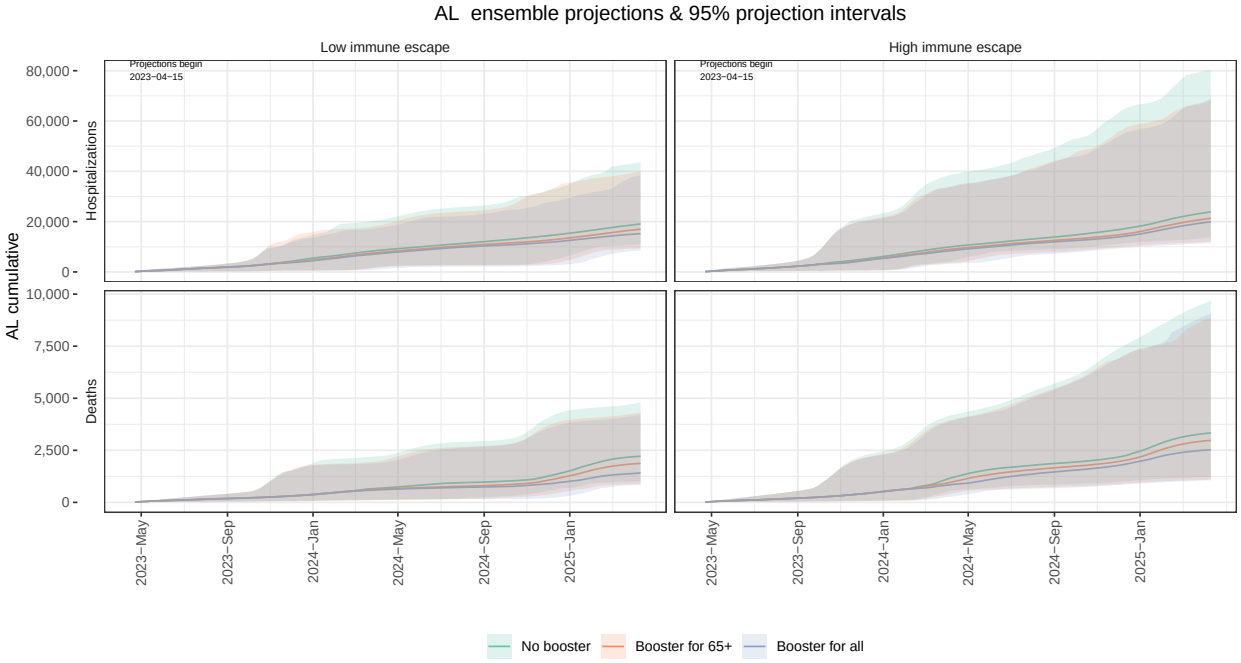

Fold change from ensemble − 52 week ahead incidence
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
UTA−ImmunoSEIRS
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
Ensemble
Booster for 65+, high immune esc
Booster for 65+, low immune esc
Booster for all, high immune esc
Booster for all, low immune esc
No booster, high immune esc
No booster, low immune esc
0.37
1.00
2.72
0.74
1.00
2.00
2.72
5.44
Fold change from ensemble, by quantile

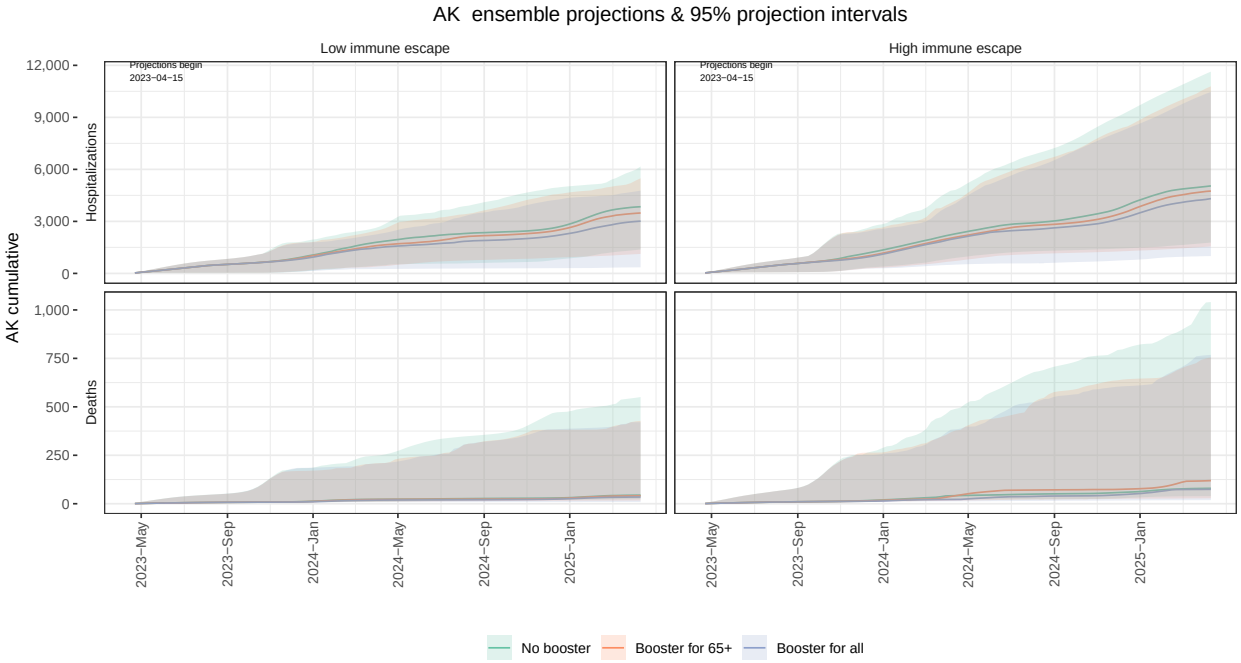

Fold change from ensemble − 52 week ahead cumulative incidence
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
UTA−ImmunoSEIRS
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
Ensemble
Booster for 65+, high immune esc
Booster for 65+, low immune esc
Booster for all, high immune esc
Booster for all, low immune esc
No booster, high immune esc
No booster, low immune esc
0.74
1.00
2.00
2.72
Fold change from ensemble, by quantile

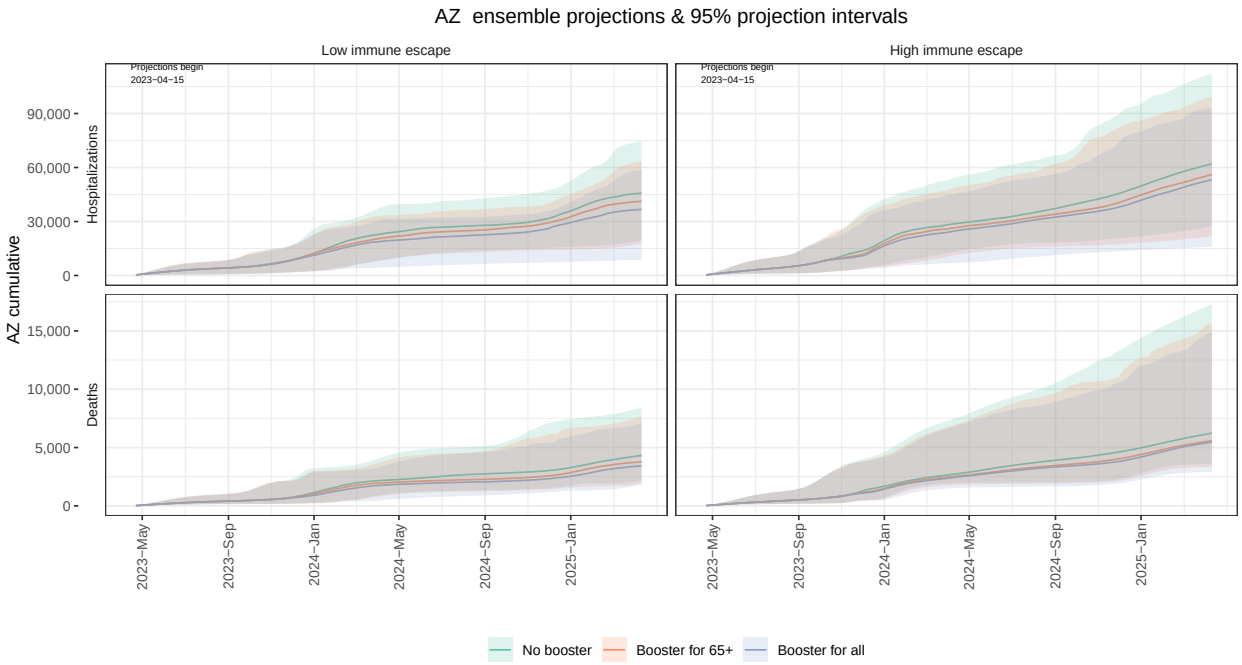

Fold change from ensemble − 104 week ahead incidence
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
UTA−ImmunoSEIRS
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
Ensemble
0.37
1.00
2.72
Fold change from ensemble, by quantile

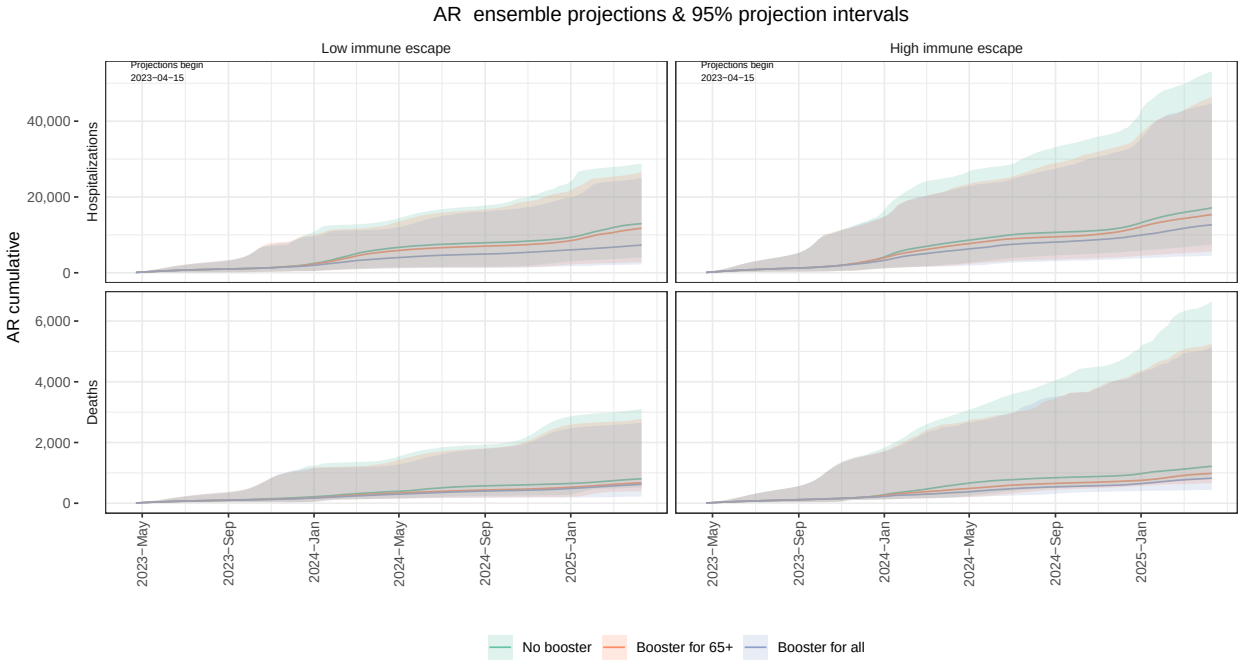

Fold change from ensemble − 104 week ahead cumulative incidence
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
UTA−ImmunoSEIRS
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
Ensemble
0.37
1.00
2.72
Fold change from ensemble, by quantile

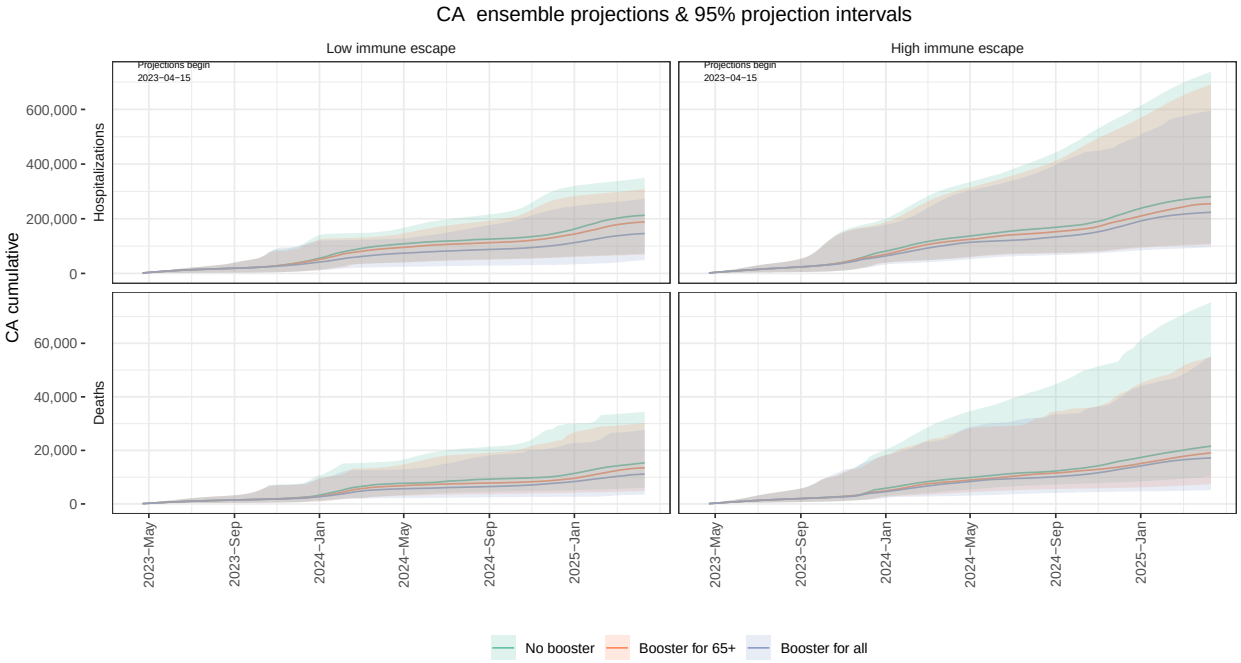
State-level ensemble plots

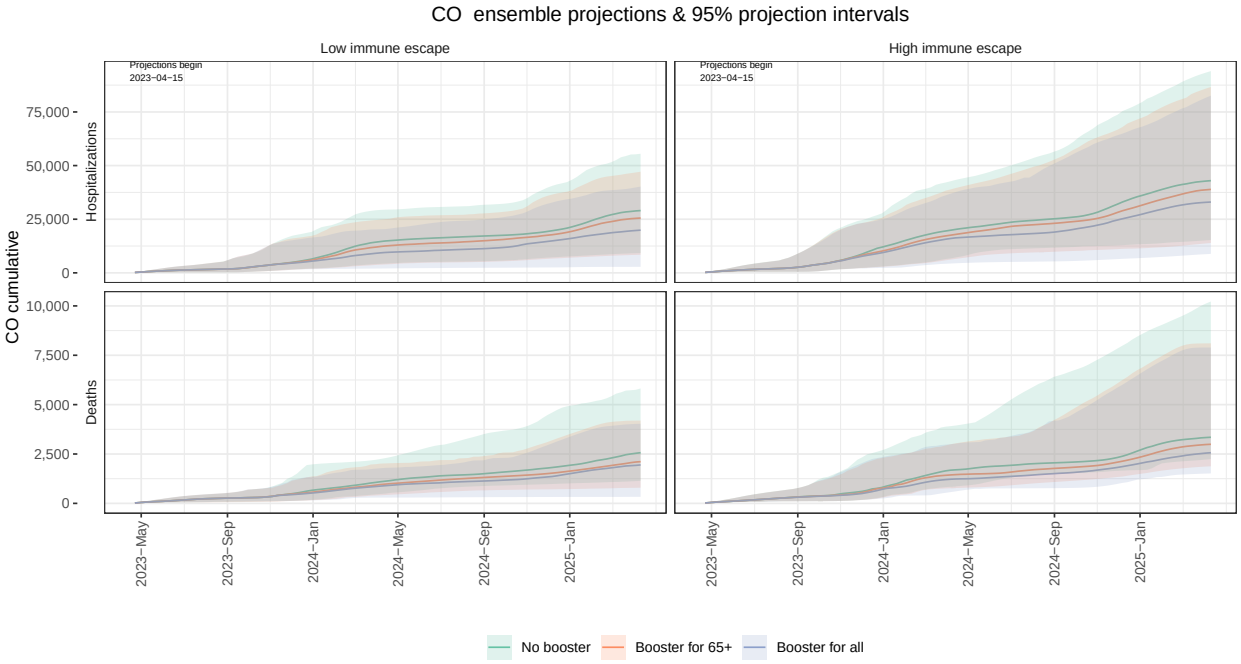


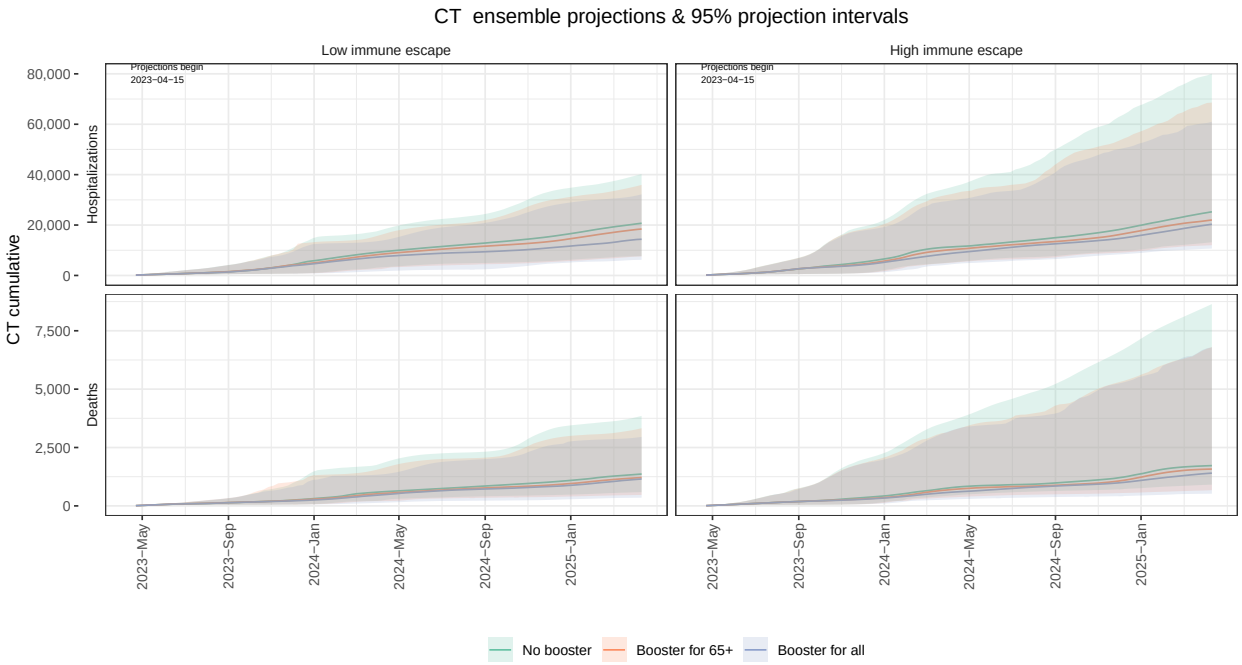


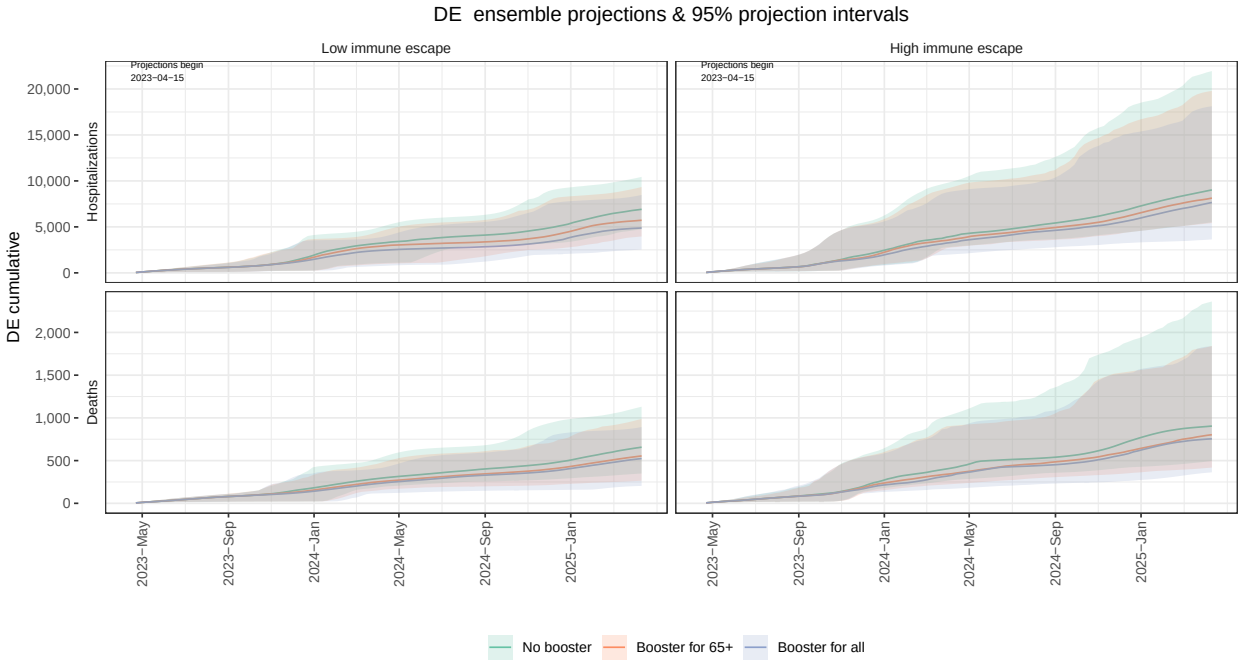

AZ ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
AZ cumulative
Hospitalizations
Deaths
90,000
60,000
30,000
0
15,000
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

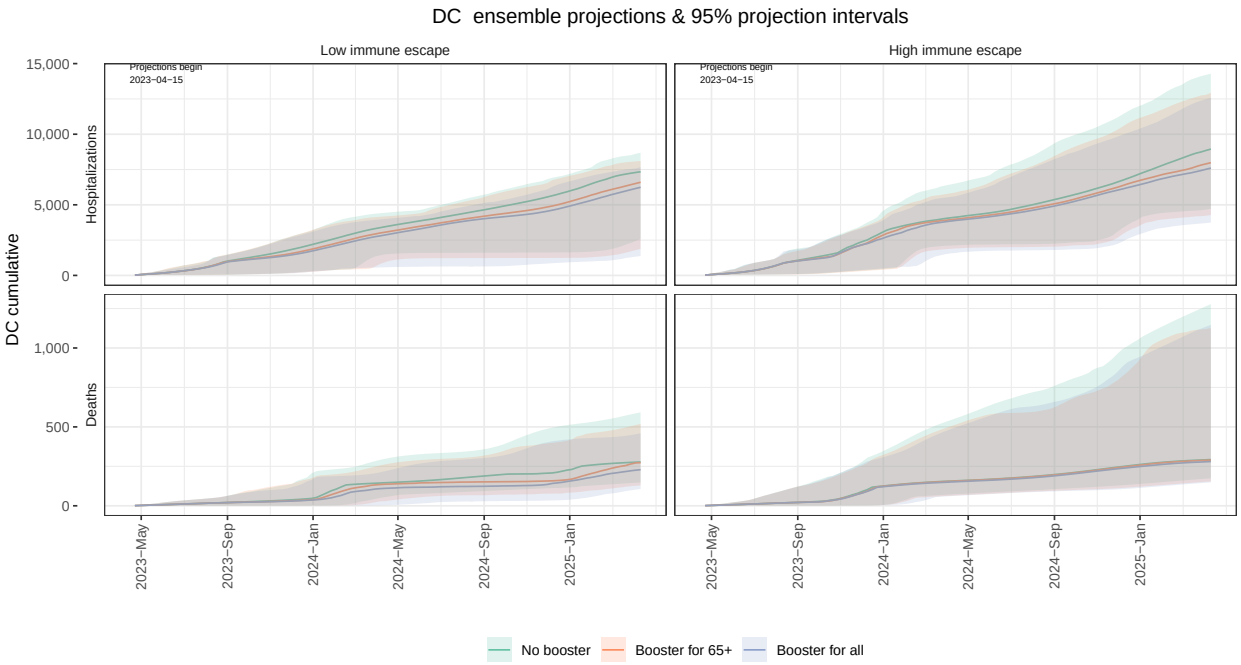

AR ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
AR cumulative
Hospitalizations
Deaths
40,000
20,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

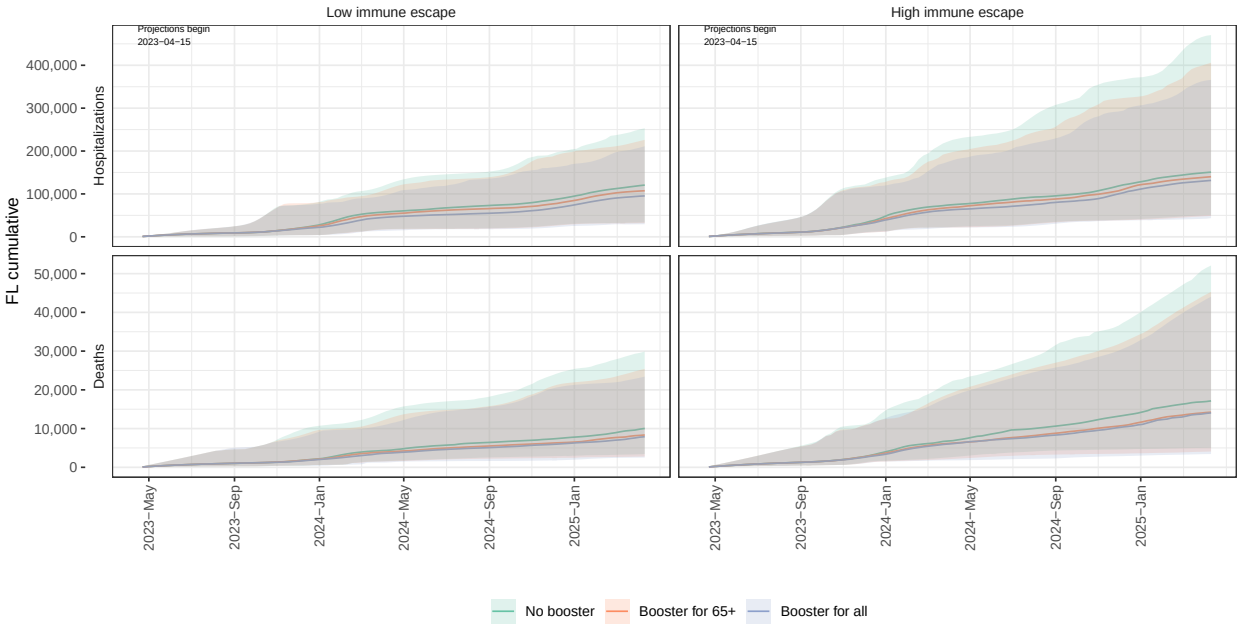

CA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
CA cumulative
Hospitalizations
Deaths
600,000
400,000
200,000
0
60,000
40,000
20,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

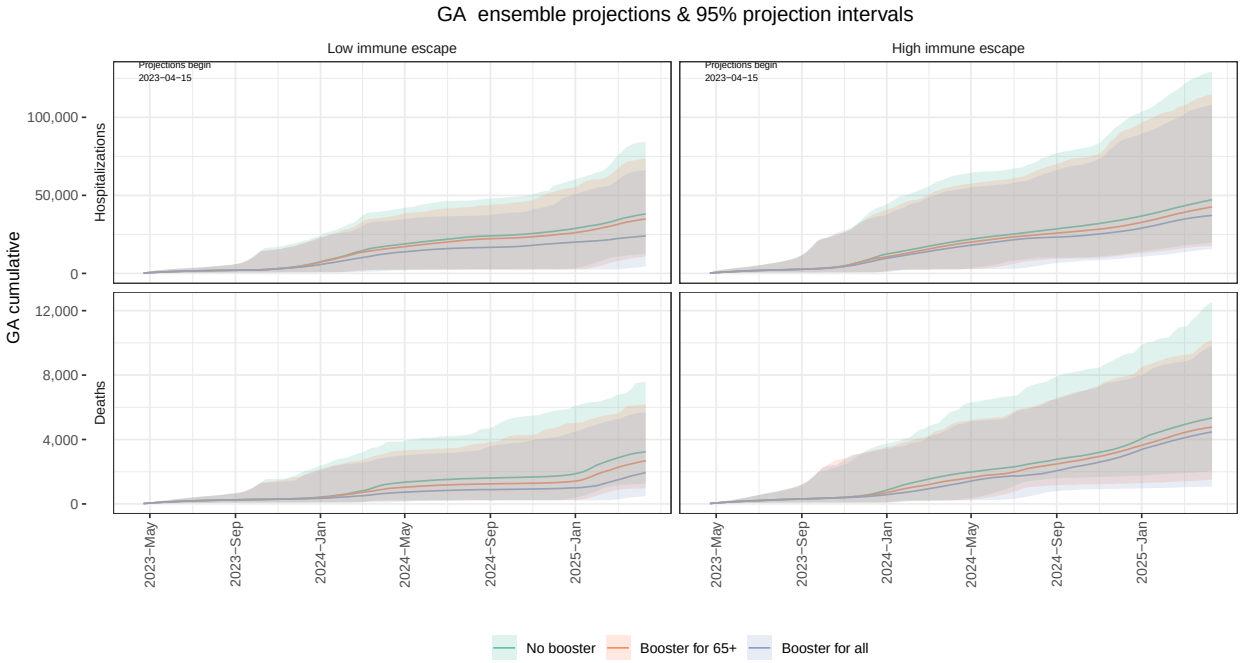

CO ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
CO cumulative
Hospitalizations
Deaths
75,000
50,000
25,000
0
10,000
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

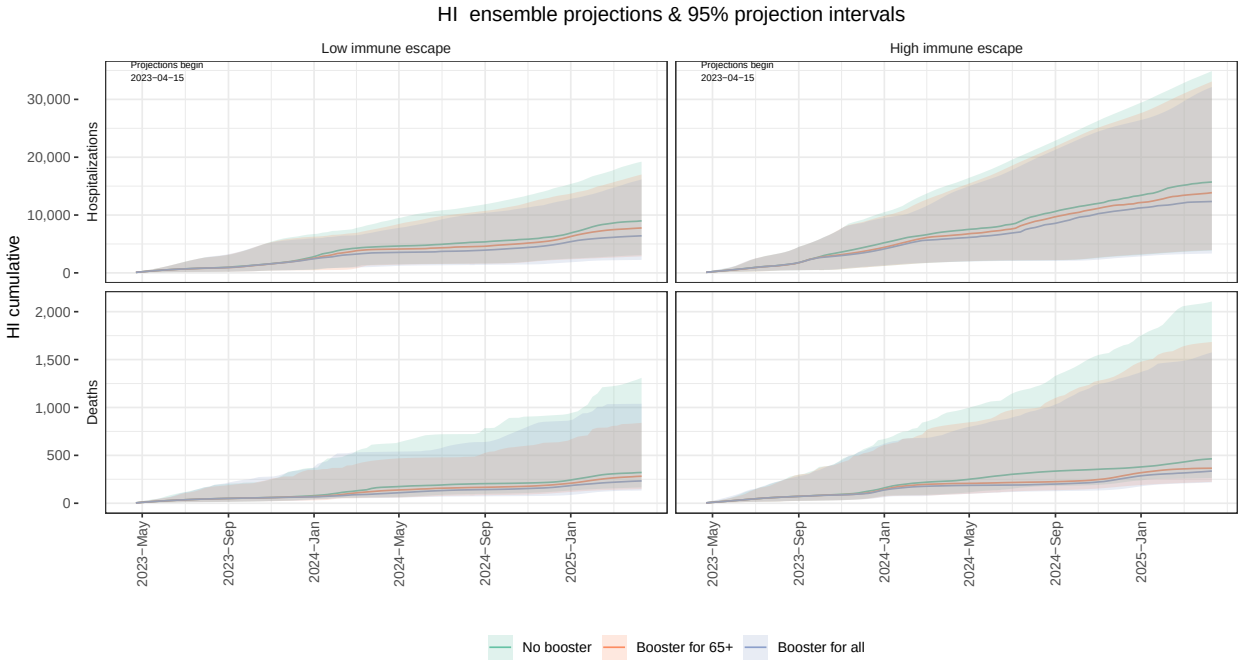

CT ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
CT cumulative
Hospitalizations
Deaths
80,000
60,000
40,000
20,000
0
7,500
5,000
2,500
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

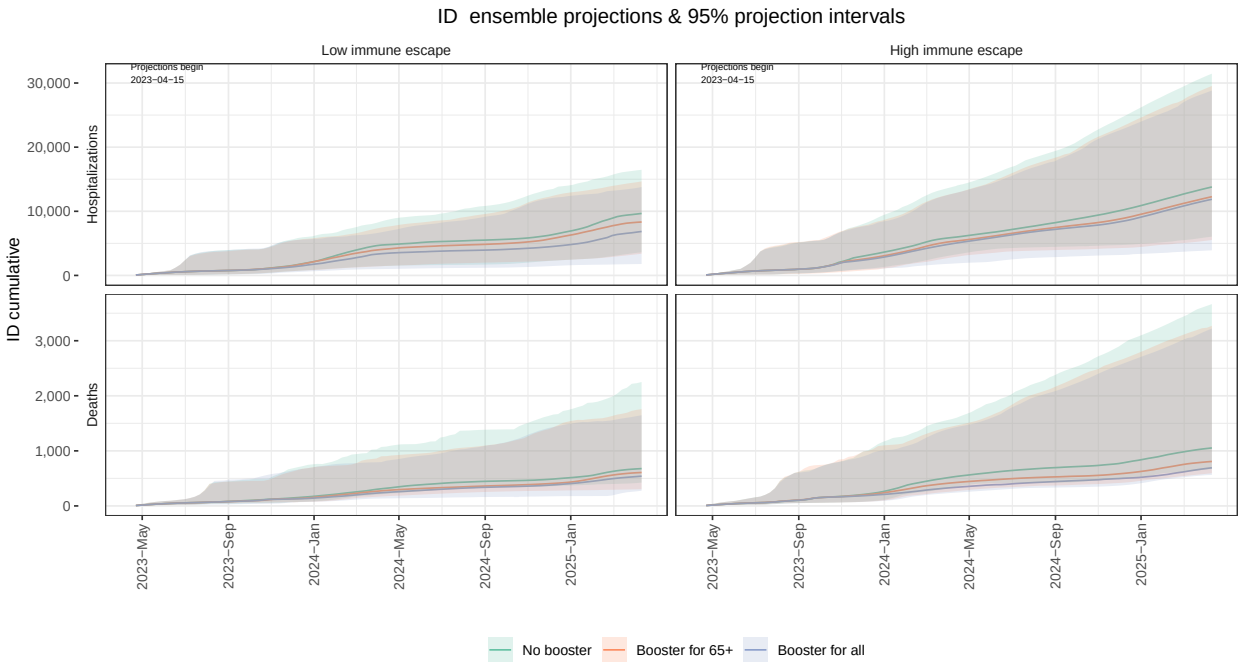

DE ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
DE cumulative
Hospitalizations
Deaths
20,000
15,000
10,000
5,000
0
2,000
1,500
1,000
500
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

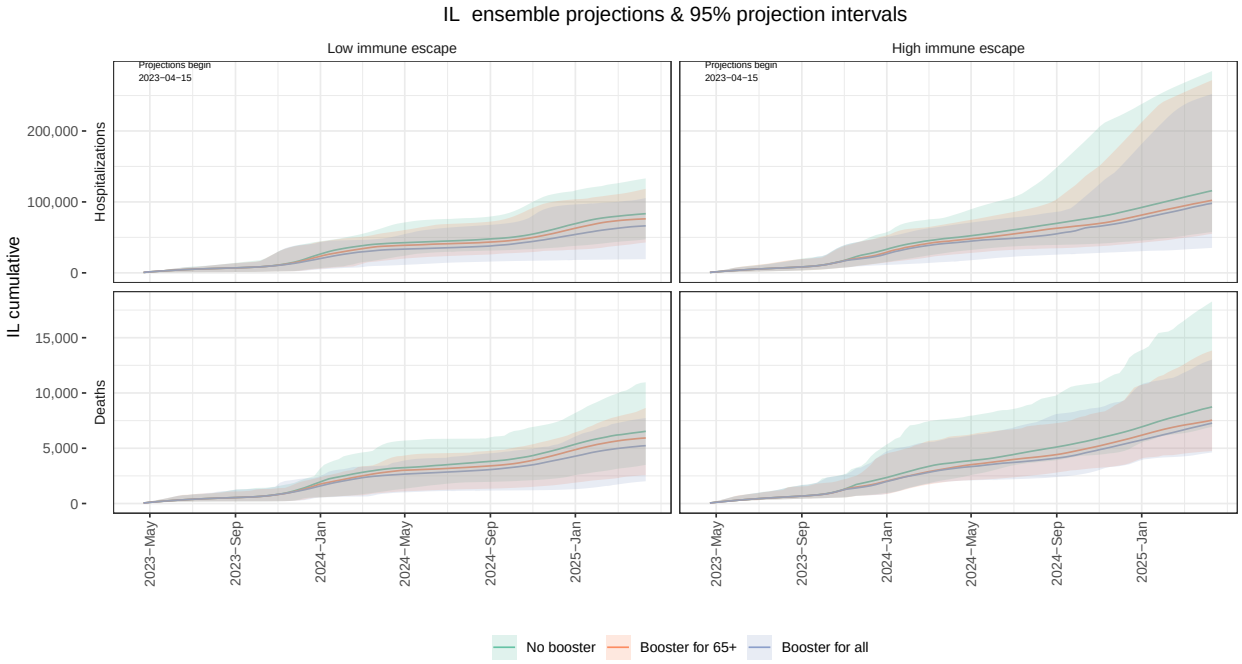

DC ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
DC cumulative
Hospitalizations
Deaths
15,000
10,000
5,000
0
1,000
500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

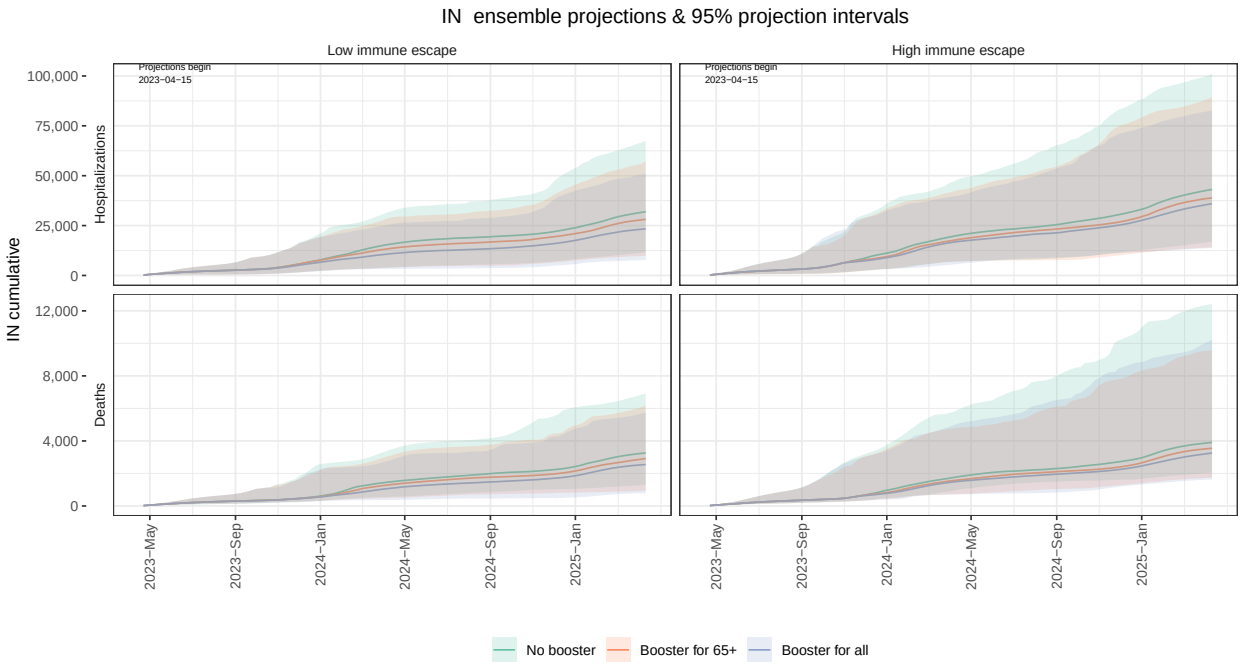

FL ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
FL cumulative
Hospitalizations
Deaths
400,000
300,000
200,000
100,000
0
50,000
40,000
30,000
20,000
10,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

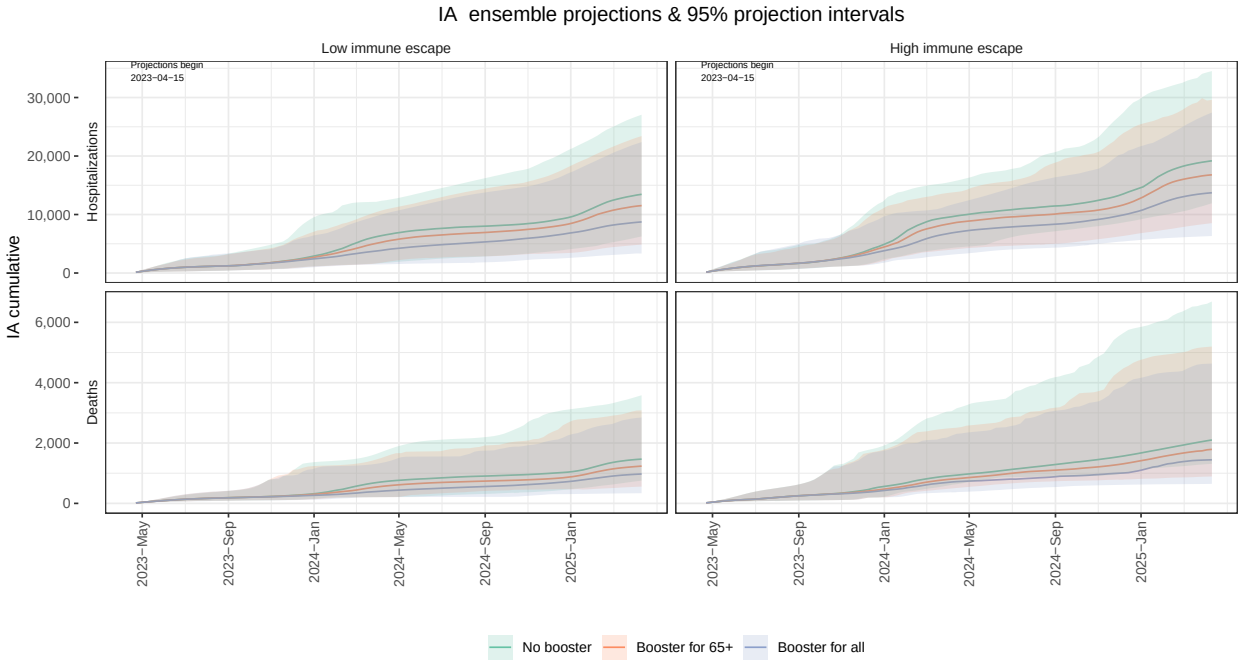

GA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
GA cumulative
Hospitalizations
Deaths
100,000
50,000
0
12,000
8,000
4,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

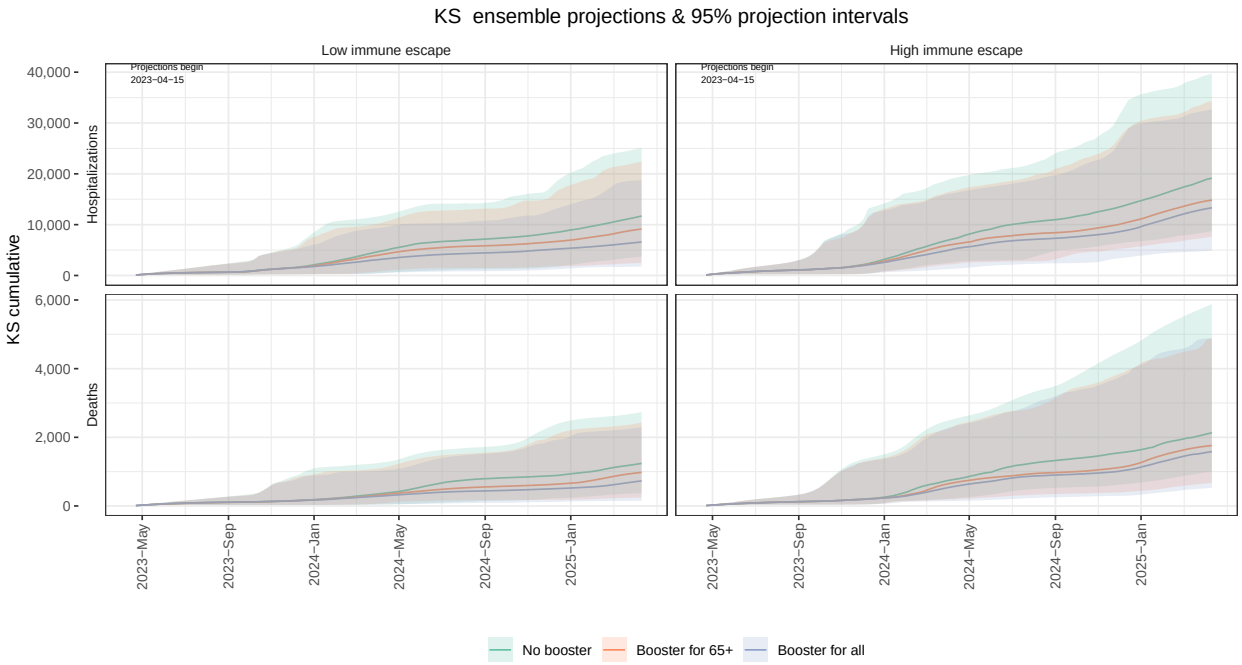

HI ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
HI cumulative
Hospitalizations
Deaths
30,000
20,000
10,000
0
2,000
1,500
1,000
500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

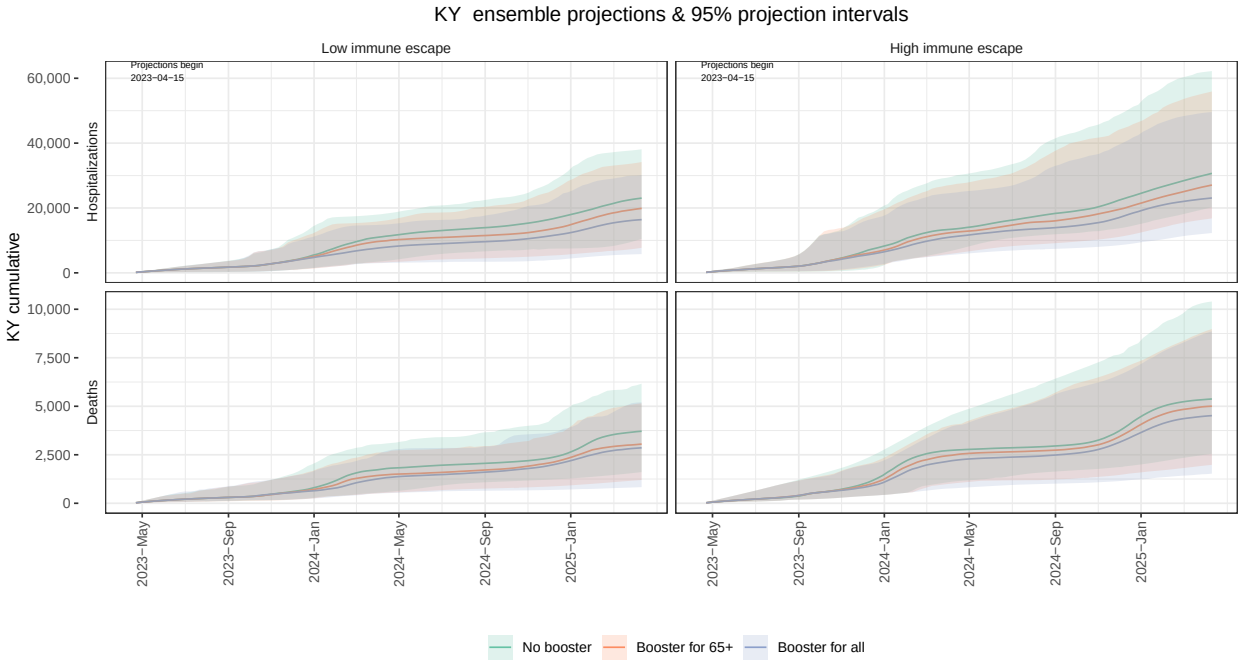

ID ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
ID cumulative
Hospitalizations
Deaths
30,000
20,000
10,000
0
3,000
2,000
1,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

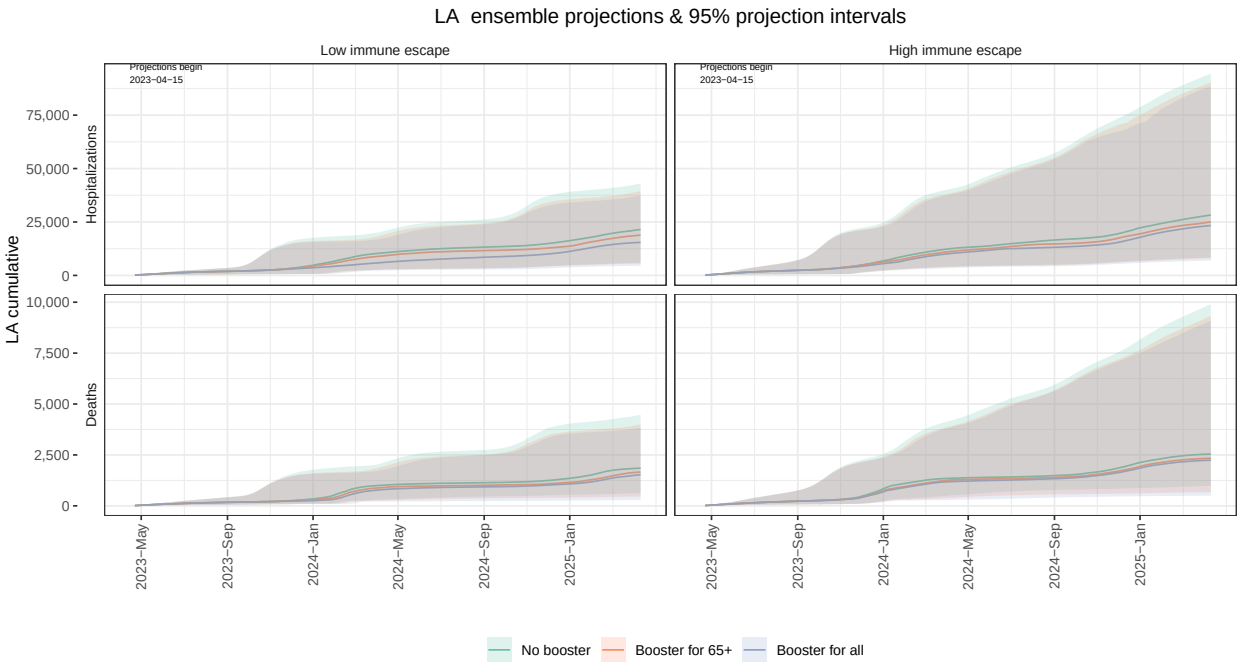

IL ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
IL cumulative
Hospitalizations
Deaths
200,000
100,000
0
15,000
10,000
5,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

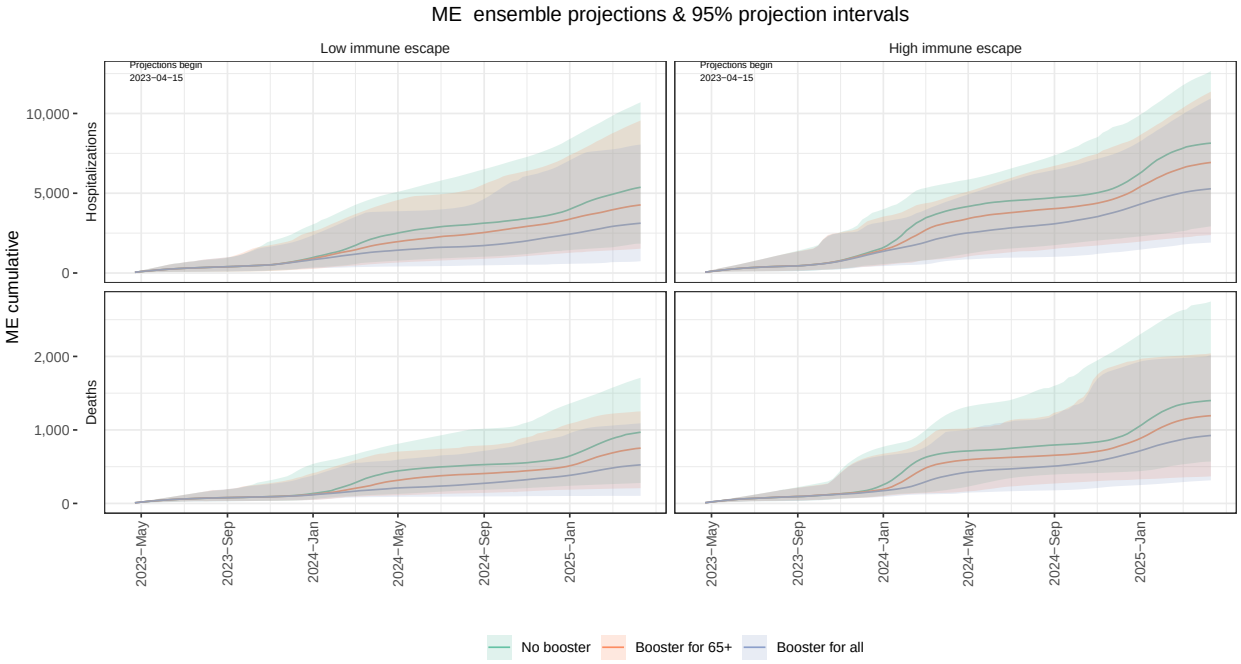

IN ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
IN cumulative
Hospitalizations
Deaths
100,000
75,000
50,000
25,000
0
12,000
8,000
4,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

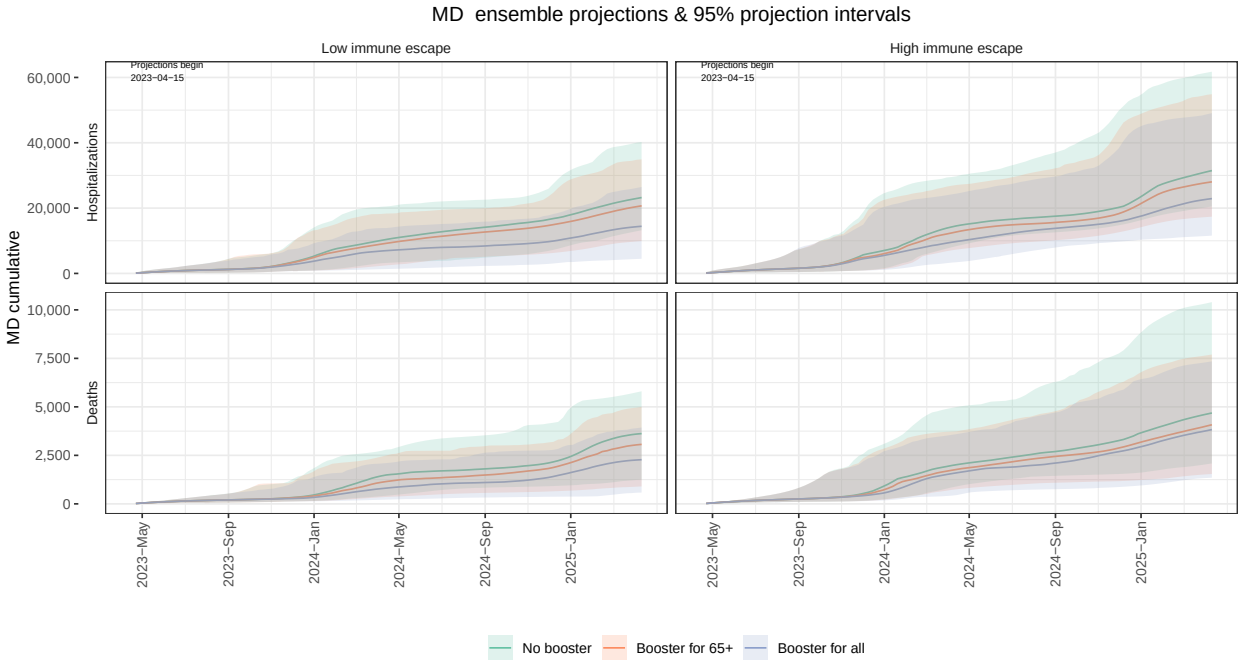

IA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
IA cumulative
Hospitalizations
Deaths
30,000
20,000
10,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

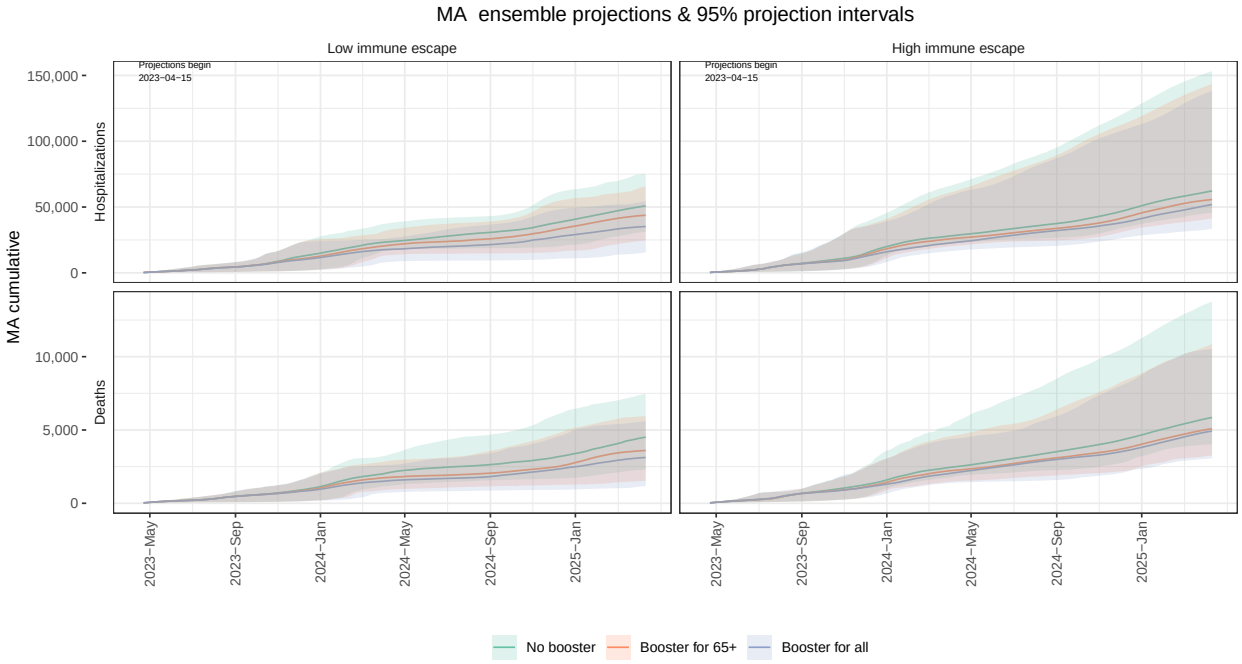

KS ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
KS cumulative
Hospitalizations
Deaths
40,000
30,000
20,000
10,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

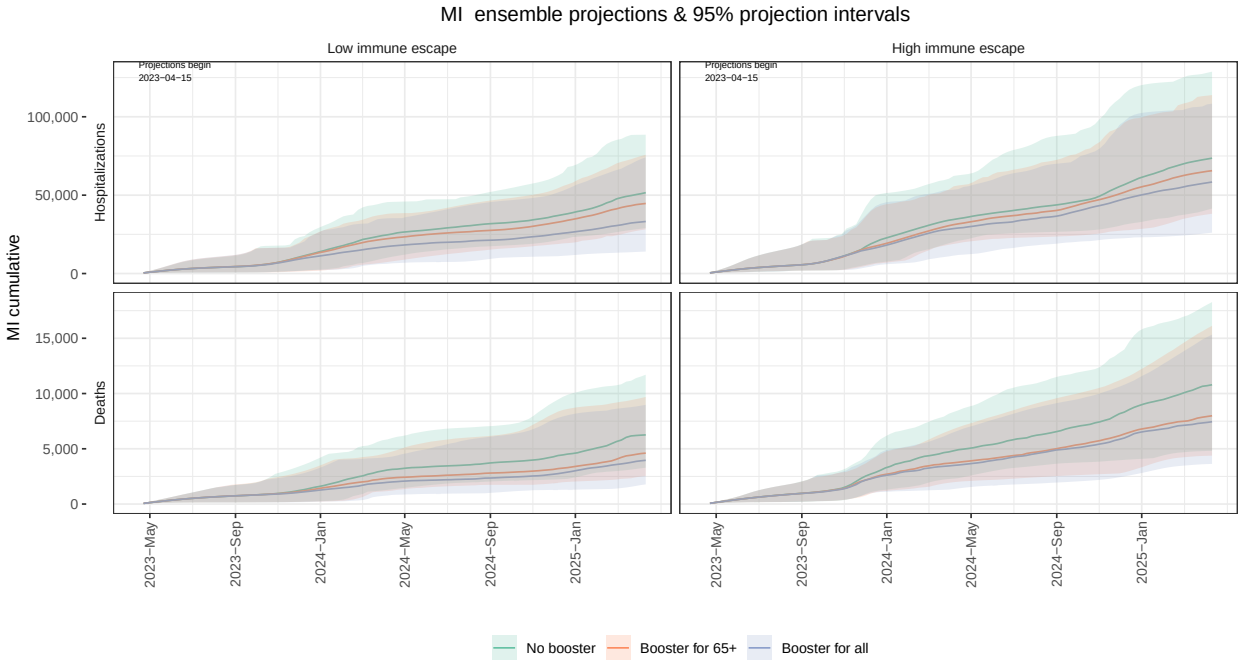

KY ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
KY cumulative
Hospitalizations
Deaths
60,000
40,000
20,000
0
10,000
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

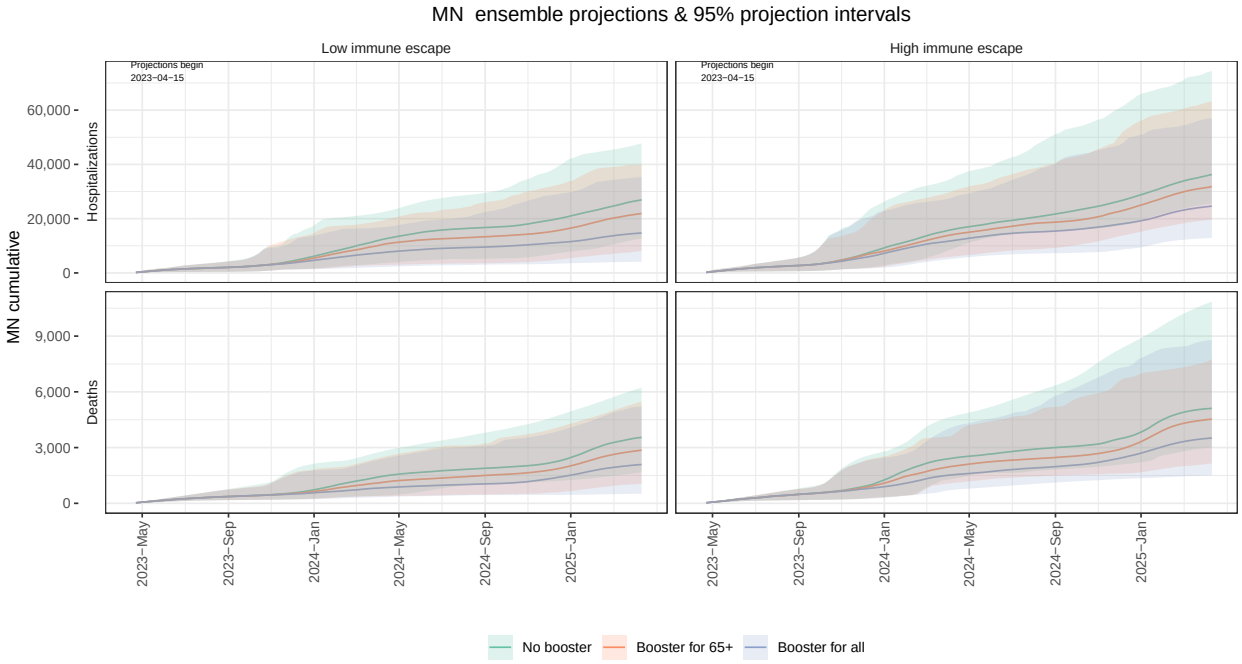

LA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
LA cumulative
Hospitalizations
Deaths
75,000
50,000
25,000
0
10,000
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

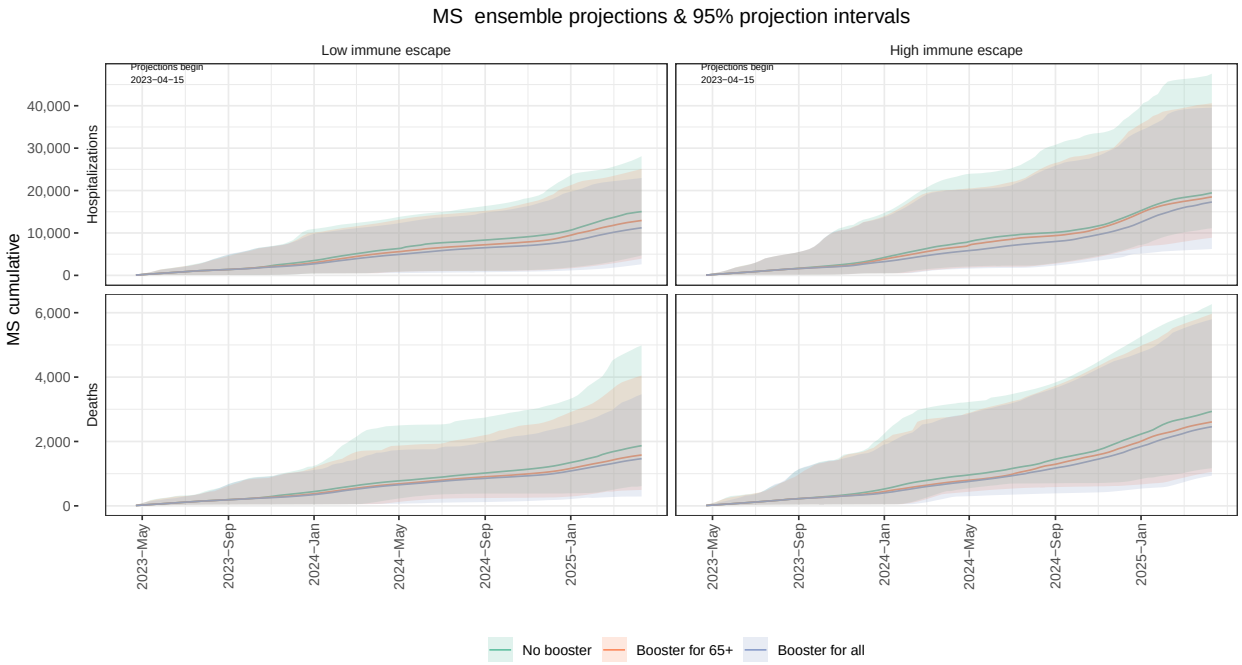

ME ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
ME cumulative
Hospitalizations
Deaths
10,000
5,000
0
2,000
1,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

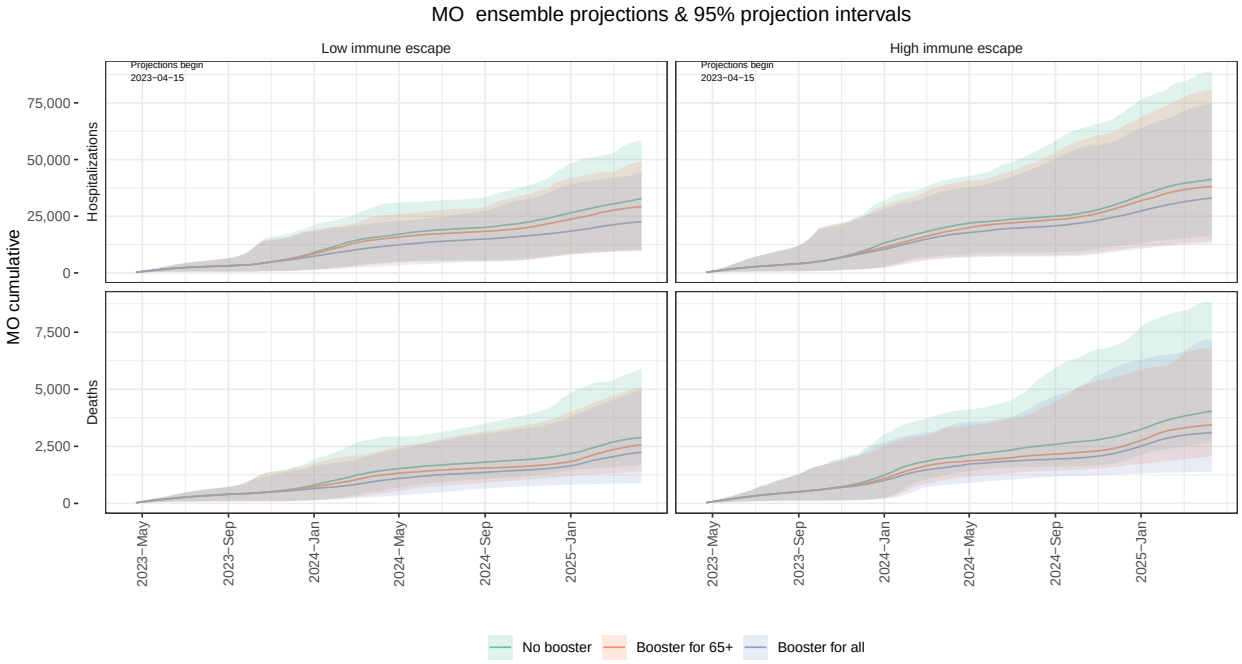

MD ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MD cumulative
Hospitalizations
Deaths
60,000
40,000
20,000
0
10,000
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

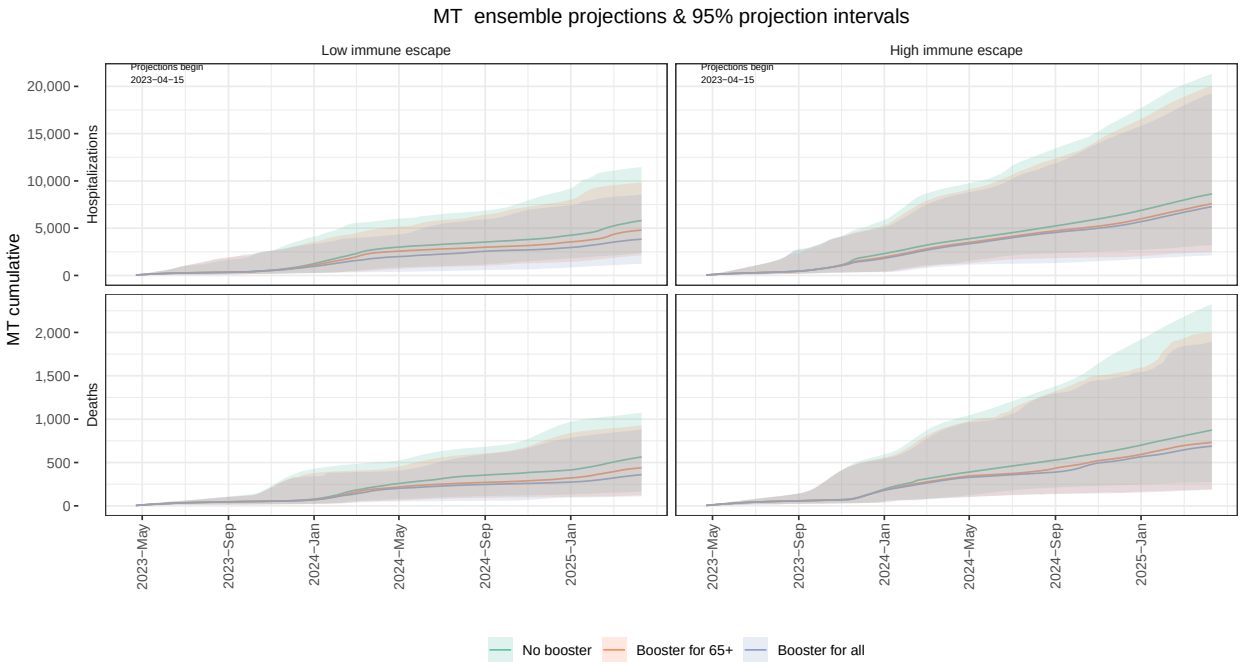

MA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MA cumulative
Hospitalizations
Deaths
150,000
100,000
50,000
0
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

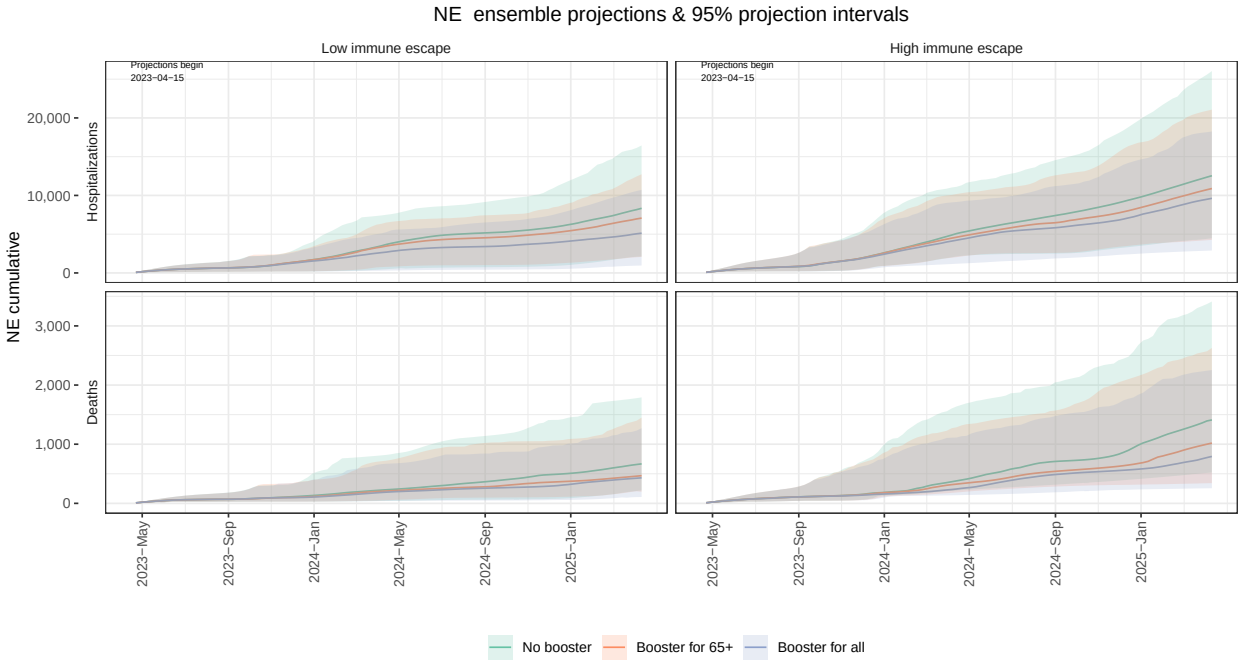

MI ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MI cumulative
Hospitalizations
Deaths
100,000
50,000
0
15,000
10,000
5,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

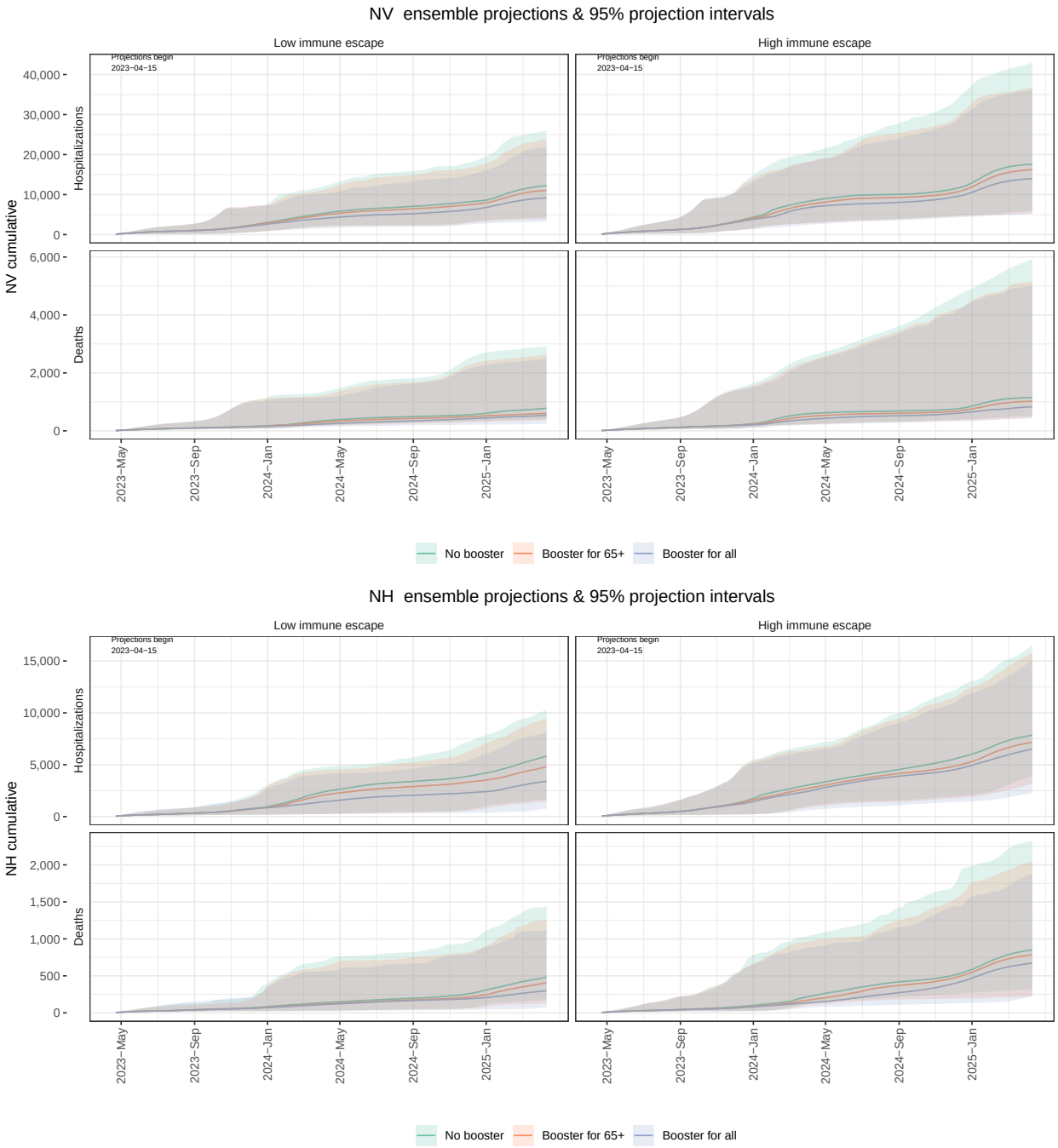

MN ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MN cumulative
Hospitalizations
Deaths
60,000
40,000
20,000
0
9,000
6,000
3,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

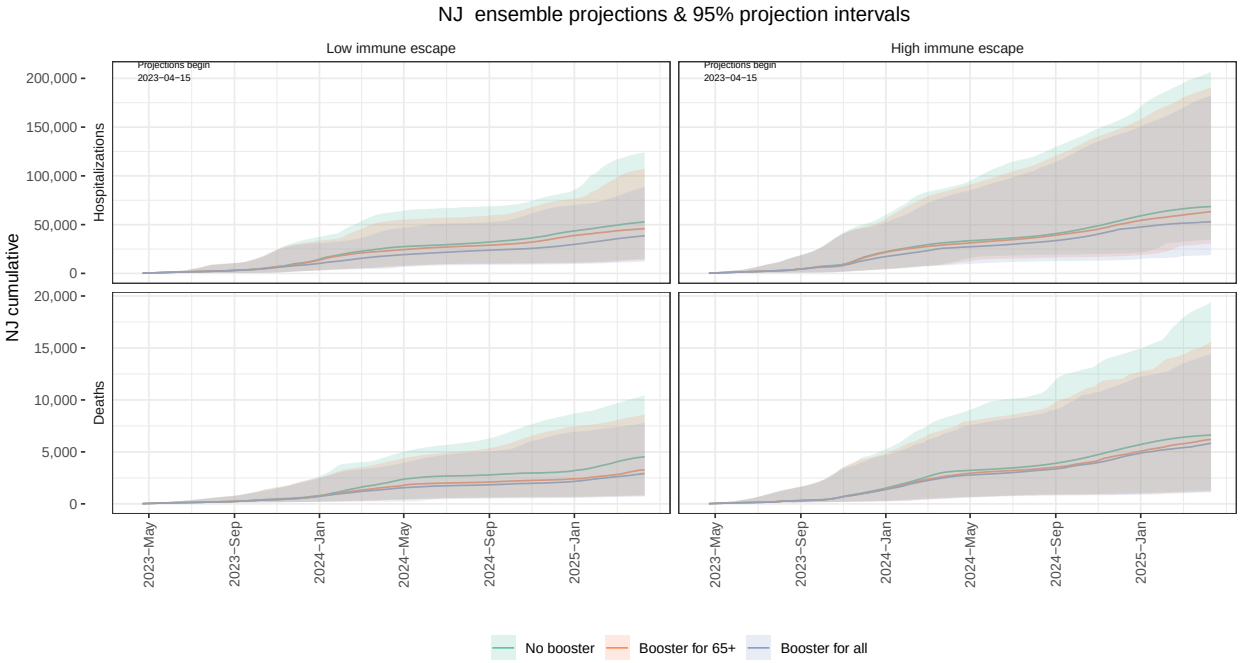

MS ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MS cumulative
Hospitalizations
Deaths
40,000
30,000
20,000
10,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

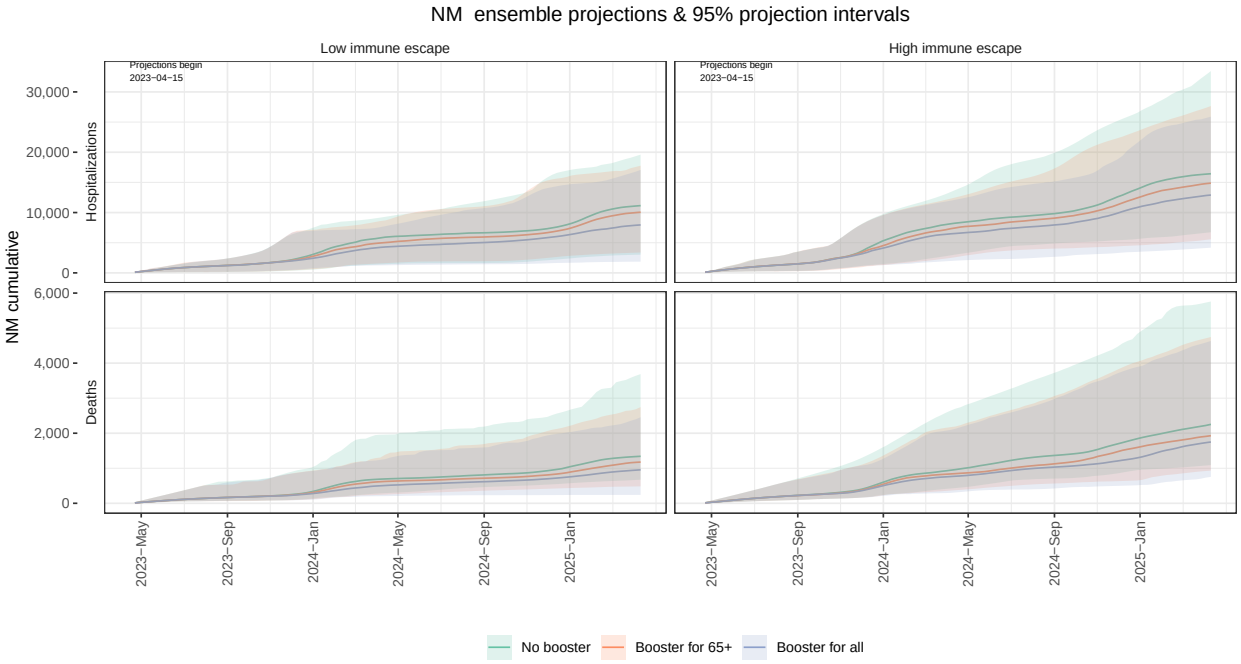

MO ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MO cumulative
Hospitalizations
Deaths
75,000
50,000
25,000
0
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

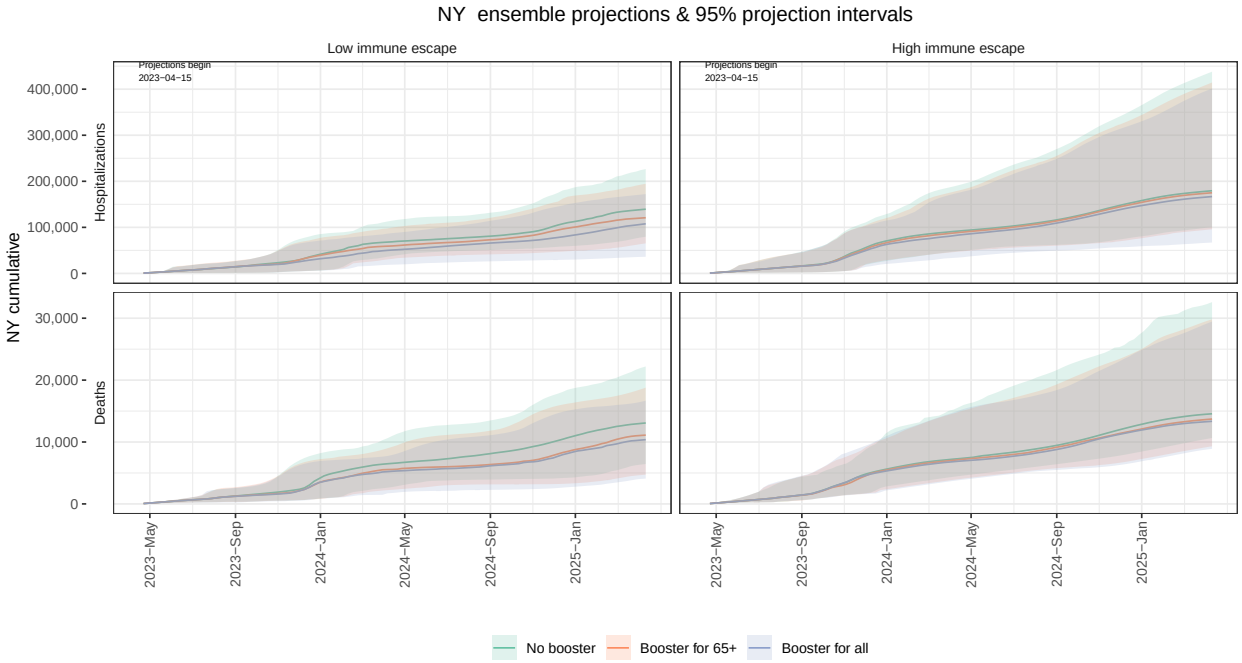

MT ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
MT cumulative
Hospitalizations
Deaths
20,000
15,000
10,000
5,000
0
2,000
1,500
1,000
500
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

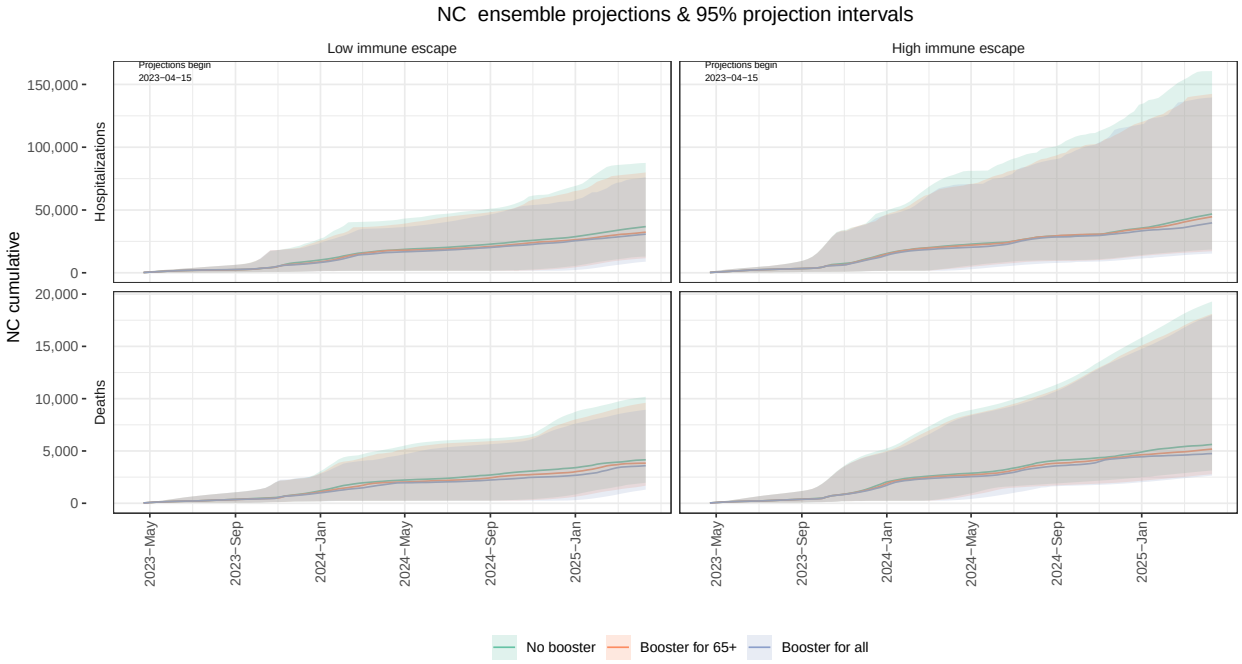

NE ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NE cumulative
Hospitalizations
Deaths
20,000
10,000
0
3,000
2,000
1,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

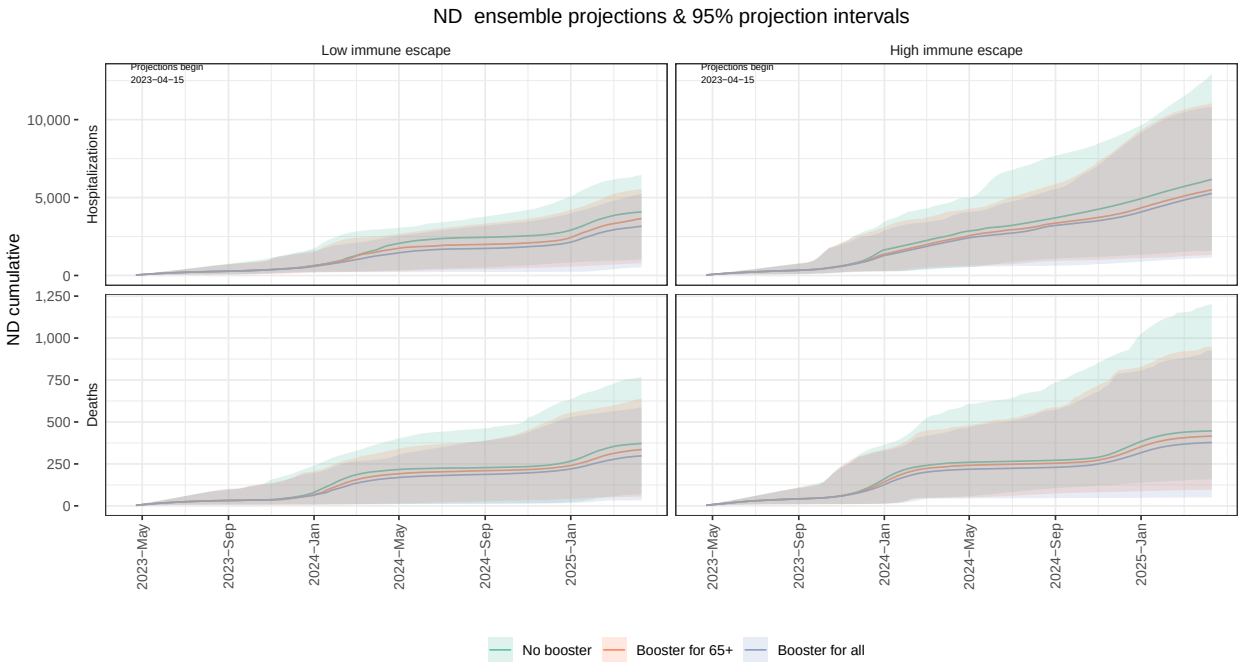

NV ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NV cumulative
Hospitalizations
Deaths
40,000
30,000
20,000
10,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all
NH ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NH cumulative
Hospitalizations
Deaths
15,000
10,000
5,000
0
2,000
1,500
1,000
500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

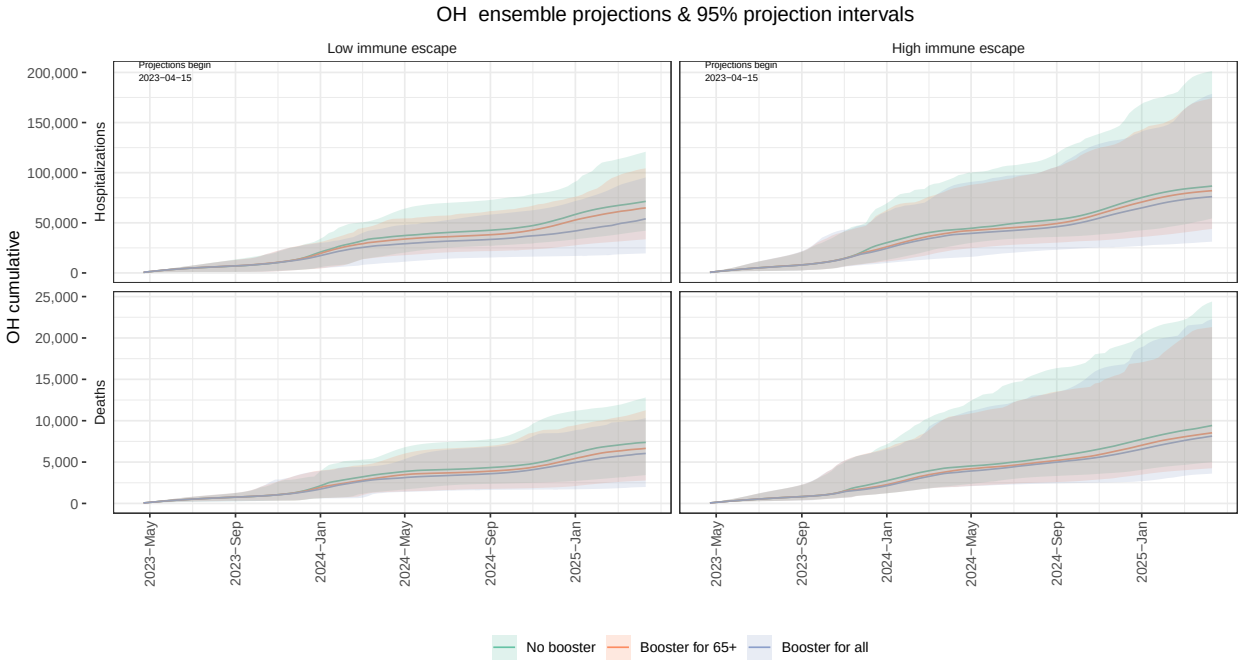

NJ ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NJ cumulative
Hospitalizations
Deaths
200,000
150,000
100,000
50,000
0
20,000
15,000
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

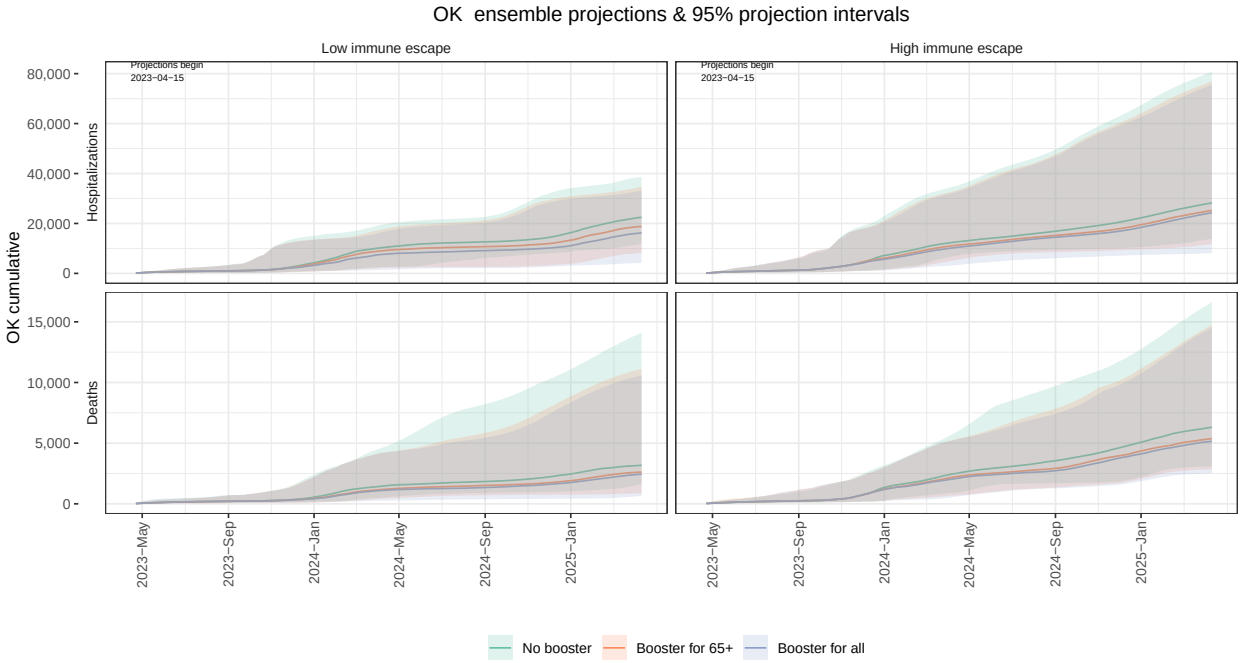

NM ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NM cumulative
Hospitalizations
Deaths
30,000
20,000
10,000
0
6,000
4,000
2,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

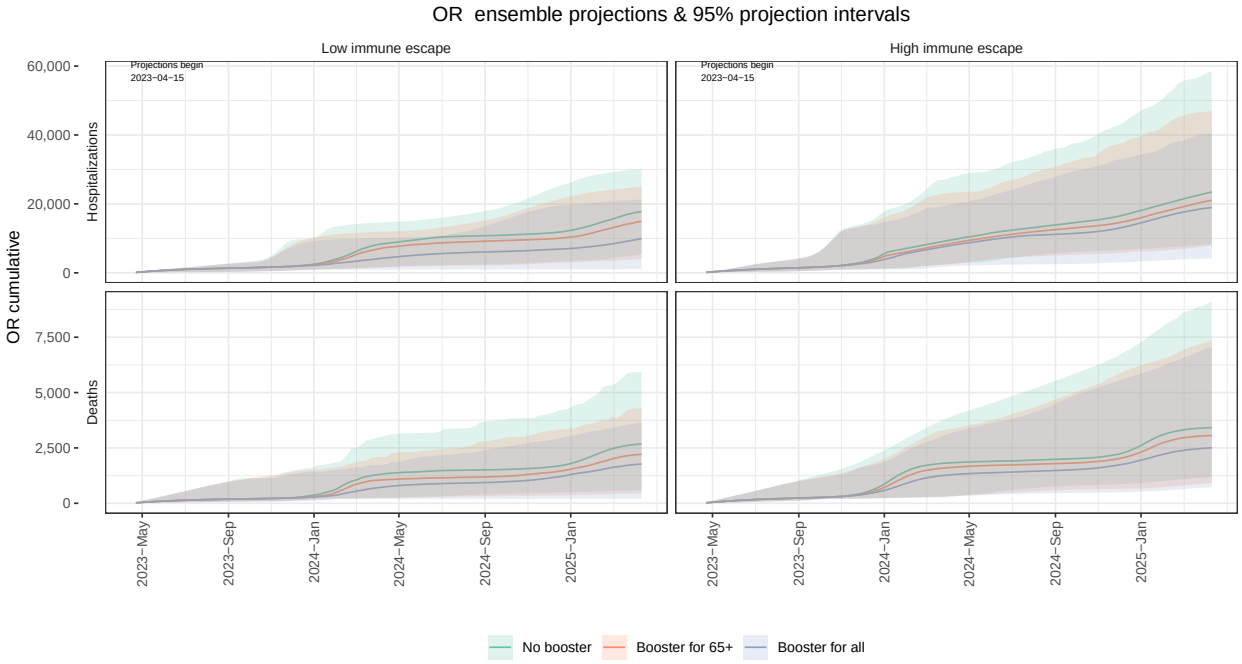

NY ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NY cumulative
Hospitalizations
Deaths
400,000
300,000
200,000
100,000
0
30,000
20,000
10,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

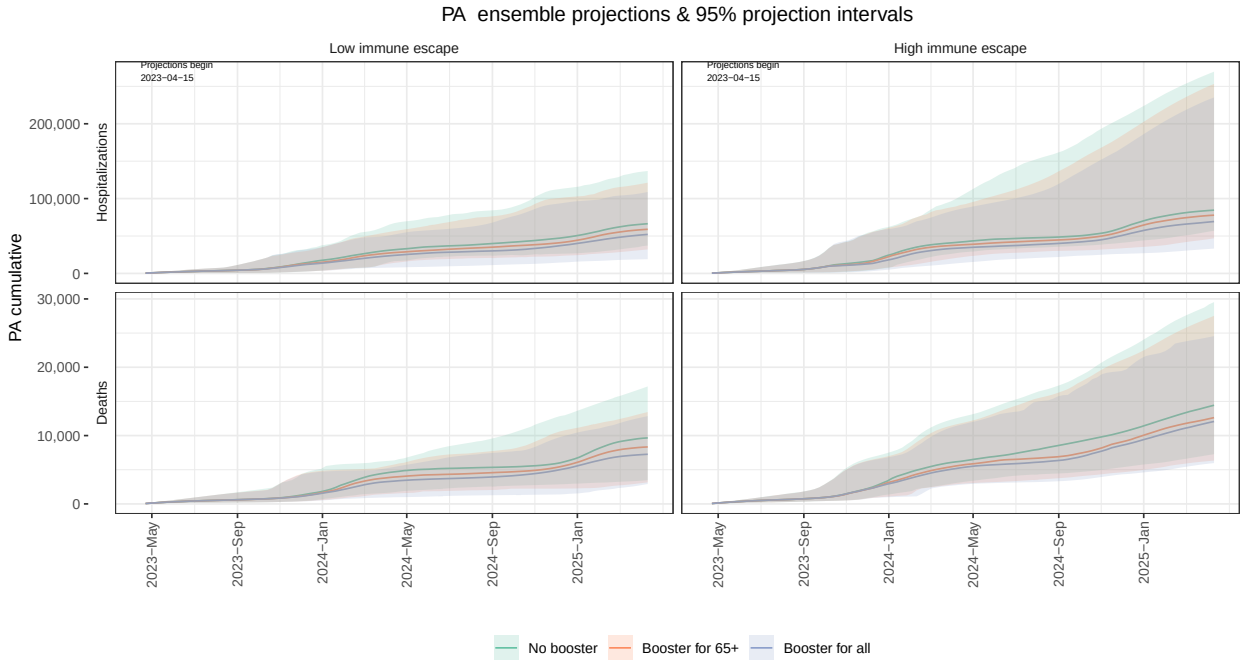

NC ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
NC cumulative
Hospitalizations
Deaths
150,000
100,000
50,000
0
20,000
15,000
10,000
5,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

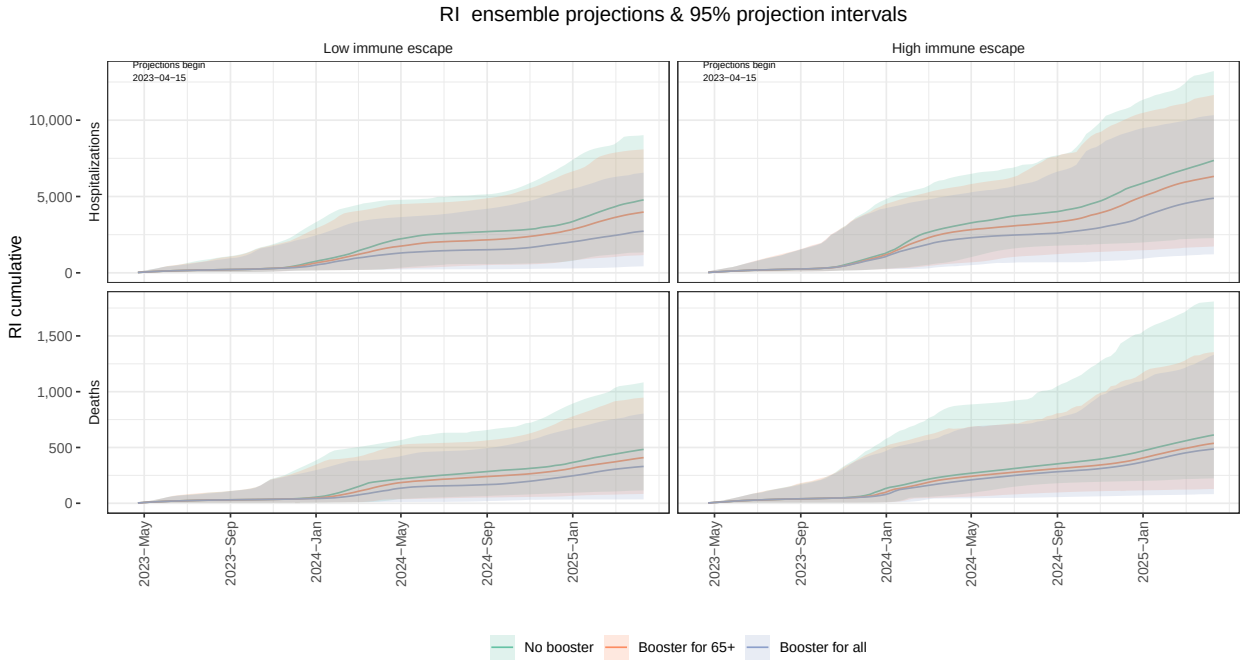

ND ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
ND cumulative
Hospitalizations
Deaths
10,000
5,000
0
1,250
1,000
750
500
250
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

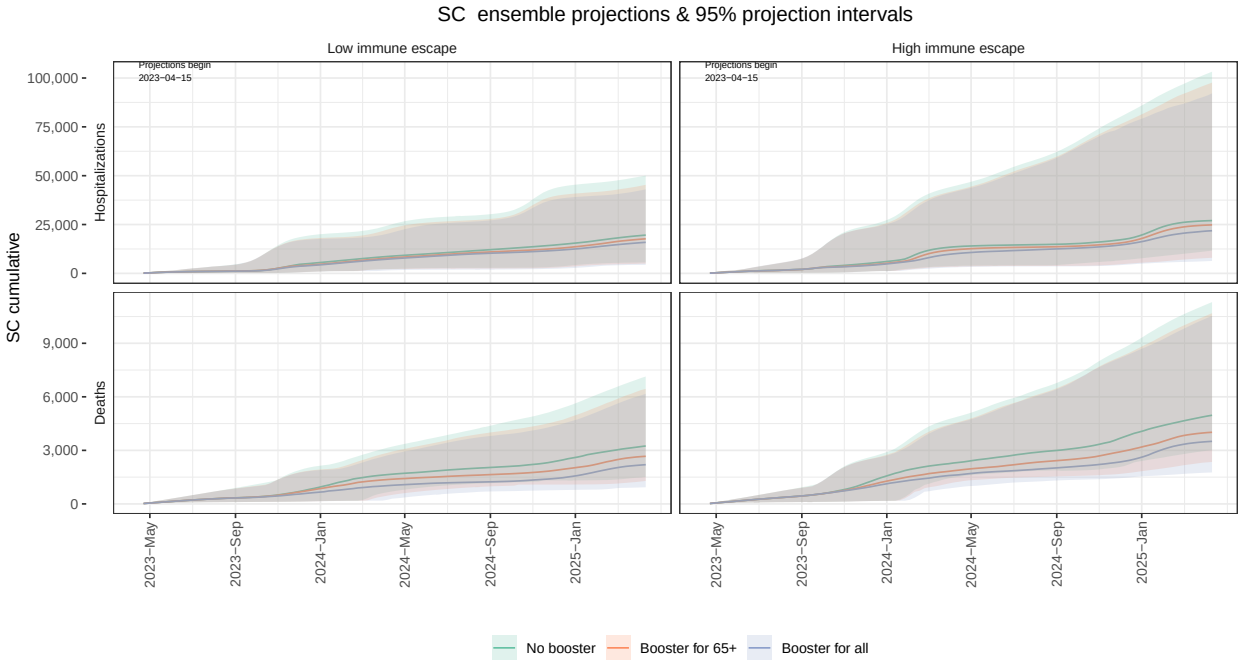

OH ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
OH cumulative
Hospitalizations
Deaths
200,000
150,000
100,000
50,000
0
25,000
20,000
15,000
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

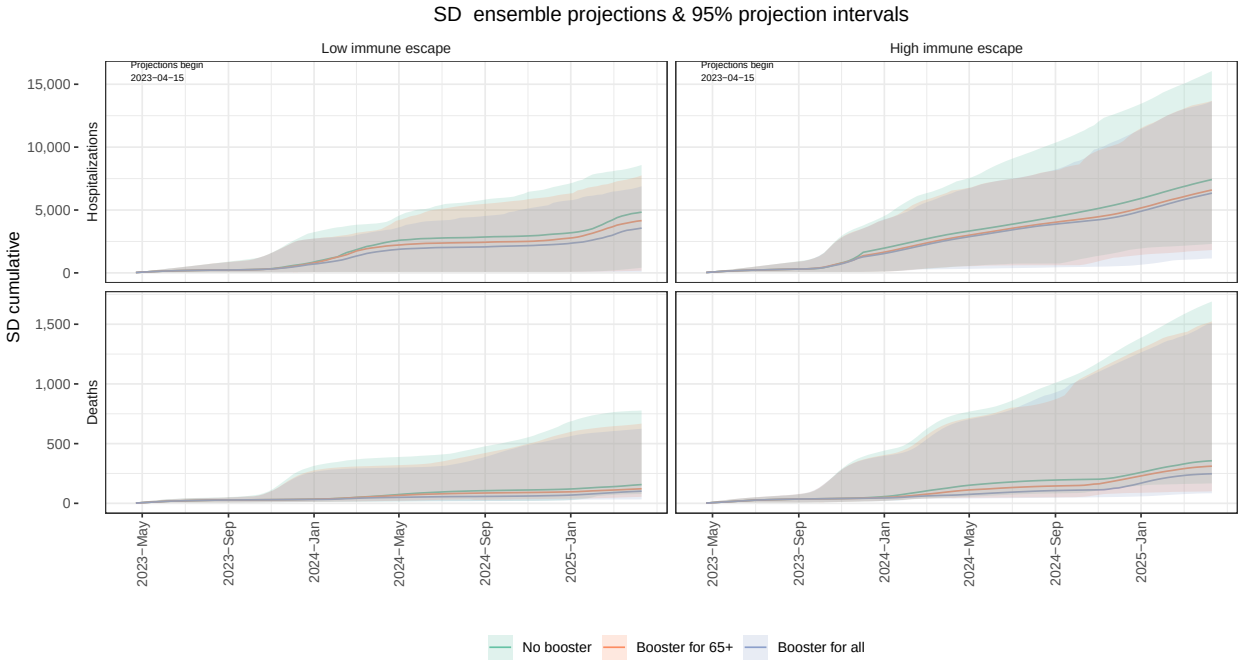

OK ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
OK cumulative
Hospitalizations
Deaths
80,000
60,000
40,000
20,000
0
15,000
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

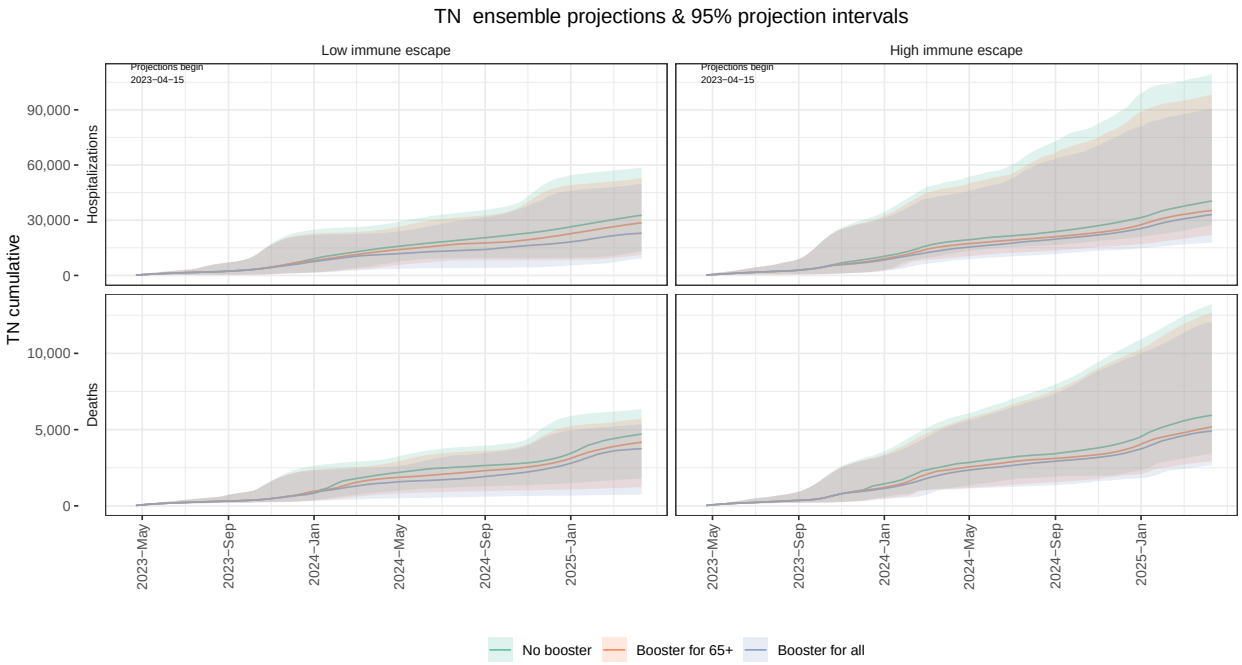

OR ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
OR cumulative
Hospitalizations
Deaths
60,000
40,000
20,000
0
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

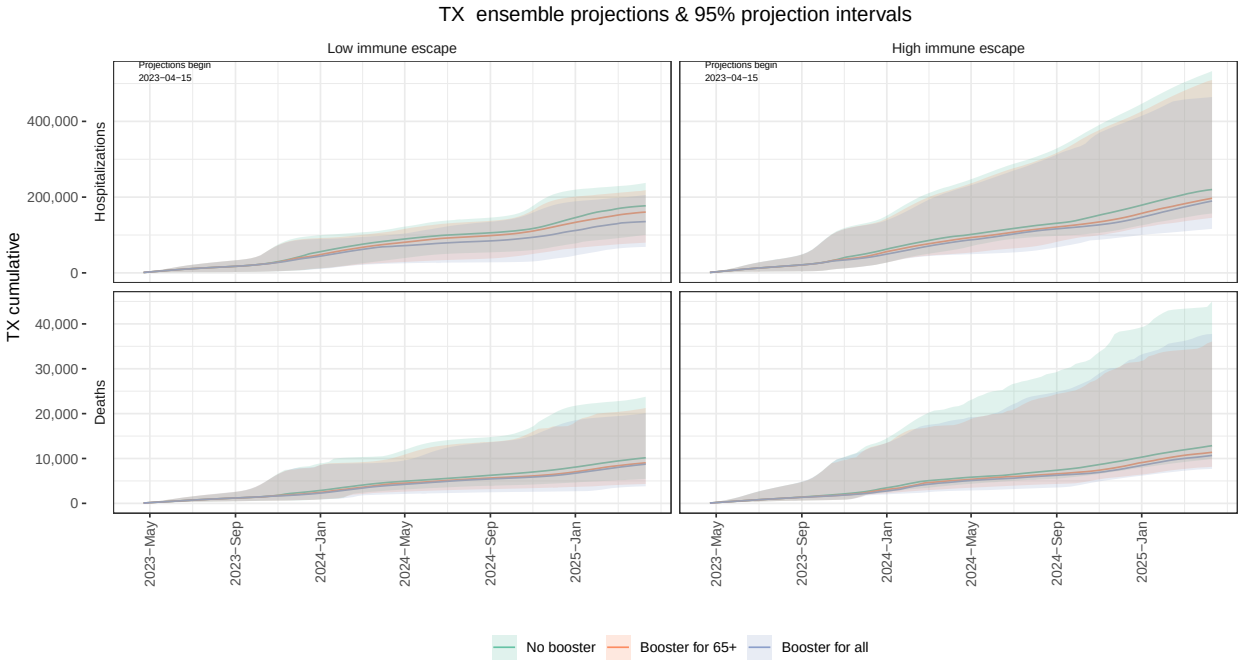

PA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
PA cumulative
Hospitalizations
Deaths
200,000
100,000
0
30,000
20,000
10,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

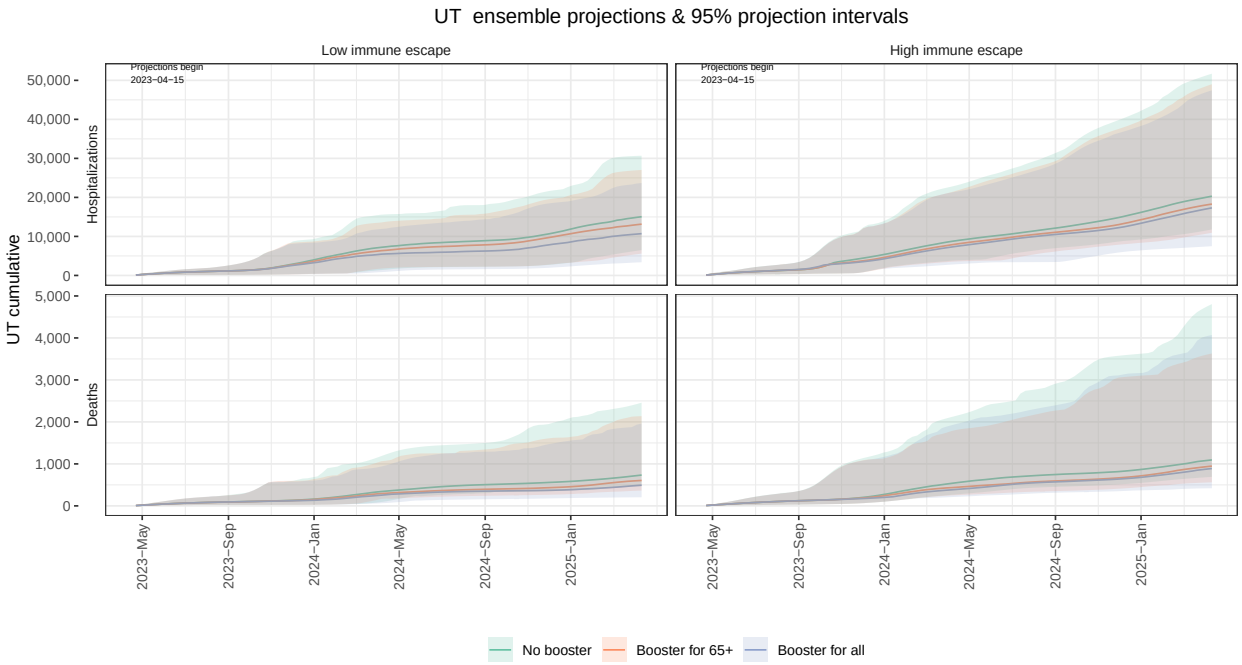

RI ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
RI cumulative
Hospitalizations
Deaths
10,000
5,000
0
1,500
1,000
500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

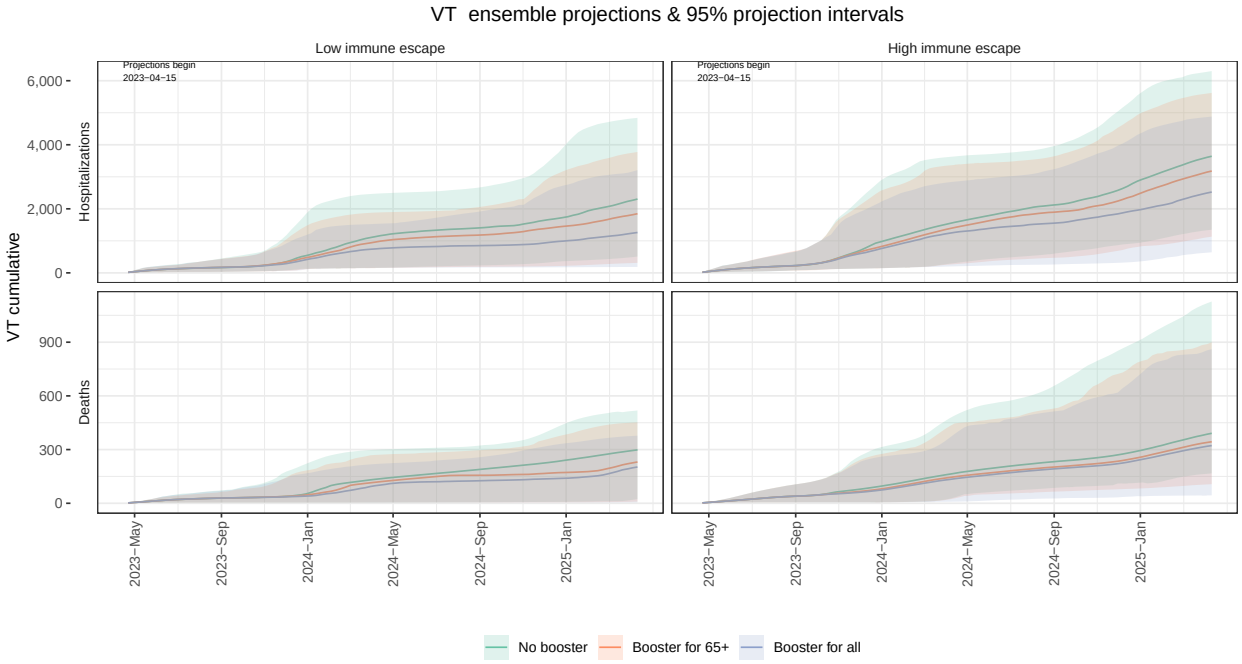

SC ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
SC cumulative
Hospitalizations
Deaths
100,000
75,000
50,000
25,000
0
9,000
6,000
3,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

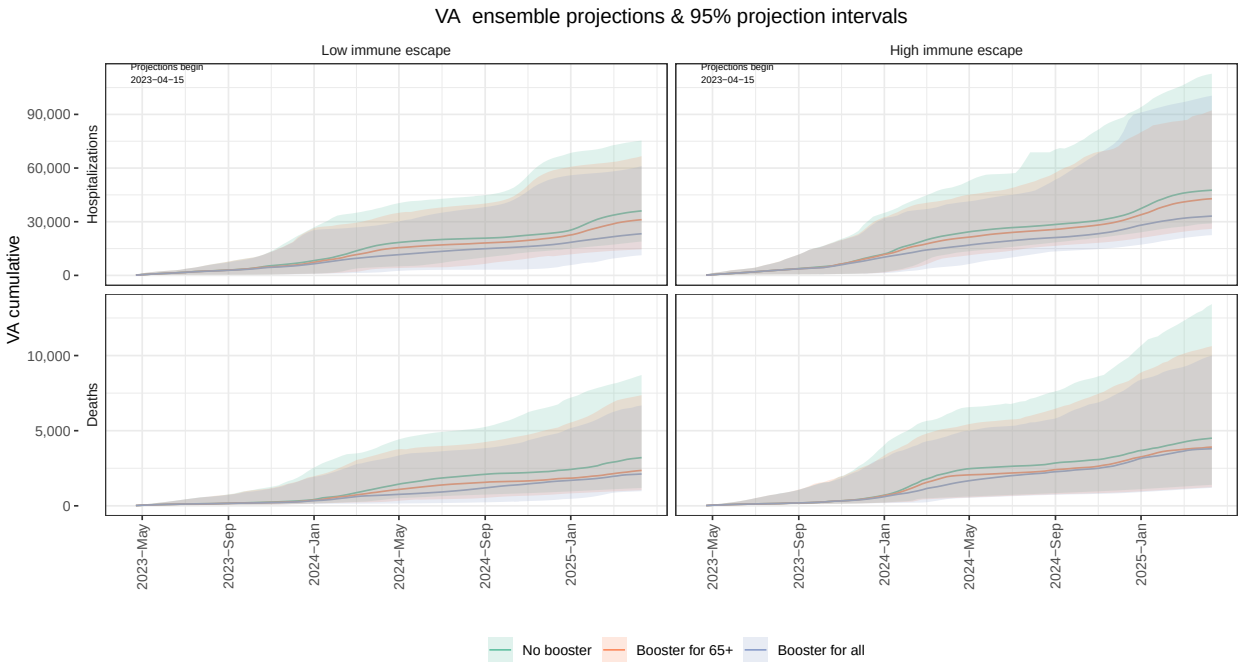

SD ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
SD cumulative
Hospitalizations
Deaths
15,000
10,000
5,000
0
1,500
1,000
500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

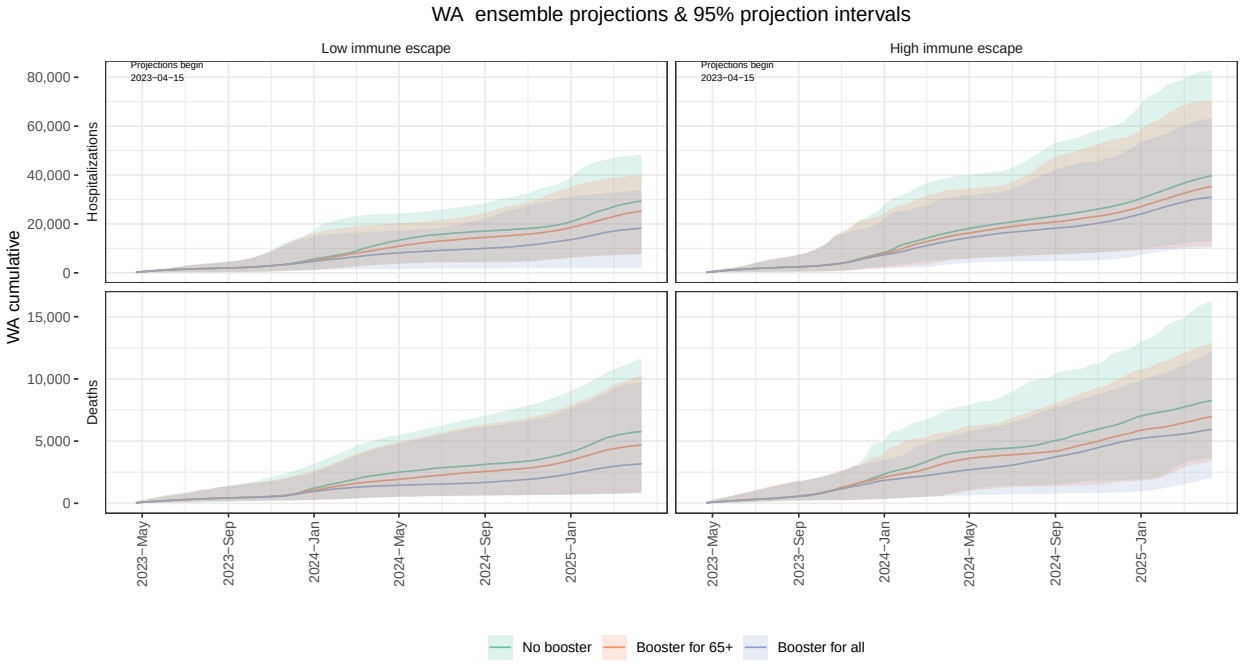

TN ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
TN cumulative
Hospitalizations
Deaths
90,000
60,000
30,000
0
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

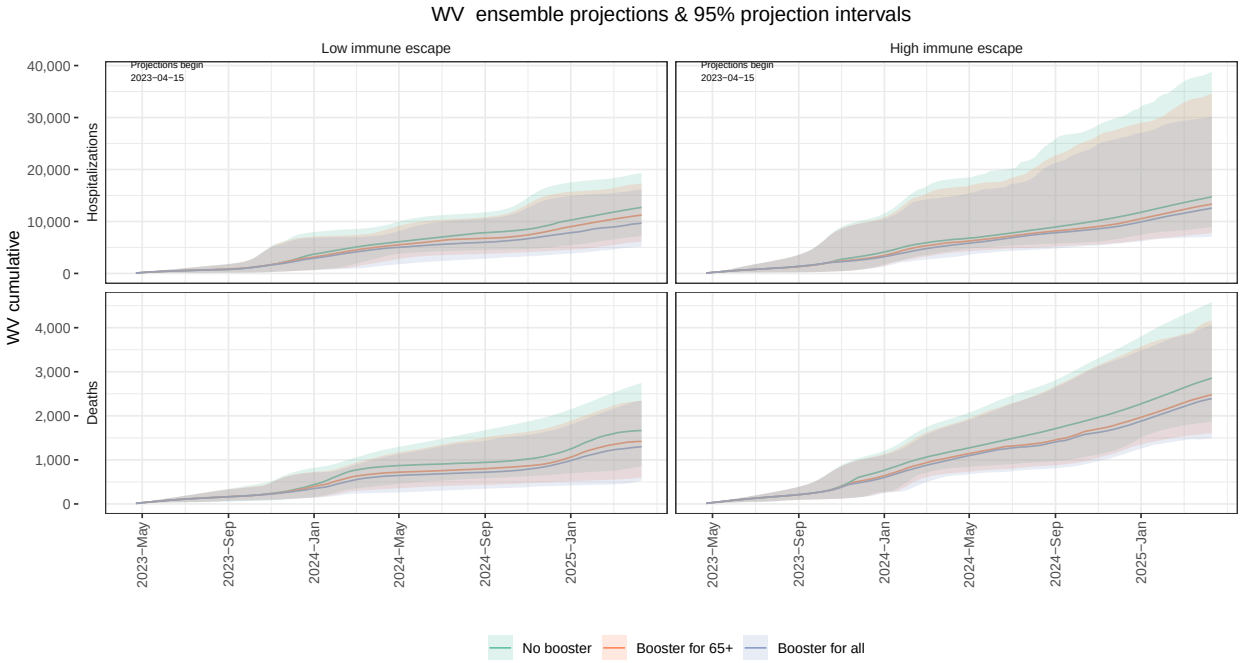

TX ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
TX cumulative
Hospitalizations
Deaths
400,000
200,000
0
40,000
30,000
20,000
10,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

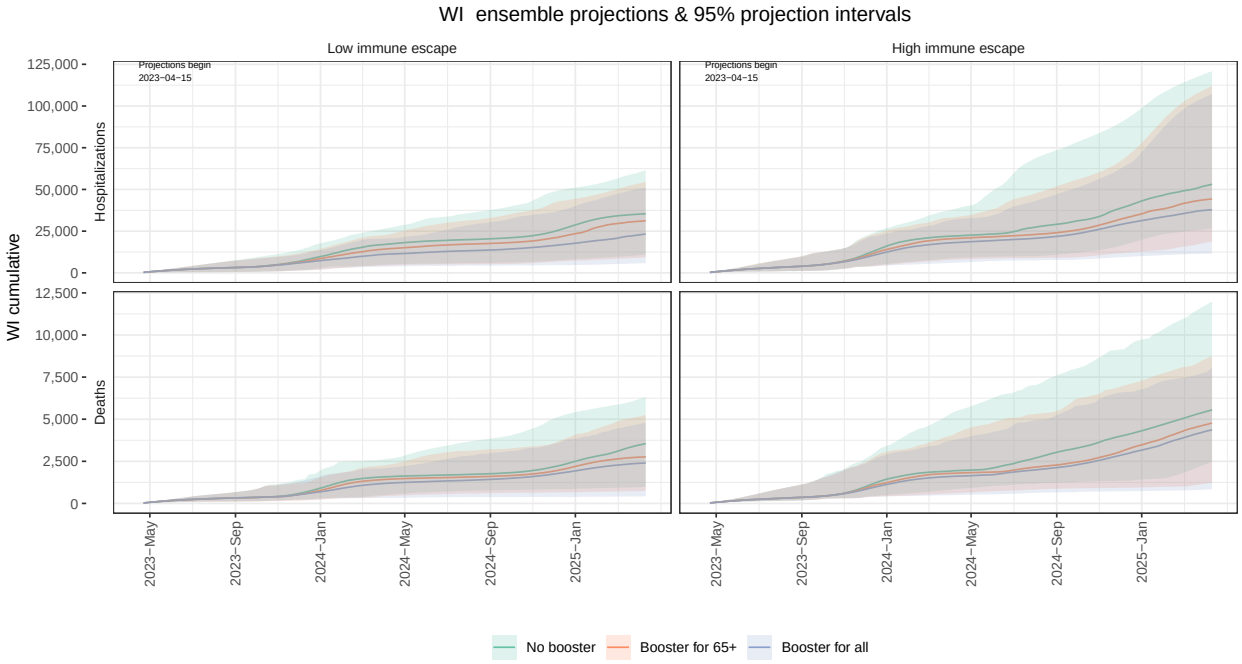

UT ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
UT cumulative
Hospitalizations
Deaths
50,000
40,000
30,000
20,000
10,000
0
5,000
4,000
3,000
2,000
1,000
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

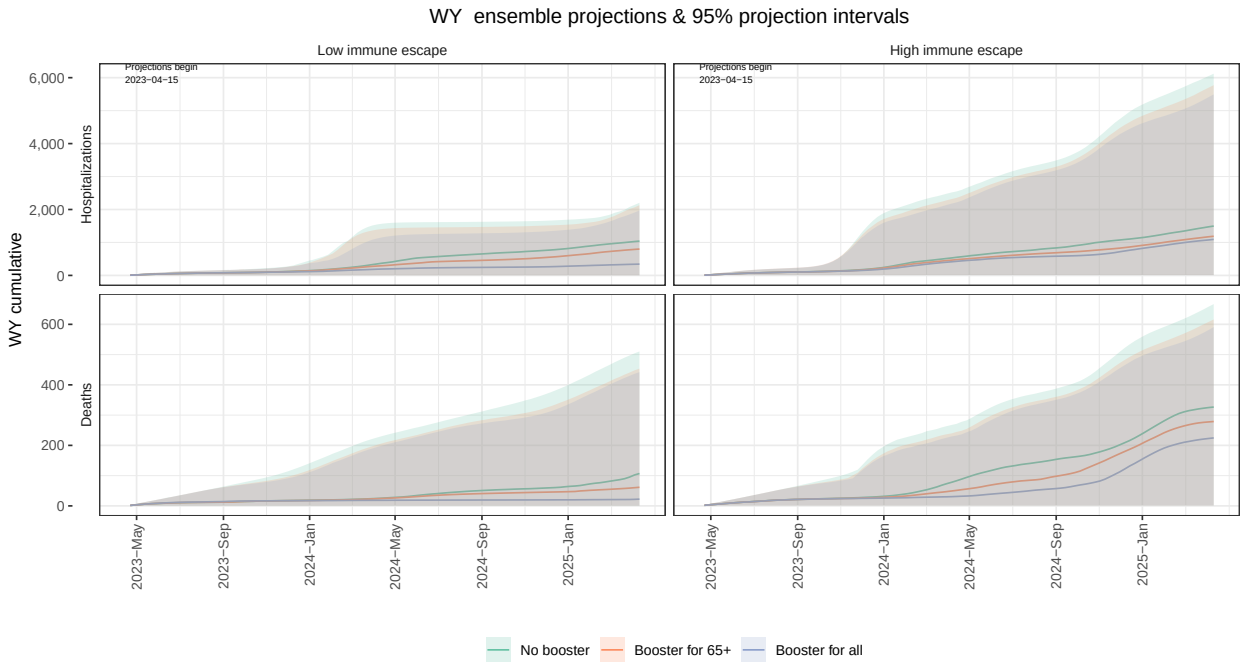

VT ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
VT cumulative
Hospitalizations
Deaths
6,000
4,000
2,000
900
600
300
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all


VA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
VA cumulative
Hospitalizations
Deaths
90,000
60,000
30,000
0
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all


WA ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
WA cumulative
Hospitalizations
Deaths
80,000
60,000
40,000
20,000
0
15,000
10,000
5,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

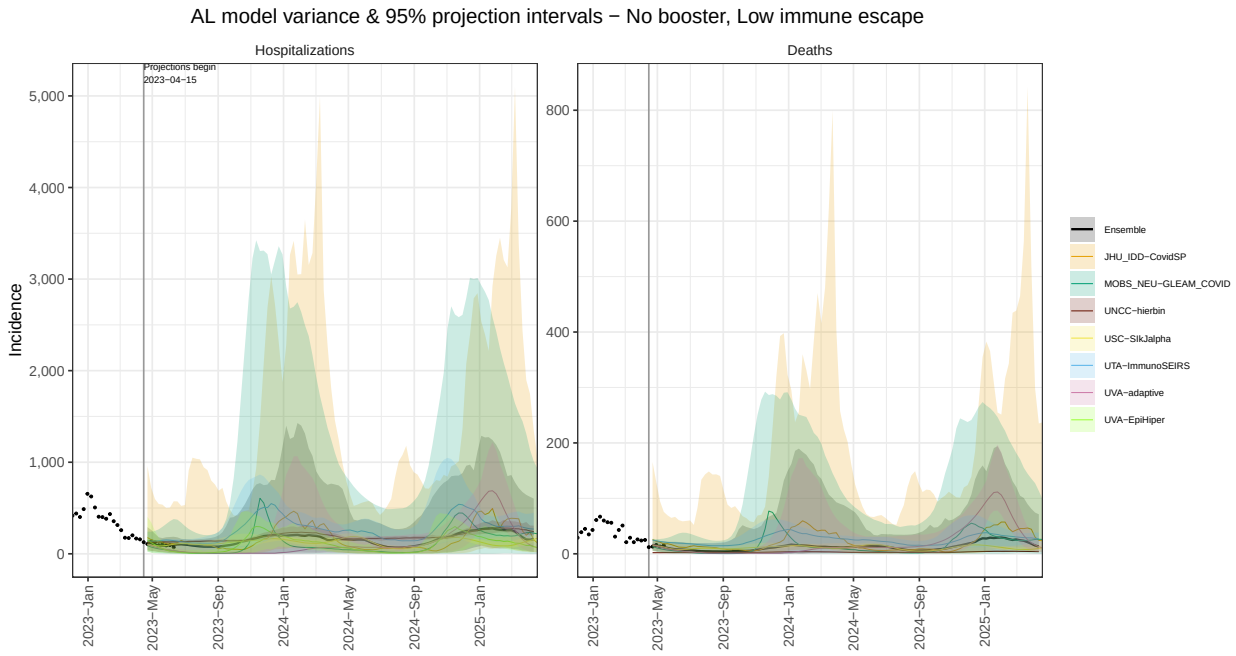

WV ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
WV cumulative
Hospitalizations
Deaths
40,000
30,000
20,000
10,000
0
4,000
3,000
2,000
1,000
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all


WI ensemble projections & 95% projection intervals
Low immune escape
High immune escape
Projections begin
2023−04−15
WI cumulative
Hospitalizations
Deaths
125,000
100,000
75,000
50,000
25,000
0
12,500
10,000
7,500
5,000
2,500
0
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
No booster
Booster for 65+
Booster for all

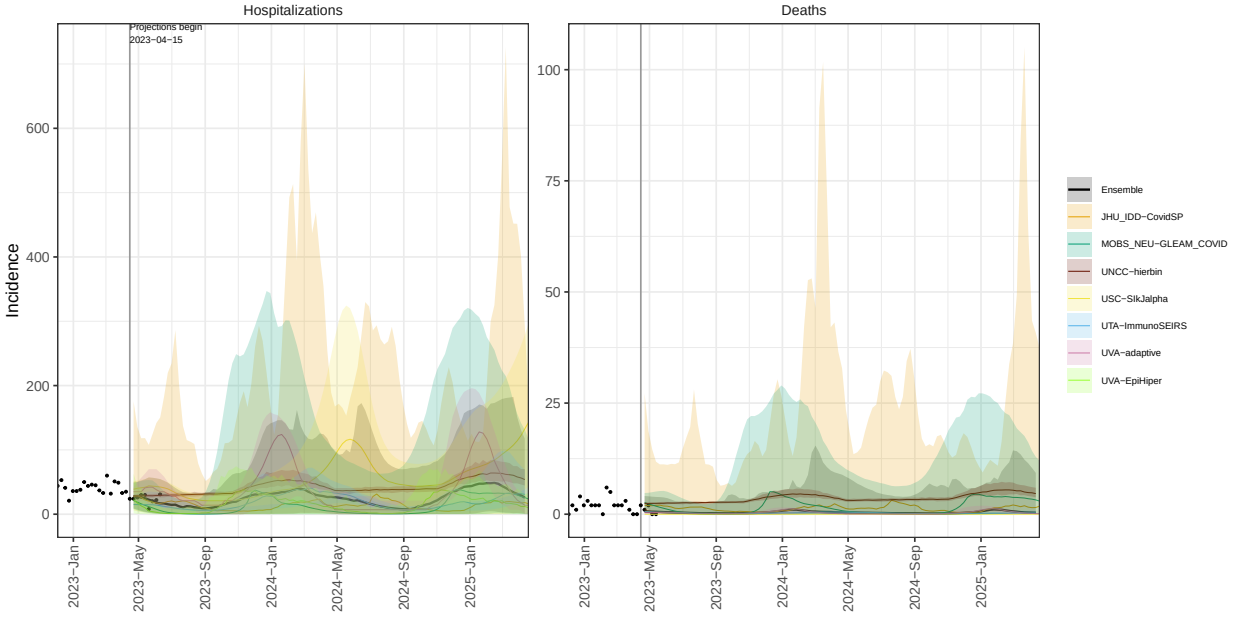


State-level model variation

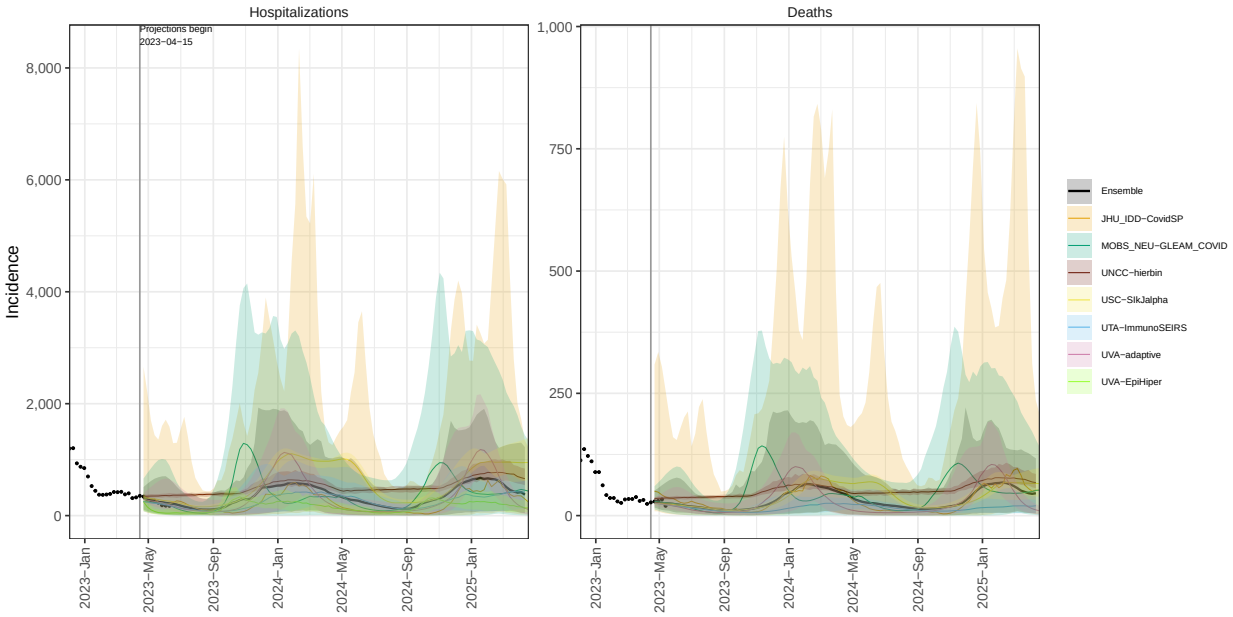
Model variation for No booster, Low immune escape scenario.



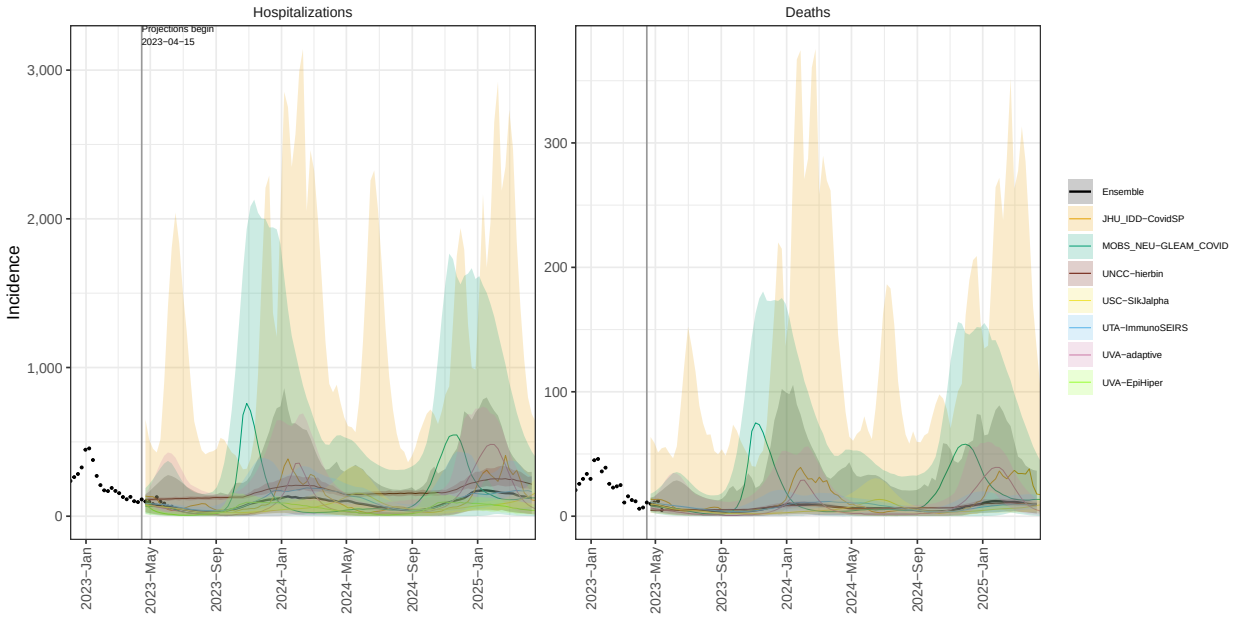
AK model variance & 95% projection intervals − No booster, Low immune escape



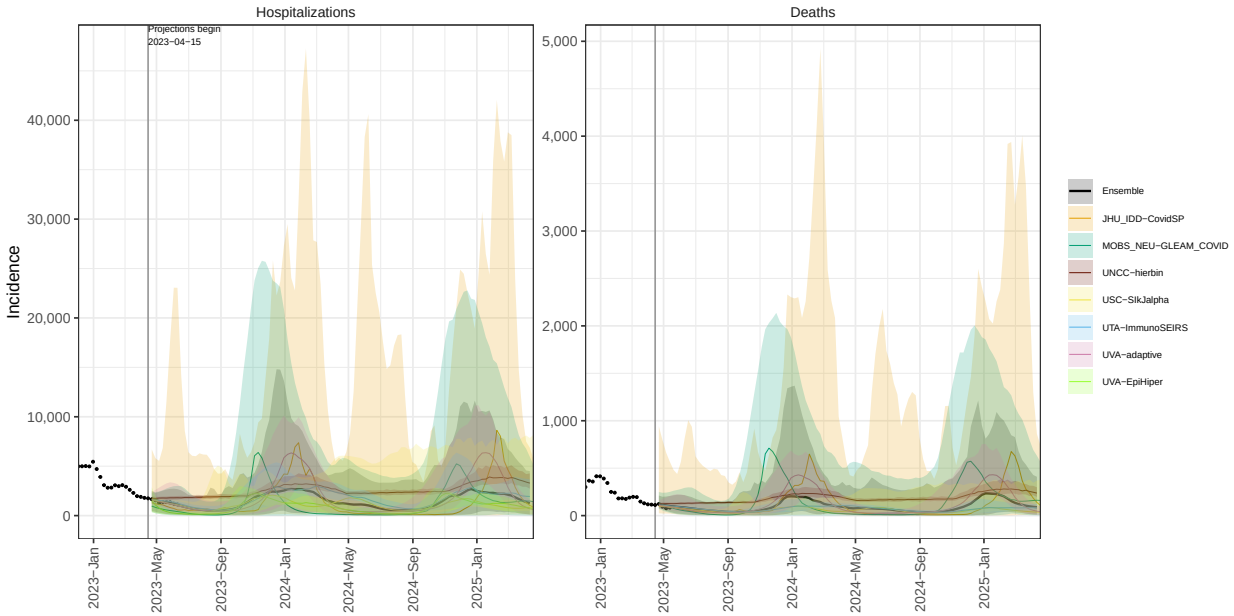
AZ model variance & 95% projection intervals − No booster, Low immune escape



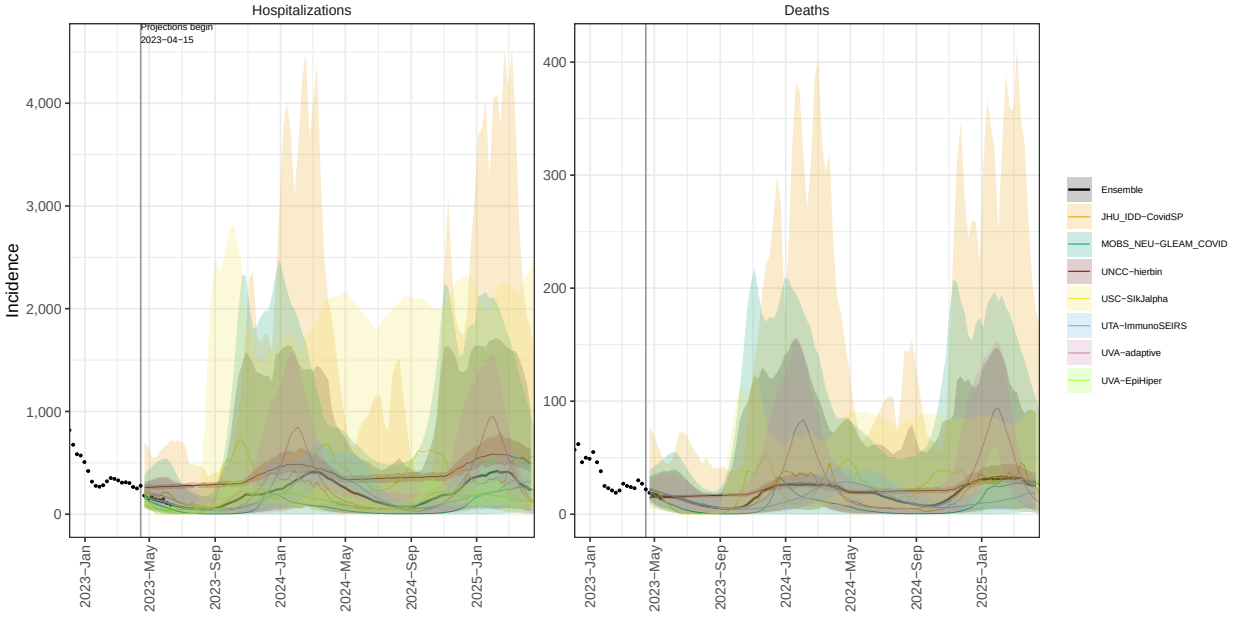
AR model variance & 95% projection intervals − No booster, Low immune escape



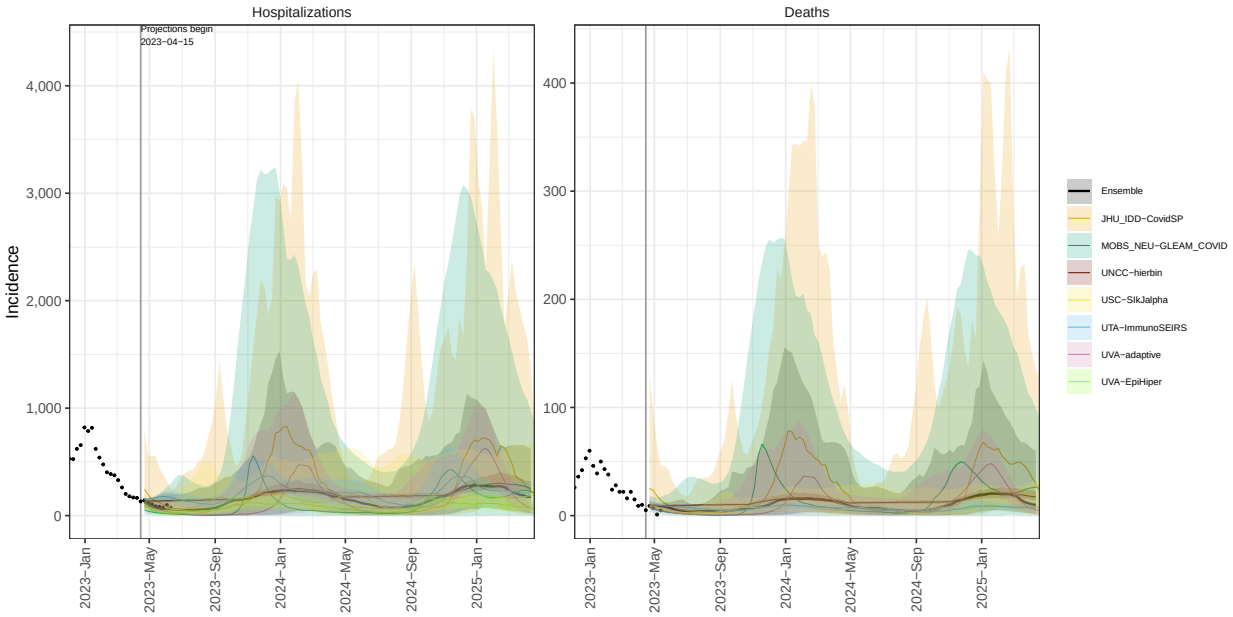
CA model variance & 95% projection intervals − No booster, Low immune escape



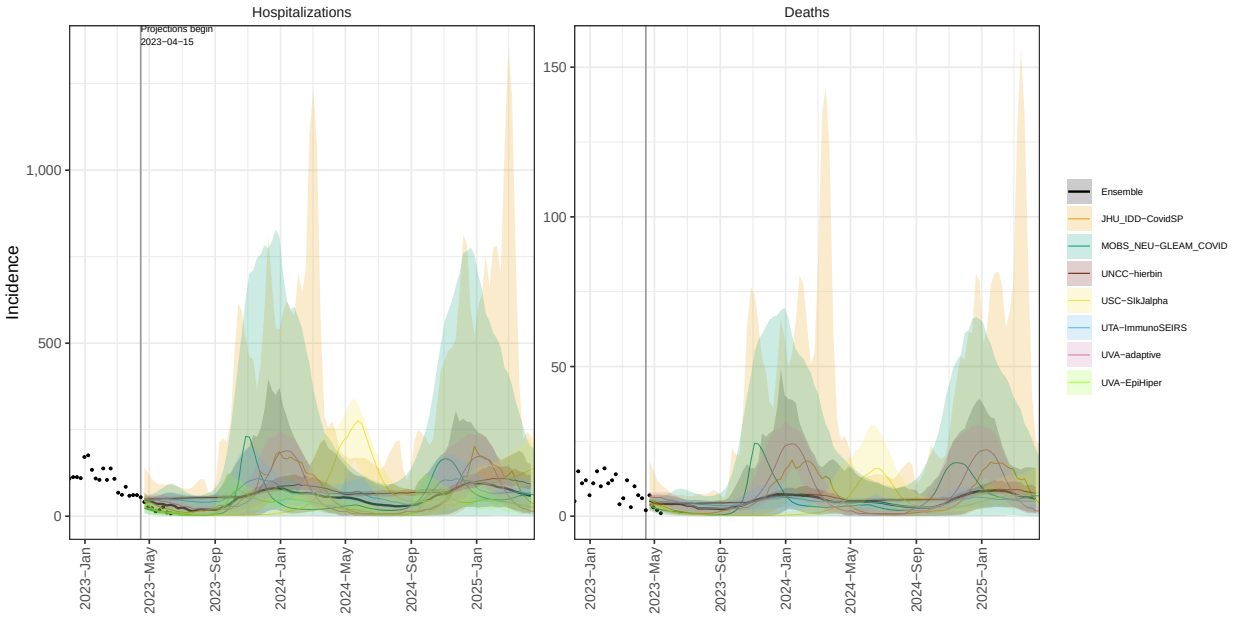
CO model variance & 95% projection intervals − No booster, Low immune escape



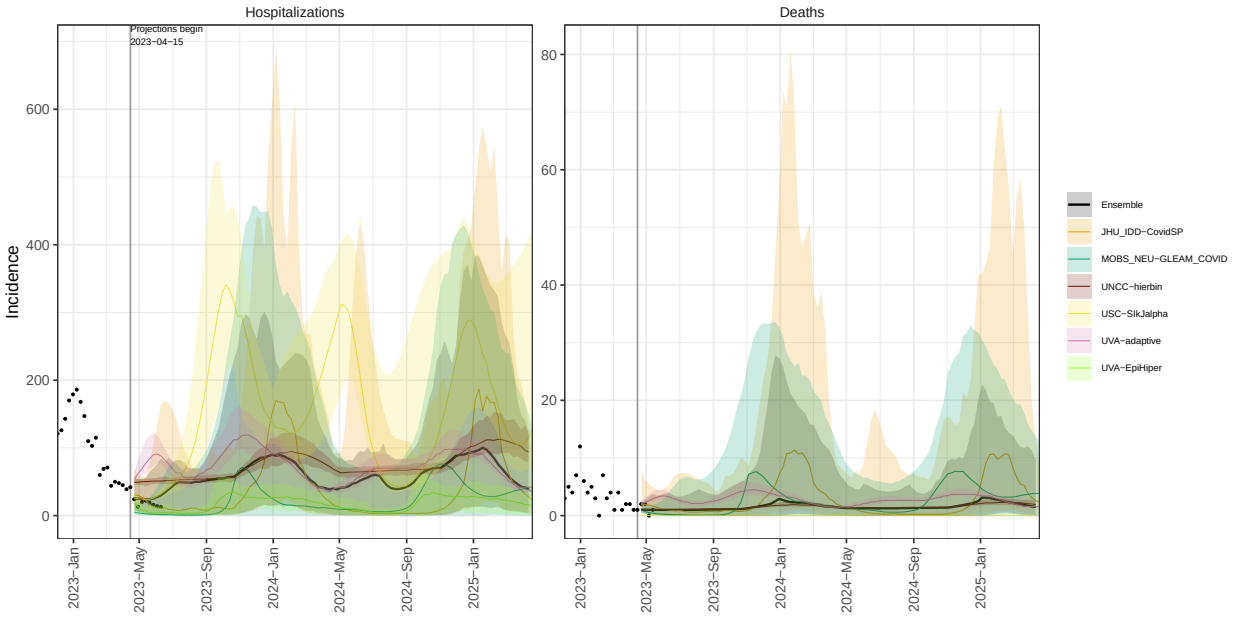
CT model variance & 95% projection intervals − No booster, Low immune escape



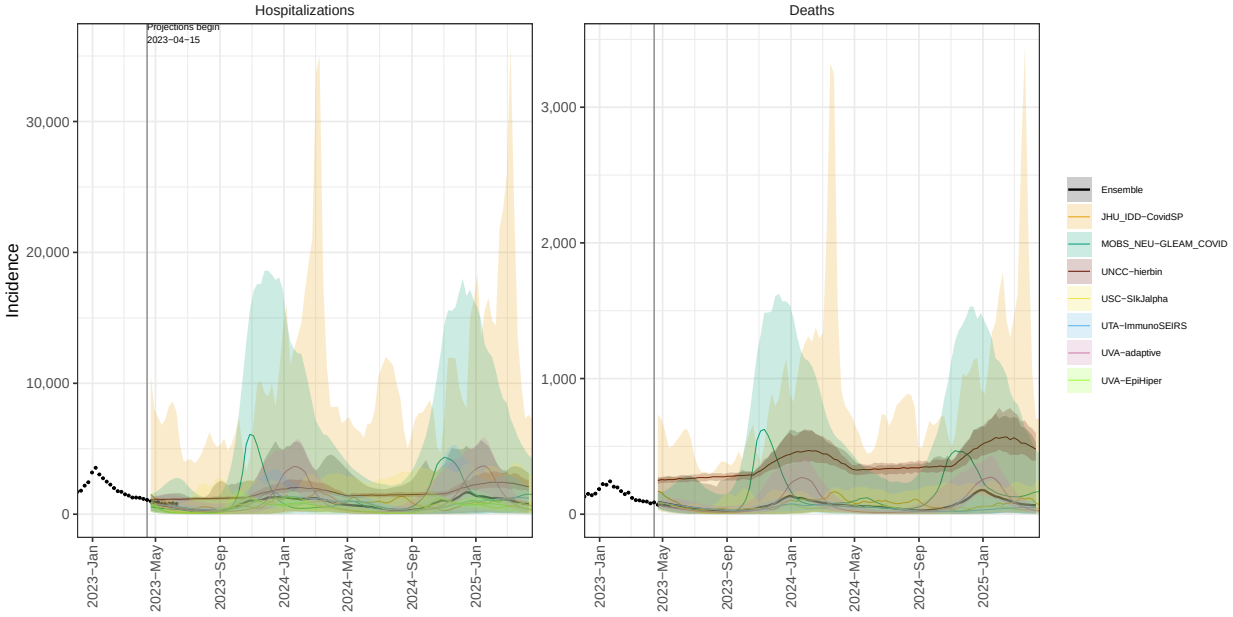
DE model variance & 95% projection intervals − No booster, Low immune escape



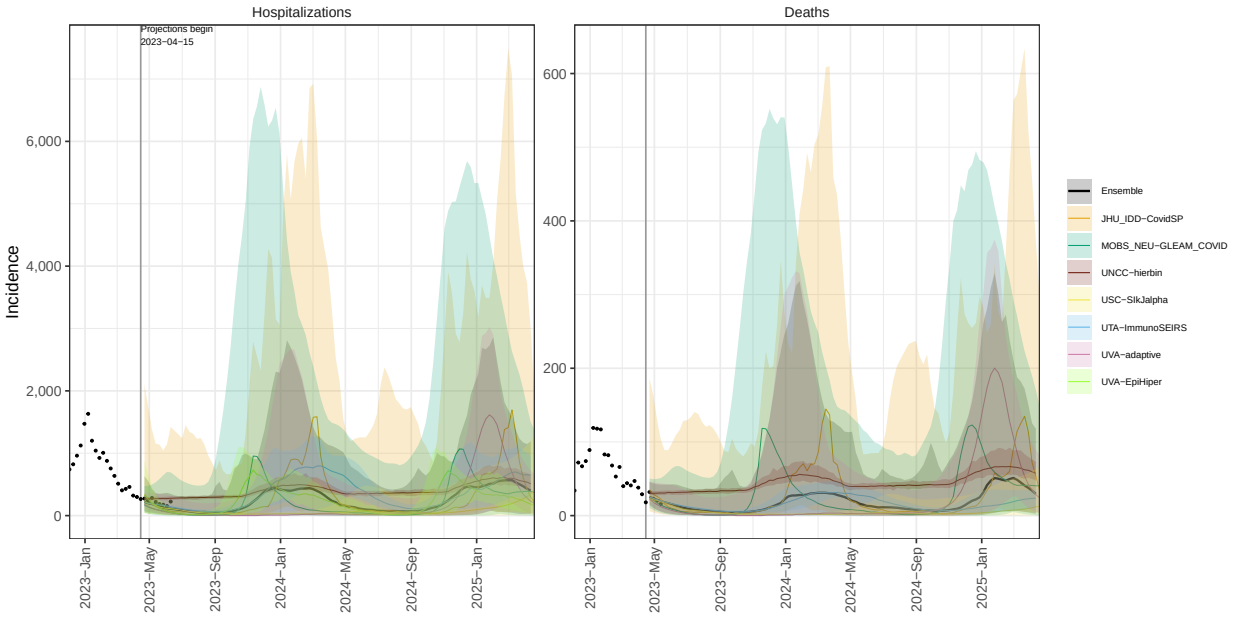
DC model variance & 95% projection intervals − No booster, Low immune escape



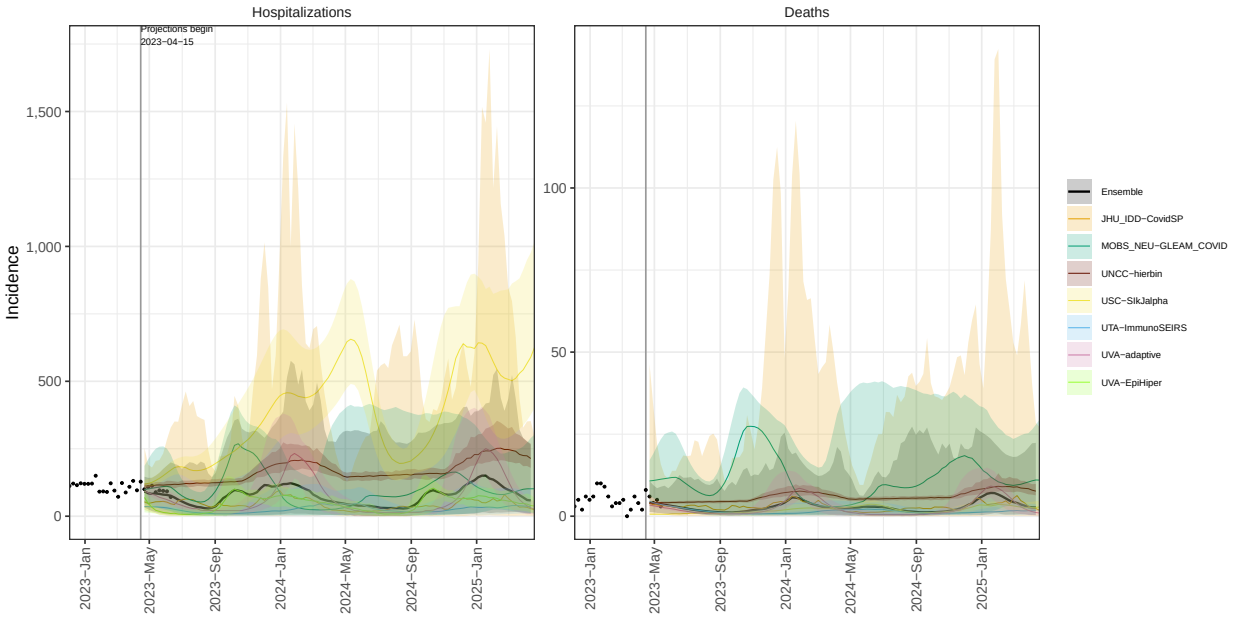
FL model variance & 95% projection intervals − No booster, Low immune escape



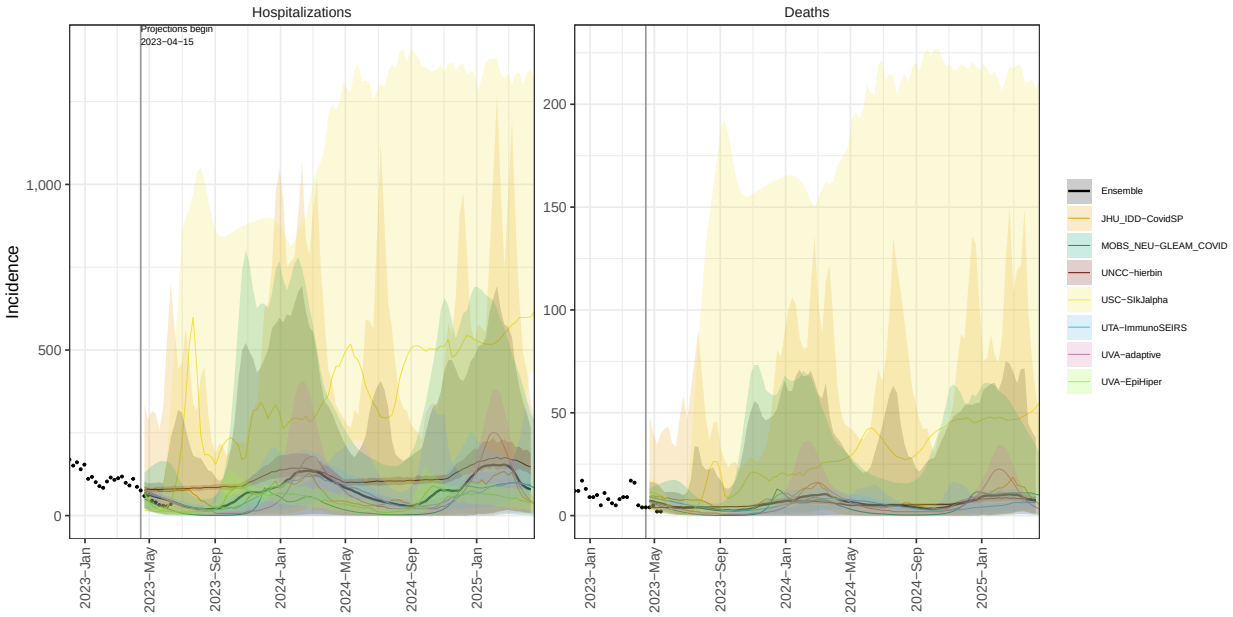
GA model variance & 95% projection intervals − No booster, Low immune escape



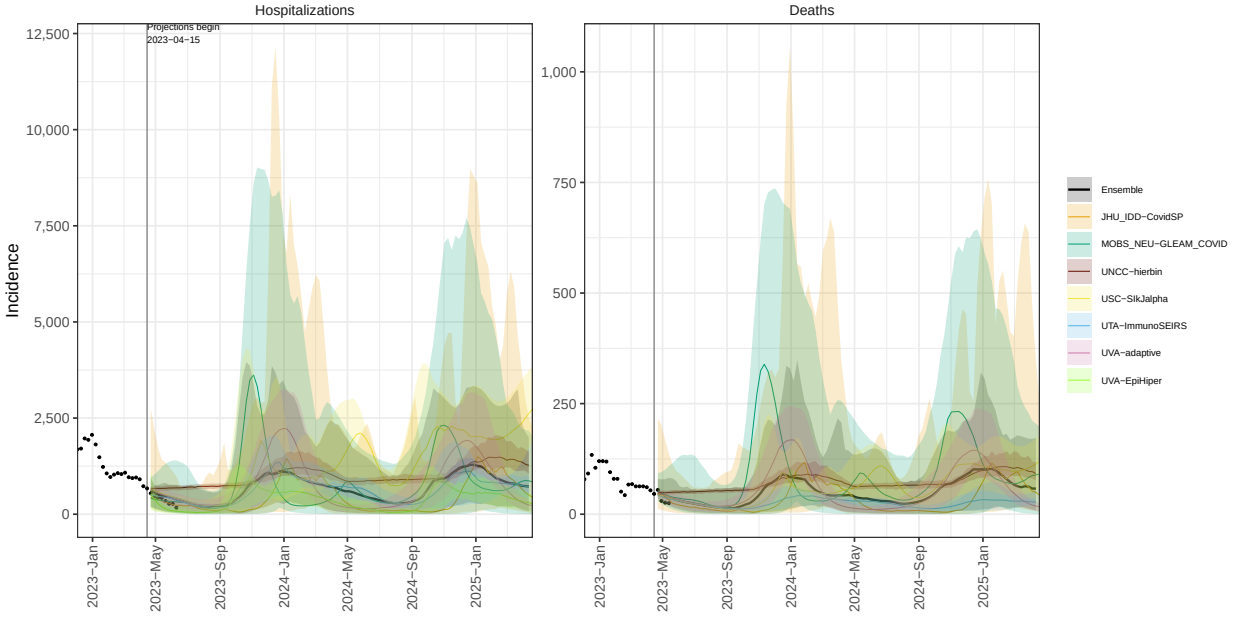
HI model variance & 95% projection intervals − No booster, Low immune escape



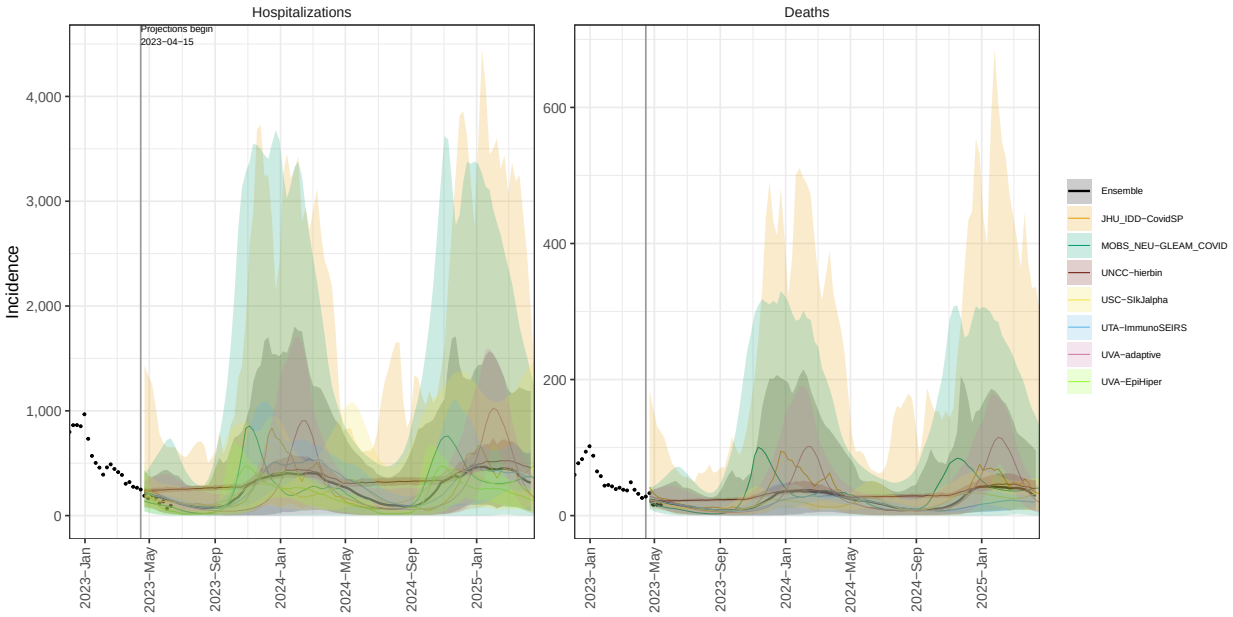
ID model variance & 95% projection intervals − No booster, Low immune escape



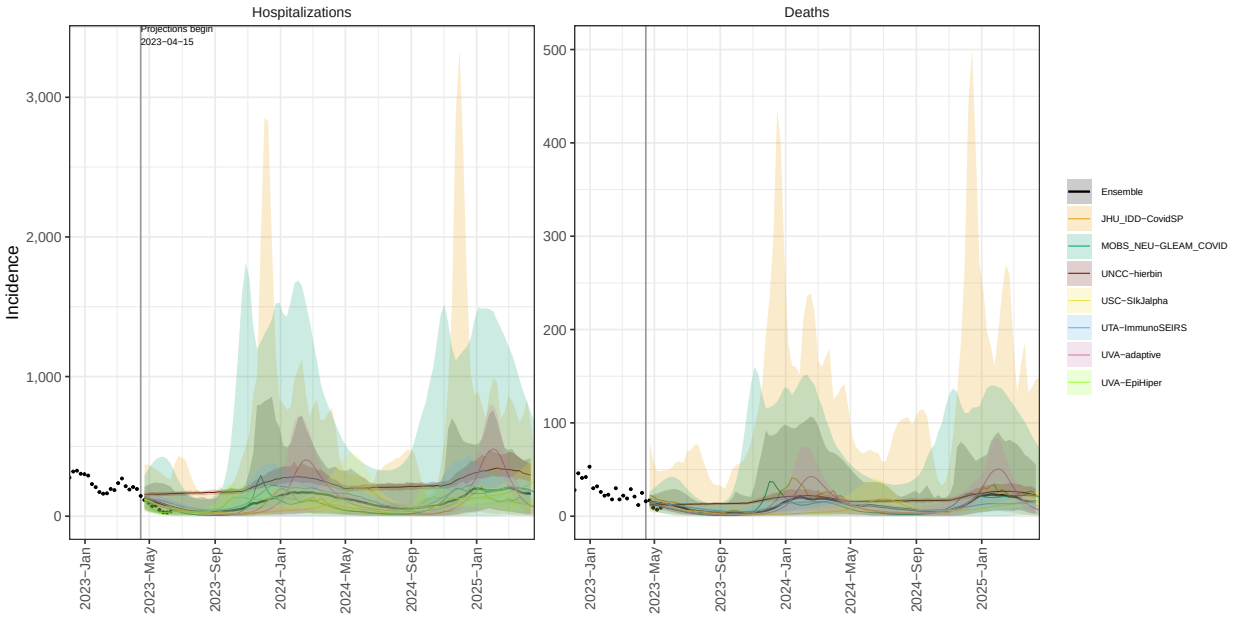
IL model variance & 95% projection intervals − No booster, Low immune escape



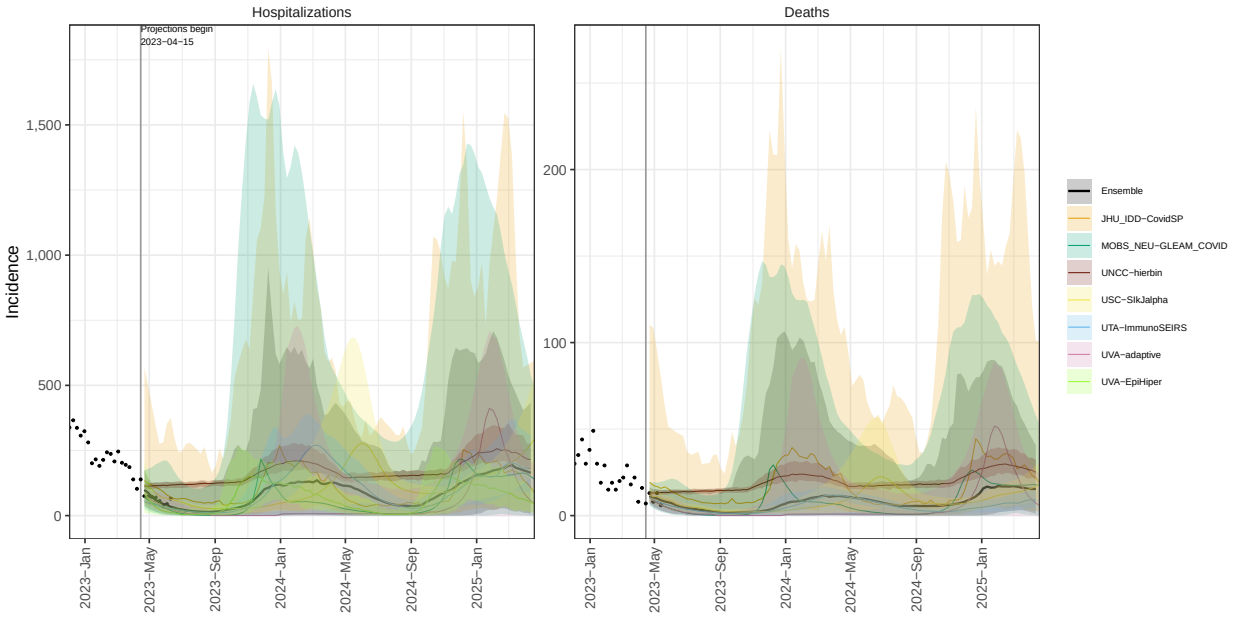
IN model variance & 95% projection intervals − No booster, Low immune escape



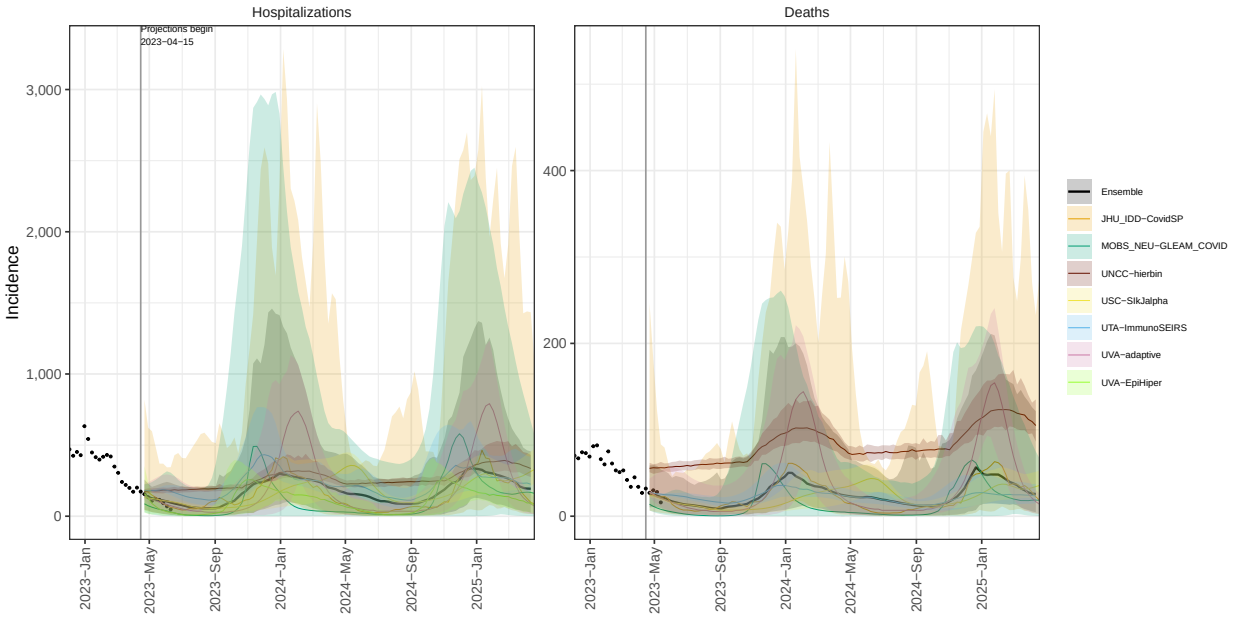
IA model variance & 95% projection intervals − No booster, Low immune escape



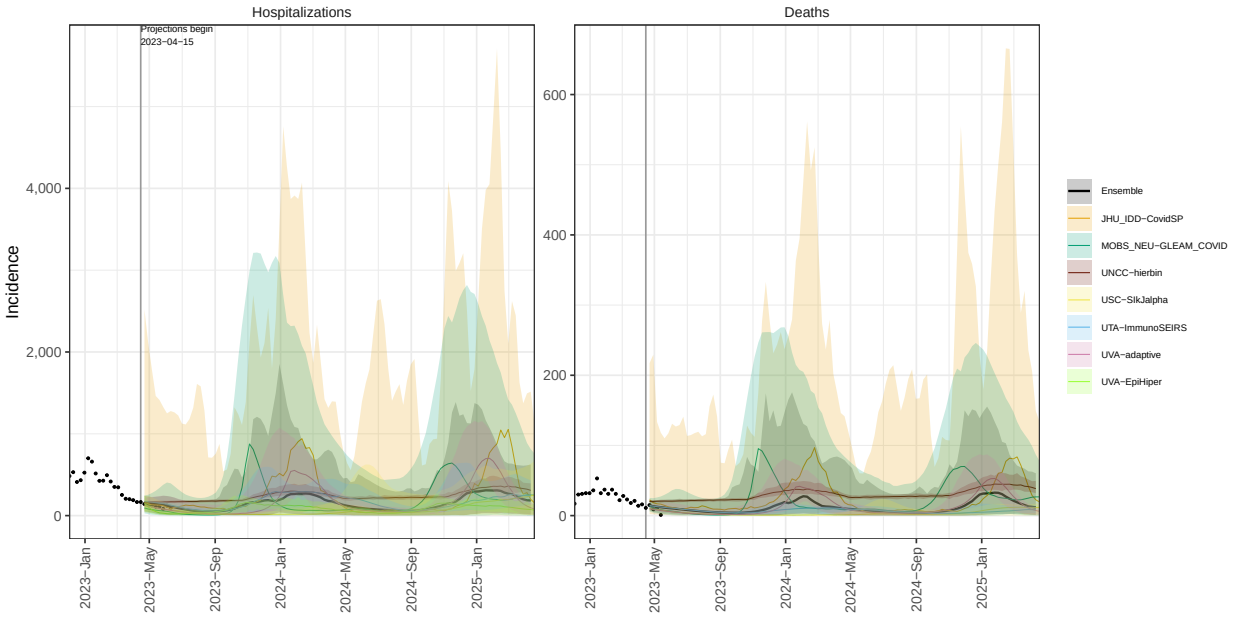
KS model variance & 95% projection intervals − No booster, Low immune escape



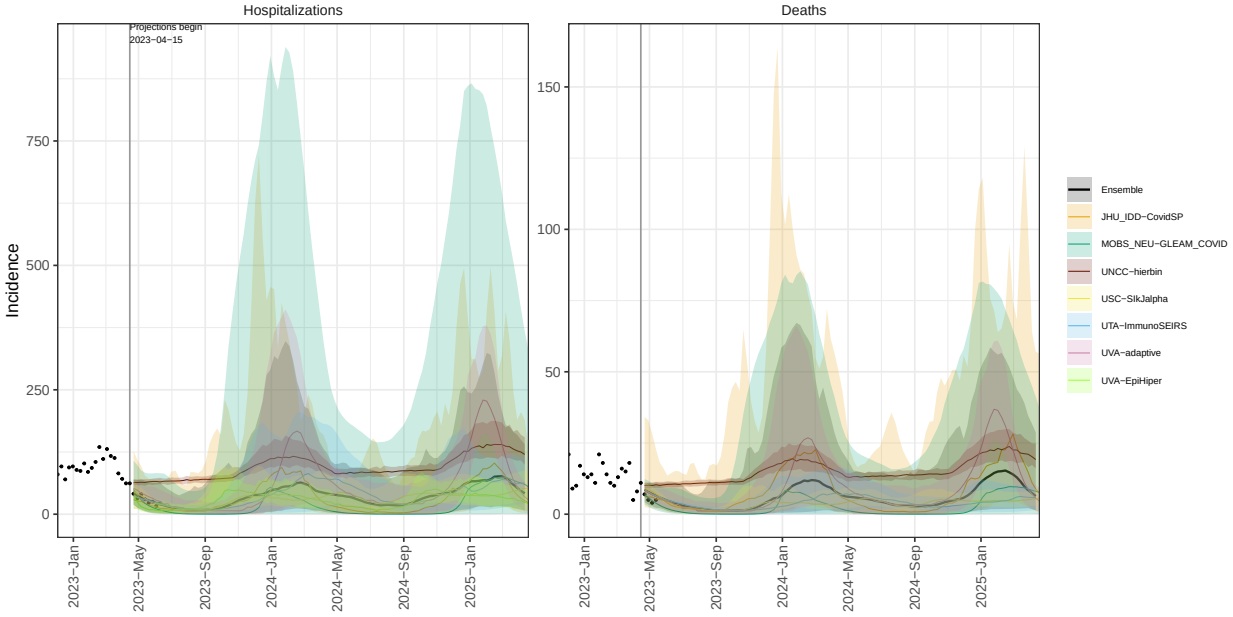
KY model variance & 95% projection intervals − No booster, Low immune escape



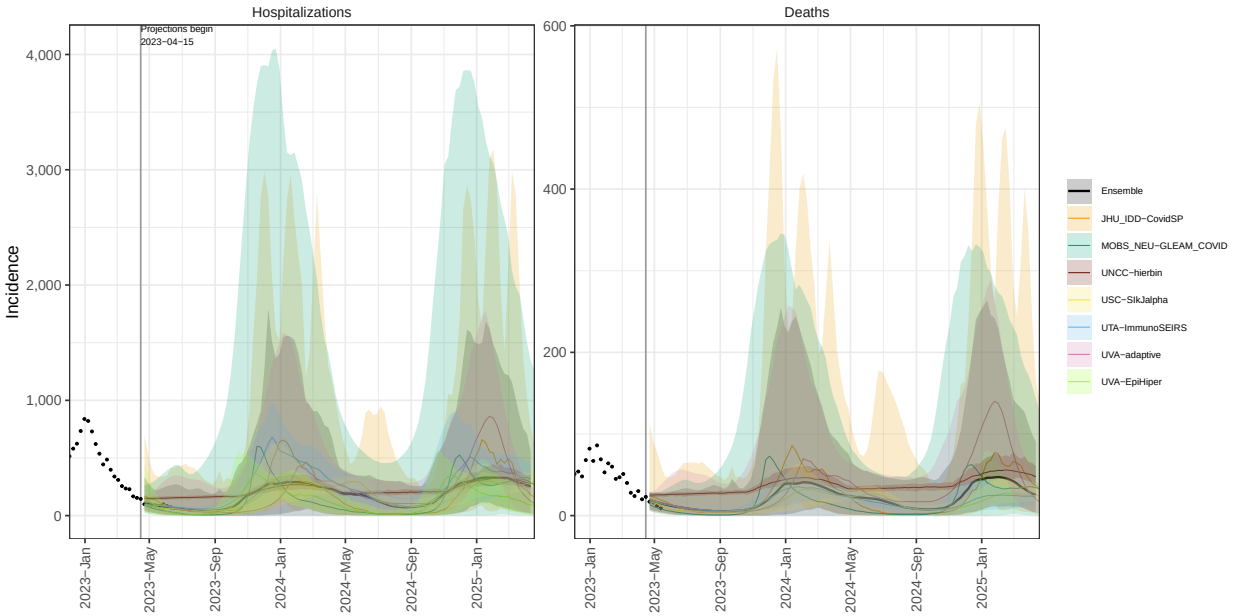
LA model variance & 95% projection intervals − No booster, Low immune escape



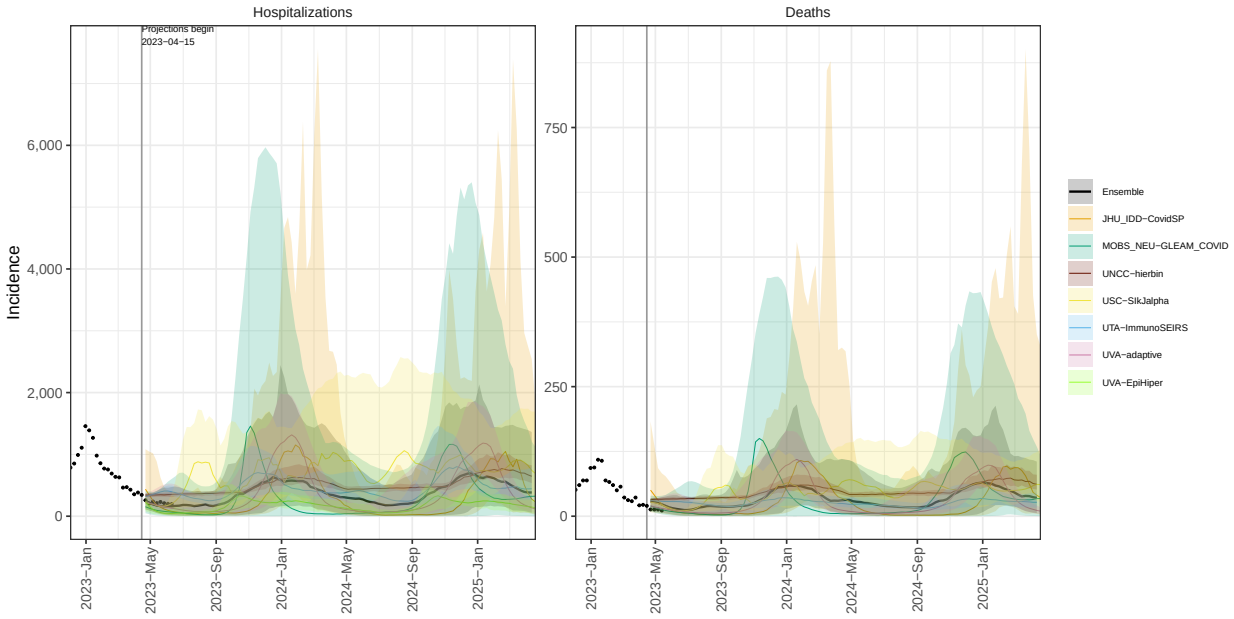
ME model variance & 95% projection intervals − No booster, Low immune escape



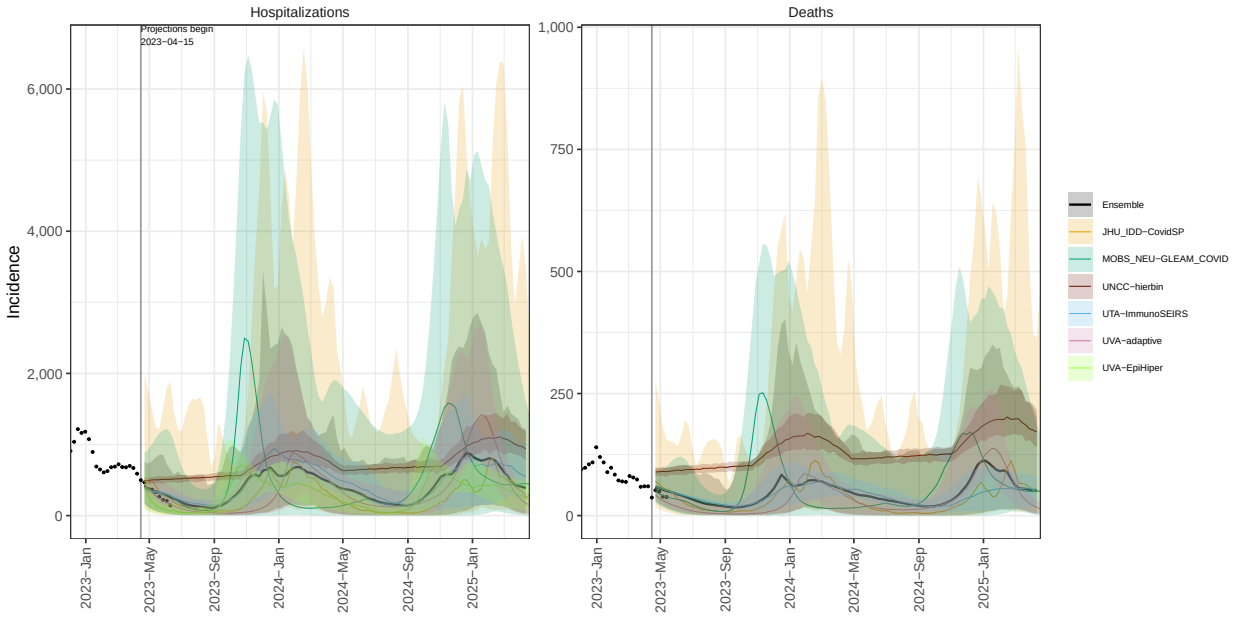
MD model variance & 95% projection intervals − No booster, Low immune escape



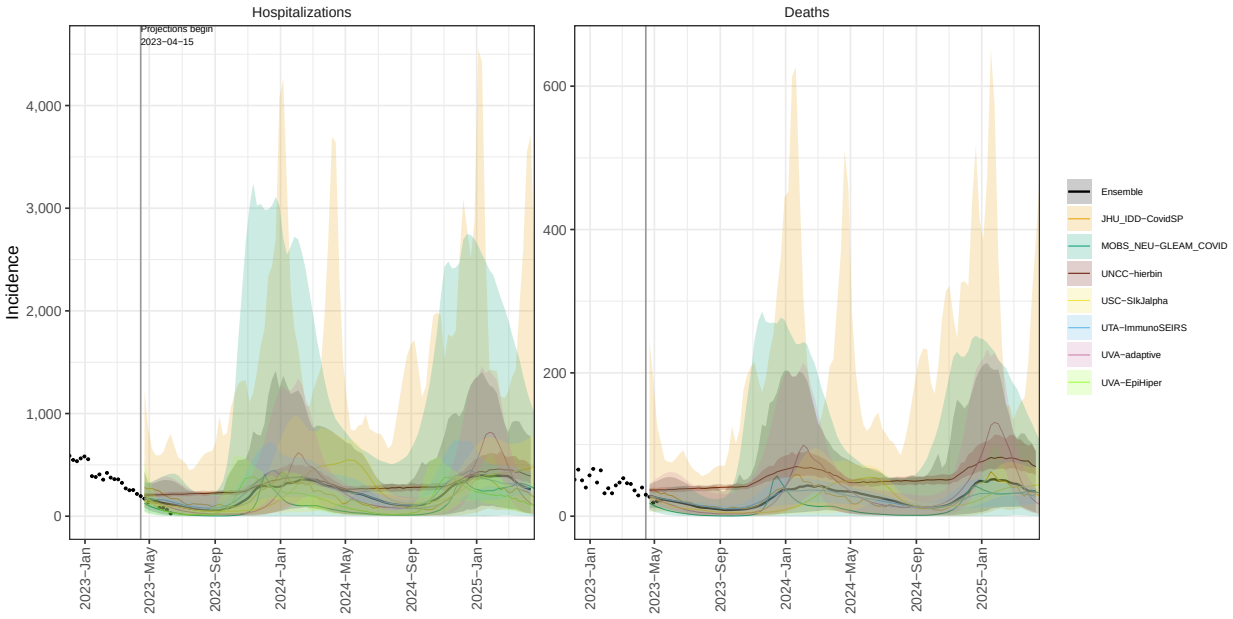
MA model variance & 95% projection intervals − No booster, Low immune escape



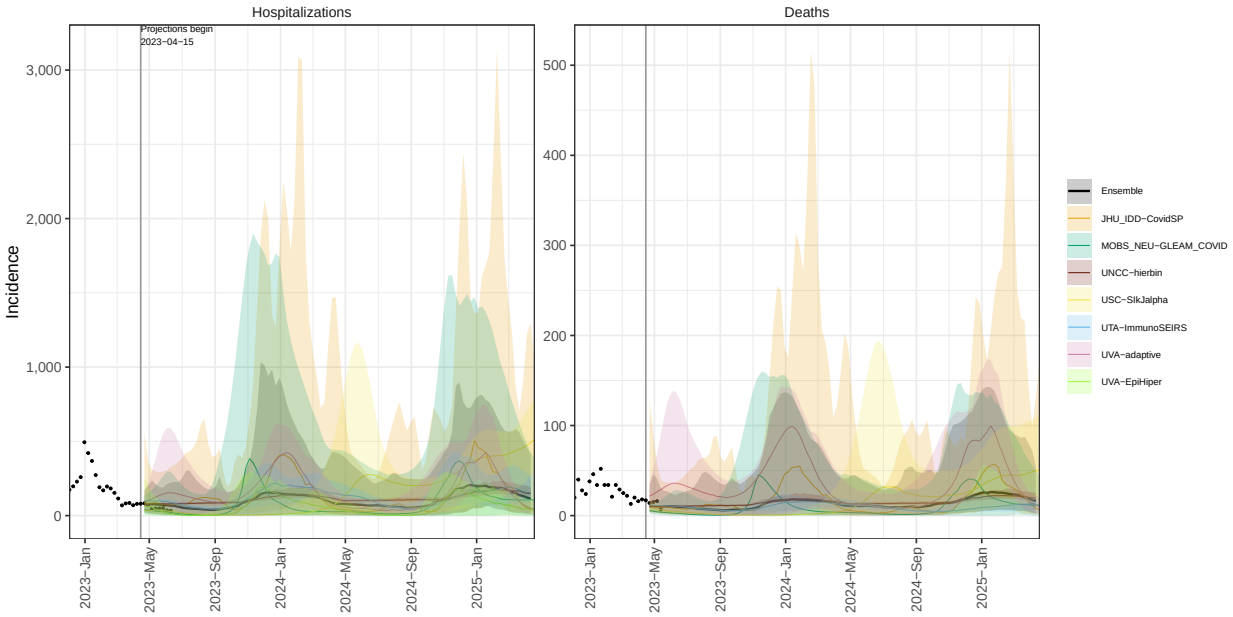
MI model variance & 95% projection intervals − No booster, Low immune escape



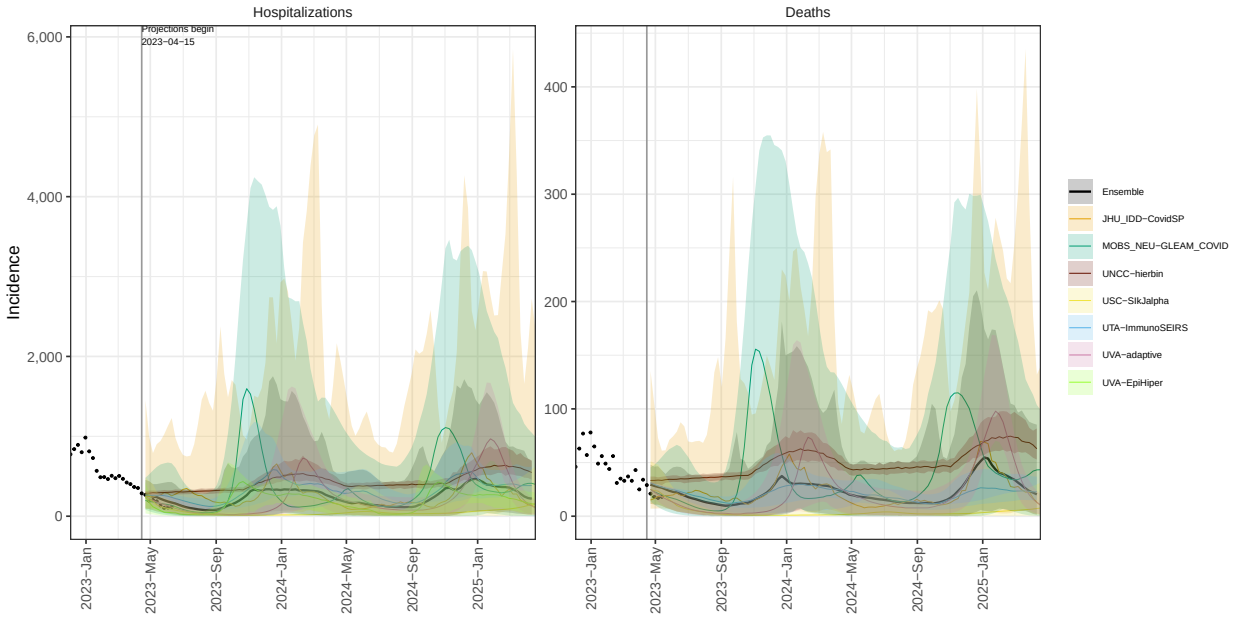
MN model variance & 95% projection intervals − No booster, Low immune escape



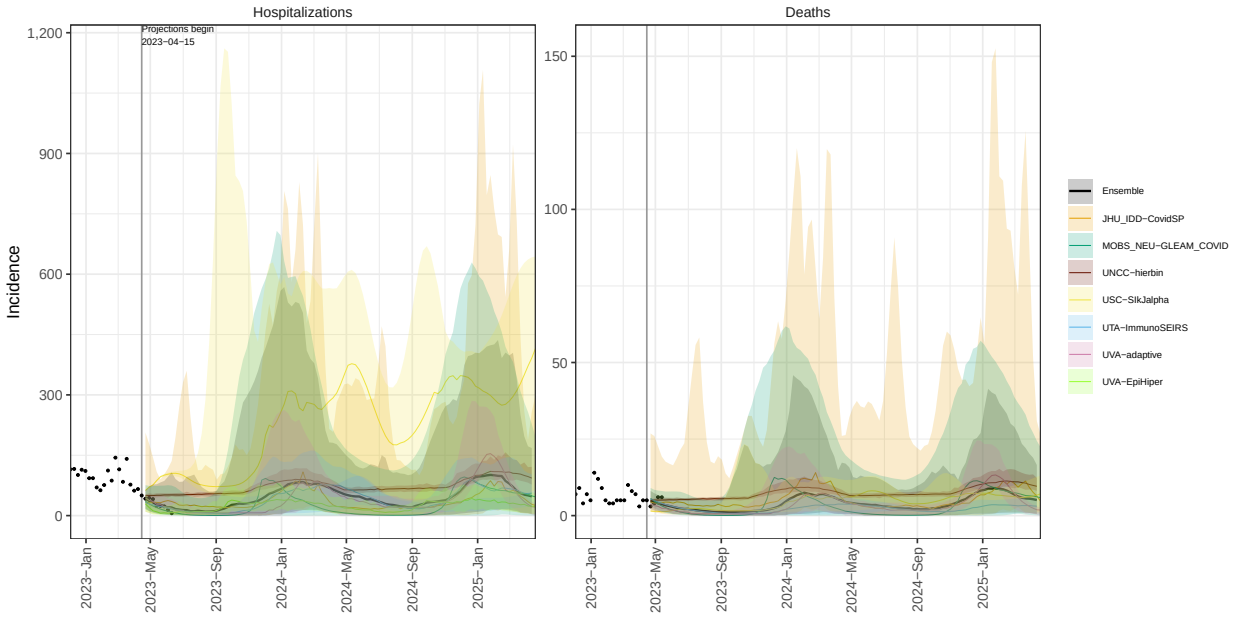
MS model variance & 95% projection intervals − No booster, Low immune escape



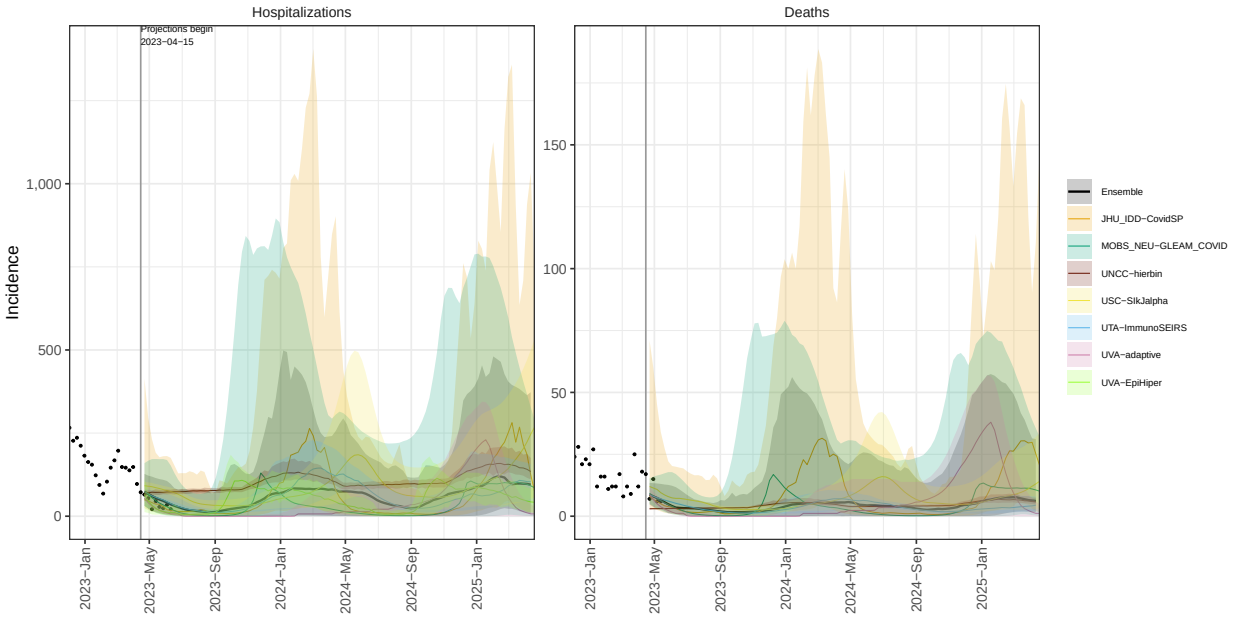
MO model variance & 95% projection intervals − No booster, Low immune escape



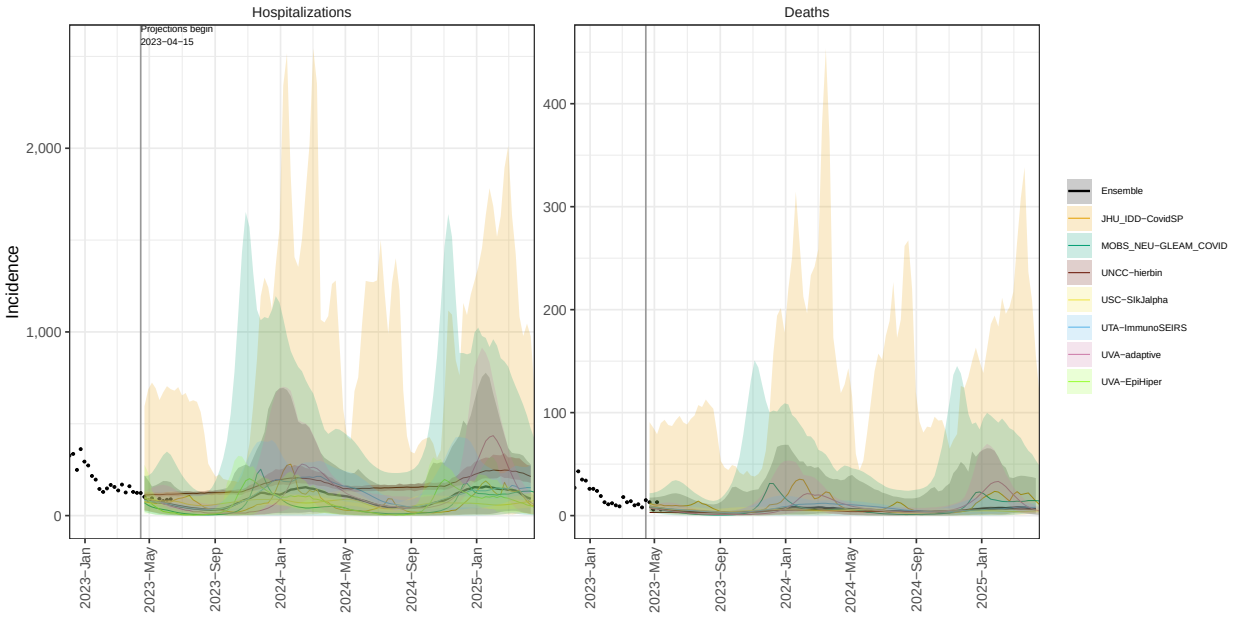
MT model variance & 95% projection intervals − No booster, Low immune escape



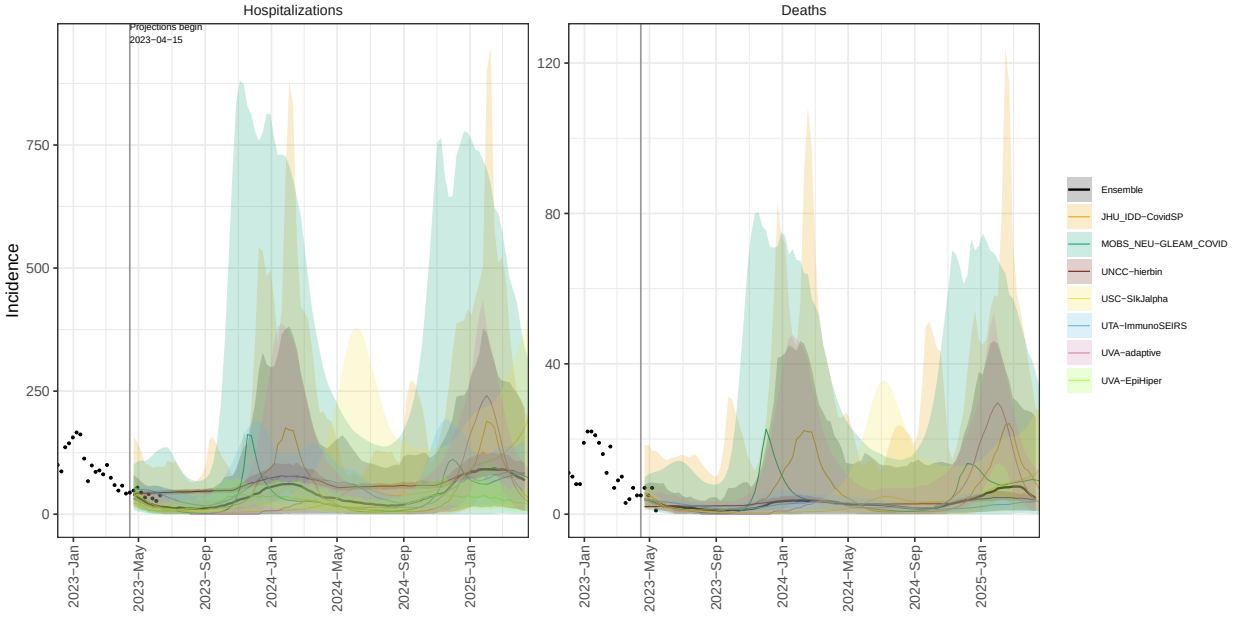
NE model variance & 95% projection intervals − No booster, Low immune escape



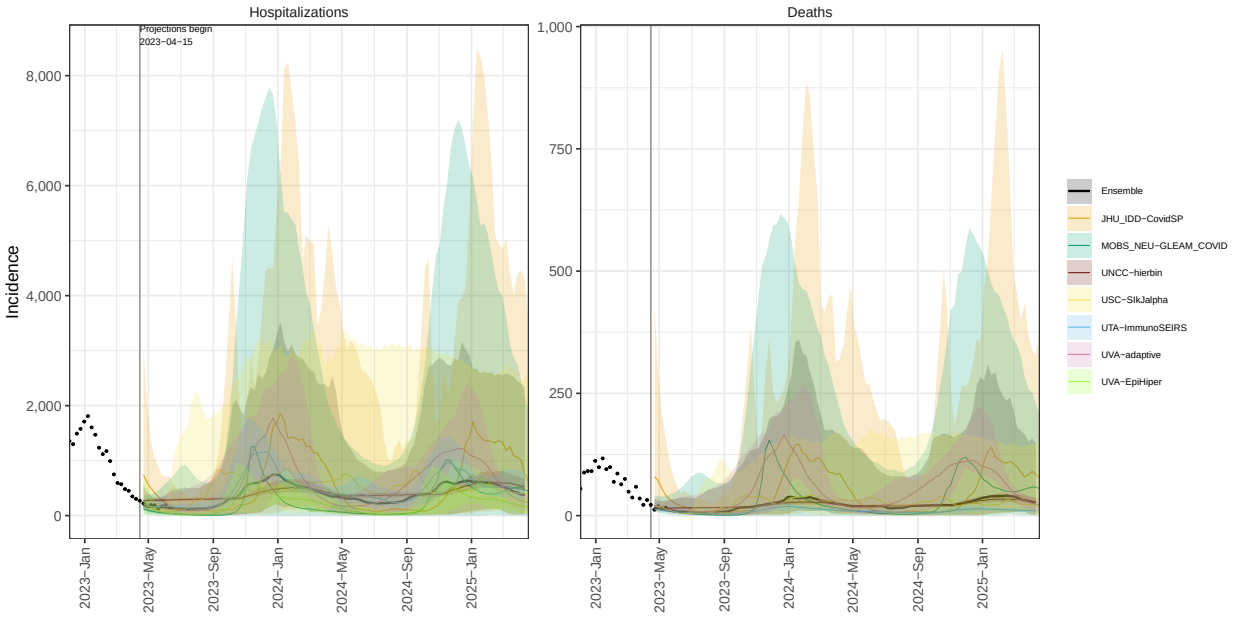
NV model variance & 95% projection intervals − No booster, Low immune escape



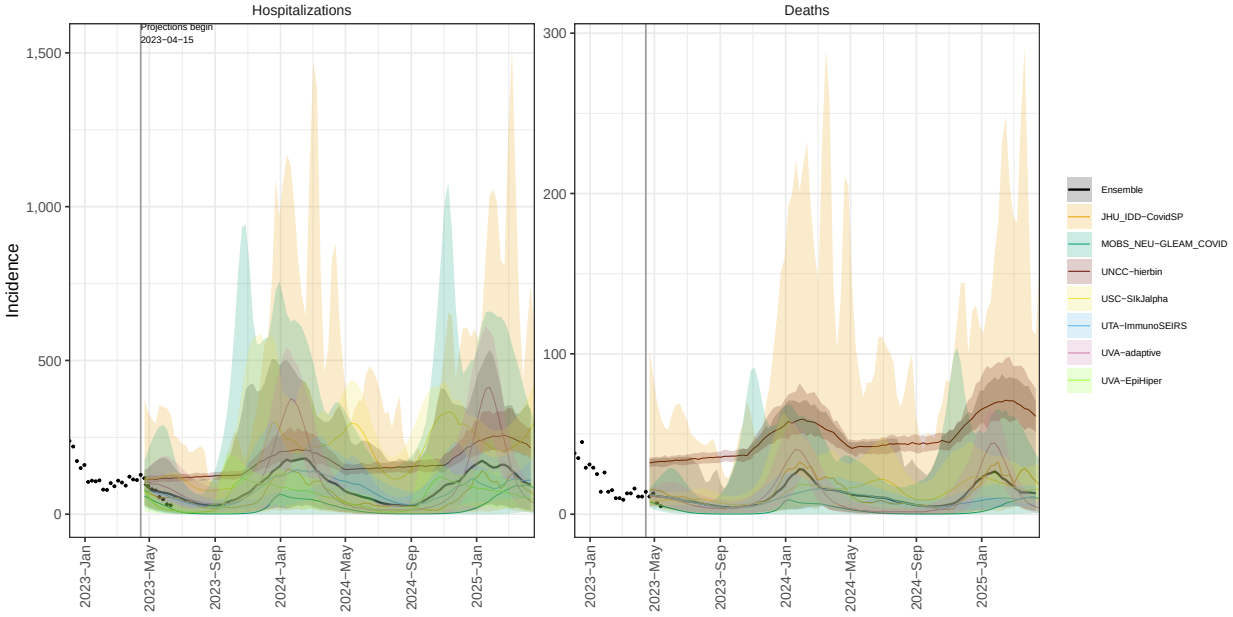
NH model variance & 95% projection intervals − No booster, Low immune escape



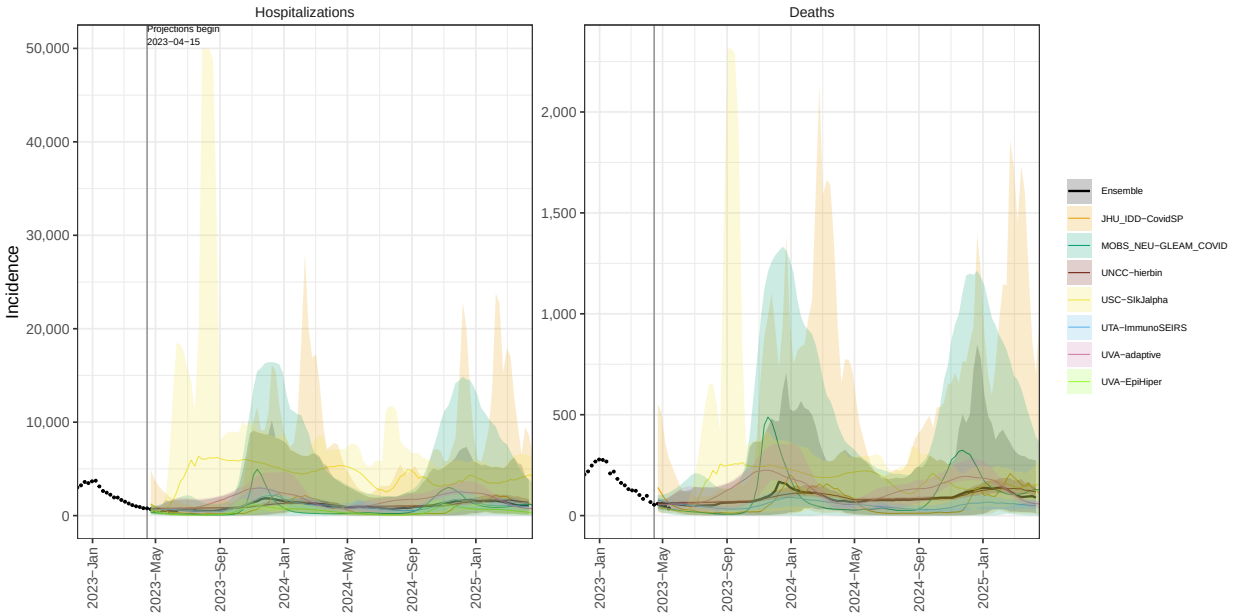
NJ model variance & 95% projection intervals − No booster, Low immune escape



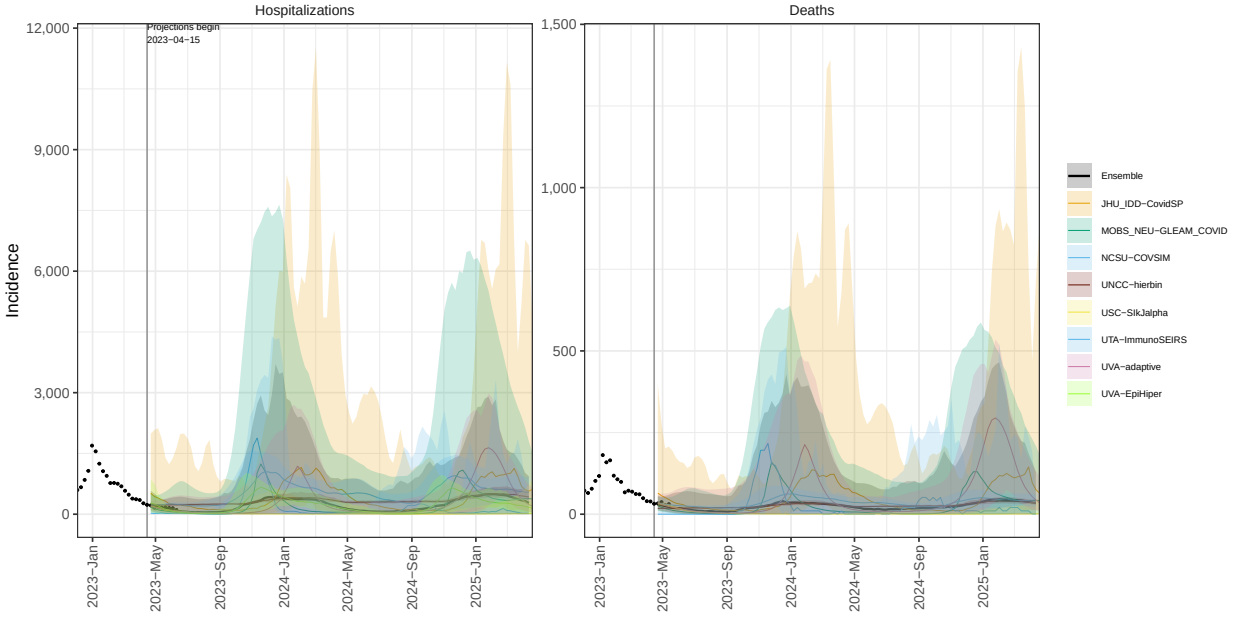
NM model variance & 95% projection intervals − No booster, Low immune escape



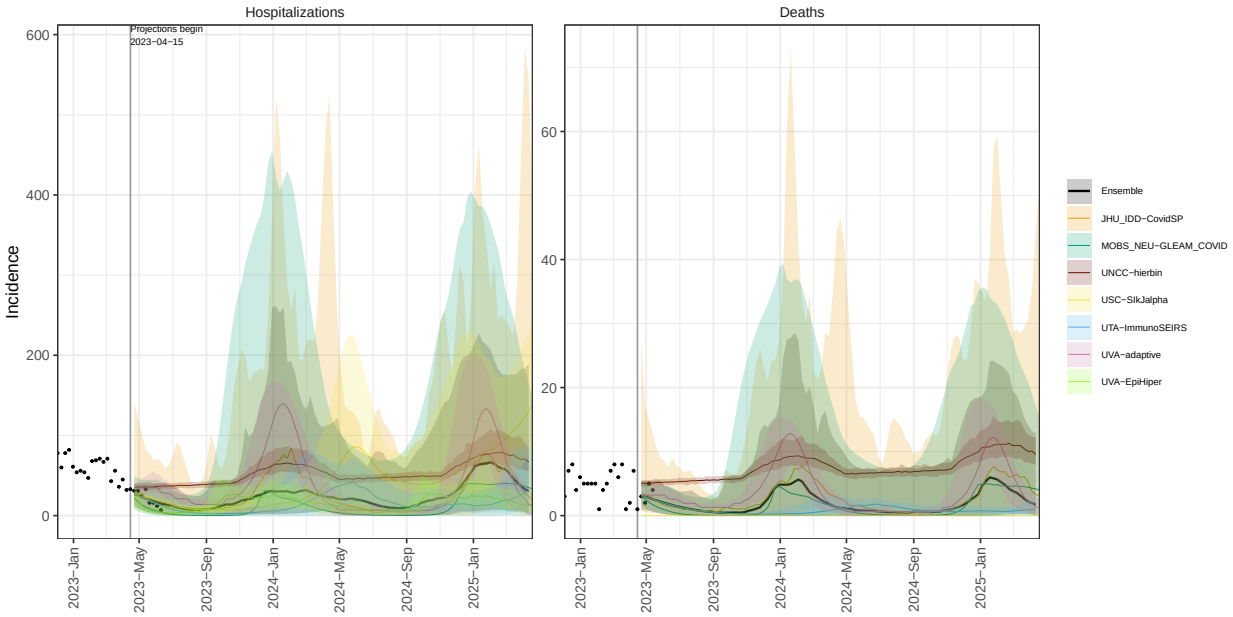
NY model variance & 95% projection intervals − No booster, Low immune escape



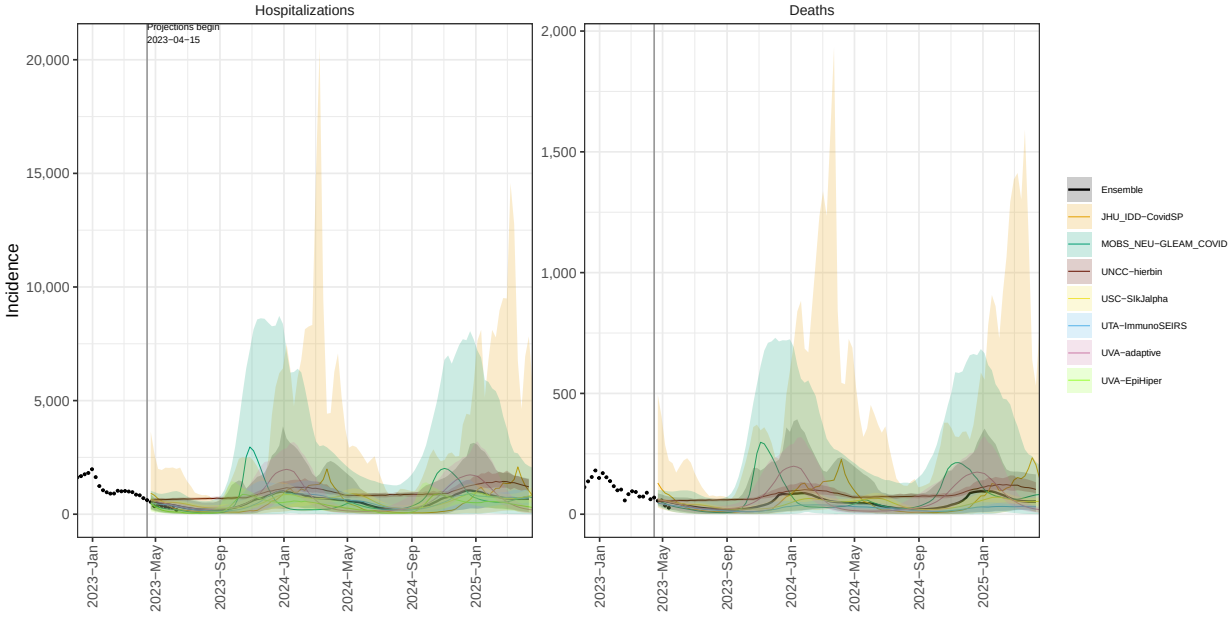
NC model variance & 95% projection intervals − No booster, Low immune escape



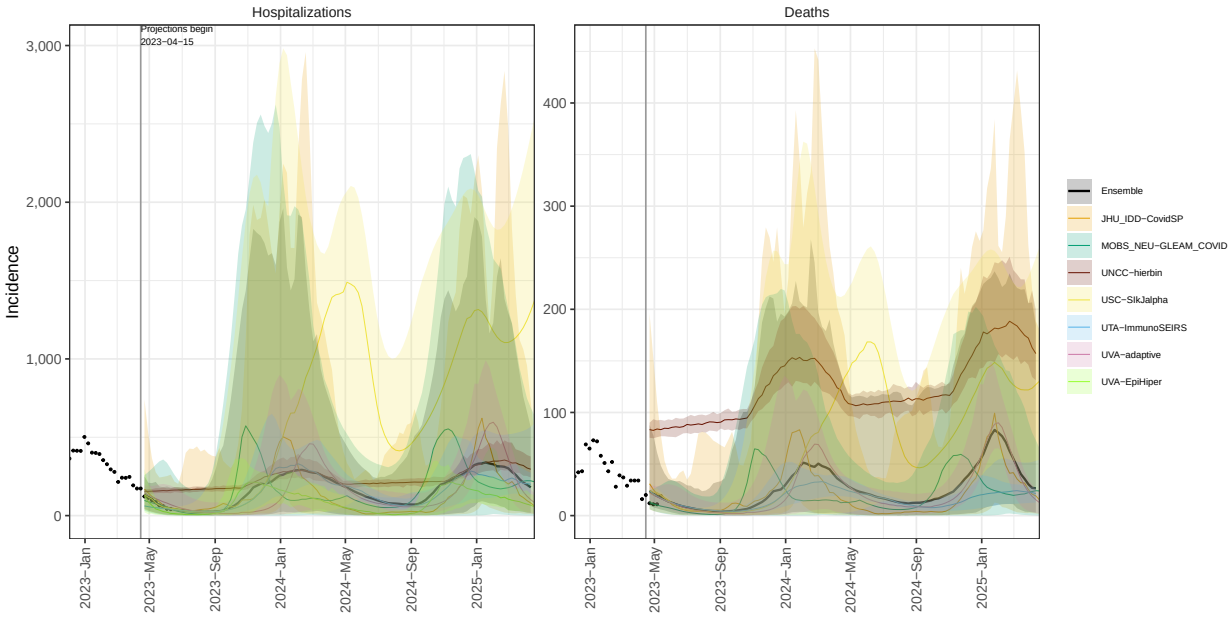
ND model variance & 95% projection intervals − No booster, Low immune escape



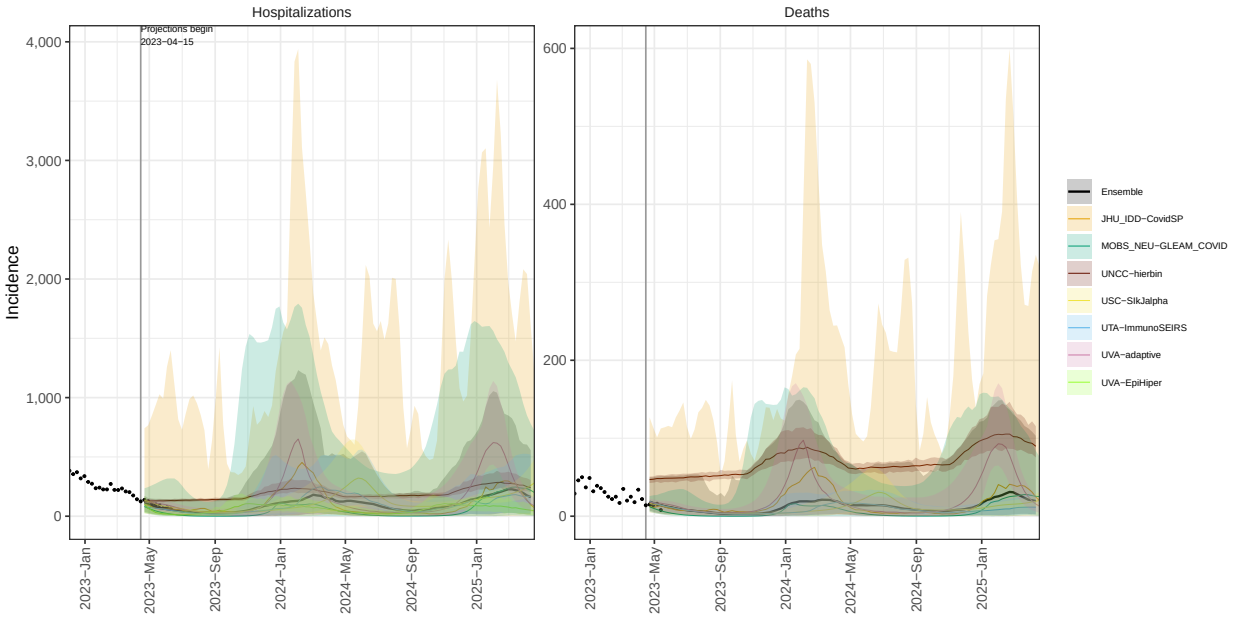
OH model variance & 95% projection intervals − No booster, Low immune escape



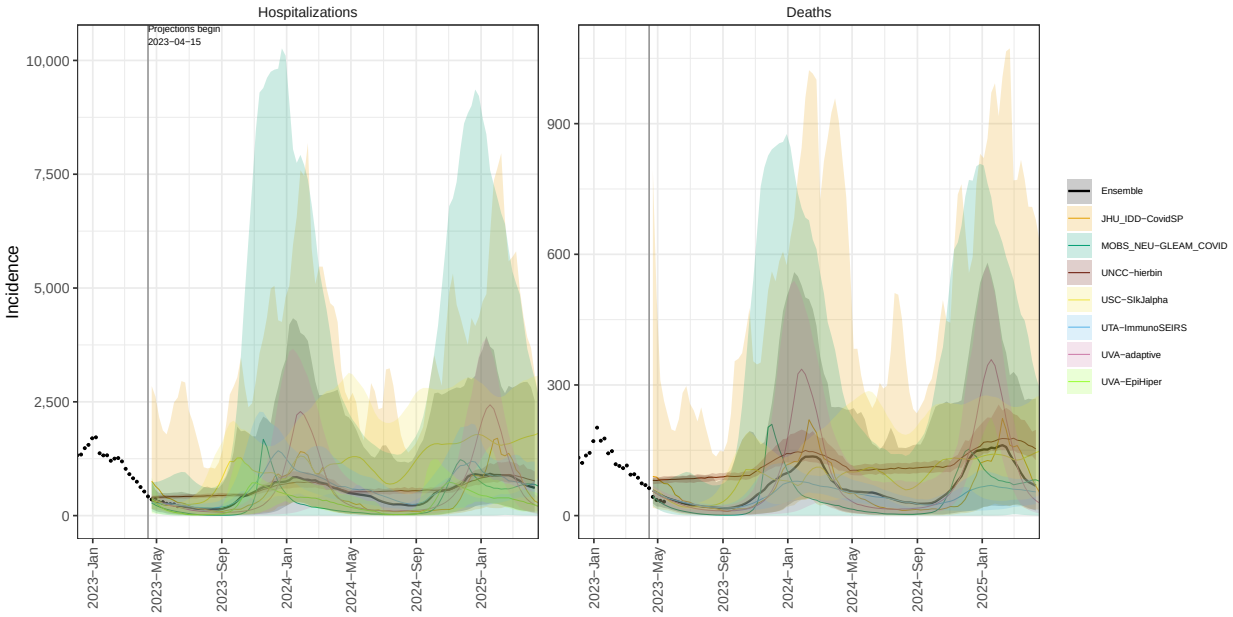
OK model variance & 95% projection intervals − No booster, Low immune escape



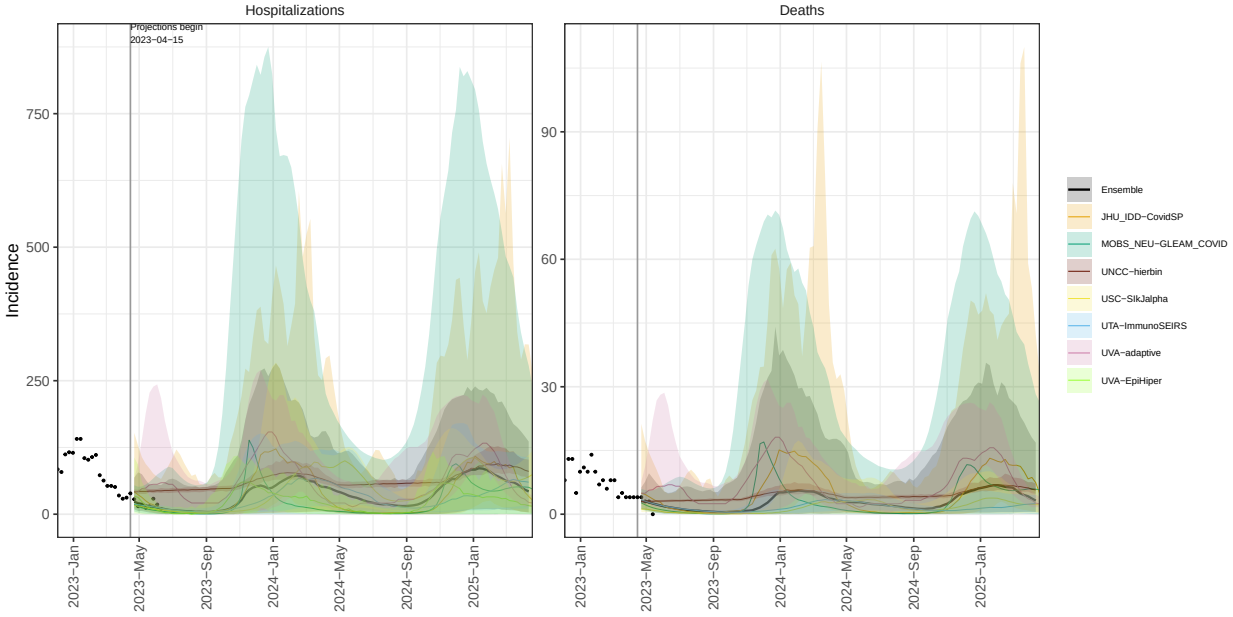
OR model variance & 95% projection intervals − No booster, Low immune escape



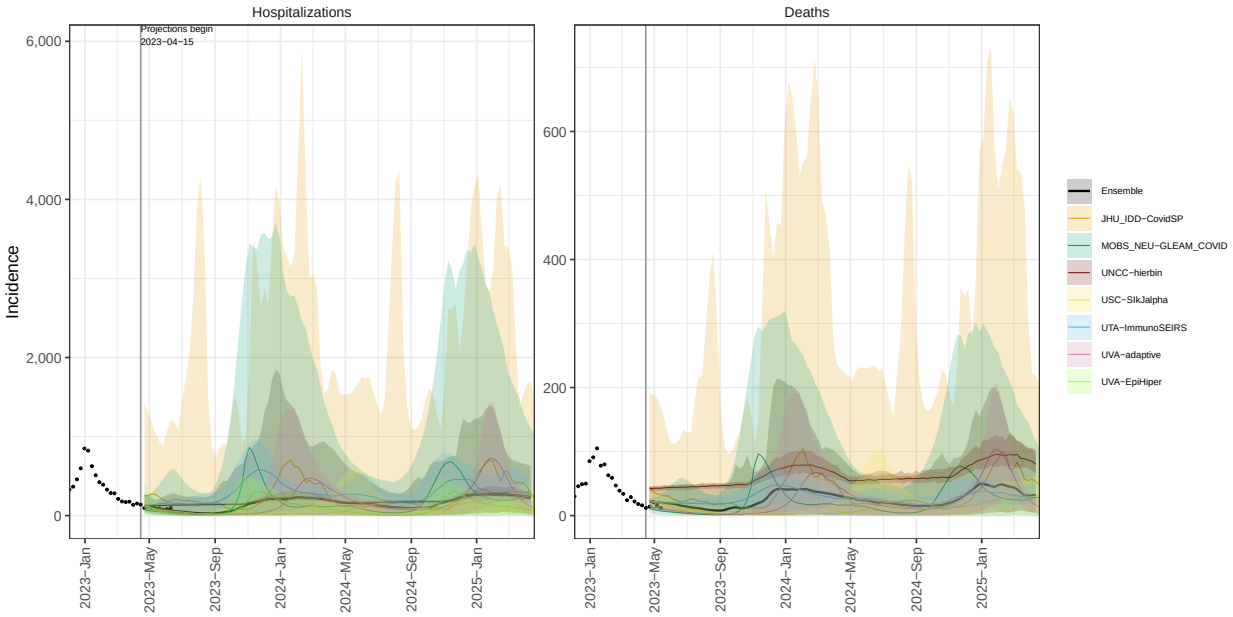
PA model variance & 95% projection intervals − No booster, Low immune escape



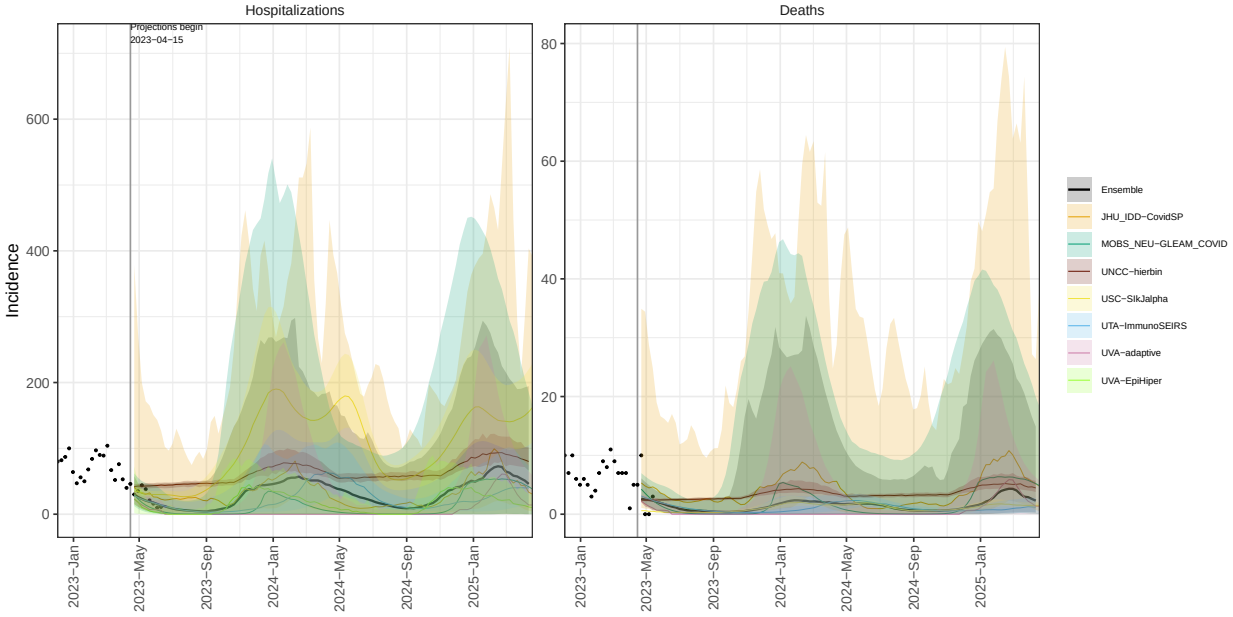
RI model variance & 95% projection intervals − No booster, Low immune escape



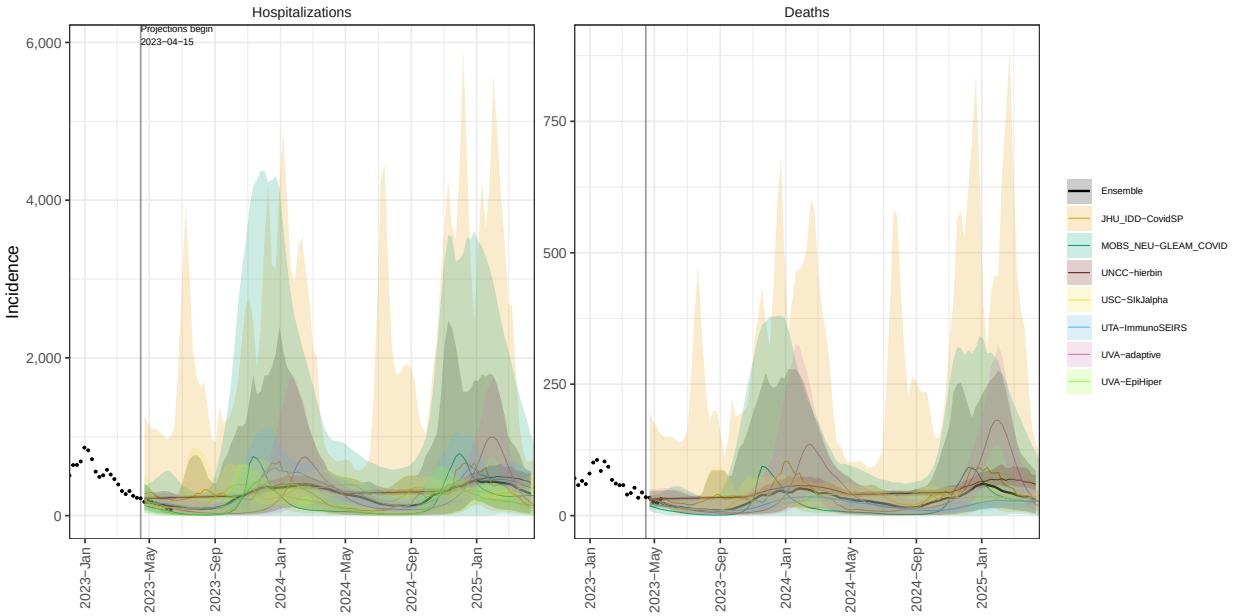
SC model variance & 95% projection intervals − No booster, Low immune escape



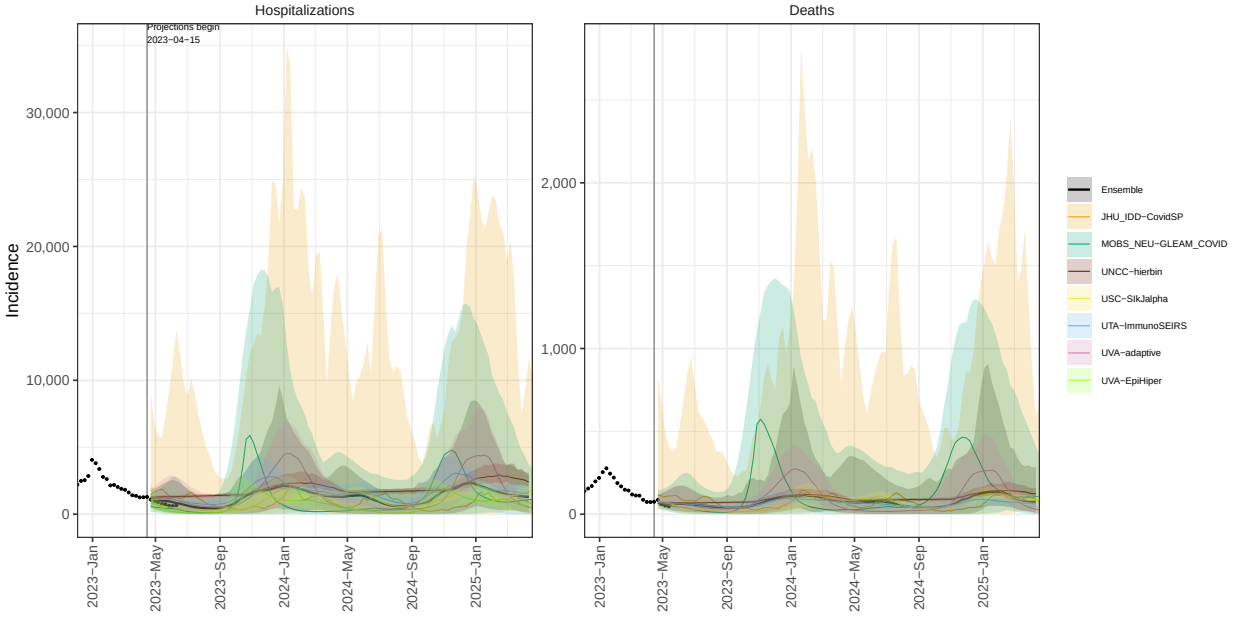
SD model variance & 95% projection intervals − No booster, Low immune escape



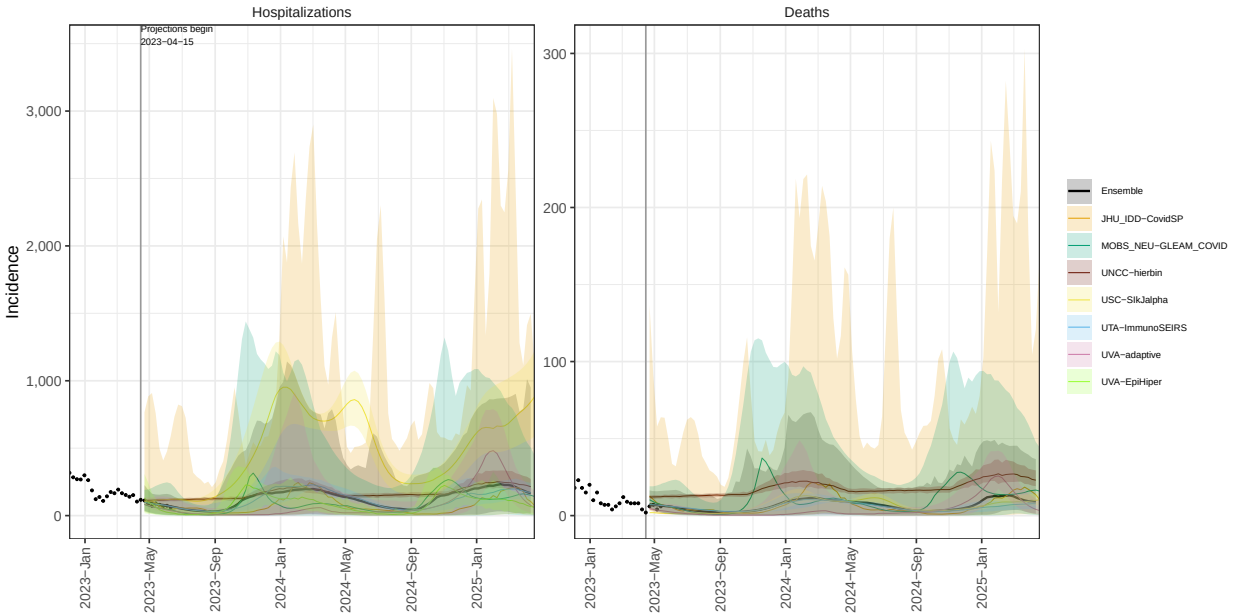
TN model variance & 95% projection intervals − No booster, Low immune escape



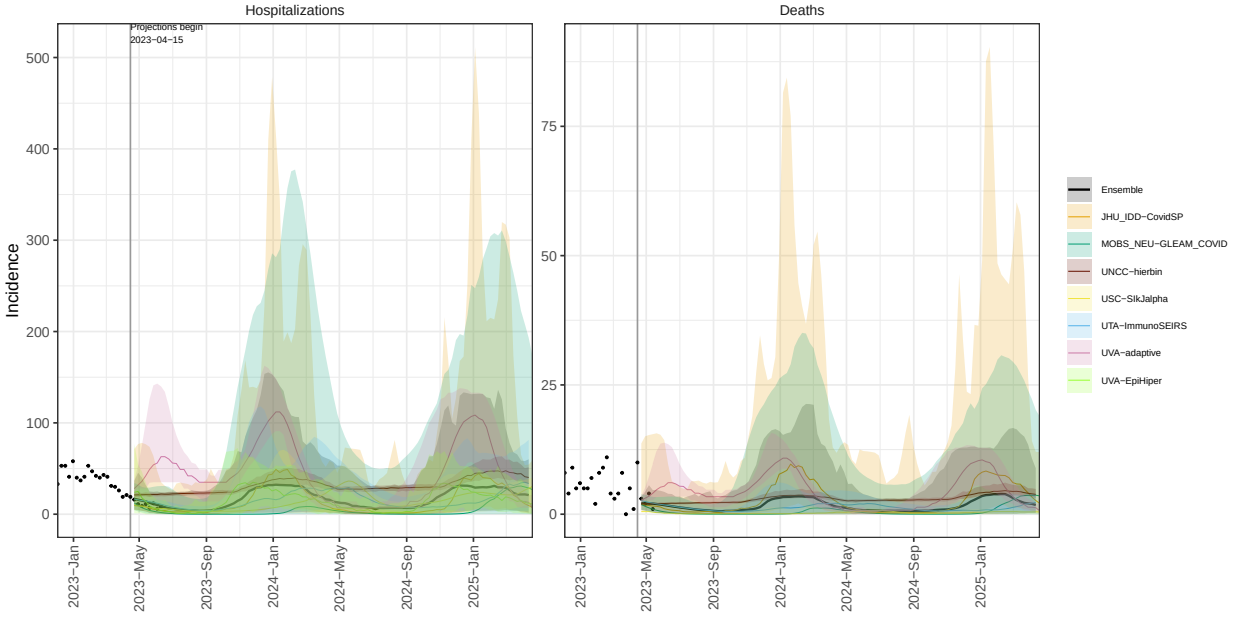
TX model variance & 95% projection intervals − No booster, Low immune escape



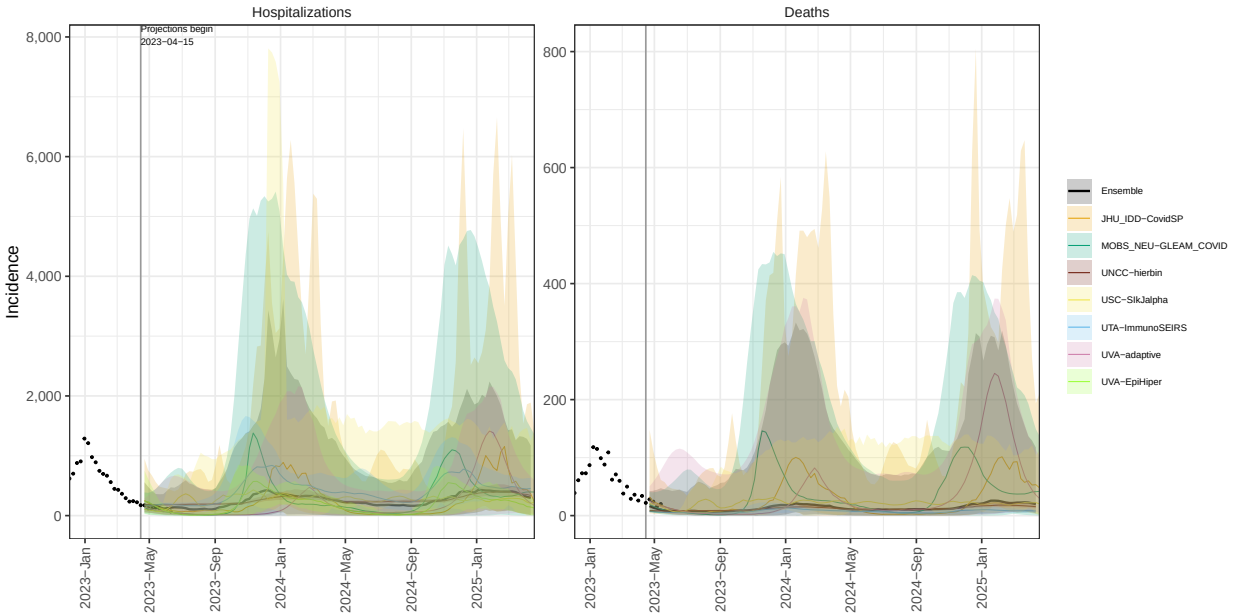
UT model variance & 95% projection intervals − No booster, Low immune escape



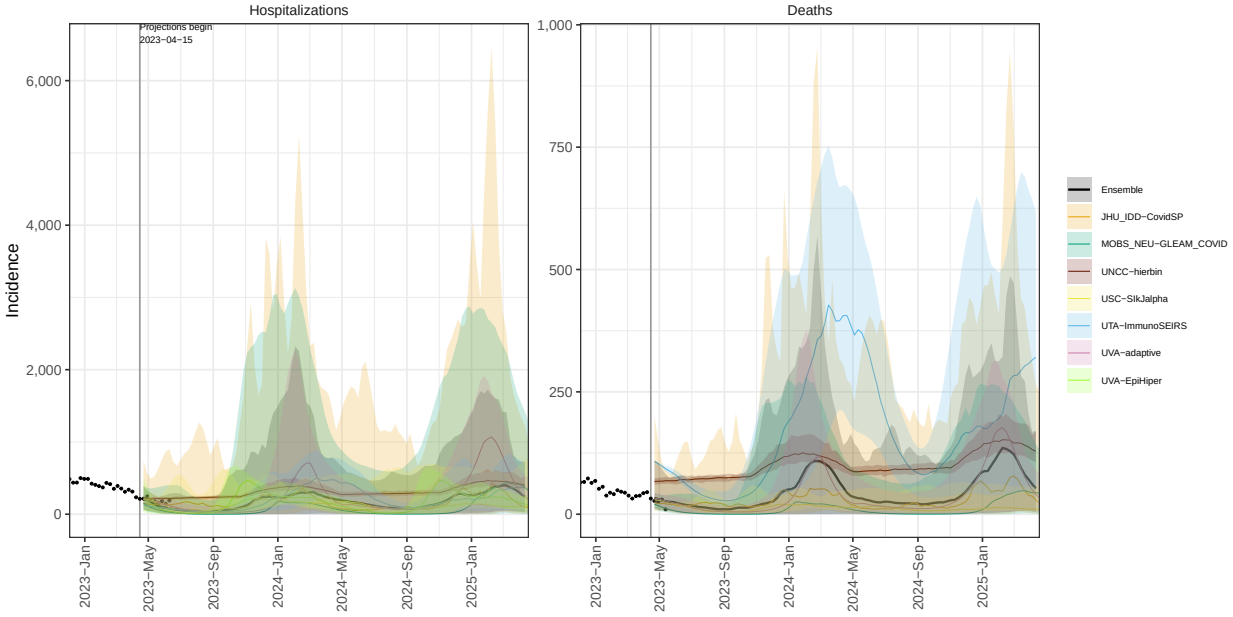
VT model variance & 95% projection intervals − No booster, Low immune escape



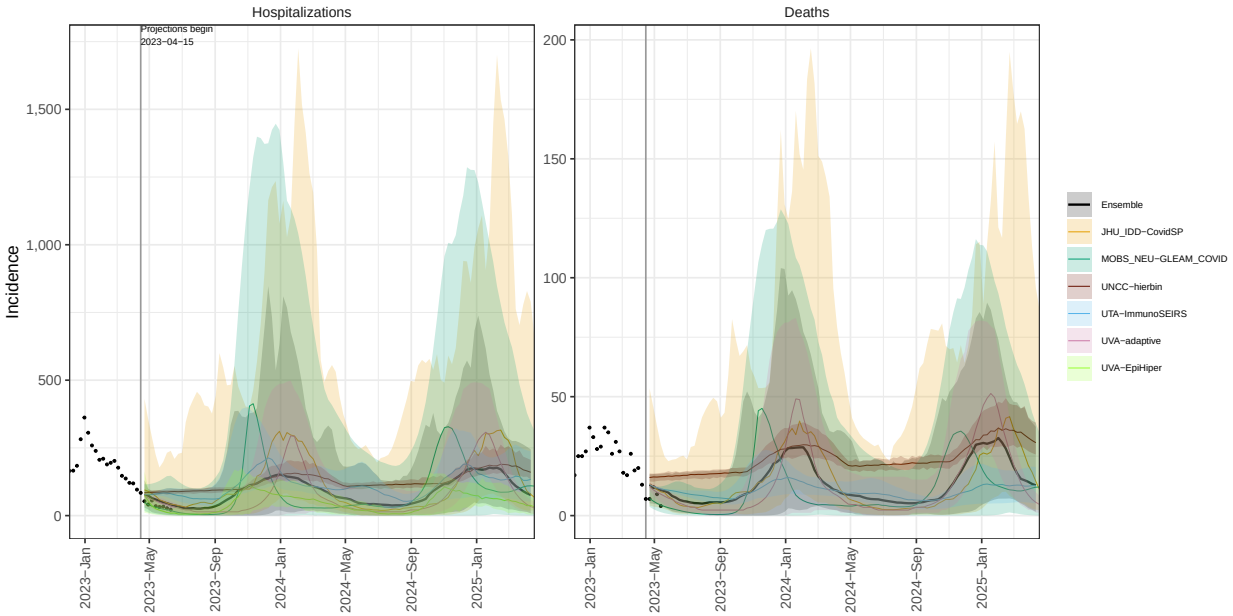
VA model variance & 95% projection intervals − No booster, Low immune escape

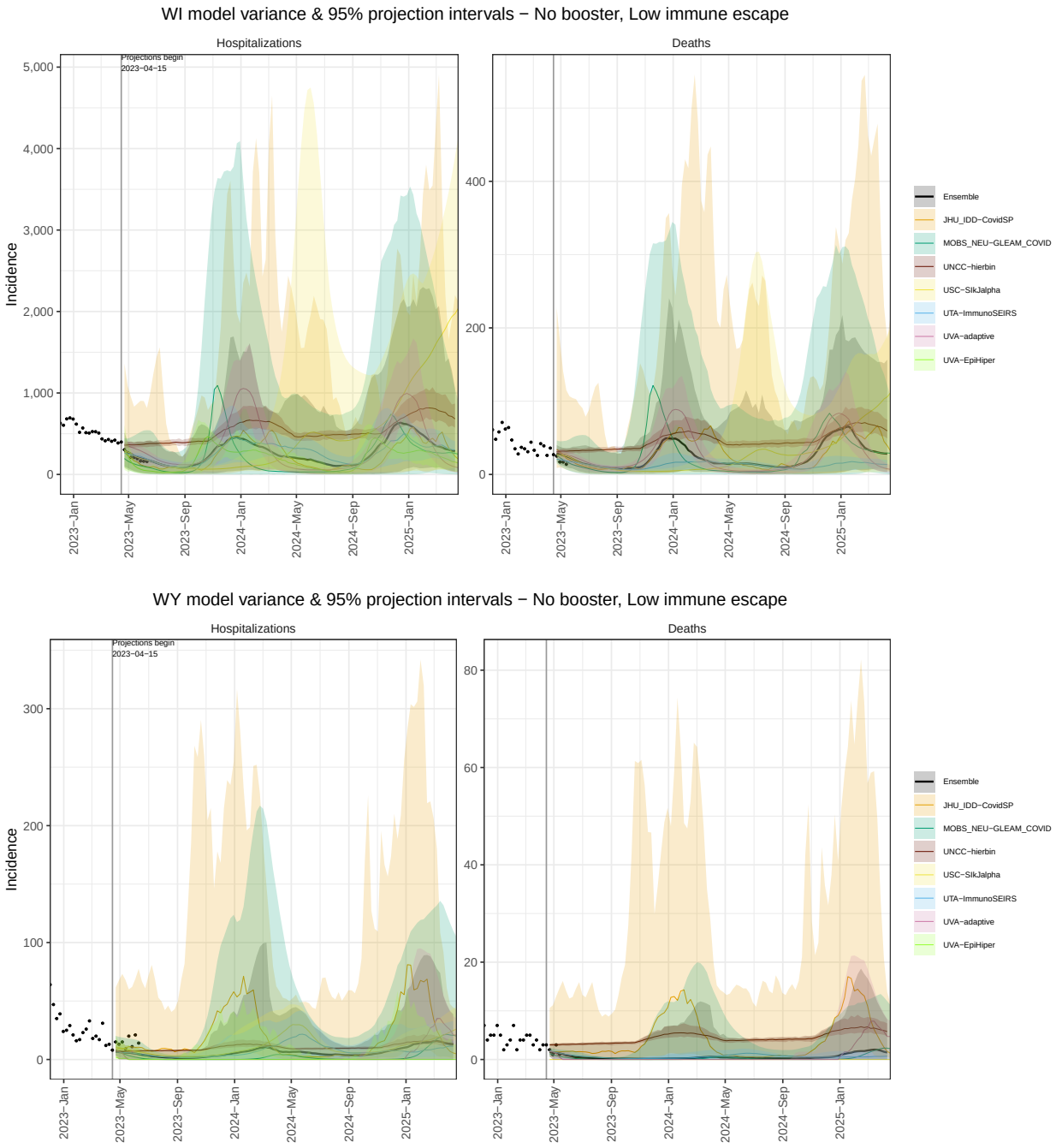


WA model variance & 95% projection intervals − No booster, Low immune escape



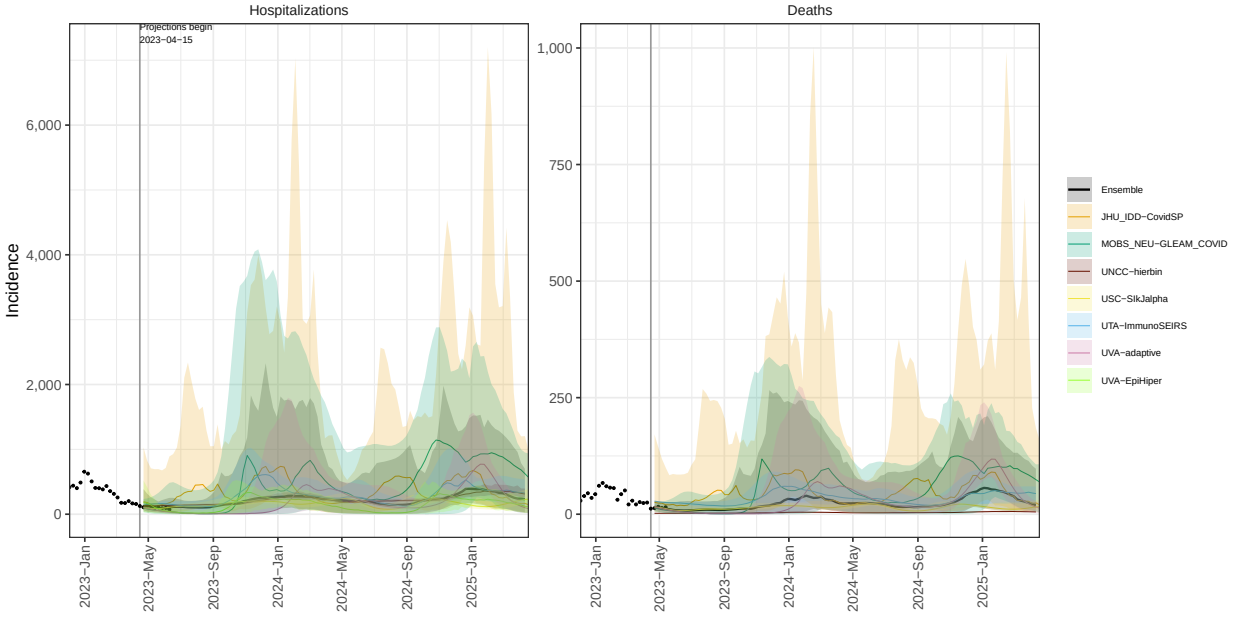
WV model variance & 95% projection intervals − No booster, Low immune escape



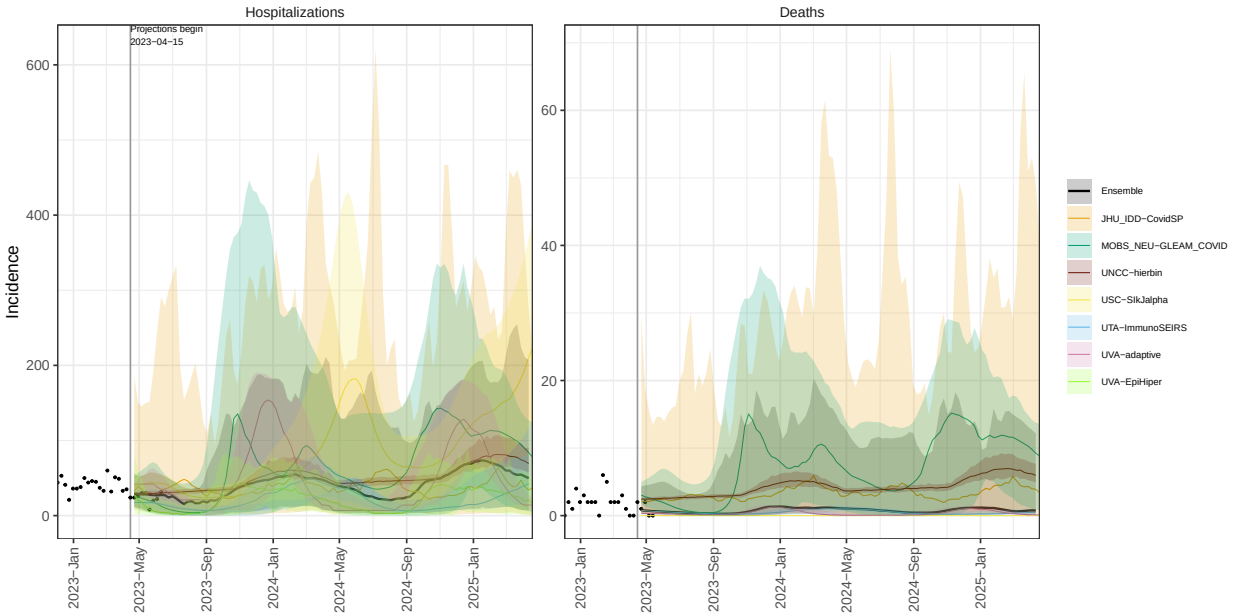


Model variation for No booster, High immune escape scenario.

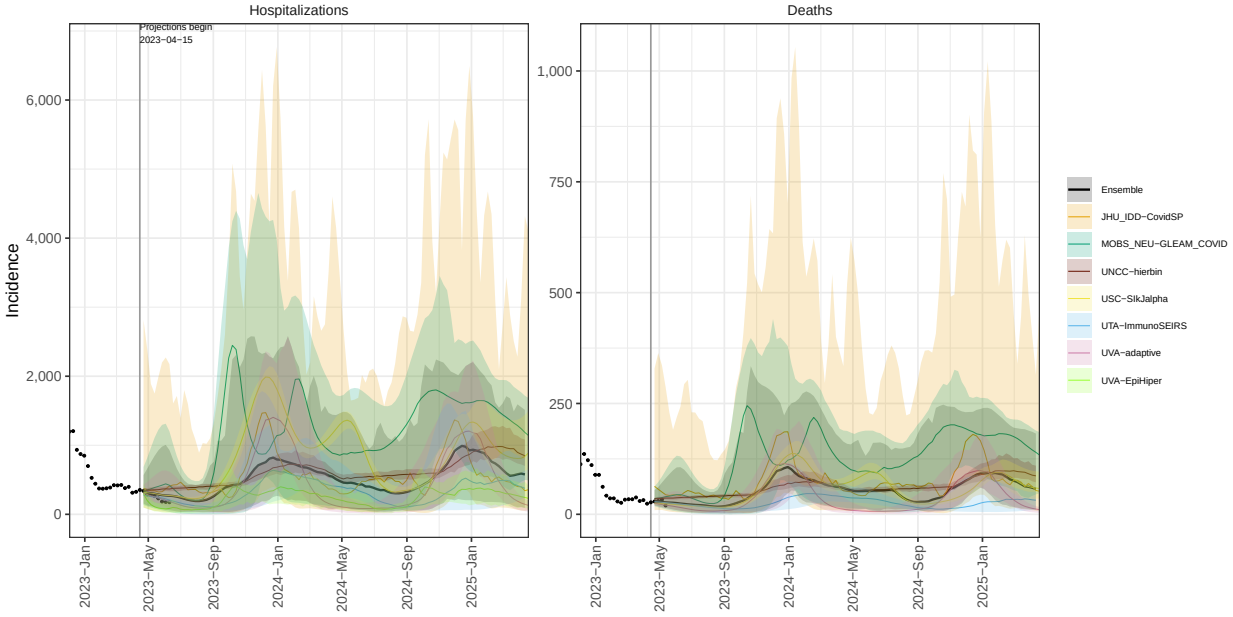
AL model variance & 95% projection intervals − No booster, High immune escape



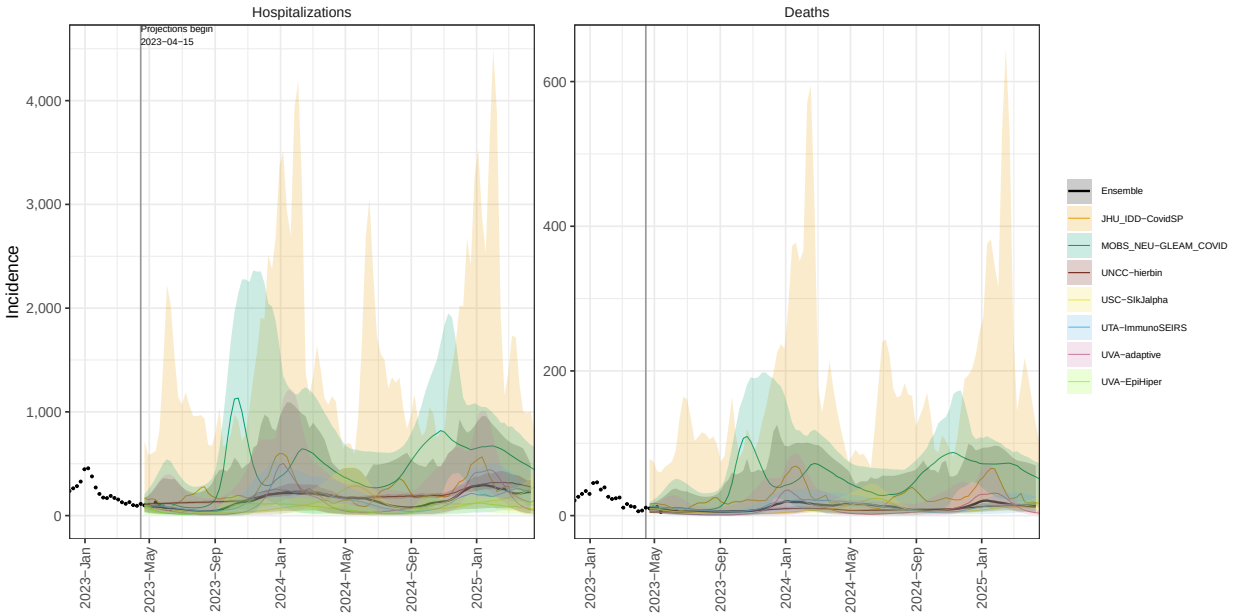
AK model variance & 95% projection intervals − No booster, High immune escape



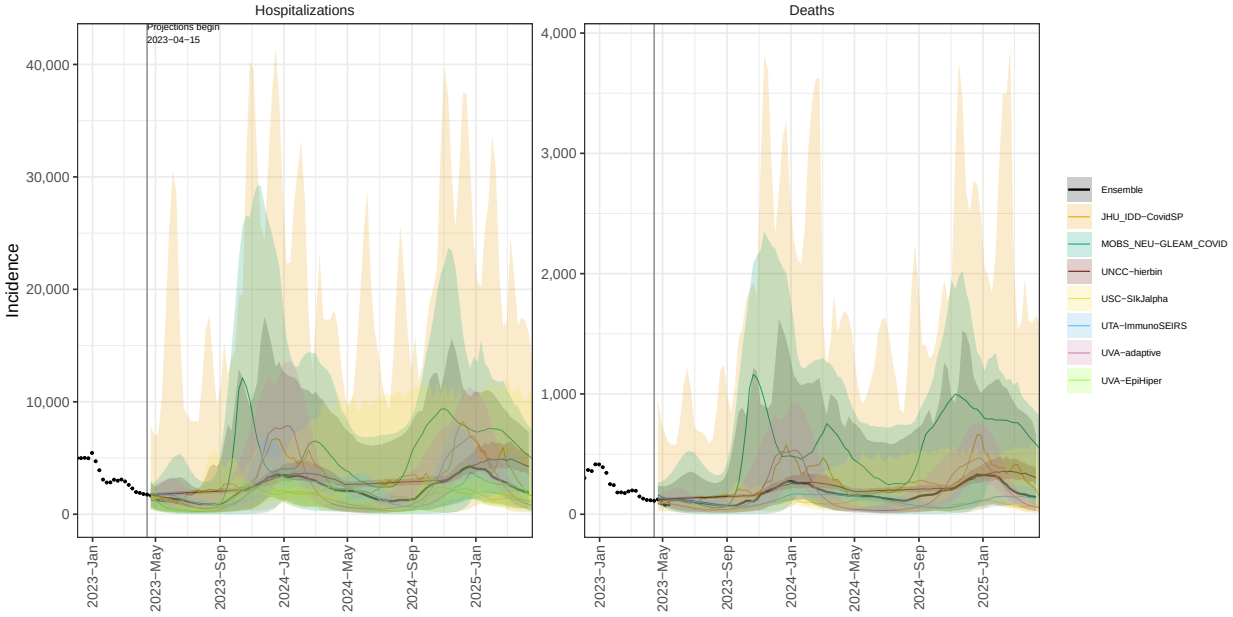
AZ model variance & 95% projection intervals − No booster, High immune escape



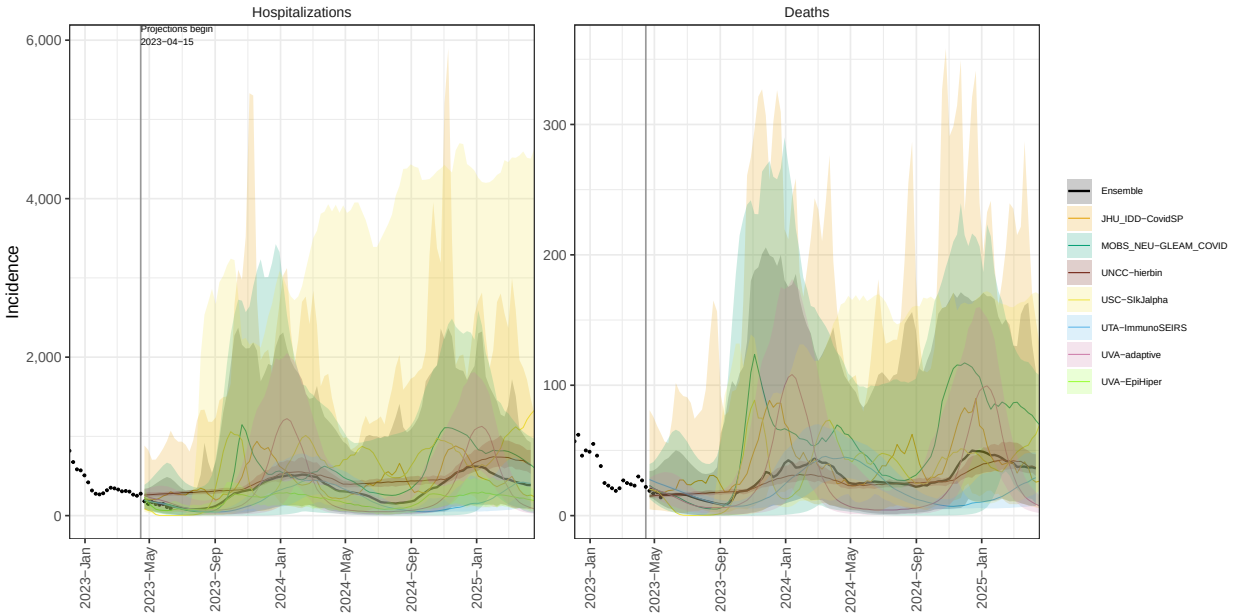
AR model variance & 95% projection intervals − No booster, High immune escape



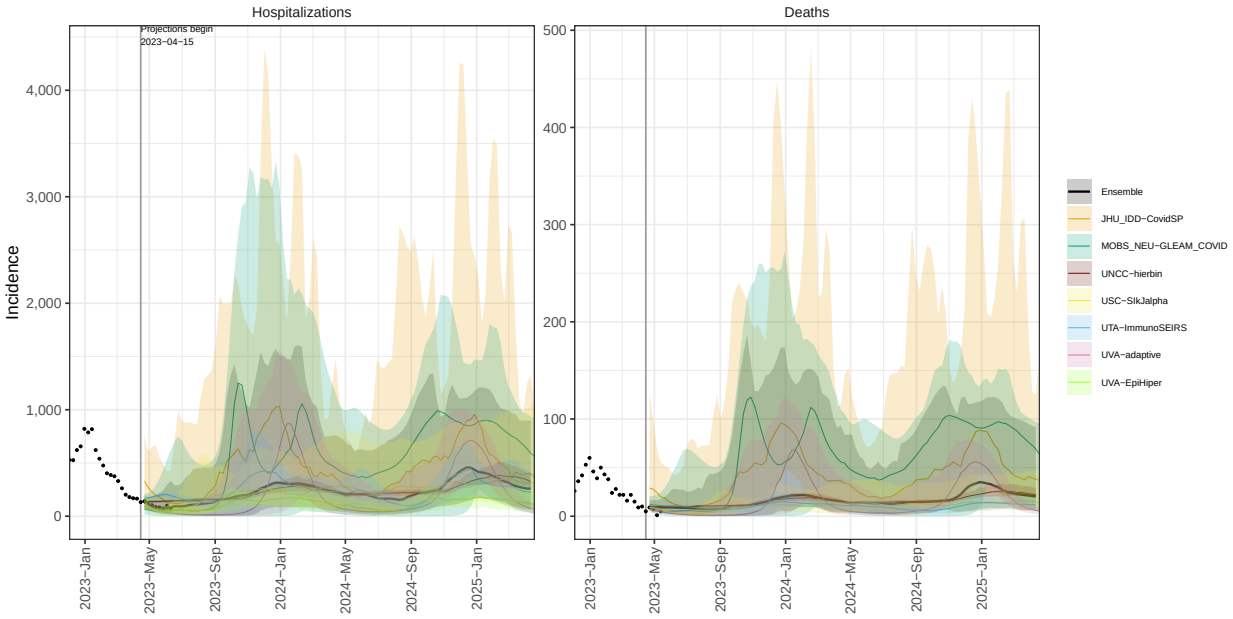
CA model variance & 95% projection intervals − No booster, High immune escape



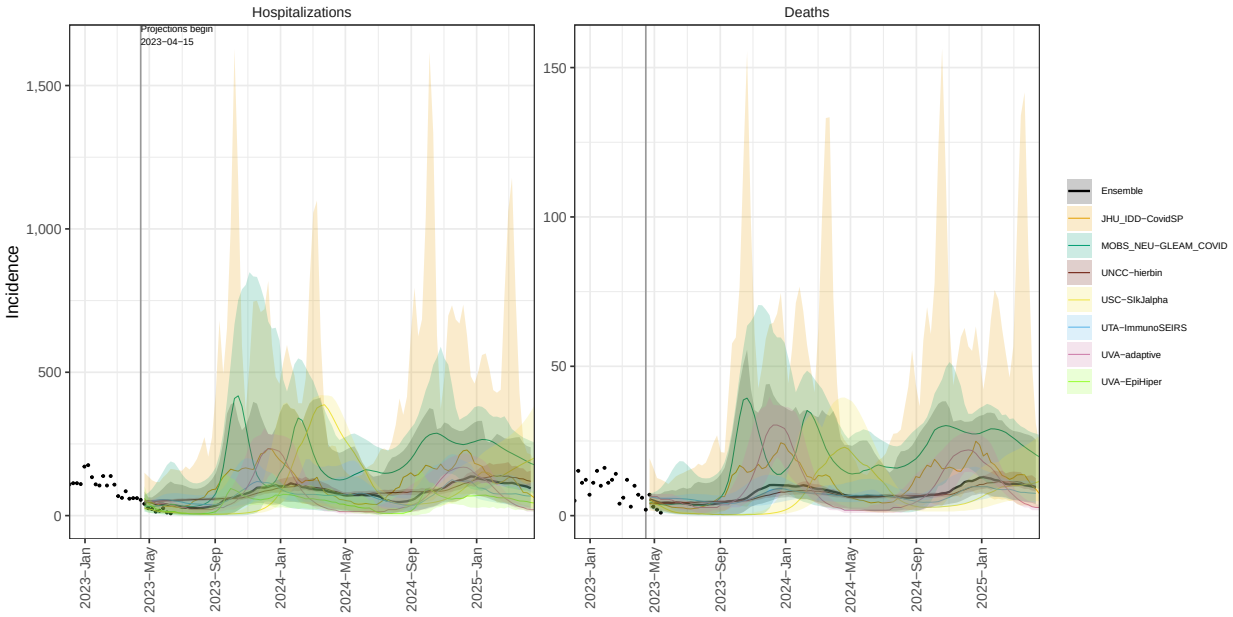
CO model variance & 95% projection intervals − No booster, High immune escape



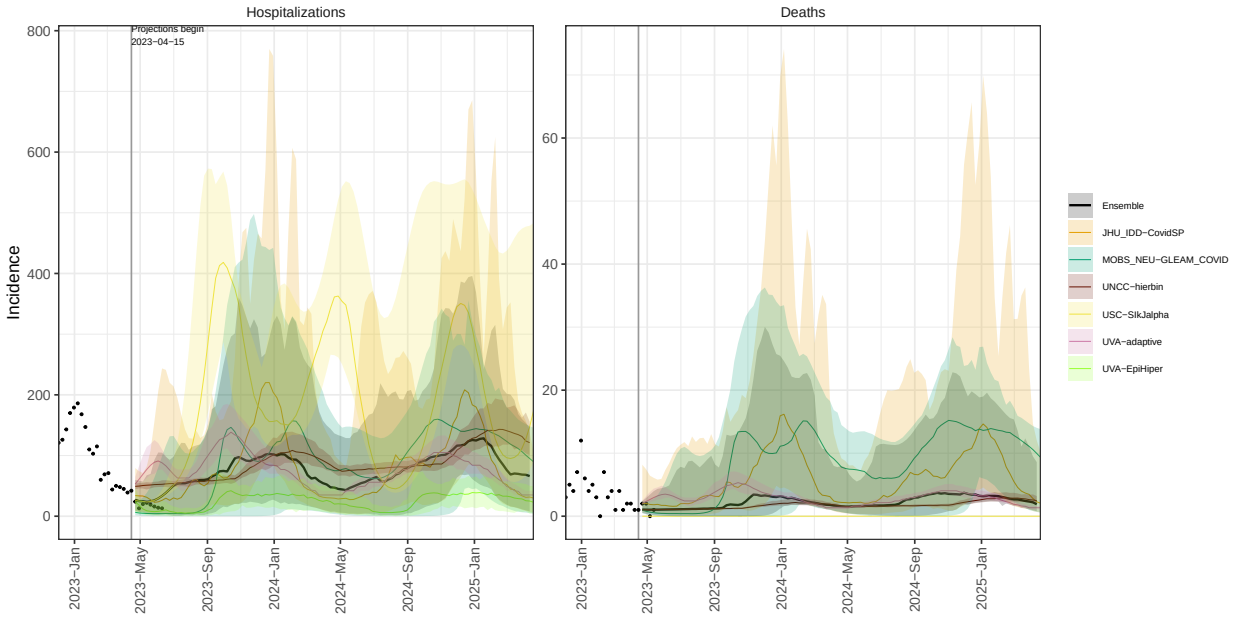
CT model variance & 95% projection intervals − No booster, High immune escape



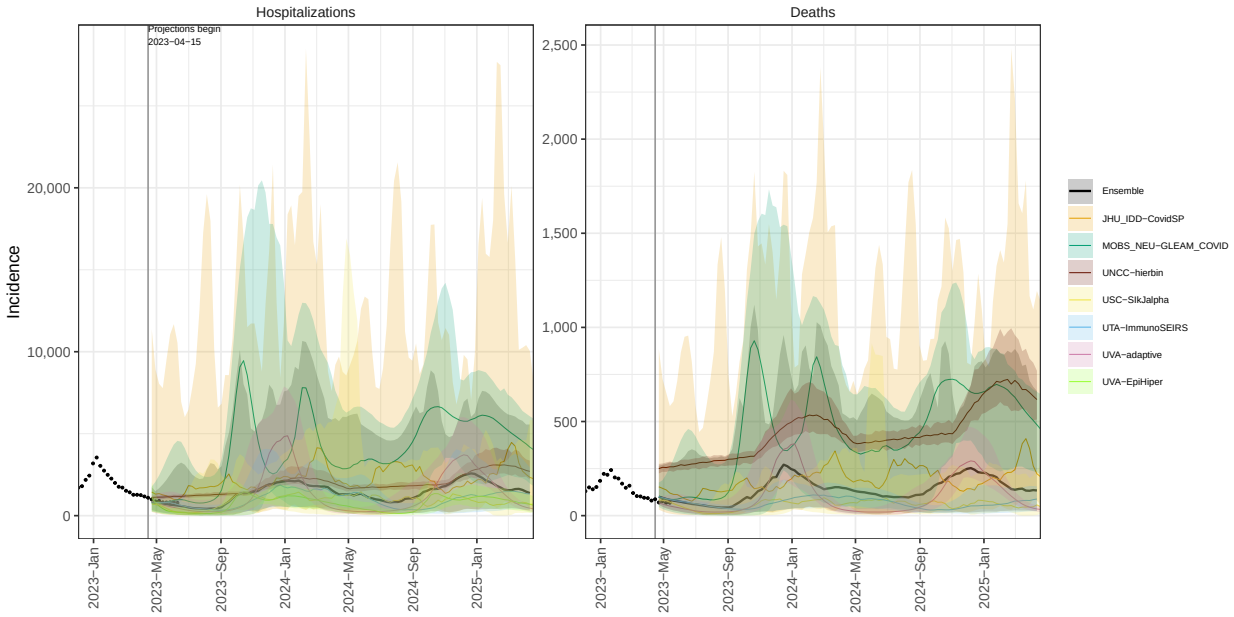
DE model variance & 95% projection intervals − No booster, High immune escape



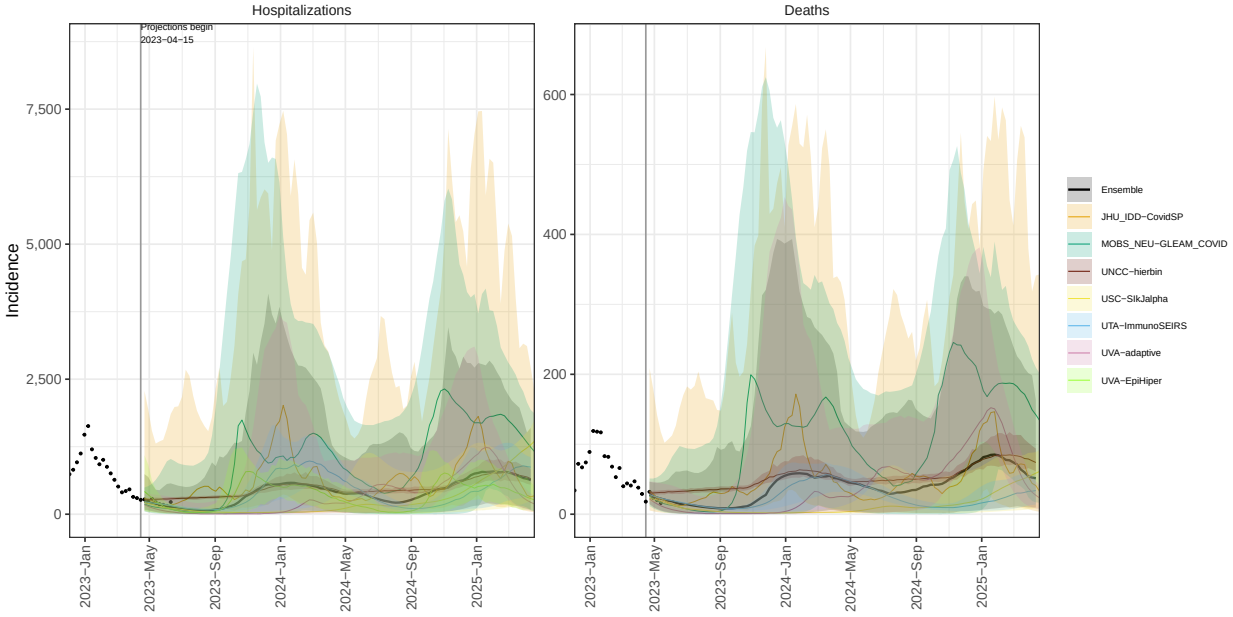
DC model variance & 95% projection intervals − No booster, High immune escape



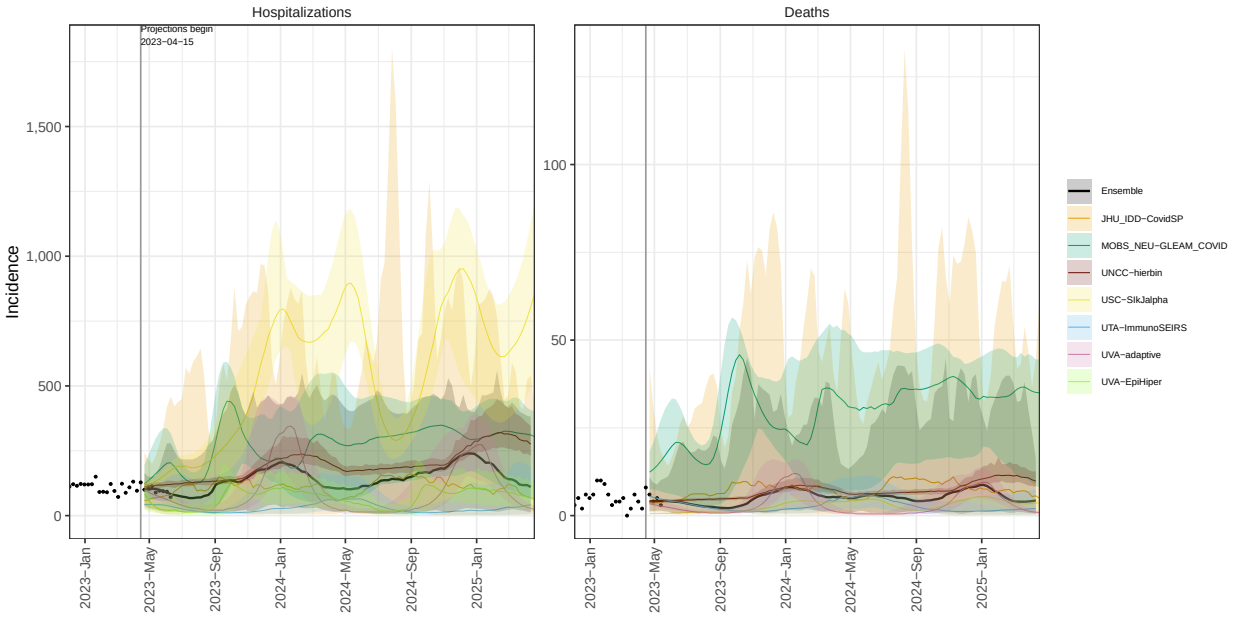
FL model variance & 95% projection intervals − No booster, High immune escape



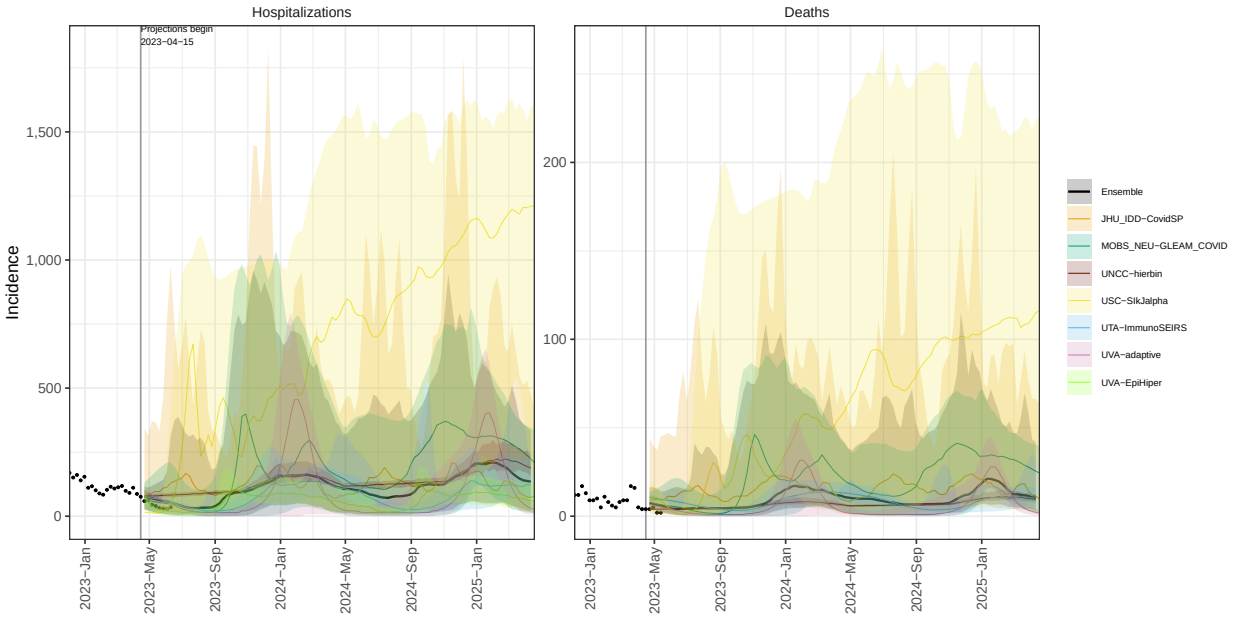
GA model variance & 95% projection intervals − No booster, High immune escape



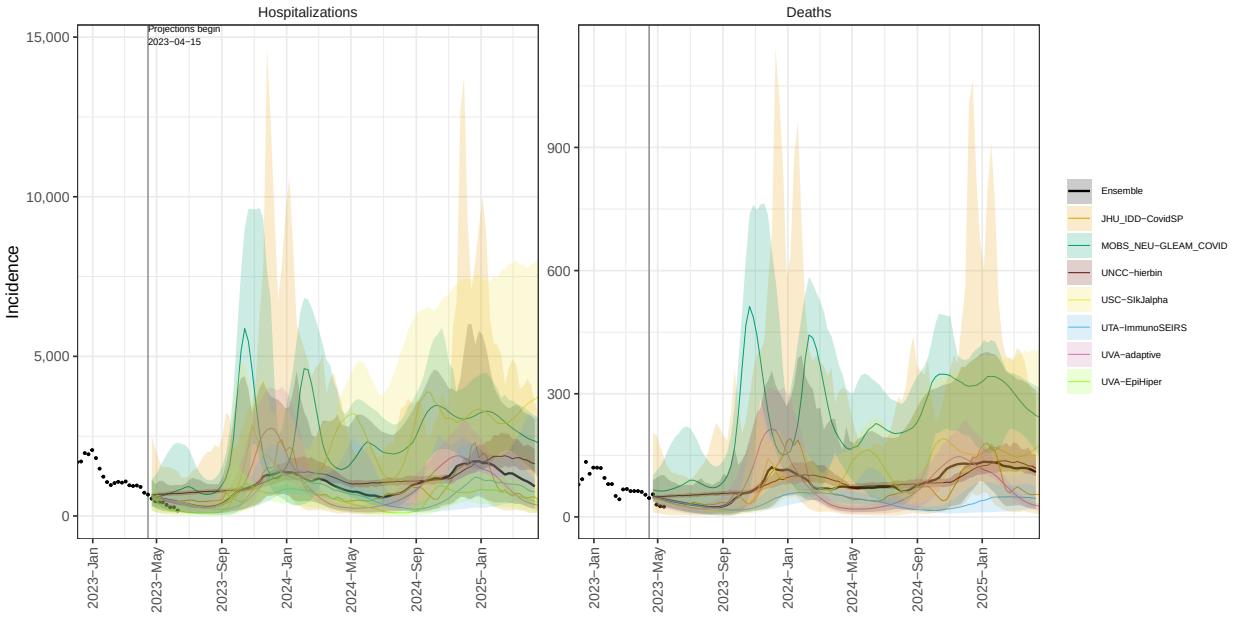
HI model variance & 95% projection intervals − No booster, High immune escape



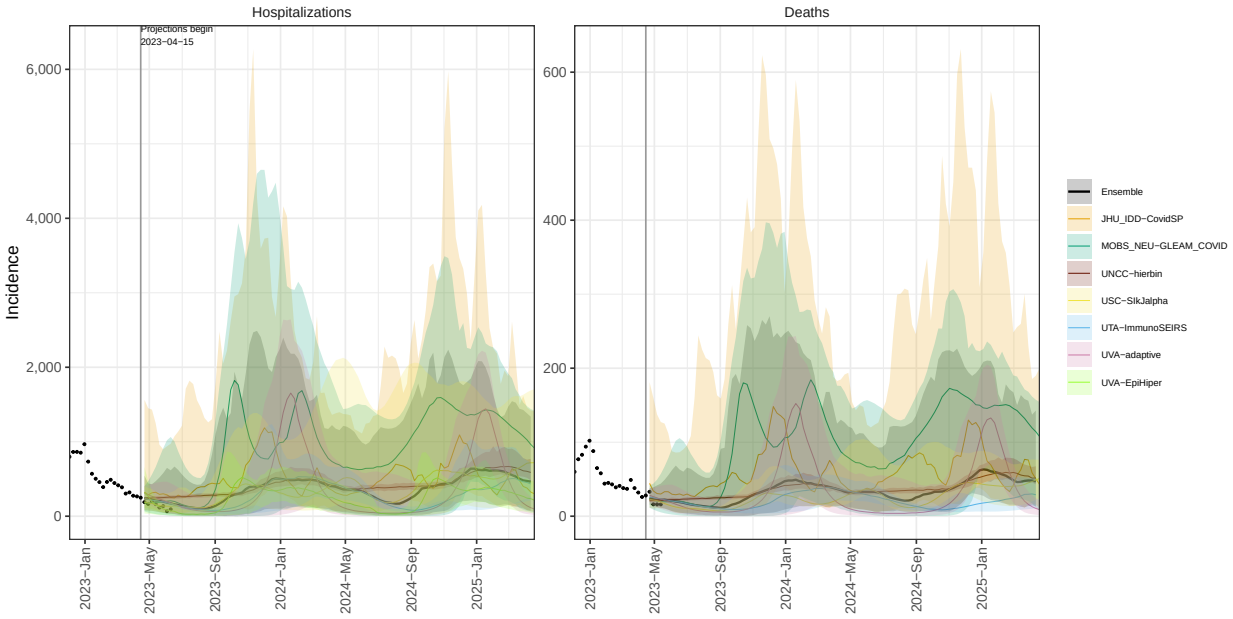
ID model variance & 95% projection intervals − No booster, High immune escape



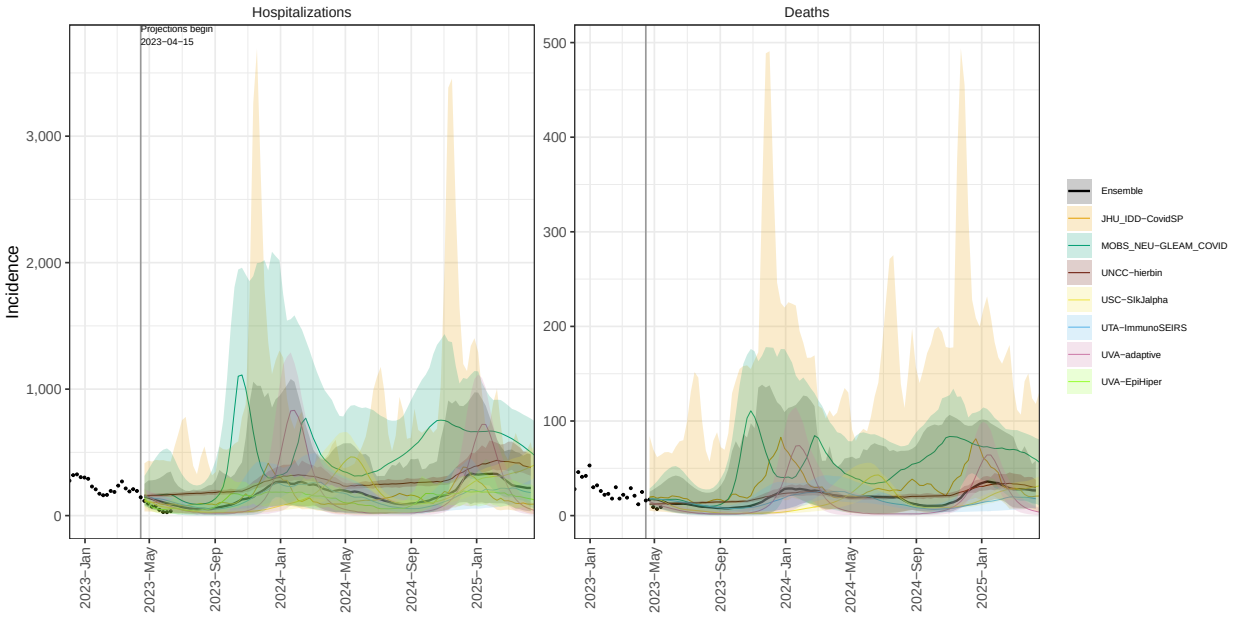
IL model variance & 95% projection intervals − No booster, High immune escape



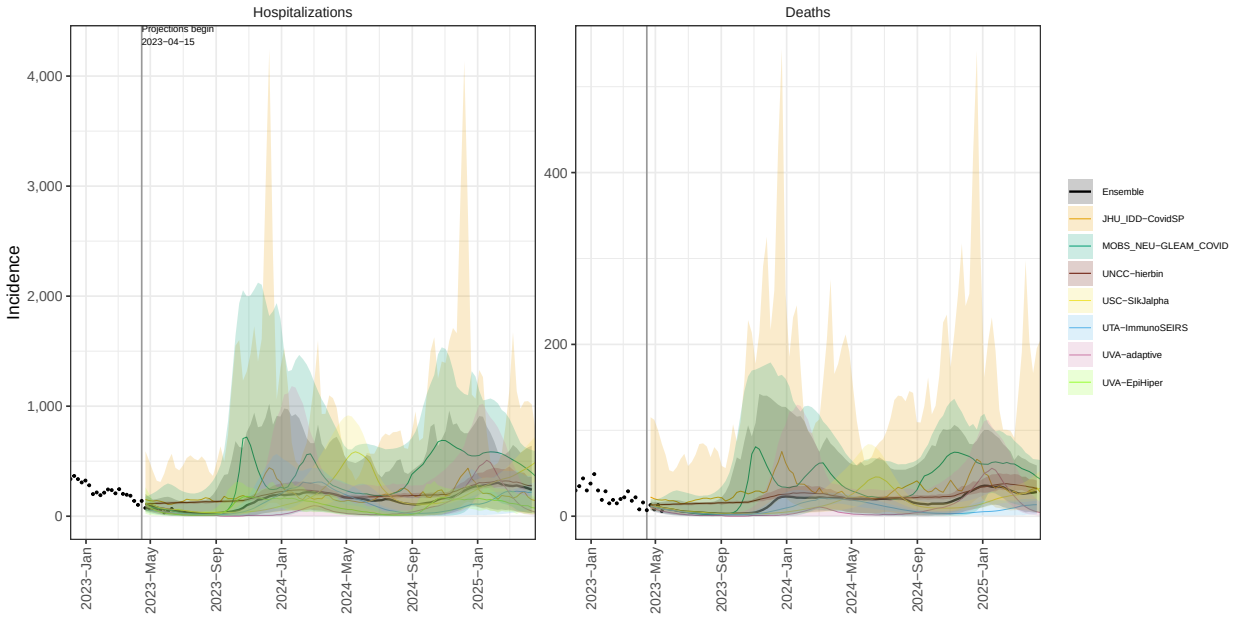
IN model variance & 95% projection intervals − No booster, High immune escape



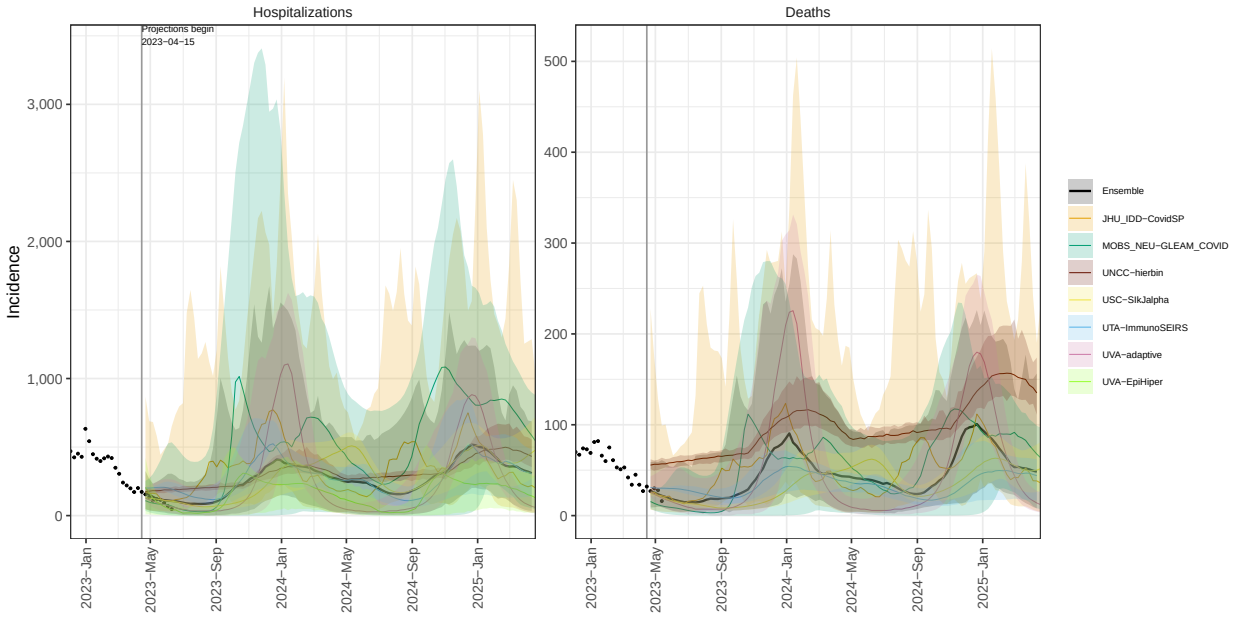
IA model variance & 95% projection intervals − No booster, High immune escape



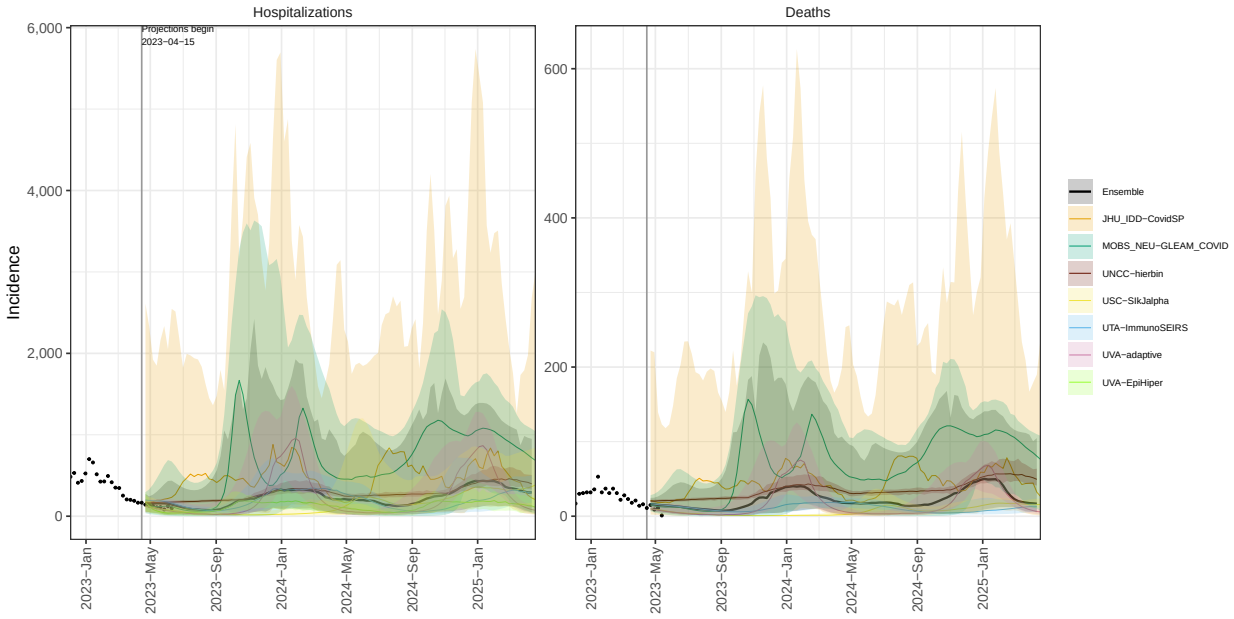
KS model variance & 95% projection intervals − No booster, High immune escape



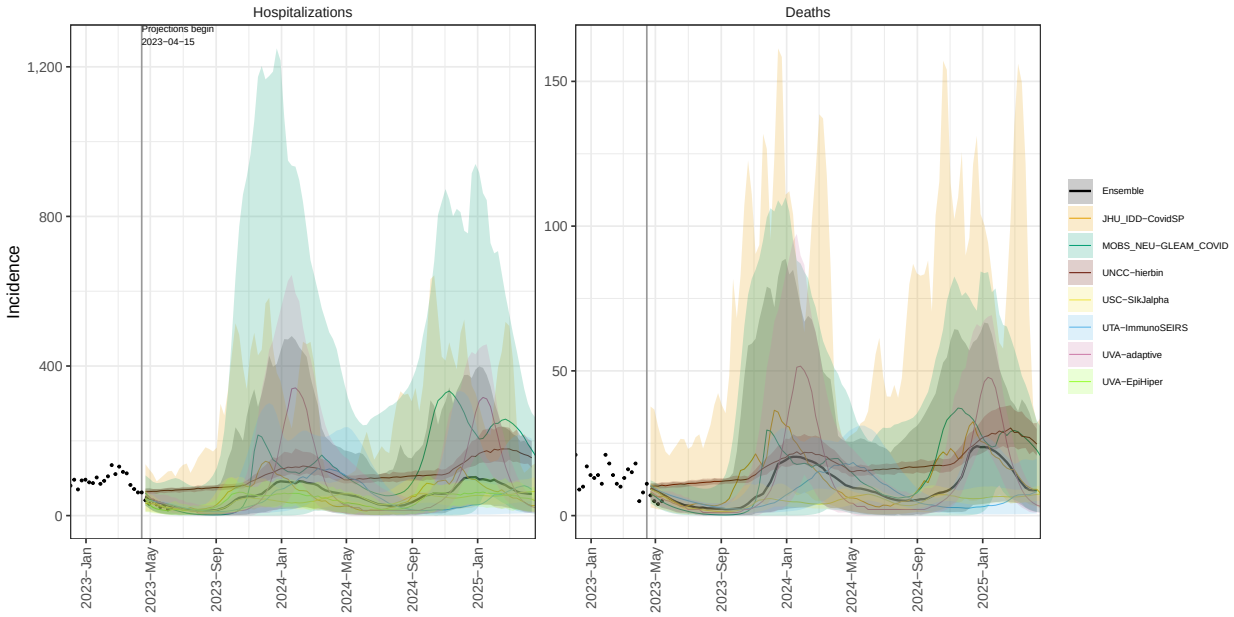
KY model variance & 95% projection intervals − No booster, High immune escape



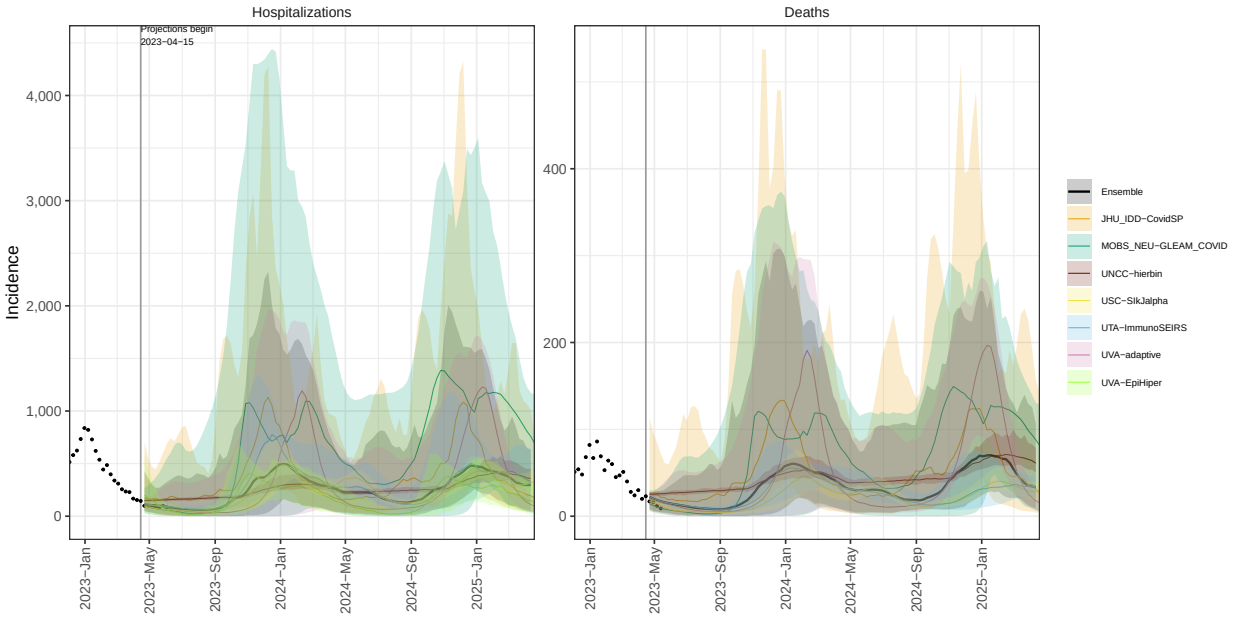
LA model variance & 95% projection intervals − No booster, High immune escape



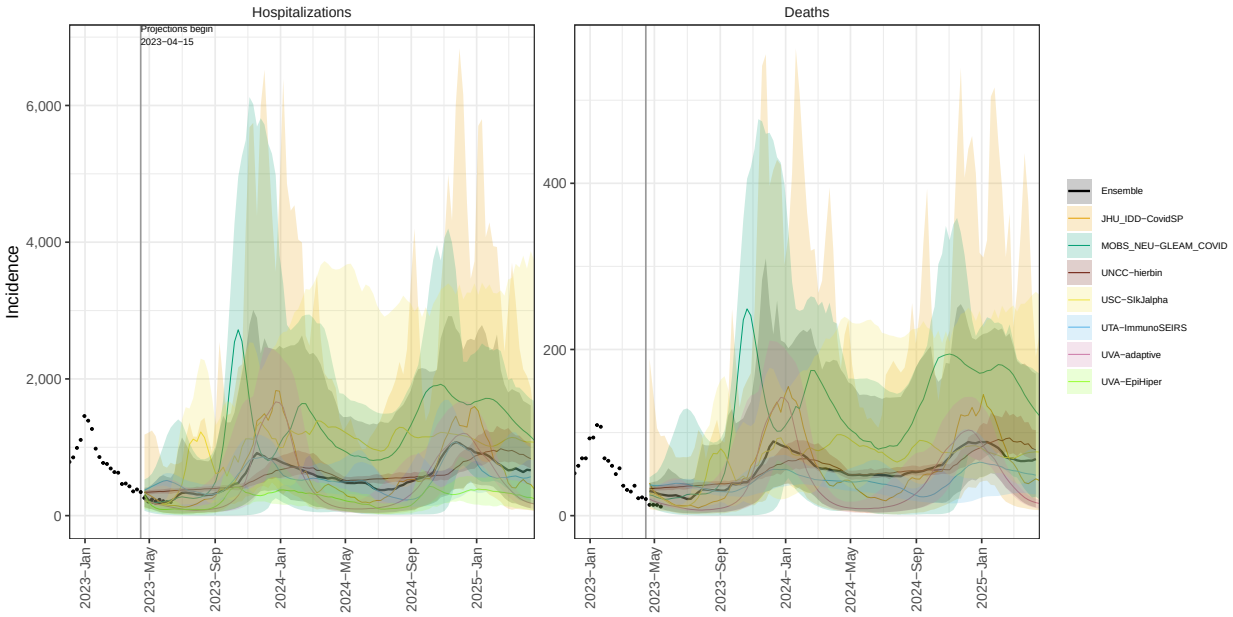
ME model variance & 95% projection intervals − No booster, High immune escape



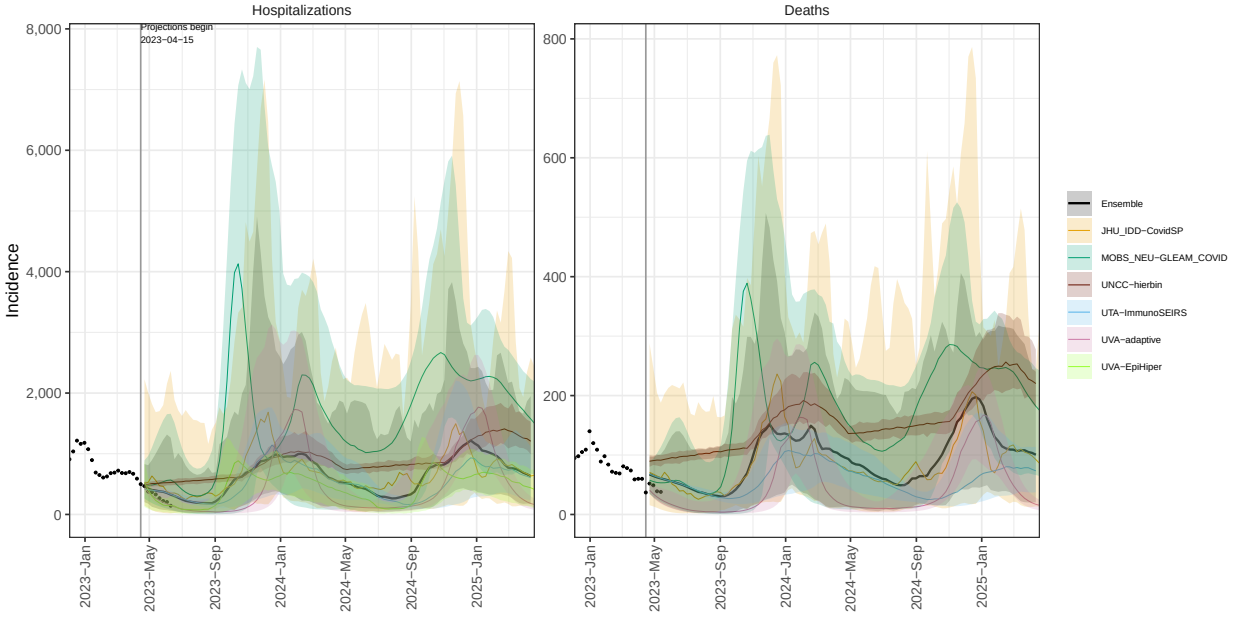
MD model variance & 95% projection intervals − No booster, High immune escape



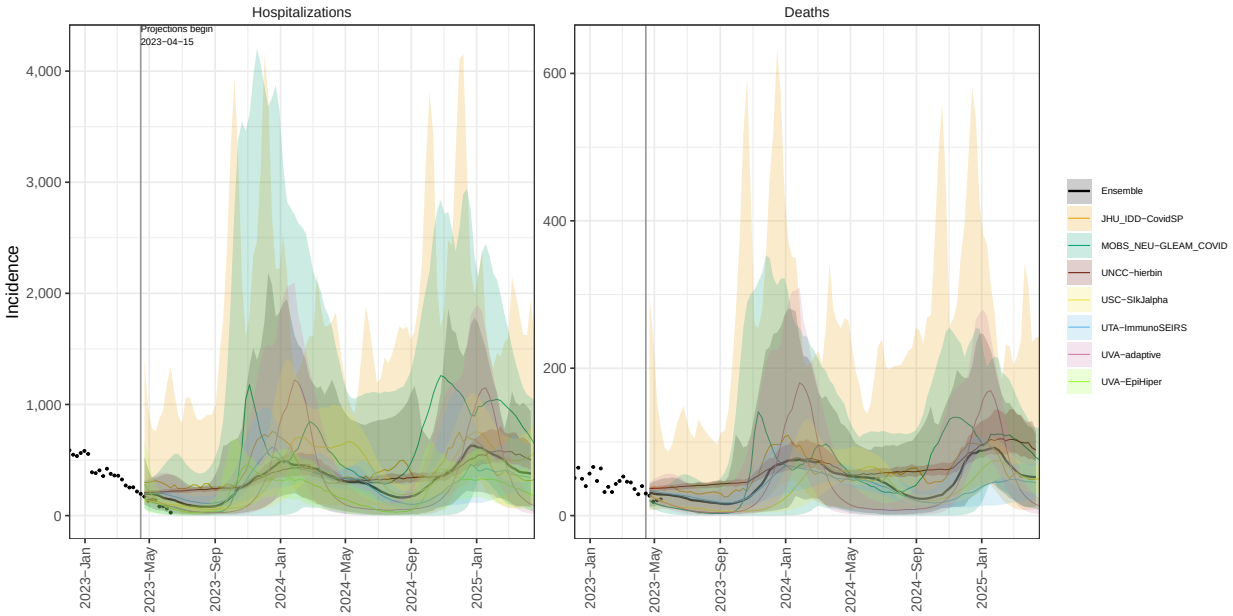
MA model variance & 95% projection intervals − No booster, High immune escape



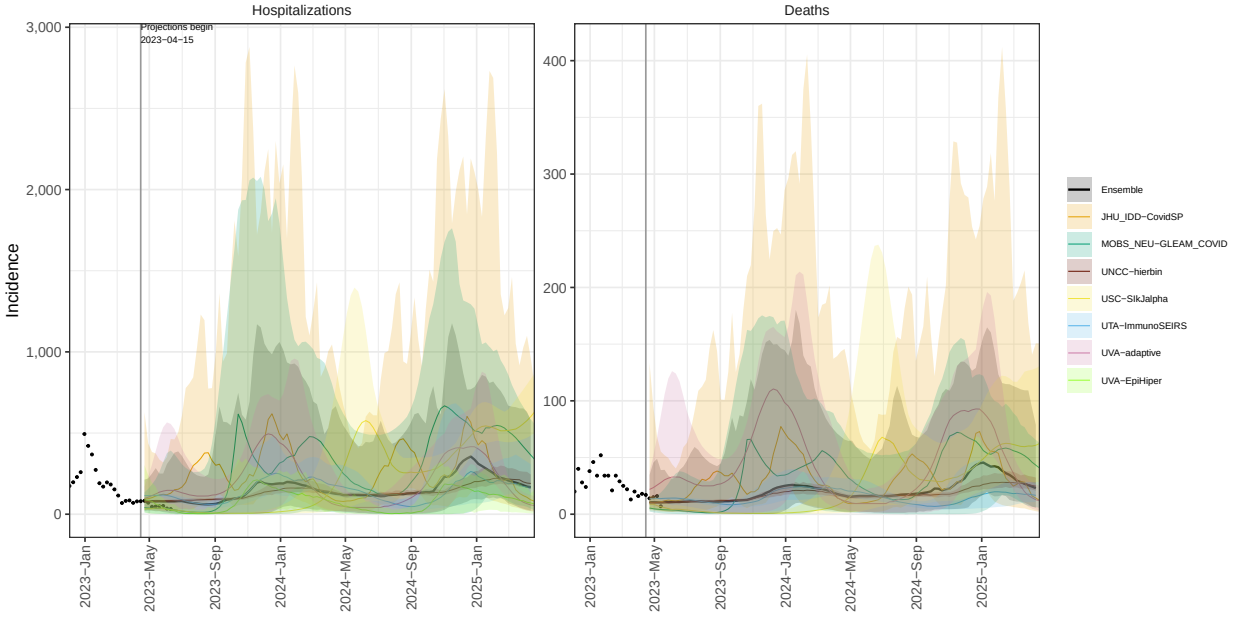
MI model variance & 95% projection intervals − No booster, High immune escape



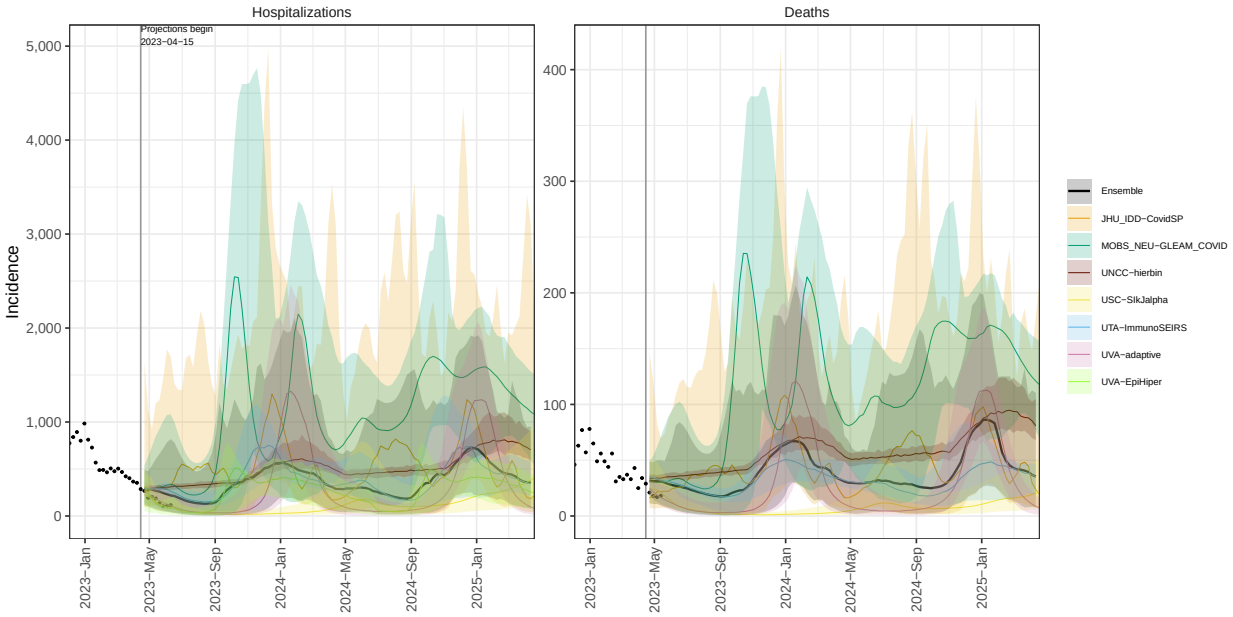
MN model variance & 95% projection intervals − No booster, High immune escape

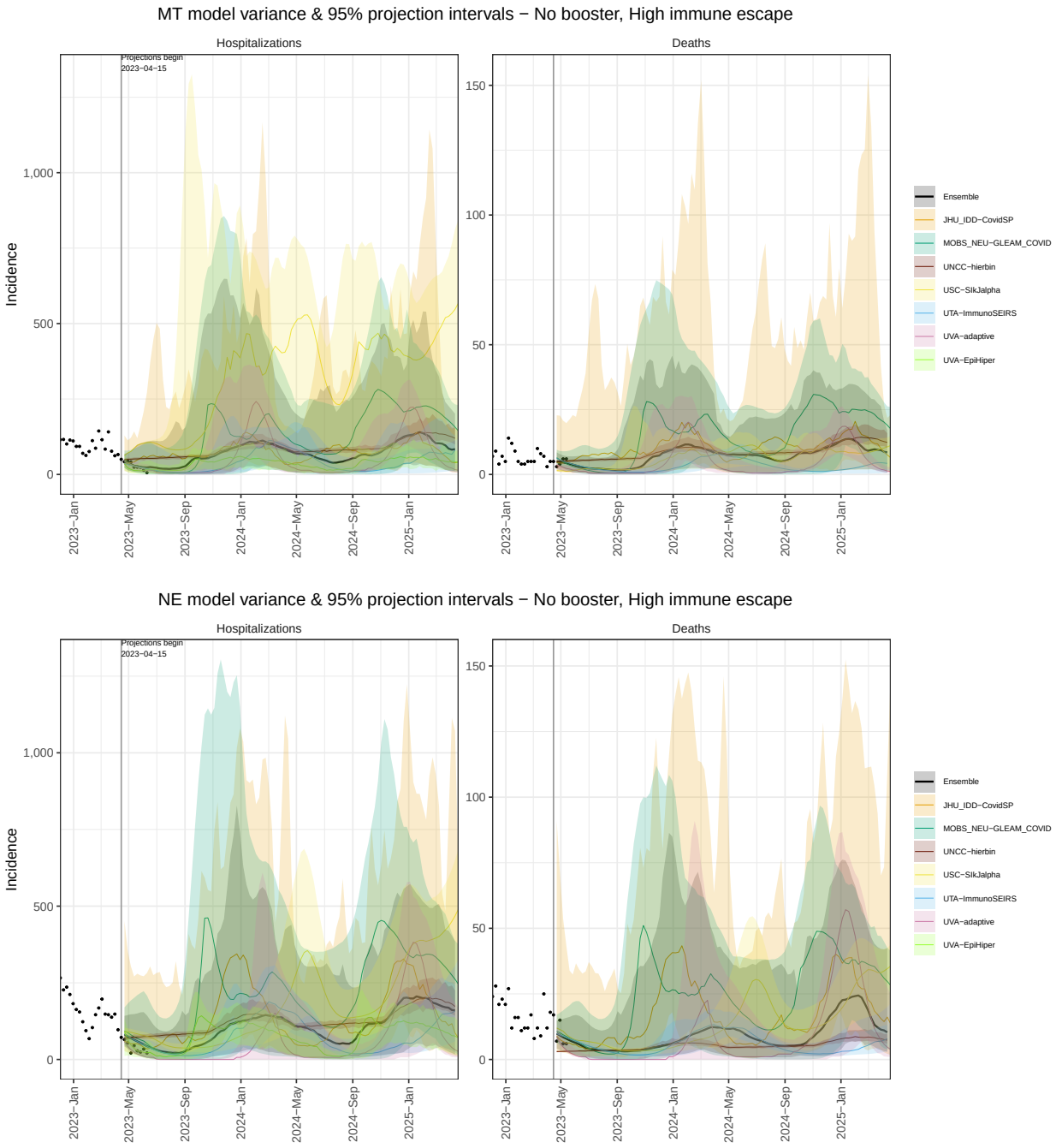


MS model variance & 95% projection intervals − No booster, High immune escape

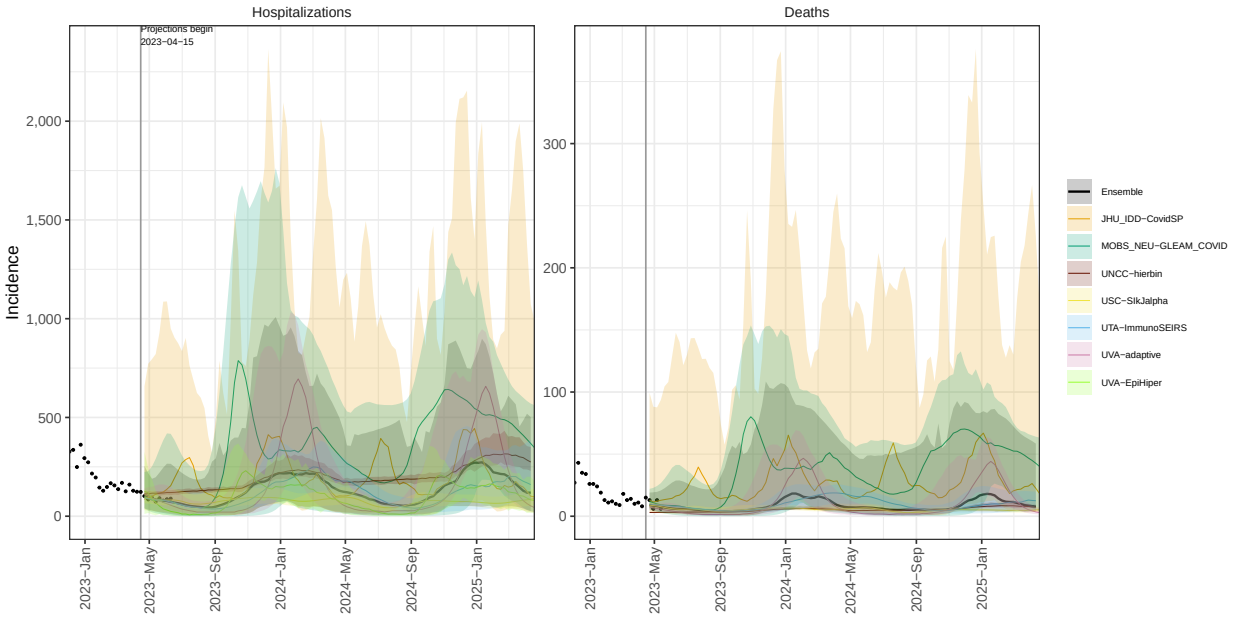


MO model variance & 95% projection intervals − No booster, High immune escape

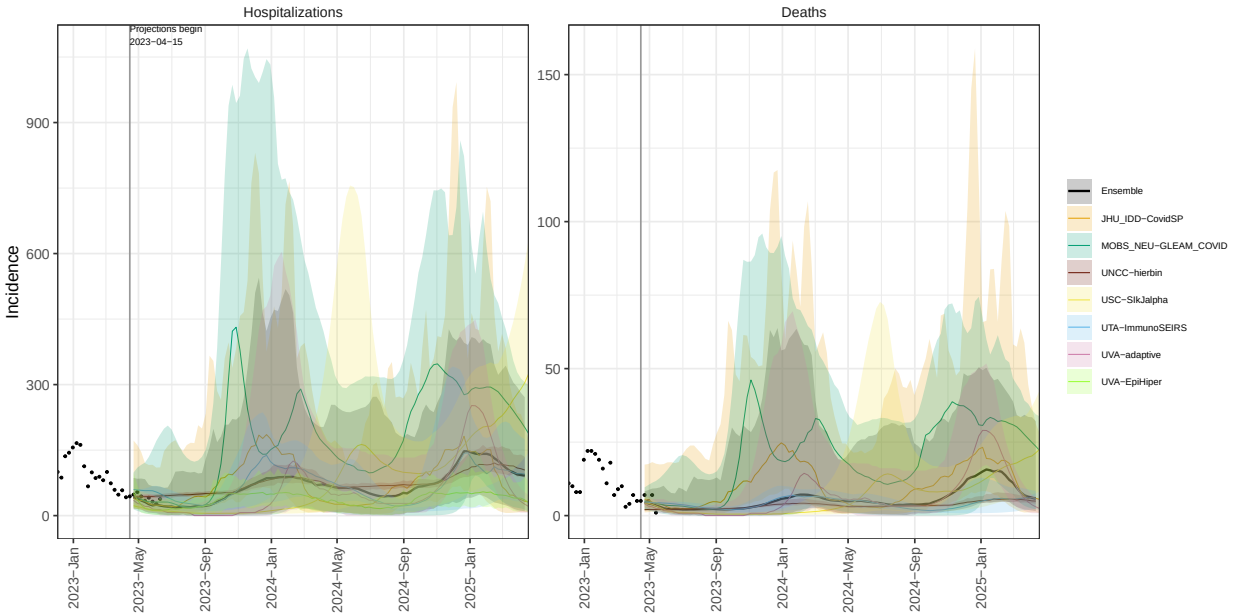



MT model variance & 95% projection intervals − No booster, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
1,000
500
0
150
100
50
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper
NE model variance & 95% projection intervals − No booster, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
1,000
500
0
150
100
50
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

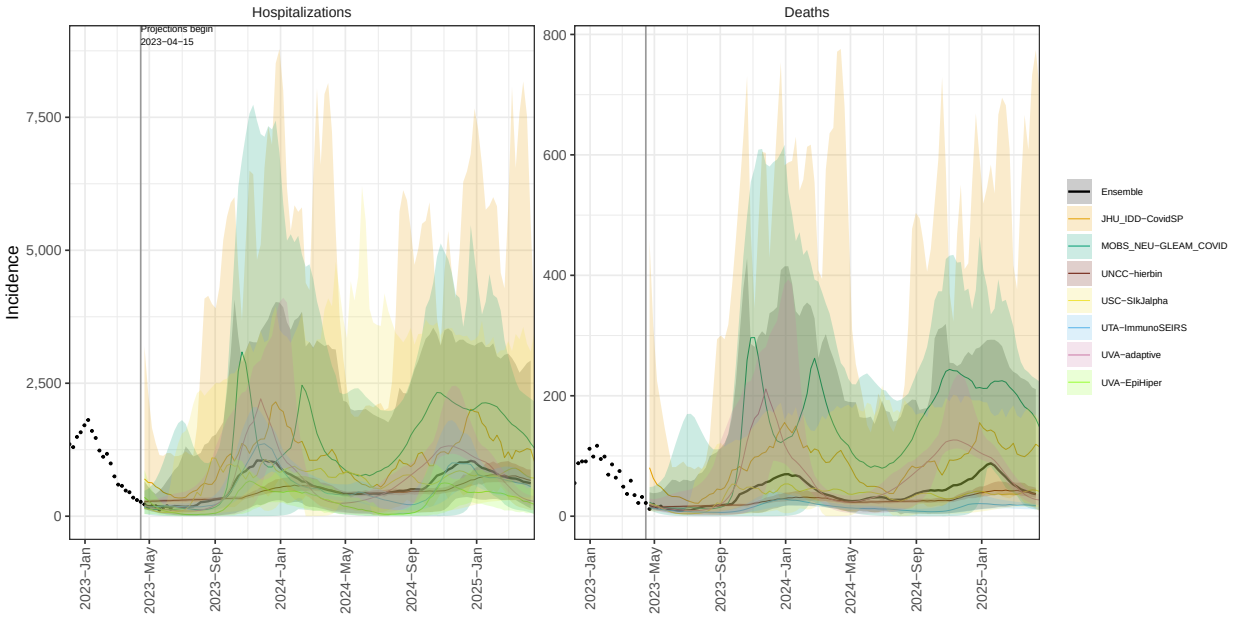
NV model variance & 95% projection intervals − No booster, High immune escape



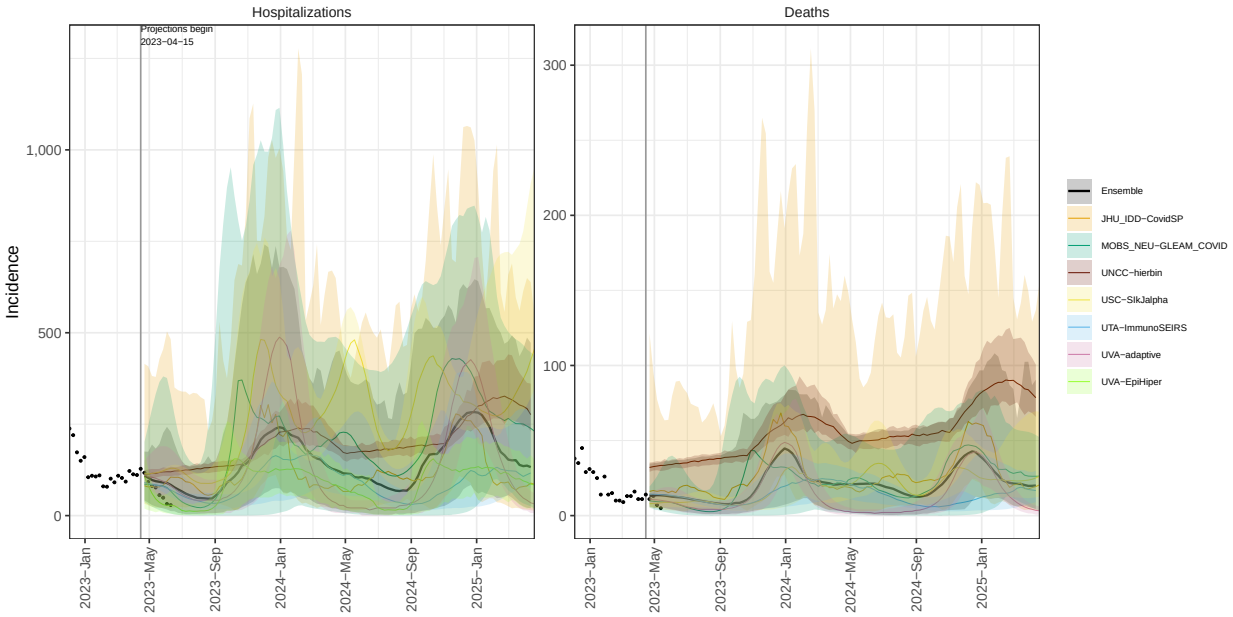
NH model variance & 95% projection intervals − No booster, High immune escape



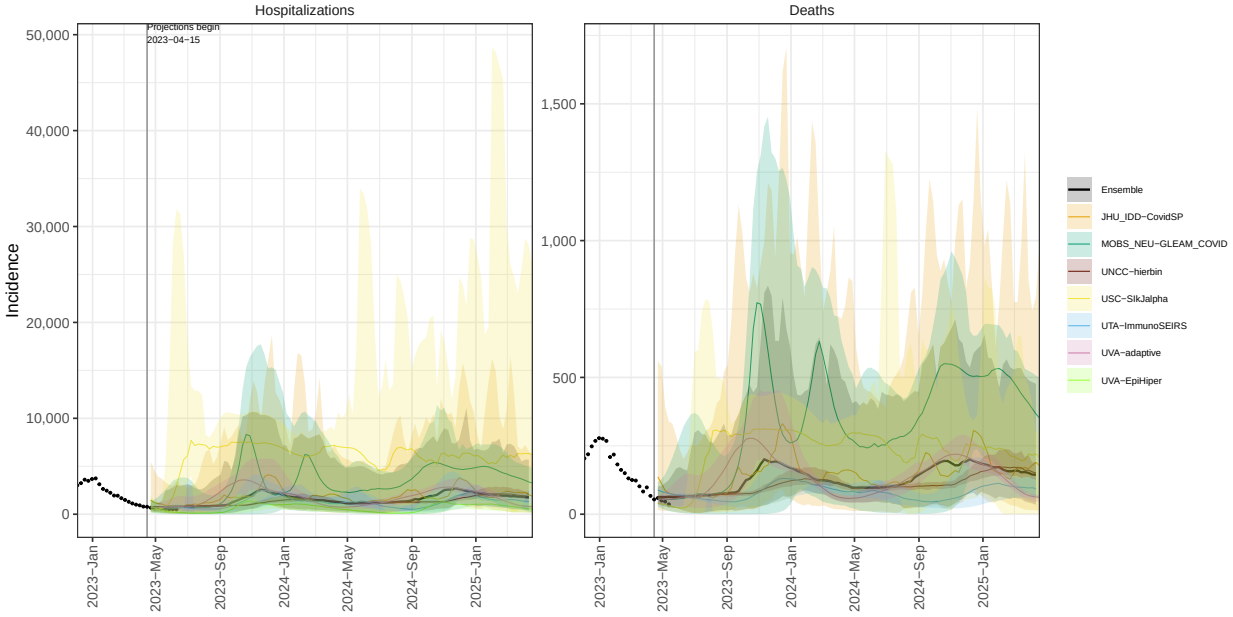
NJ model variance & 95% projection intervals − No booster, High immune escape



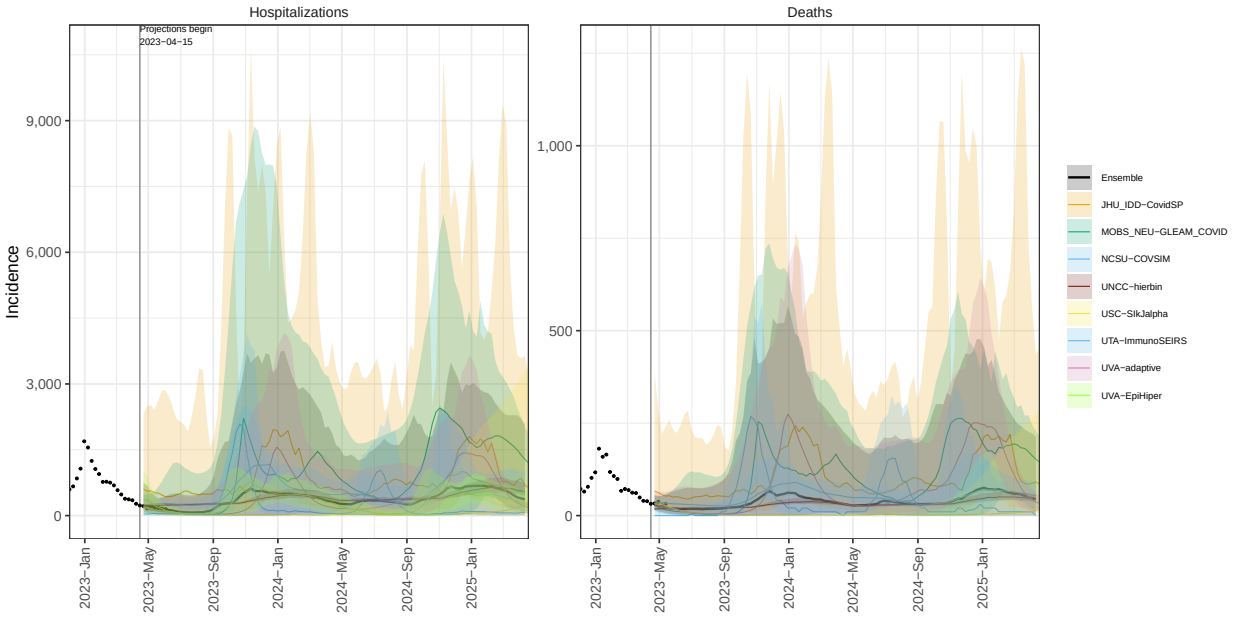
NM model variance & 95% projection intervals − No booster, High immune escape



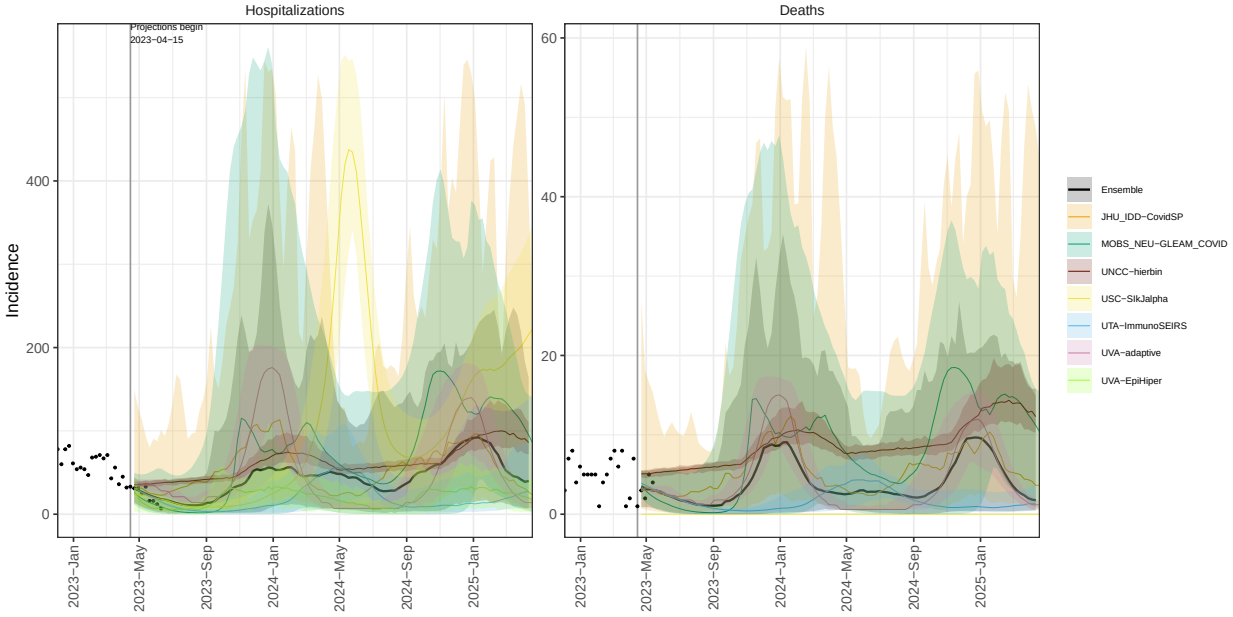
NY model variance & 95% projection intervals − No booster, High immune escape



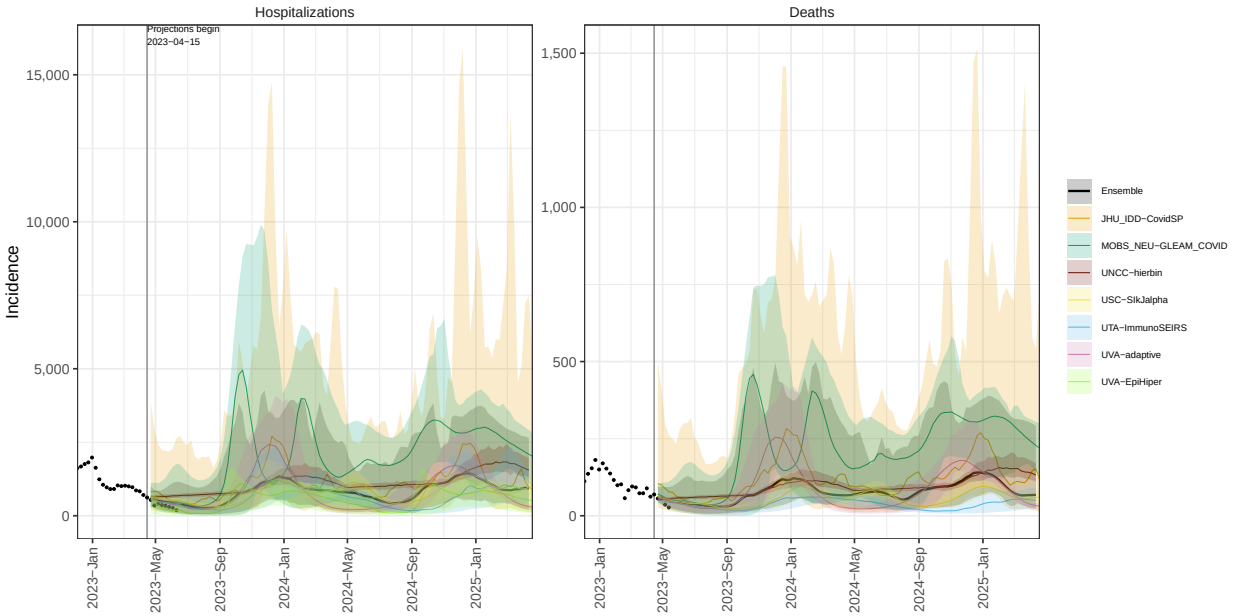
NC model variance & 95% projection intervals − No booster, High immune escape



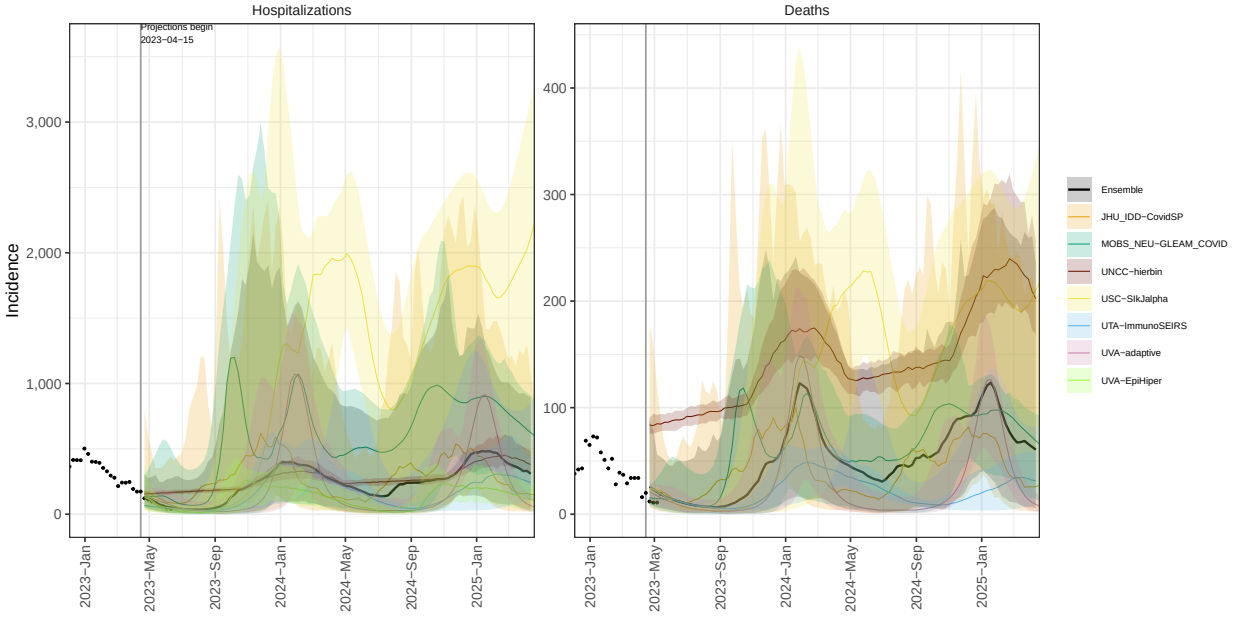
ND model variance & 95% projection intervals − No booster, High immune escape



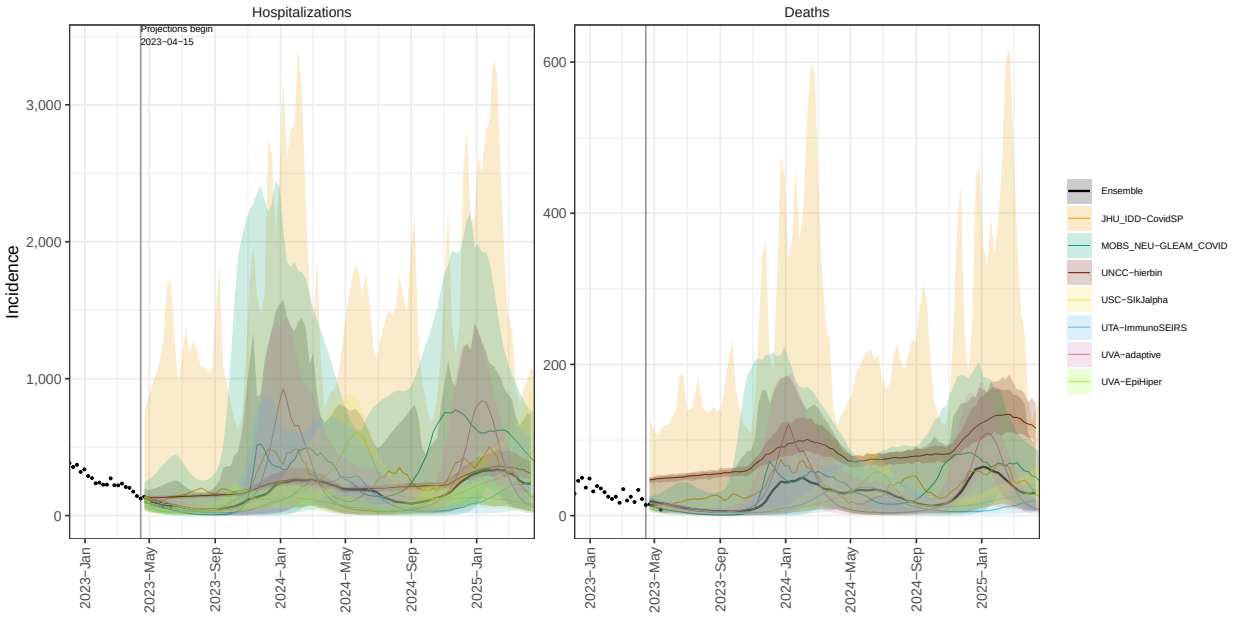
OH model variance & 95% projection intervals − No booster, High immune escape



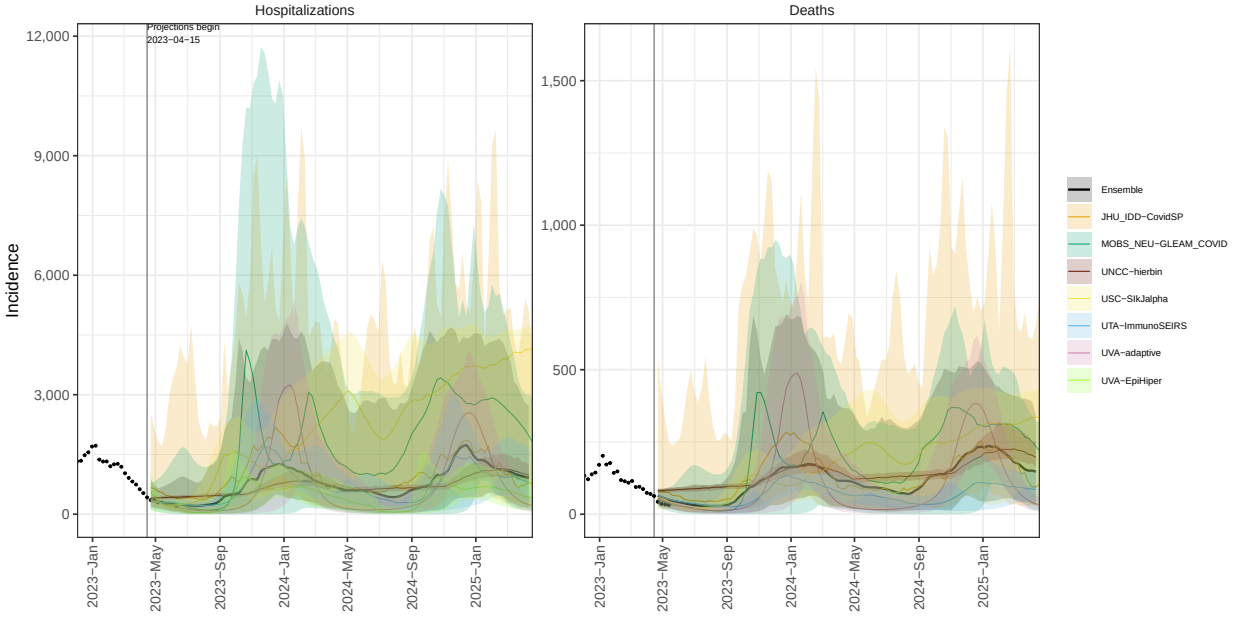
OK model variance & 95% projection intervals − No booster, High immune escape



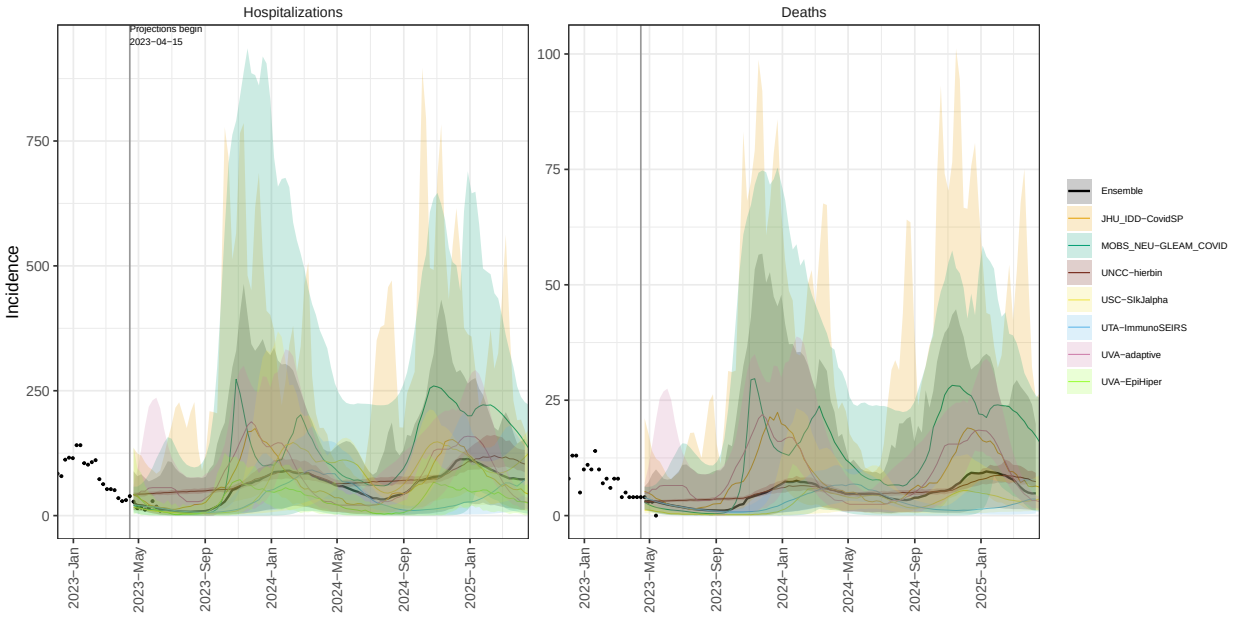
OR model variance & 95% projection intervals − No booster, High immune escape



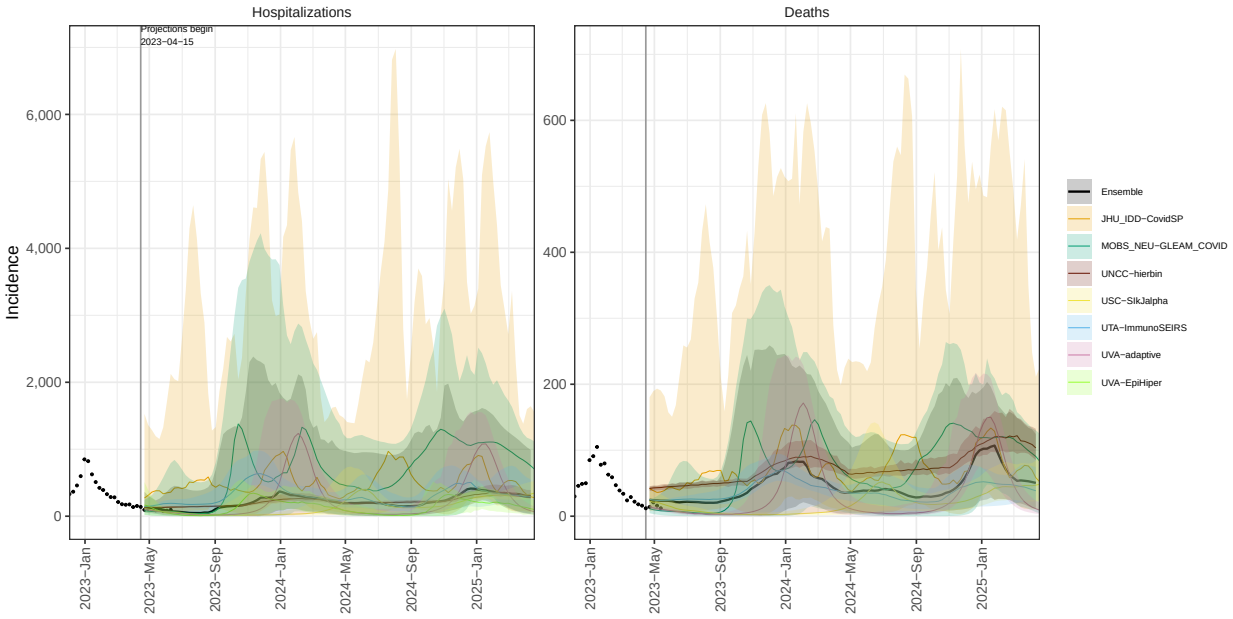
PA model variance & 95% projection intervals − No booster, High immune escape



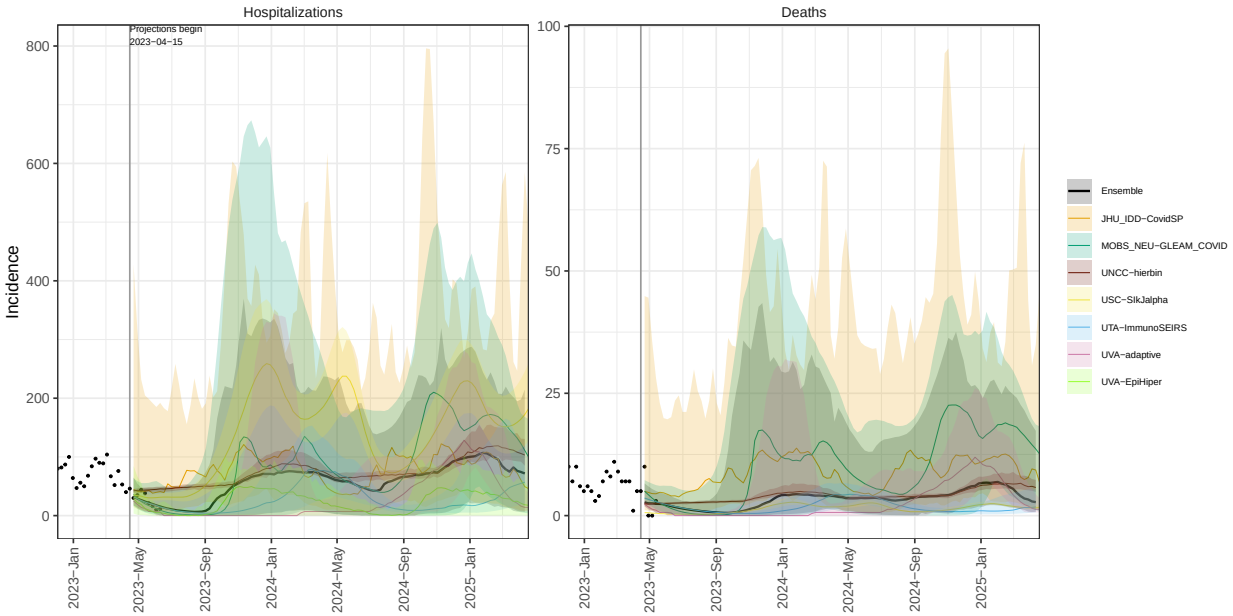
RI model variance & 95% projection intervals − No booster, High immune escape



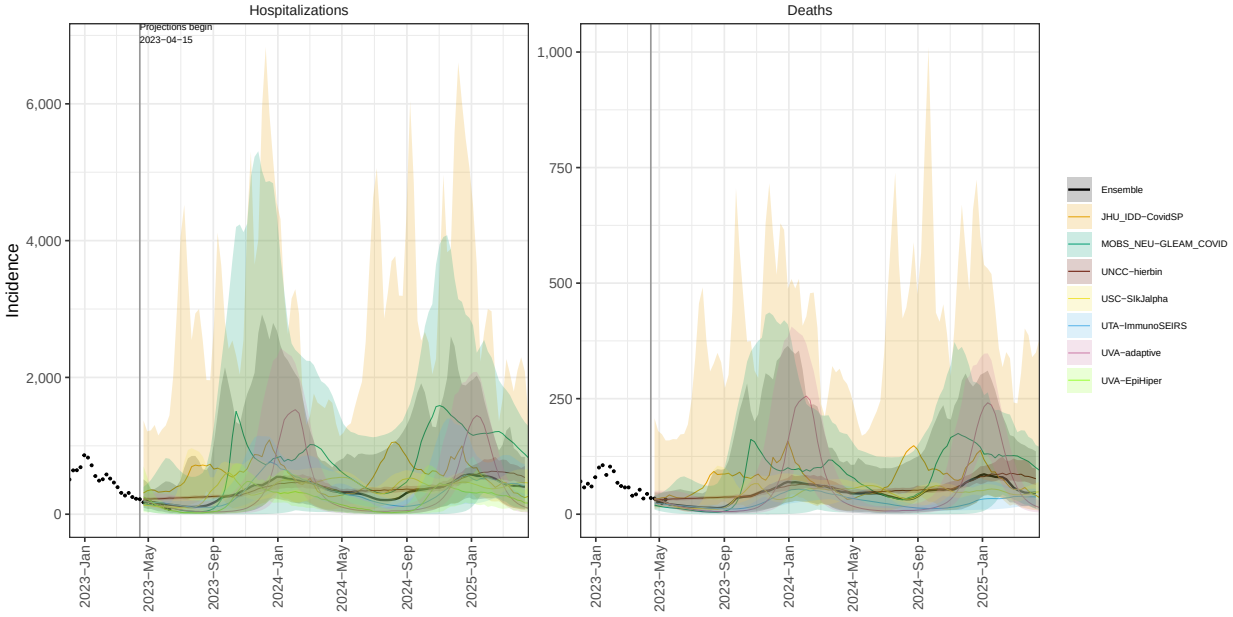
SC model variance & 95% projection intervals − No booster, High immune escape



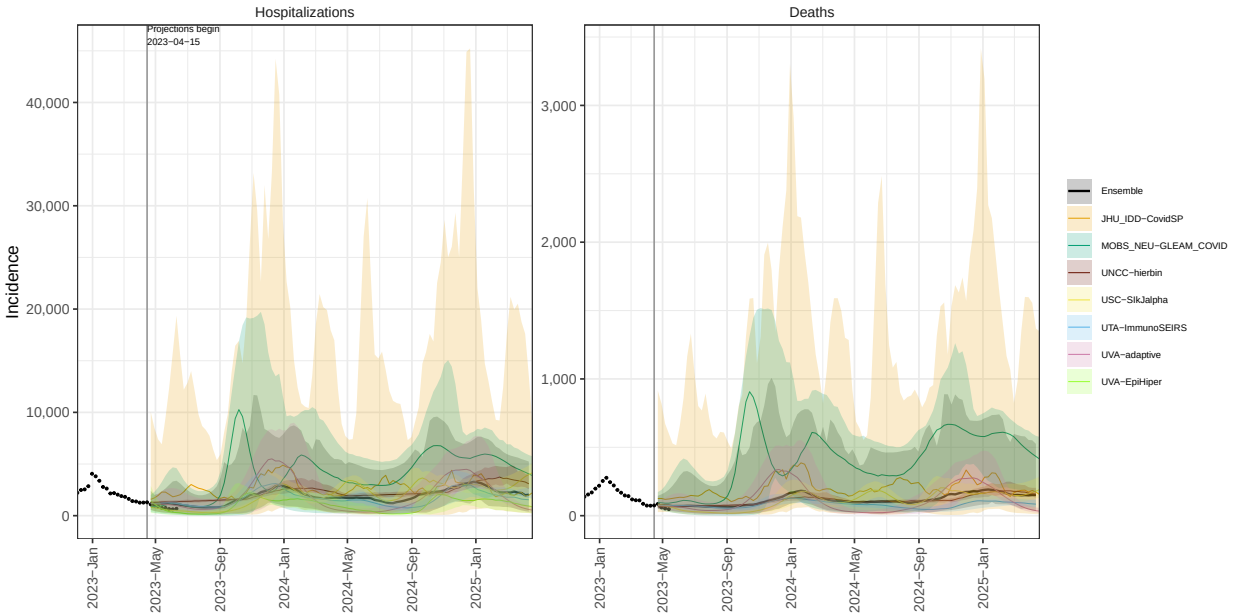
SD model variance & 95% projection intervals − No booster, High immune escape



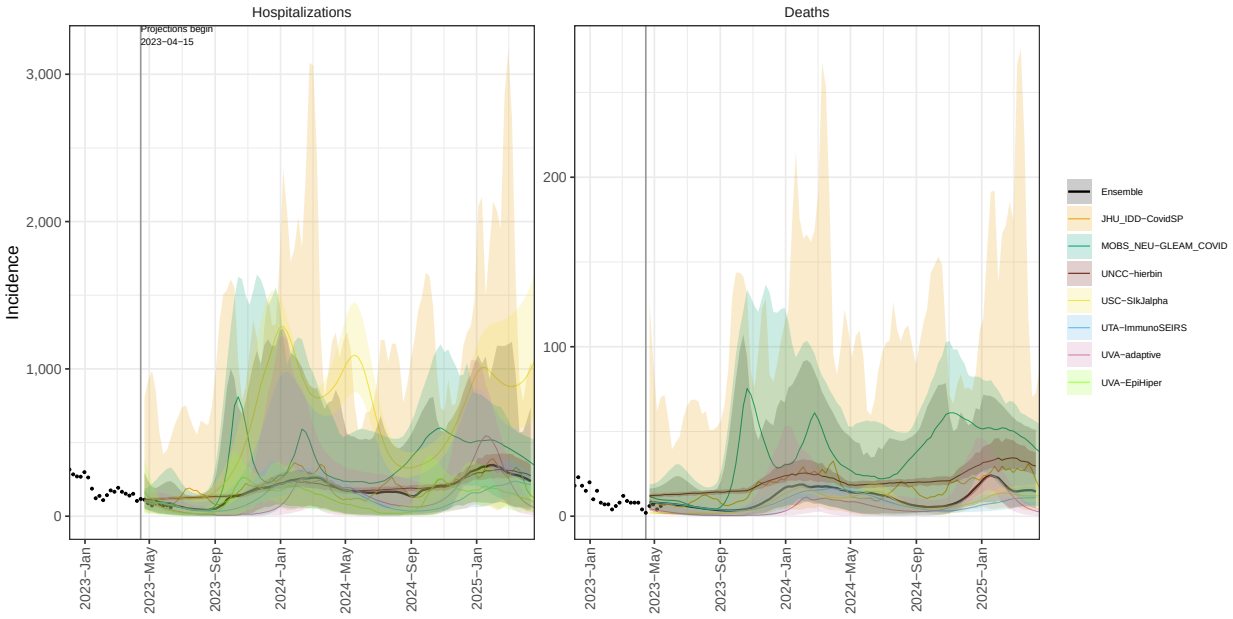
TN model variance & 95% projection intervals − No booster, High immune escape



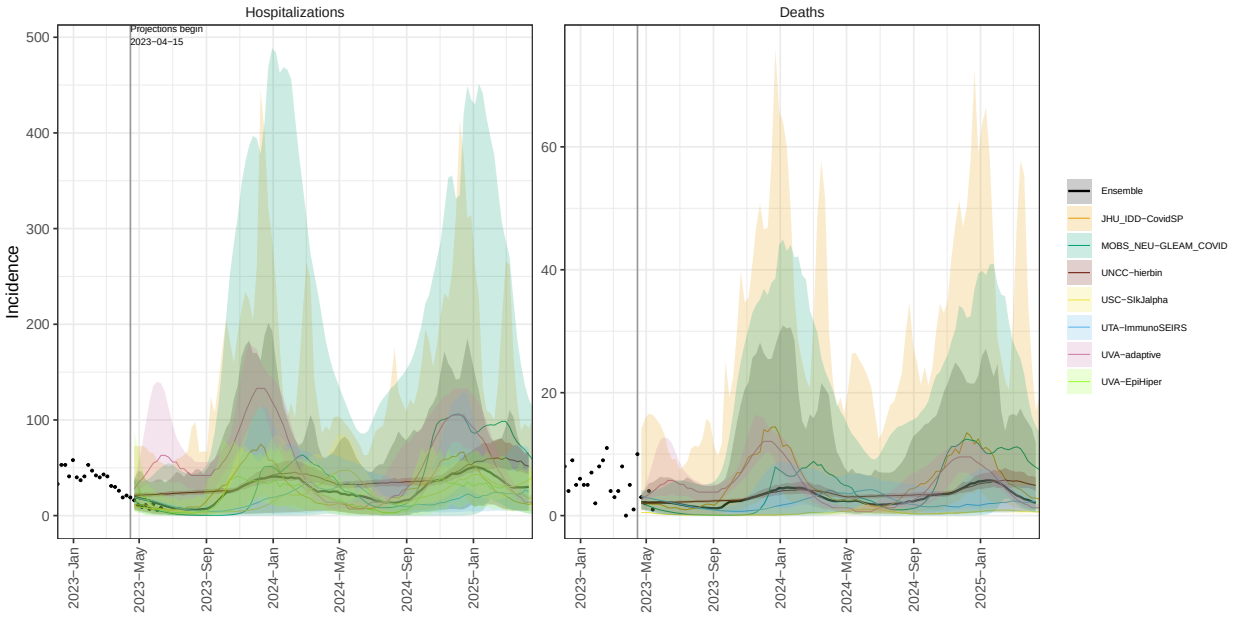
TX model variance & 95% projection intervals − No booster, High immune escape



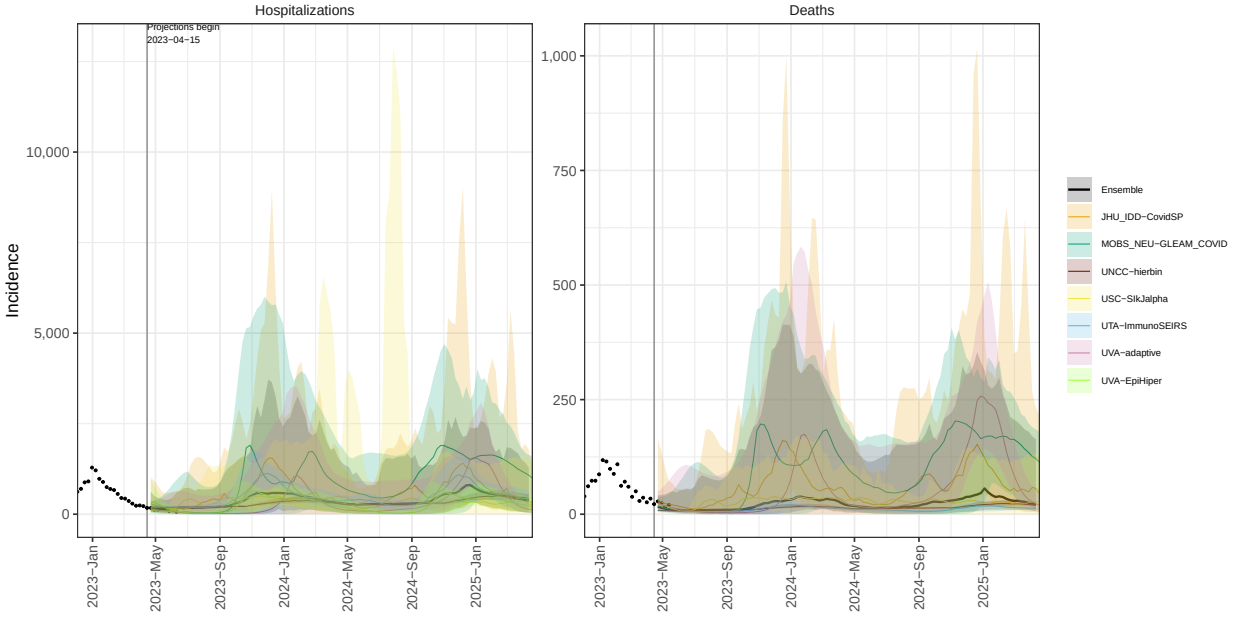
UT model variance & 95% projection intervals − No booster, High immune escape



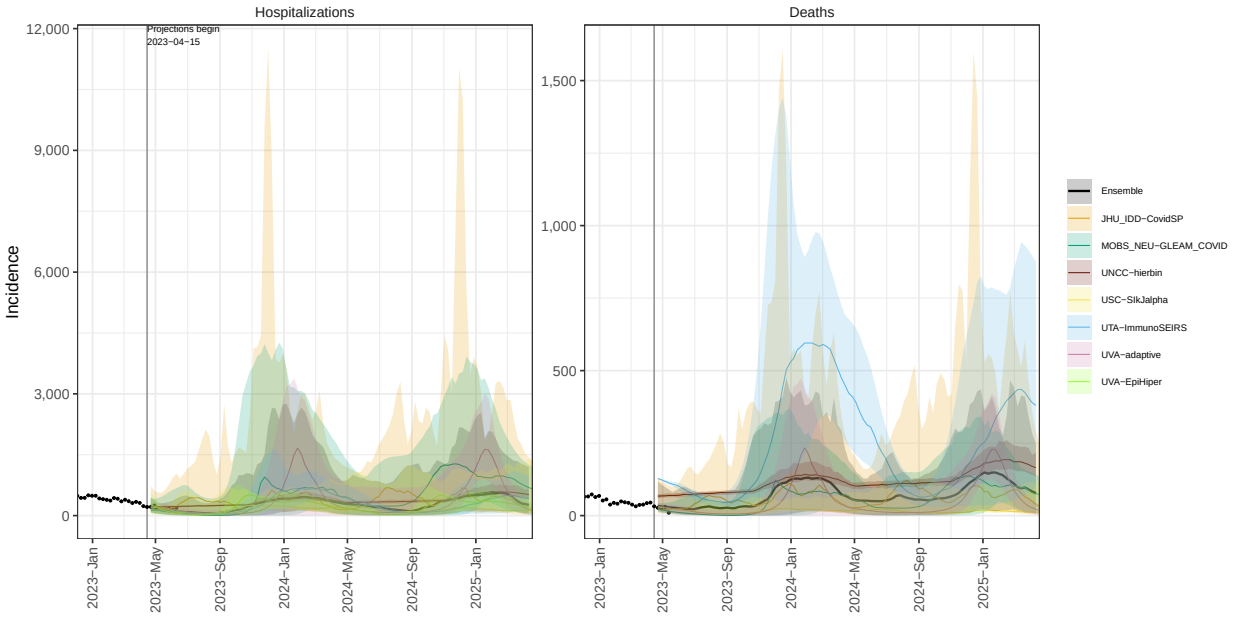
VT model variance & 95% projection intervals − No booster, High immune escape

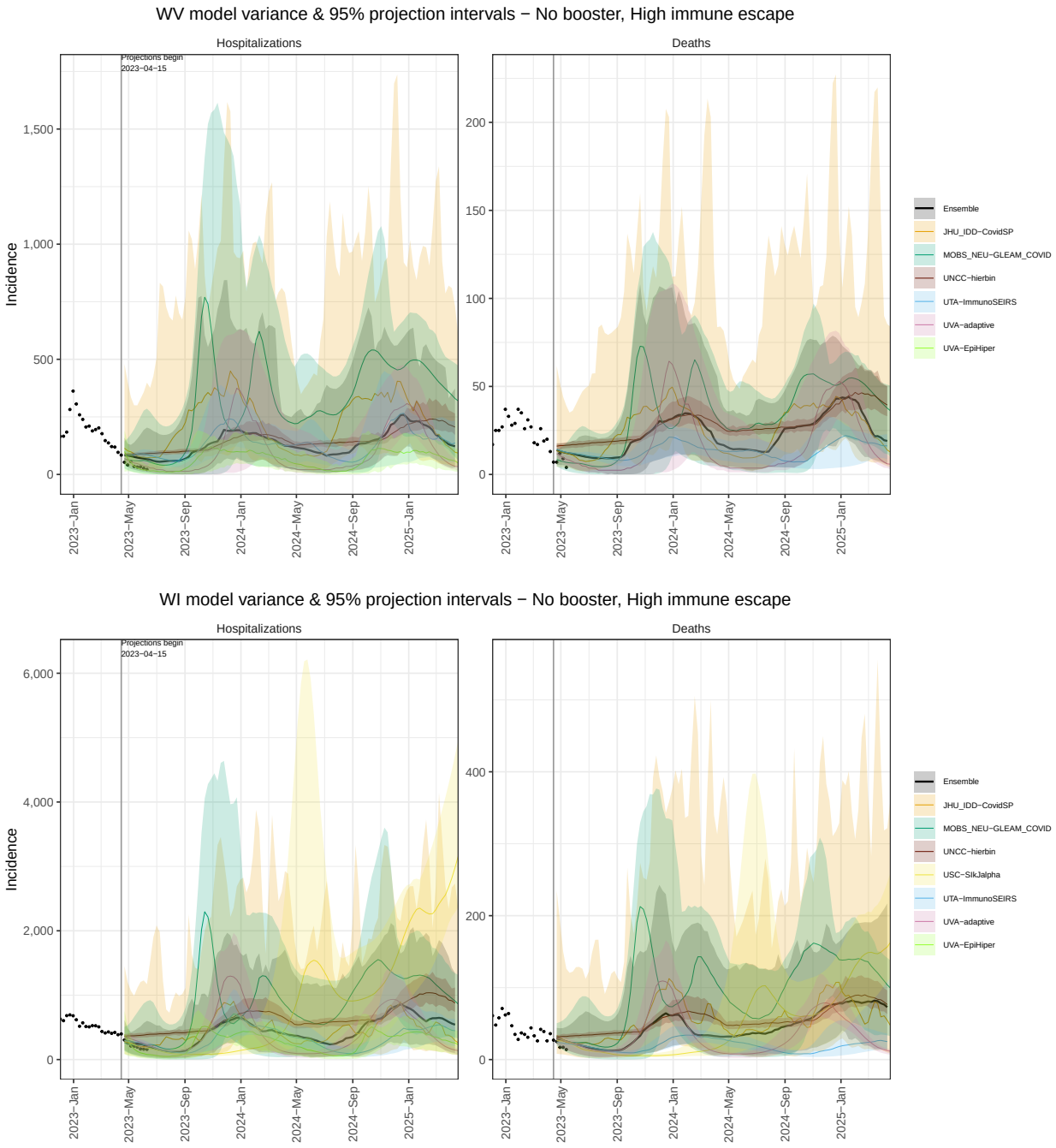


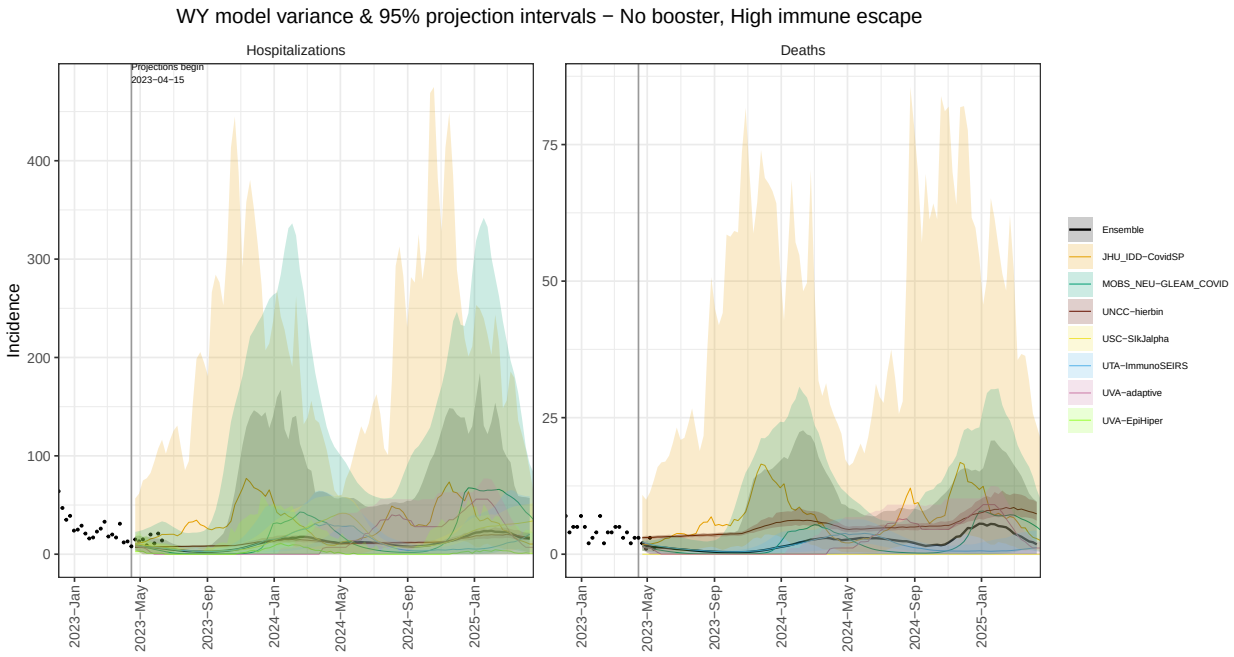
VA model variance & 95% projection intervals − No booster, High immune escape



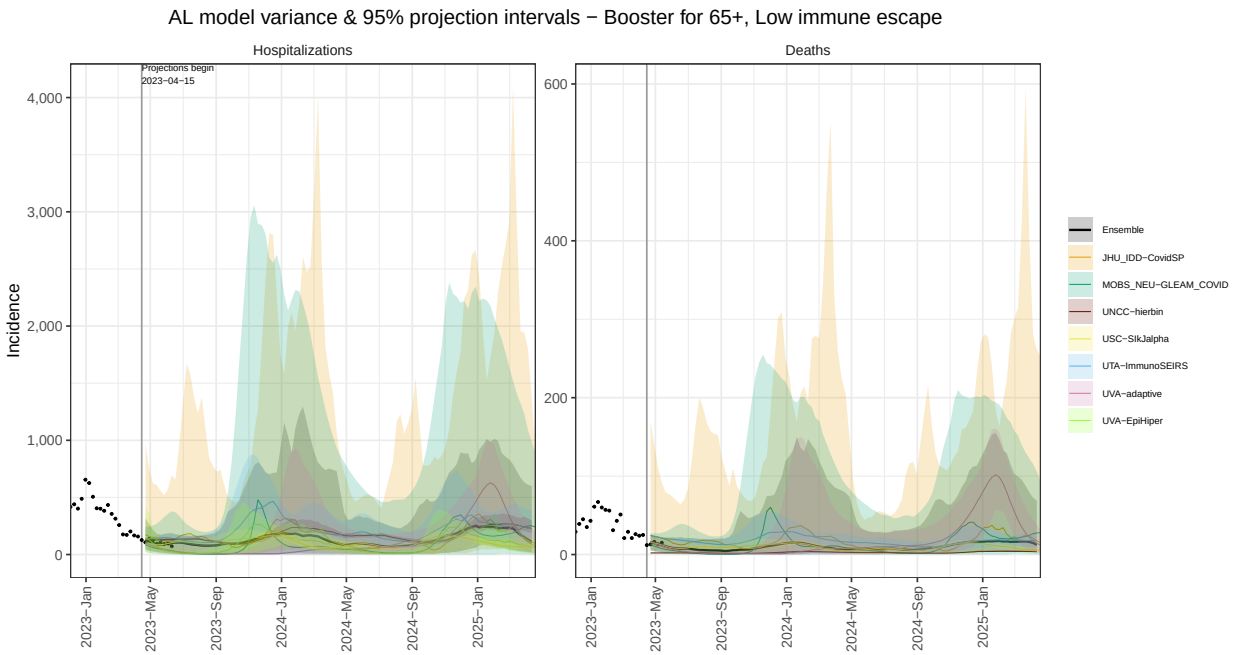
WA model variance & 95% projection intervals − No booster, High immune escape



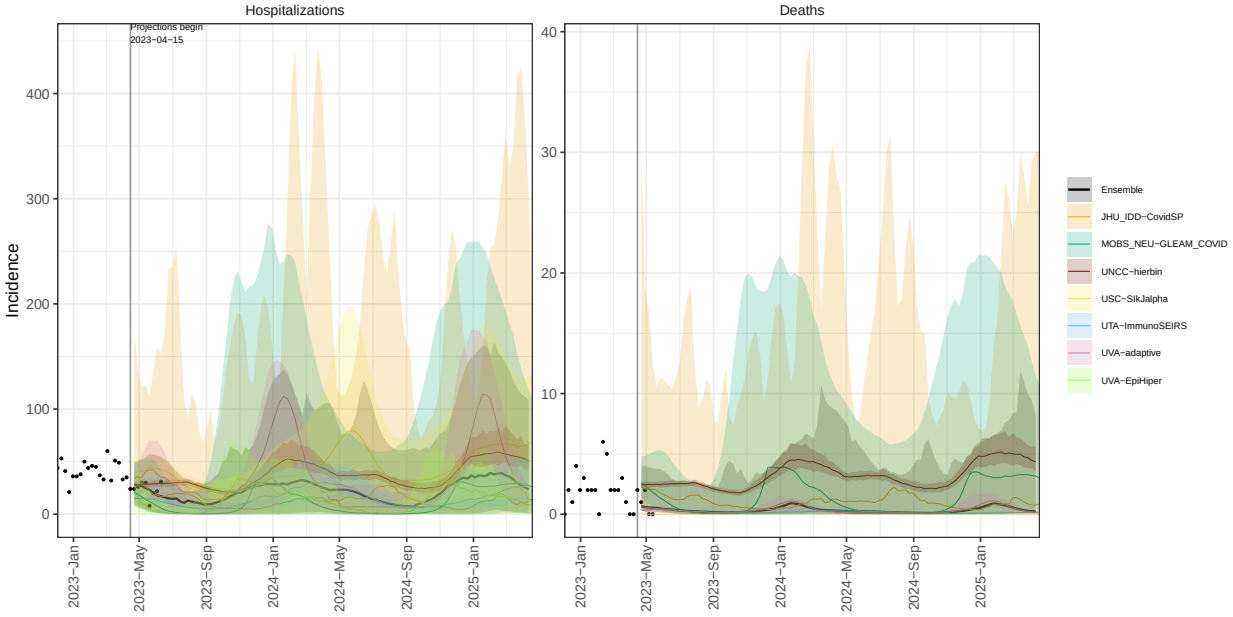

WV model variance & 95% projection intervals − No booster, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
1,500
1,000
500
0
200
150
100
50
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper
WI model variance & 95% projection intervals − No booster, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
6,000
4,000
2,000
0
400
200
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper



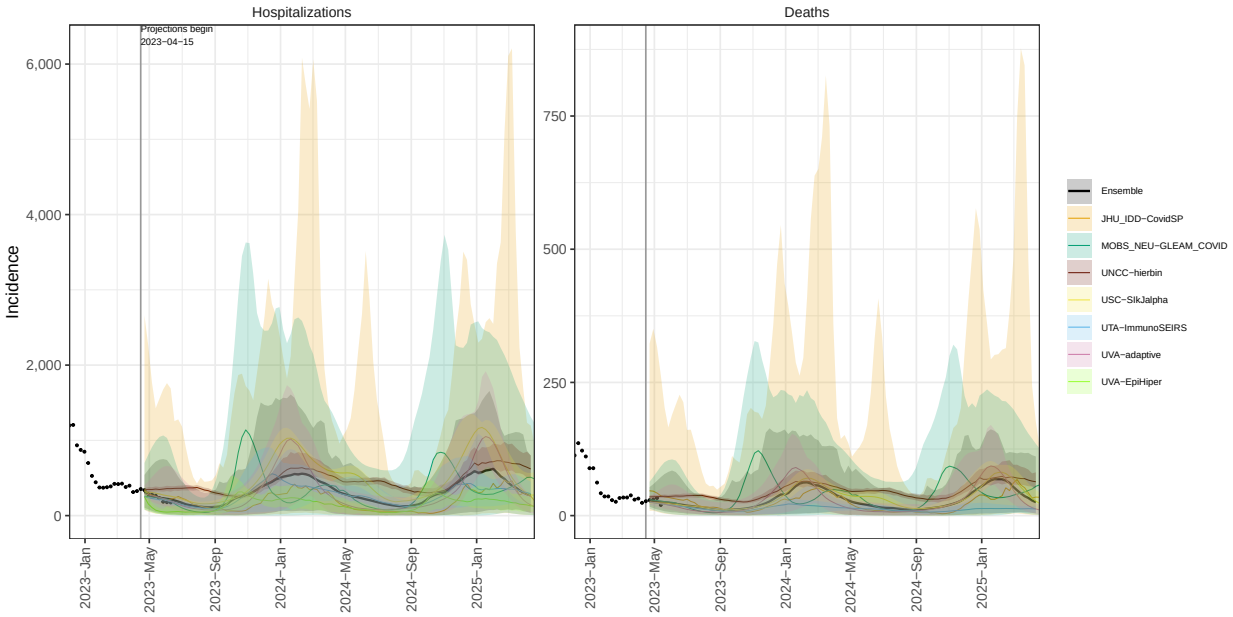
Model variation for the Booster for 65+, Low immune escape scenario



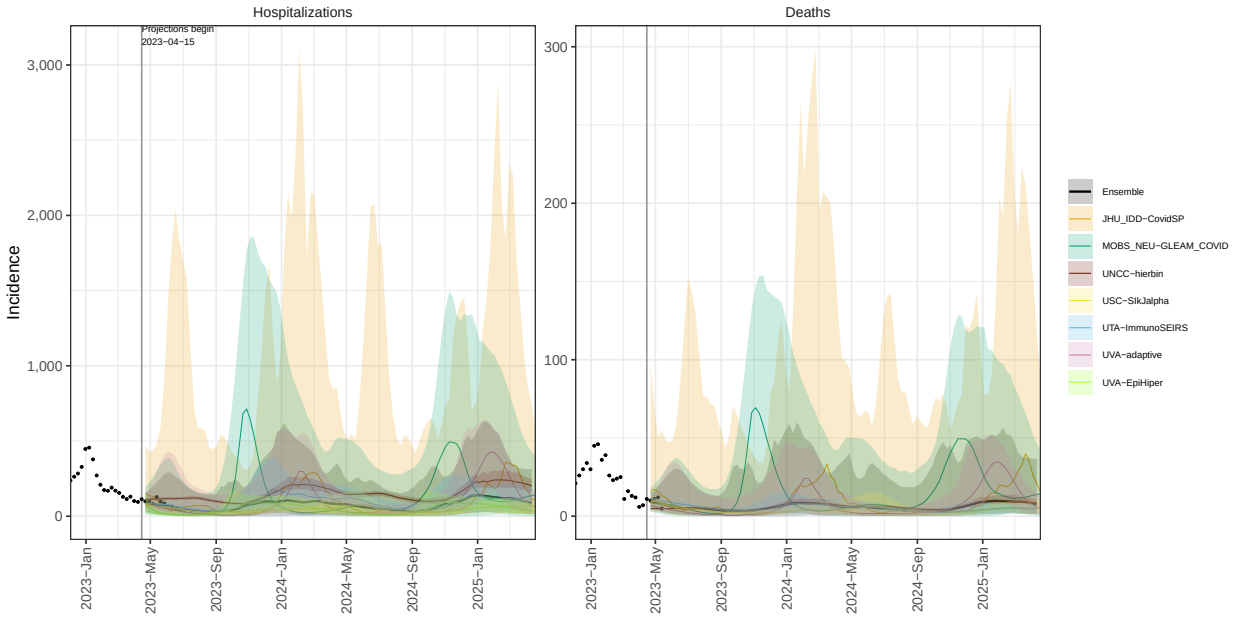
AK model variance & 95% projection intervals − Booster for 65+, Low immune escape



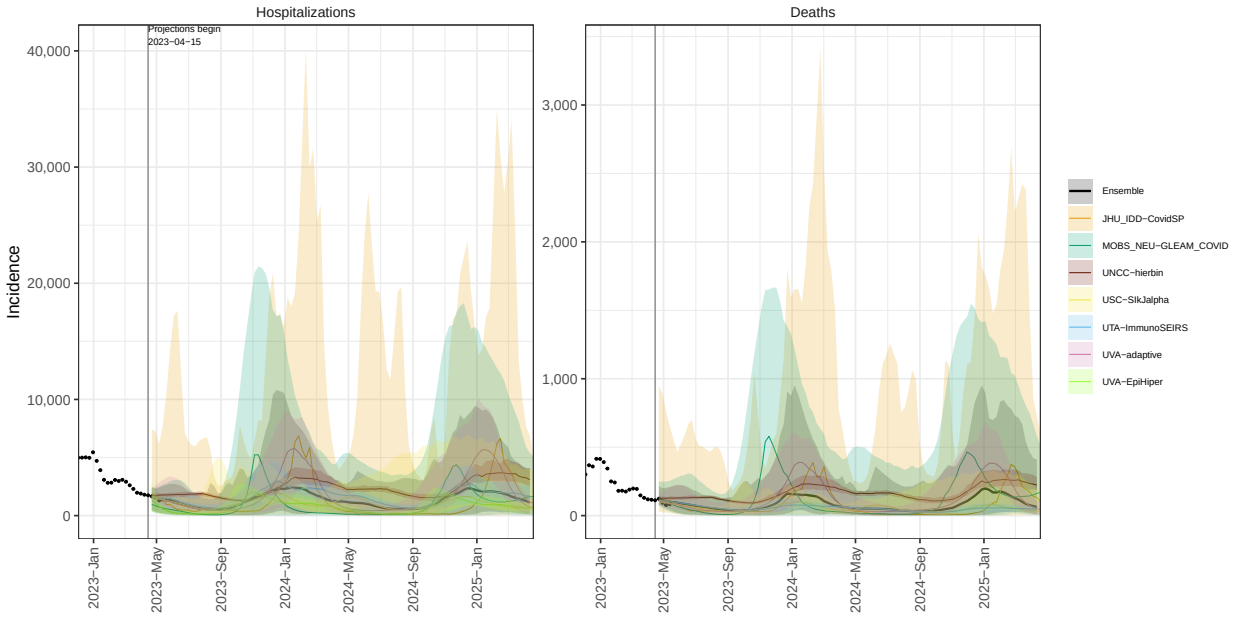
AZ model variance & 95% projection intervals − Booster for 65+, Low immune escape



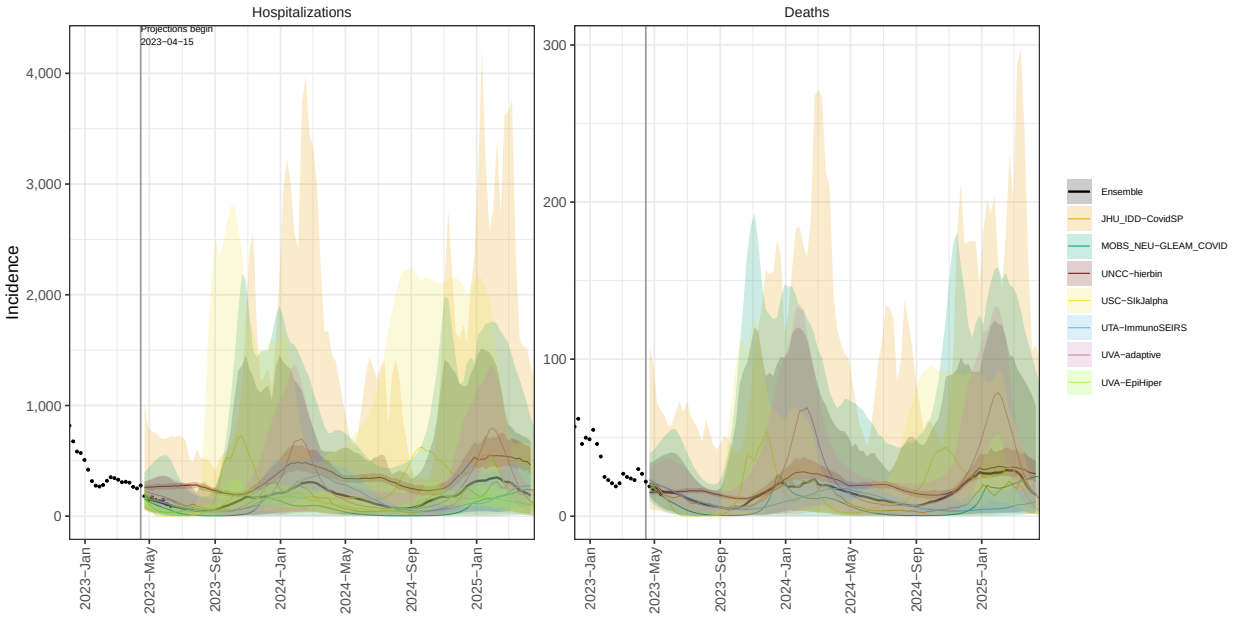
AR model variance & 95% projection intervals − Booster for 65+, Low immune escape



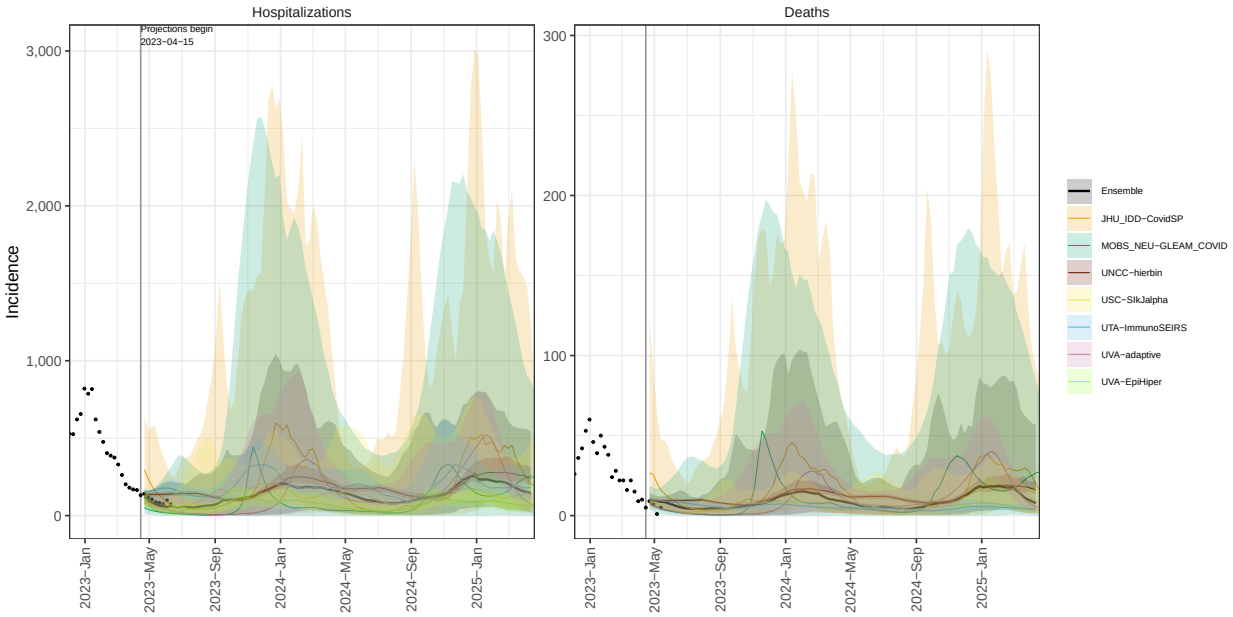
CA model variance & 95% projection intervals − Booster for 65+, Low immune escape



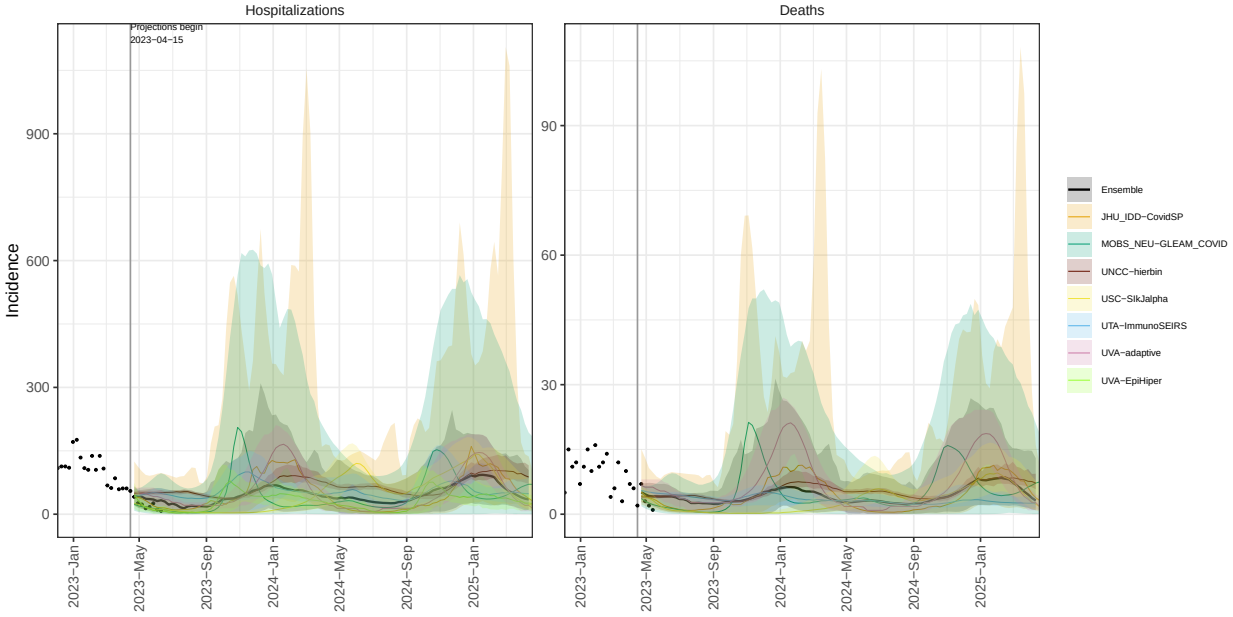
CO model variance & 95% projection intervals − Booster for 65+, Low immune escape



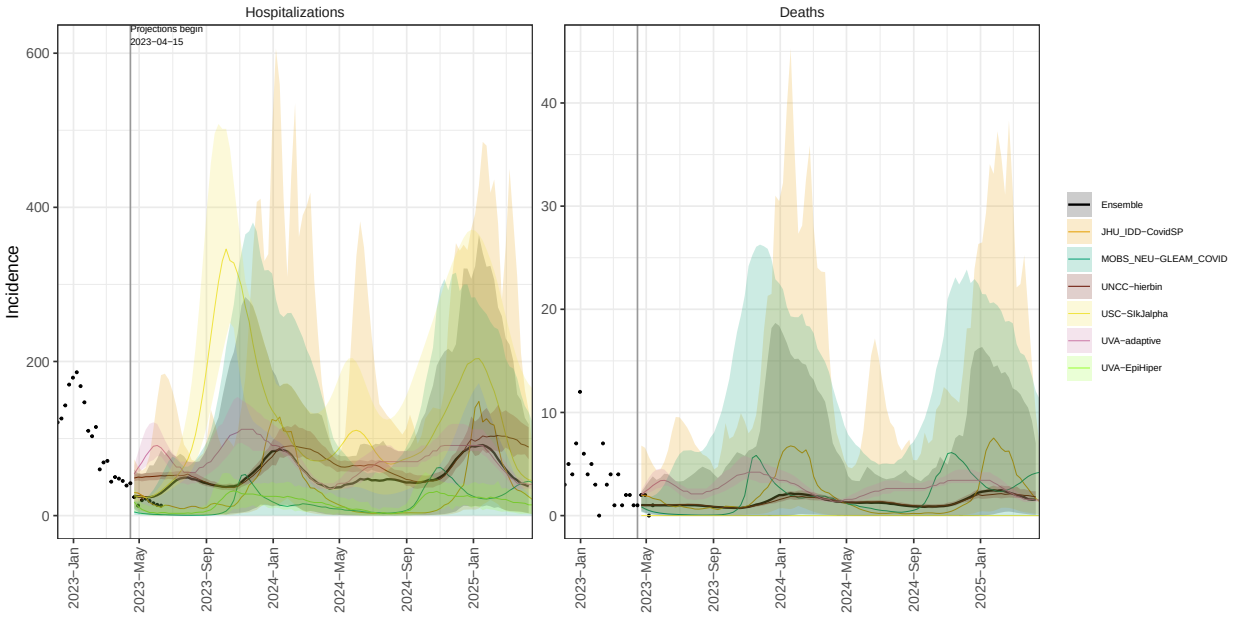
CT model variance & 95% projection intervals − Booster for 65+, Low immune escape



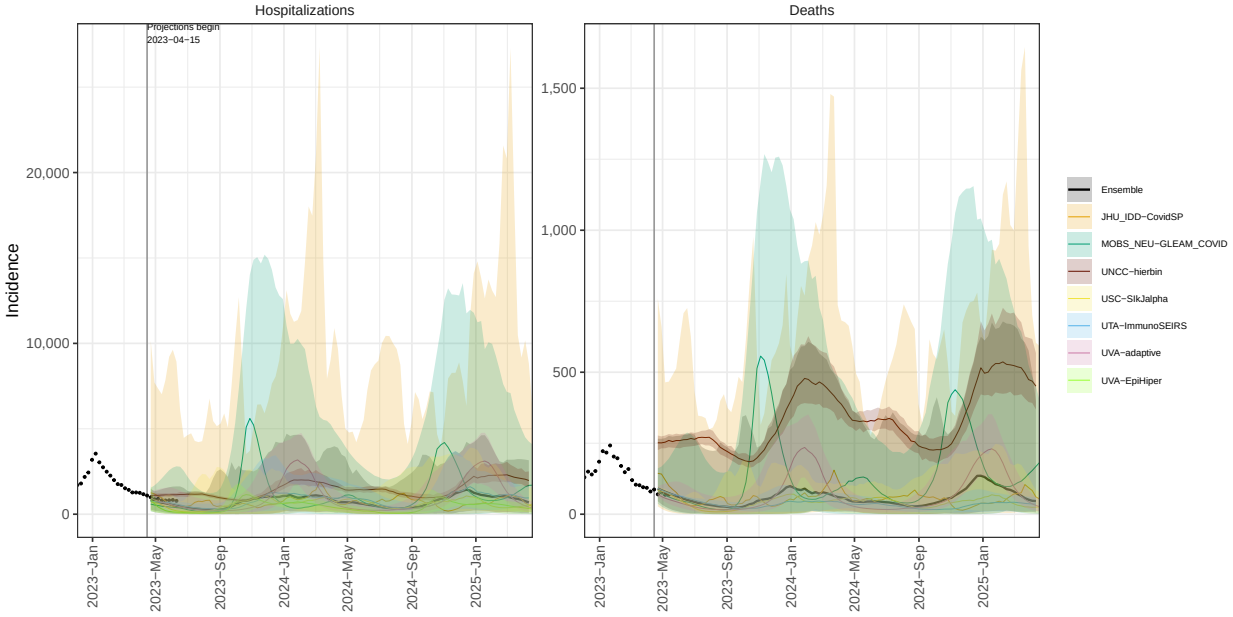
DE model variance & 95% projection intervals − Booster for 65+, Low immune escape



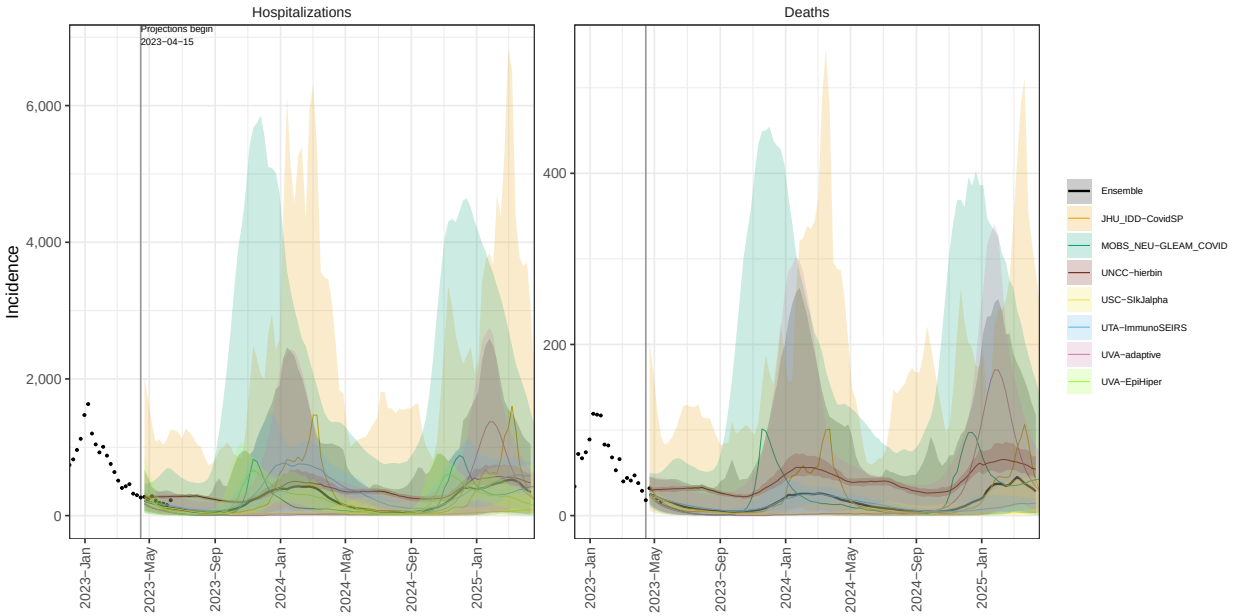
DC model variance & 95% projection intervals − Booster for 65+, Low immune escape



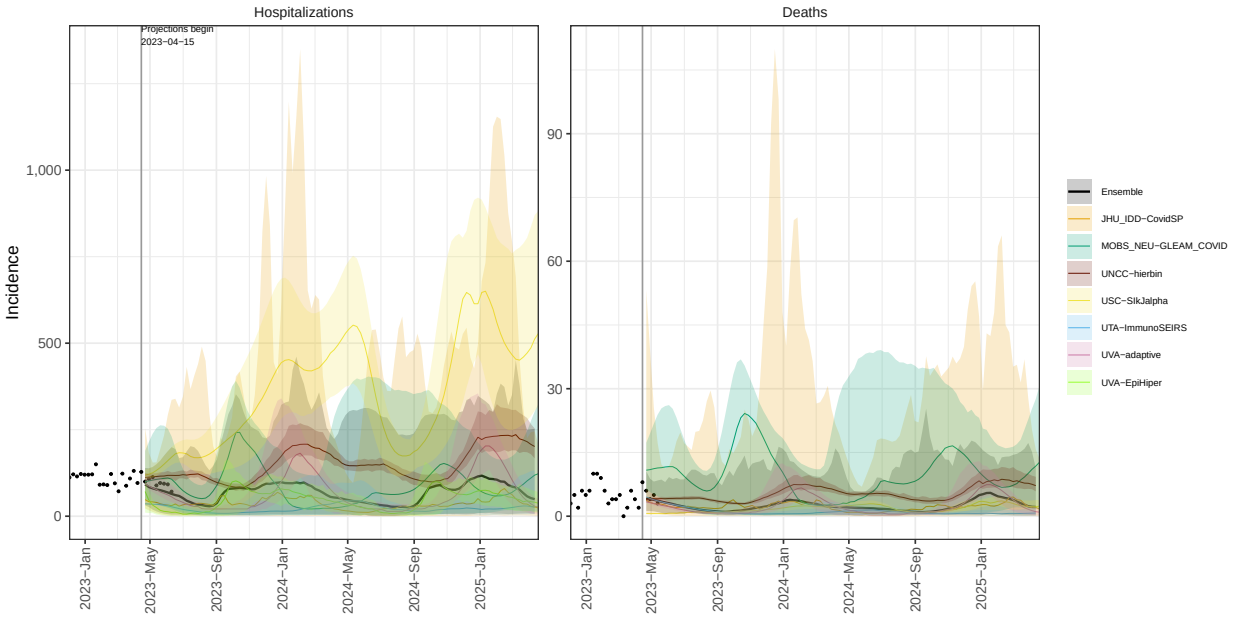
FL model variance & 95% projection intervals − Booster for 65+, Low immune escape



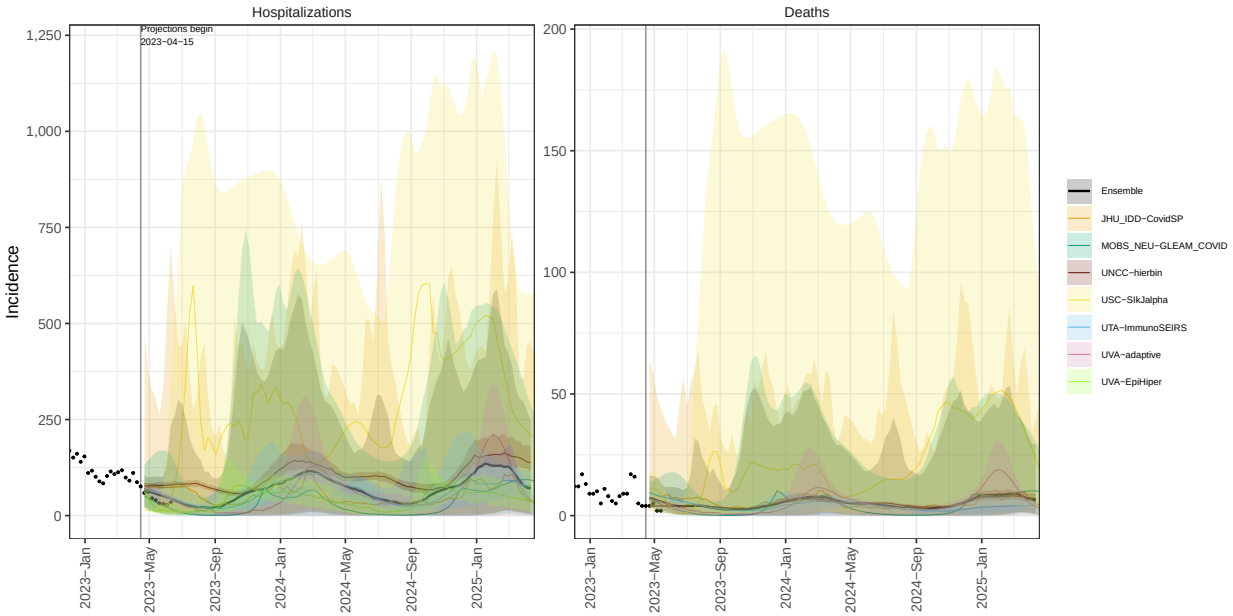
GA model variance & 95% projection intervals − Booster for 65+, Low immune escape



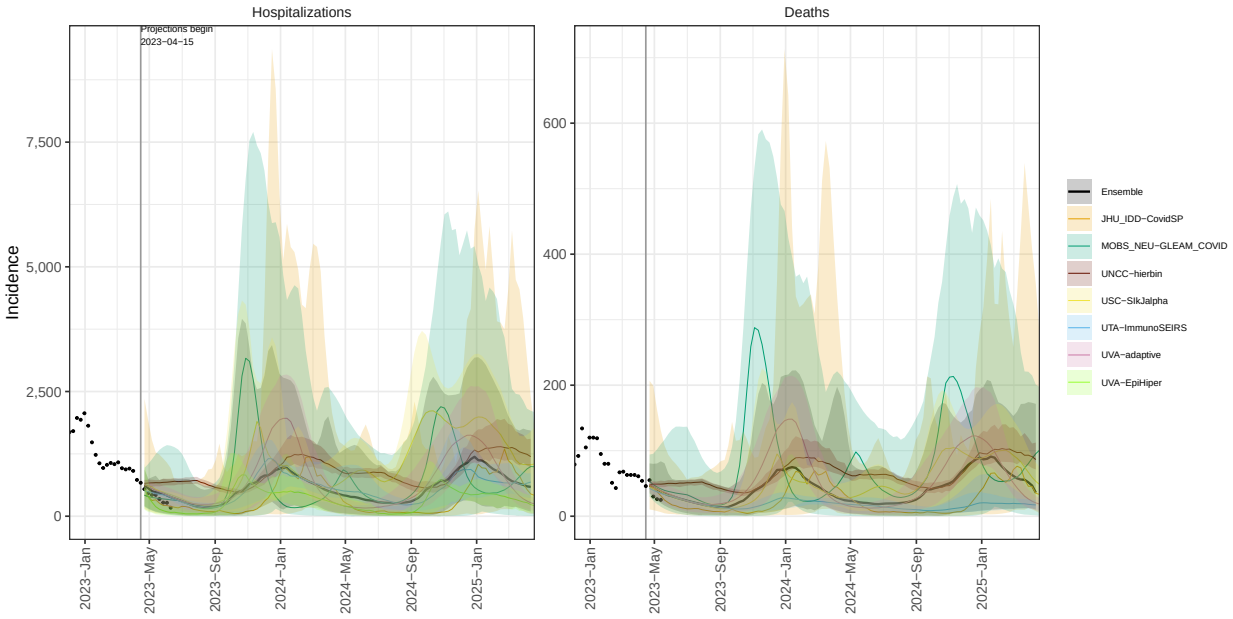
HI model variance & 95% projection intervals − Booster for 65+, Low immune escape



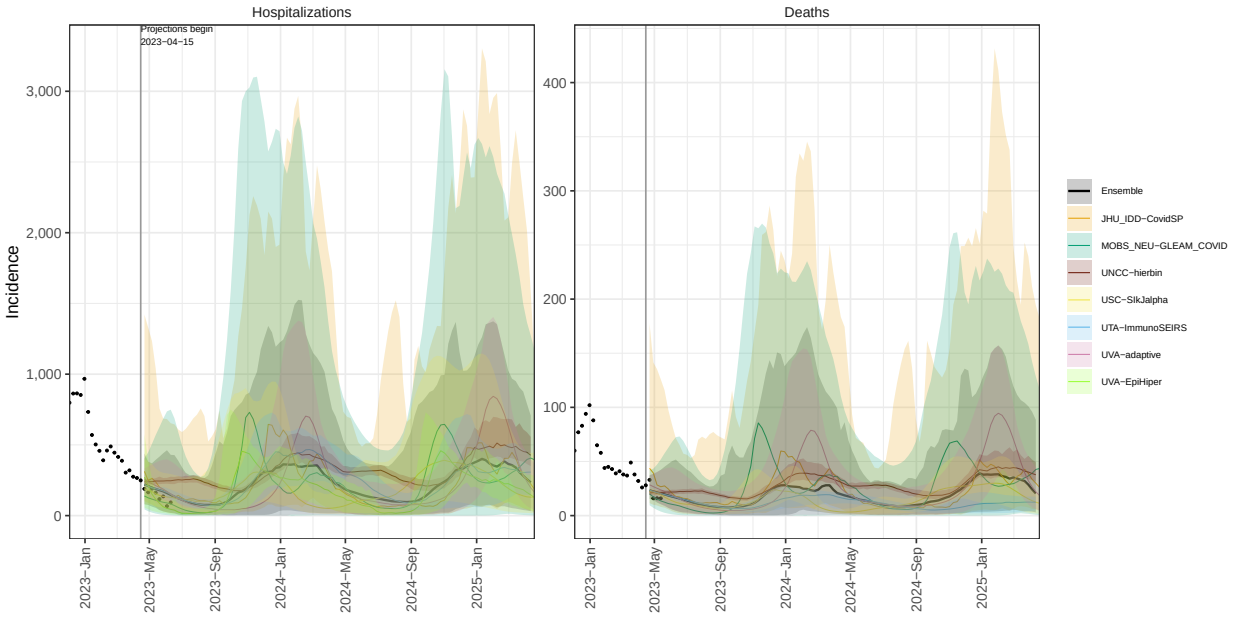
ID model variance & 95% projection intervals − Booster for 65+, Low immune escape



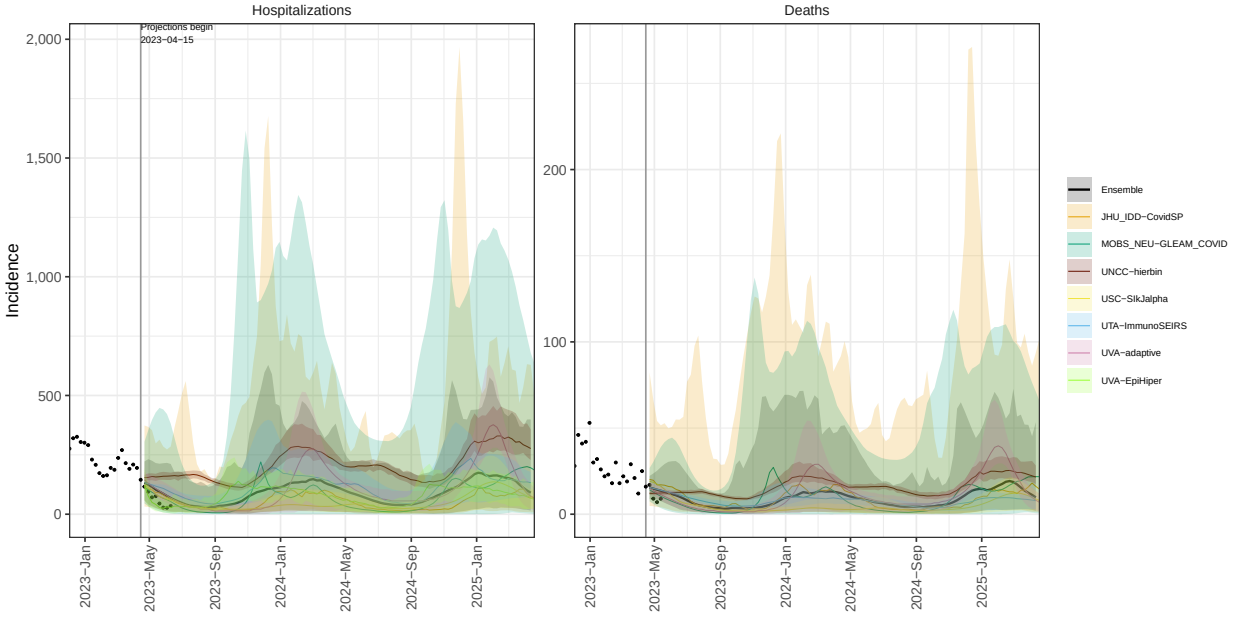
IL model variance & 95% projection intervals − Booster for 65+, Low immune escape



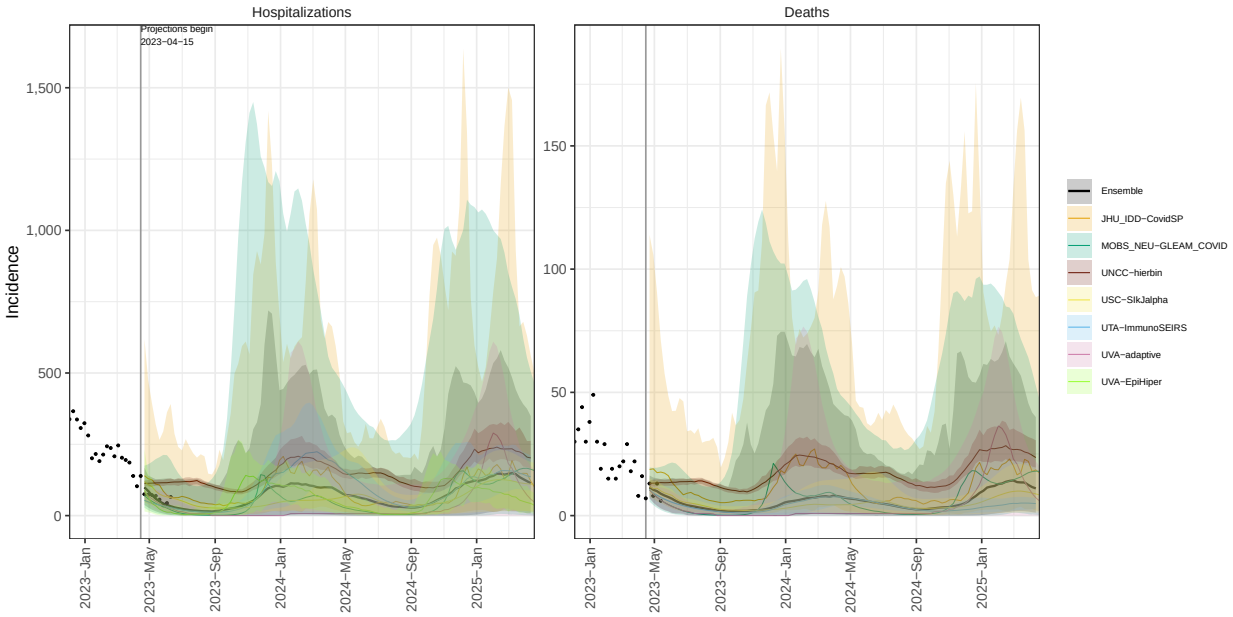
IN model variance & 95% projection intervals − Booster for 65+, Low immune escape



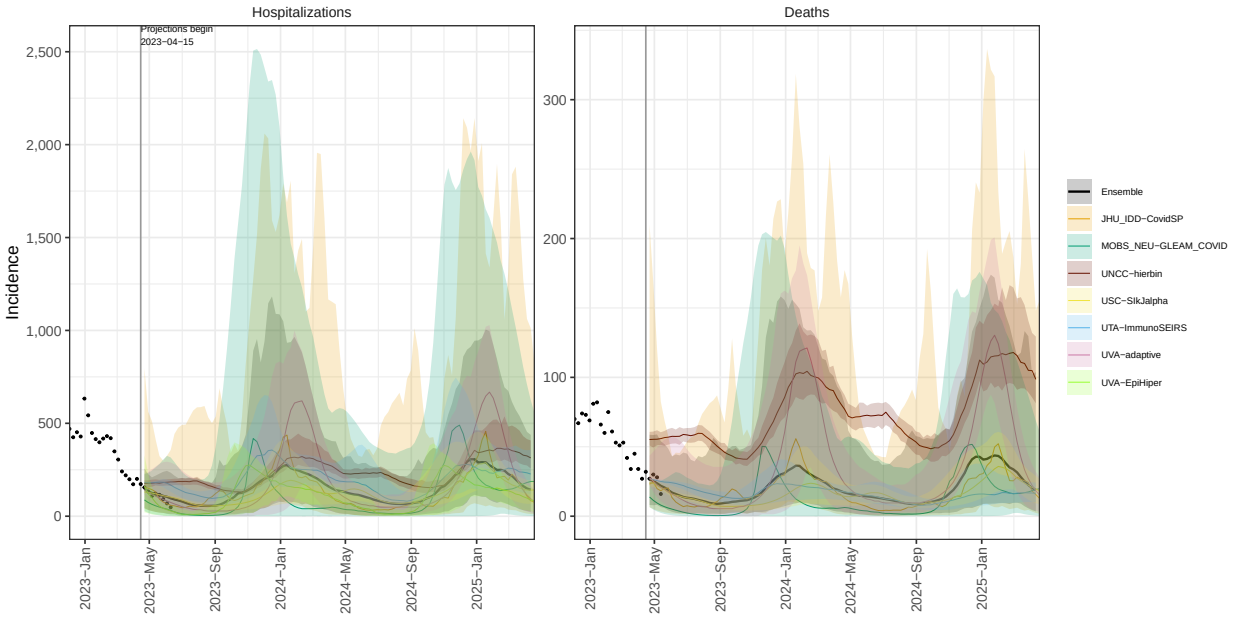
IA model variance & 95% projection intervals − Booster for 65+, Low immune escape



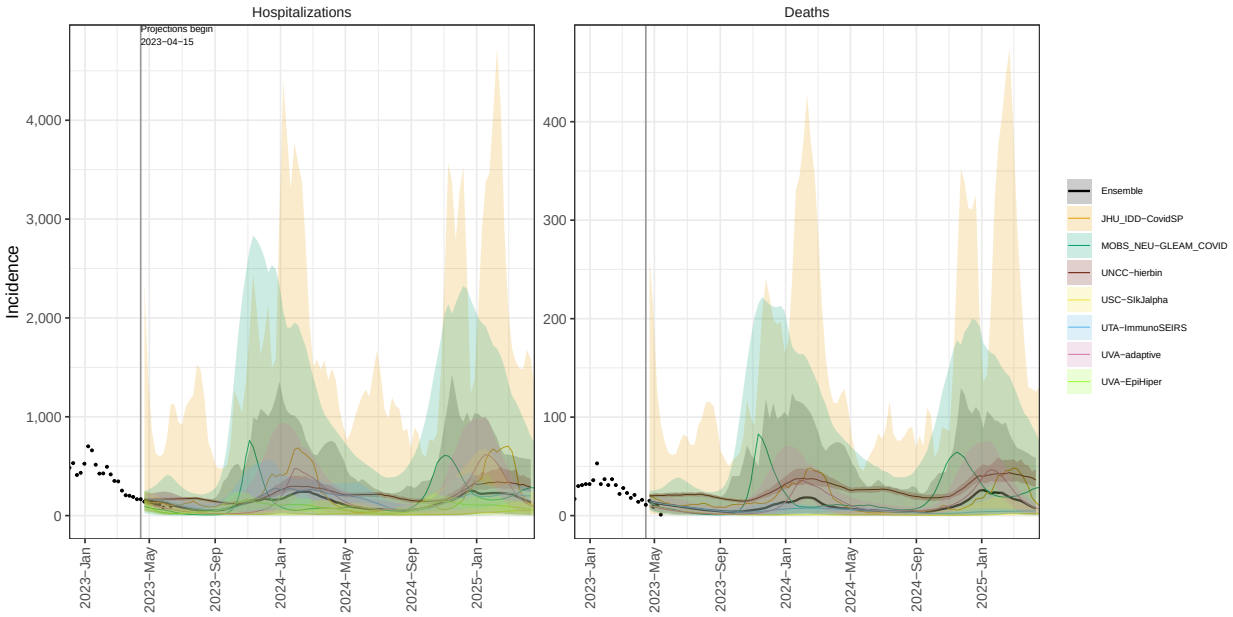
KS model variance & 95% projection intervals − Booster for 65+, Low immune escape



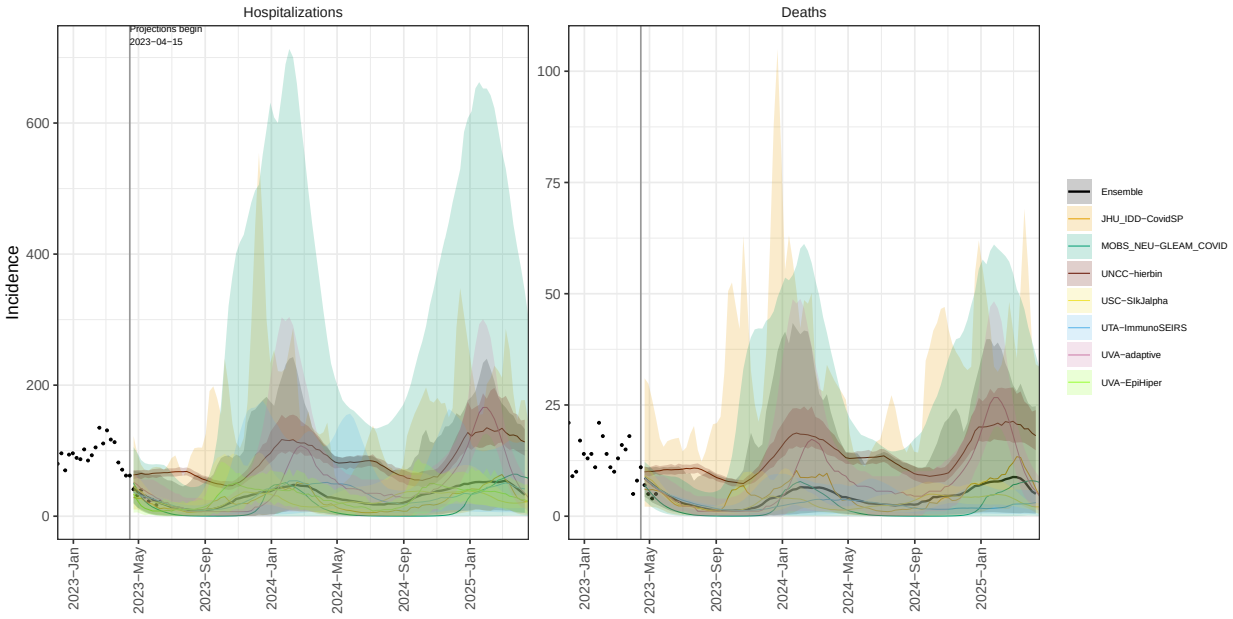
KY model variance & 95% projection intervals − Booster for 65+, Low immune escape



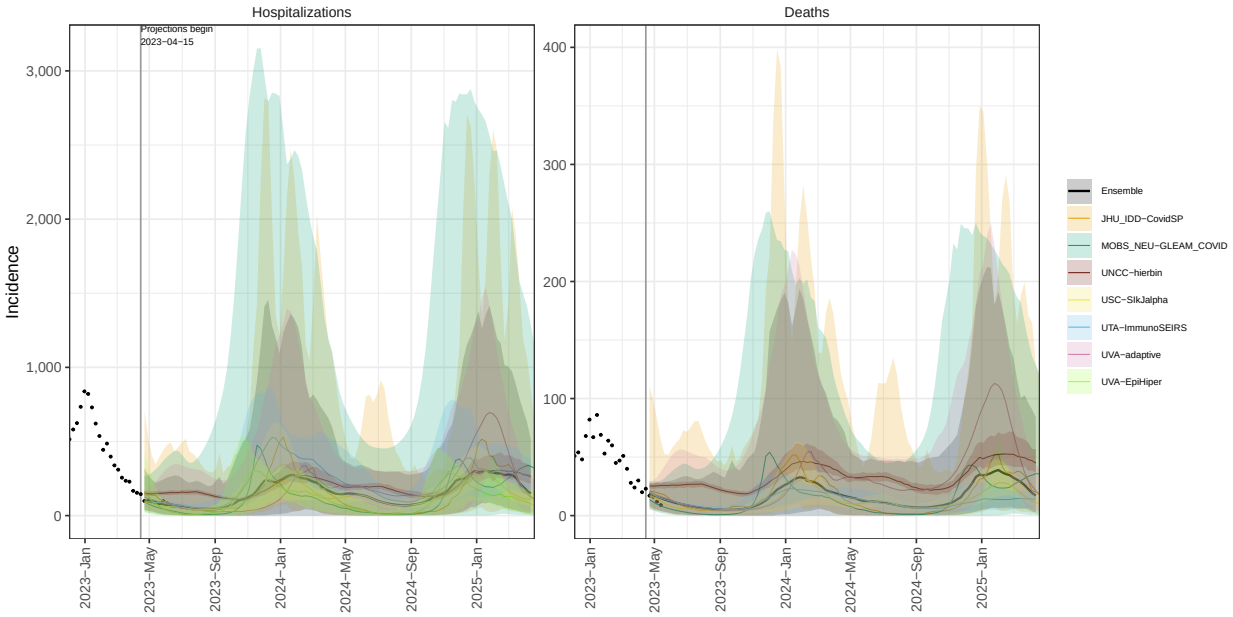
LA model variance & 95% projection intervals − Booster for 65+, Low immune escape



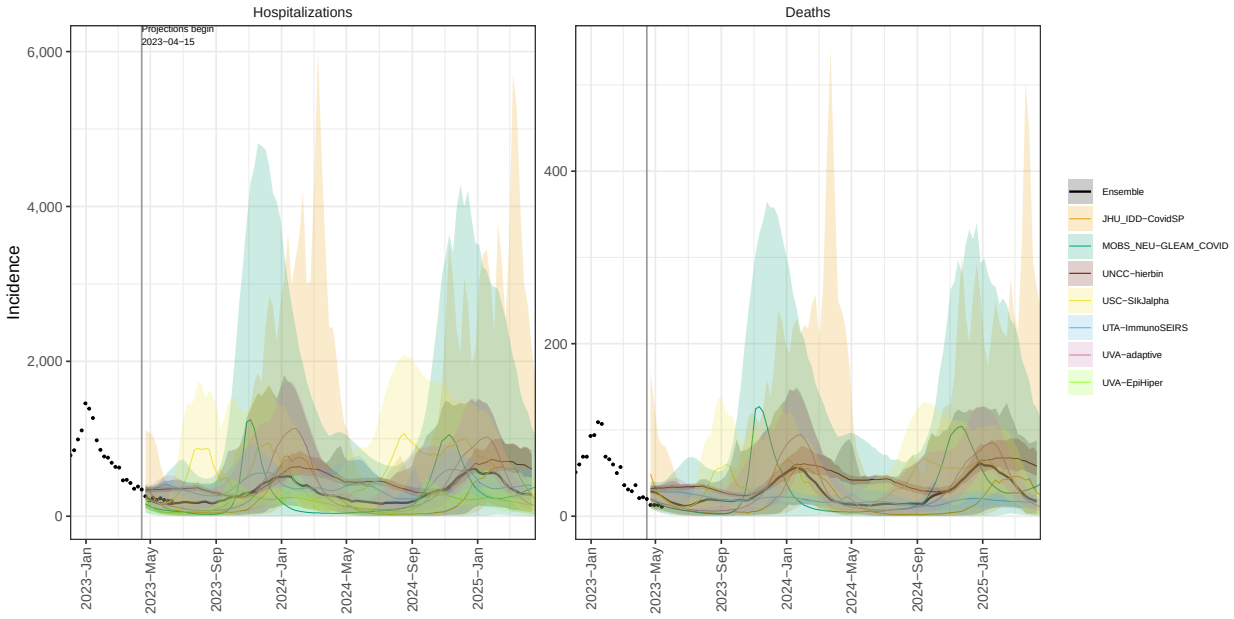
ME model variance & 95% projection intervals − Booster for 65+, Low immune escape



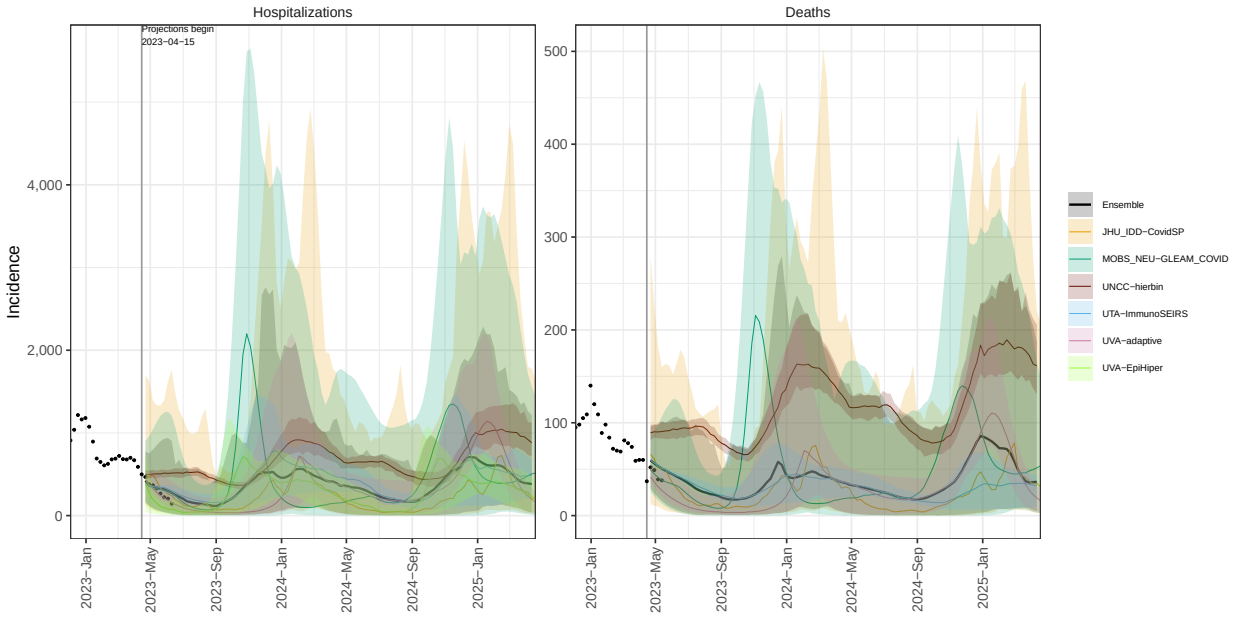
MD model variance & 95% projection intervals − Booster for 65+, Low immune escape



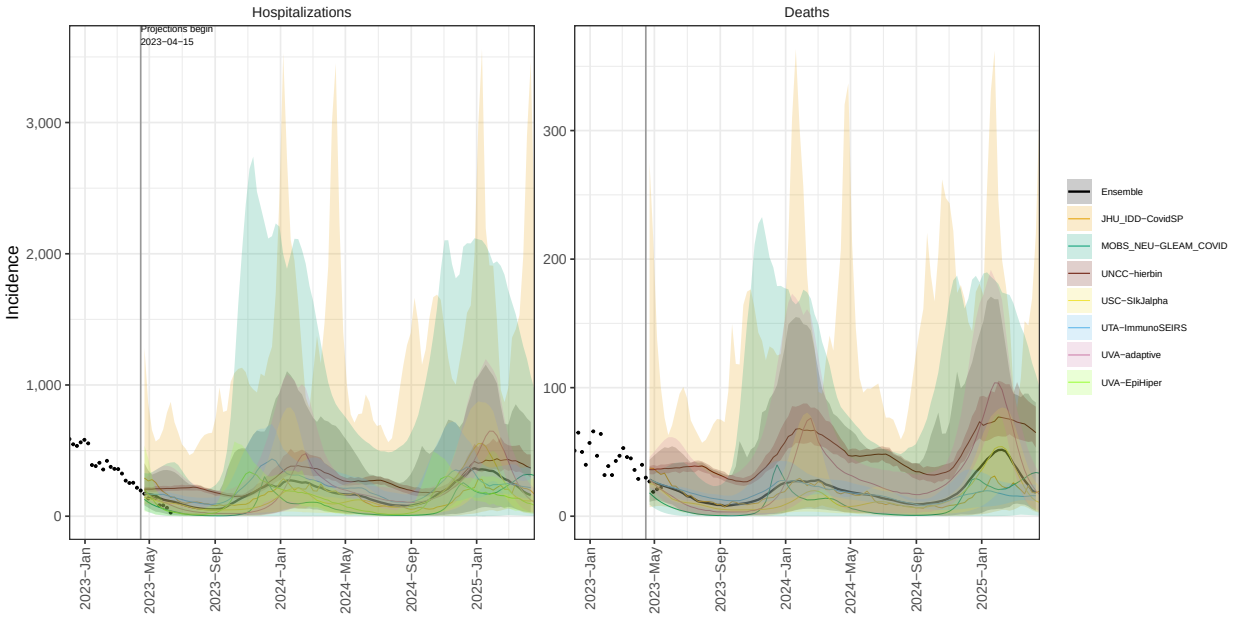
MA model variance & 95% projection intervals − Booster for 65+, Low immune escape



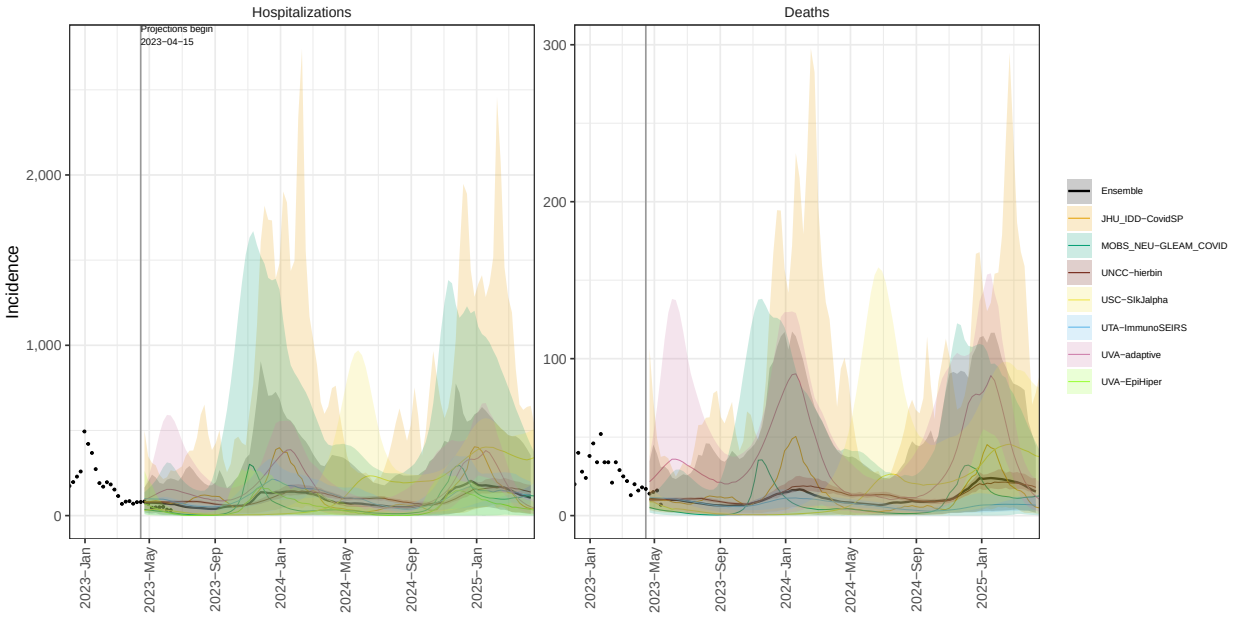
MI model variance & 95% projection intervals − Booster for 65+, Low immune escape



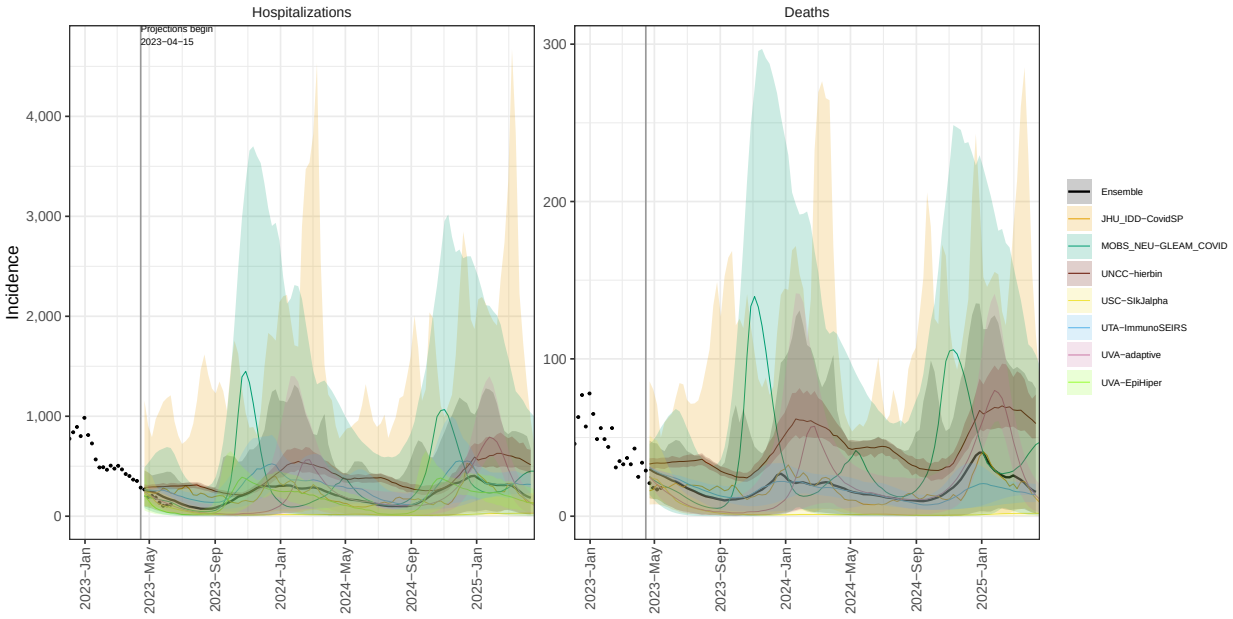
MN model variance & 95% projection intervals − Booster for 65+, Low immune escape



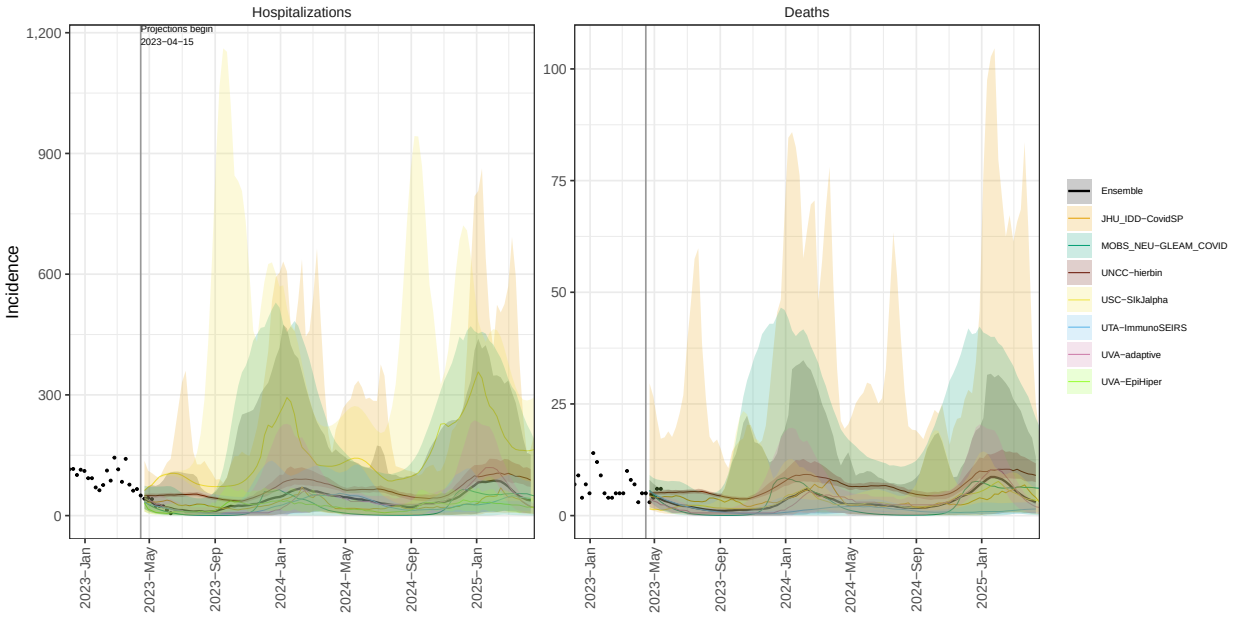
MS model variance & 95% projection intervals − Booster for 65+, Low immune escape



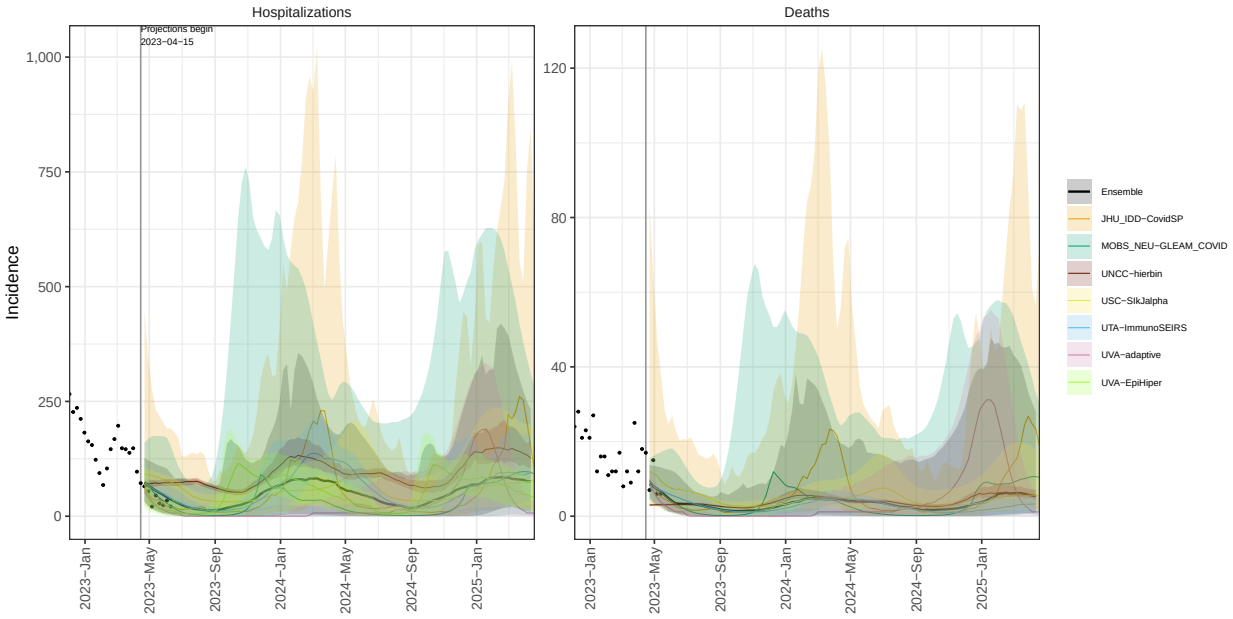
MO model variance & 95% projection intervals − Booster for 65+, Low immune escape



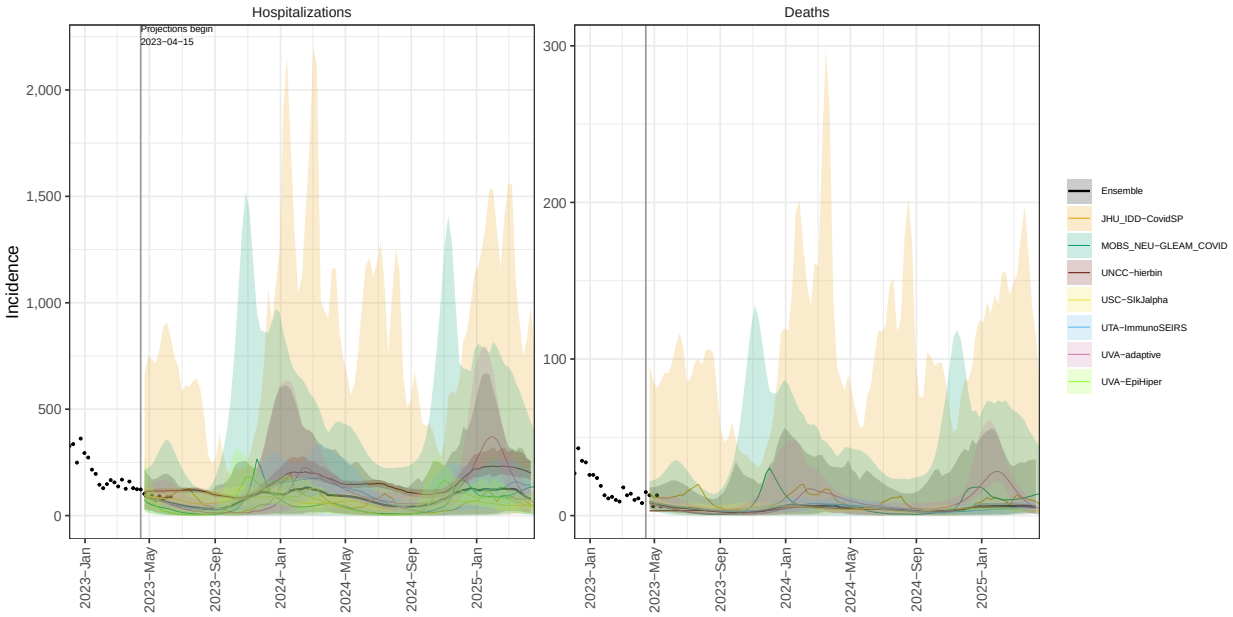
MT model variance & 95% projection intervals − Booster for 65+, Low immune escape



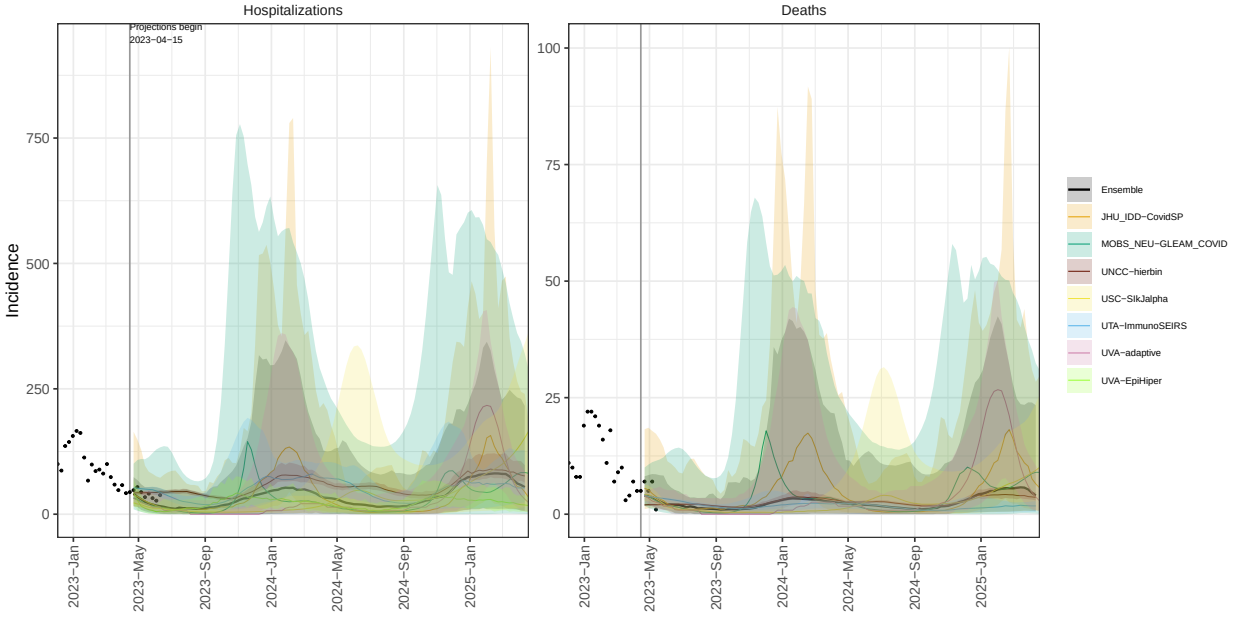
NE model variance & 95% projection intervals − Booster for 65+, Low immune escape



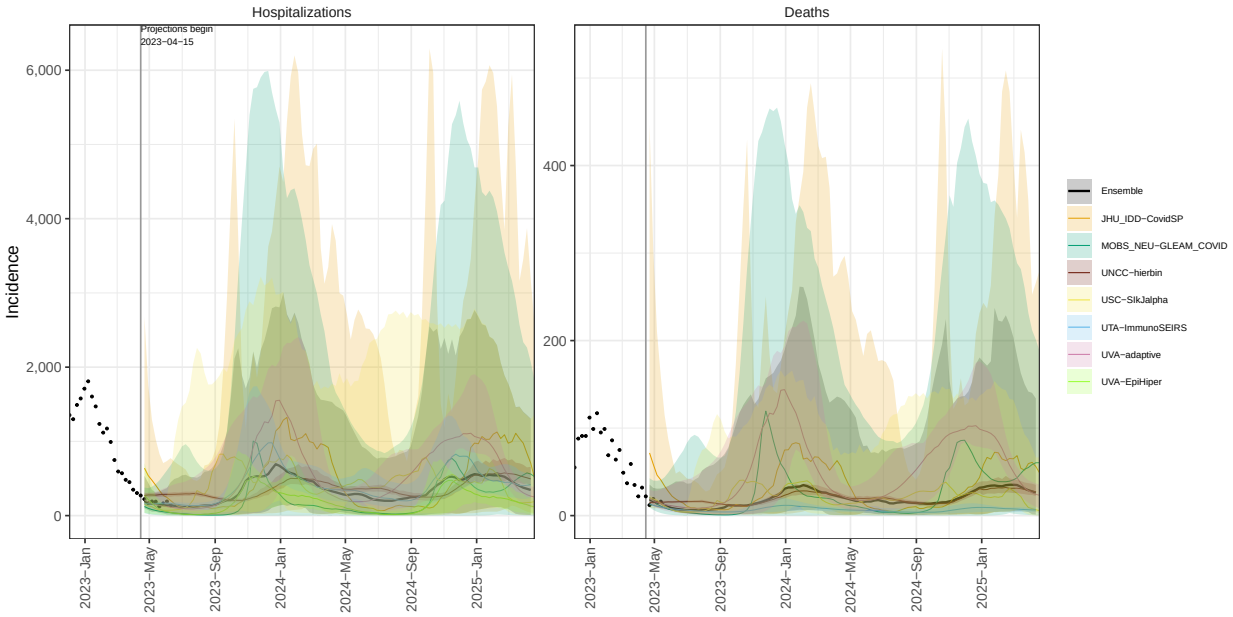
NV model variance & 95% projection intervals − Booster for 65+, Low immune escape



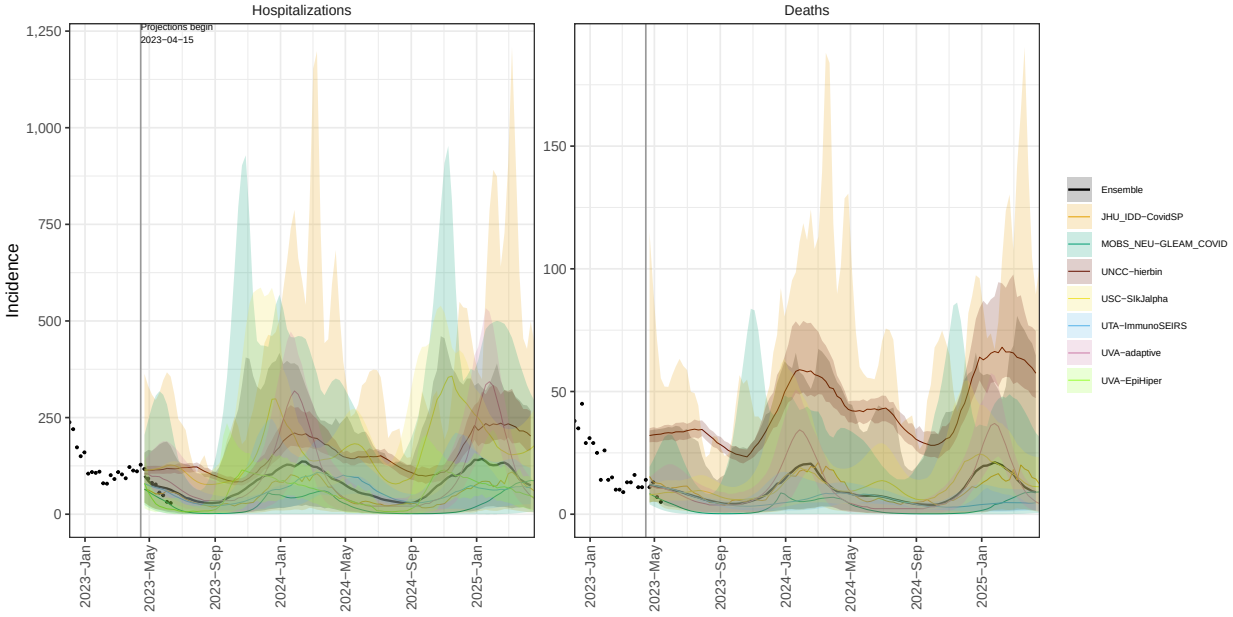
NH model variance & 95% projection intervals − Booster for 65+, Low immune escape



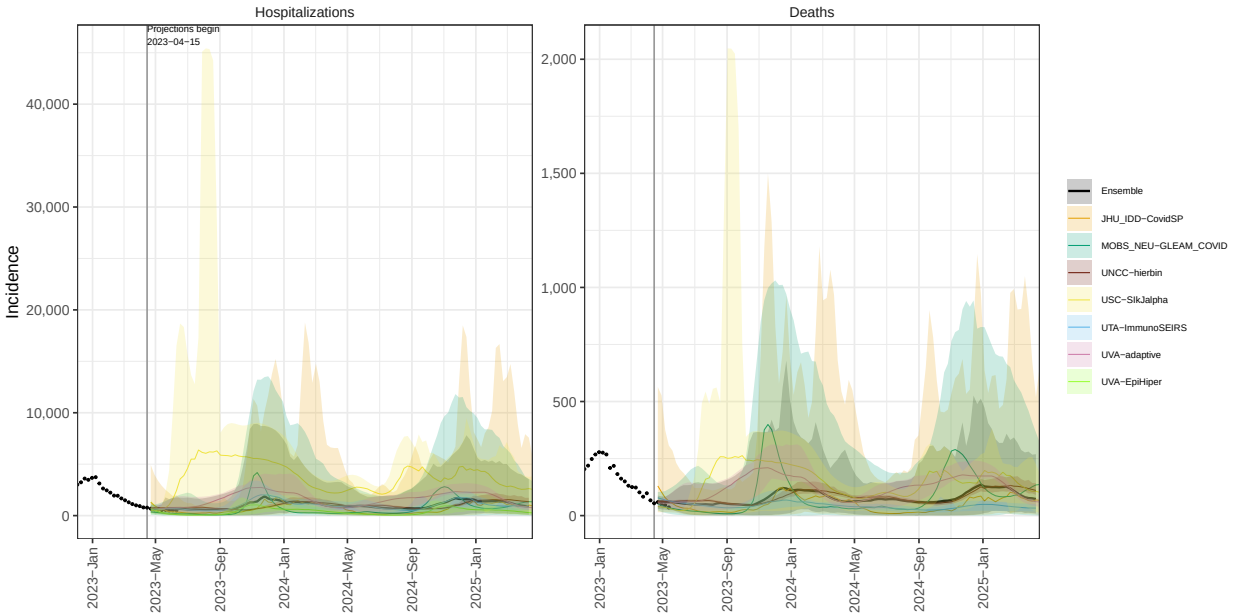
NJ model variance & 95% projection intervals − Booster for 65+, Low immune escape



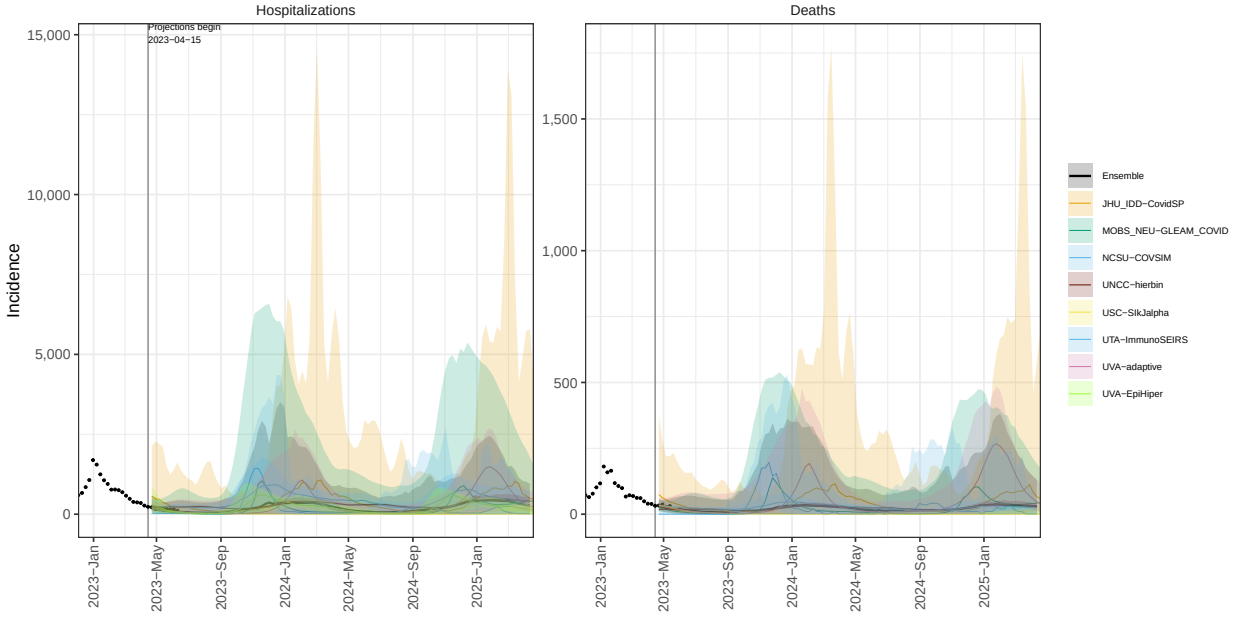
NM model variance & 95% projection intervals − Booster for 65+, Low immune escape



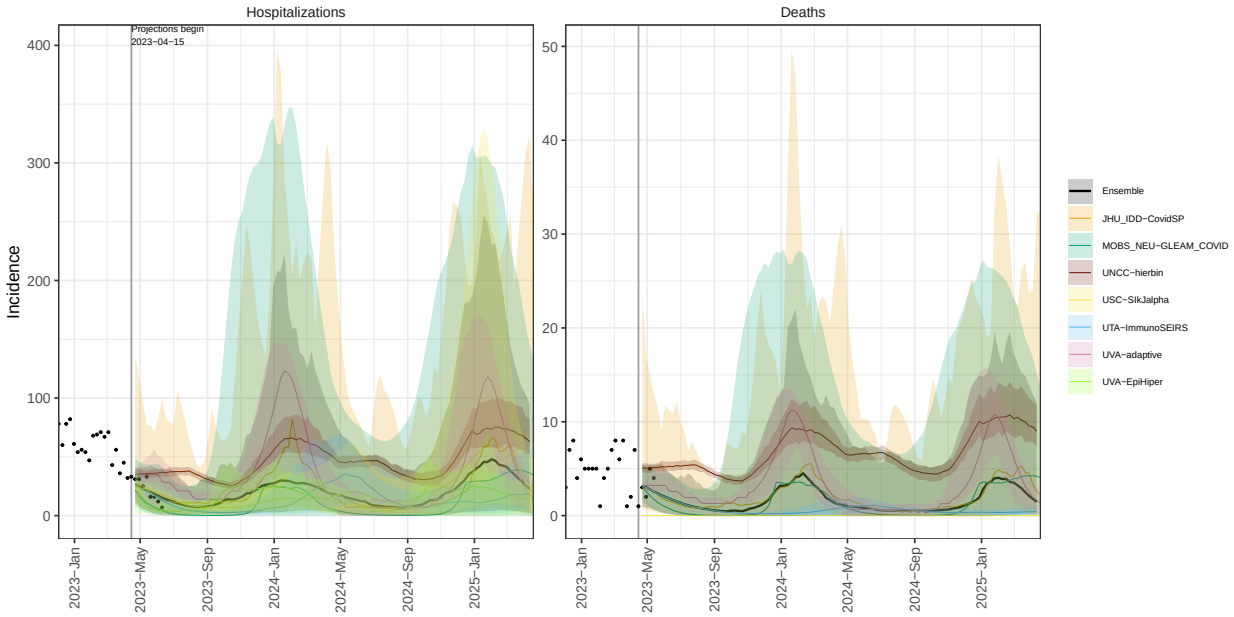
NY model variance & 95% projection intervals − Booster for 65+, Low immune escape

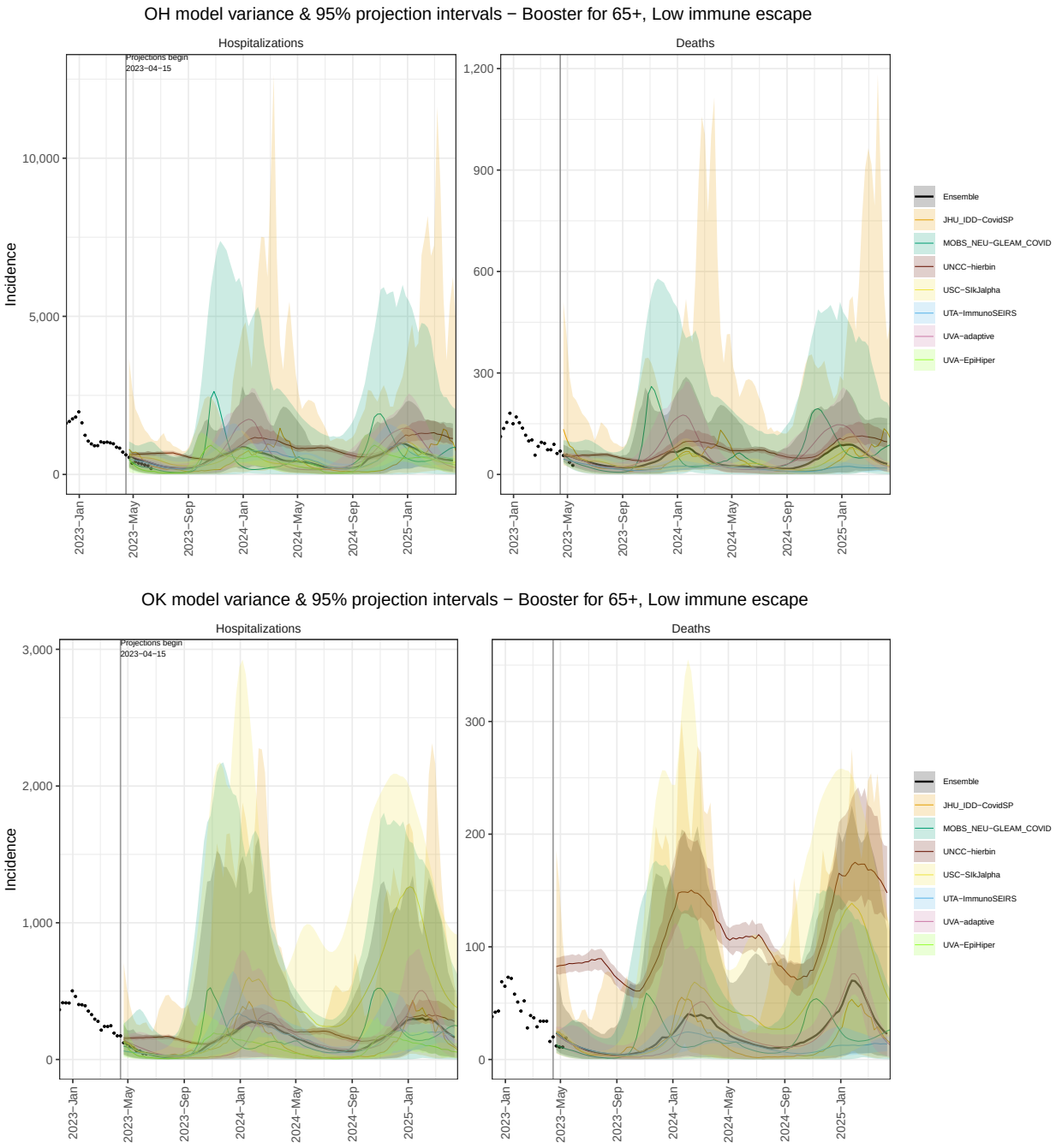


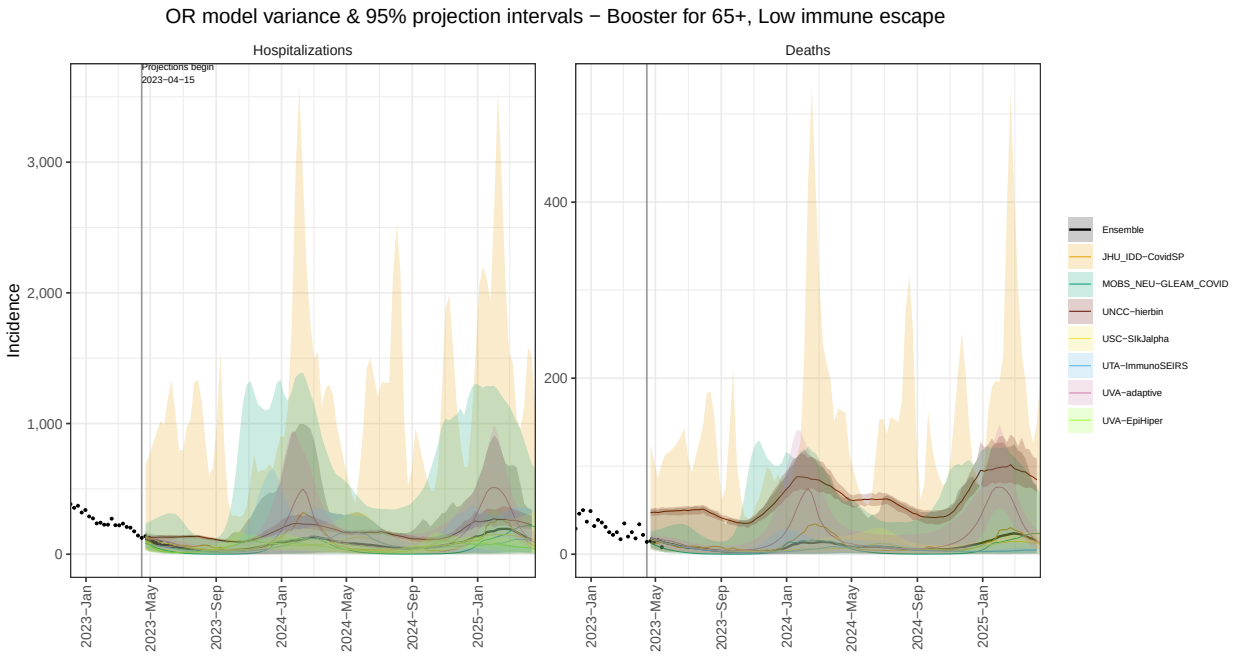
NC model variance & 95% projection intervals − Booster for 65+, Low immune escape

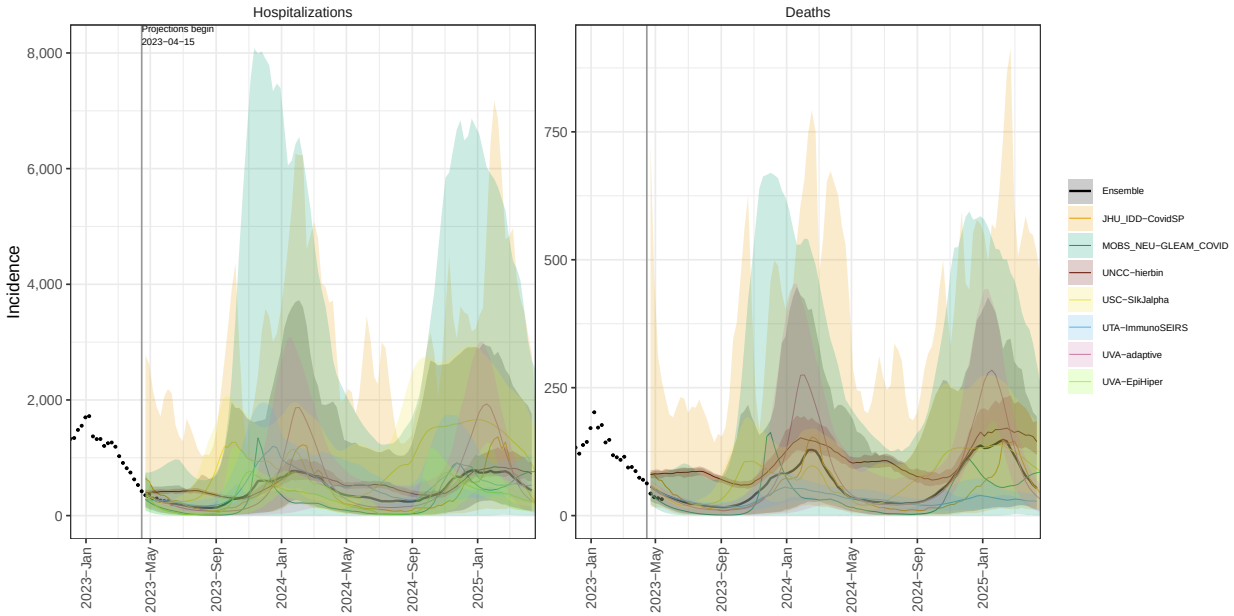


ND model variance & 95% projection intervals − Booster for 65+, Low immune escape

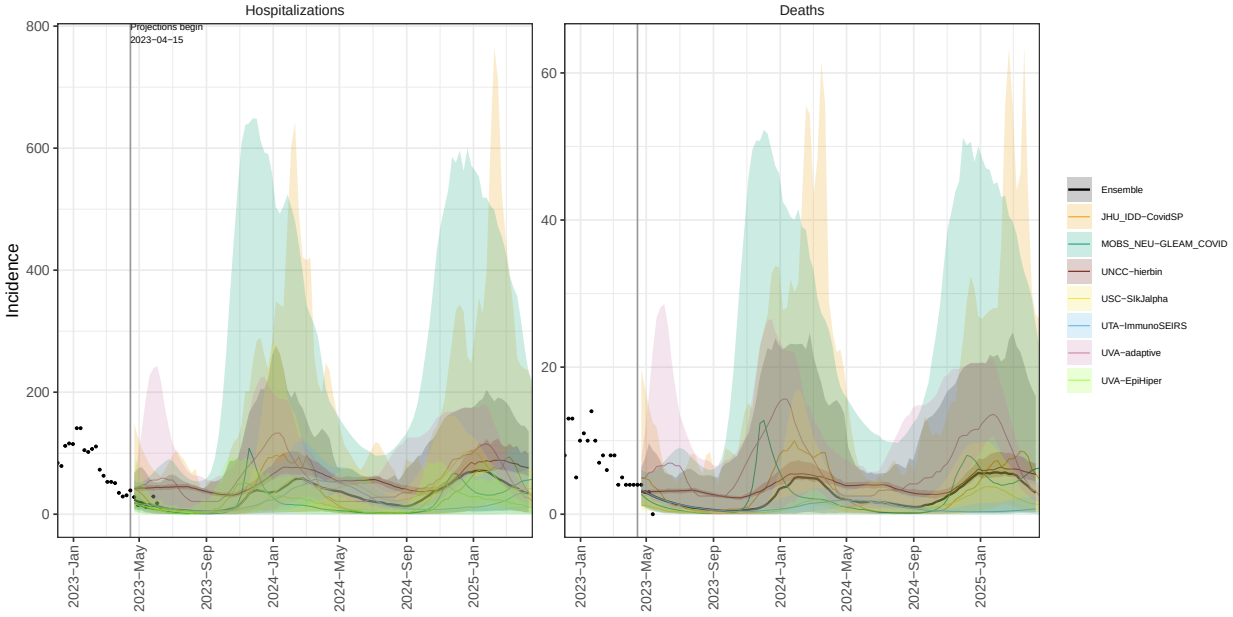



OH model variance & 95% projection intervals − Booster for 65+, Low immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
10,000
5,000
0
1,200
900
600
300
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper
OK model variance & 95% projection intervals − Booster for 65+, Low immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
3,000
2,000
1,000
0
300
200
100
0
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

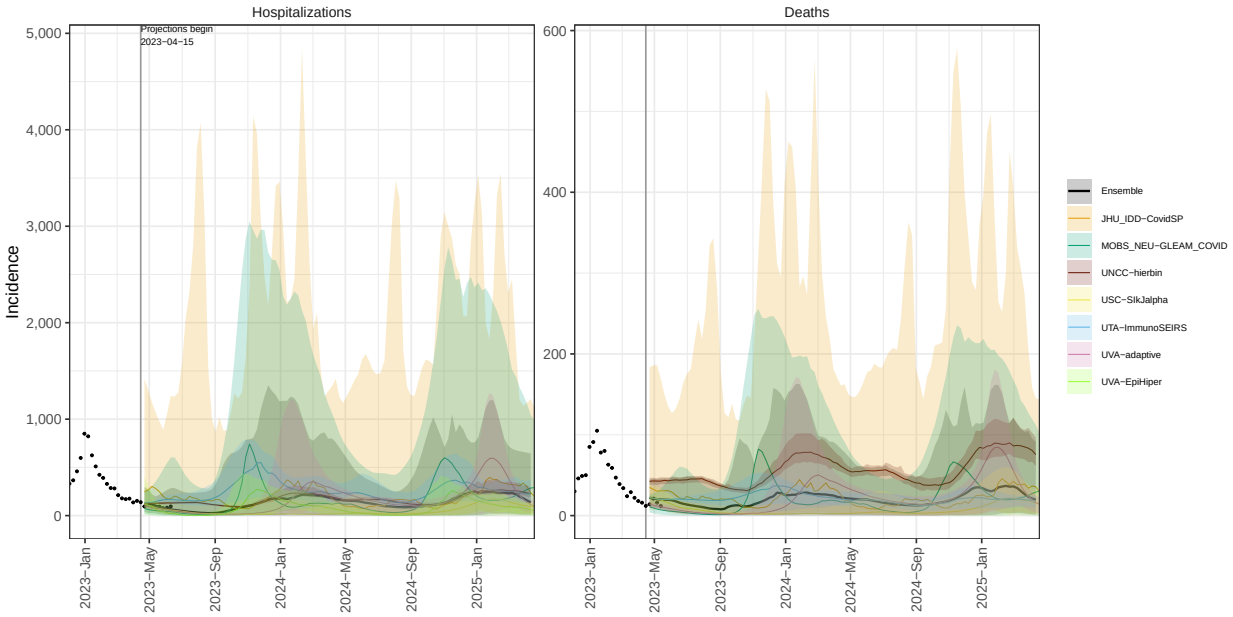

OR model variance & 95% projection intervals − Booster for 65+, Low immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
3,000
2,000
1,000
0
400
200
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper


PA model variance & 95% projection intervals − Booster for 65+, Low immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
8,000
6,000
4,000
2,000
0
750
500
250
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

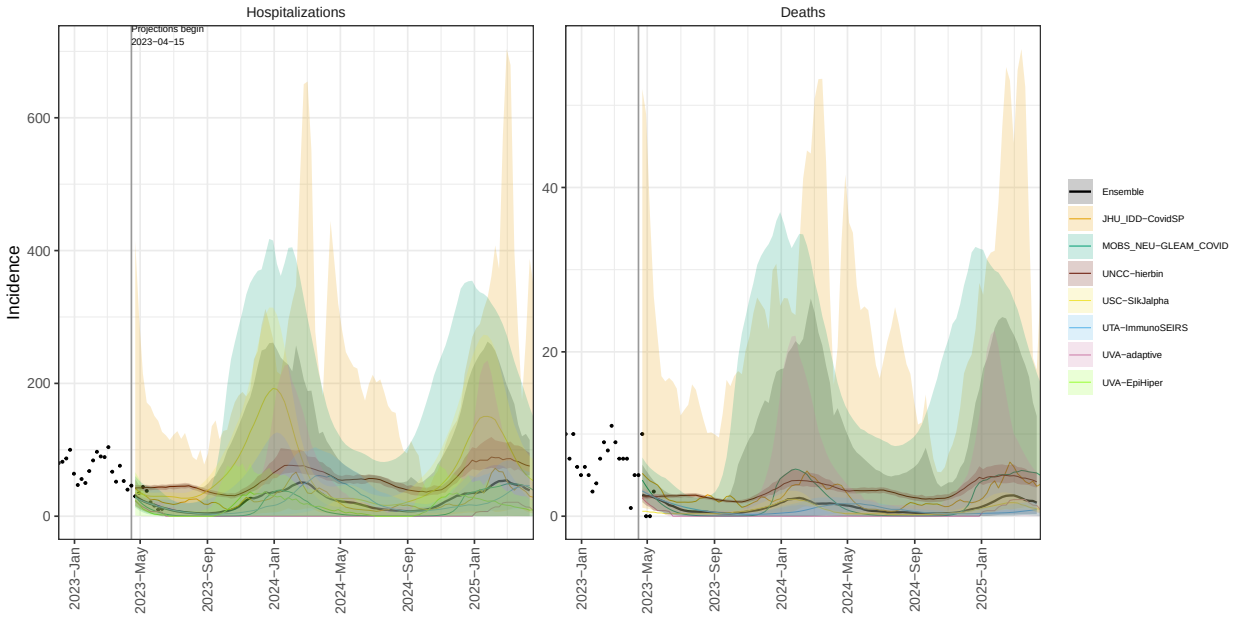
RI model variance & 95% projection intervals − Booster for 65+, Low immune escape



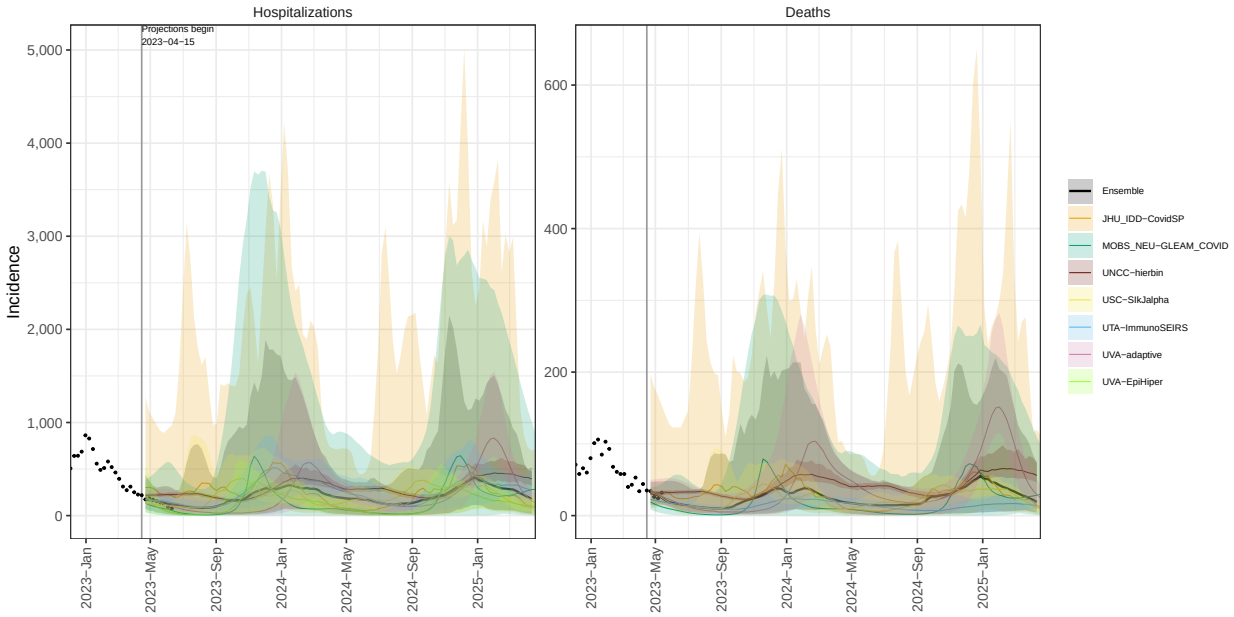
SC model variance & 95% projection intervals − Booster for 65+, Low immune escape



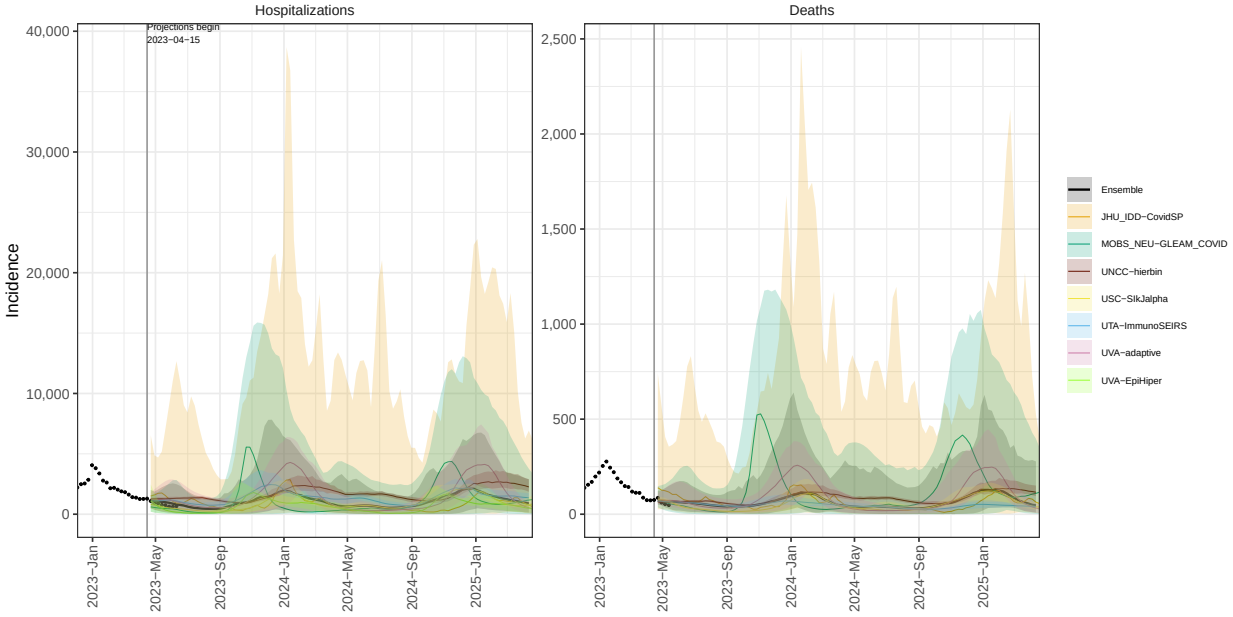
SD model variance & 95% projection intervals − Booster for 65+, Low immune escape



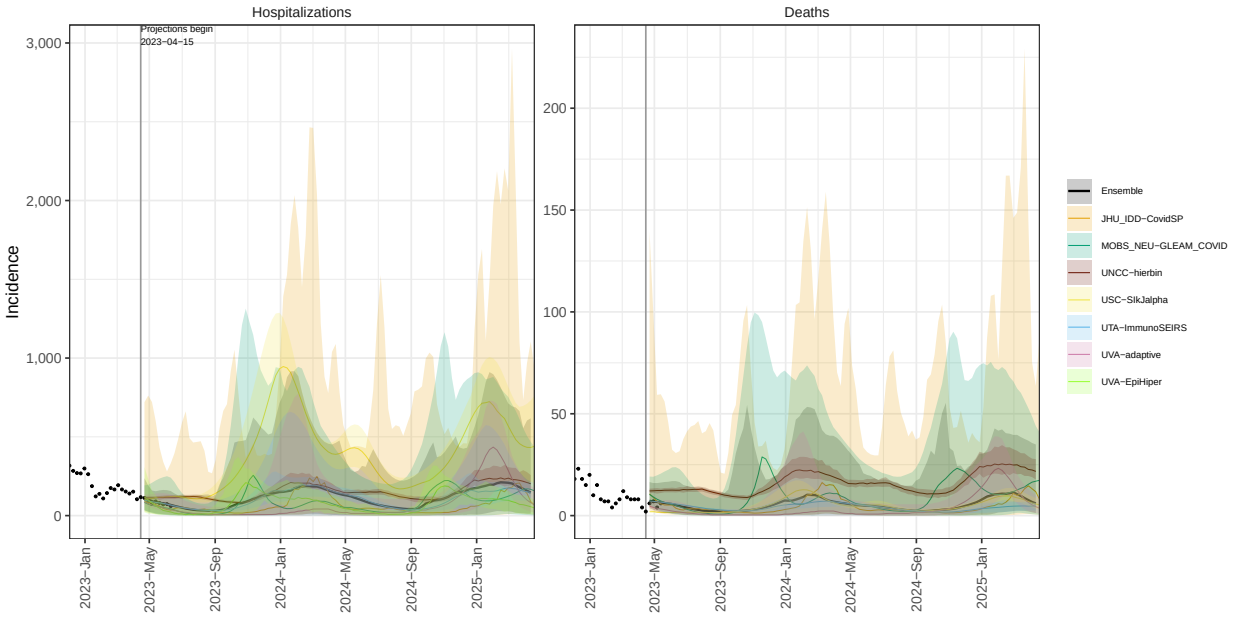
TN model variance & 95% projection intervals − Booster for 65+, Low immune escape



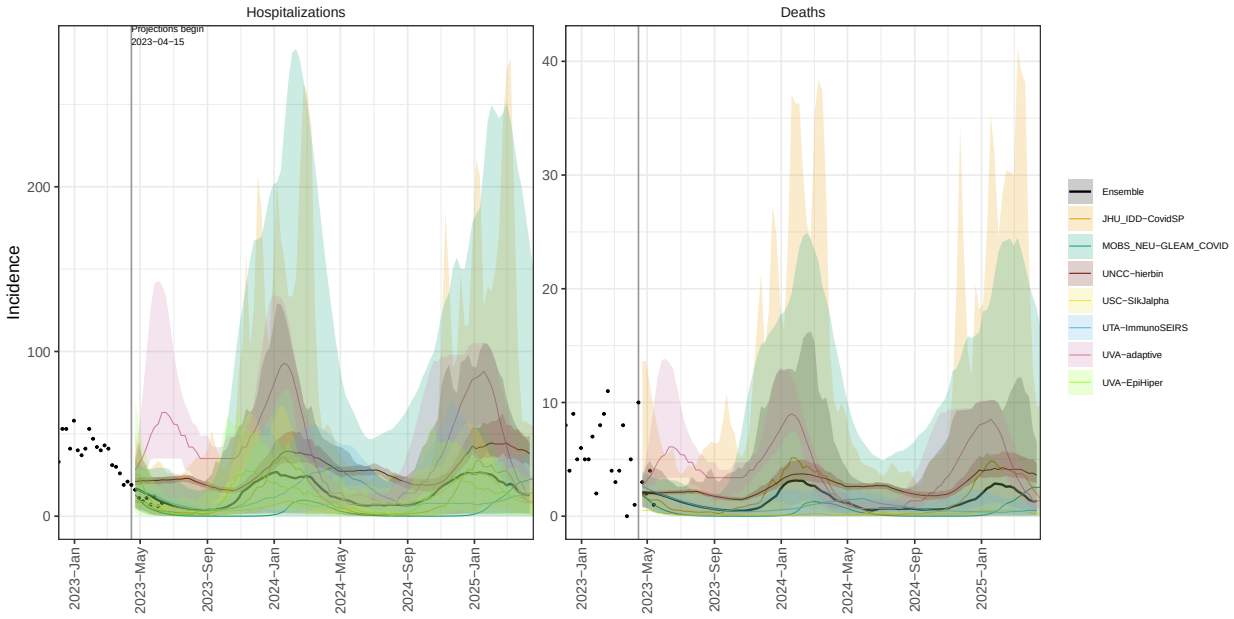
TX model variance & 95% projection intervals − Booster for 65+, Low immune escape



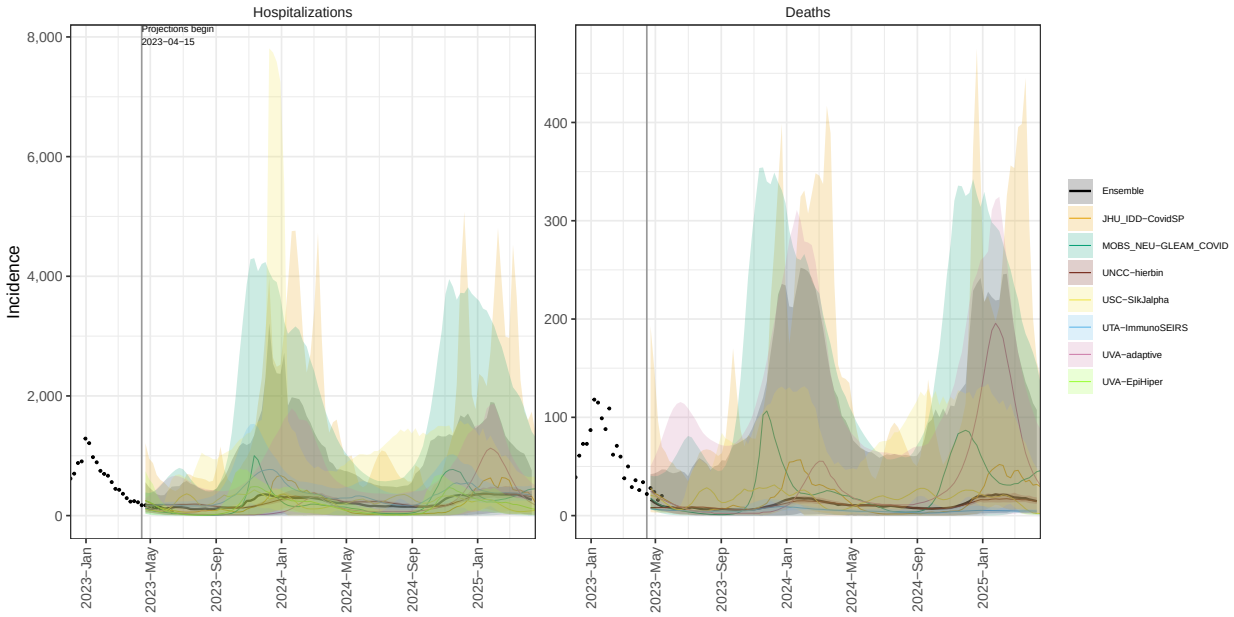
UT model variance & 95% projection intervals − Booster for 65+, Low immune escape



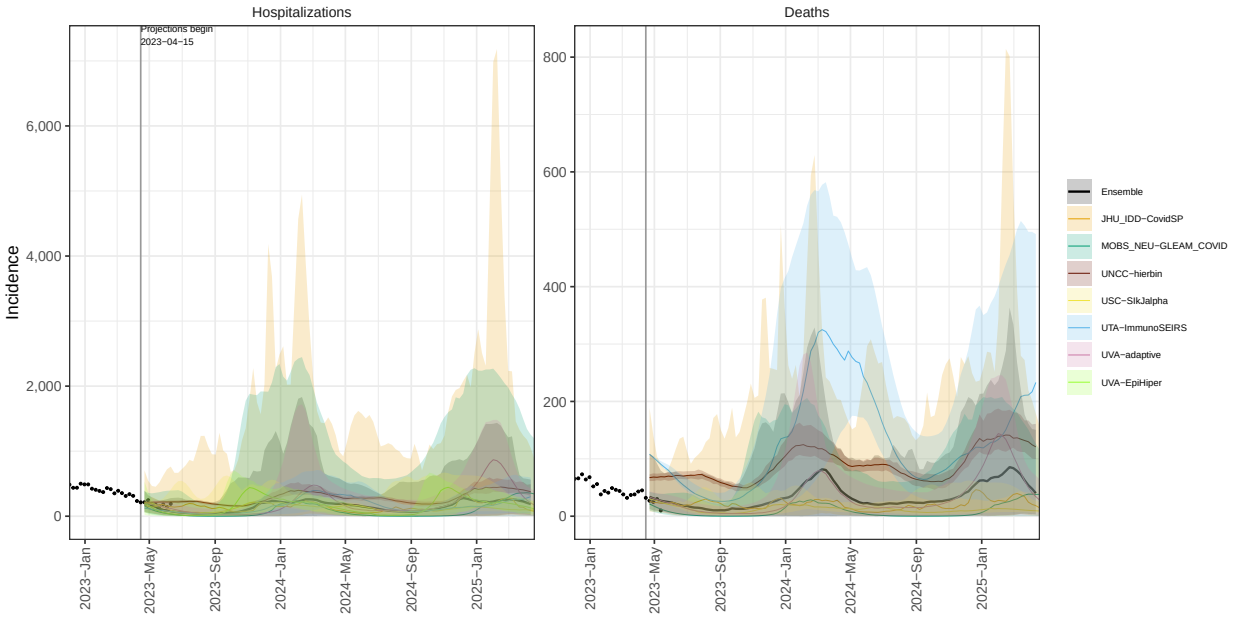
VT model variance & 95% projection intervals − Booster for 65+, Low immune escape



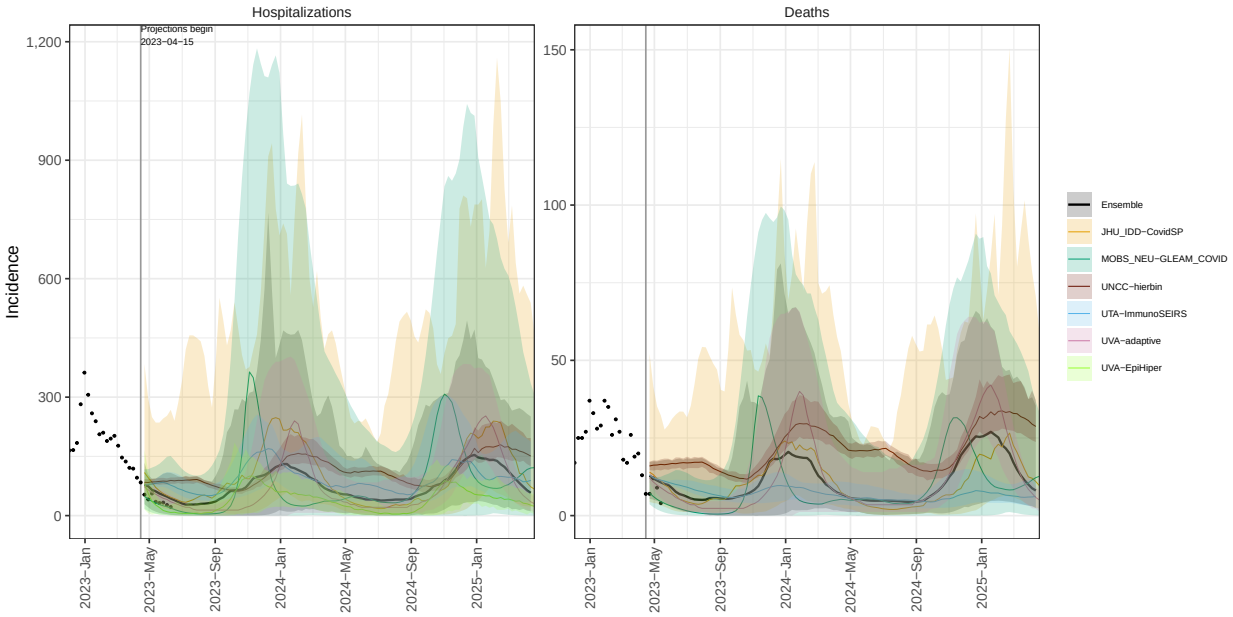
VA model variance & 95% projection intervals − Booster for 65+, Low immune escape

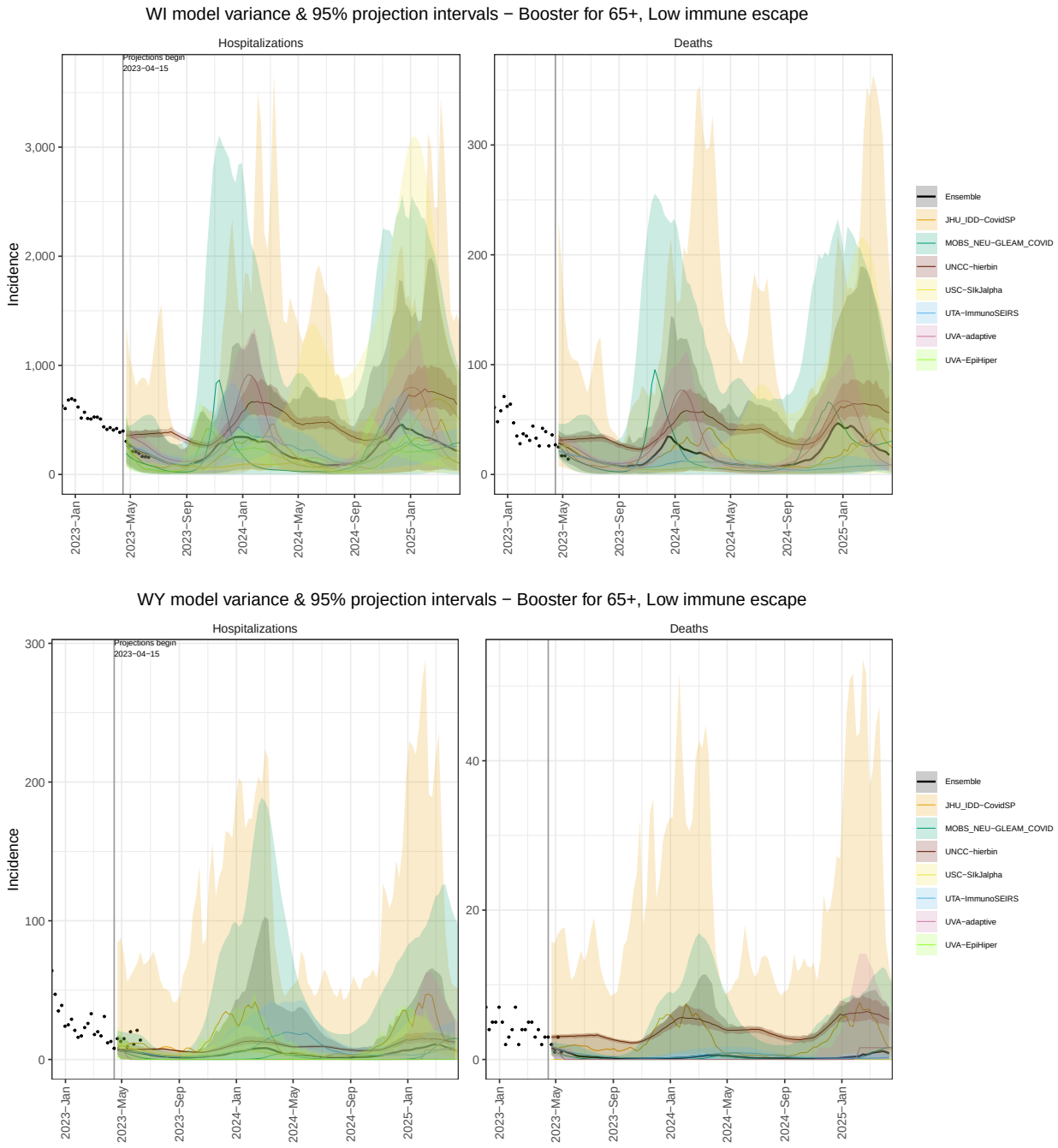


WA model variance & 95% projection intervals − Booster for 65+, Low immune escape



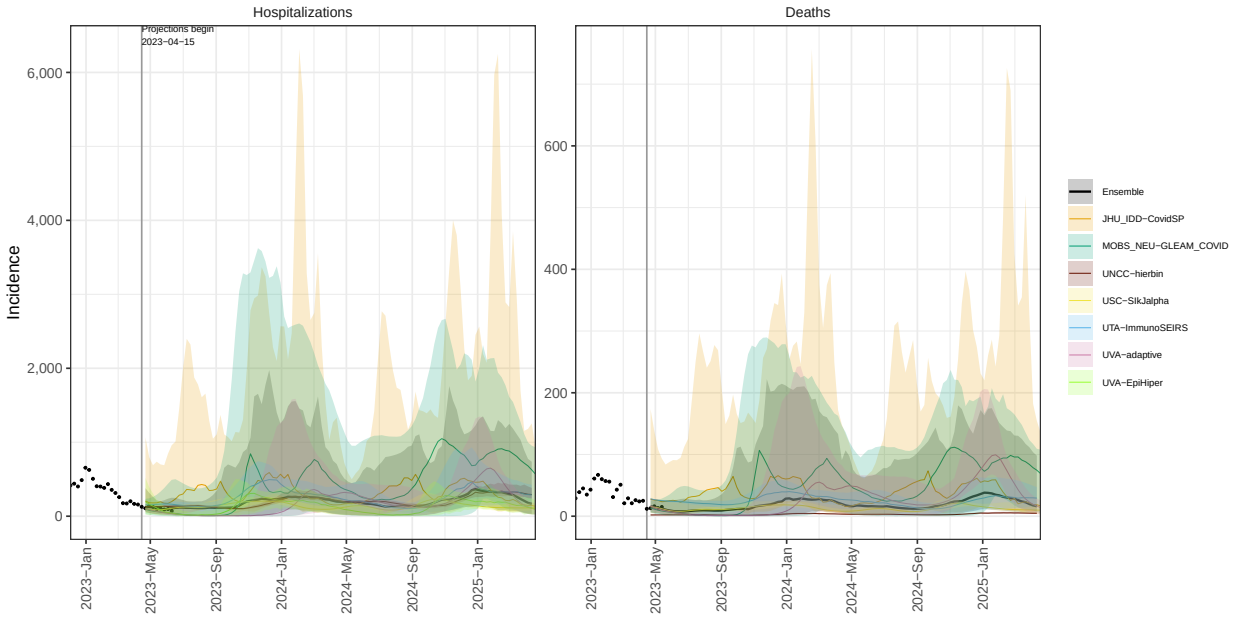
WV model variance & 95% projection intervals − Booster for 65+, Low immune escape



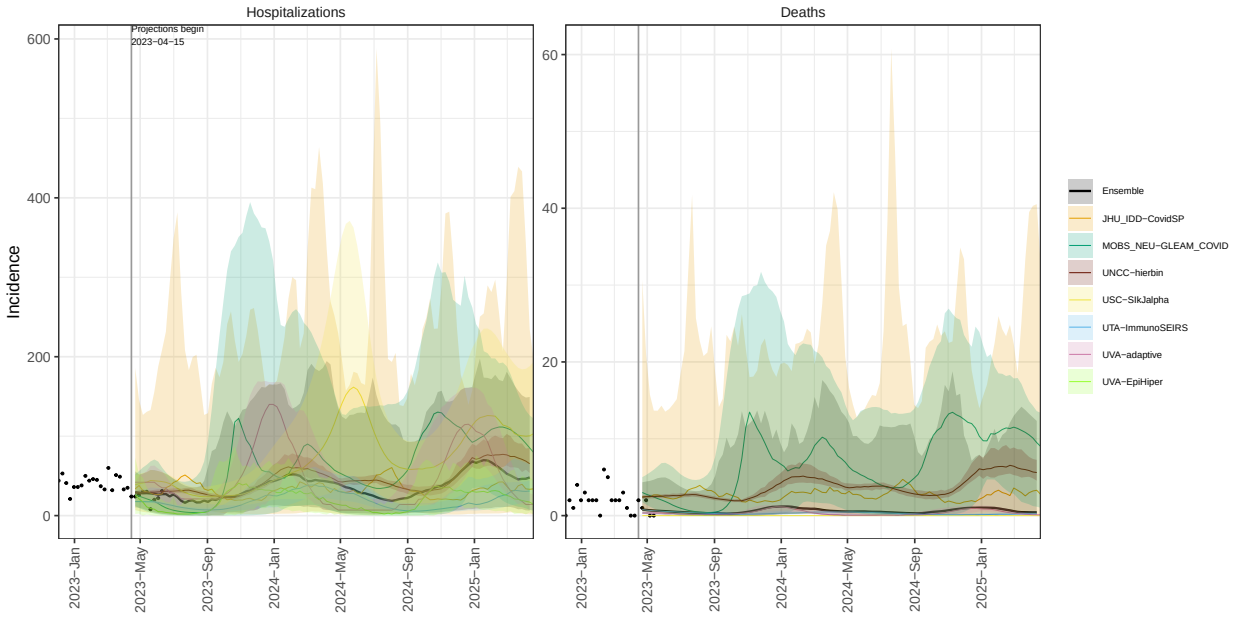


Model variation for the Booster for 65+, High immune escape scenario.

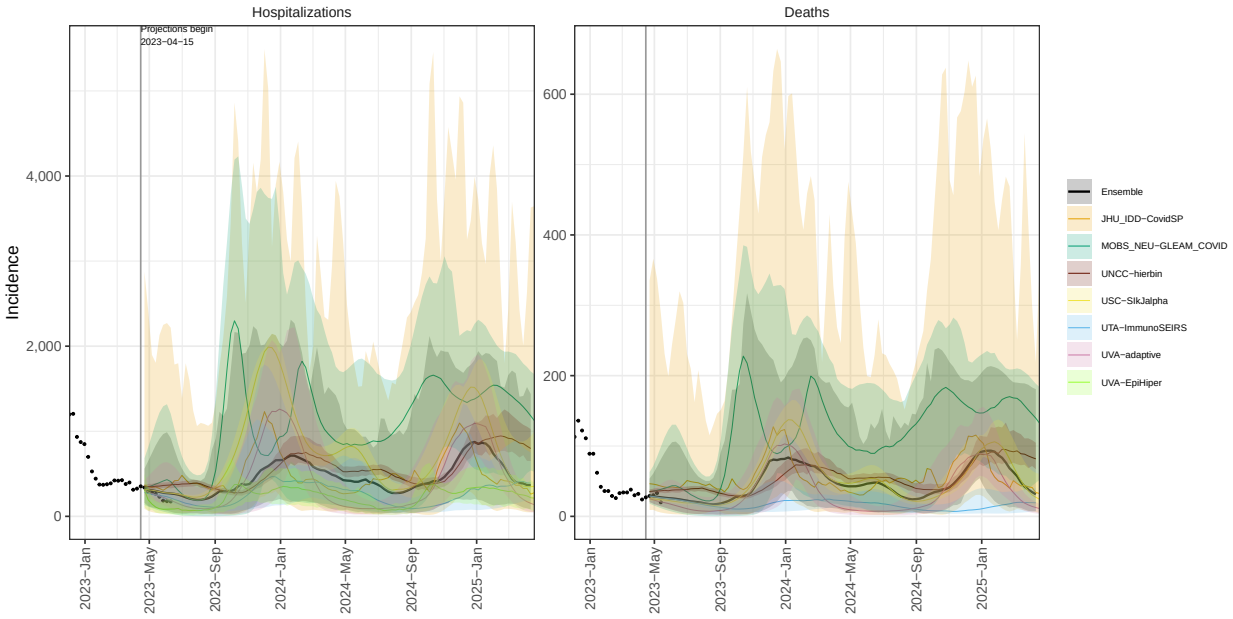
AL model variance & 95% projection intervals − Booster for 65+, High immune escape



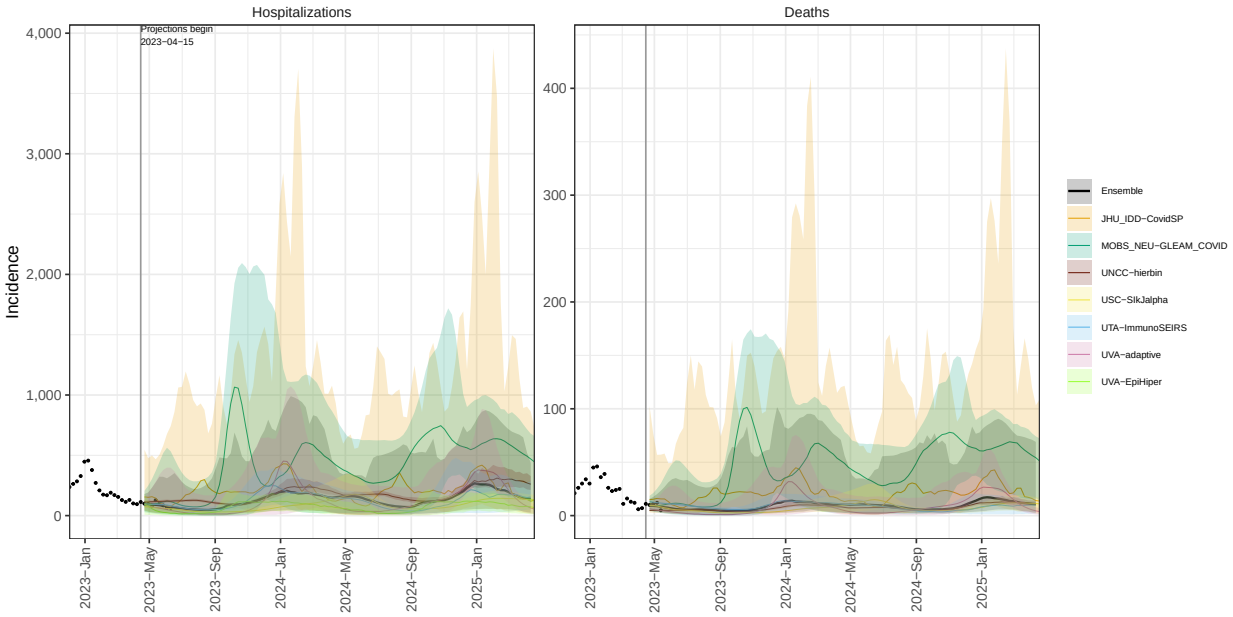
AK model variance & 95% projection intervals − Booster for 65+, High immune escape



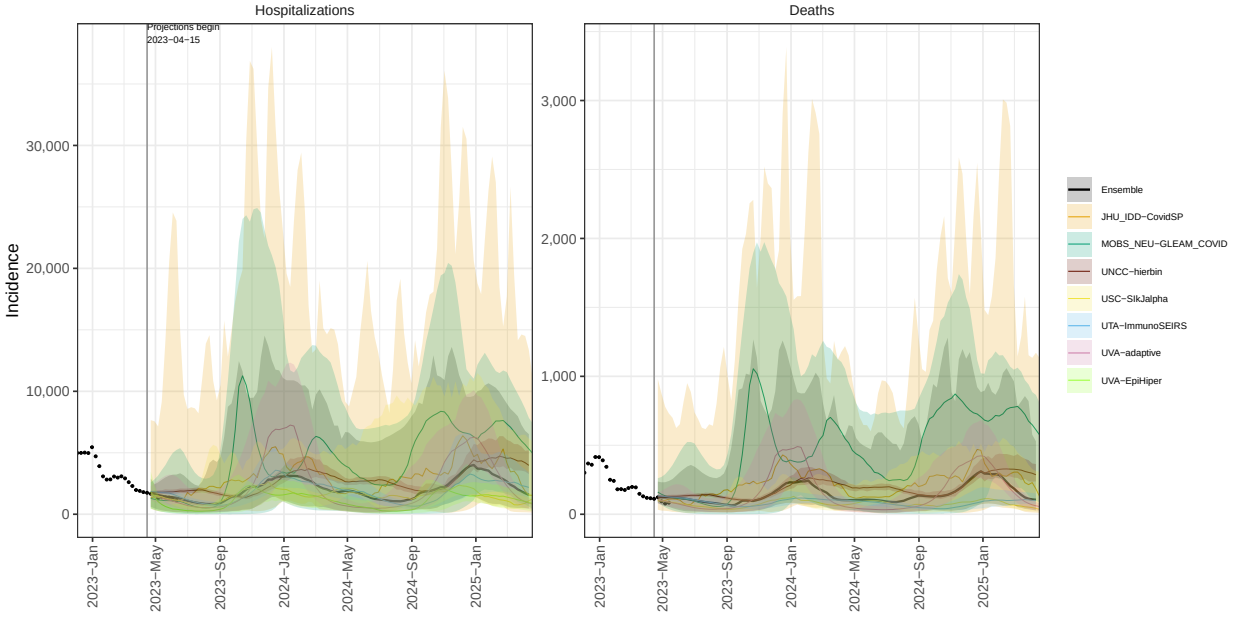
AZ model variance & 95% projection intervals − Booster for 65+, High immune escape



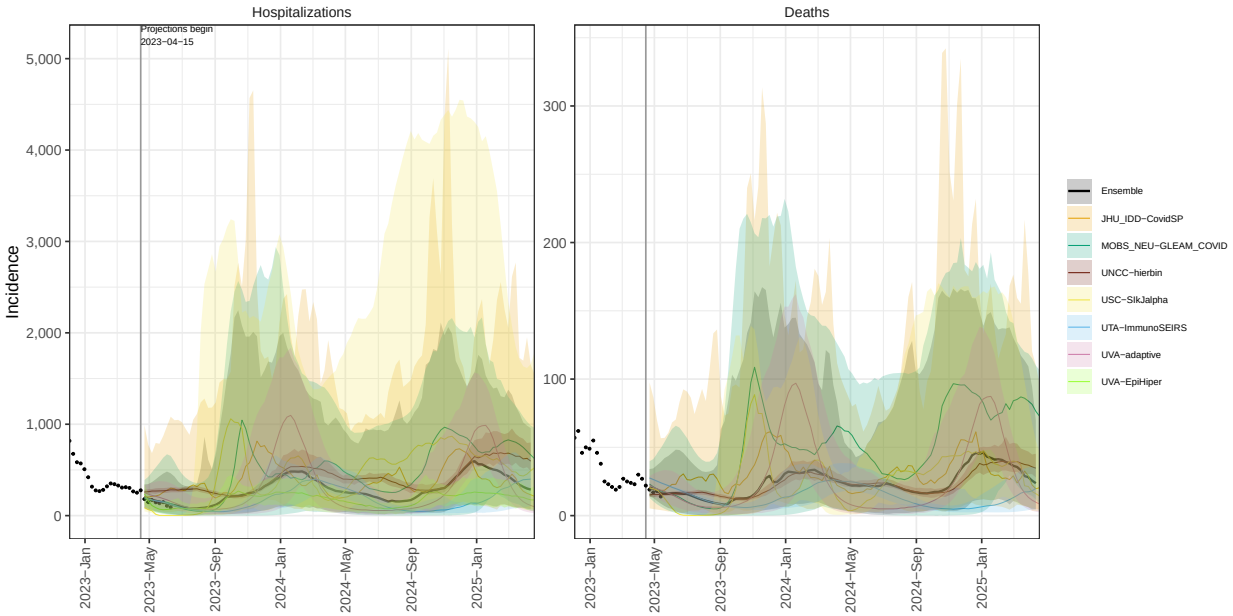
AR model variance & 95% projection intervals − Booster for 65+, High immune escape



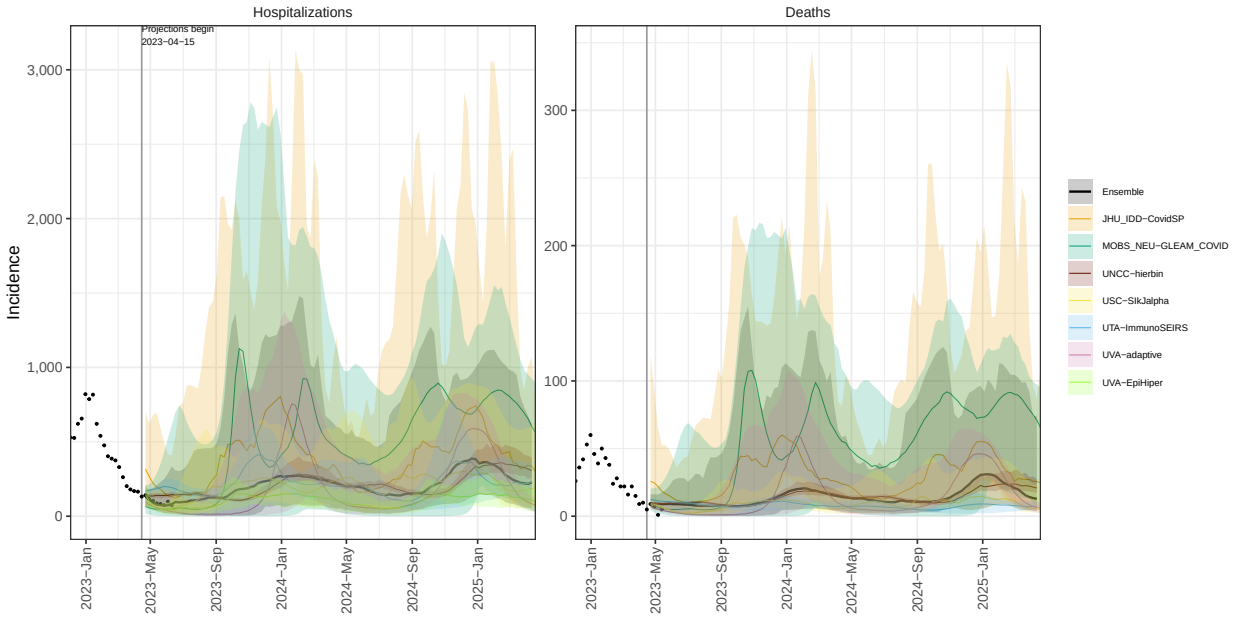
CA model variance & 95% projection intervals − Booster for 65+, High immune escape



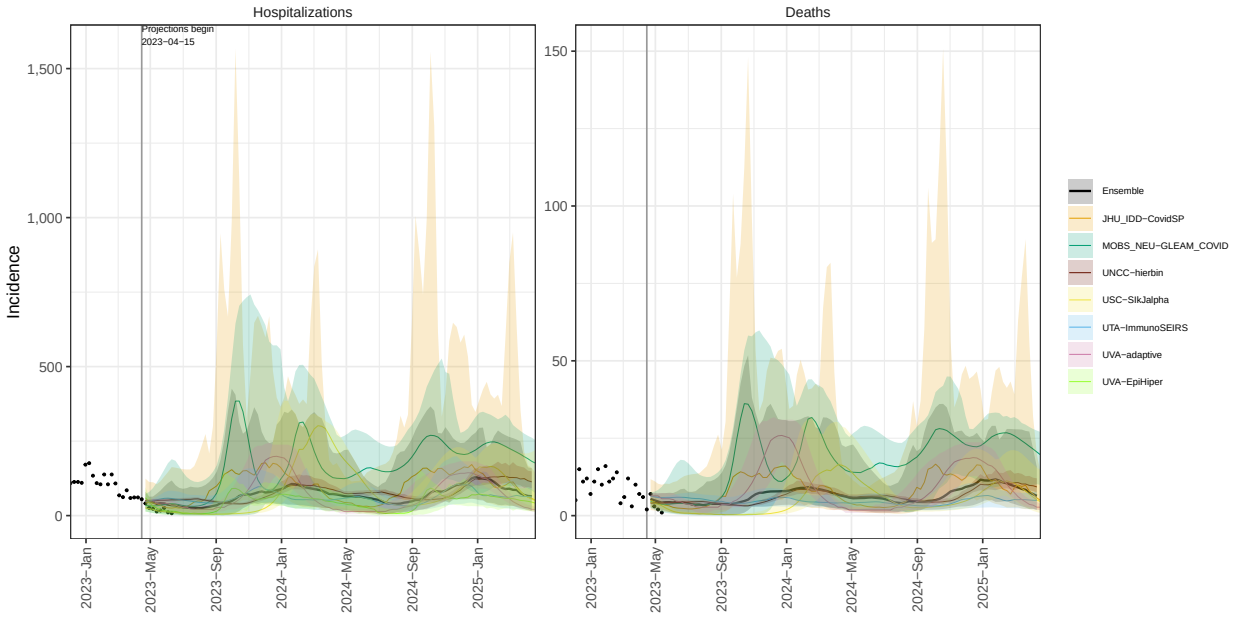
CO model variance & 95% projection intervals − Booster for 65+, High immune escape



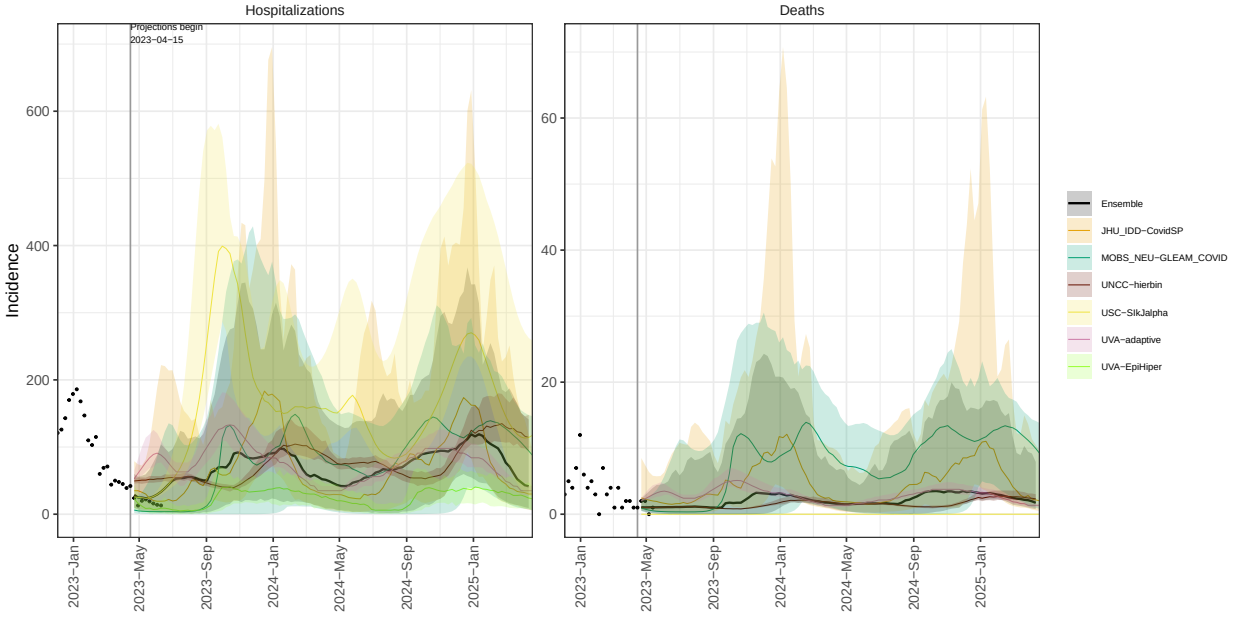
CT model variance & 95% projection intervals − Booster for 65+, High immune escape



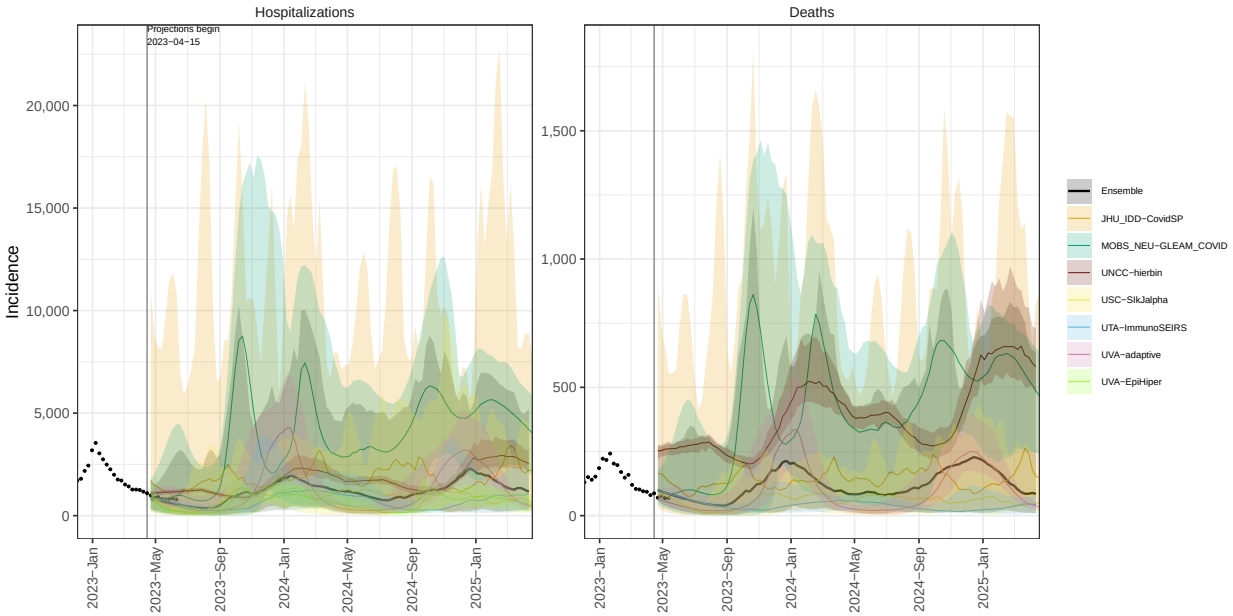
DE model variance & 95% projection intervals − Booster for 65+, High immune escape



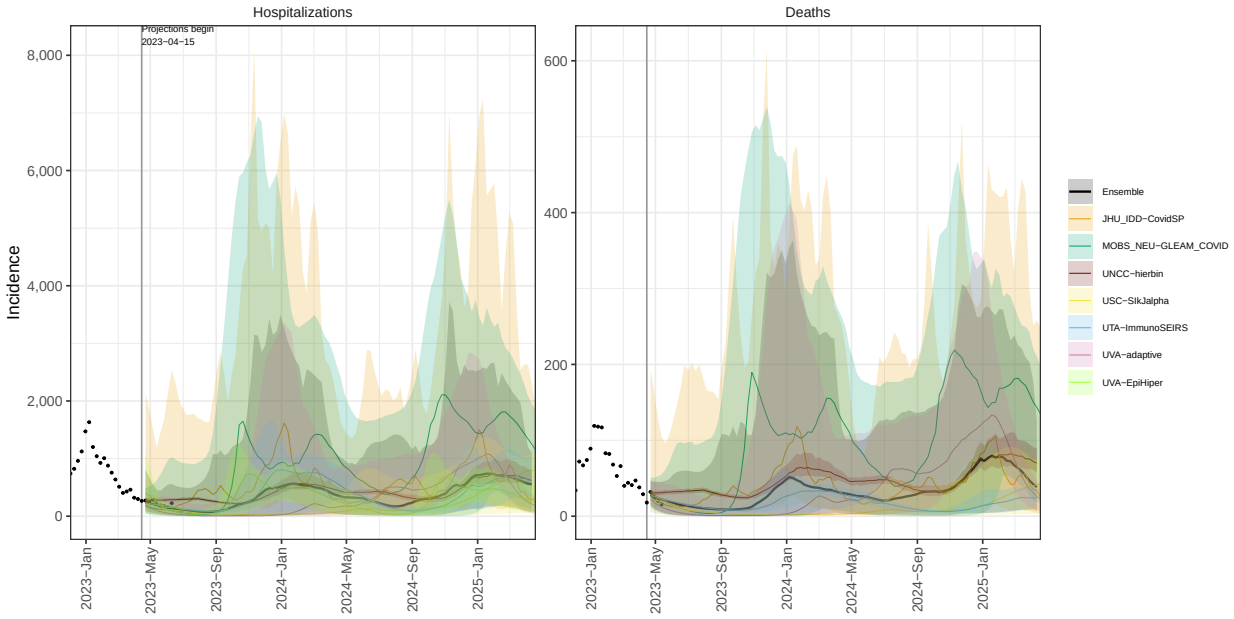
DC model variance & 95% projection intervals − Booster for 65+, High immune escape



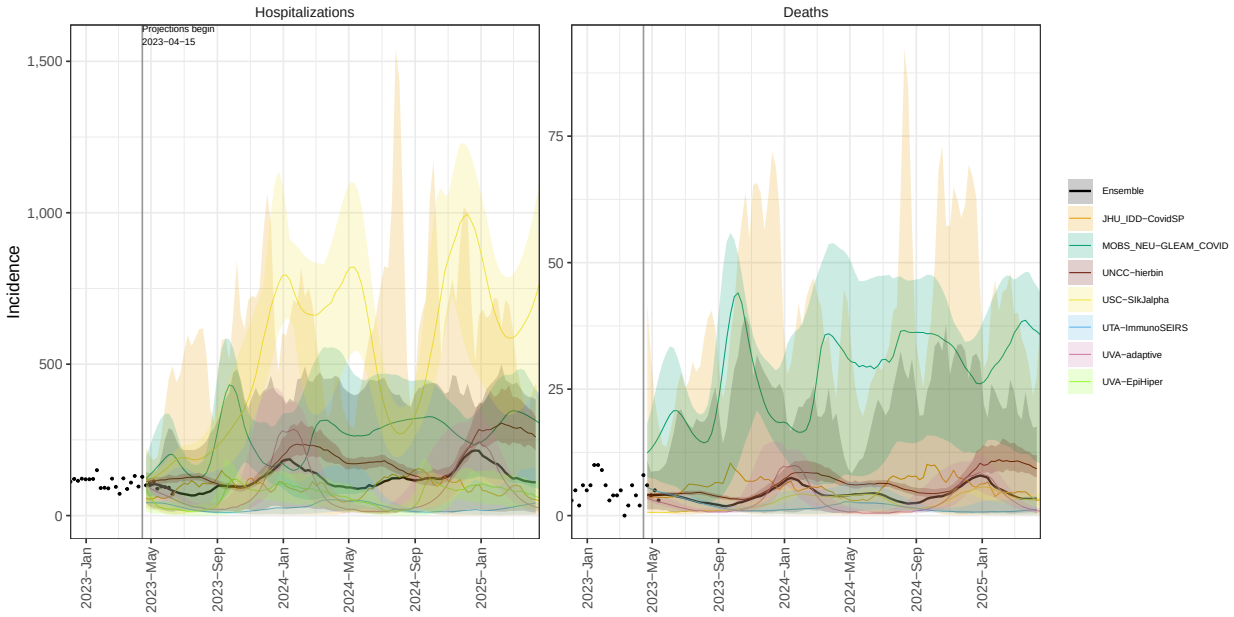
FL model variance & 95% projection intervals − Booster for 65+, High immune escape



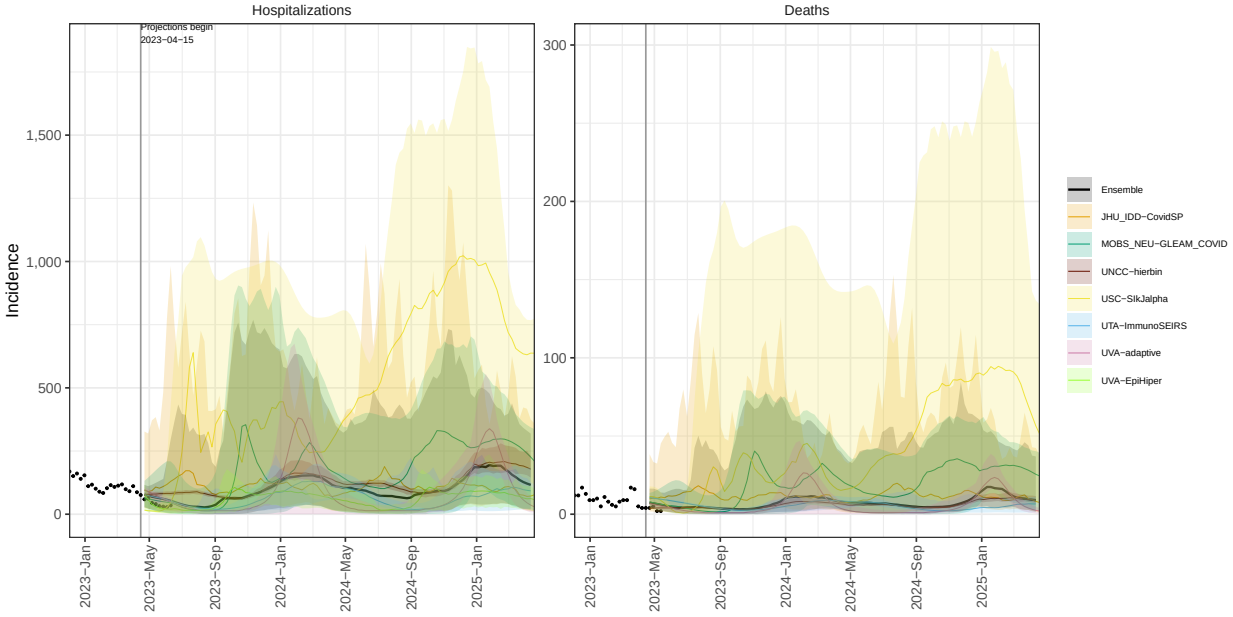
GA model variance & 95% projection intervals − Booster for 65+, High immune escape



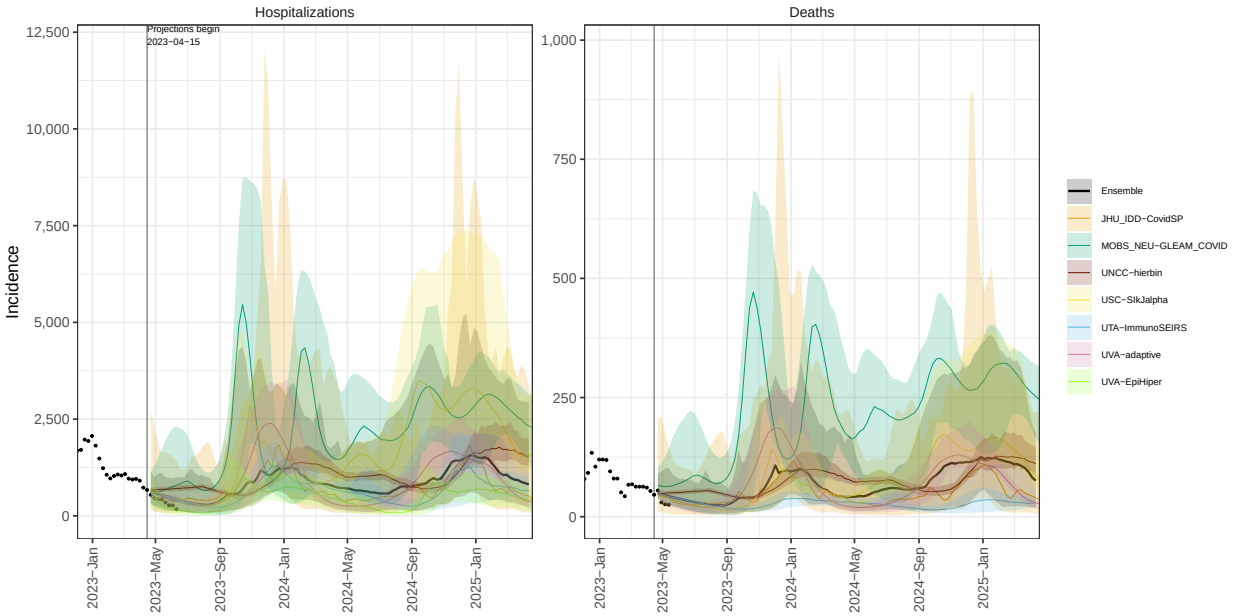
HI model variance & 95% projection intervals − Booster for 65+, High immune escape



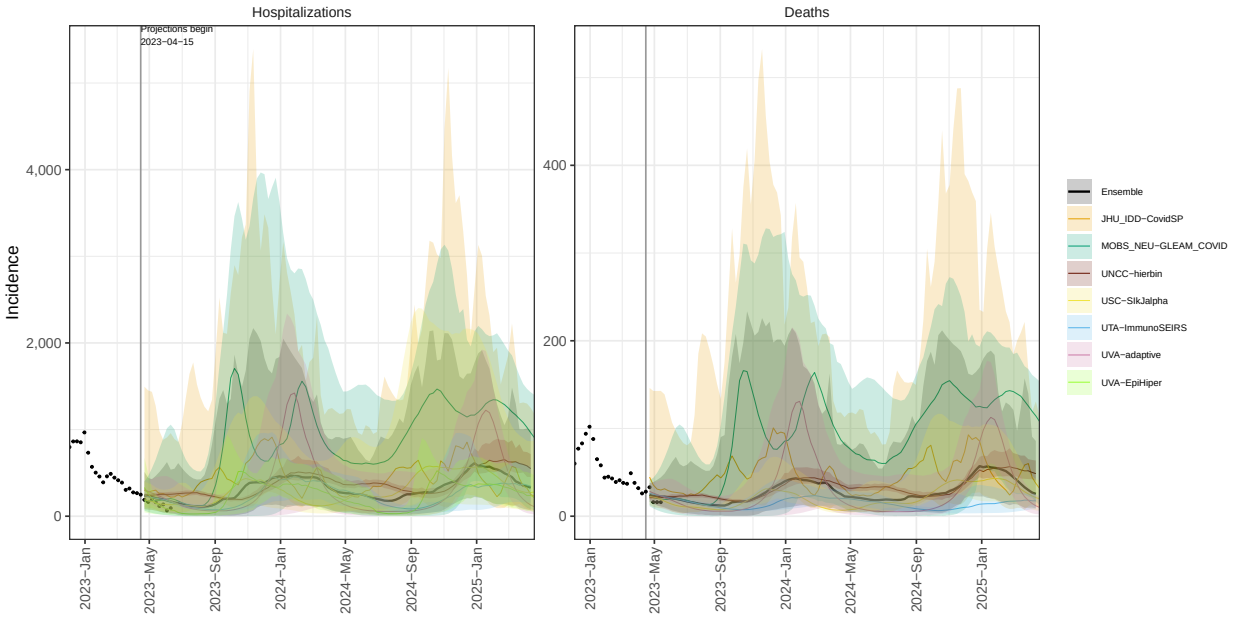
ID model variance & 95% projection intervals − Booster for 65+, High immune escape



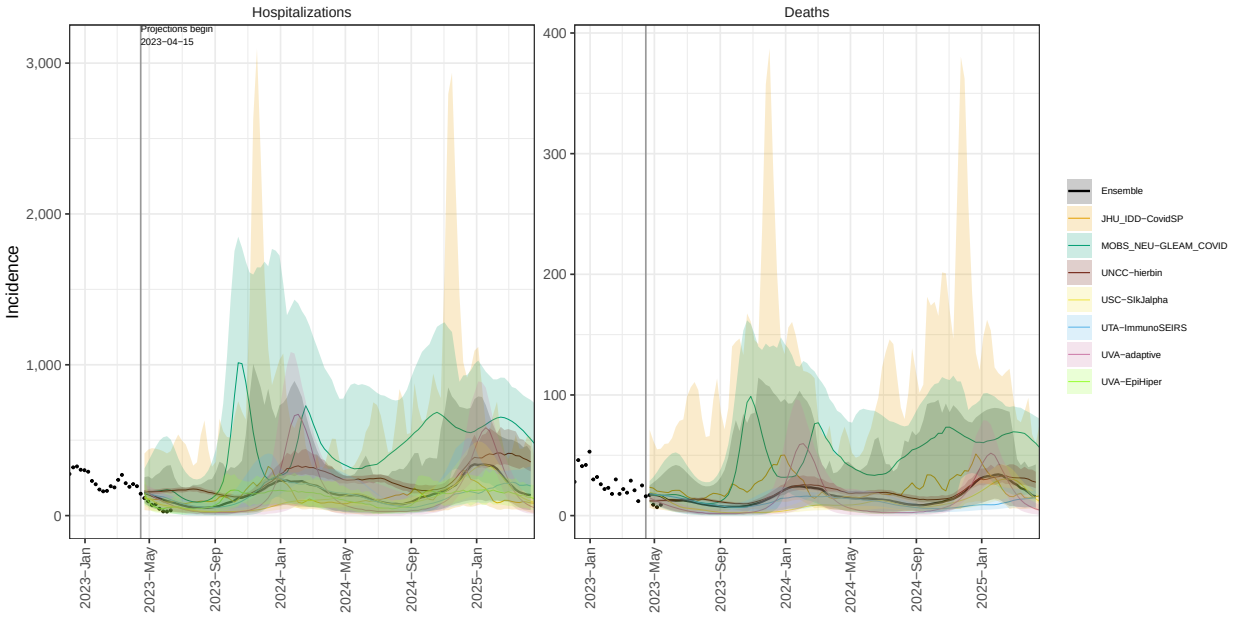
IL model variance & 95% projection intervals − Booster for 65+, High immune escape



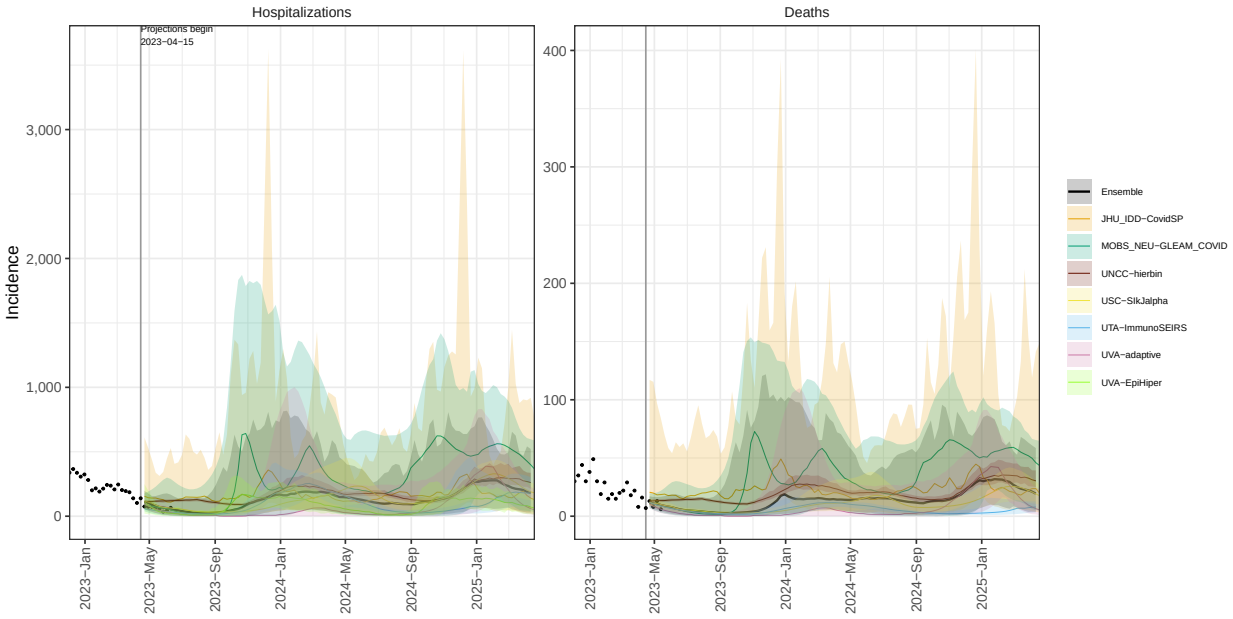
IN model variance & 95% projection intervals − Booster for 65+, High immune escape



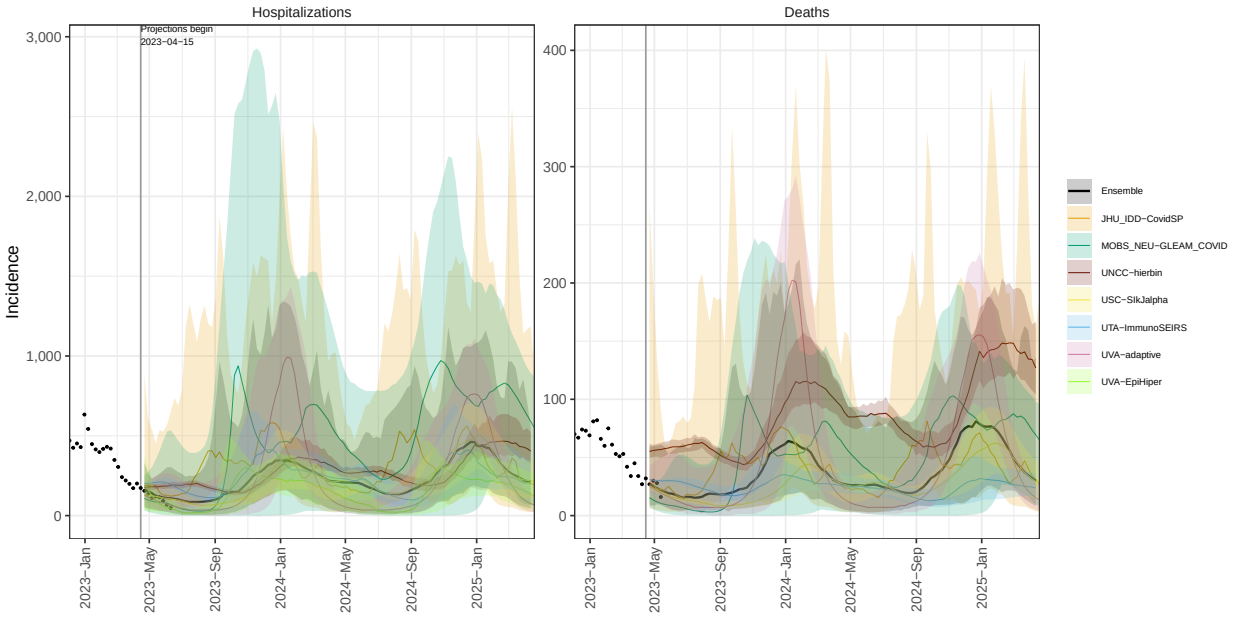
IA model variance & 95% projection intervals − Booster for 65+, High immune escape



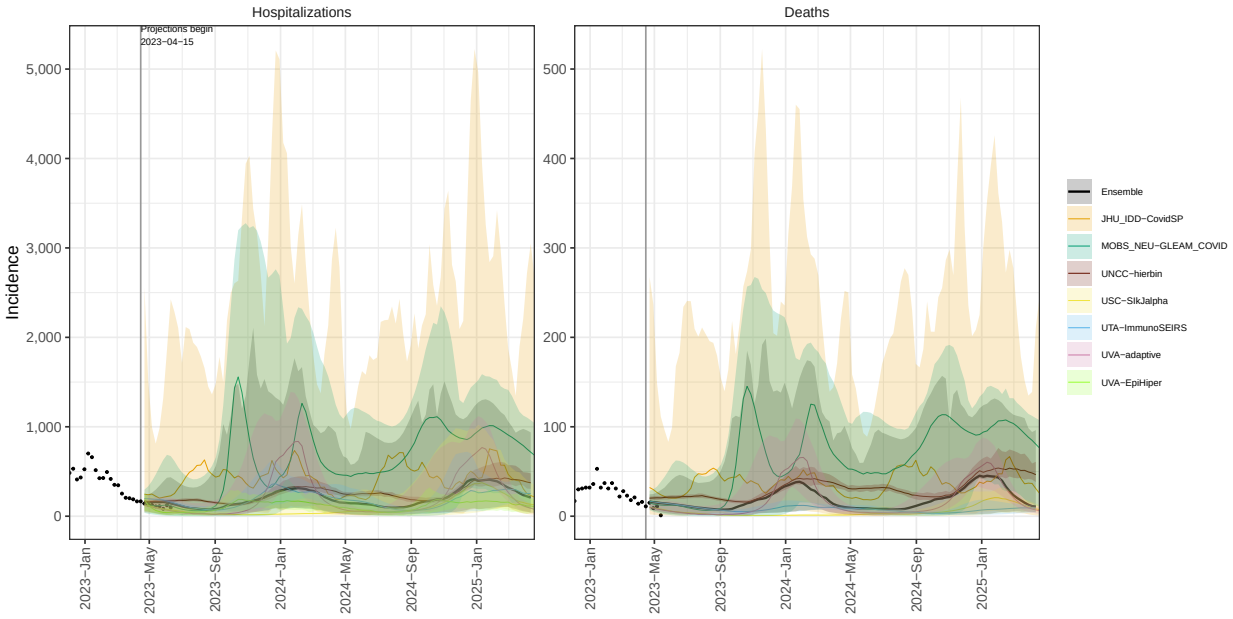
KS model variance & 95% projection intervals − Booster for 65+, High immune escape



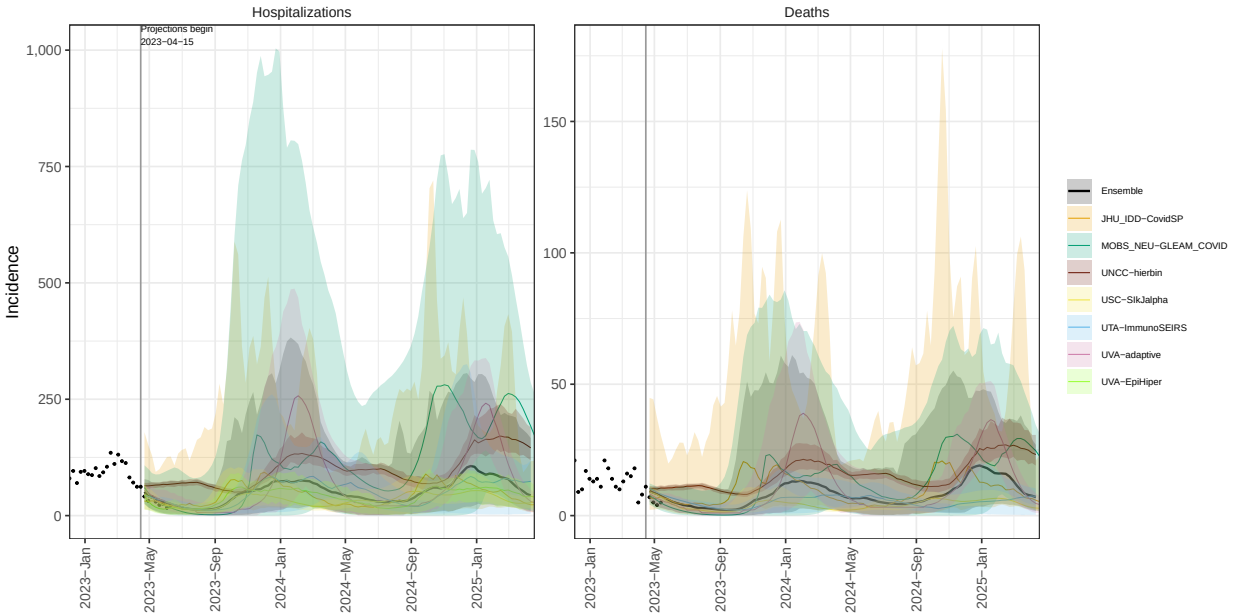
KY model variance & 95% projection intervals − Booster for 65+, High immune escape



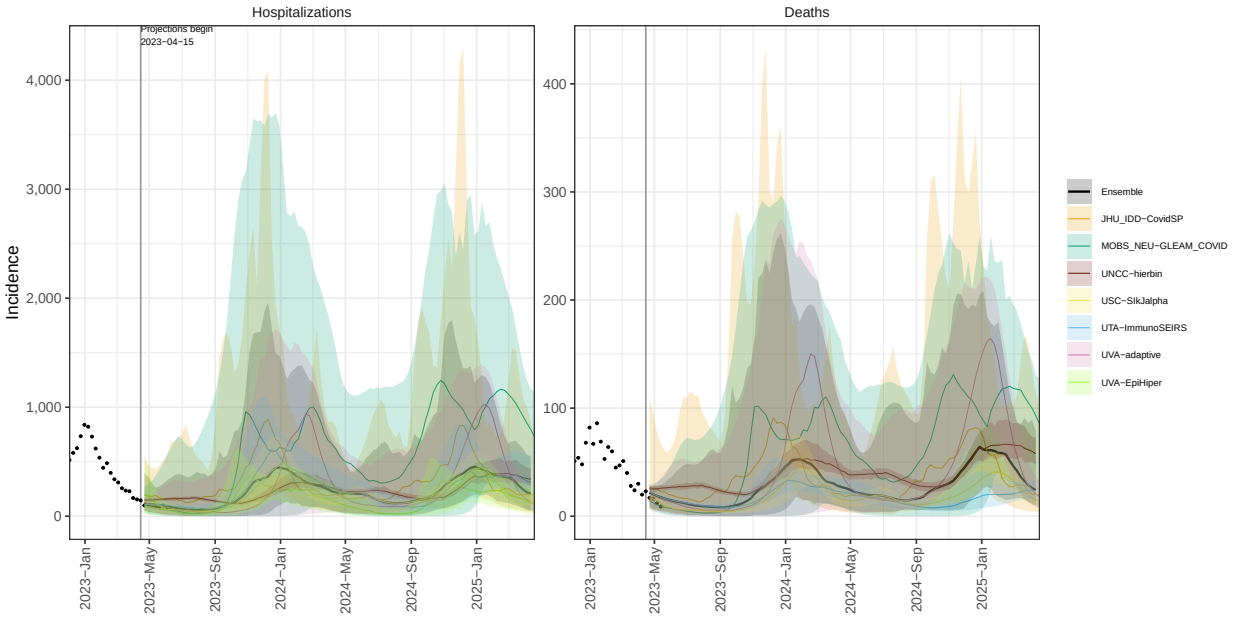
LA model variance & 95% projection intervals − Booster for 65+, High immune escape



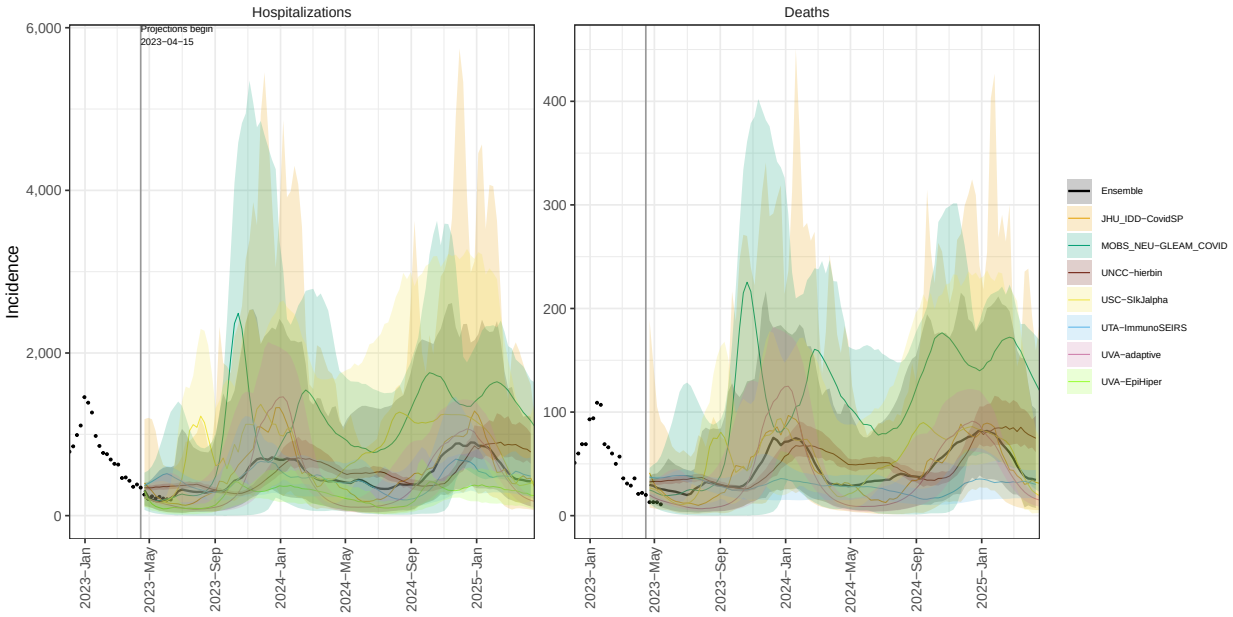
ME model variance & 95% projection intervals − Booster for 65+, High immune escape



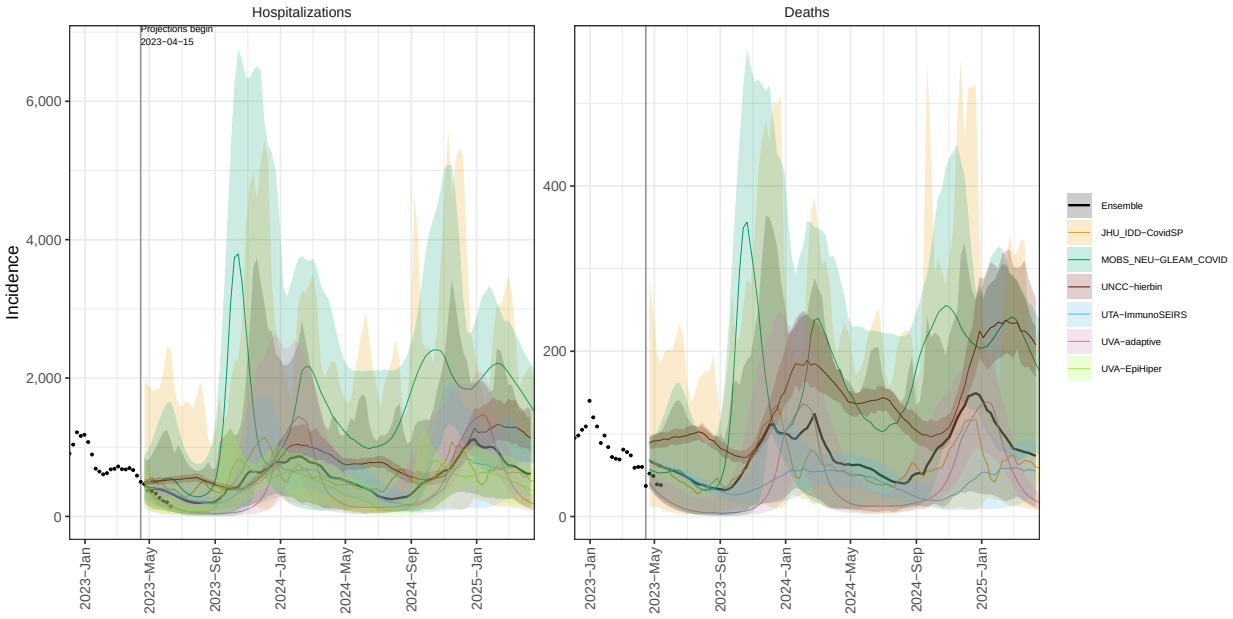
MD model variance & 95% projection intervals − Booster for 65+, High immune escape



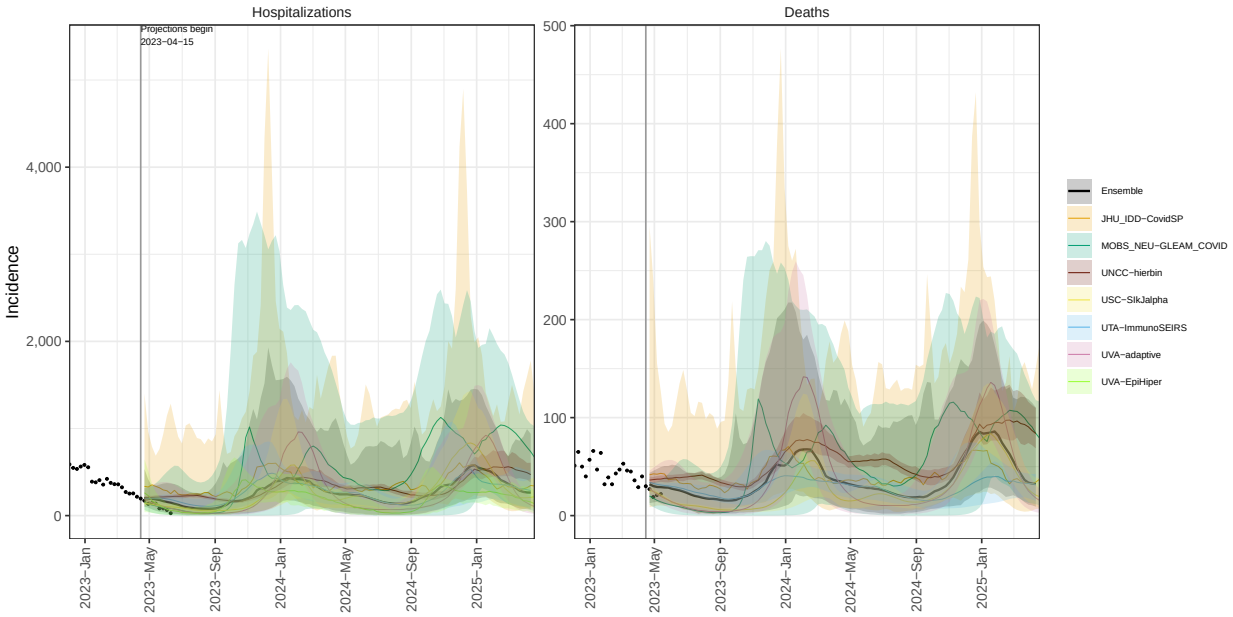
MA model variance & 95% projection intervals − Booster for 65+, High immune escape



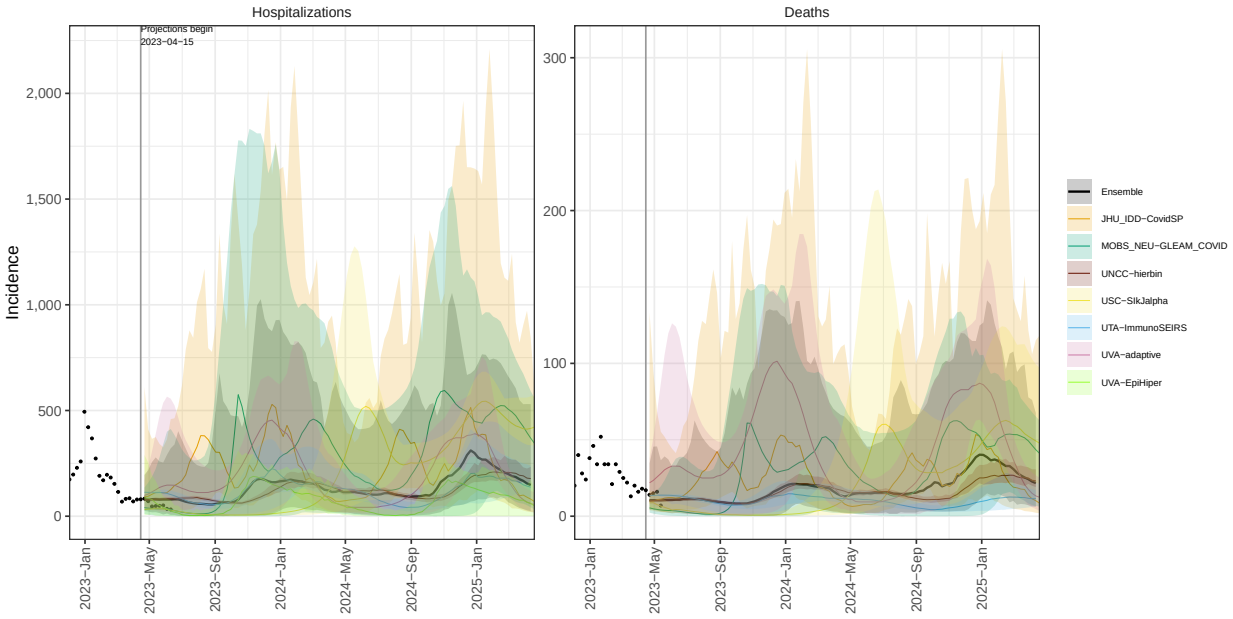
MI model variance & 95% projection intervals − Booster for 65+, High immune escape



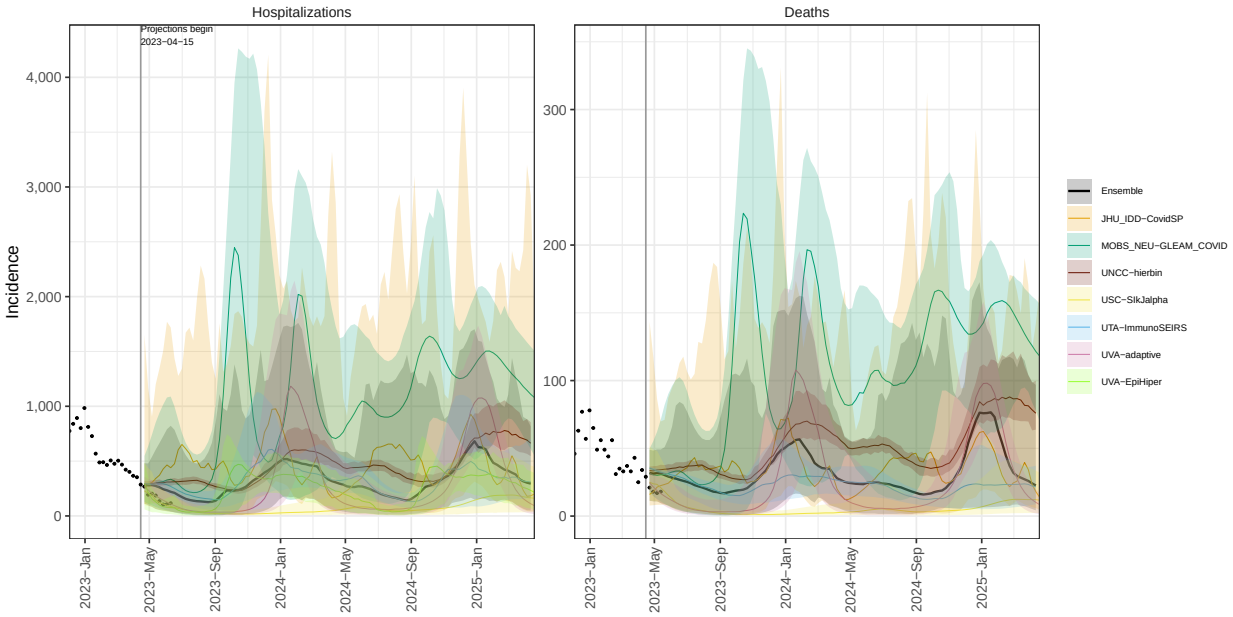
MN model variance & 95% projection intervals − Booster for 65+, High immune escape



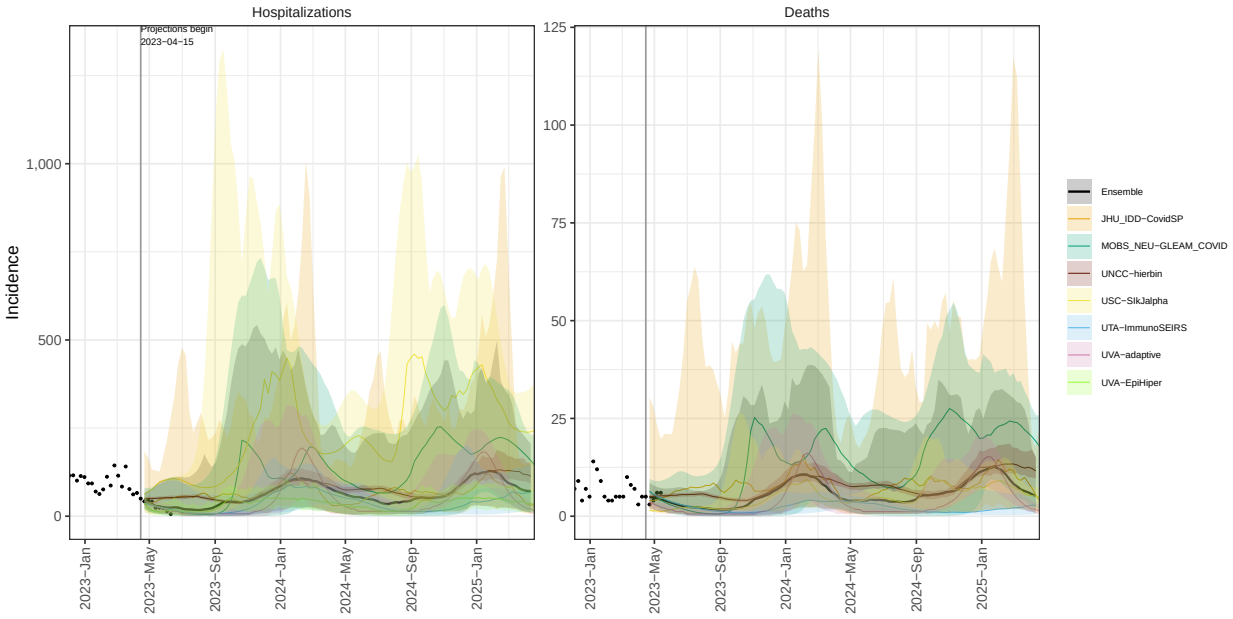
MS model variance & 95% projection intervals − Booster for 65+, High immune escape



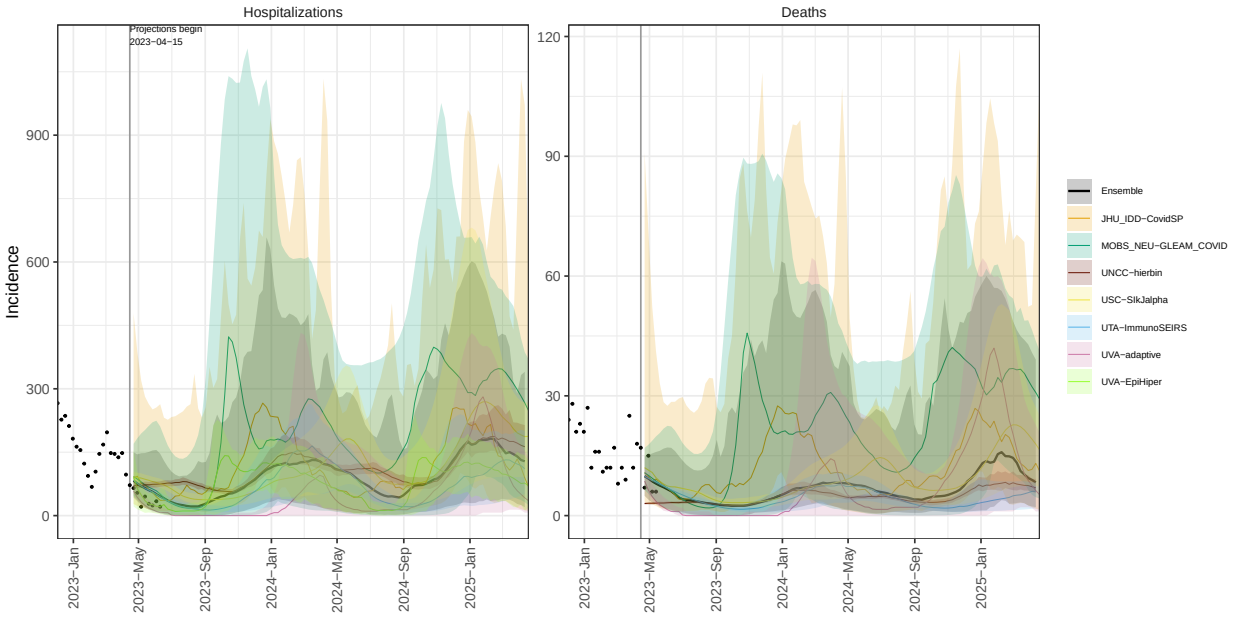
MO model variance & 95% projection intervals − Booster for 65+, High immune escape



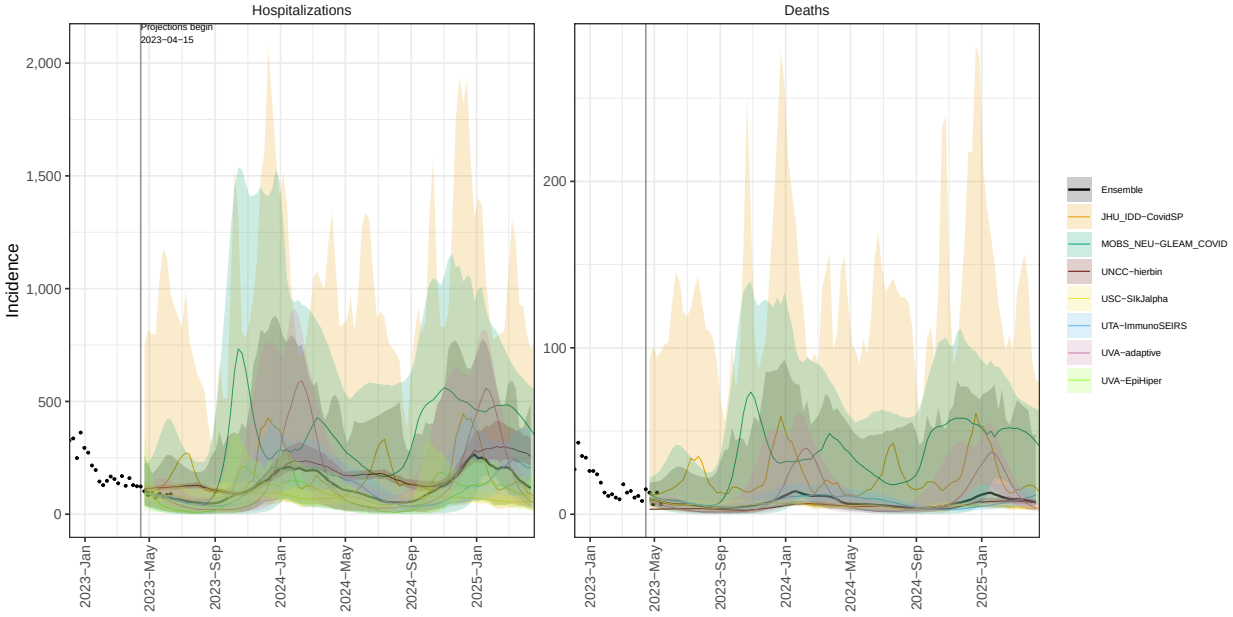
MT model variance & 95% projection intervals − Booster for 65+, High immune escape



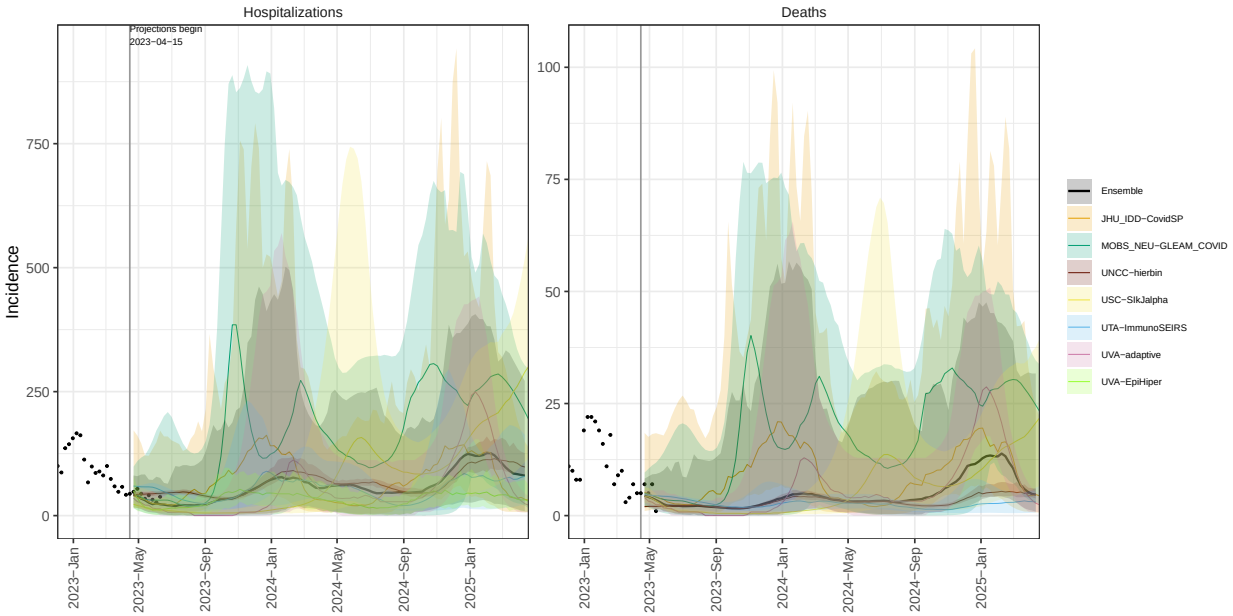
NE model variance & 95% projection intervals − Booster for 65+, High immune escape



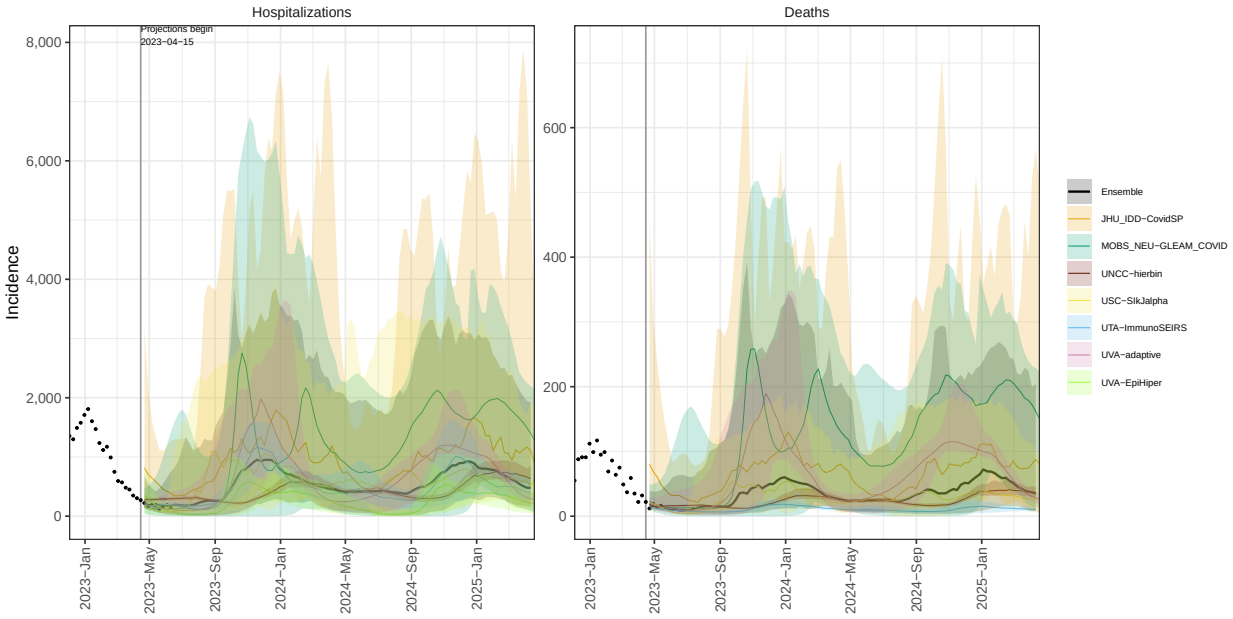
NV model variance & 95% projection intervals − Booster for 65+, High immune escape



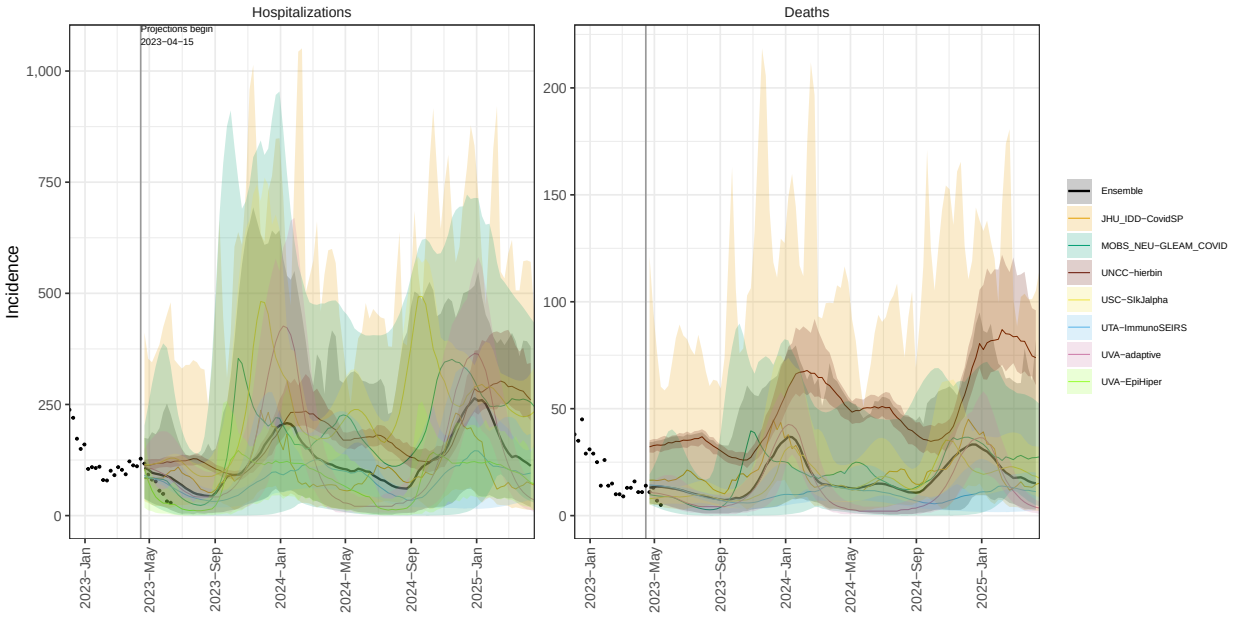
NH model variance & 95% projection intervals − Booster for 65+, High immune escape



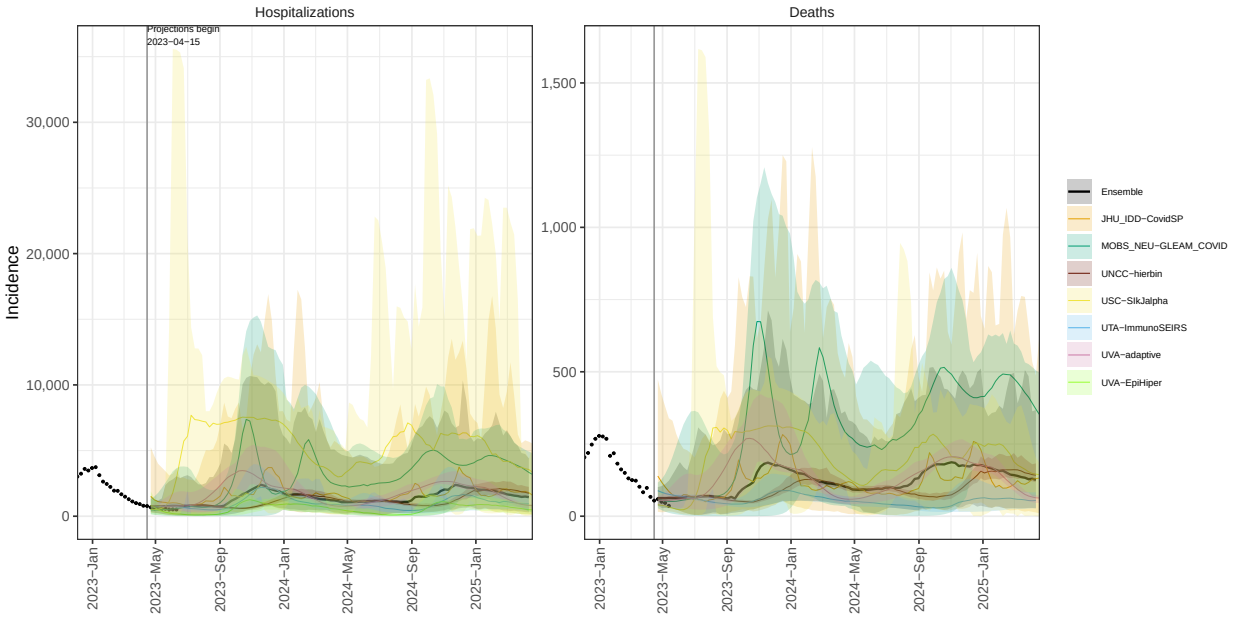
NJ model variance & 95% projection intervals − Booster for 65+, High immune escape



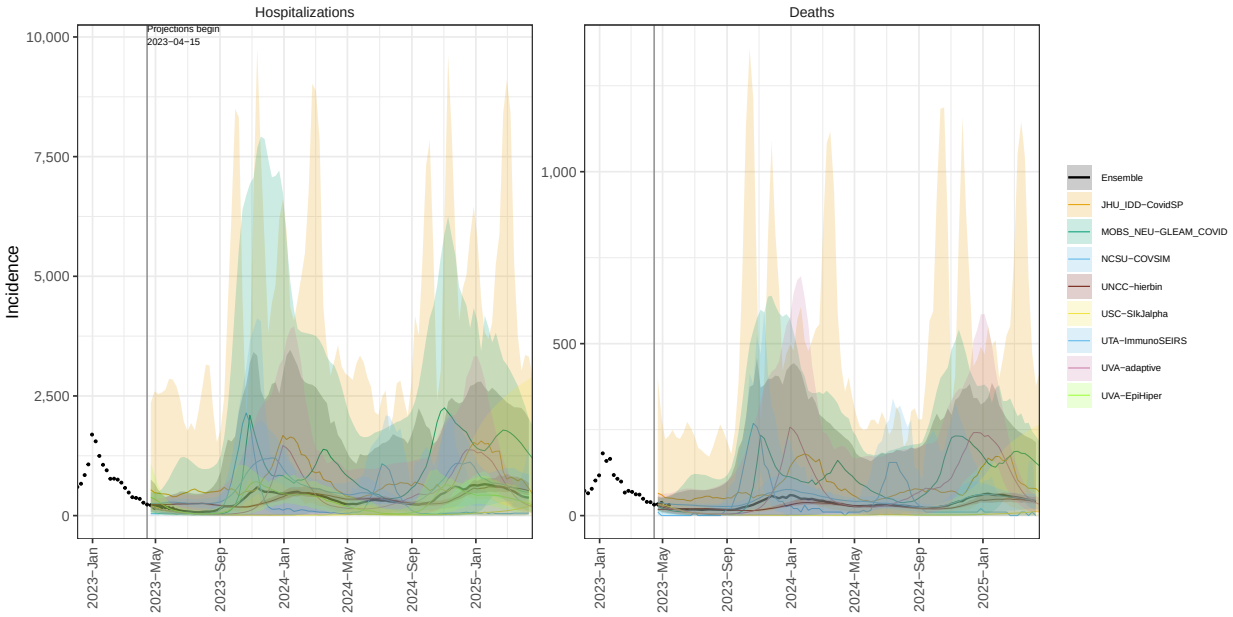
NM model variance & 95% projection intervals − Booster for 65+, High immune escape



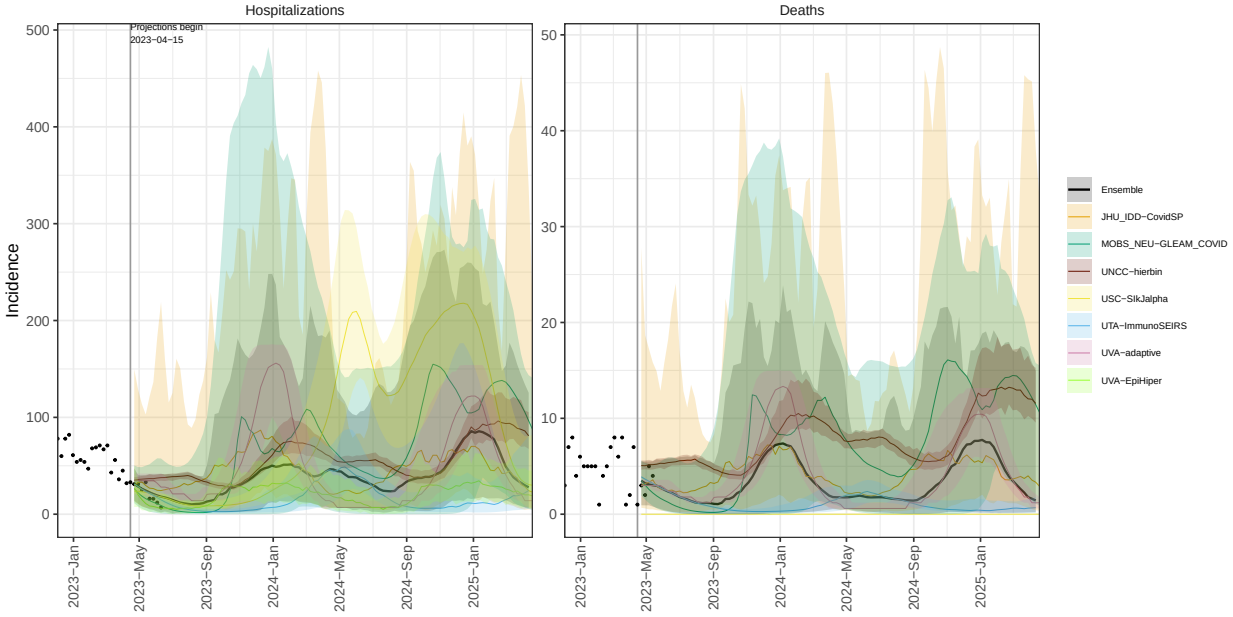
NY model variance & 95% projection intervals − Booster for 65+, High immune escape



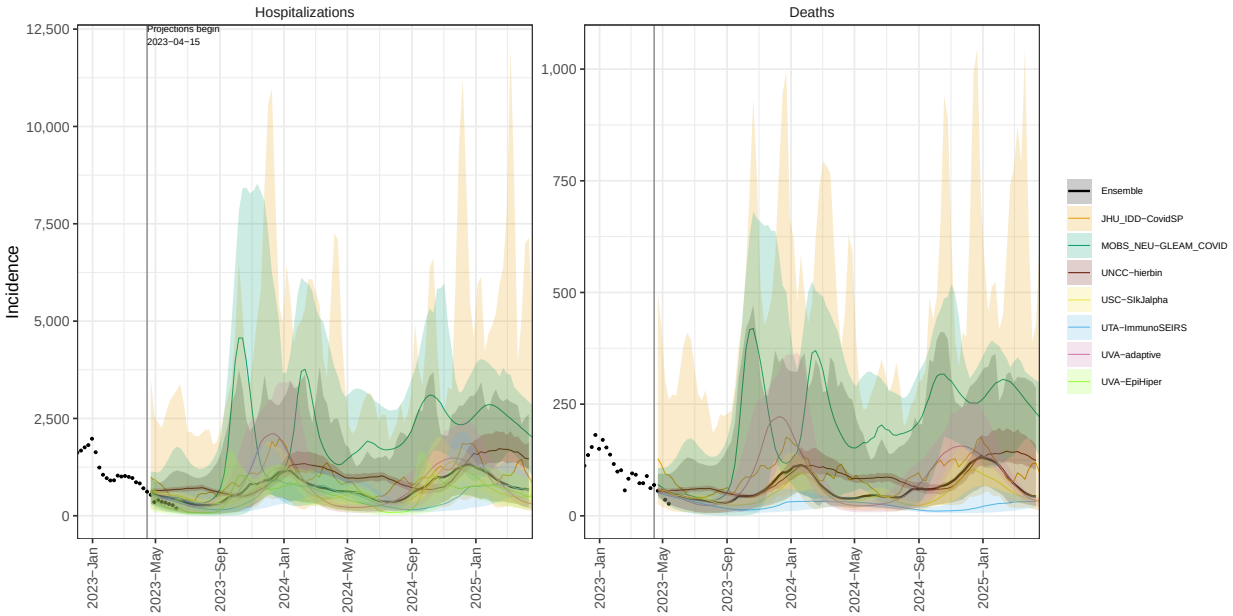
NC model variance & 95% projection intervals − Booster for 65+, High immune escape

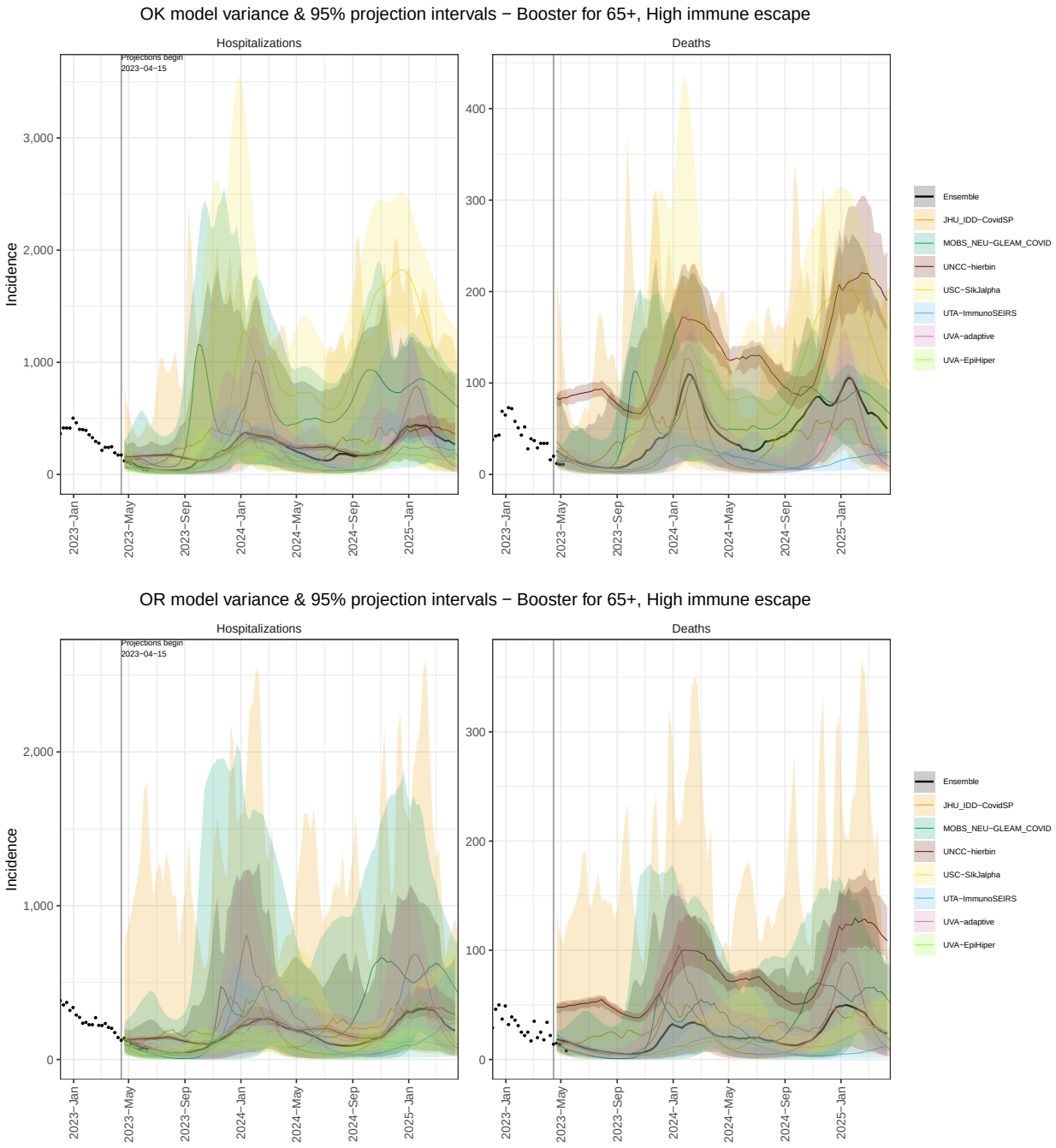


ND model variance & 95% projection intervals − Booster for 65+, High immune escape

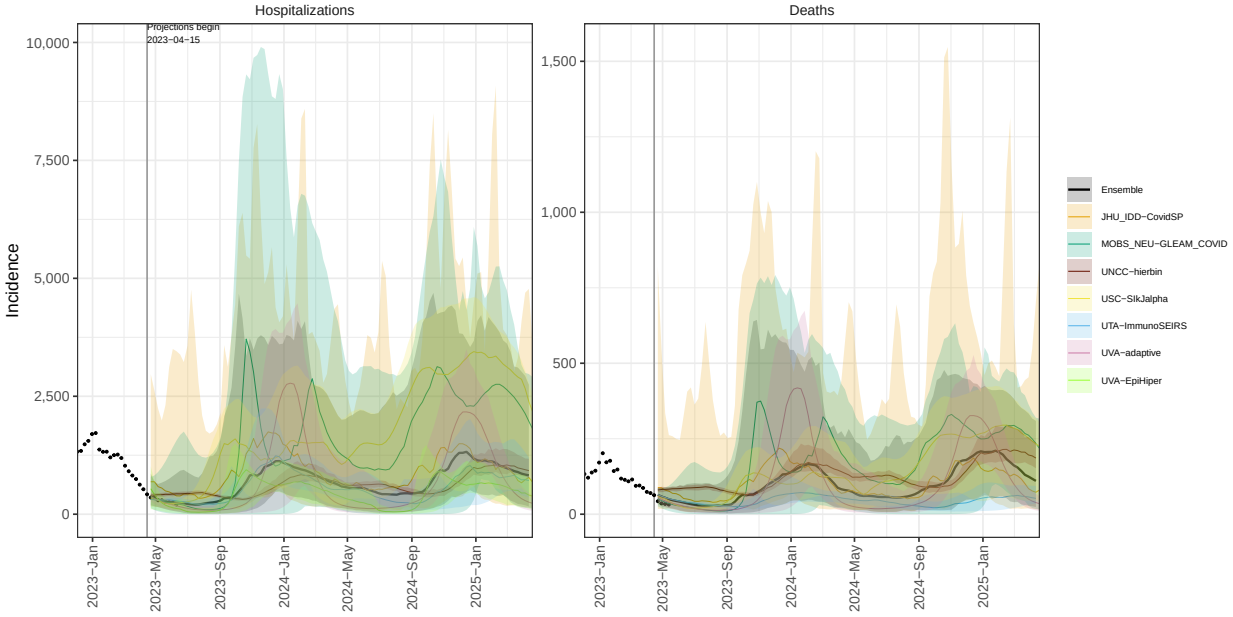


OH model variance & 95% projection intervals − Booster for 65+, High immune escape

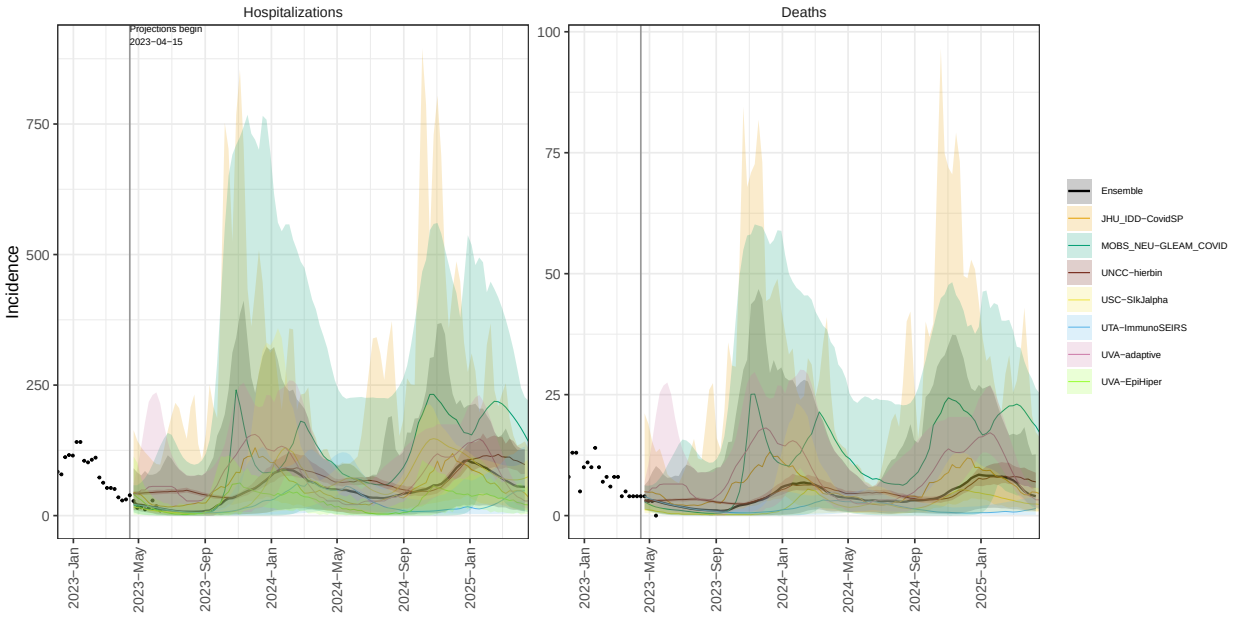



OK model variance & 95% projection intervals − Booster for 65+, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
3,000
2,000
1,000
0
400
300
200
100
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper
OR model variance & 95% projection intervals − Booster for 65+, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
2,000
1,000
0
300
200
100
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

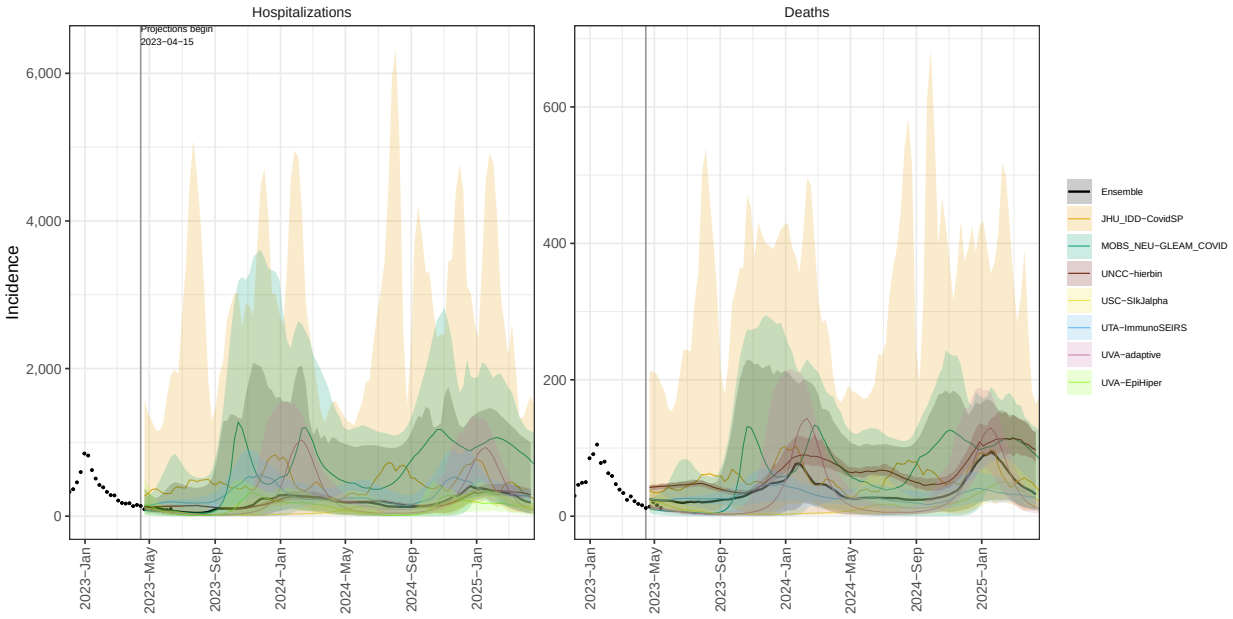
PA model variance & 95% projection intervals − Booster for 65+, High immune escape



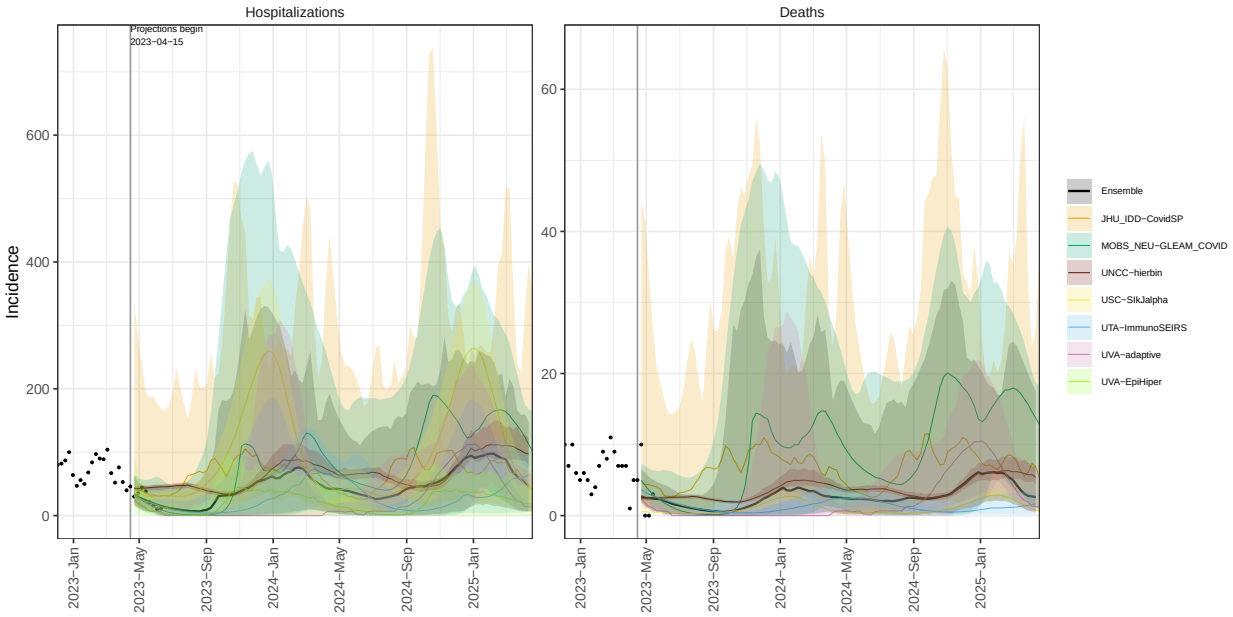
RI model variance & 95% projection intervals − Booster for 65+, High immune escape



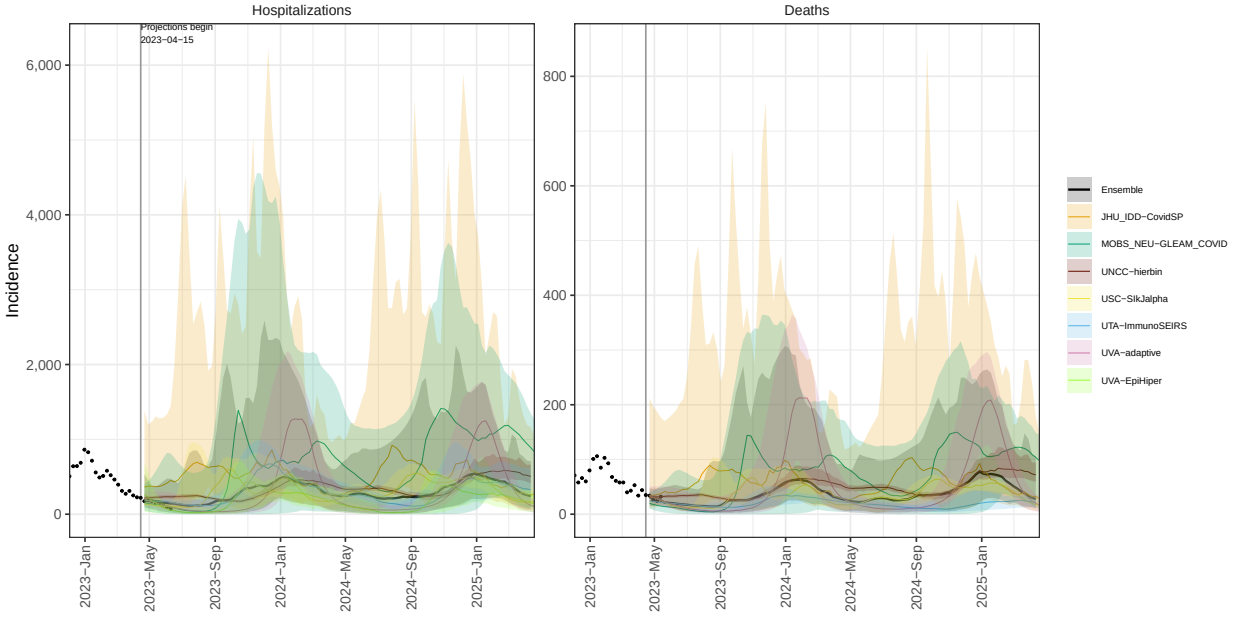
SC model variance & 95% projection intervals − Booster for 65+, High immune escape



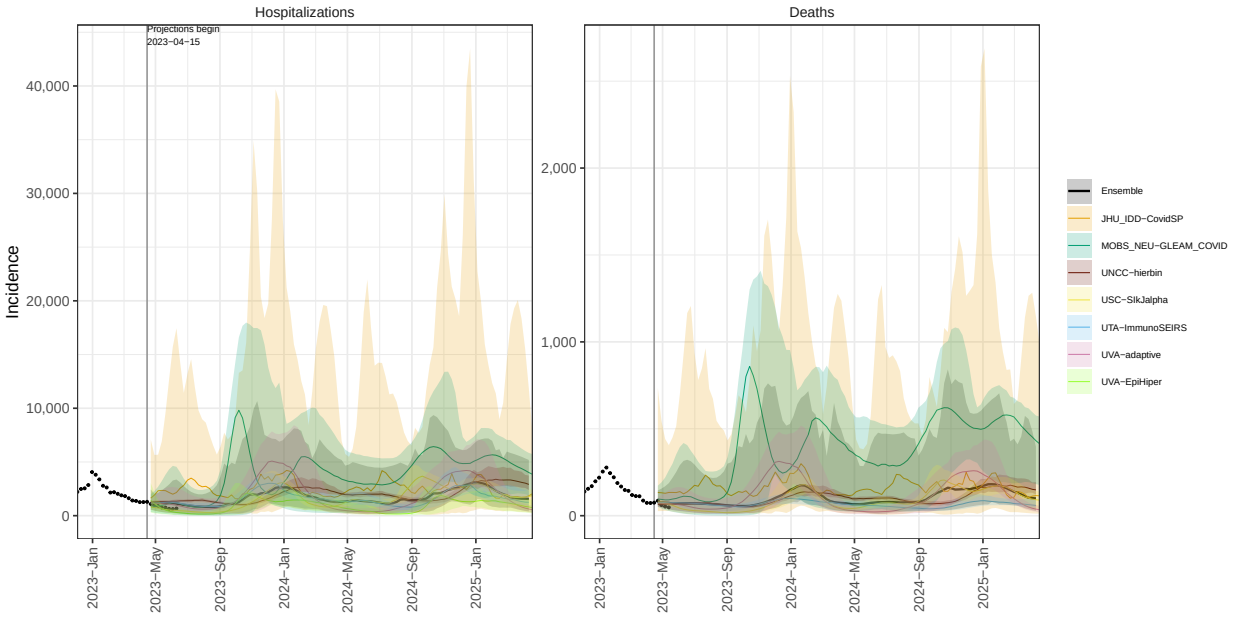
SD model variance & 95% projection intervals − Booster for 65+, High immune escape



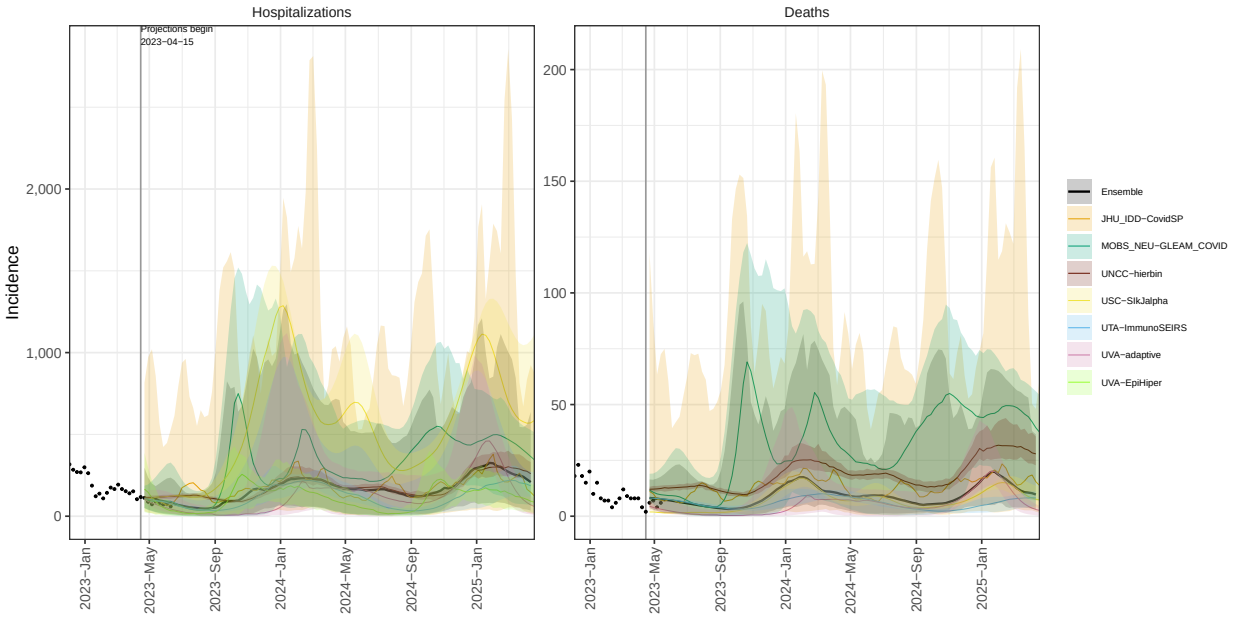
TN model variance & 95% projection intervals − Booster for 65+, High immune escape



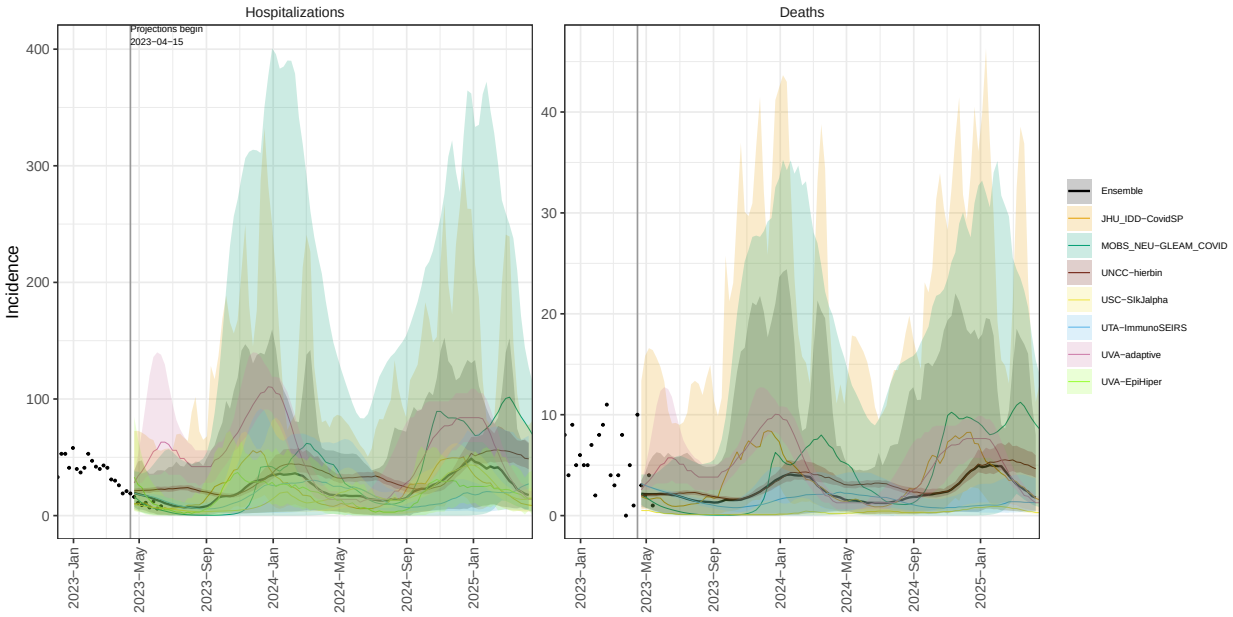
TX model variance & 95% projection intervals − Booster for 65+, High immune escape



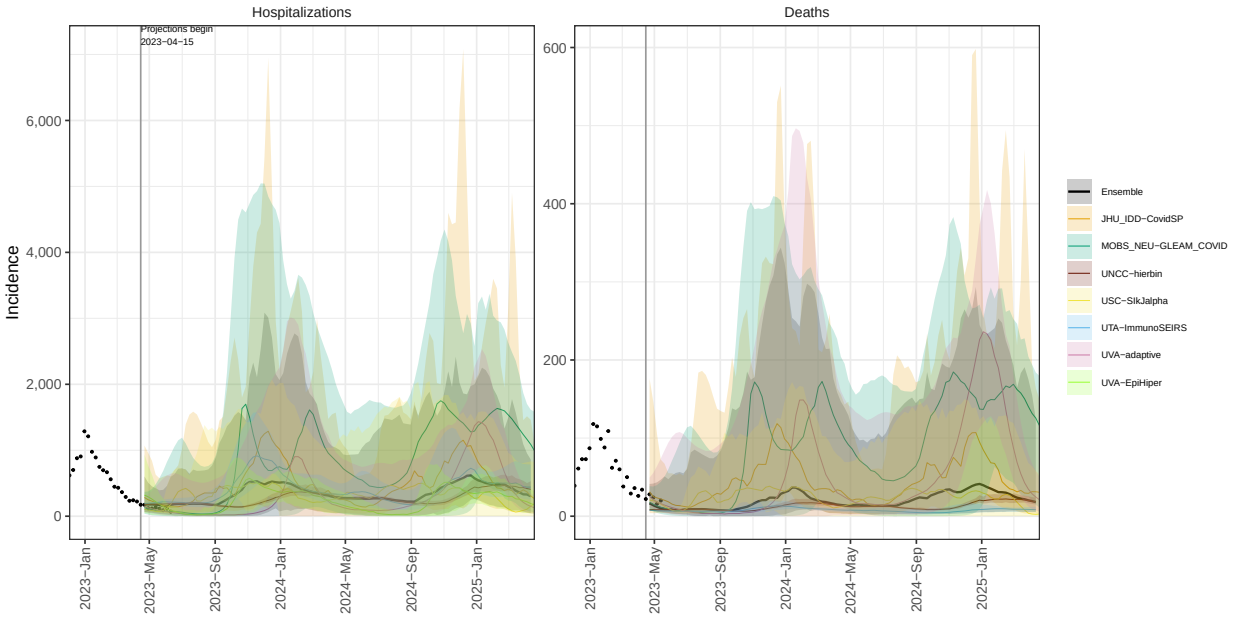
UT model variance & 95% projection intervals − Booster for 65+, High immune escape



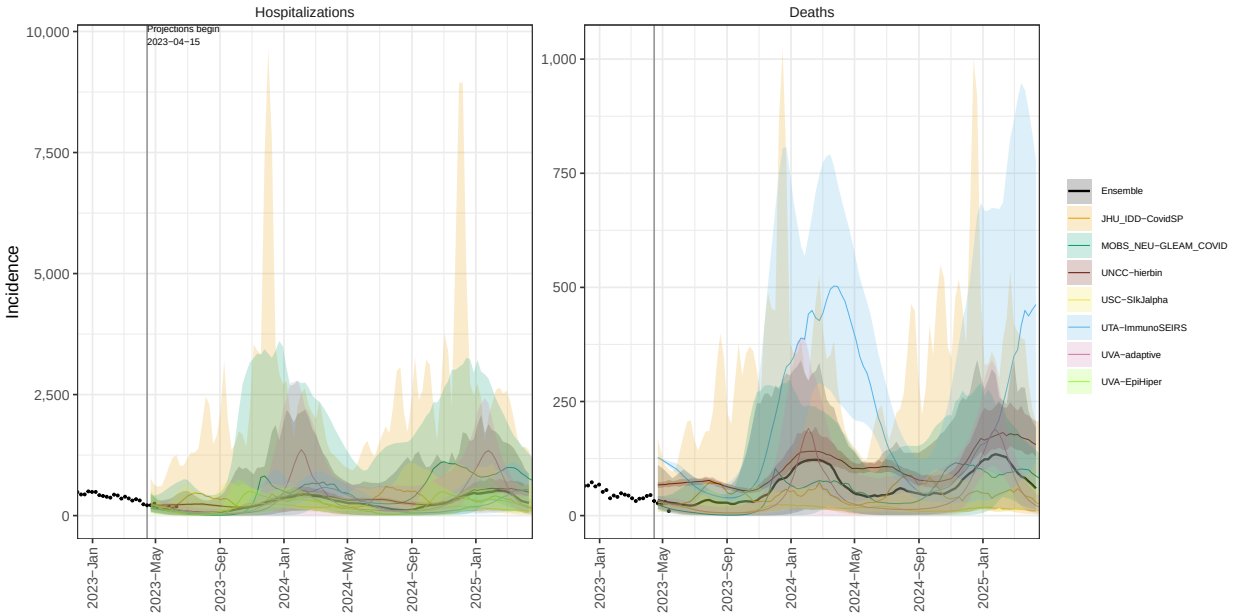
VT model variance & 95% projection intervals − Booster for 65+, High immune escape



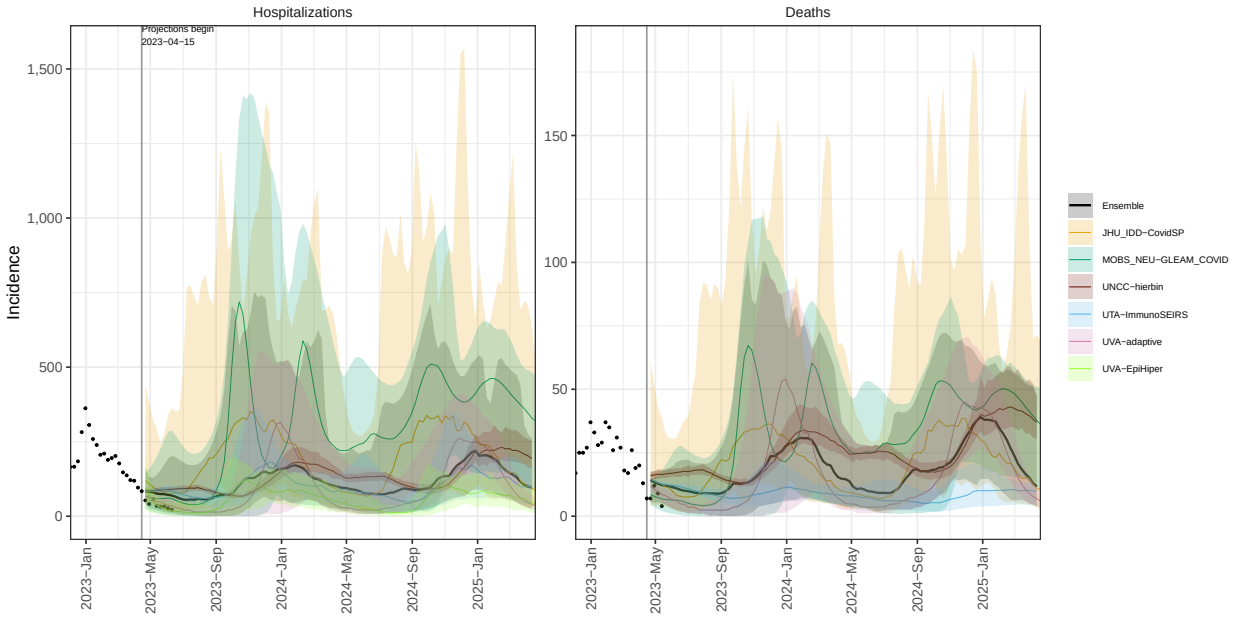
VA model variance & 95% projection intervals − Booster for 65+, High immune escape



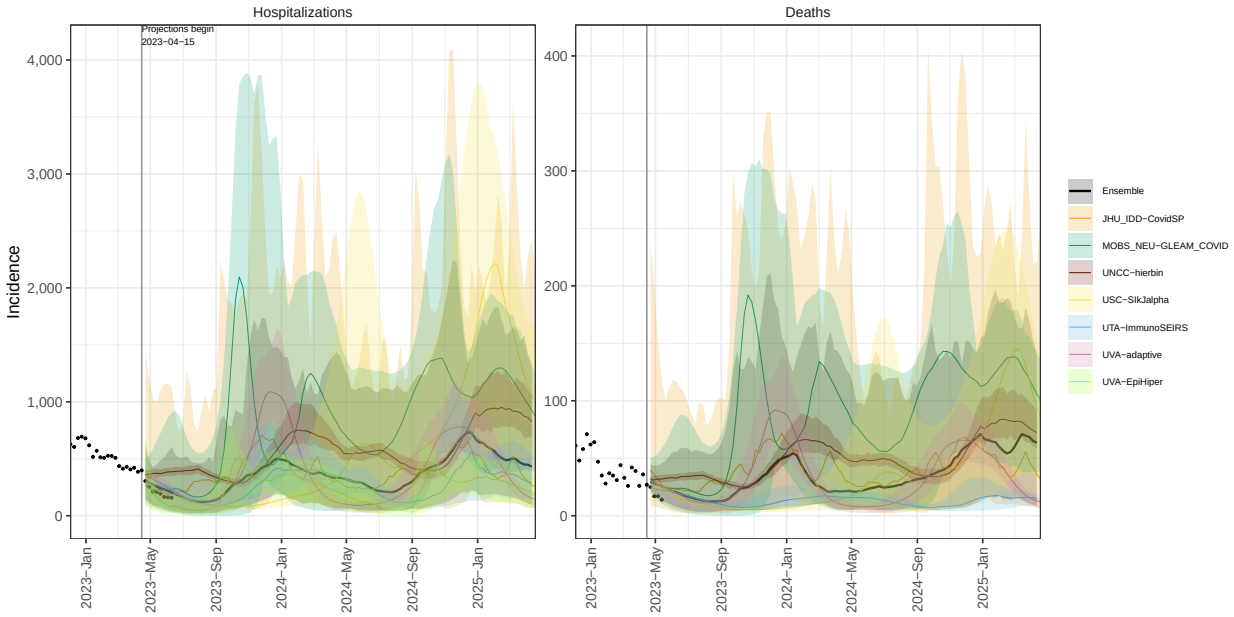
WA model variance & 95% projection intervals − Booster for 65+, High immune escape

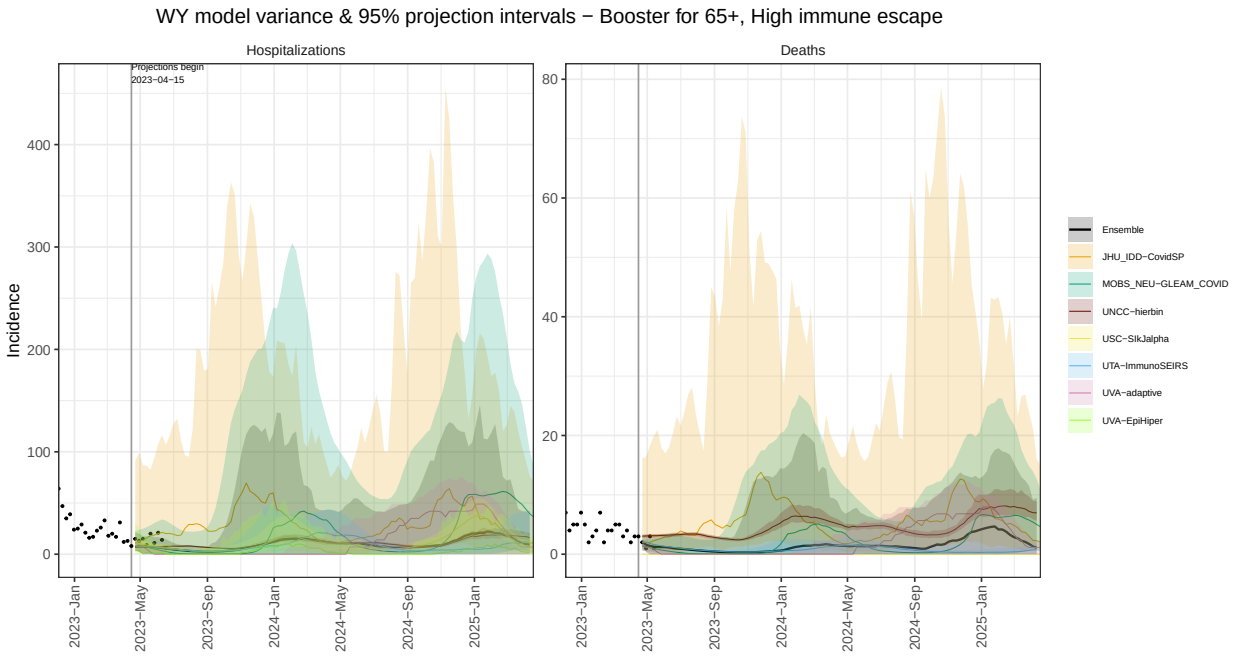


WV model variance & 95% projection intervals − Booster for 65+, High immune escape

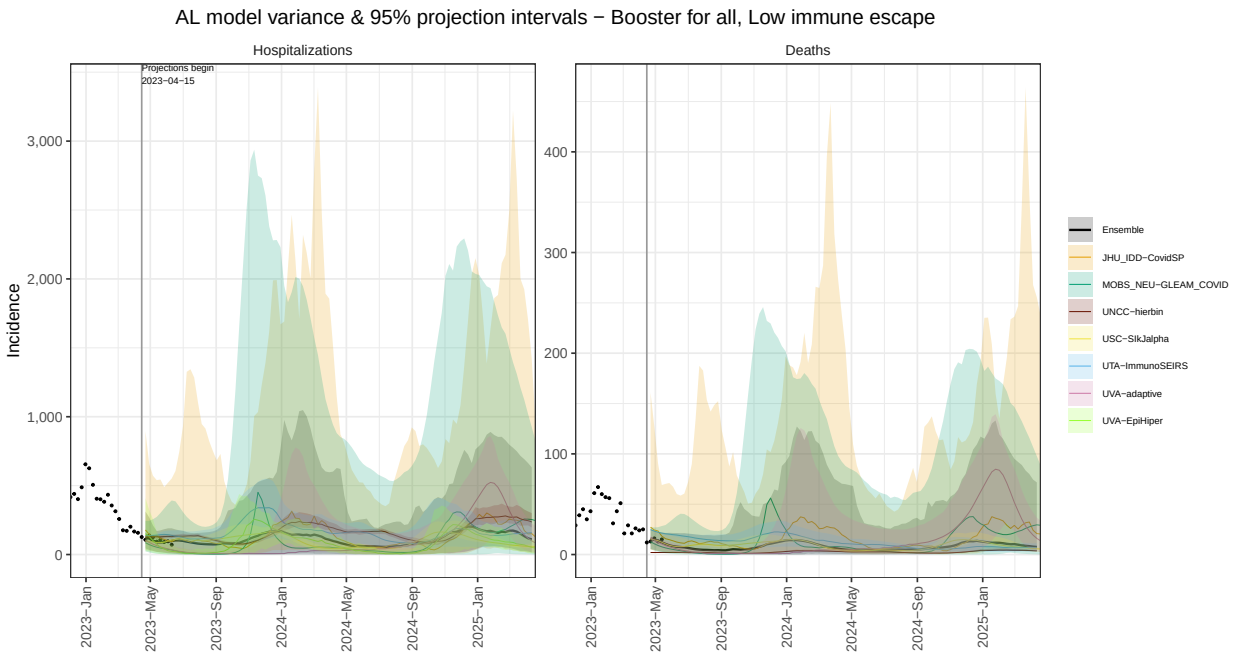


WI model variance & 95% projection intervals − Booster for 65+, High immune escape

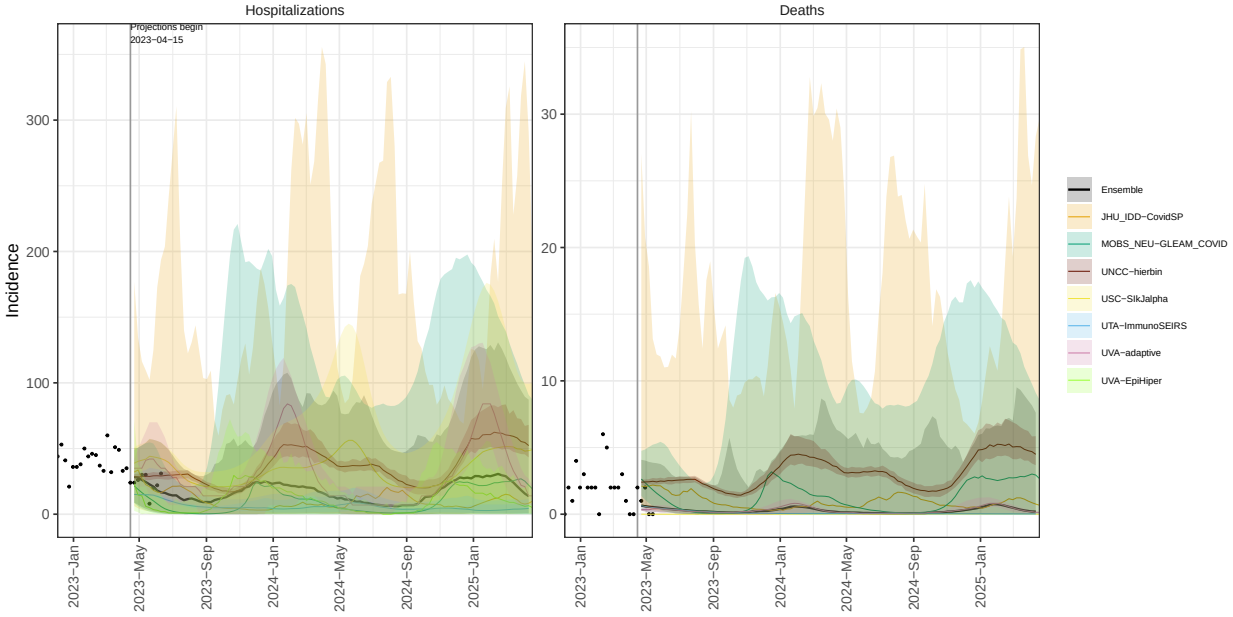




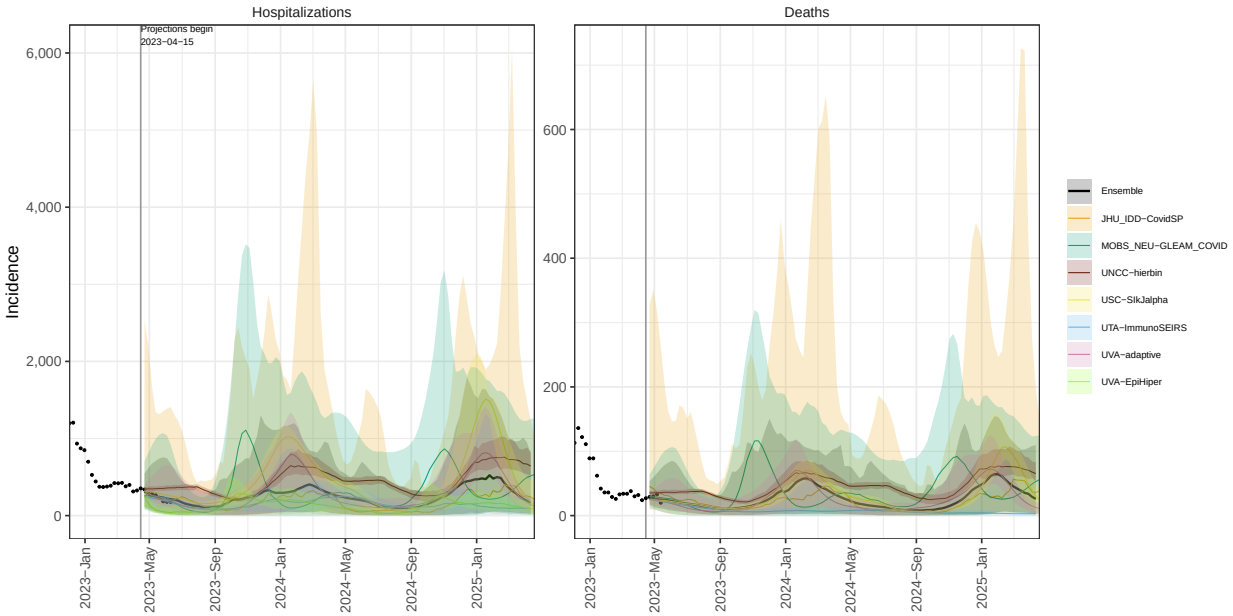
Model variation for Booster for all, Low immune escape scenario.



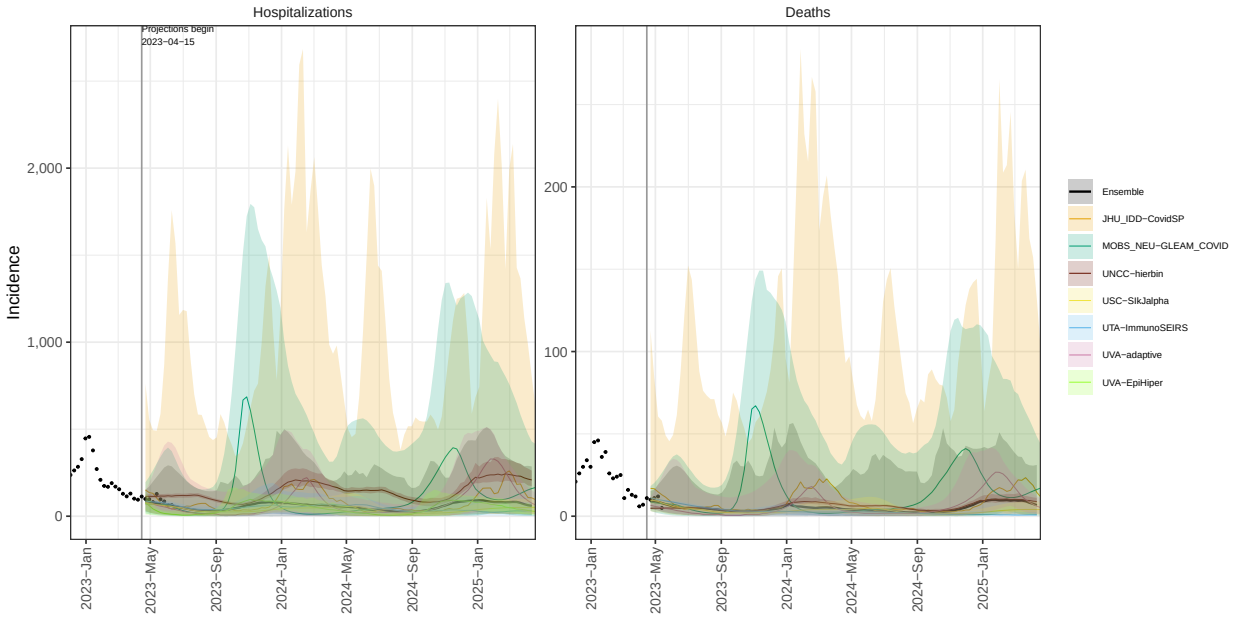
AK model variance & 95% projection intervals − Booster for all, Low immune escape



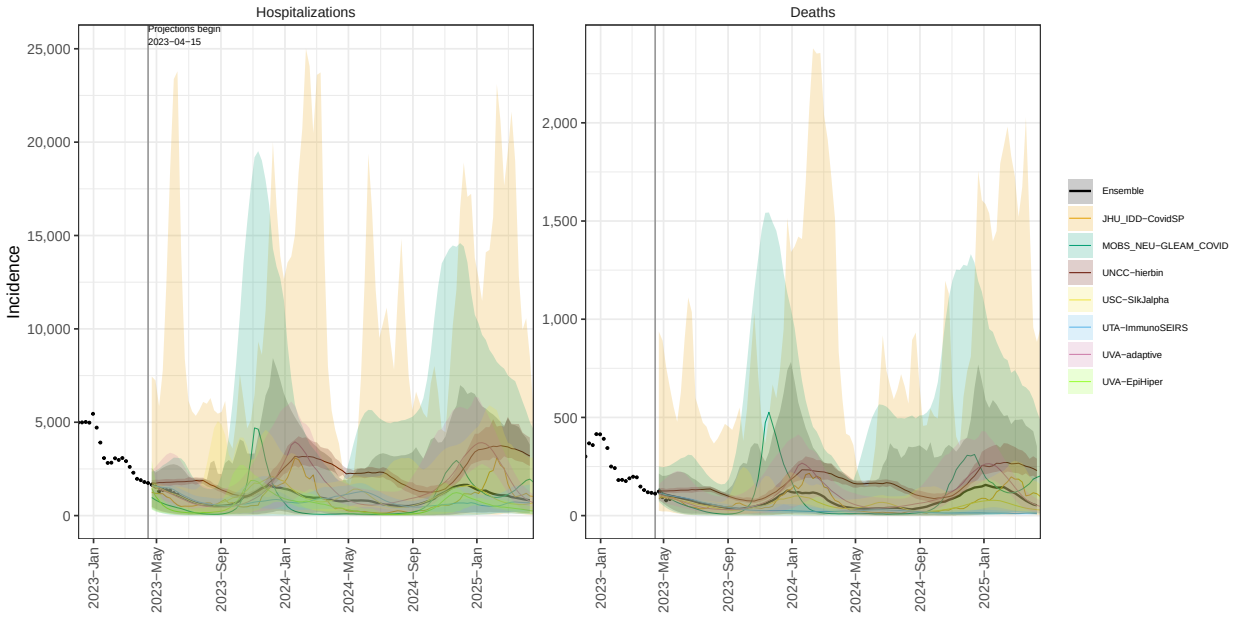
AZ model variance & 95% projection intervals − Booster for all, Low immune escape



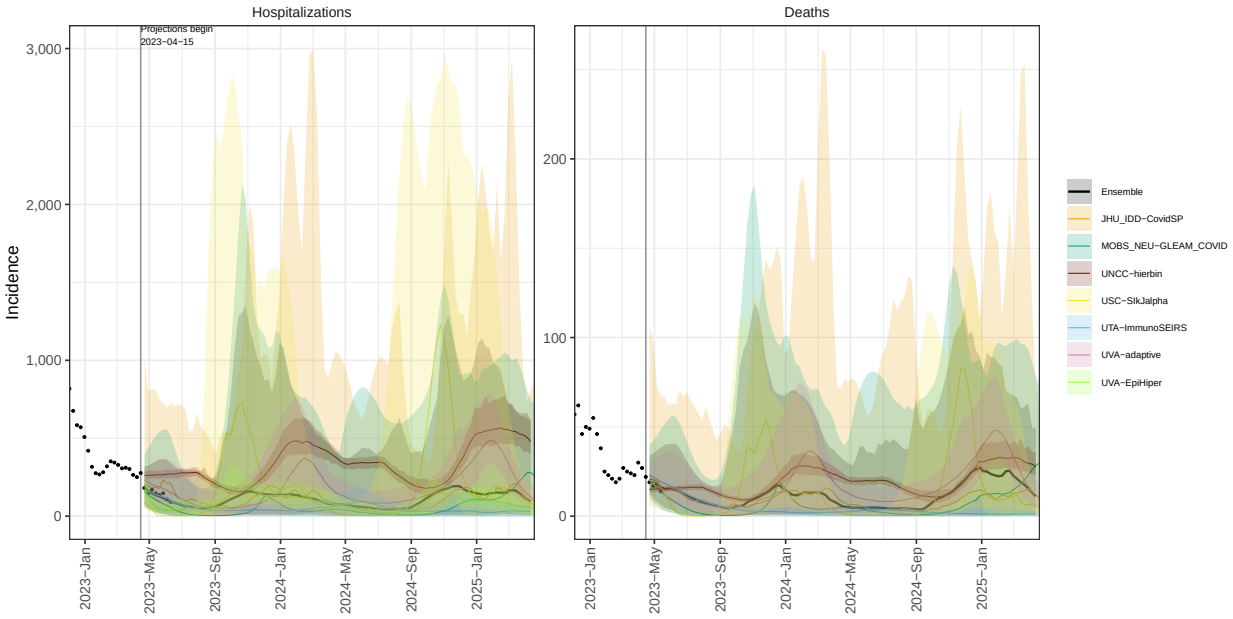
AR model variance & 95% projection intervals − Booster for all, Low immune escape



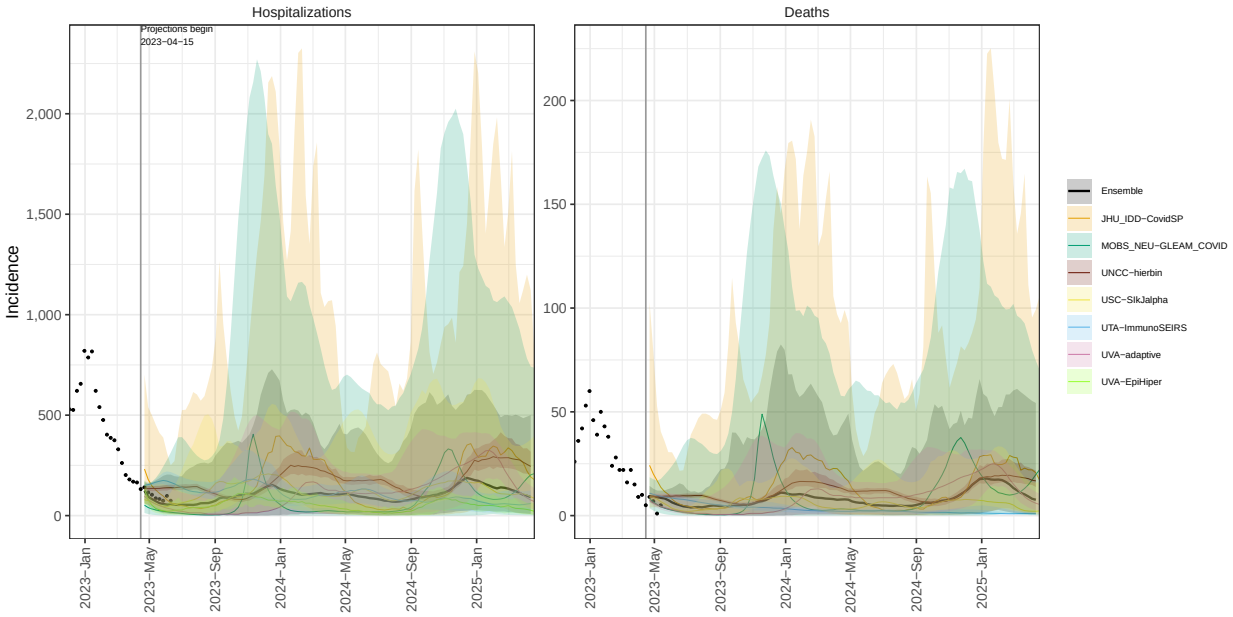
CA model variance & 95% projection intervals − Booster for all, Low immune escape



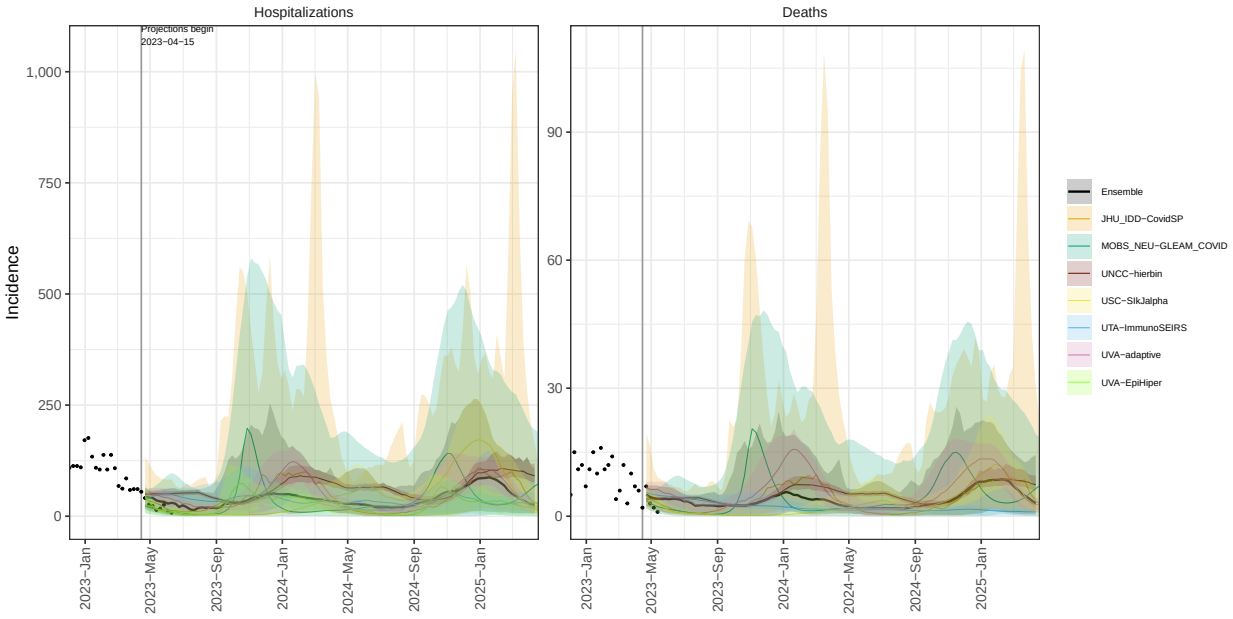
CO model variance & 95% projection intervals − Booster for all, Low immune escape



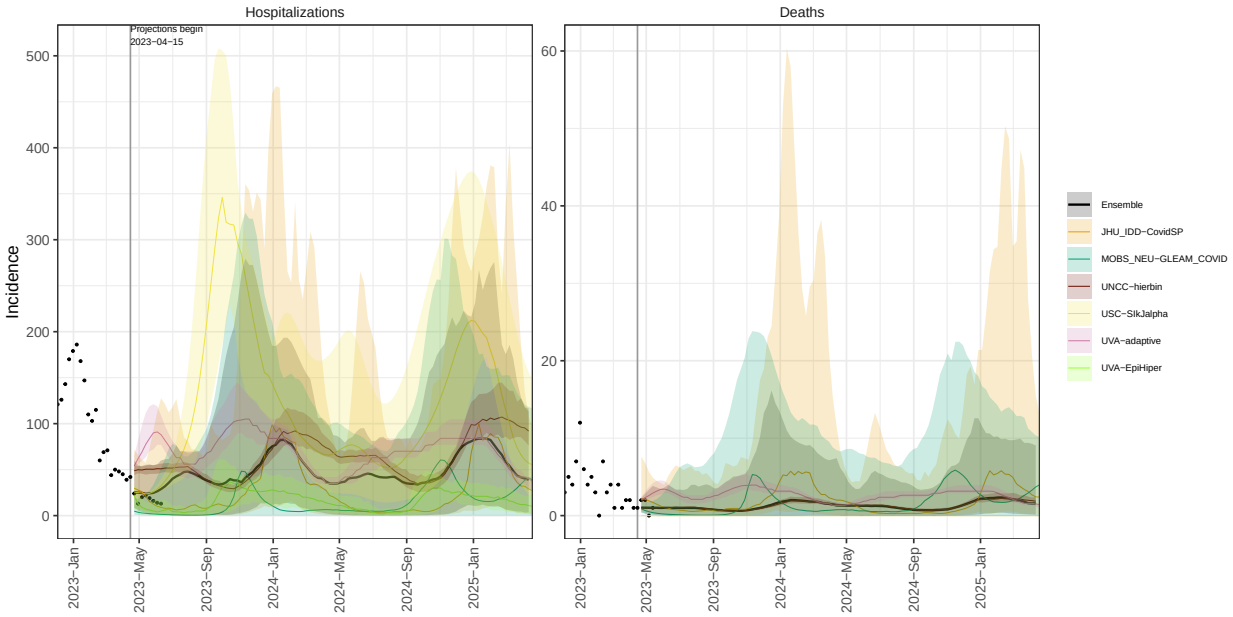
CT model variance & 95% projection intervals − Booster for all, Low immune escape



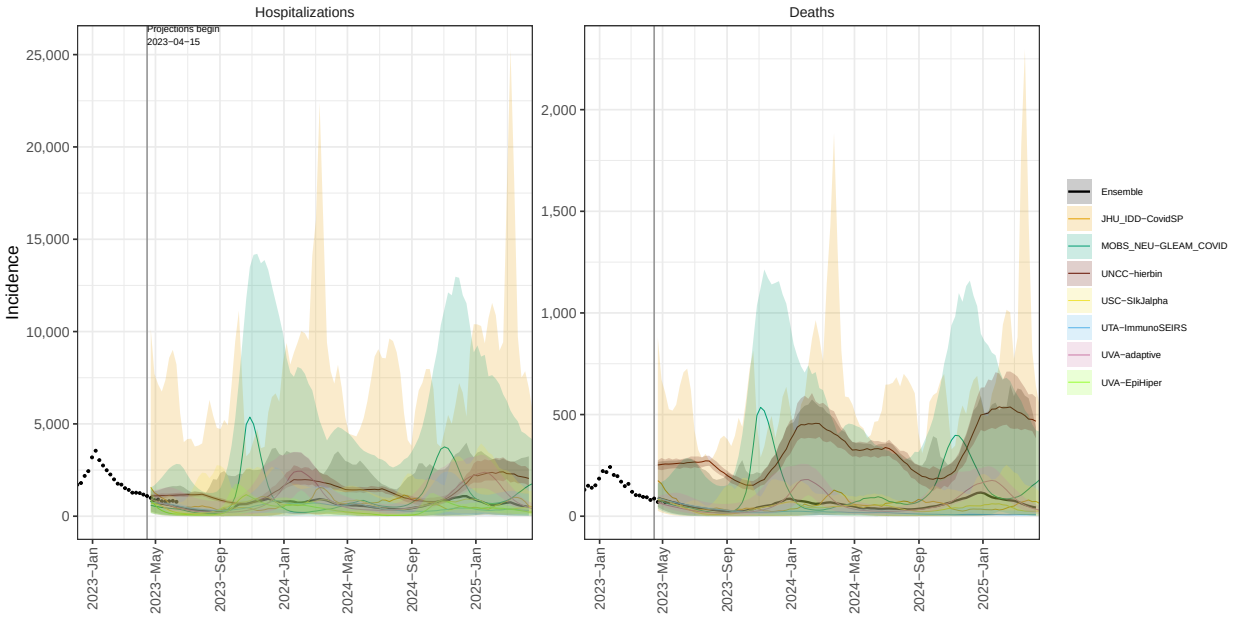
DE model variance & 95% projection intervals − Booster for all, Low immune escape



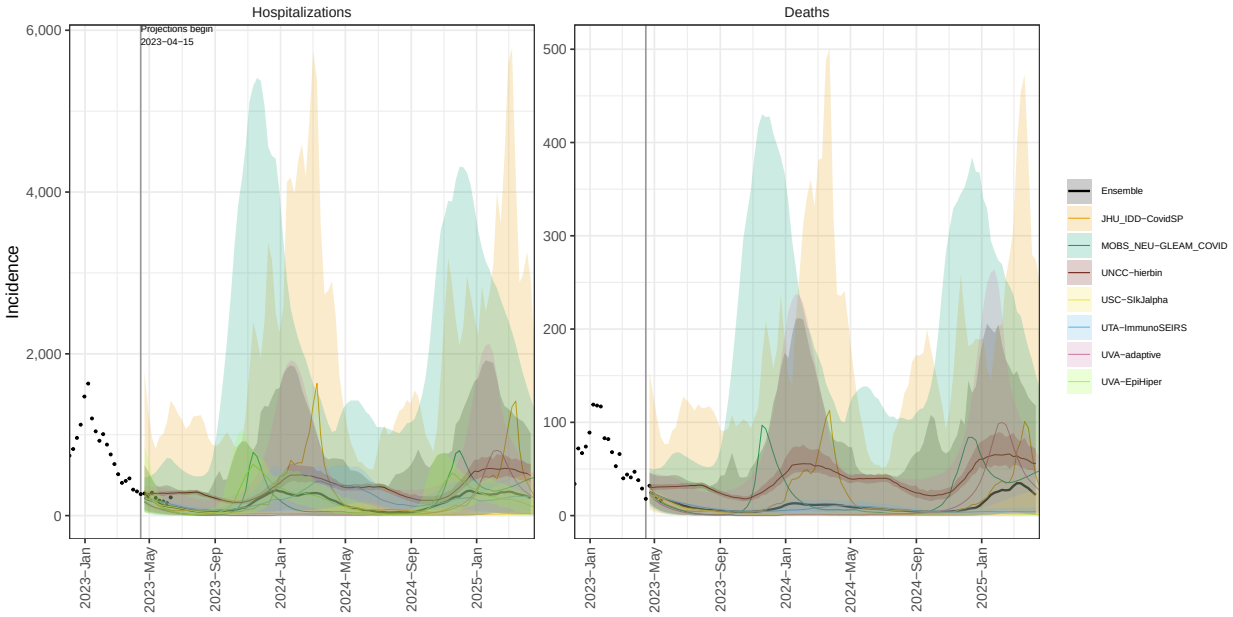
DC model variance & 95% projection intervals − Booster for all, Low immune escape



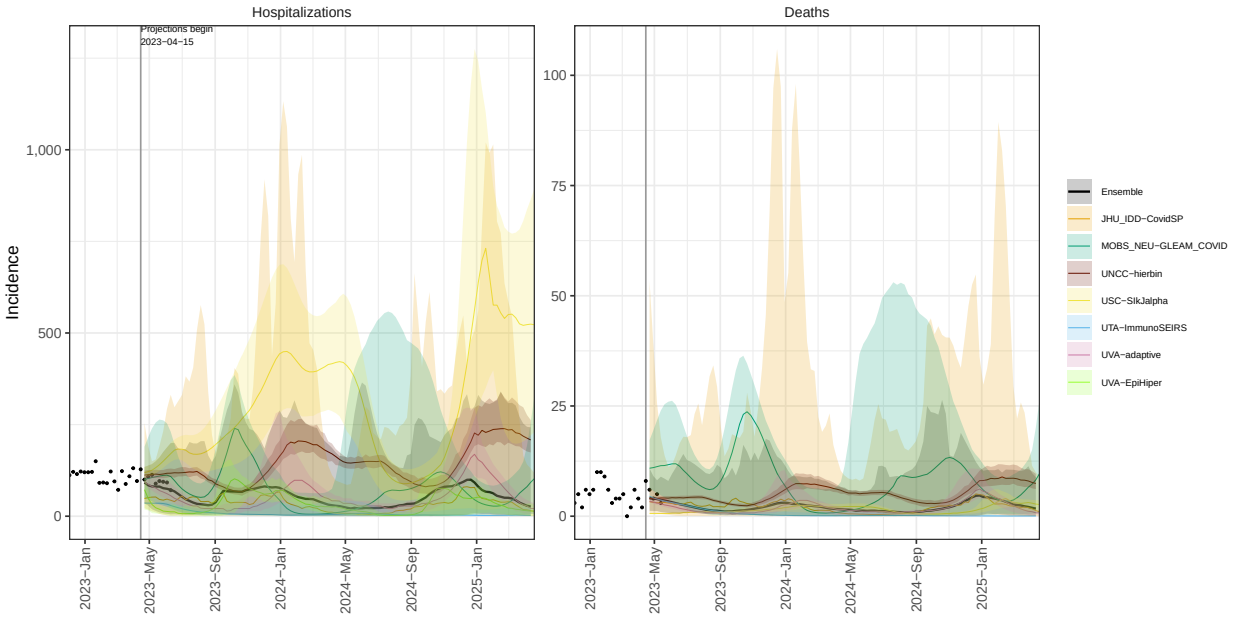
FL model variance & 95% projection intervals − Booster for all, Low immune escape



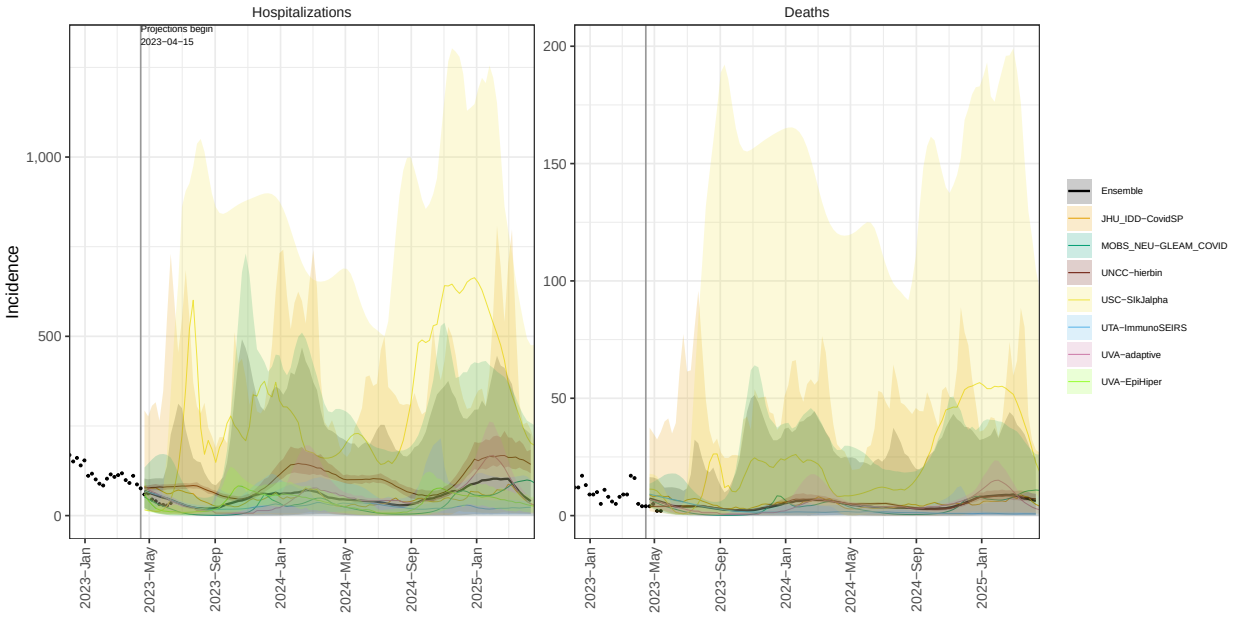
GA model variance & 95% projection intervals − Booster for all, Low immune escape



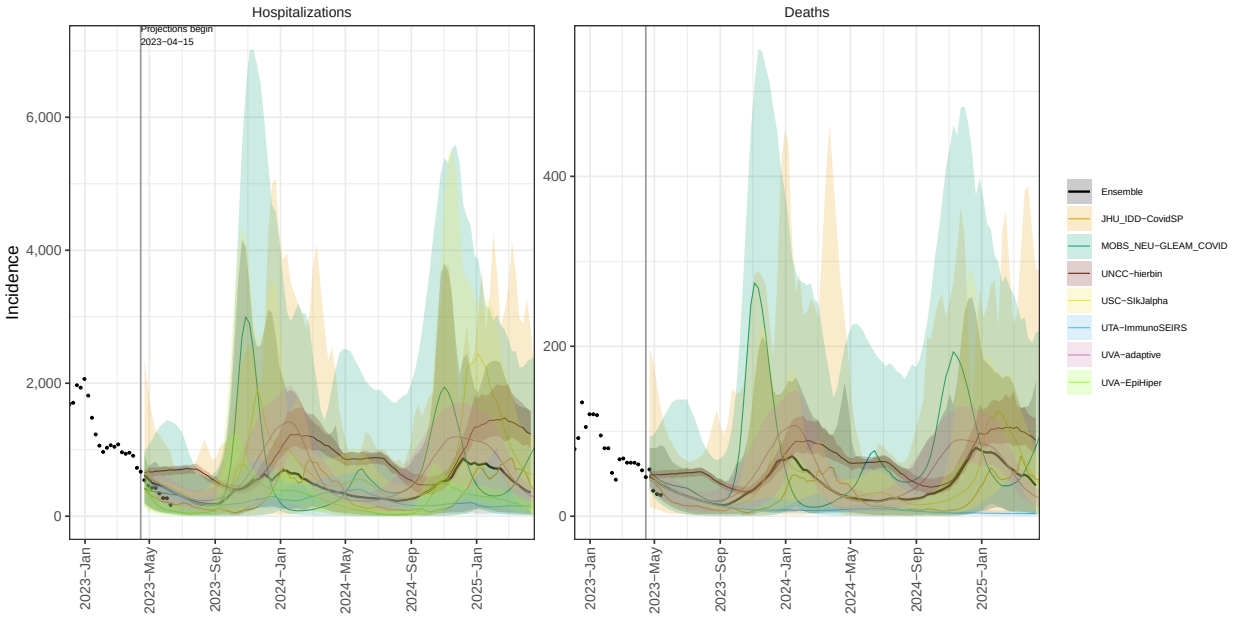
HI model variance & 95% projection intervals − Booster for all, Low immune escape



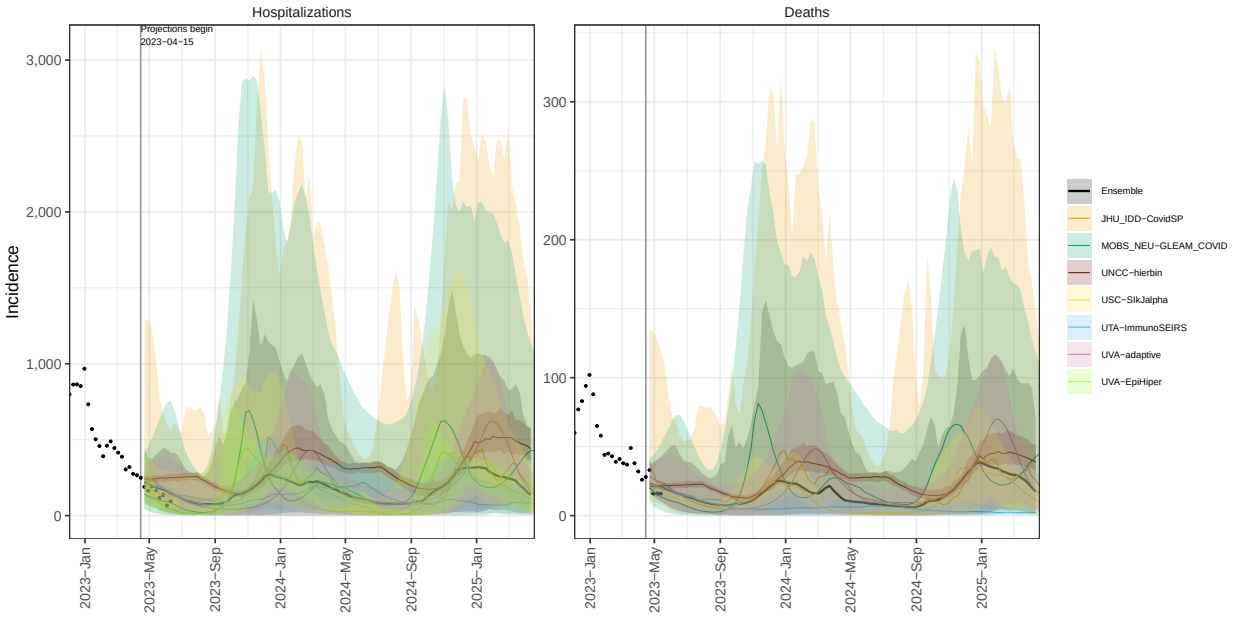
ID model variance & 95% projection intervals − Booster for all, Low immune escape



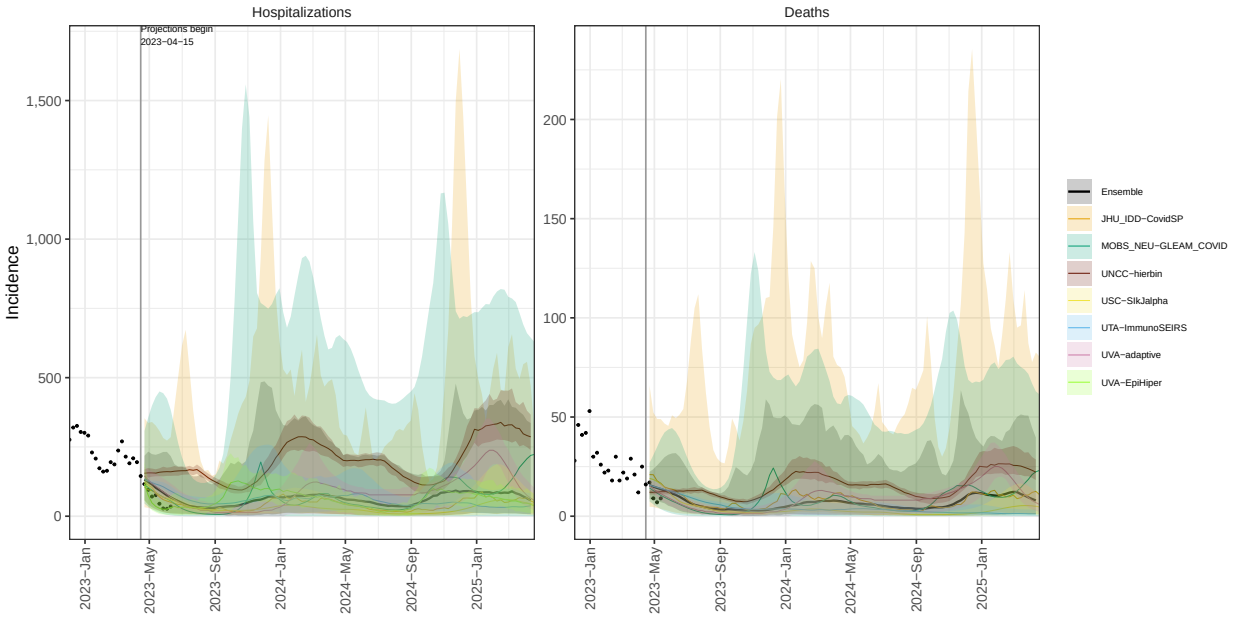
IL model variance & 95% projection intervals − Booster for all, Low immune escape



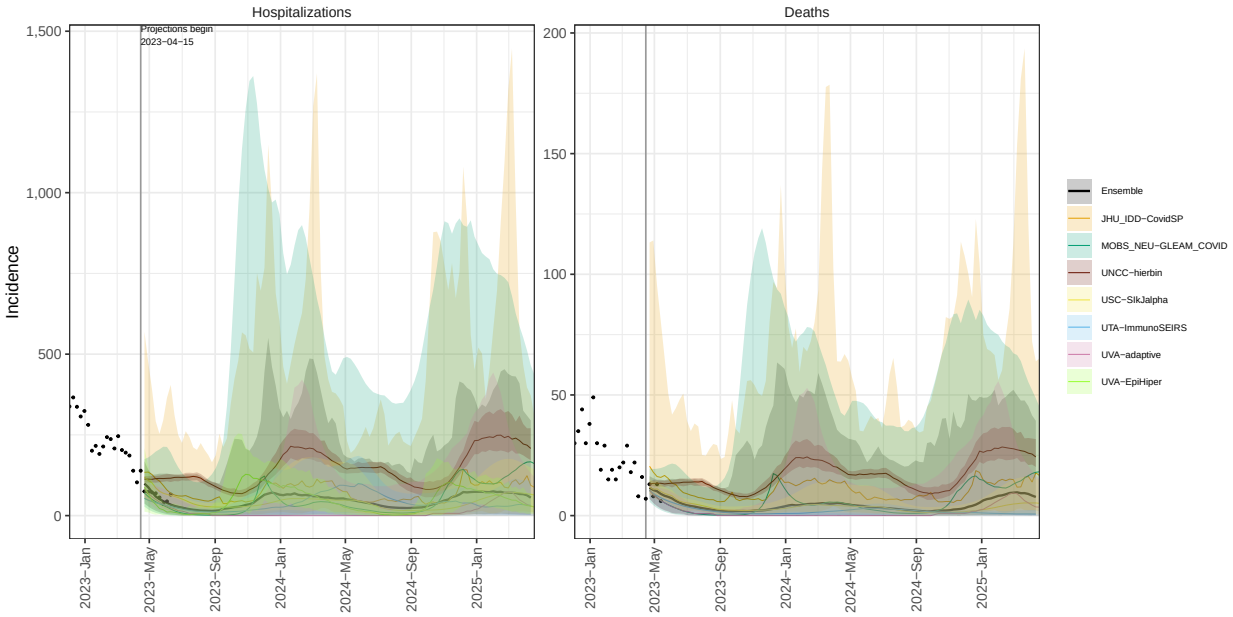
IN model variance & 95% projection intervals − Booster for all, Low immune escape



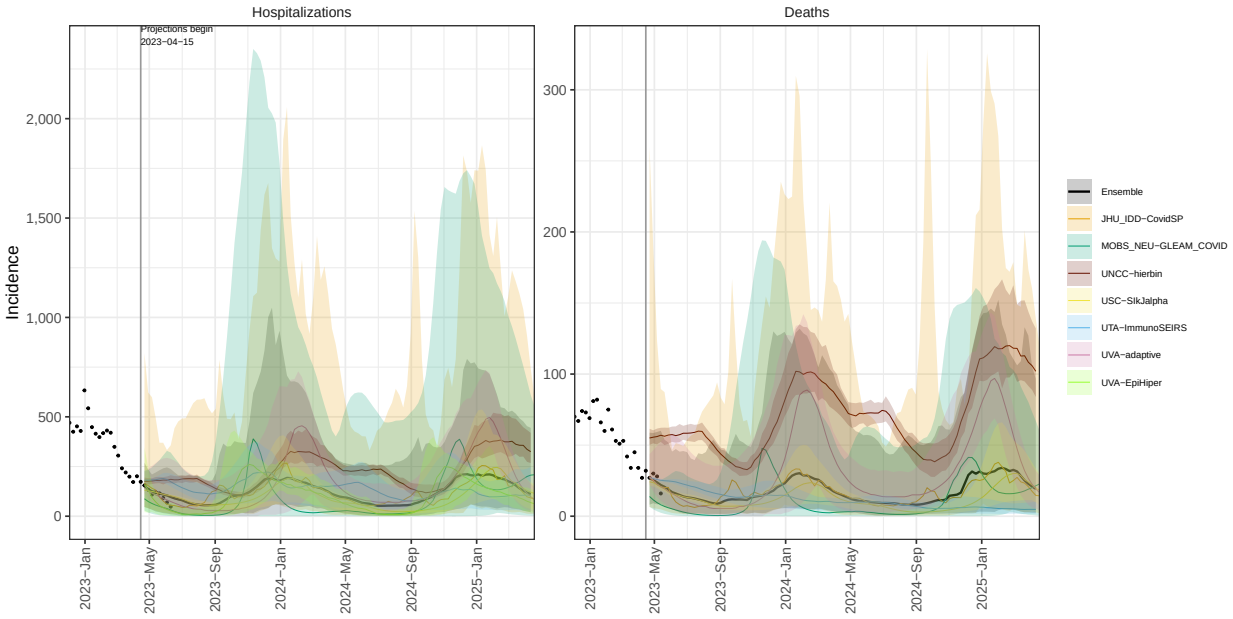
IA model variance & 95% projection intervals − Booster for all, Low immune escape



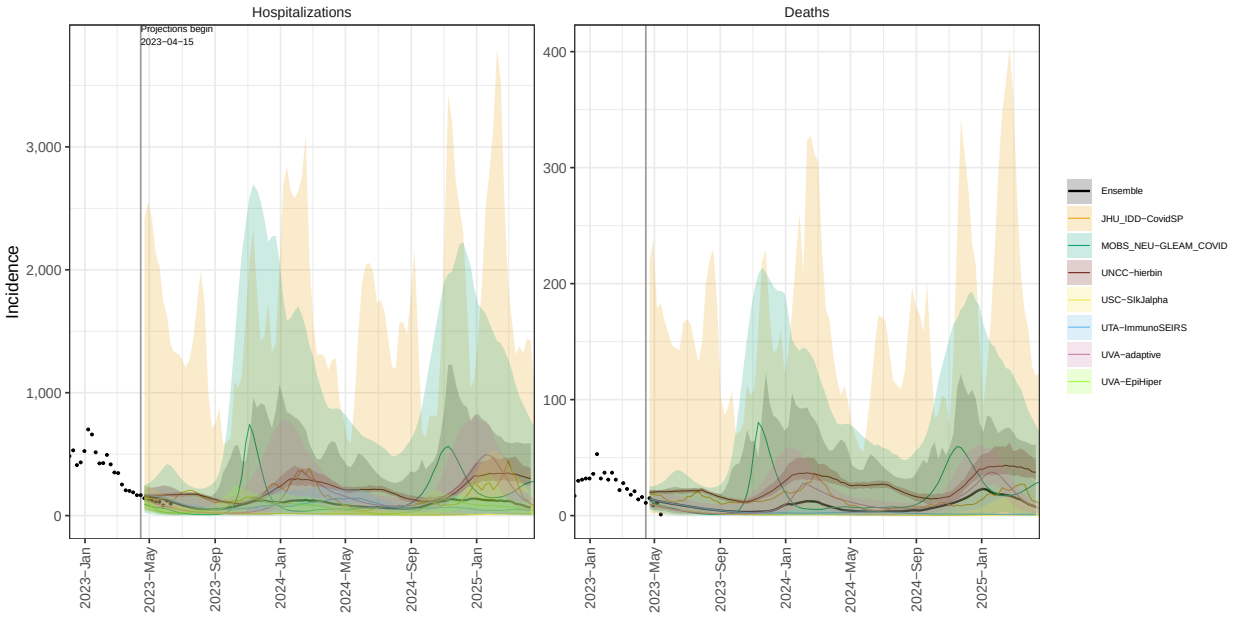
KS model variance & 95% projection intervals − Booster for all, Low immune escape



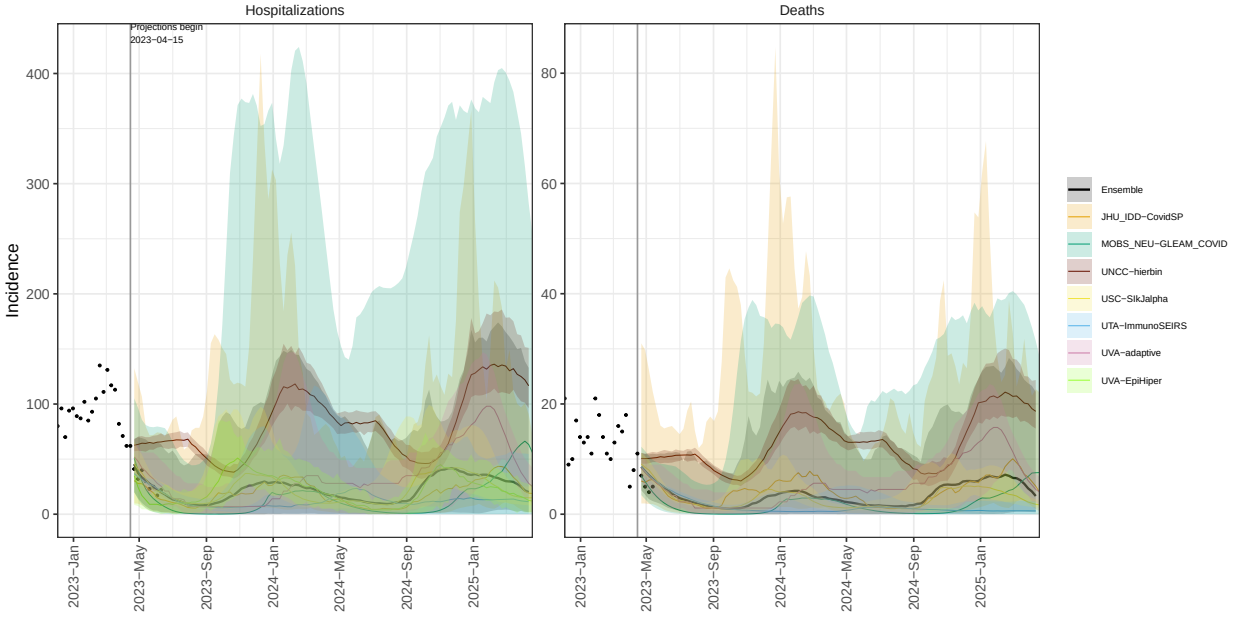
KY model variance & 95% projection intervals − Booster for all, Low immune escape



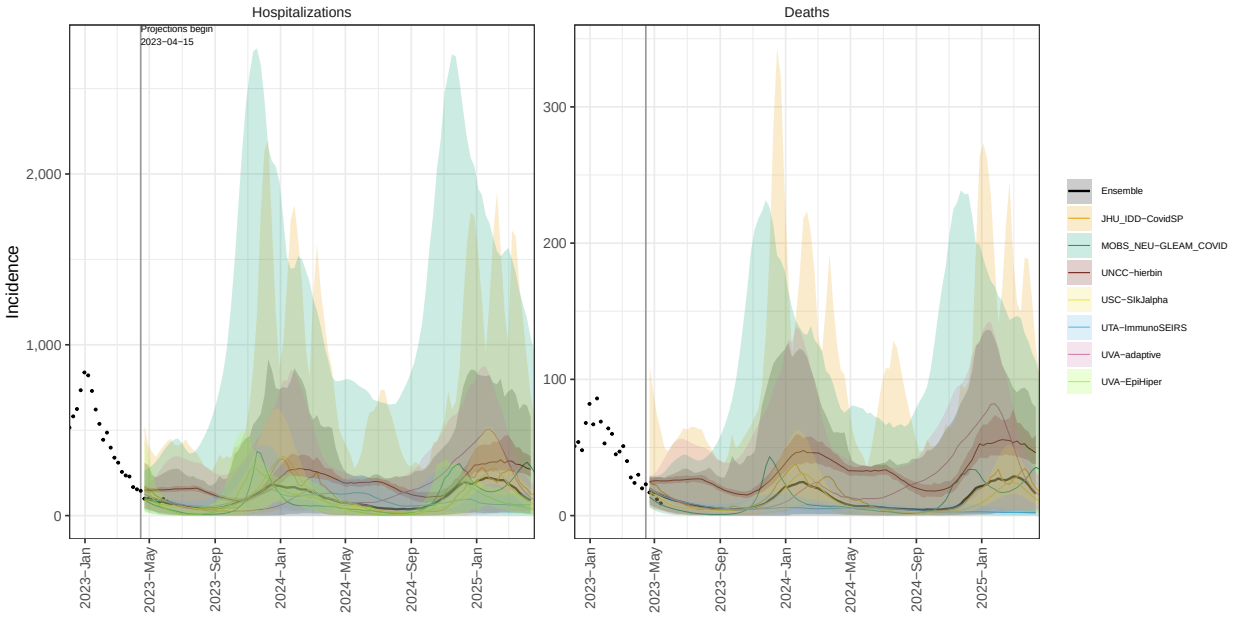
LA model variance & 95% projection intervals − Booster for all, Low immune escape



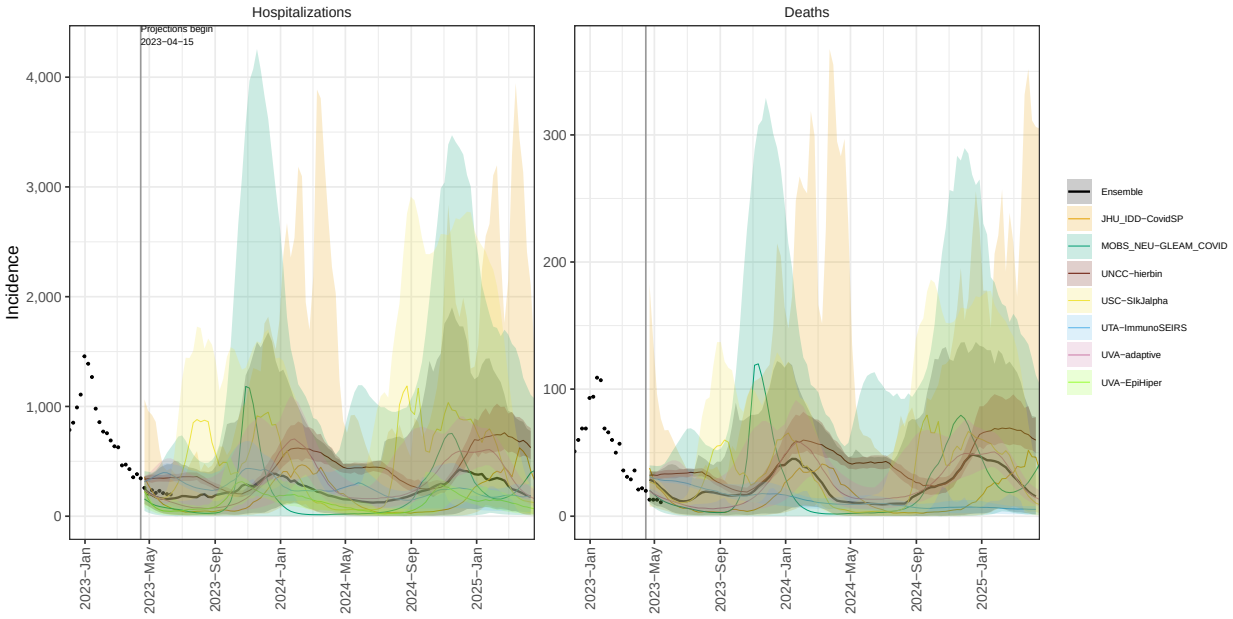
ME model variance & 95% projection intervals − Booster for all, Low immune escape



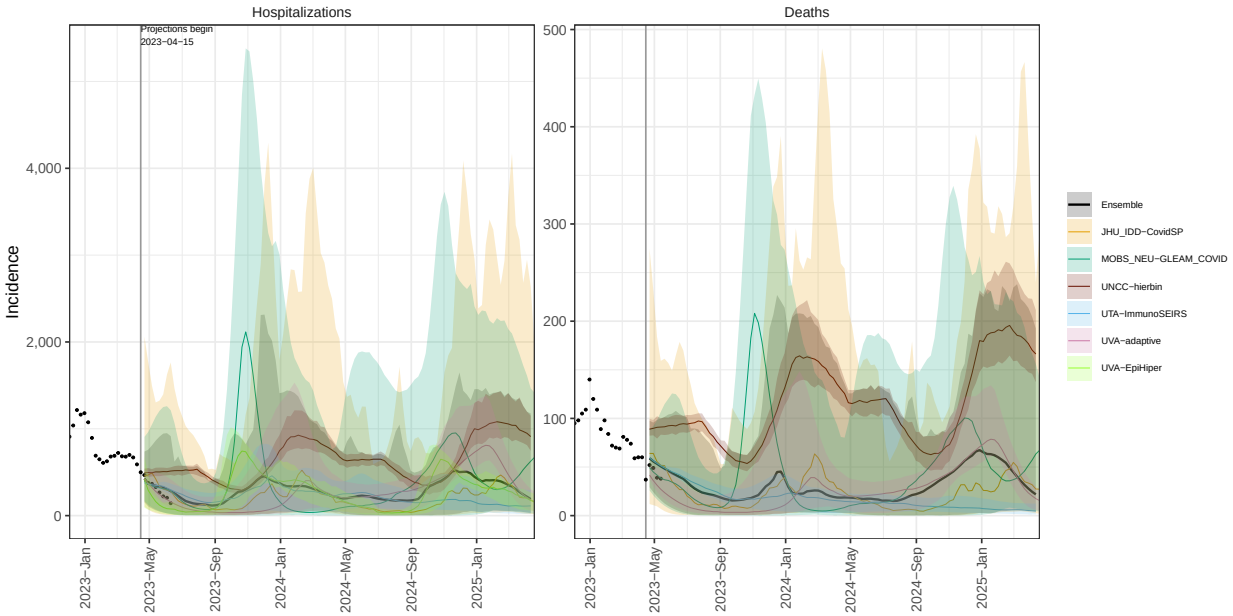
MD model variance & 95% projection intervals − Booster for all, Low immune escape



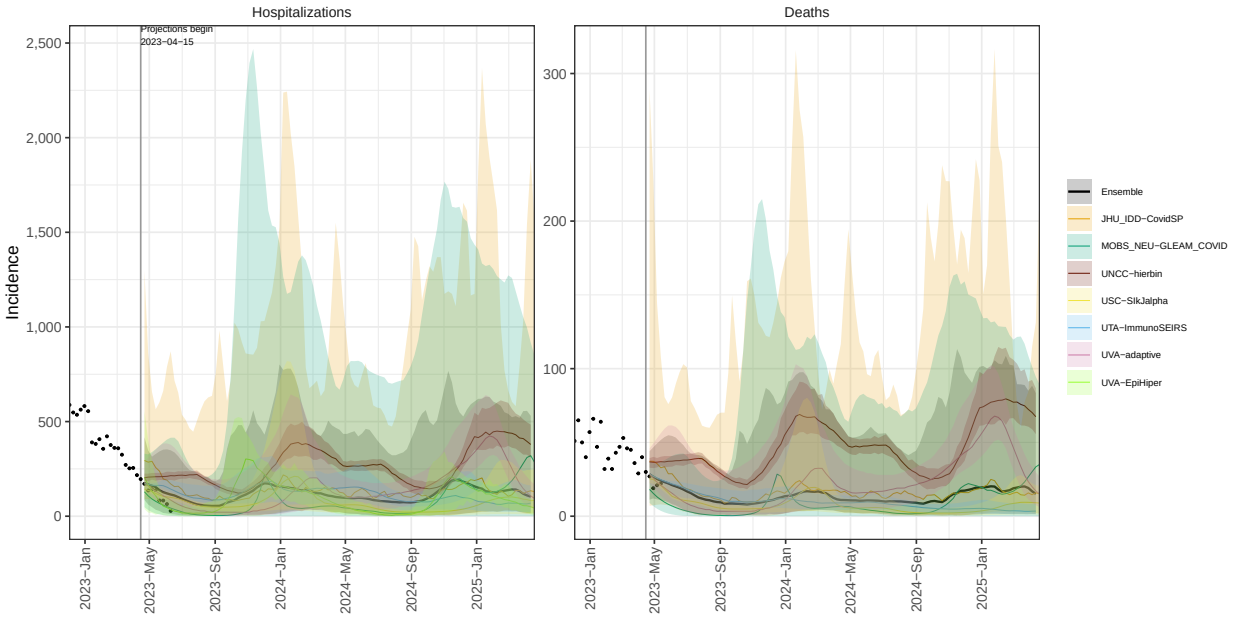
MA model variance & 95% projection intervals − Booster for all, Low immune escape



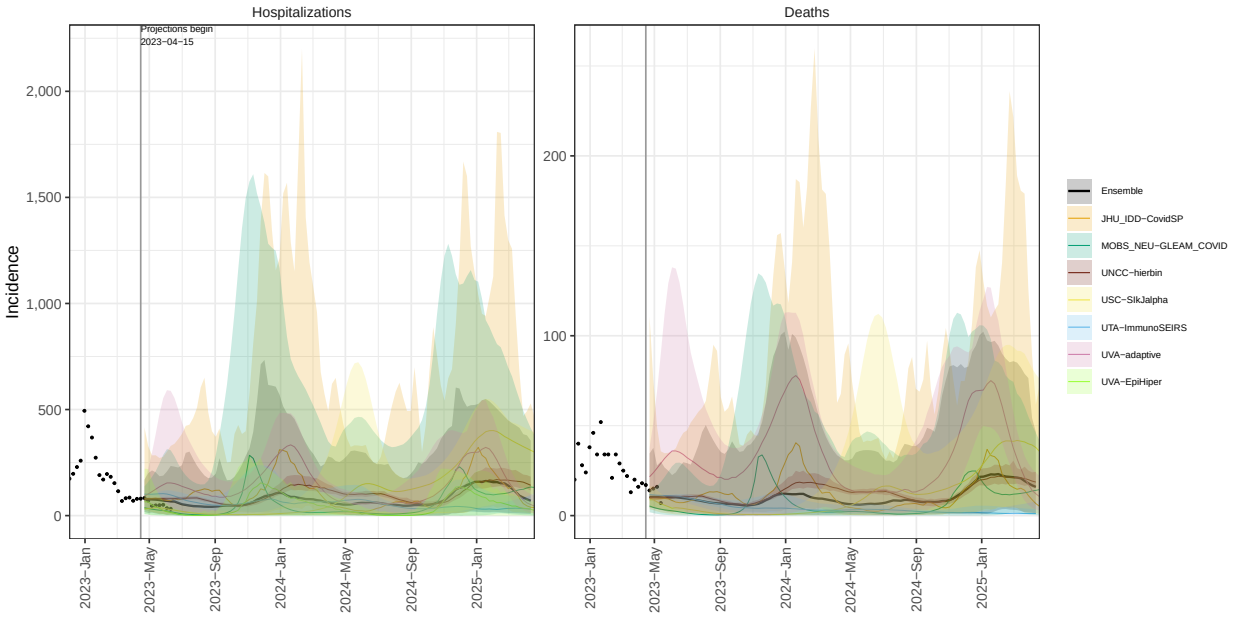
MI model variance & 95% projection intervals − Booster for all, Low immune escape



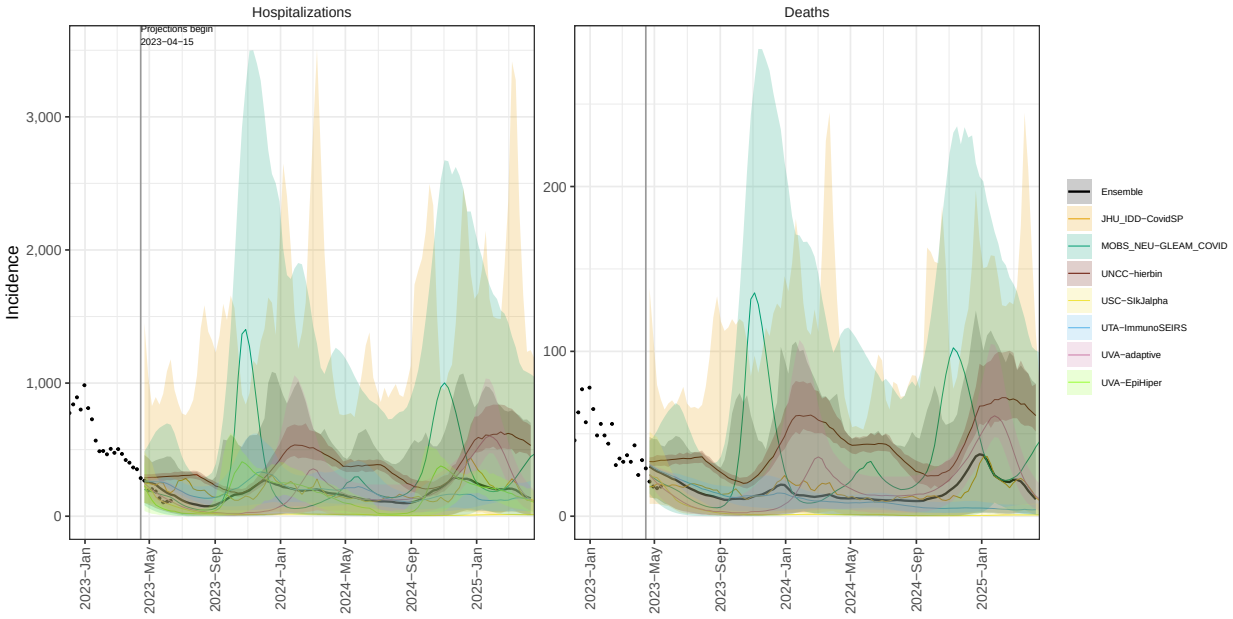
MN model variance & 95% projection intervals − Booster for all, Low immune escape



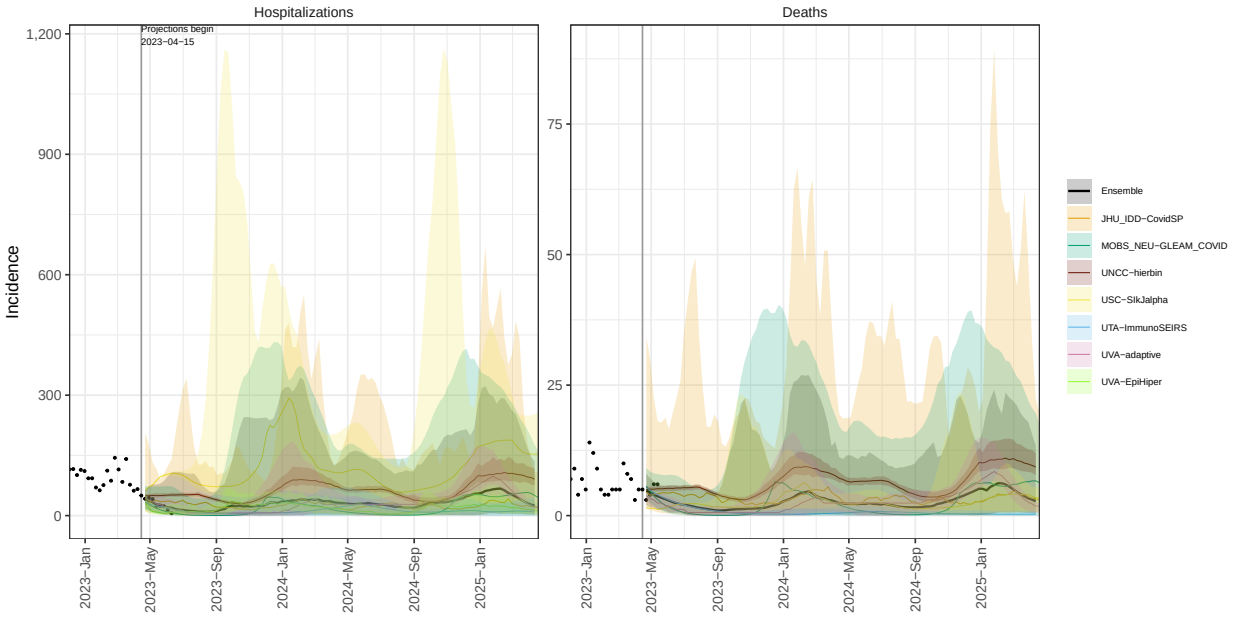
MS model variance & 95% projection intervals − Booster for all, Low immune escape



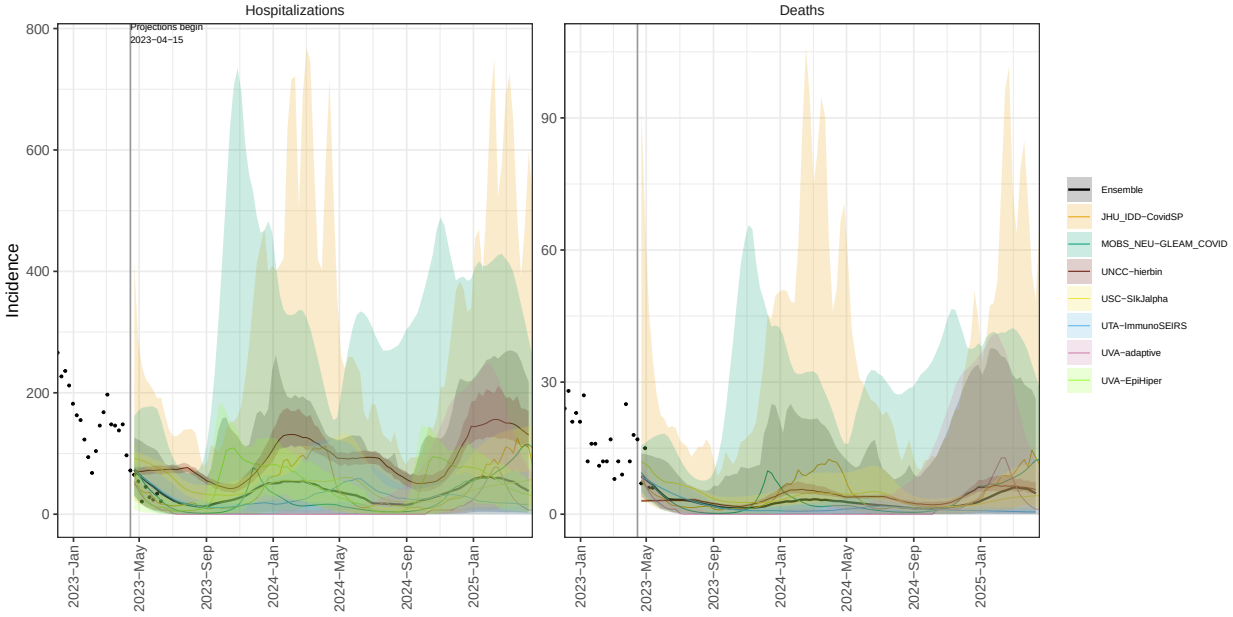
MO model variance & 95% projection intervals − Booster for all, Low immune escape



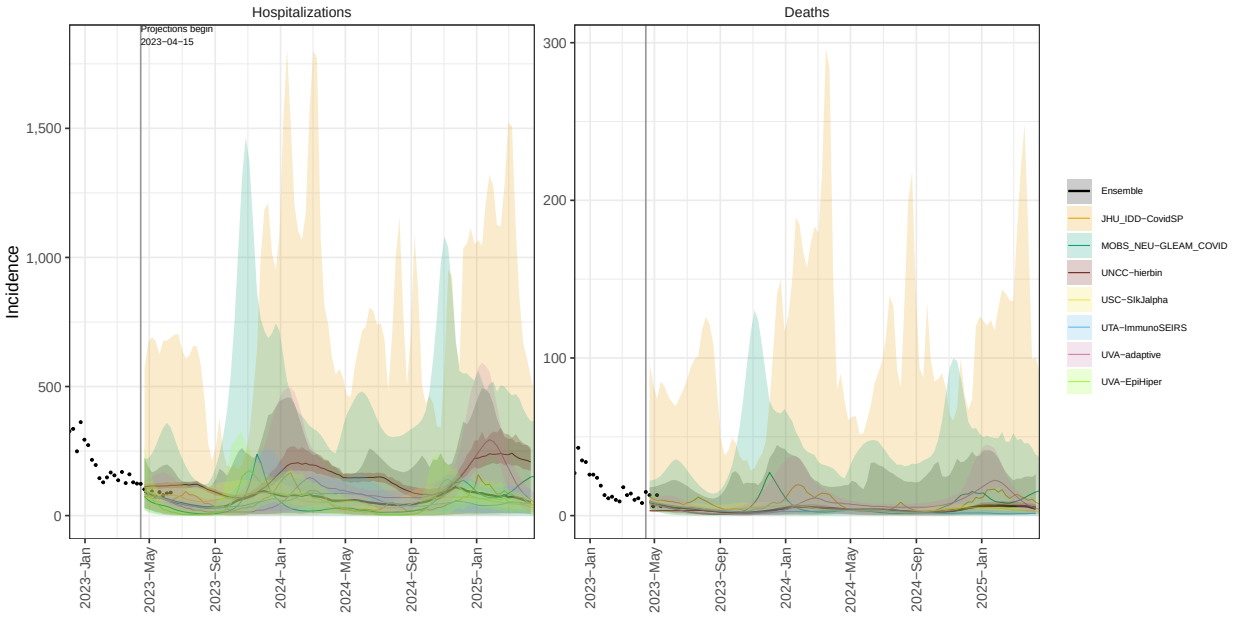
MT model variance & 95% projection intervals − Booster for all, Low immune escape



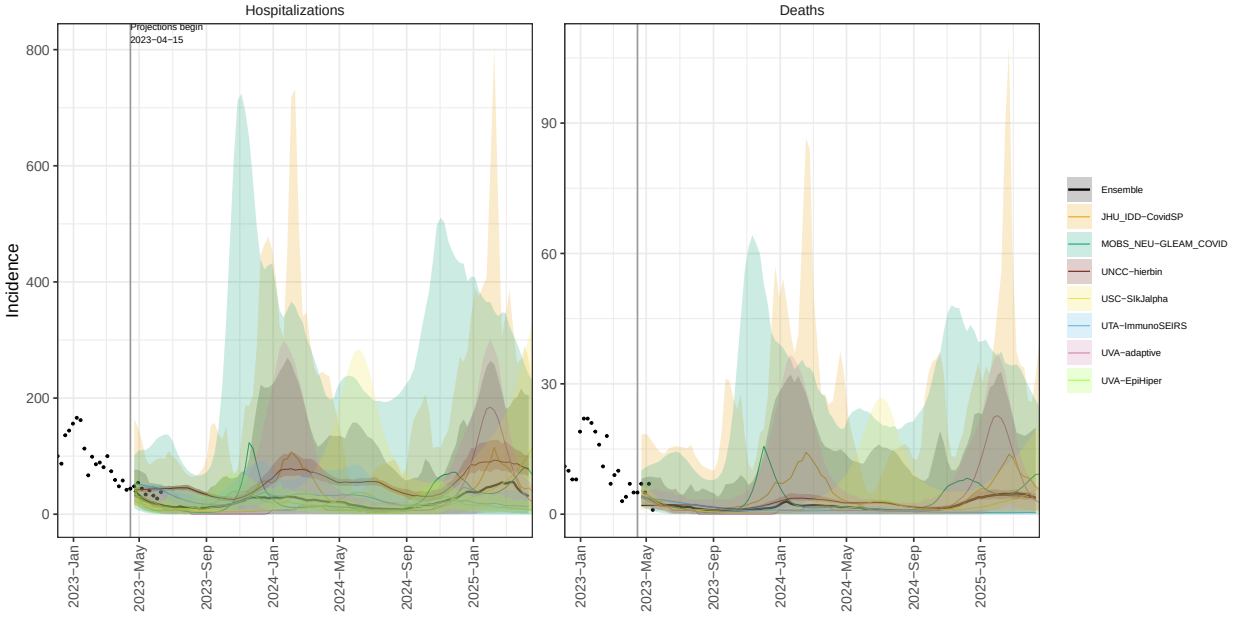
NE model variance & 95% projection intervals − Booster for all, Low immune escape



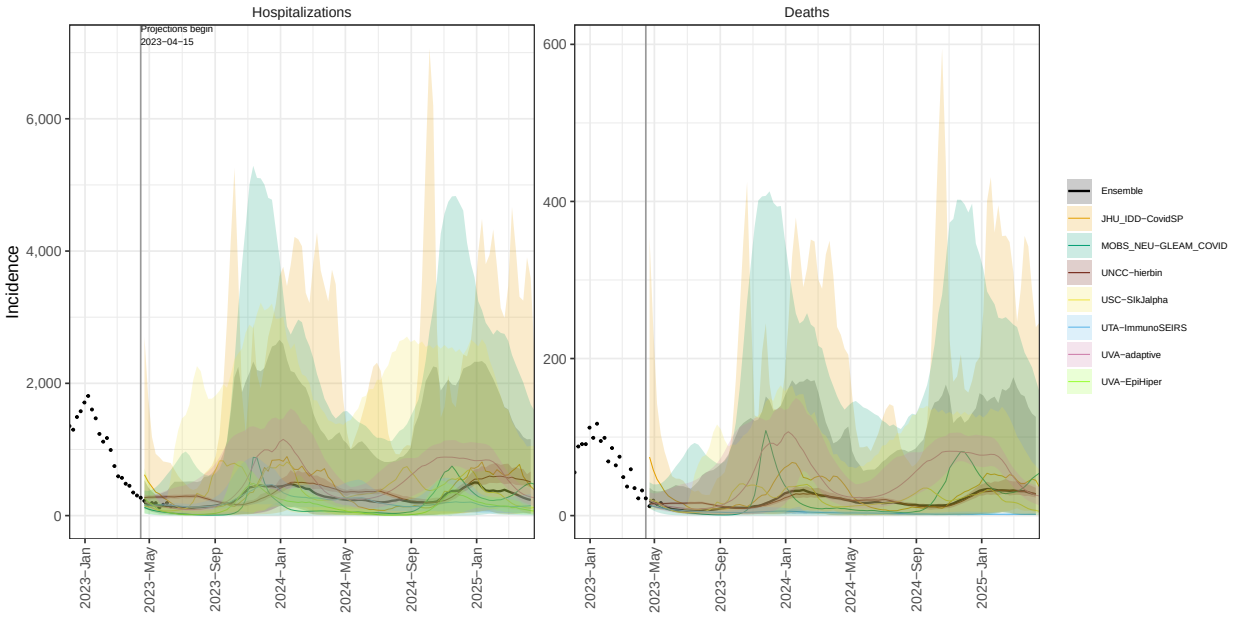
NV model variance & 95% projection intervals − Booster for all, Low immune escape



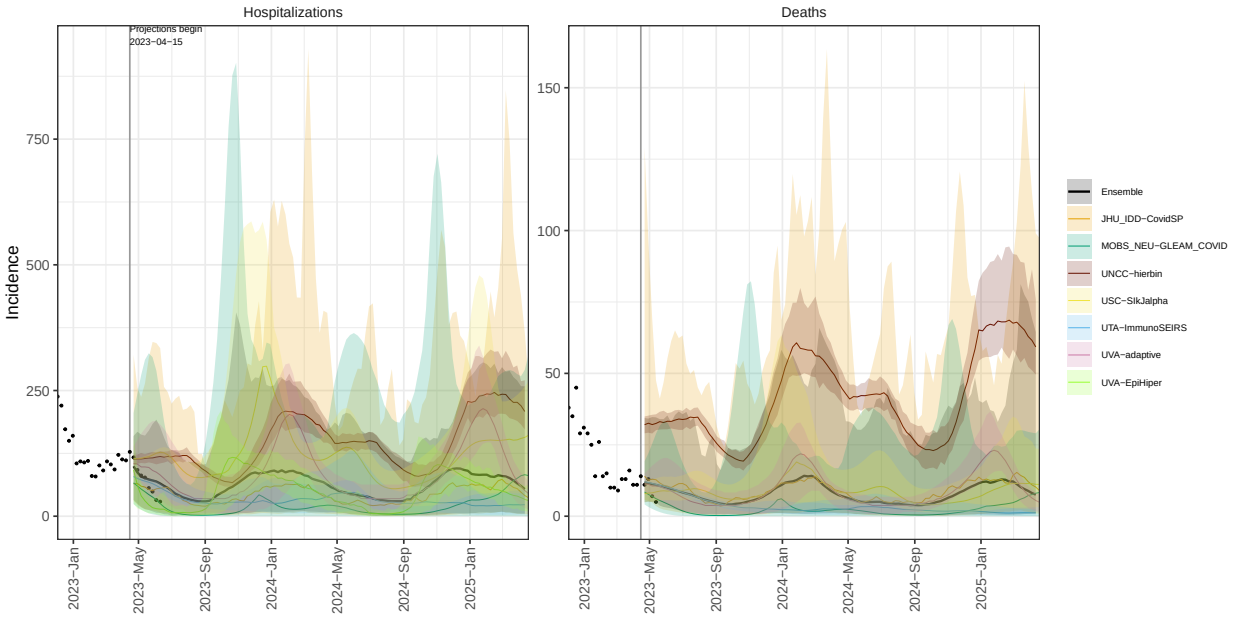
NH model variance & 95% projection intervals − Booster for all, Low immune escape



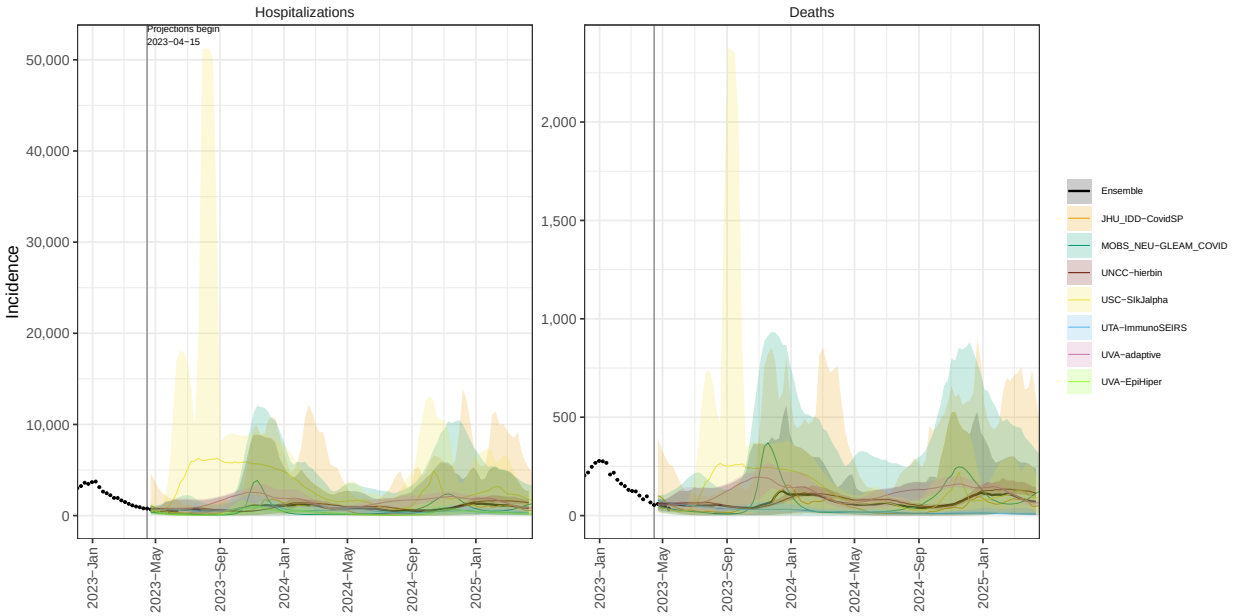
NJ model variance & 95% projection intervals − Booster for all, Low immune escape



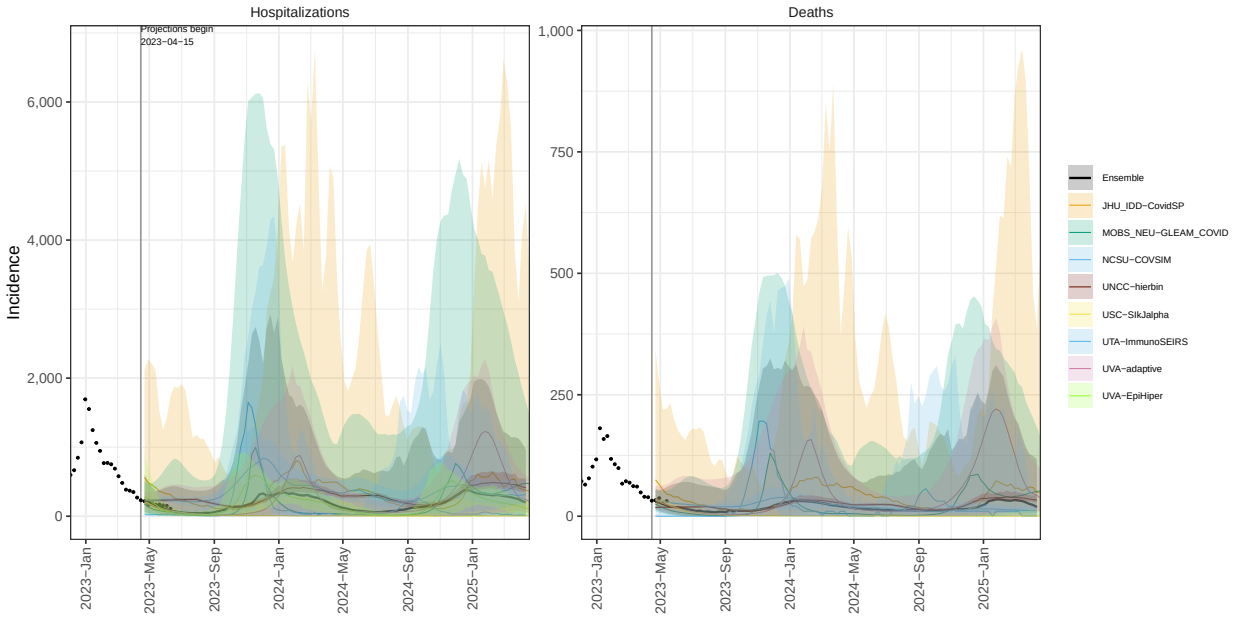
NM model variance & 95% projection intervals − Booster for all, Low immune escape



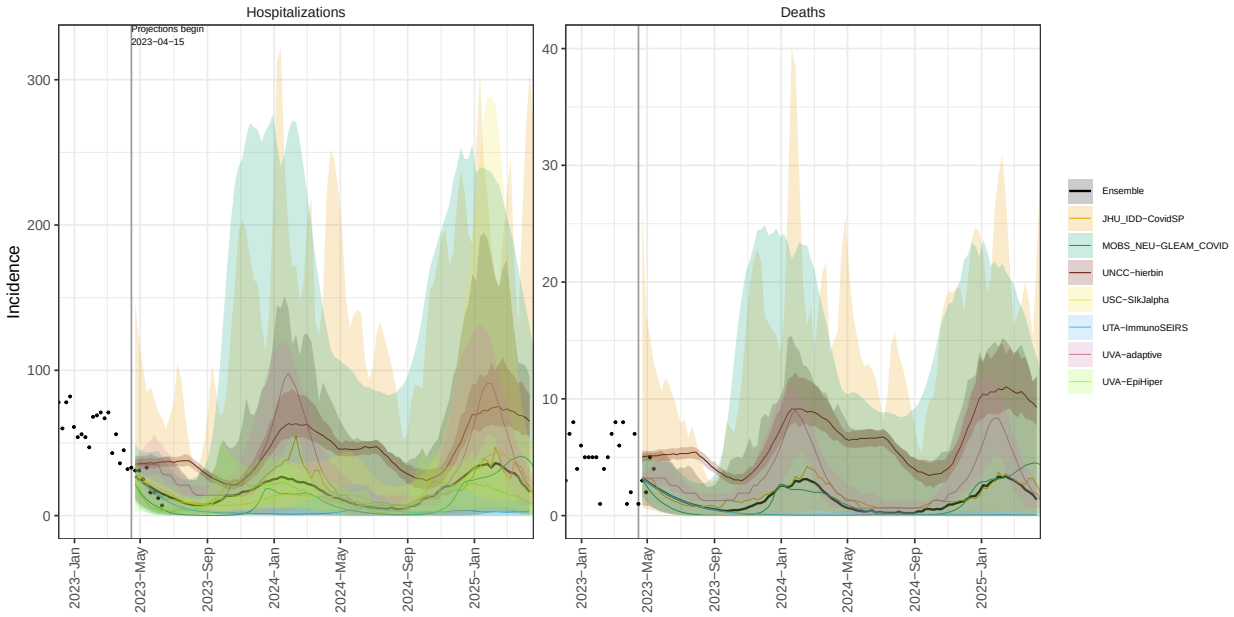
NY model variance & 95% projection intervals − Booster for all, Low immune escape



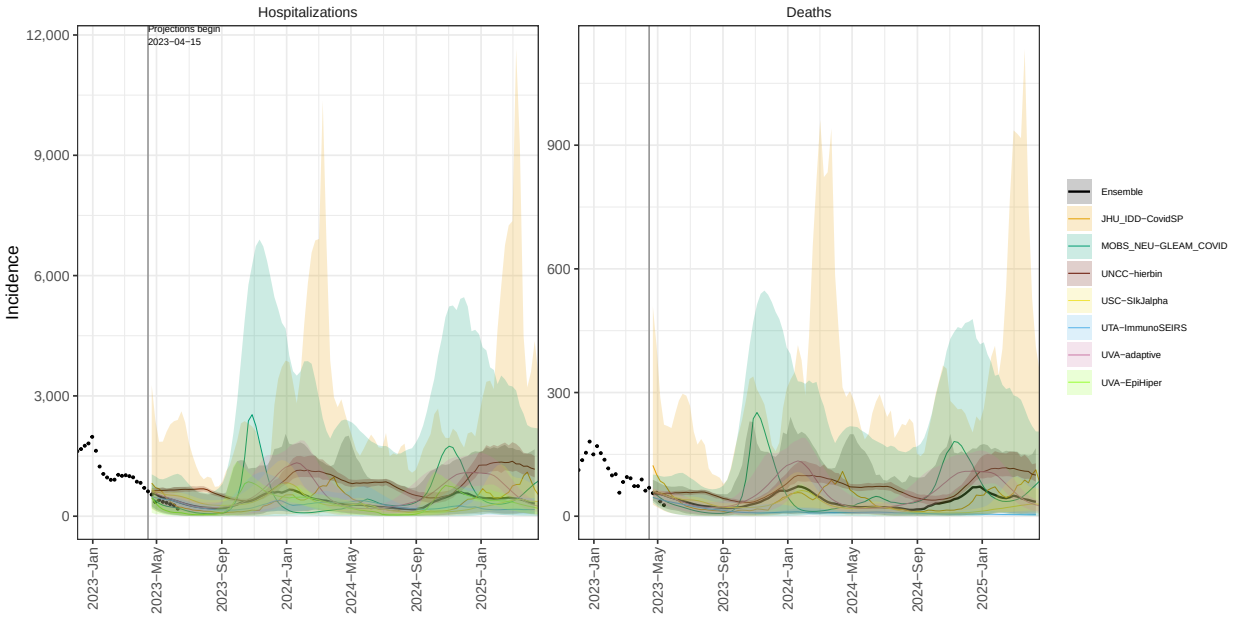
NC model variance & 95% projection intervals − Booster for all, Low immune escape



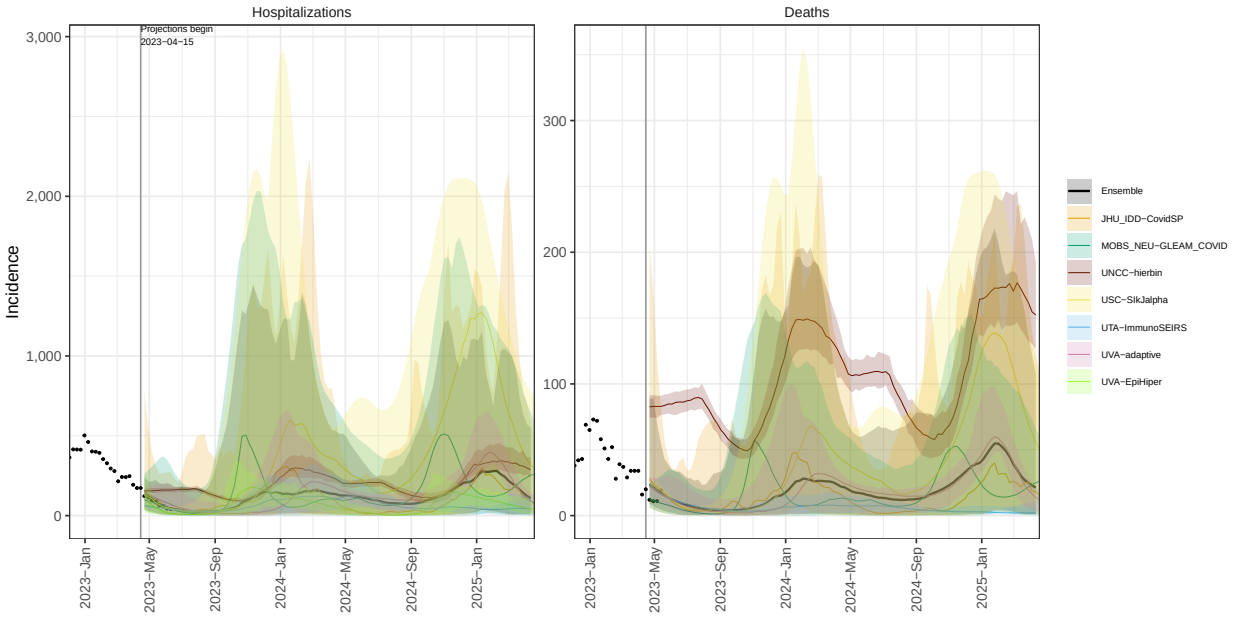
ND model variance & 95% projection intervals − Booster for all, Low immune escape



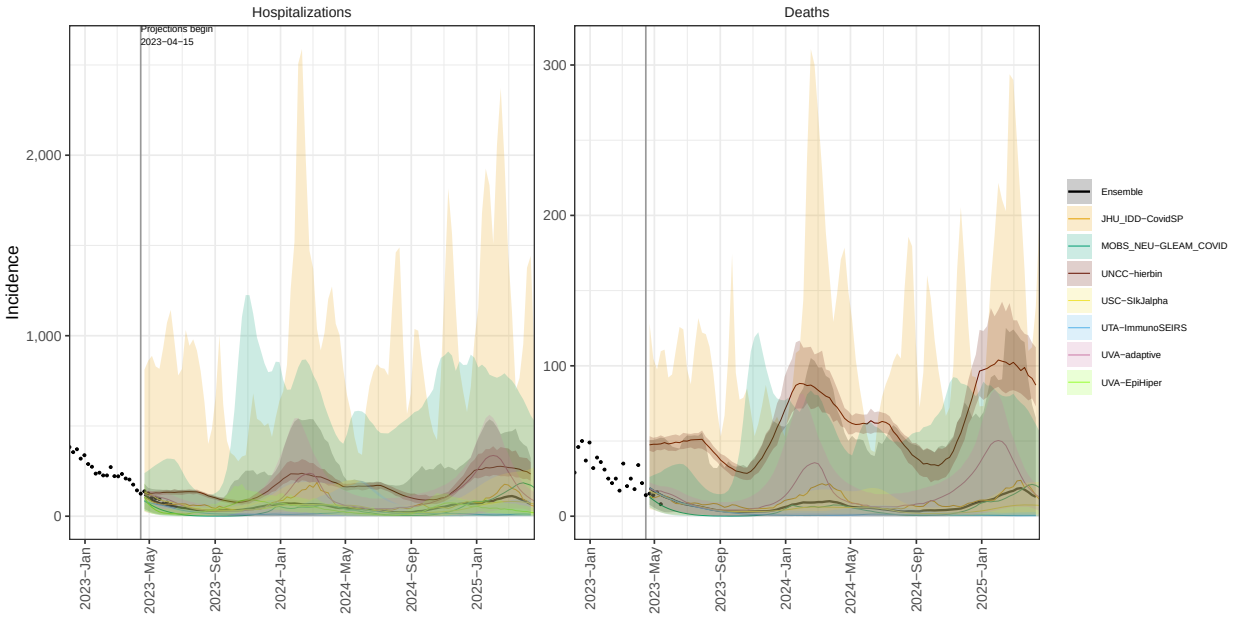
OH model variance & 95% projection intervals − Booster for all, Low immune escape



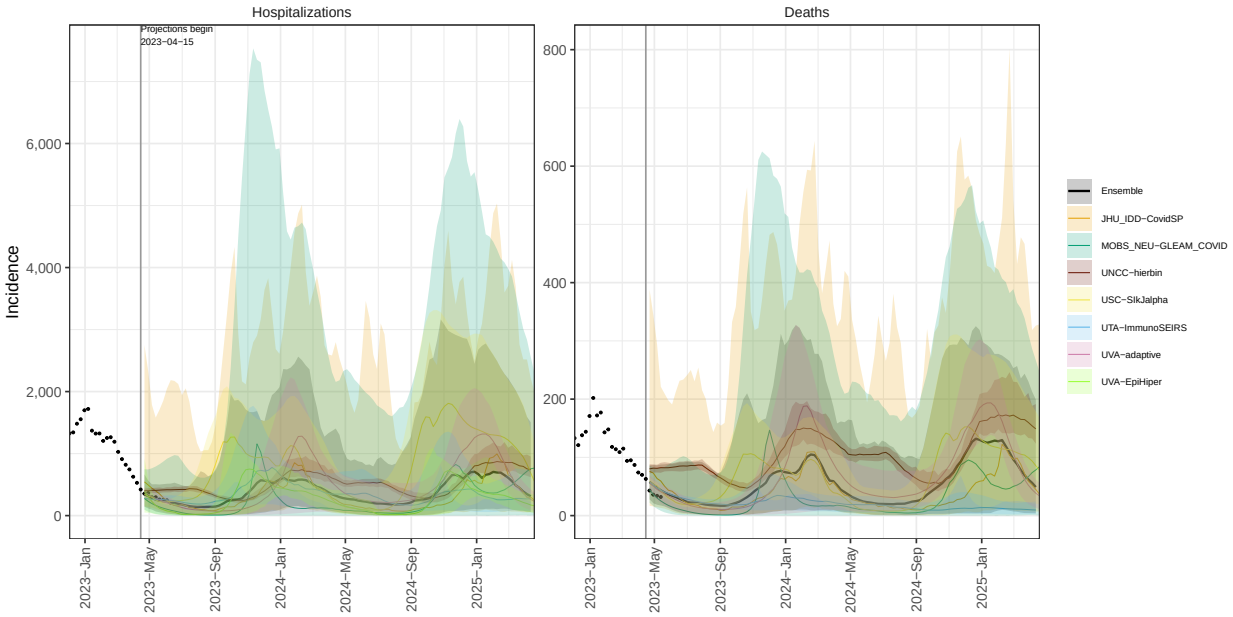
OK model variance & 95% projection intervals − Booster for all, Low immune escape



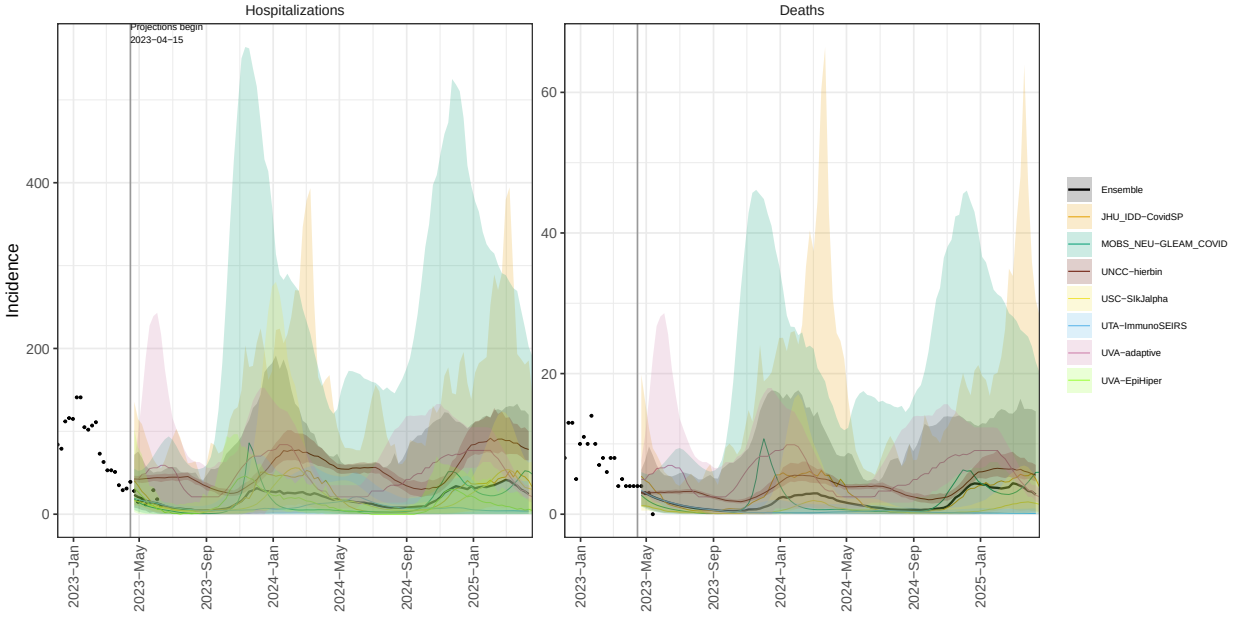
OR model variance & 95% projection intervals − Booster for all, Low immune escape



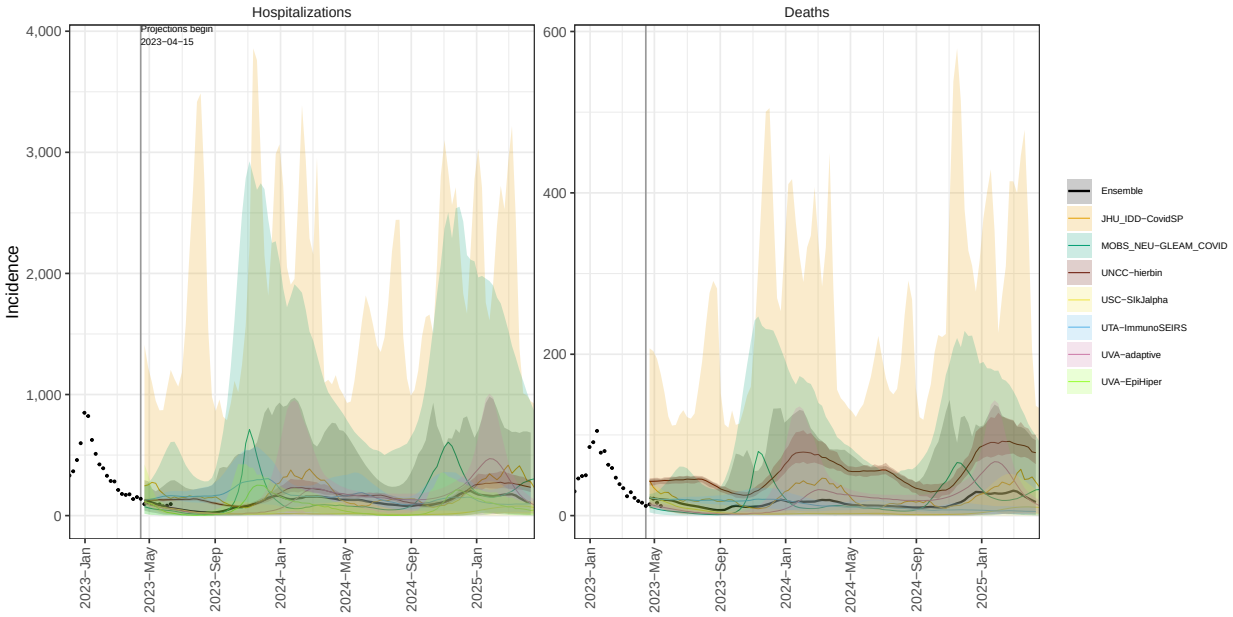
PA model variance & 95% projection intervals − Booster for all, Low immune escape



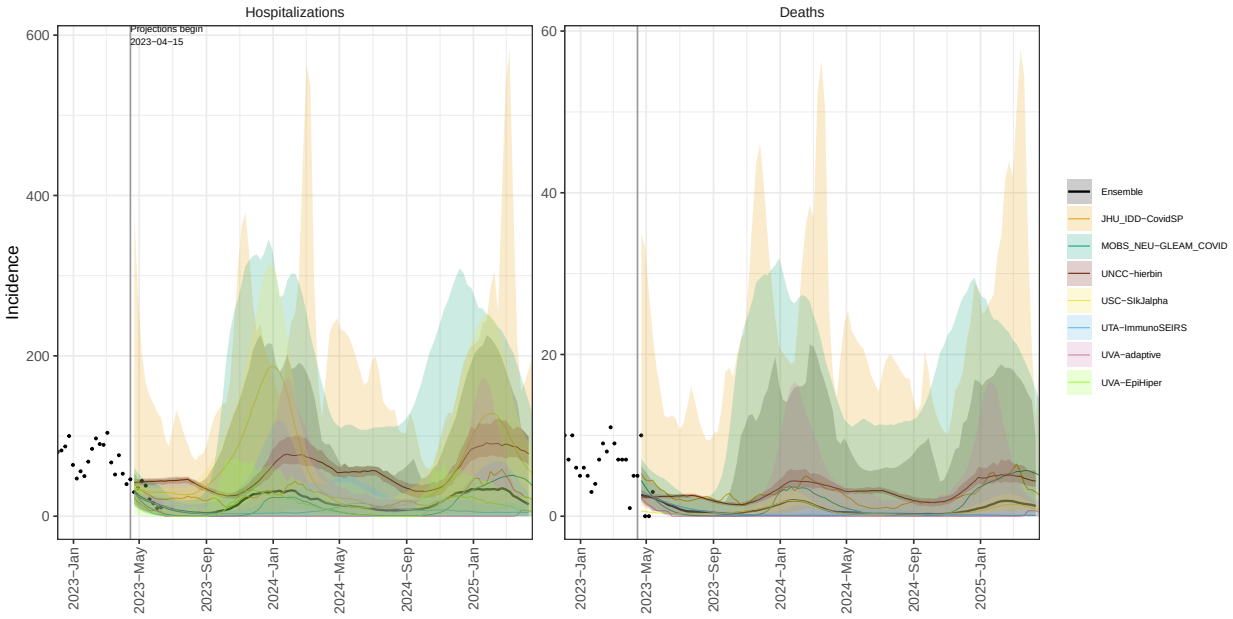
RI model variance & 95% projection intervals − Booster for all, Low immune escape



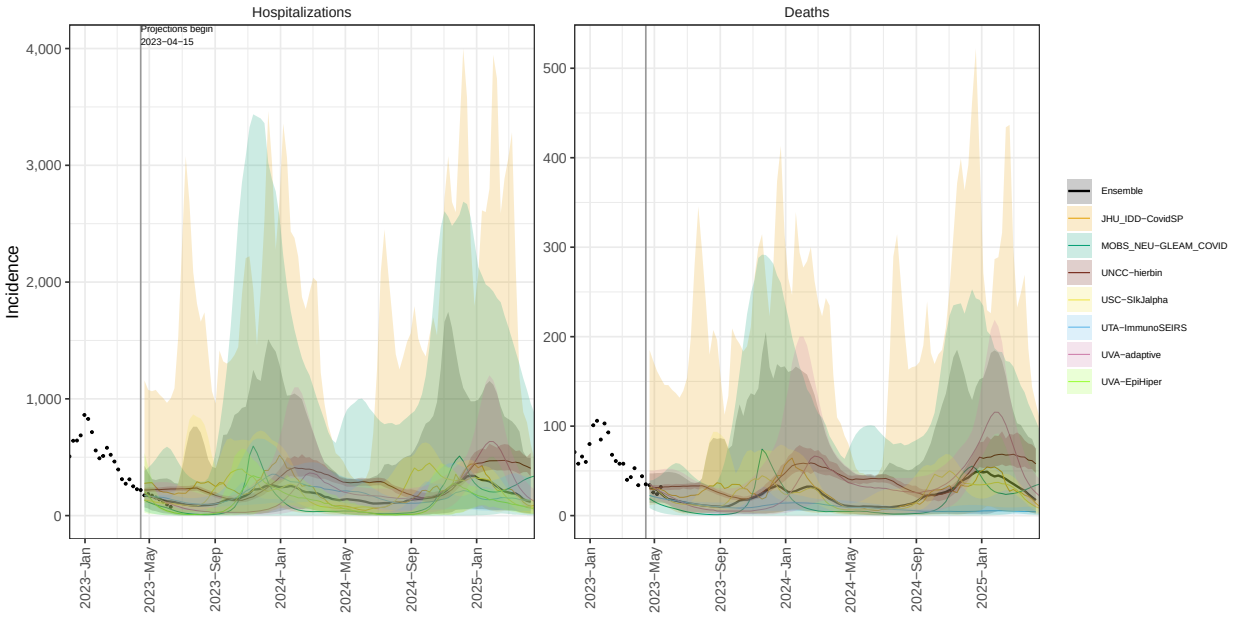
SC model variance & 95% projection intervals − Booster for all, Low immune escape



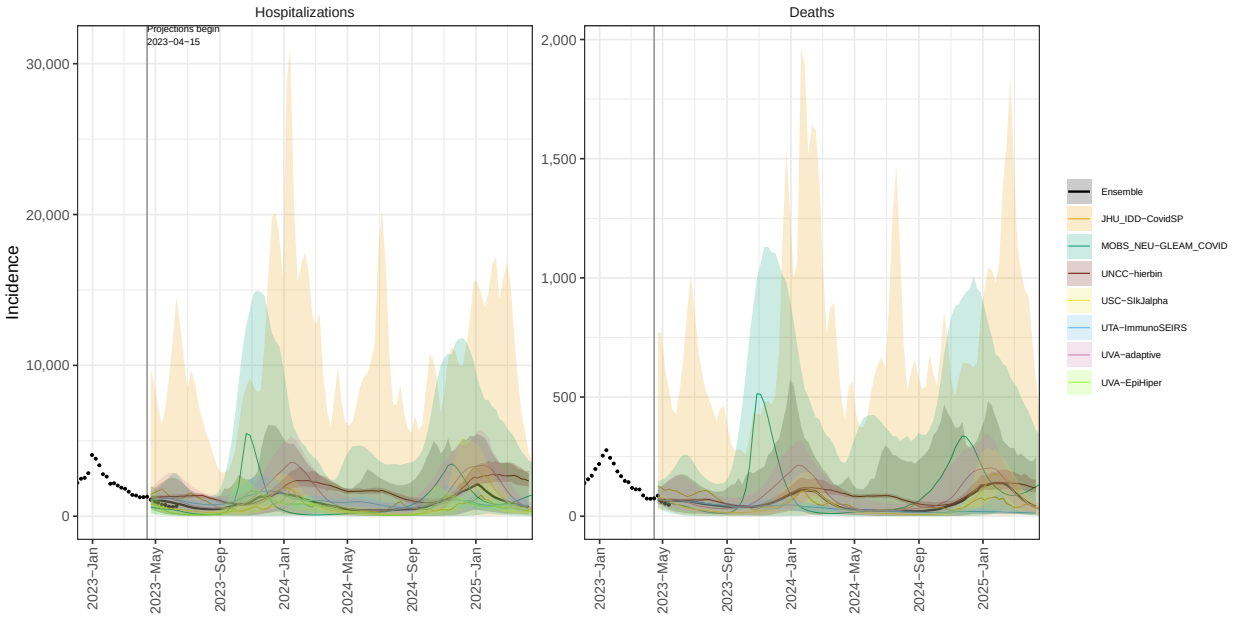
SD model variance & 95% projection intervals − Booster for all, Low immune escape



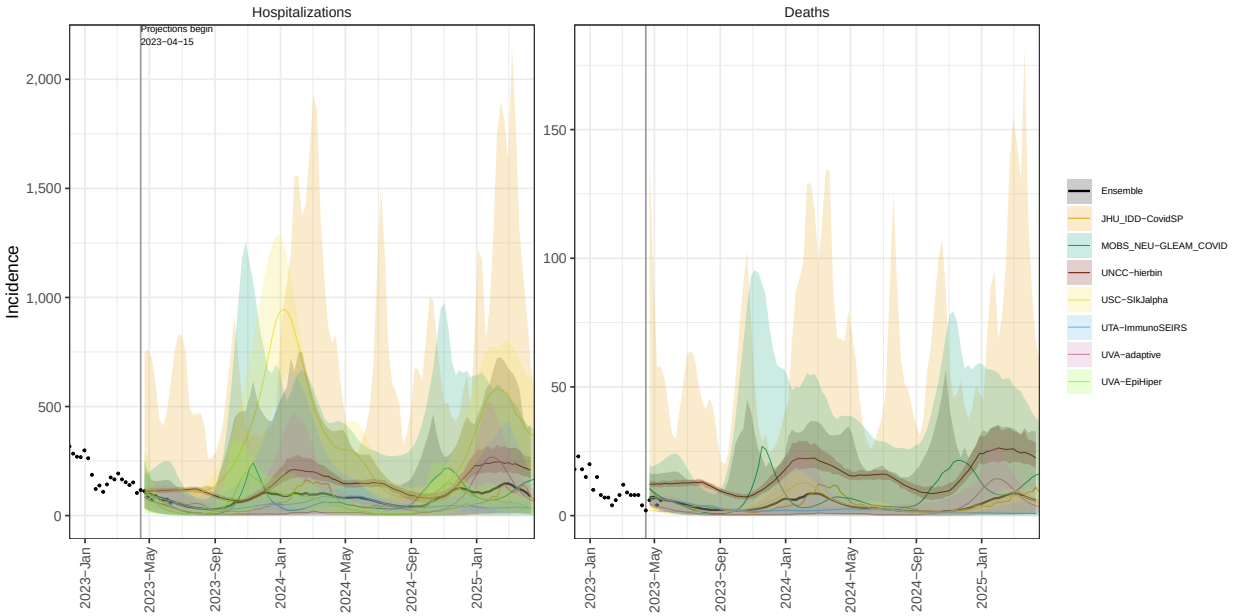
TN model variance & 95% projection intervals − Booster for all, Low immune escape



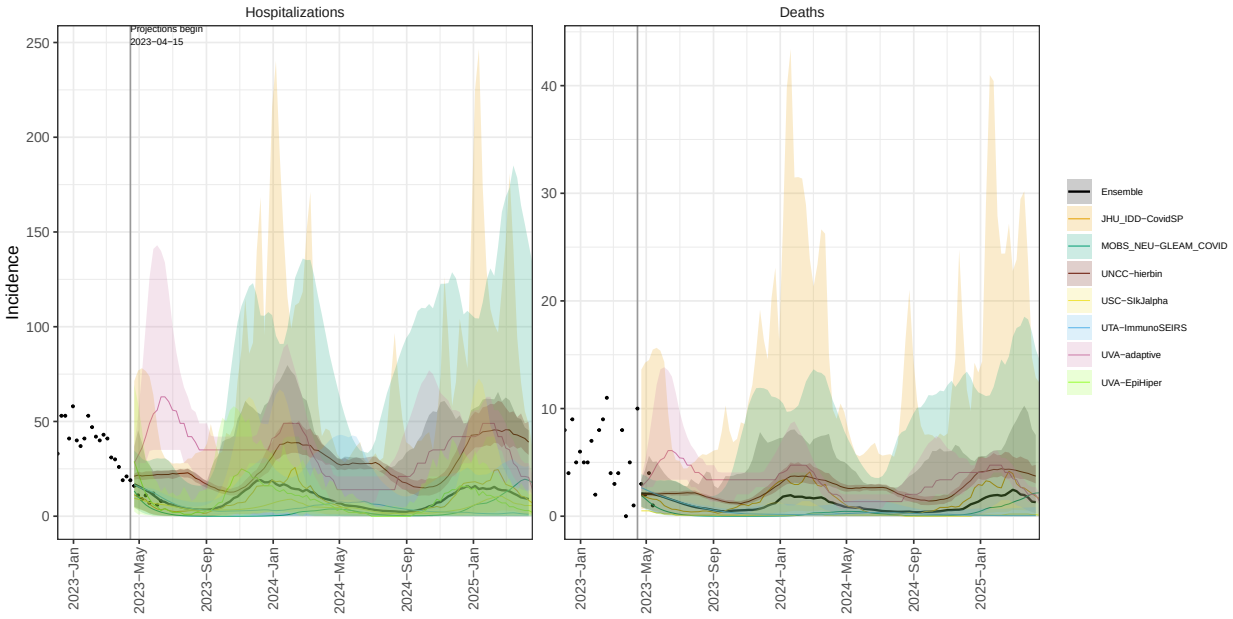
TX model variance & 95% projection intervals − Booster for all, Low immune escape



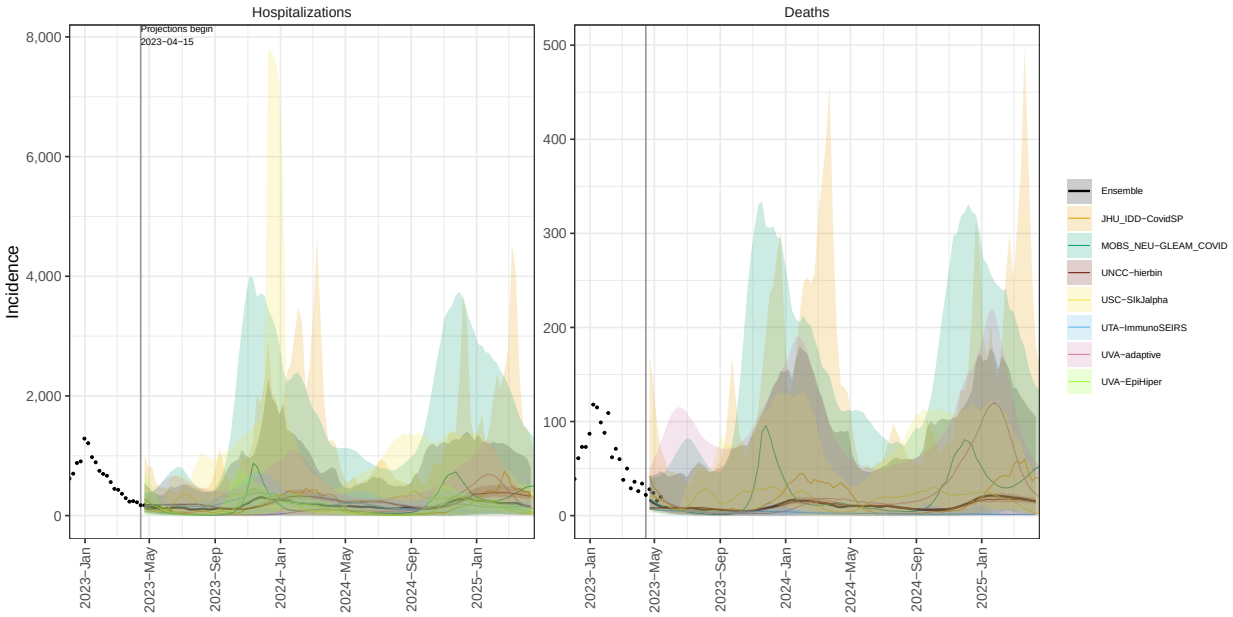
UT model variance & 95% projection intervals − Booster for all, Low immune escape



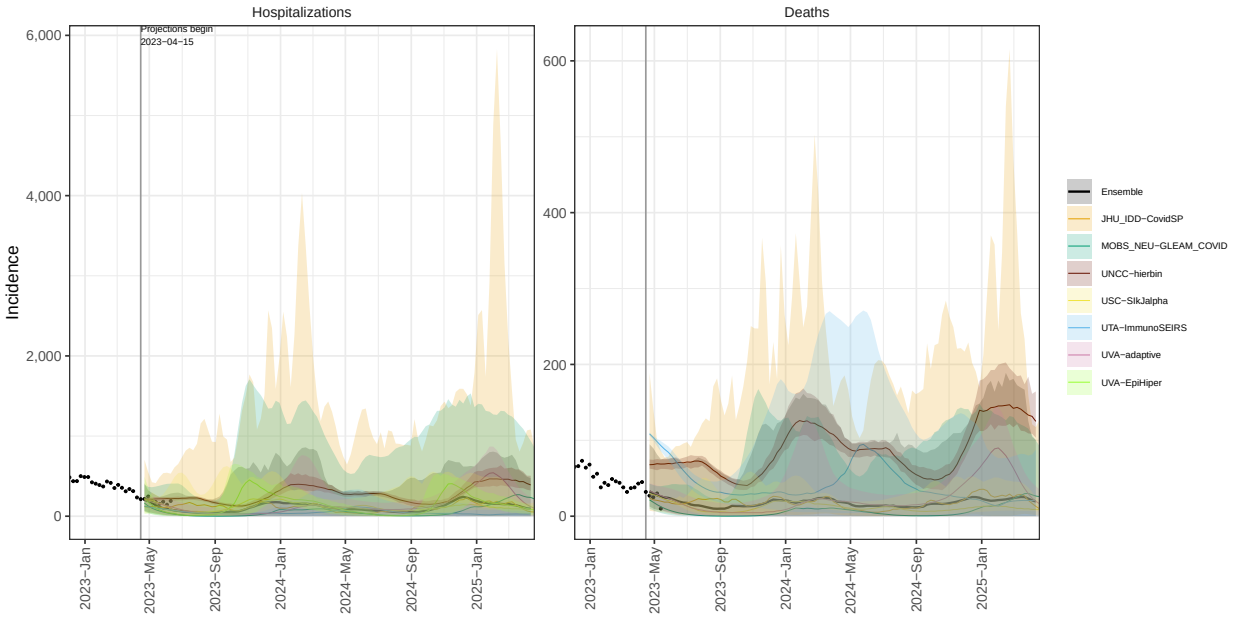
VT model variance & 95% projection intervals − Booster for all, Low immune escape



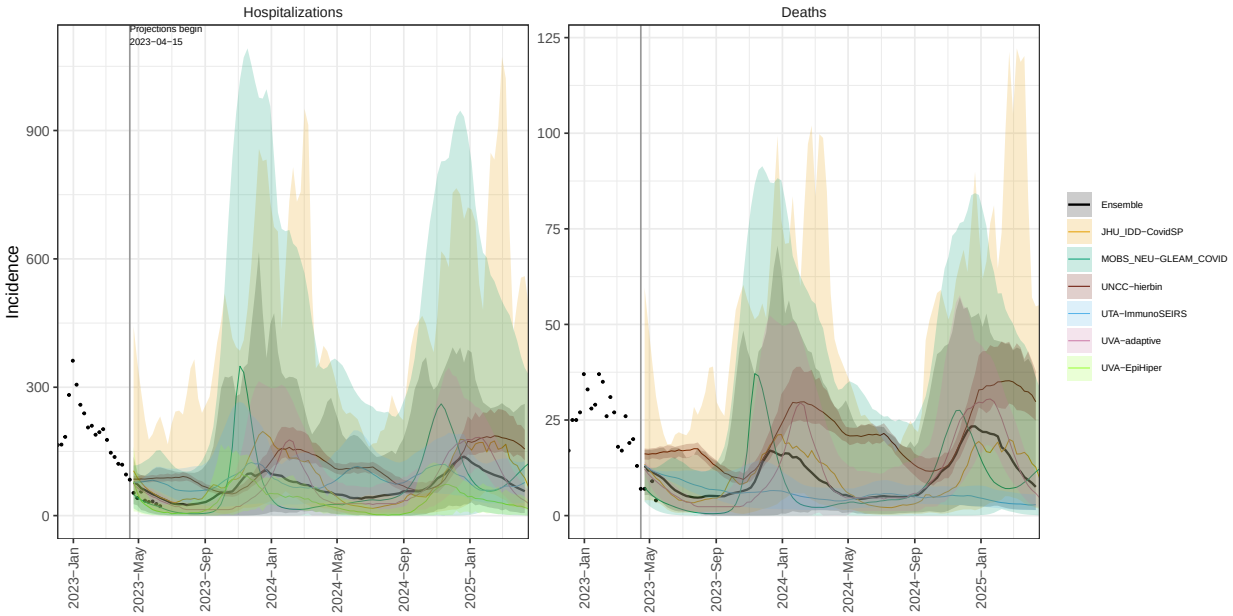
VA model variance & 95% projection intervals − Booster for all, Low immune escape

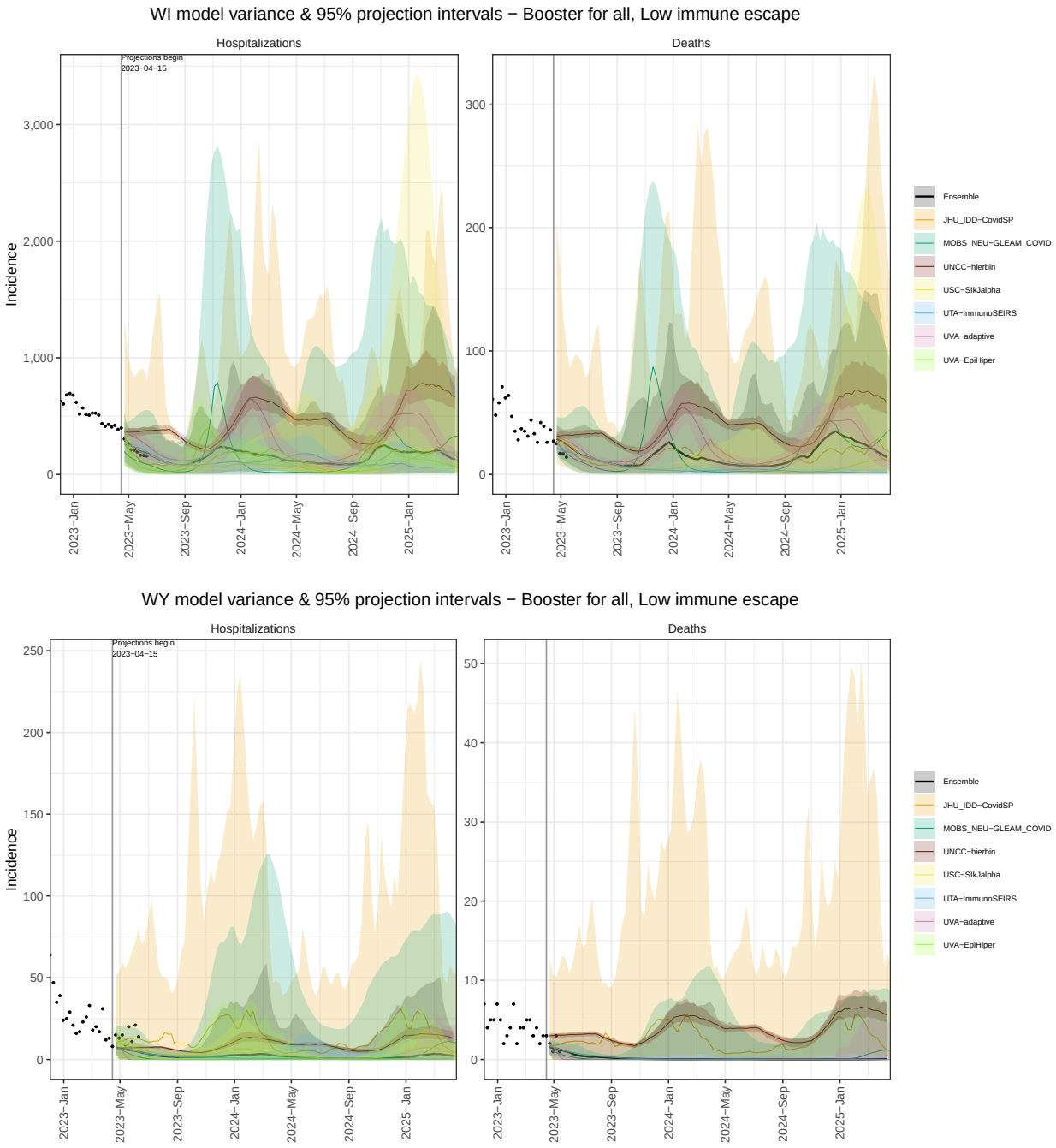


WA model variance & 95% projection intervals − Booster for all, Low immune escape



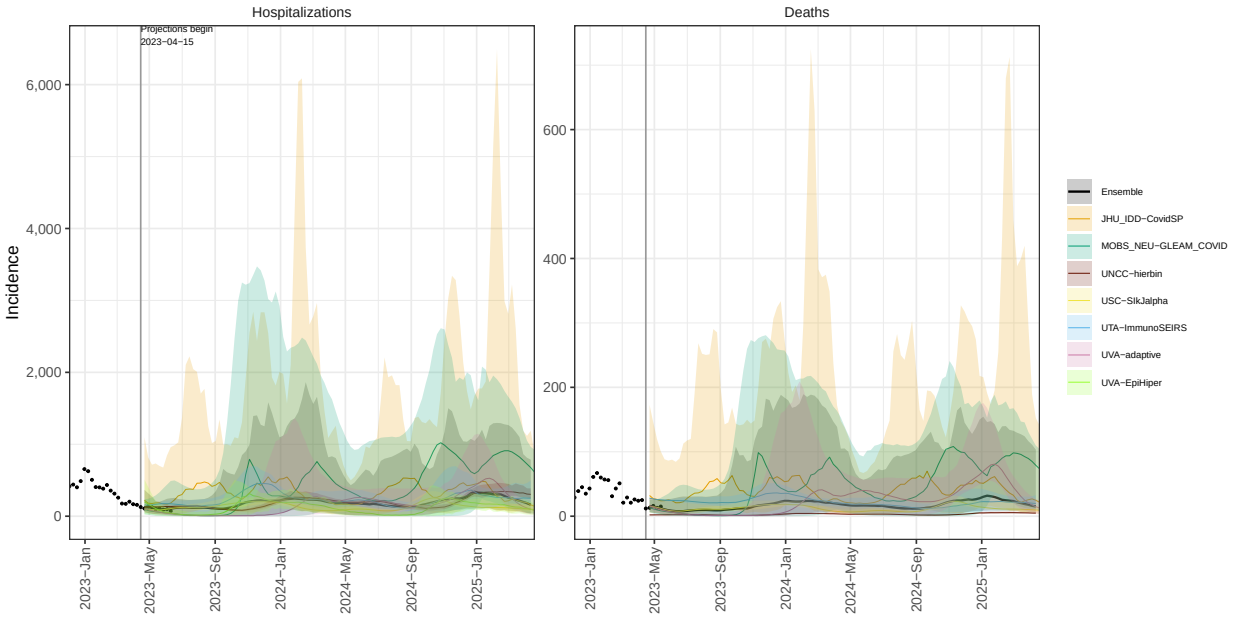
WV model variance & 95% projection intervals − Booster for all, Low immune escape



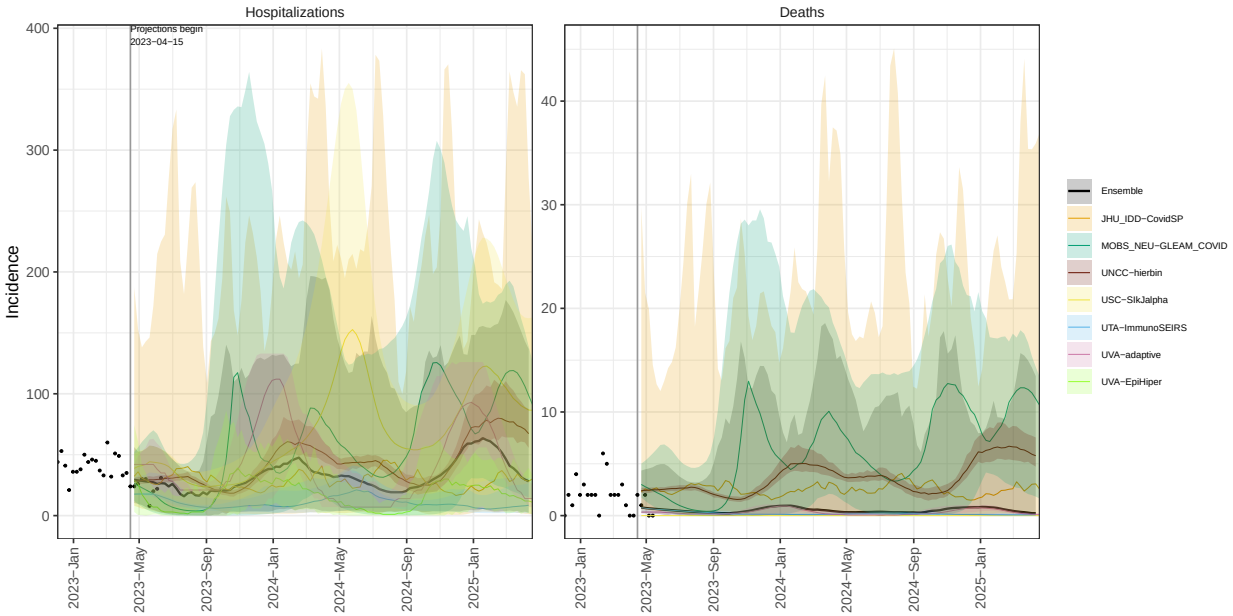


Model variation for Booster for all, High immune escape scenario.

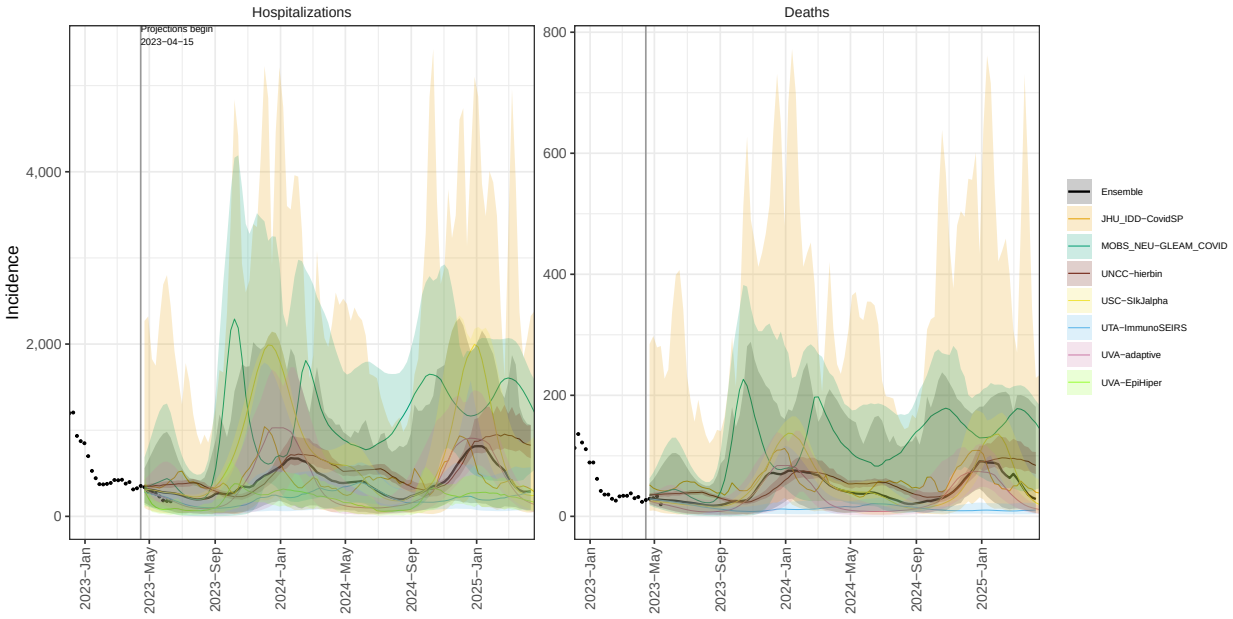
AL model variance & 95% projection intervals − Booster for all, High immune escape



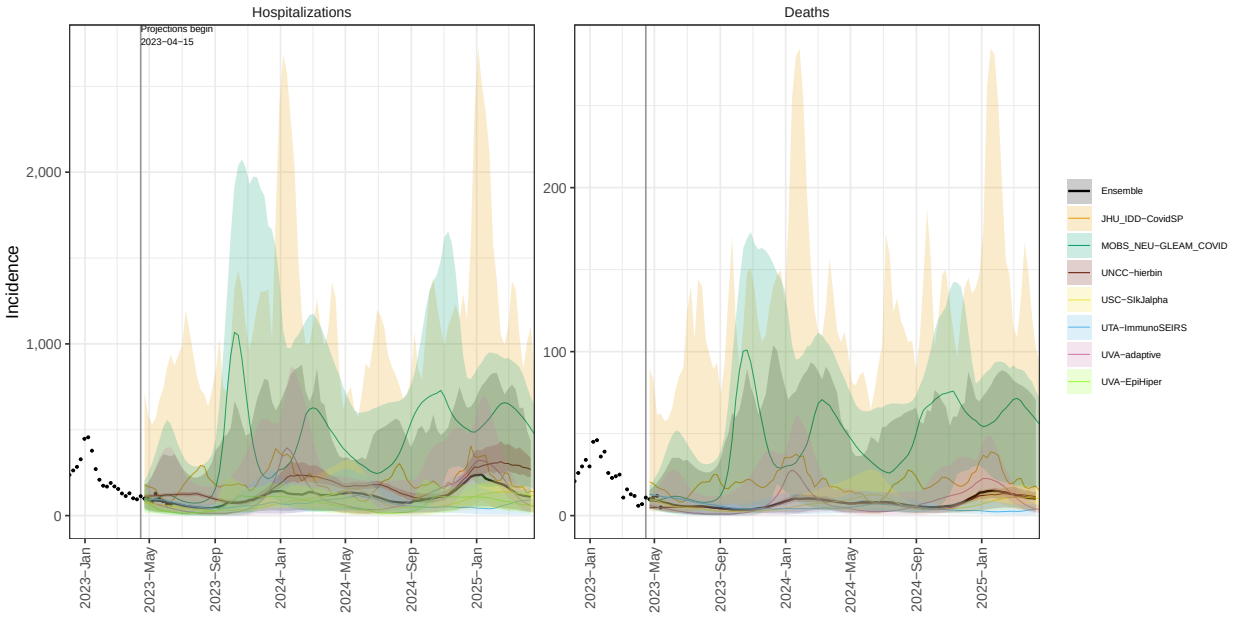
AK model variance & 95% projection intervals − Booster for all, High immune escape



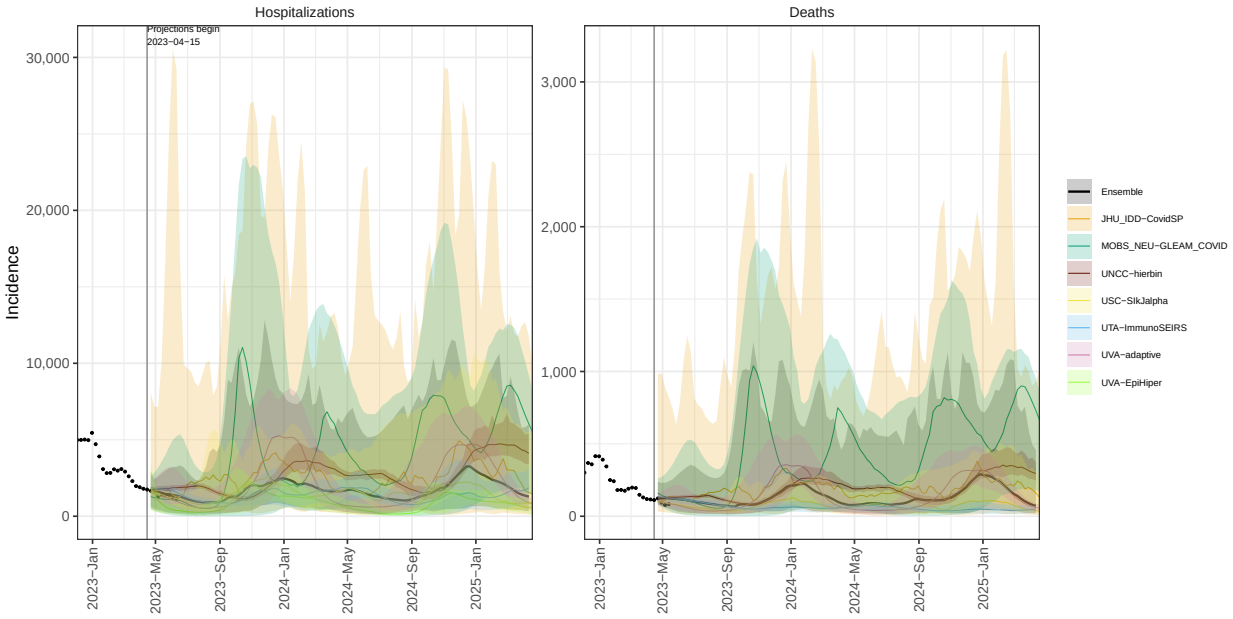
AZ model variance & 95% projection intervals − Booster for all, High immune escape



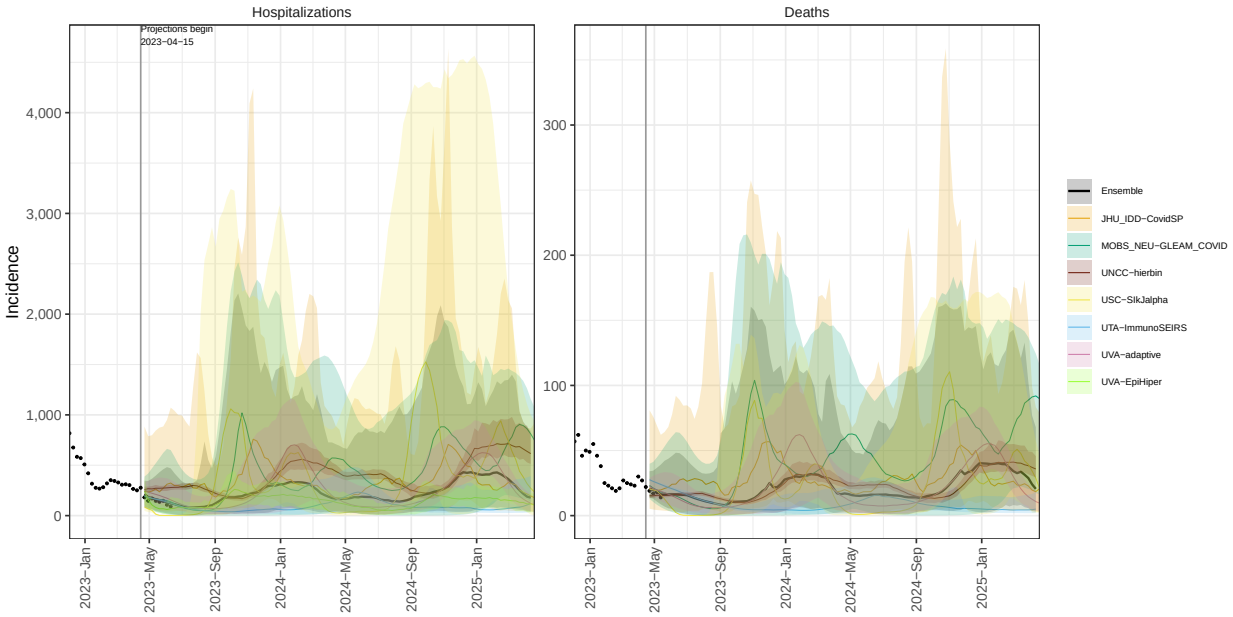
AR model variance & 95% projection intervals − Booster for all, High immune escape



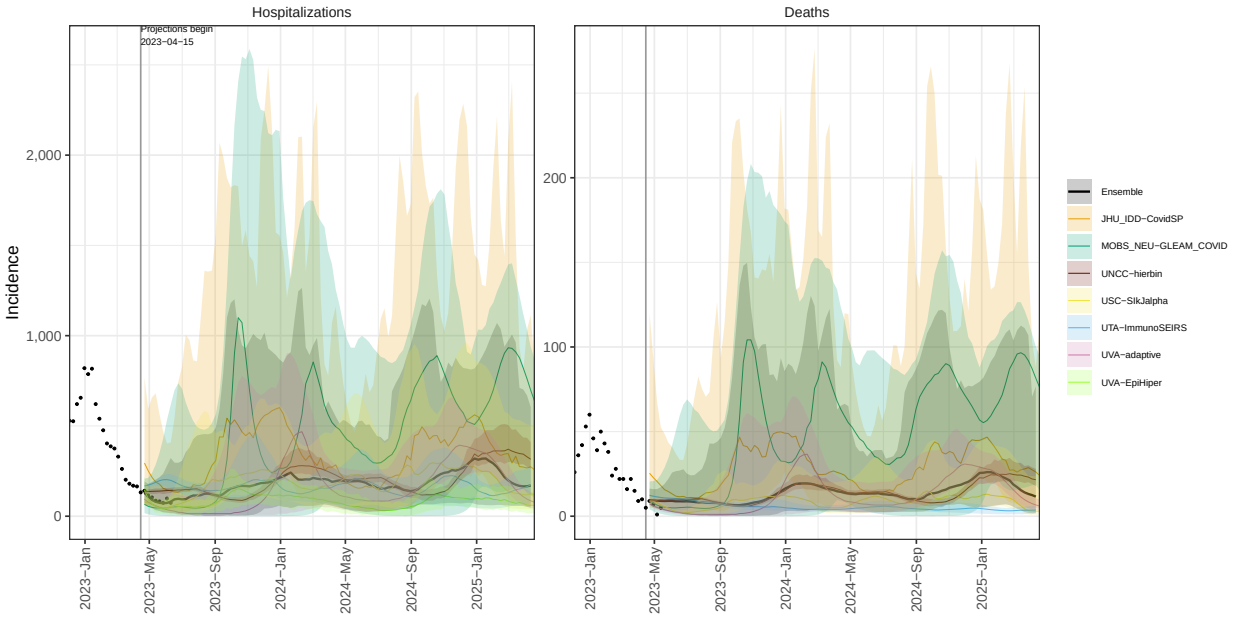
CA model variance & 95% projection intervals − Booster for all, High immune escape



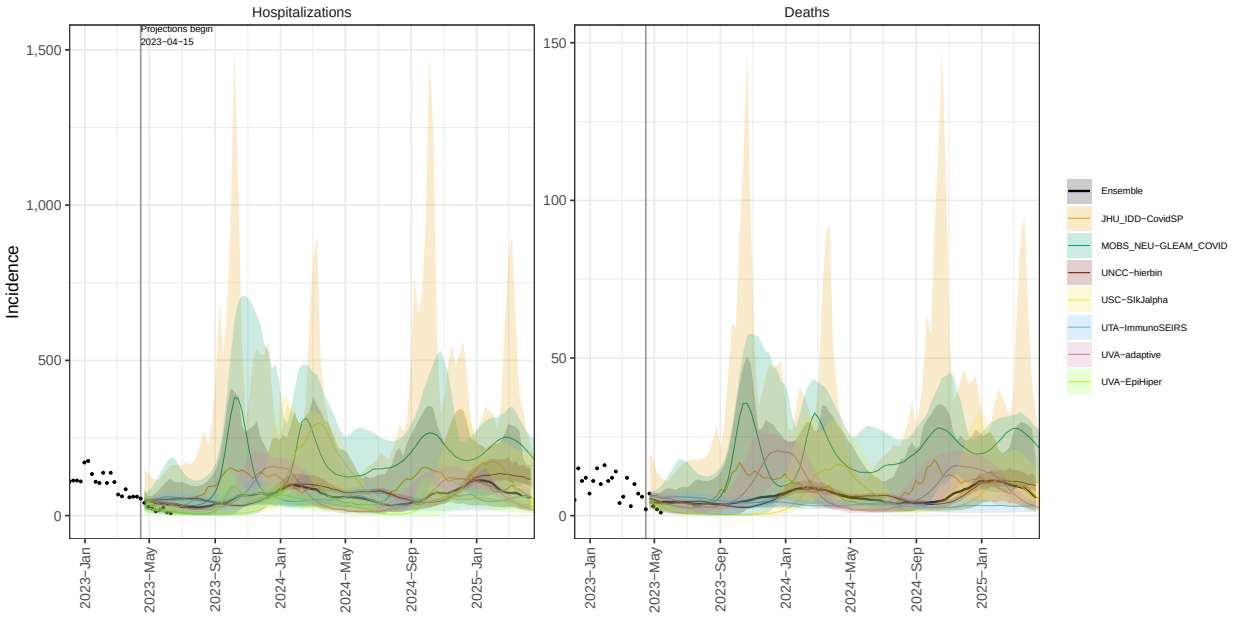
CO model variance & 95% projection intervals − Booster for all, High immune escape



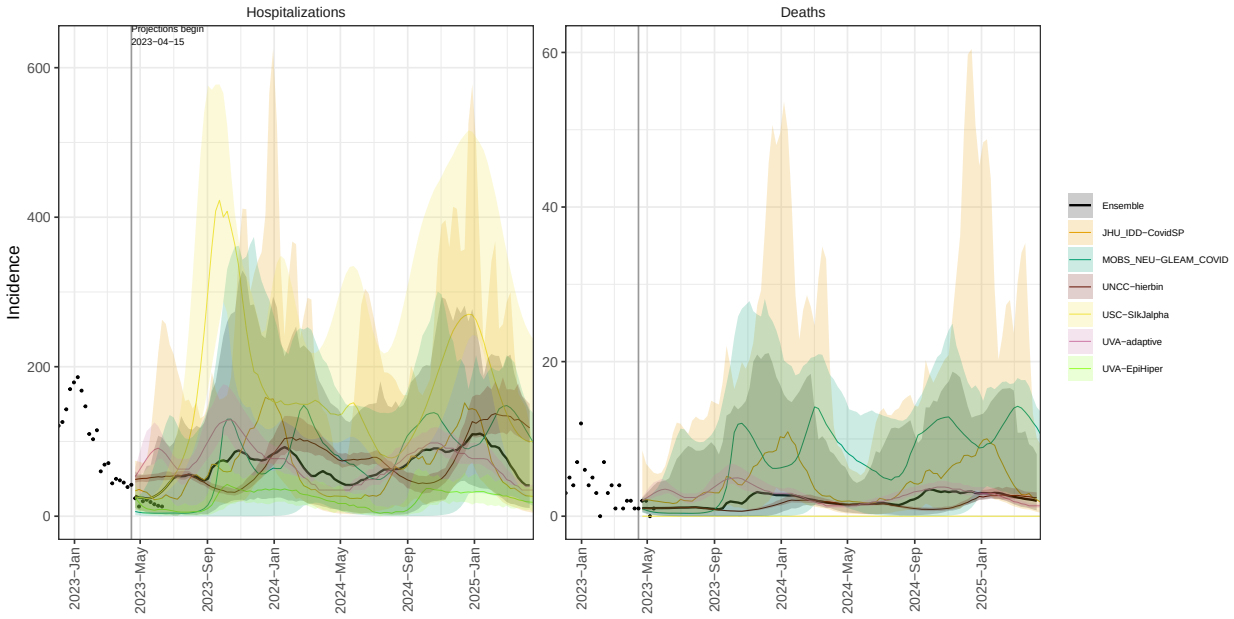
CT model variance & 95% projection intervals − Booster for all, High immune escape



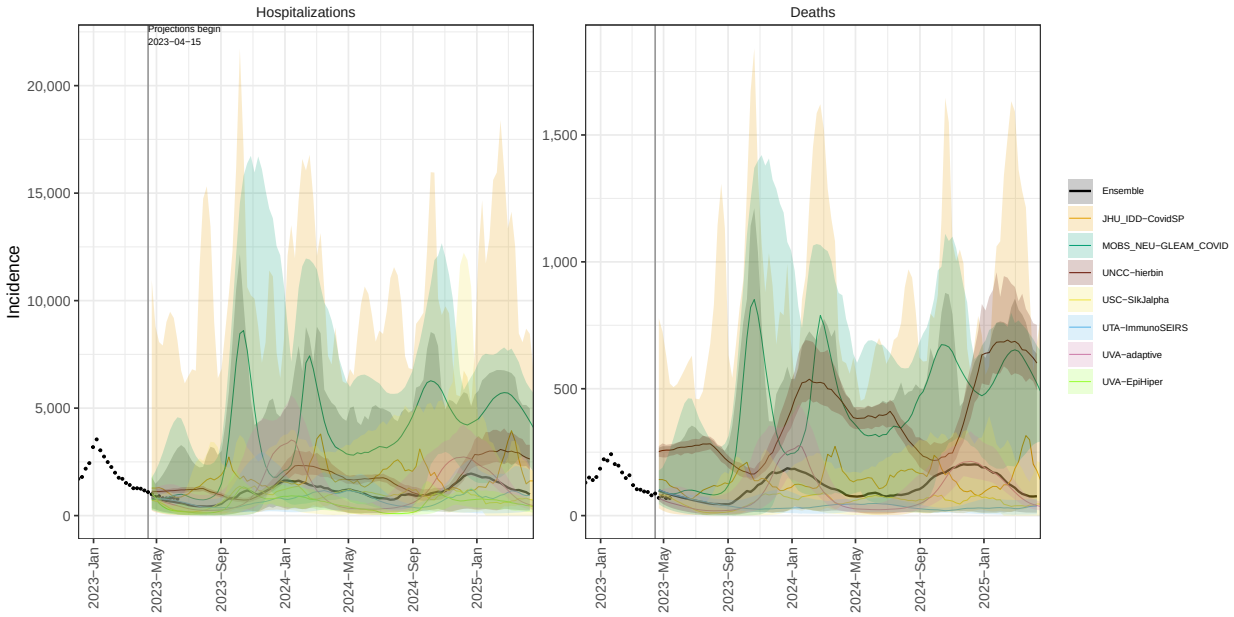
DE model variance & 95% projection intervals − Booster for all, High immune escape



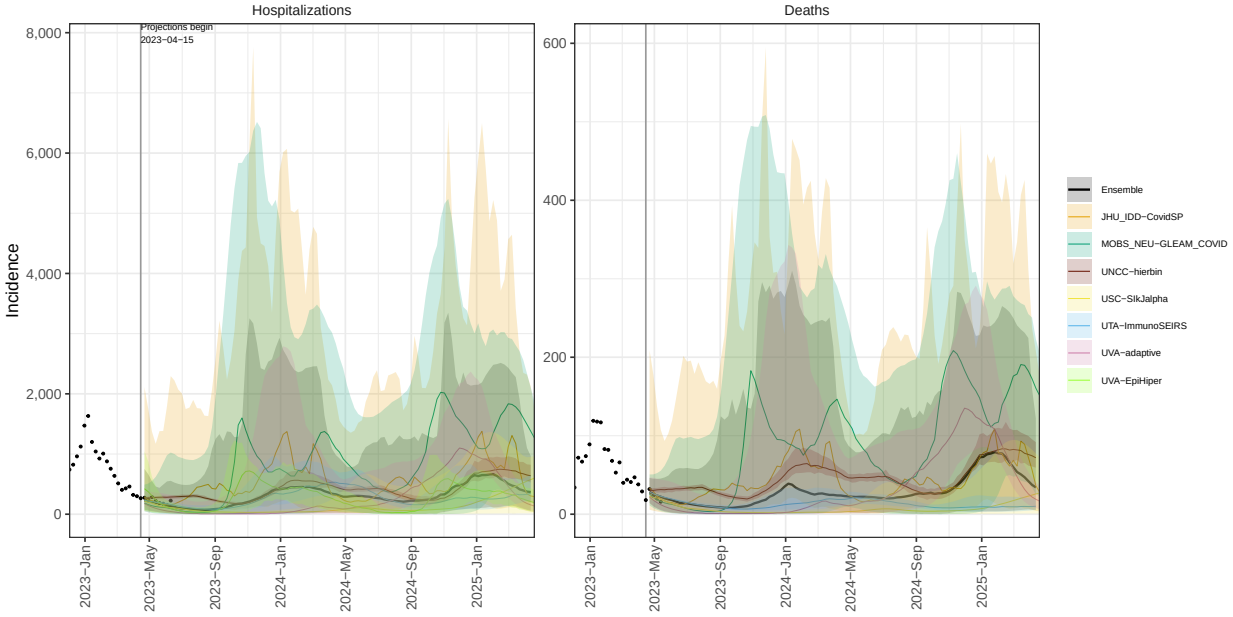
DC model variance & 95% projection intervals − Booster for all, High immune escape



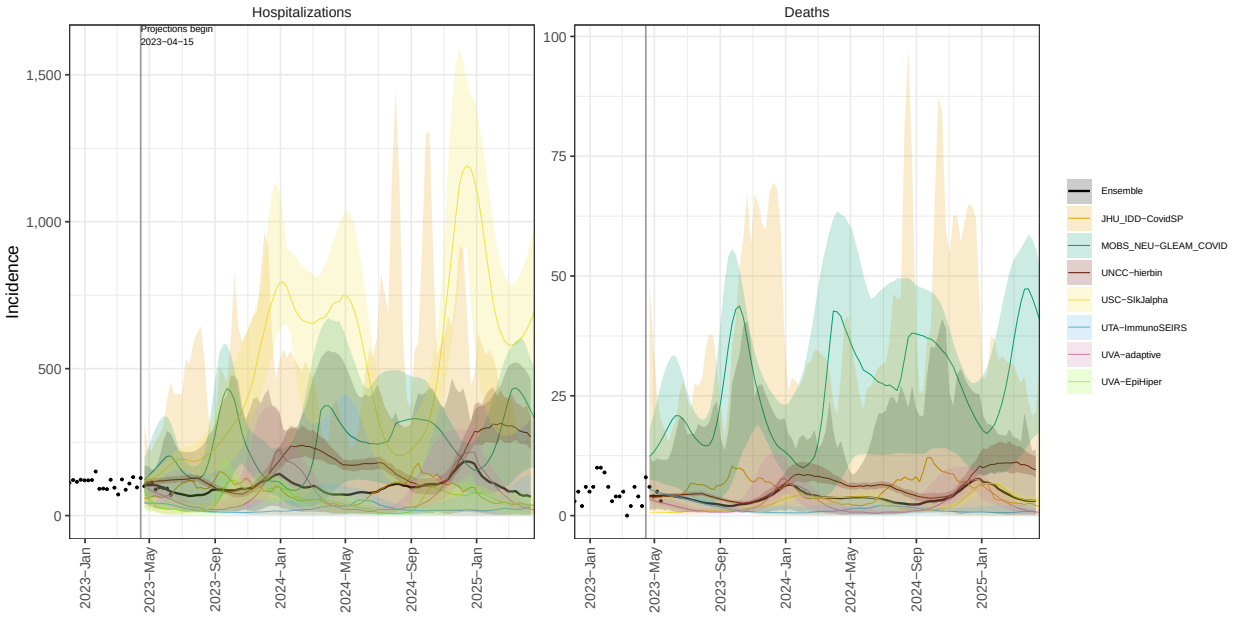
FL model variance & 95% projection intervals − Booster for all, High immune escape



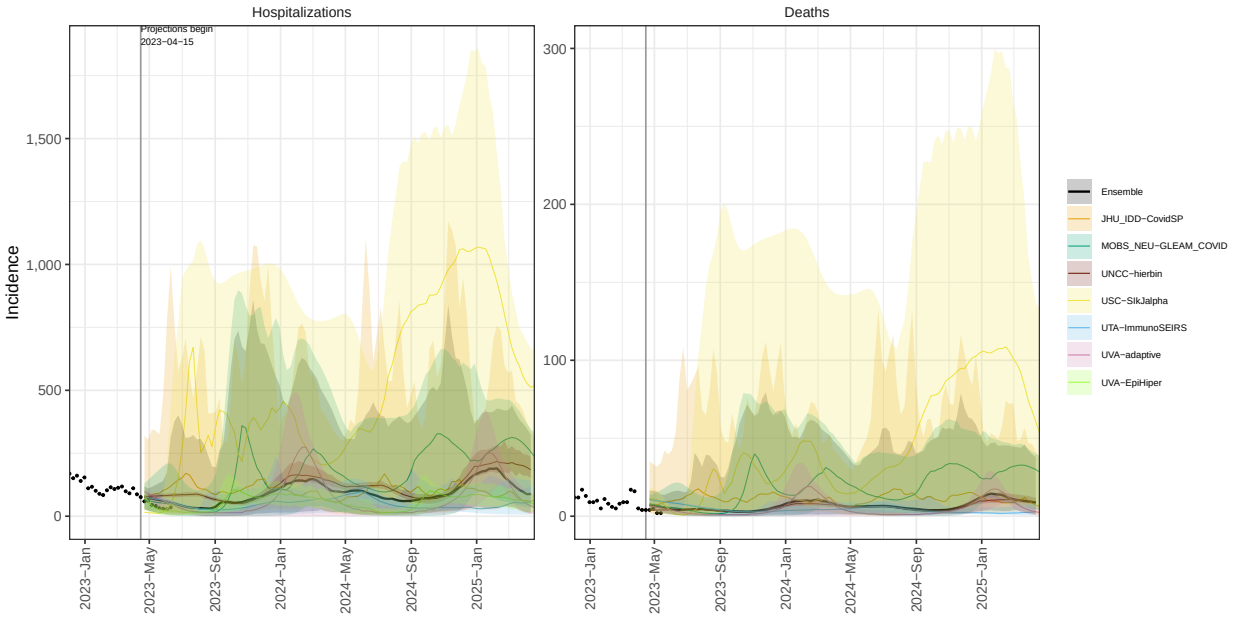
GA model variance & 95% projection intervals − Booster for all, High immune escape



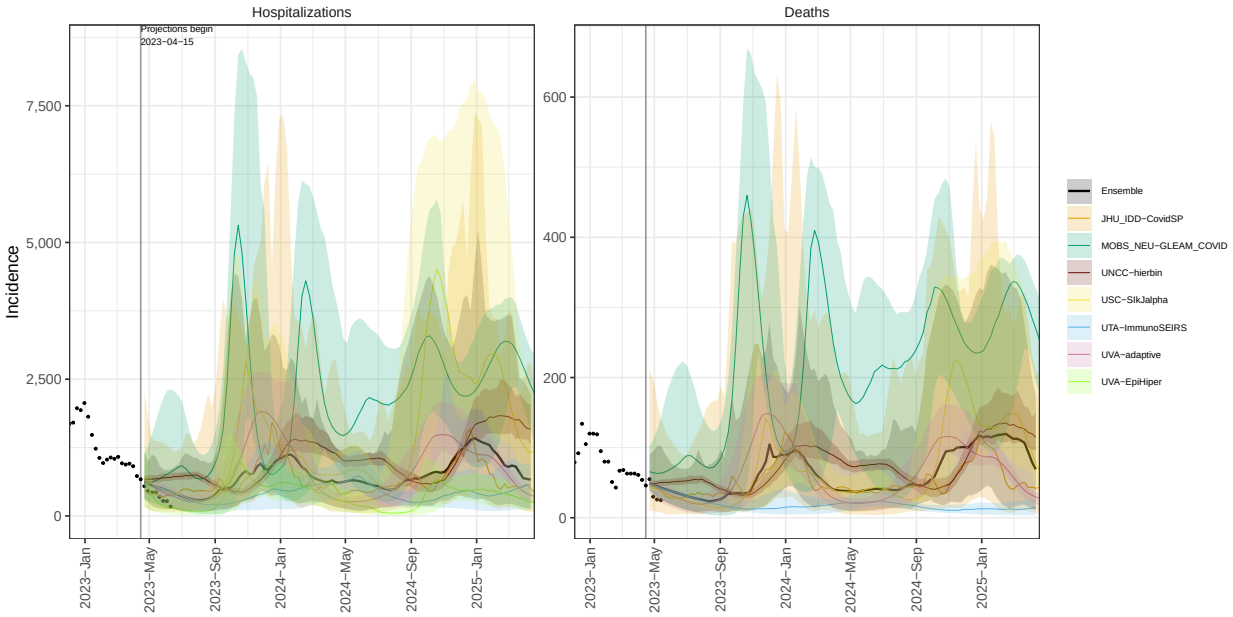
HI model variance & 95% projection intervals − Booster for all, High immune escape



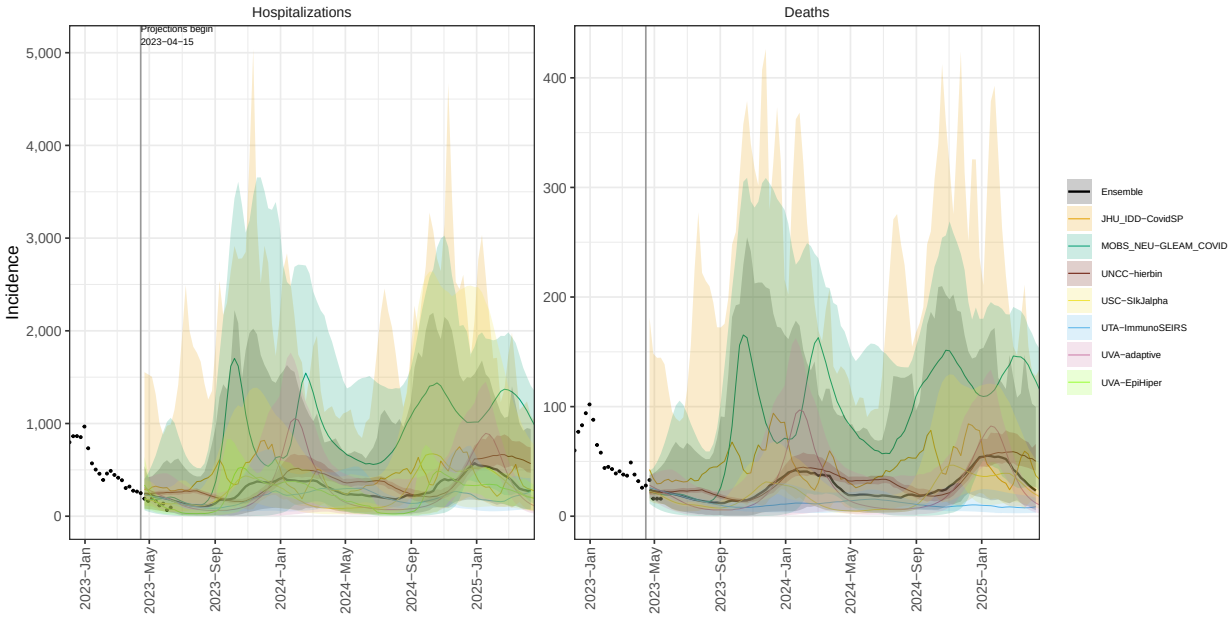
ID model variance & 95% projection intervals − Booster for all, High immune escape



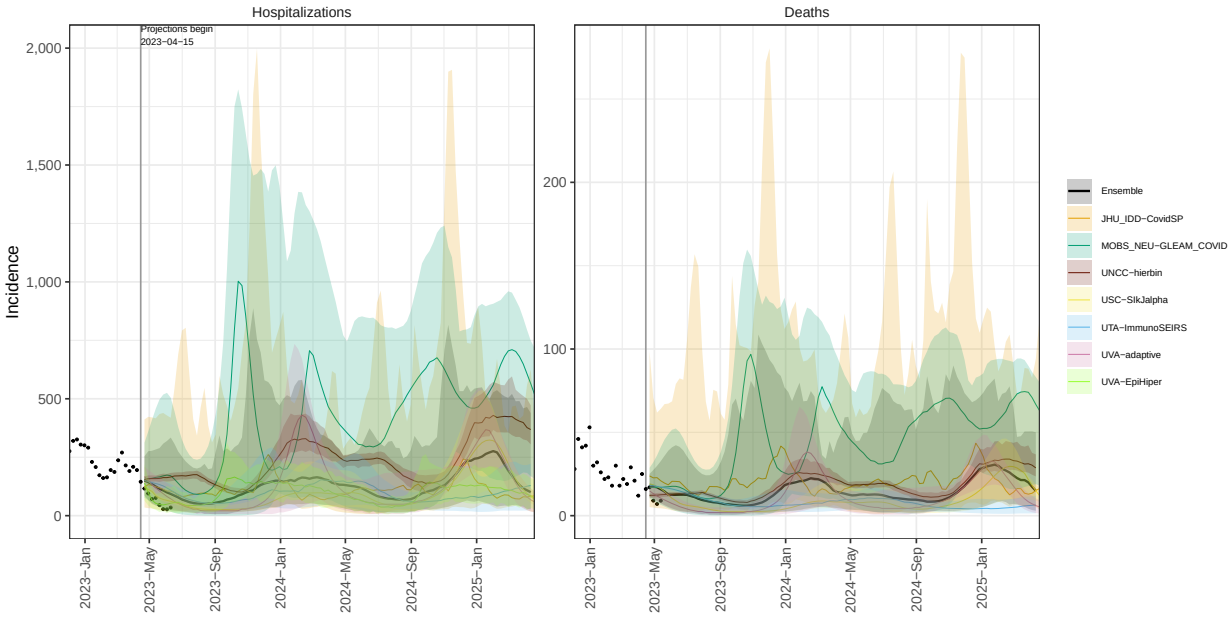
IL model variance & 95% projection intervals − Booster for all, High immune escape



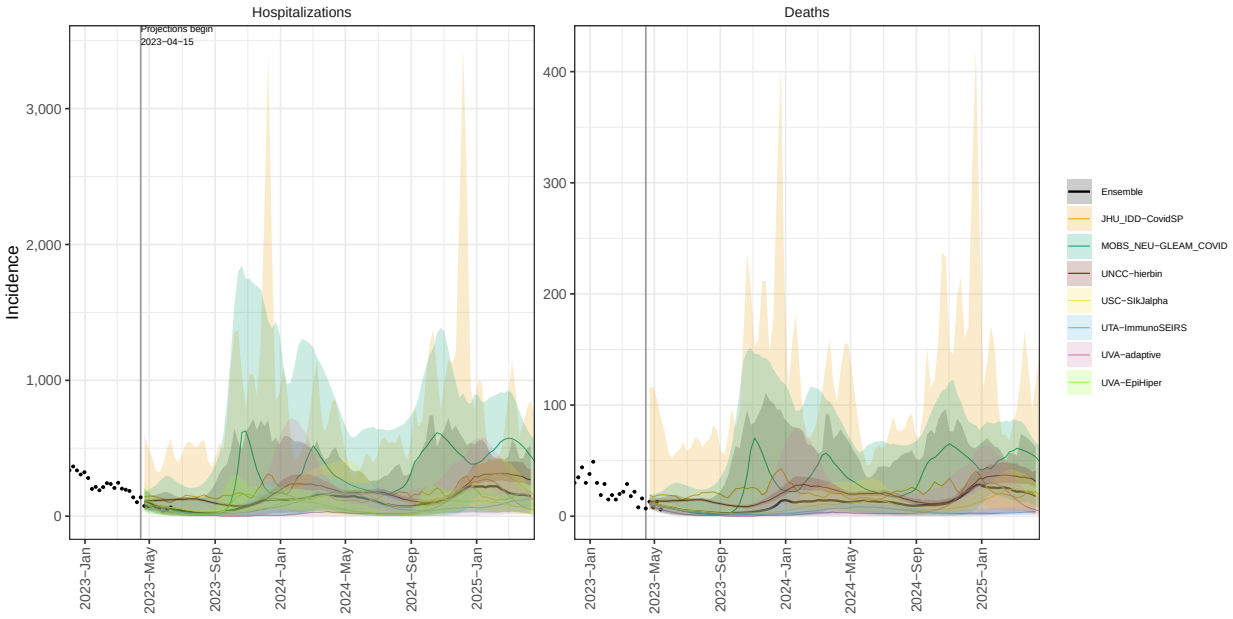
IN model variance & 95% projection intervals − Booster for all, High immune escape



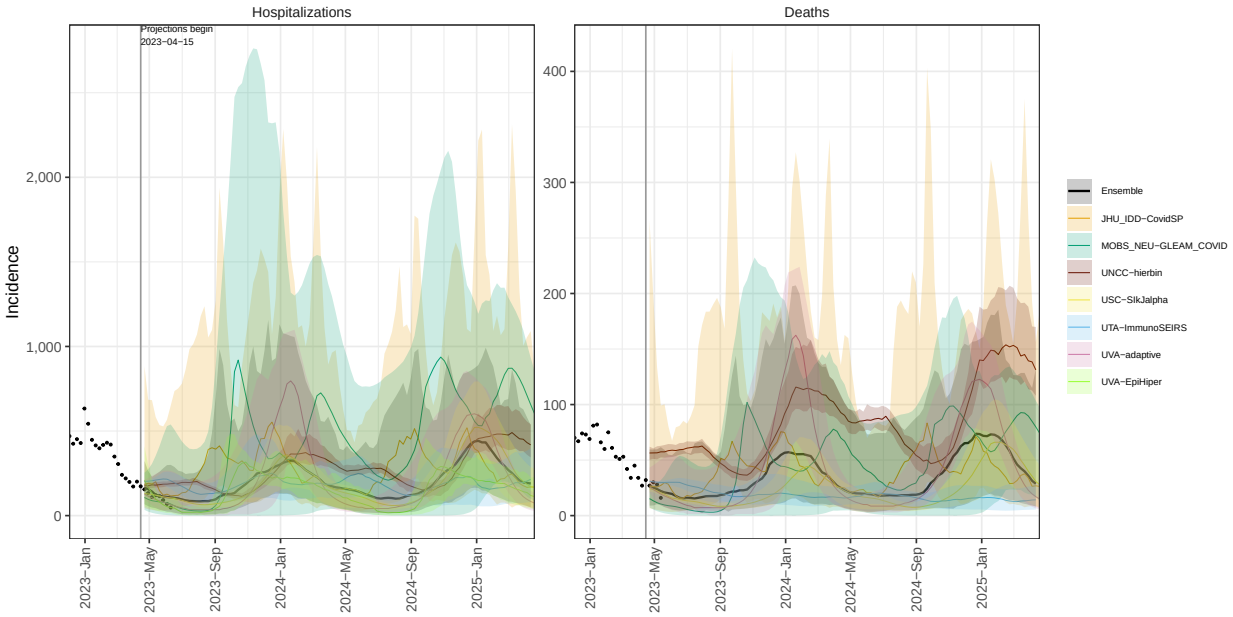
IA model variance & 95% projection intervals − Booster for all, High immune escape



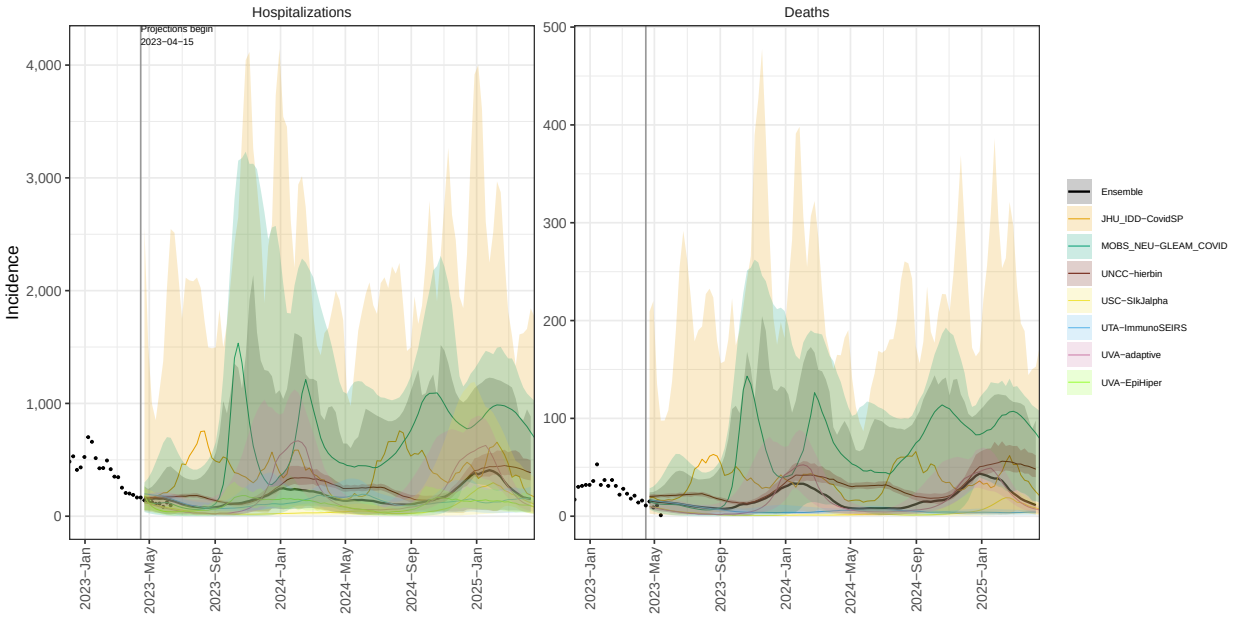
KS model variance & 95% projection intervals − Booster for all, High immune escape



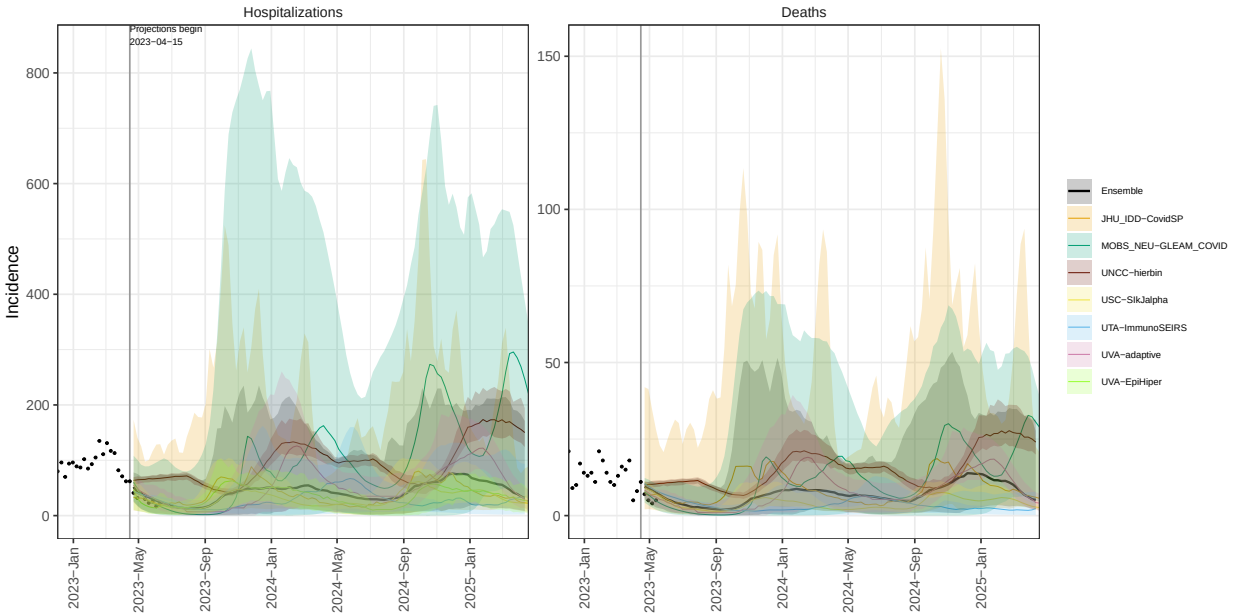
KY model variance & 95% projection intervals − Booster for all, High immune escape



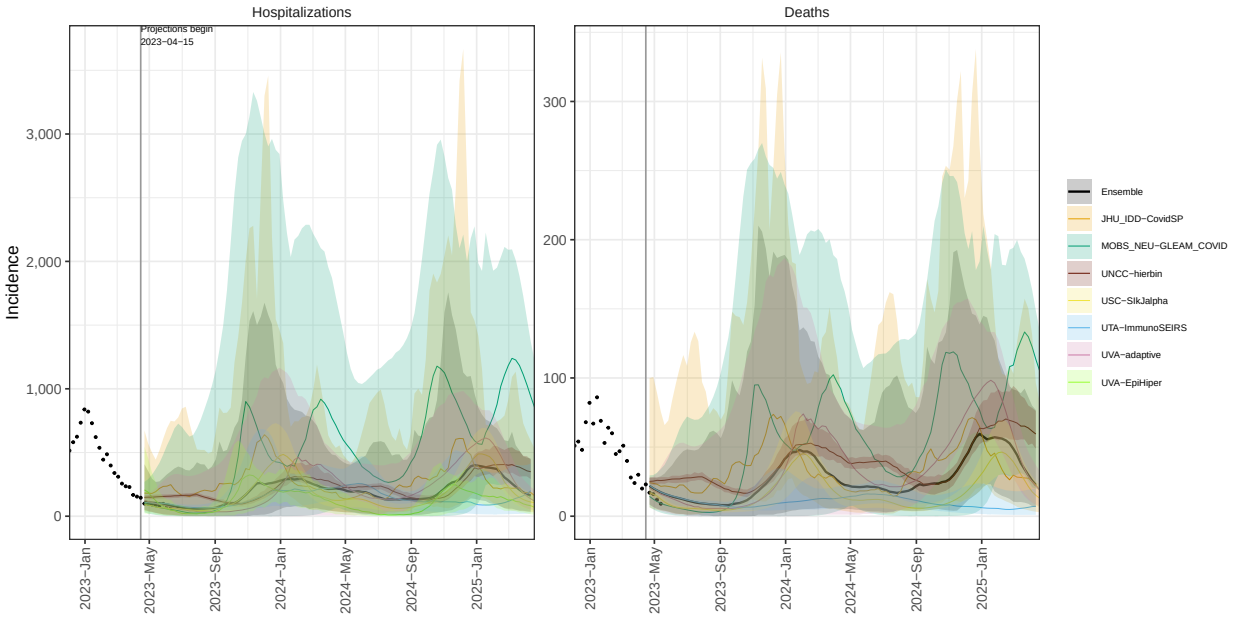
LA model variance & 95% projection intervals − Booster for all, High immune escape



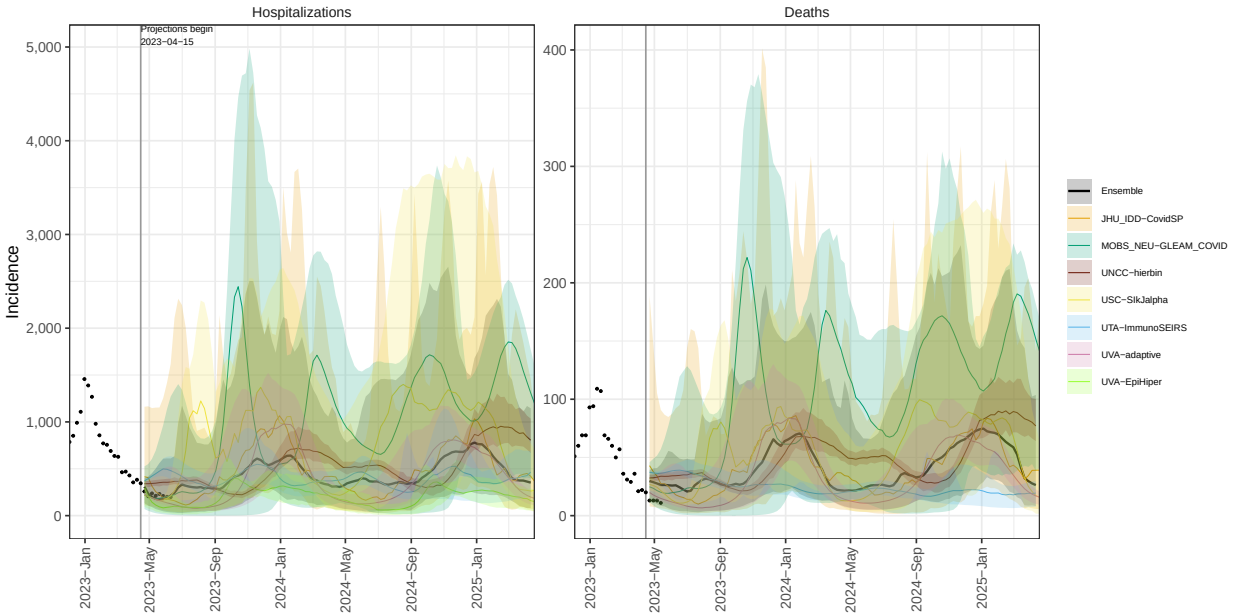
ME model variance & 95% projection intervals − Booster for all, High immune escape



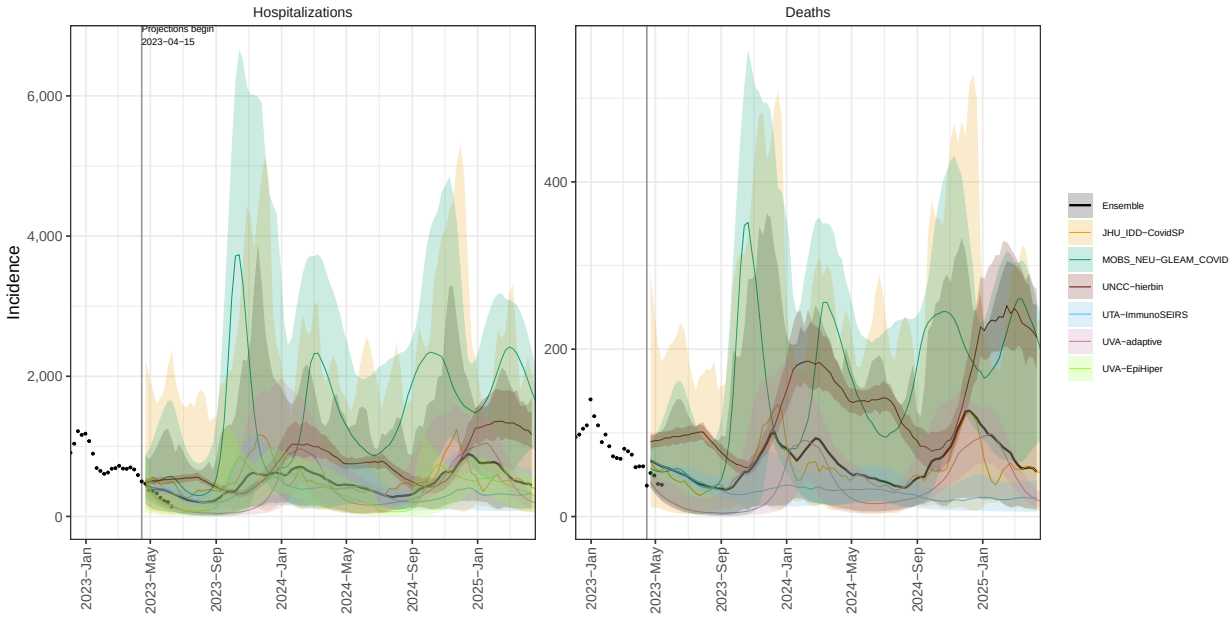
MD model variance & 95% projection intervals − Booster for all, High immune escape



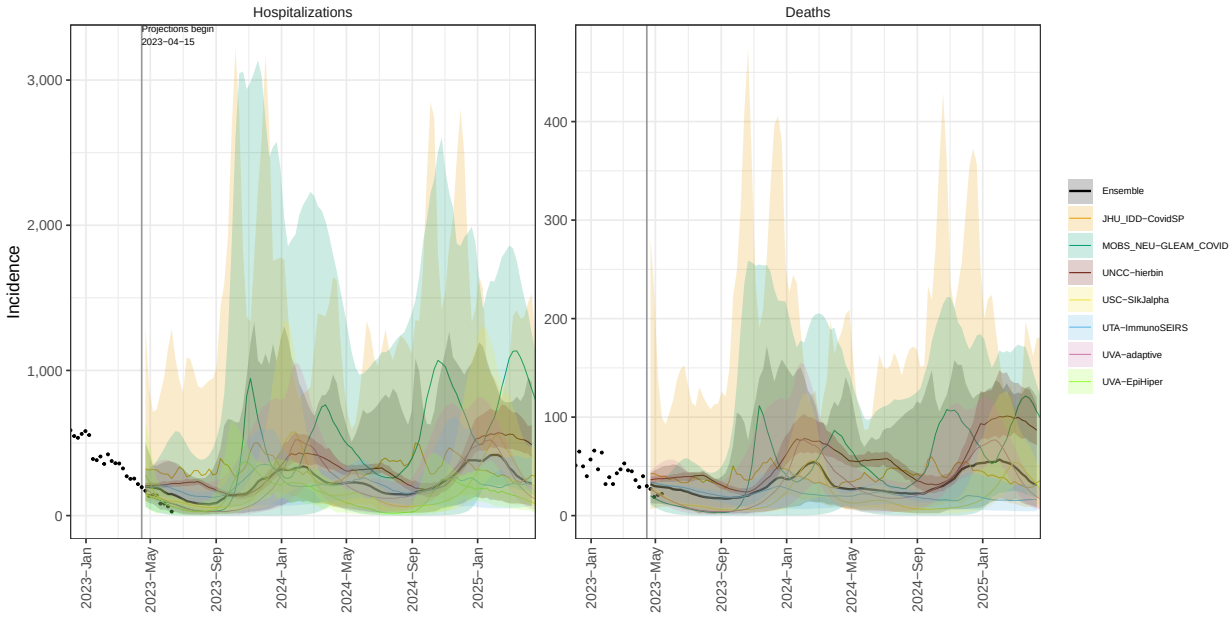
MA model variance & 95% projection intervals − Booster for all, High immune escape



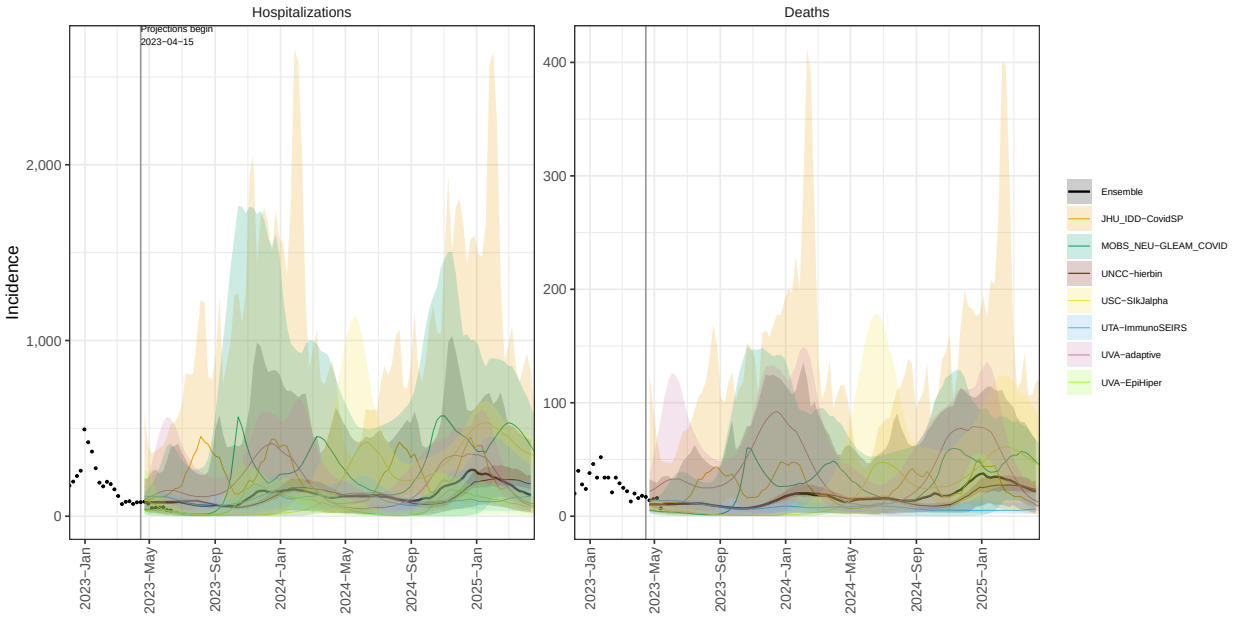
MI model variance & 95% projection intervals − Booster for all, High immune escape



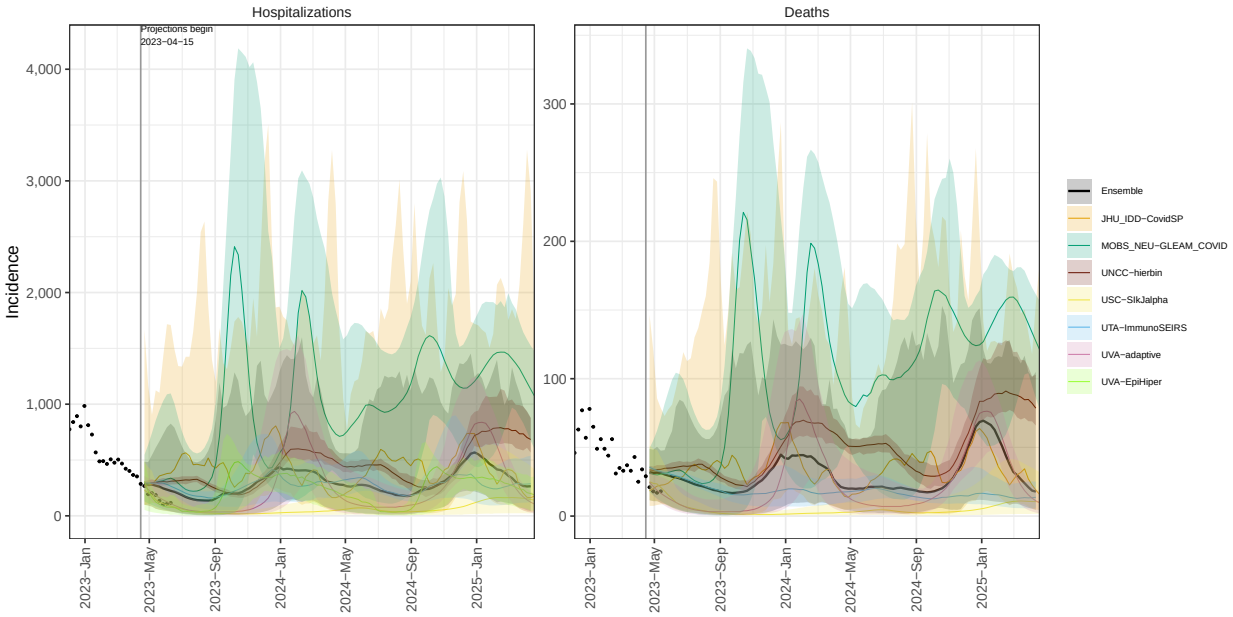
MN model variance & 95% projection intervals − Booster for all, High immune escape



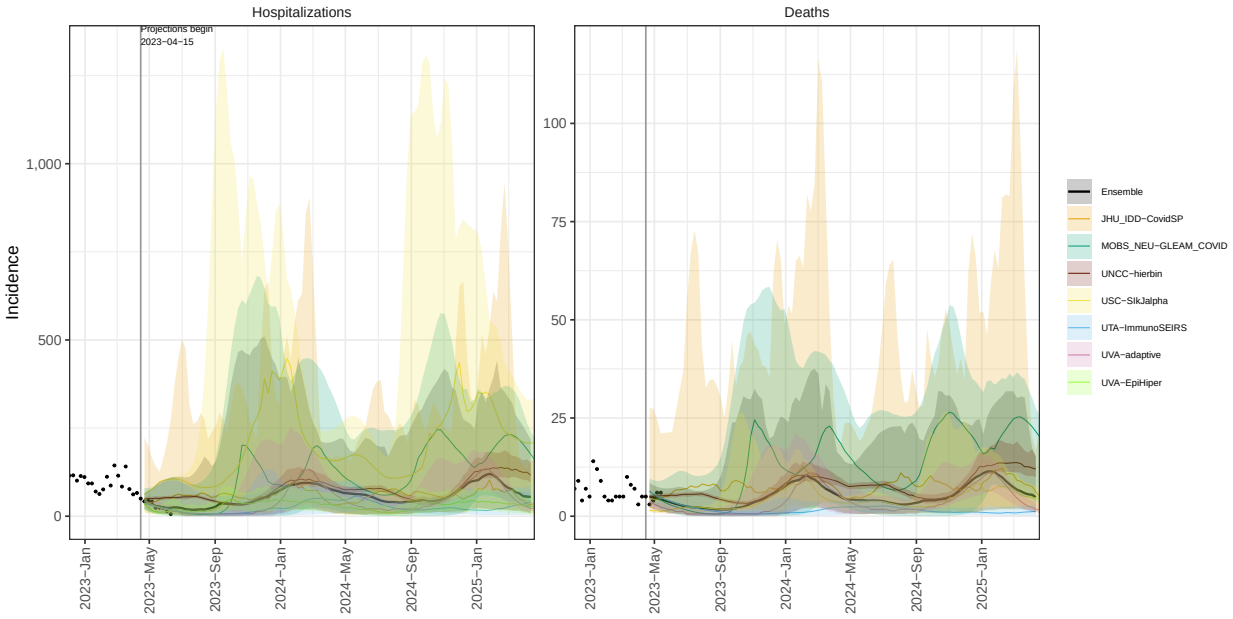
MS model variance & 95% projection intervals − Booster for all, High immune escape



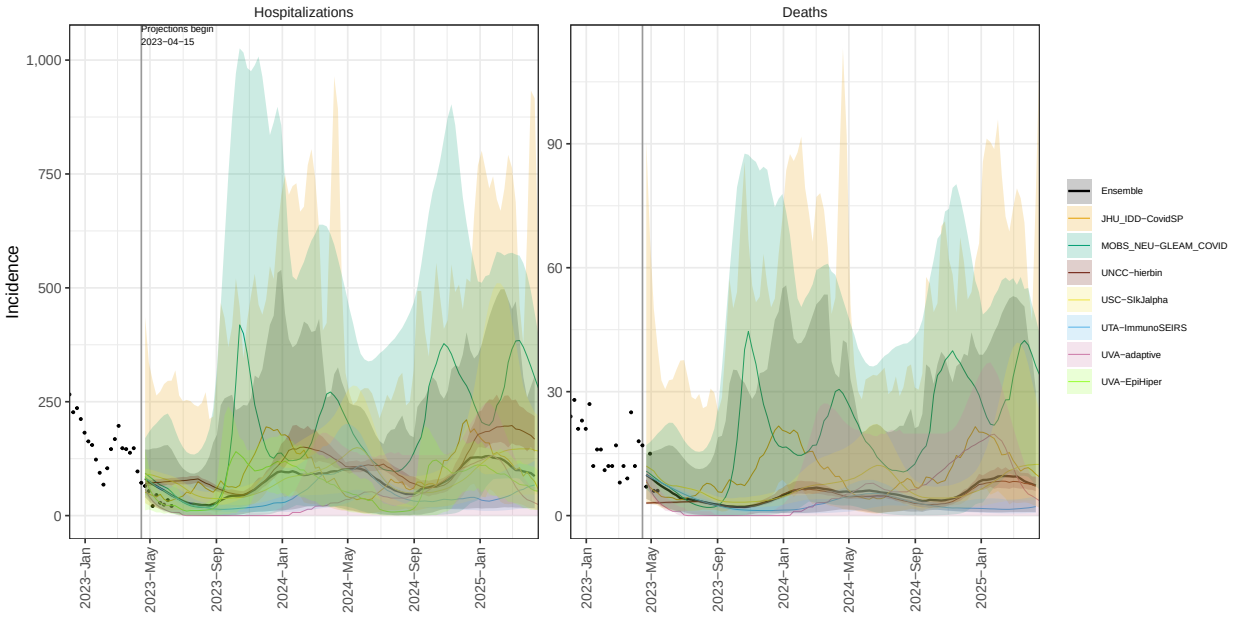
MO model variance & 95% projection intervals − Booster for all, High immune escape



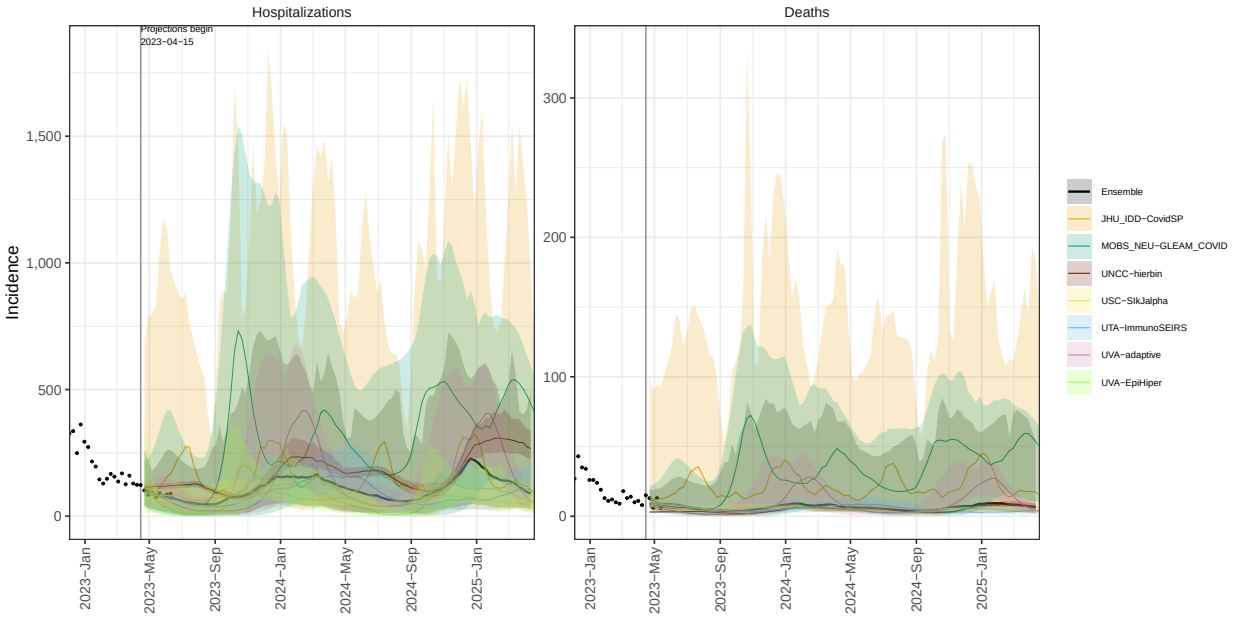
MT model variance & 95% projection intervals − Booster for all, High immune escape



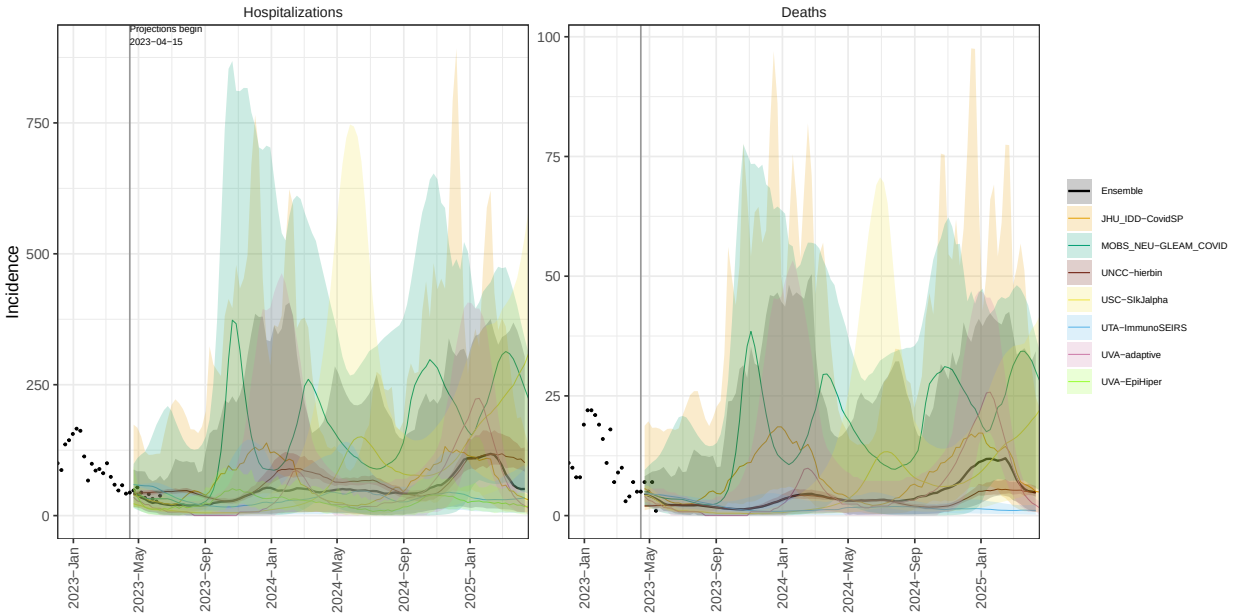
NE model variance & 95% projection intervals − Booster for all, High immune escape



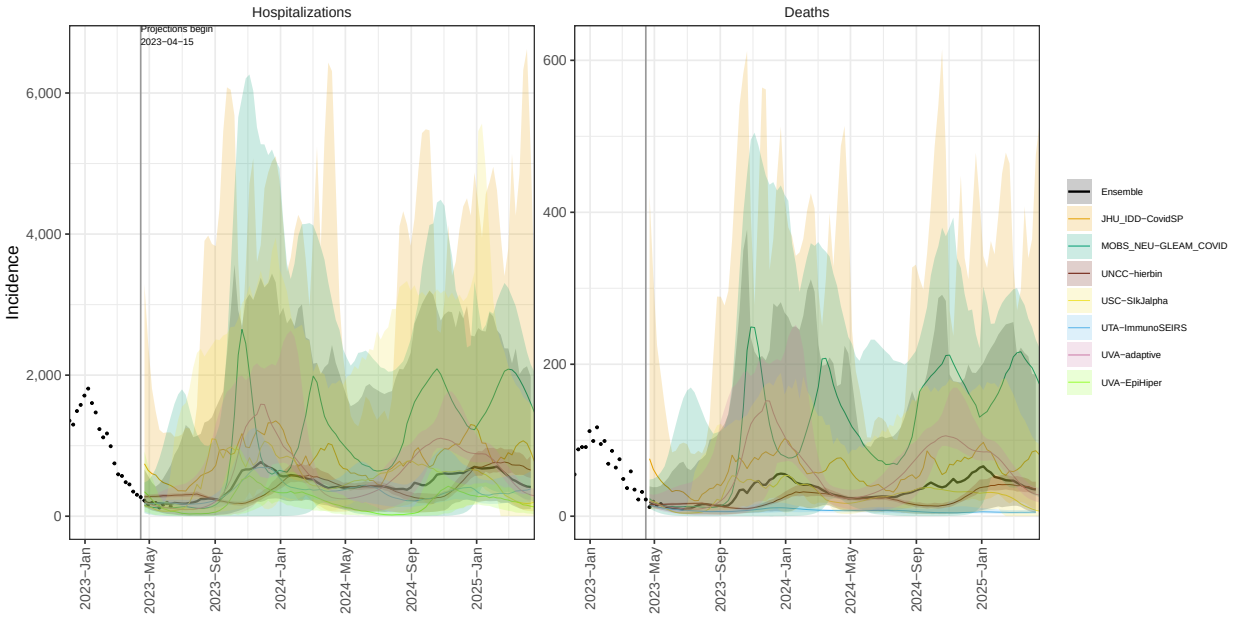
NV model variance & 95% projection intervals − Booster for all, High immune escape



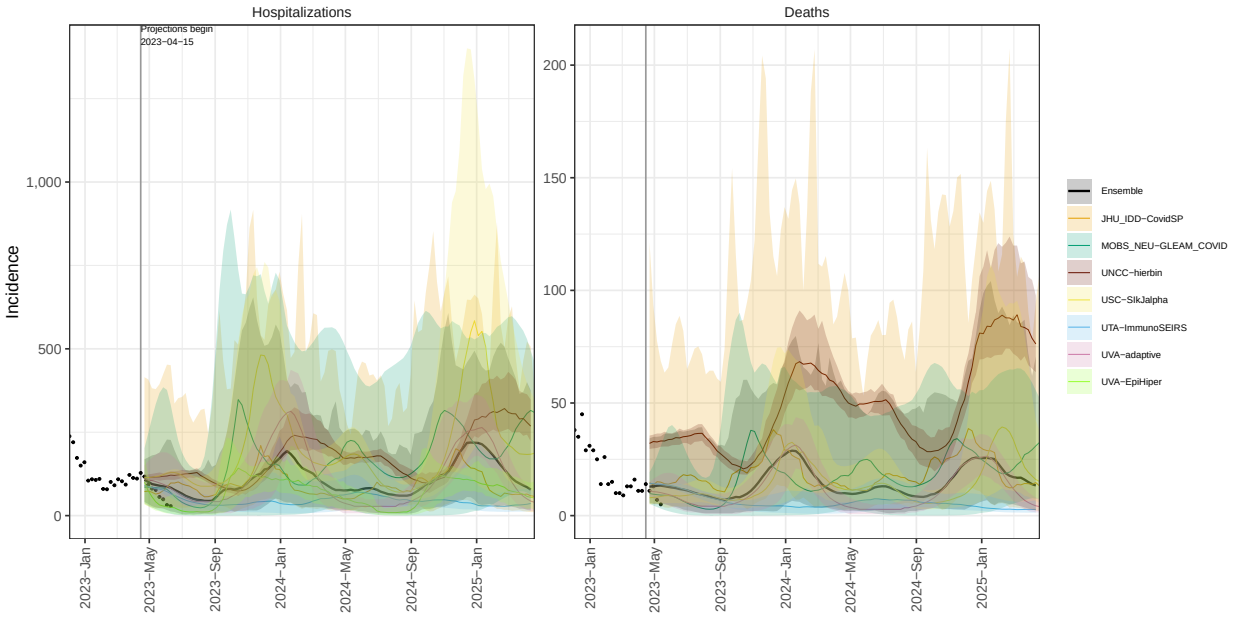
NH model variance & 95% projection intervals − Booster for all, High immune escape



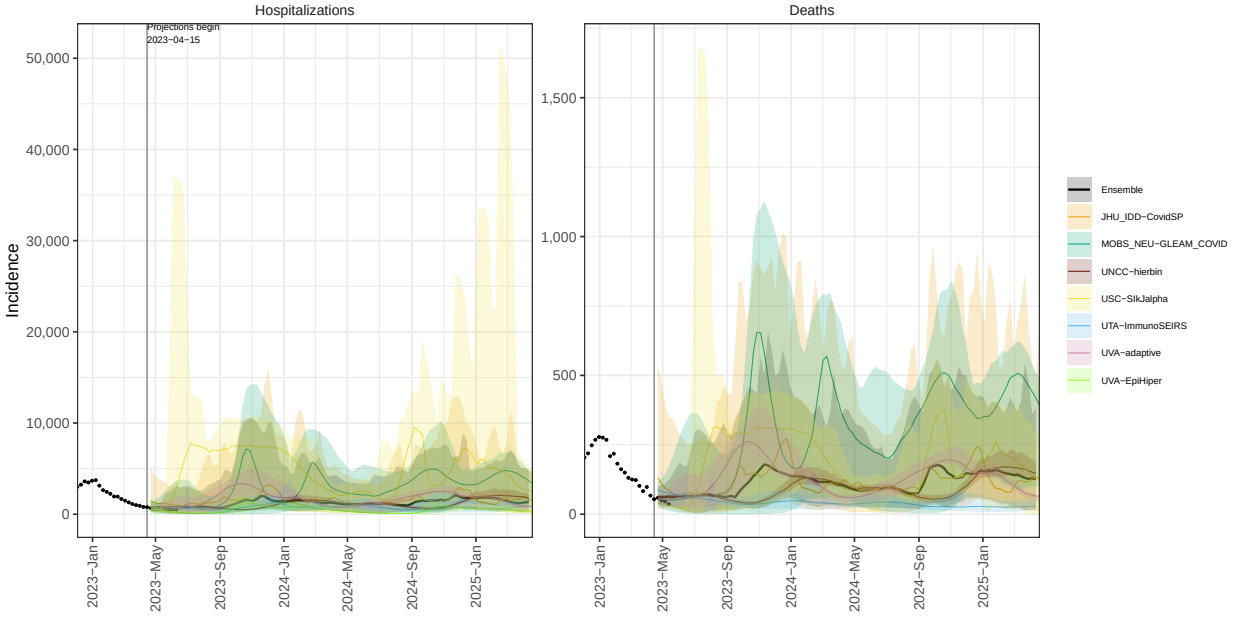
NJ model variance & 95% projection intervals − Booster for all, High immune escape



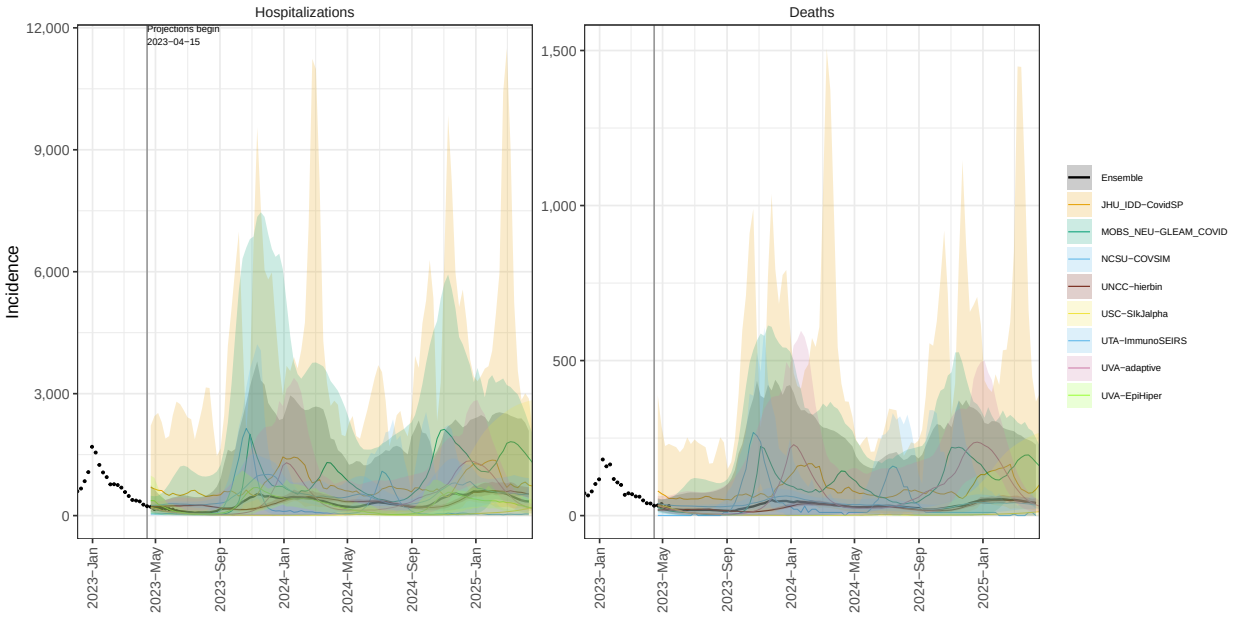
NM model variance & 95% projection intervals − Booster for all, High immune escape



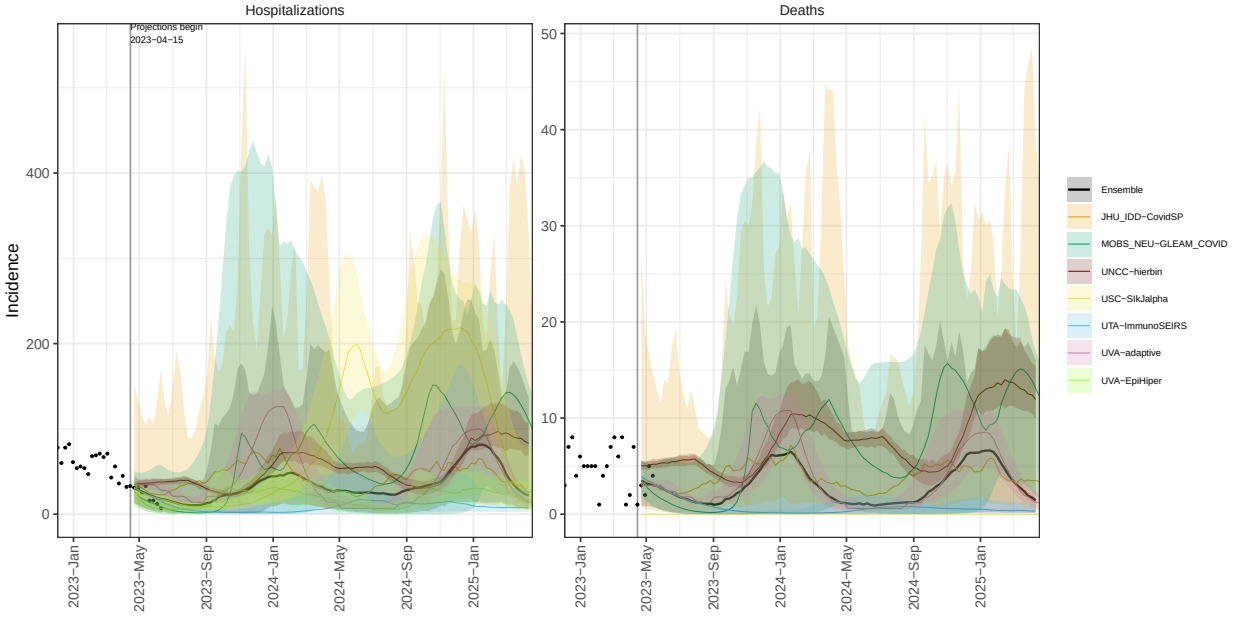
NY model variance & 95% projection intervals − Booster for all, High immune escape



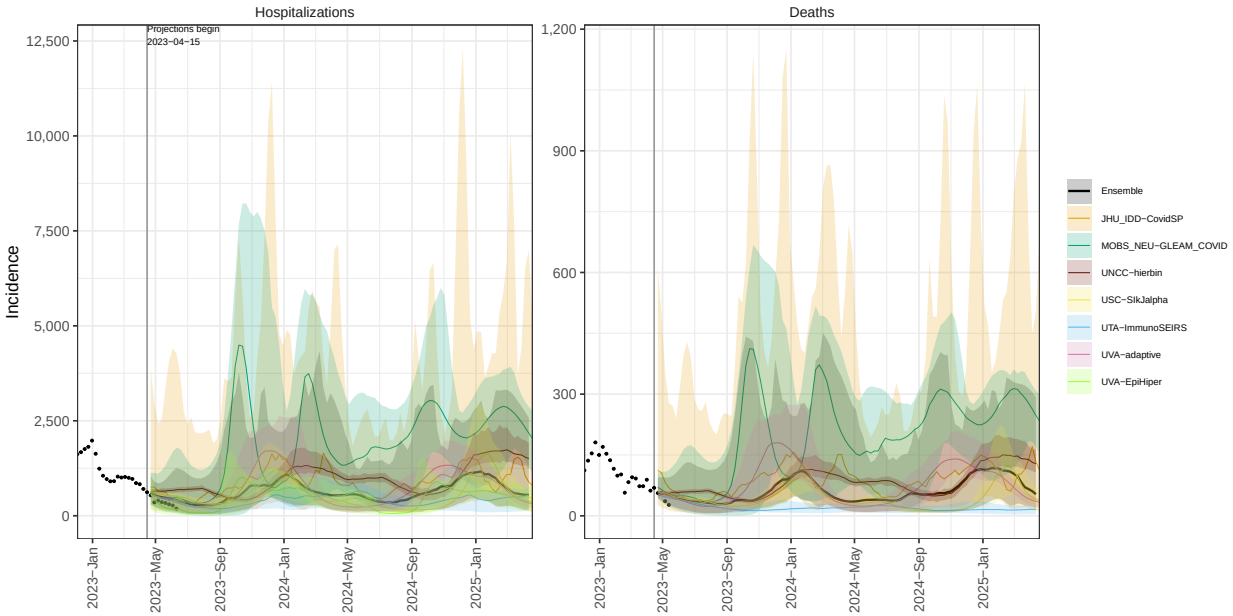
NC model variance & 95% projection intervals − Booster for all, High immune escape



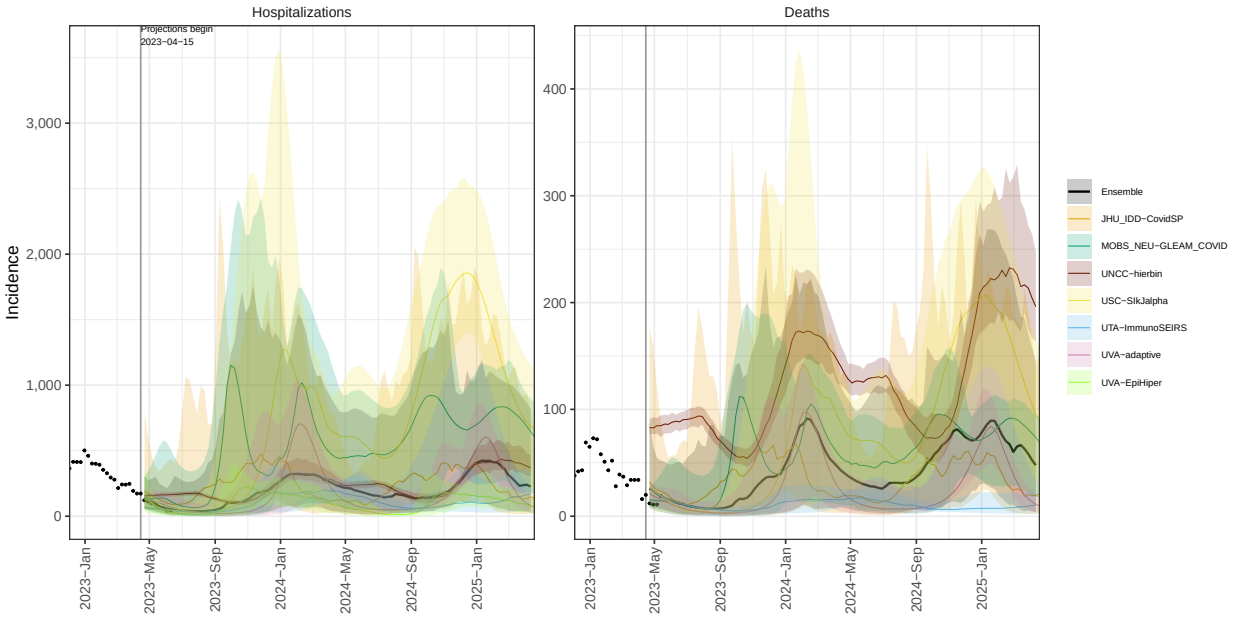
ND model variance & 95% projection intervals − Booster for all, High immune escape



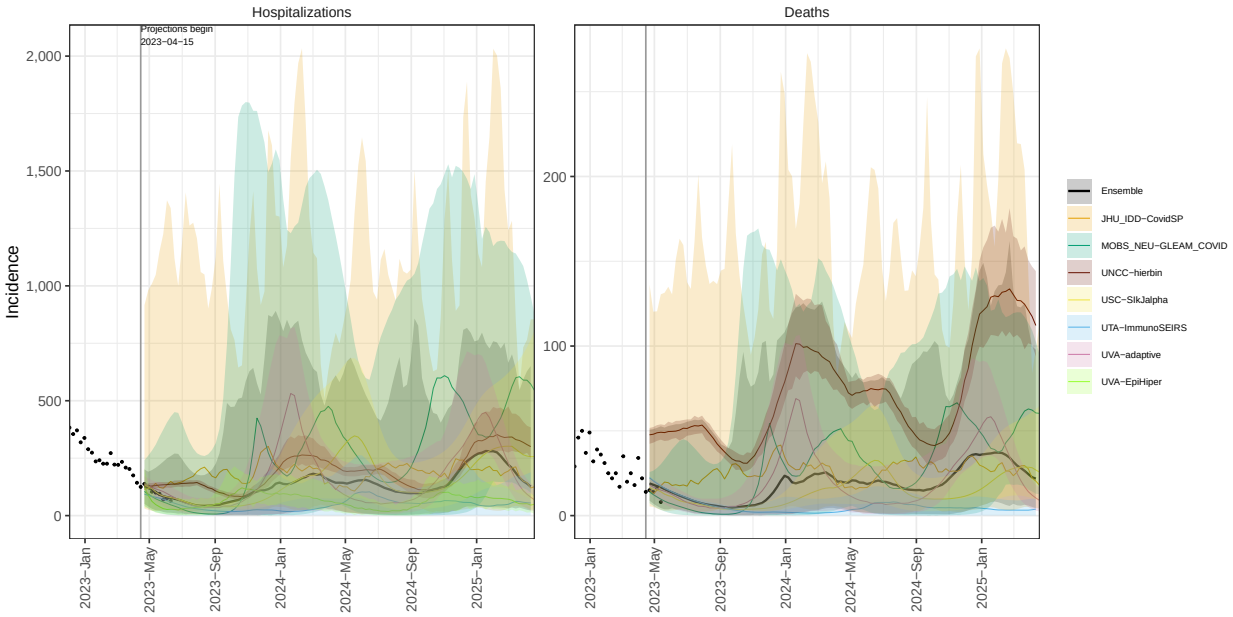
OH model variance & 95% projection intervals − Booster for all, High immune escape



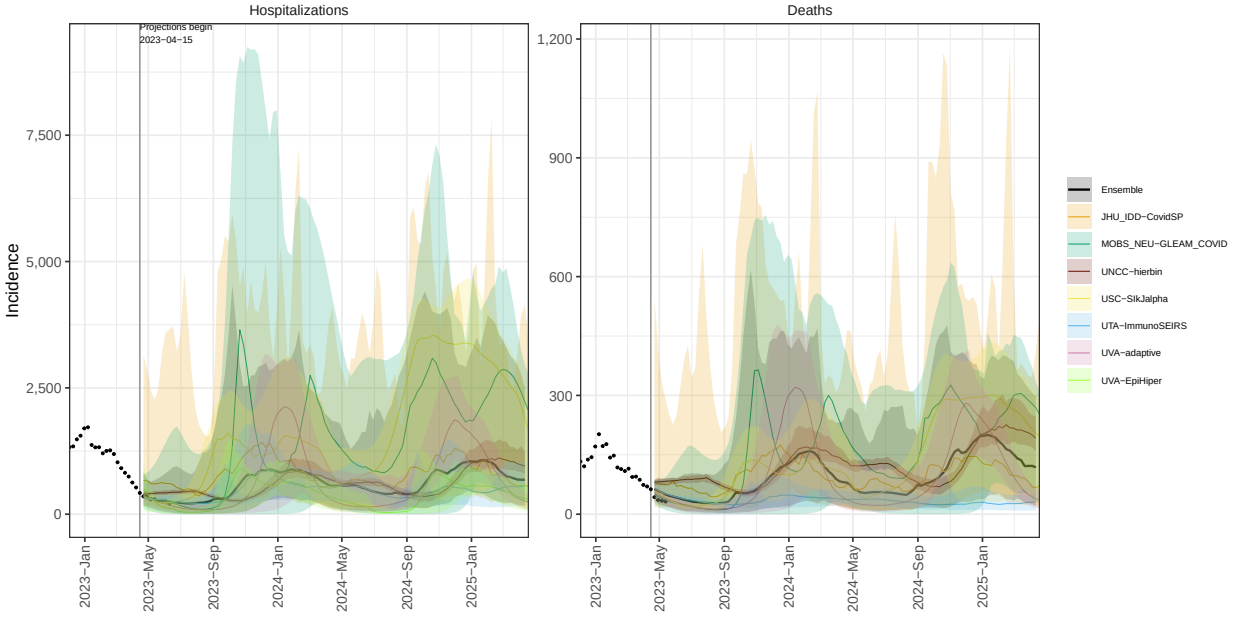
OK model variance & 95% projection intervals − Booster for all, High immune escape



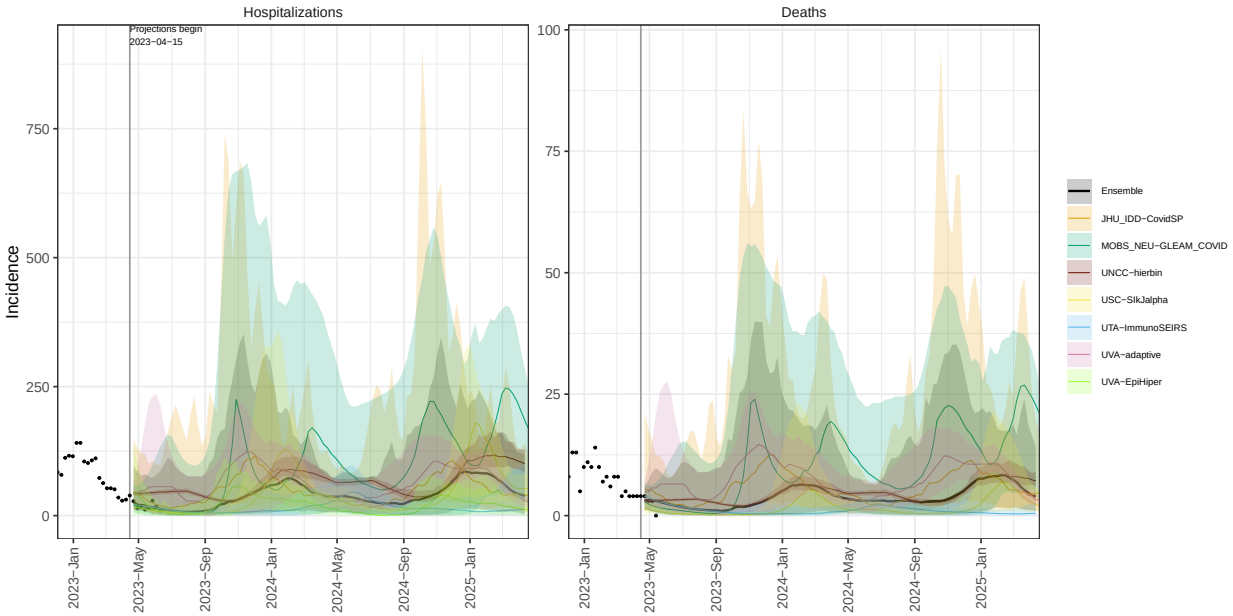
OR model variance & 95% projection intervals − Booster for all, High immune escape



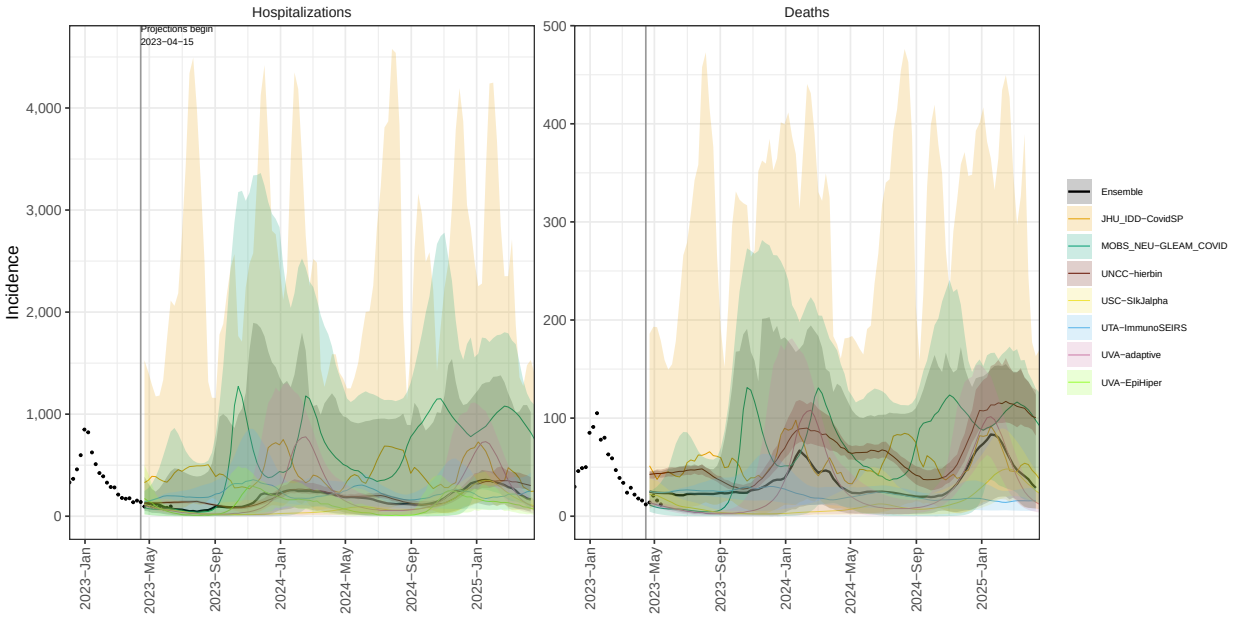
PA model variance & 95% projection intervals − Booster for all, High immune escape



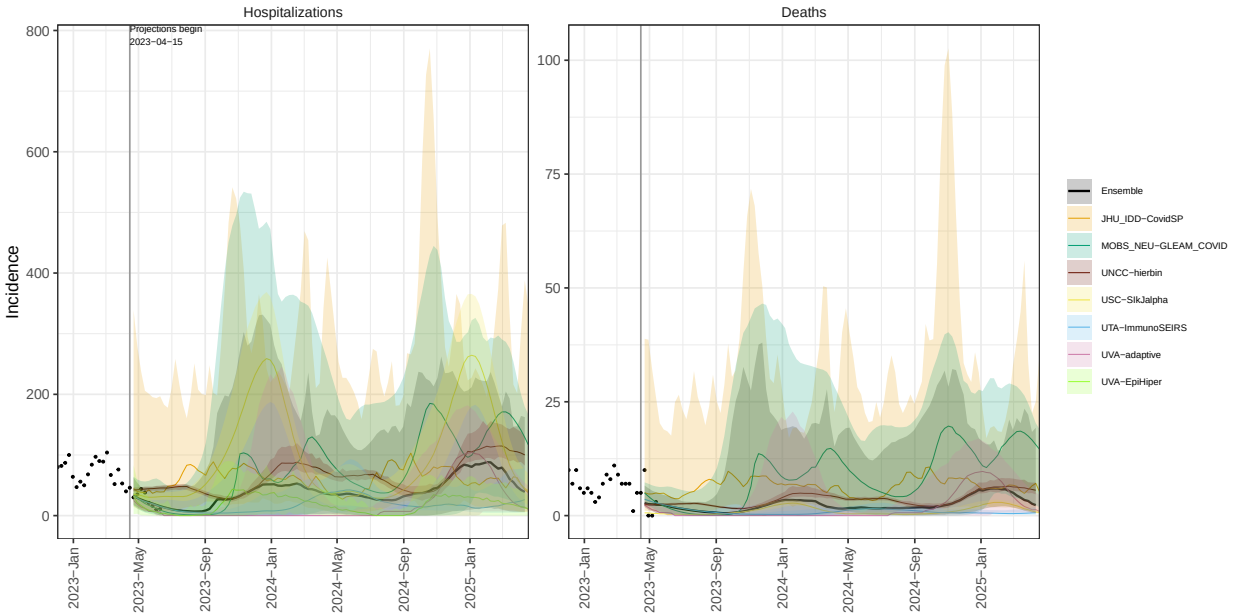
RI model variance & 95% projection intervals − Booster for all, High immune escape



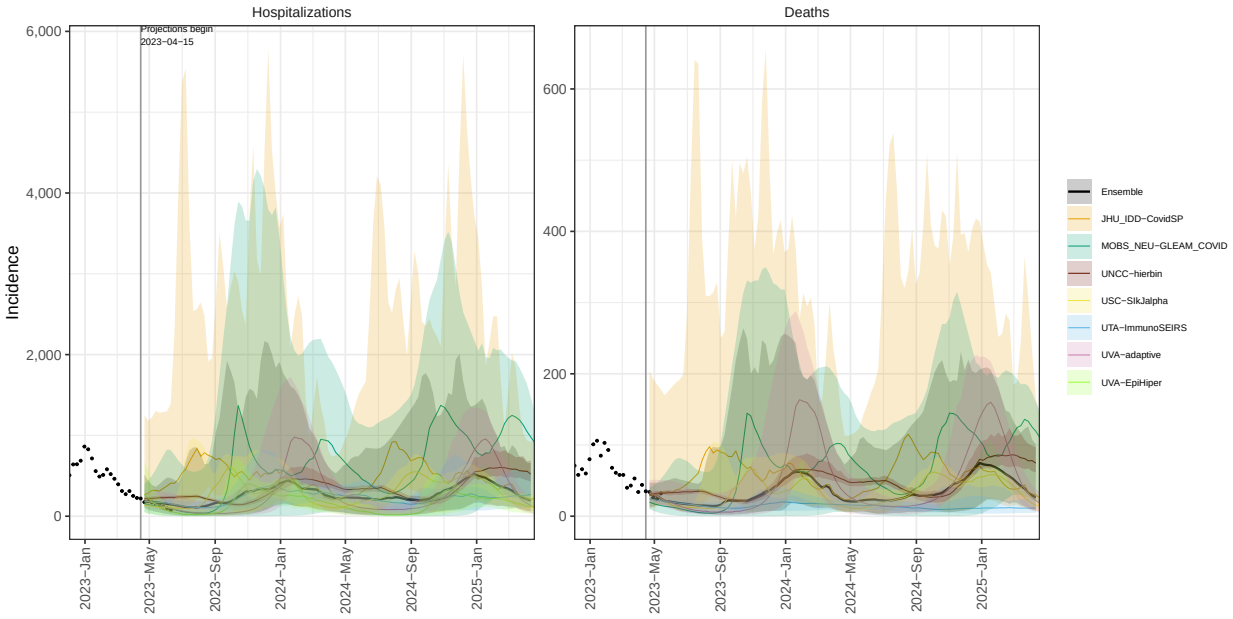
SC model variance & 95% projection intervals − Booster for all, High immune escape



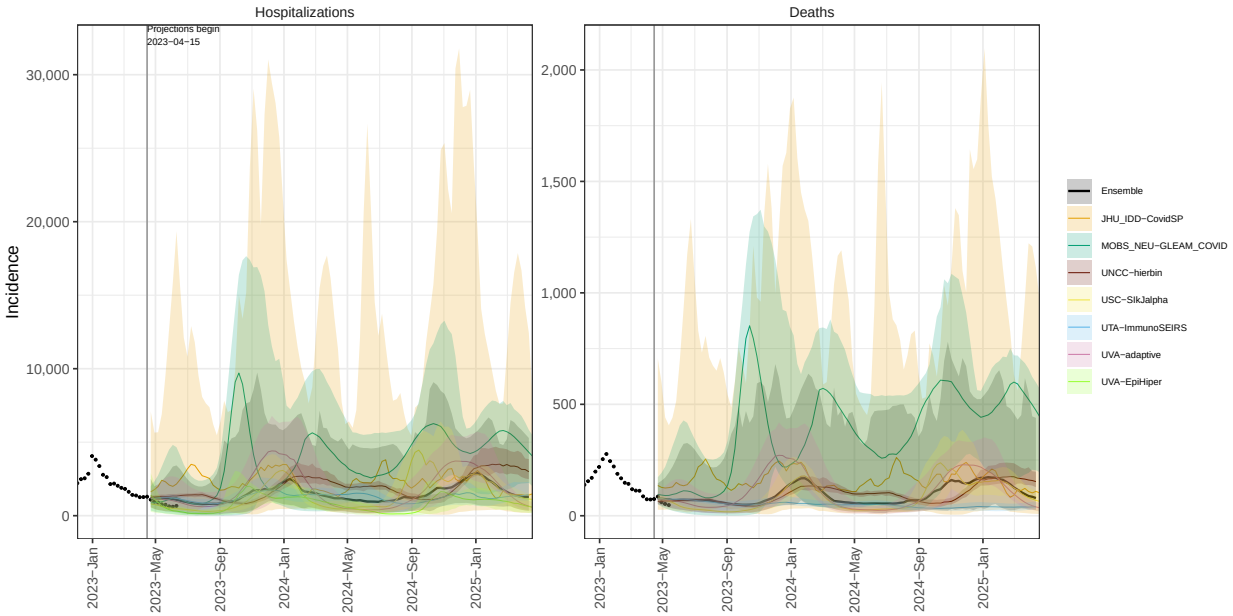
SD model variance & 95% projection intervals − Booster for all, High immune escape



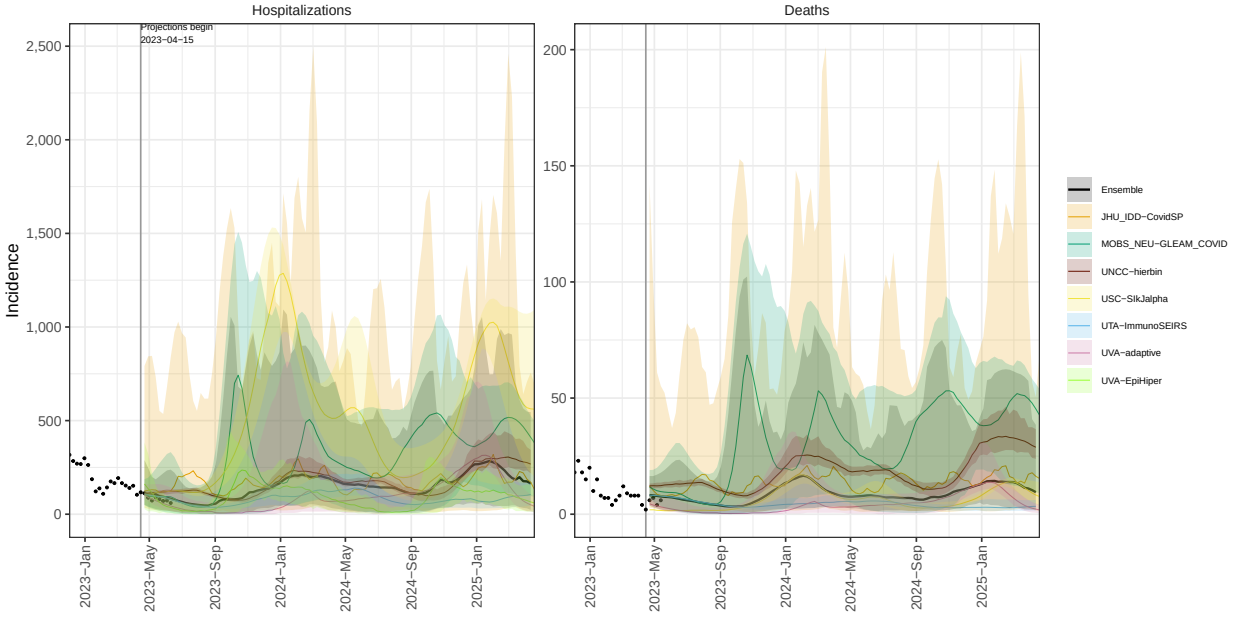
TN model variance & 95% projection intervals − Booster for all, High immune escape



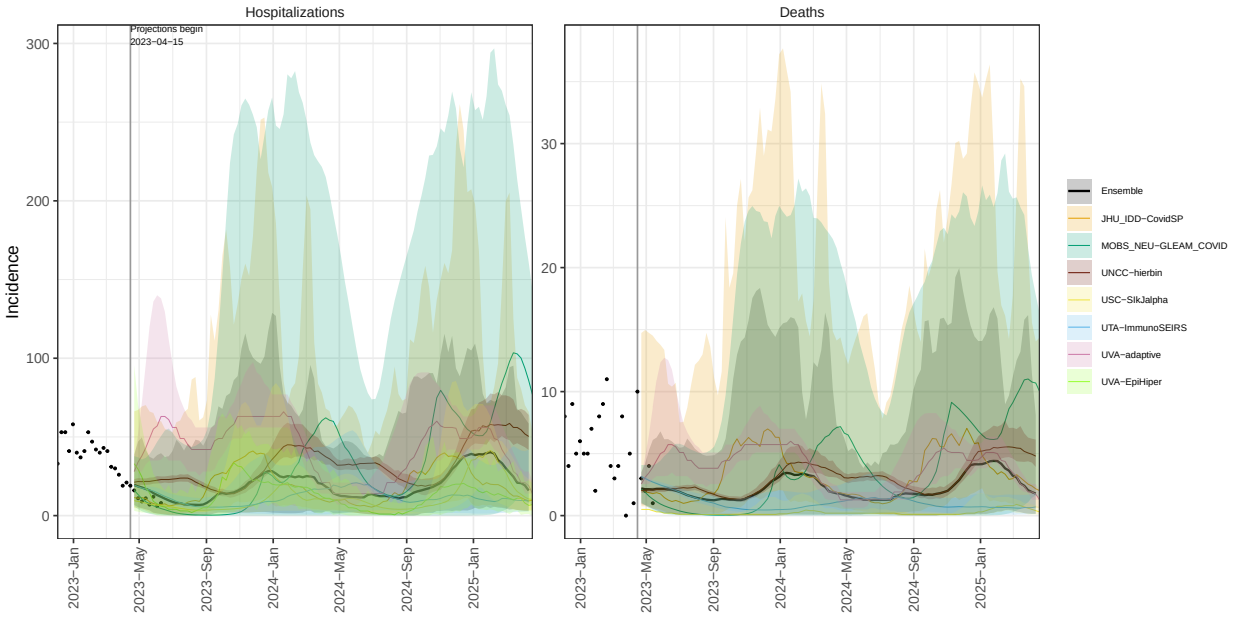
TX model variance & 95% projection intervals − Booster for all, High immune escape



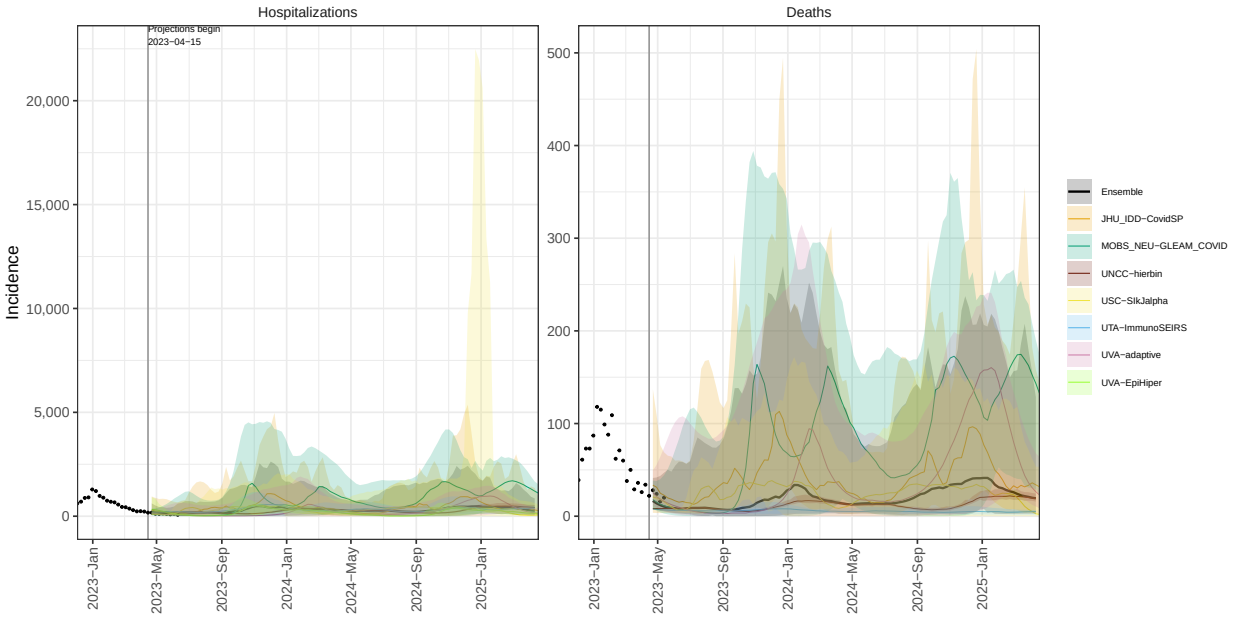
UT model variance & 95% projection intervals − Booster for all, High immune escape



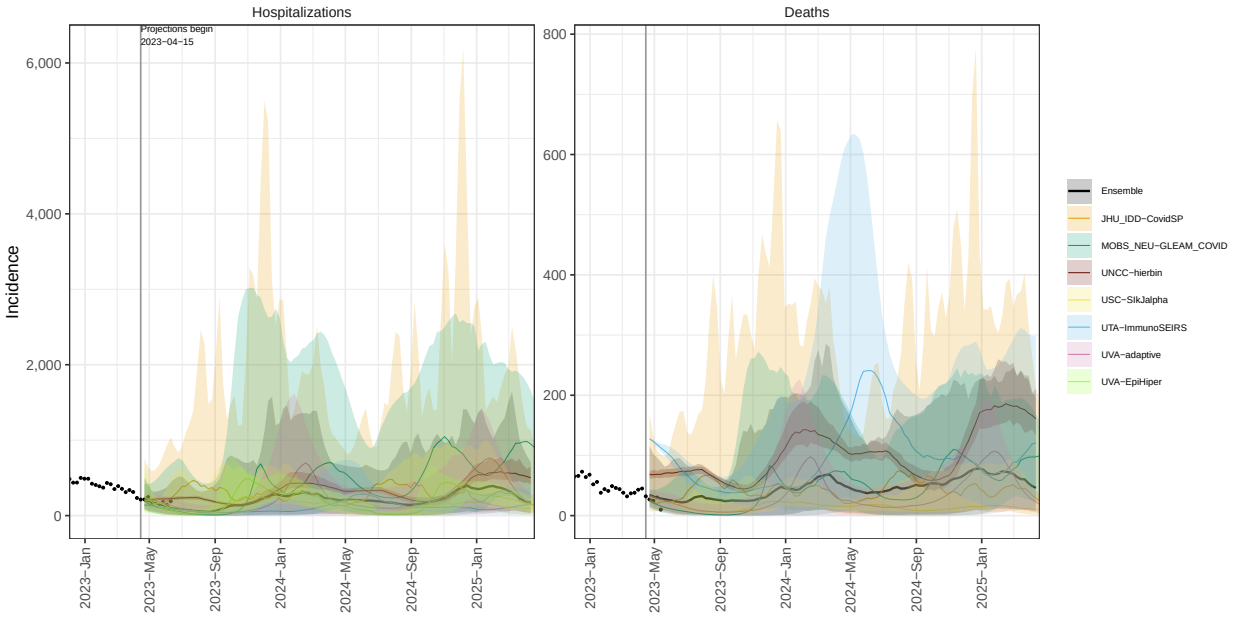
VT model variance & 95% projection intervals − Booster for all, High immune escape



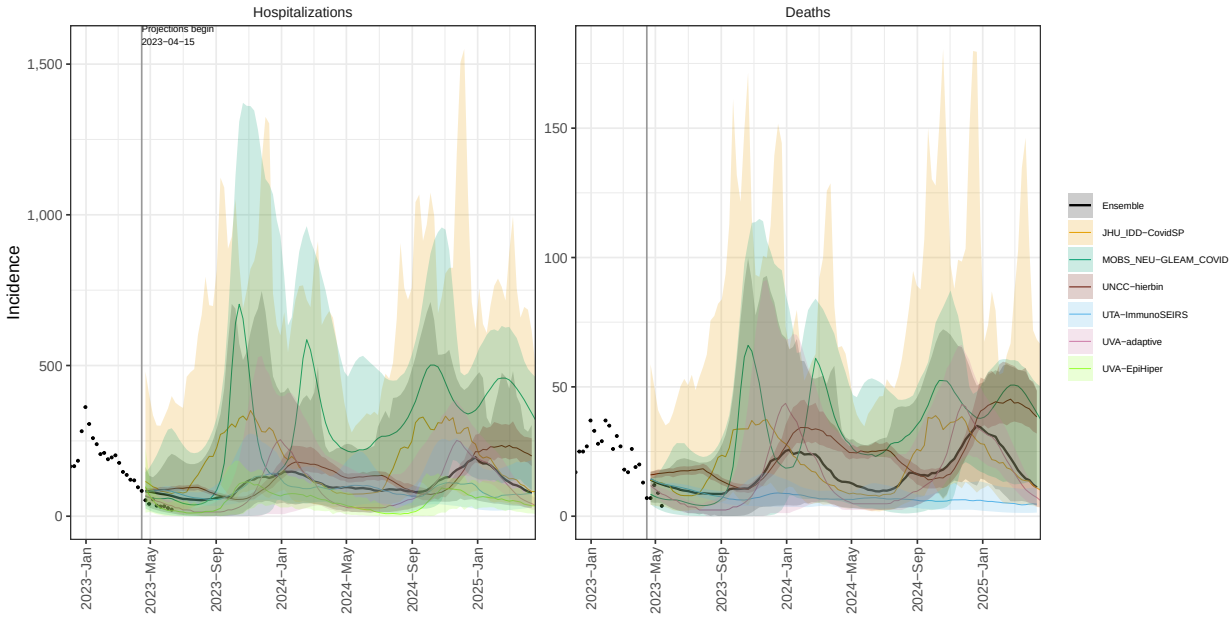
VA model variance & 95% projection intervals − Booster for all, High immune escape



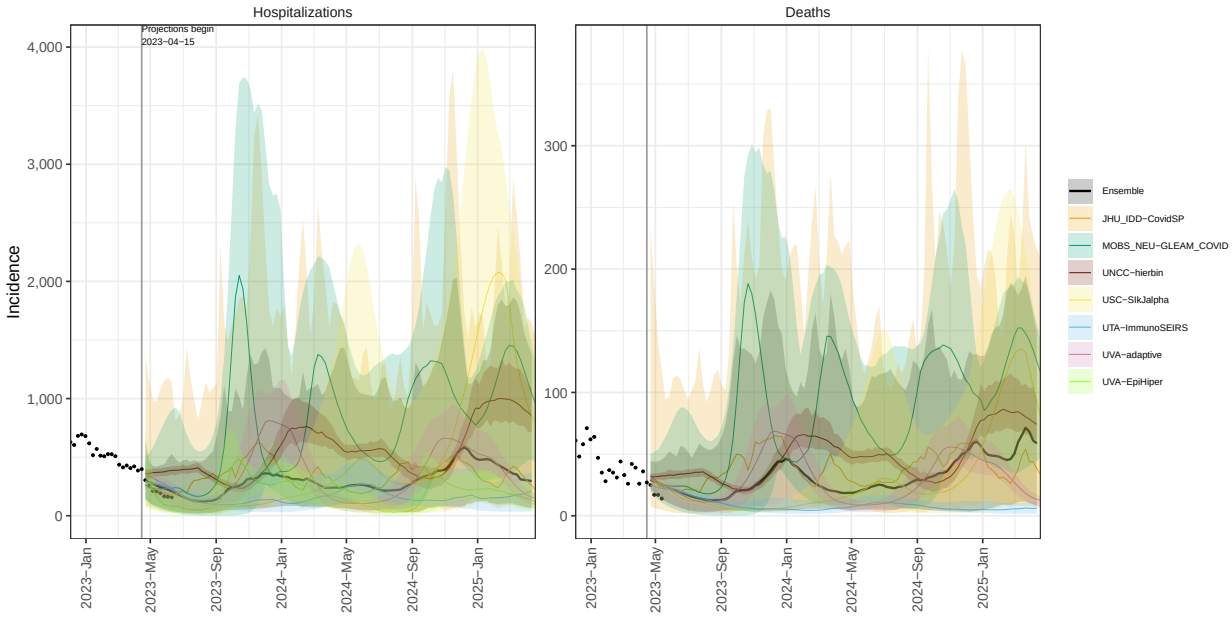
WA model variance & 95% projection intervals − Booster for all, High immune escape

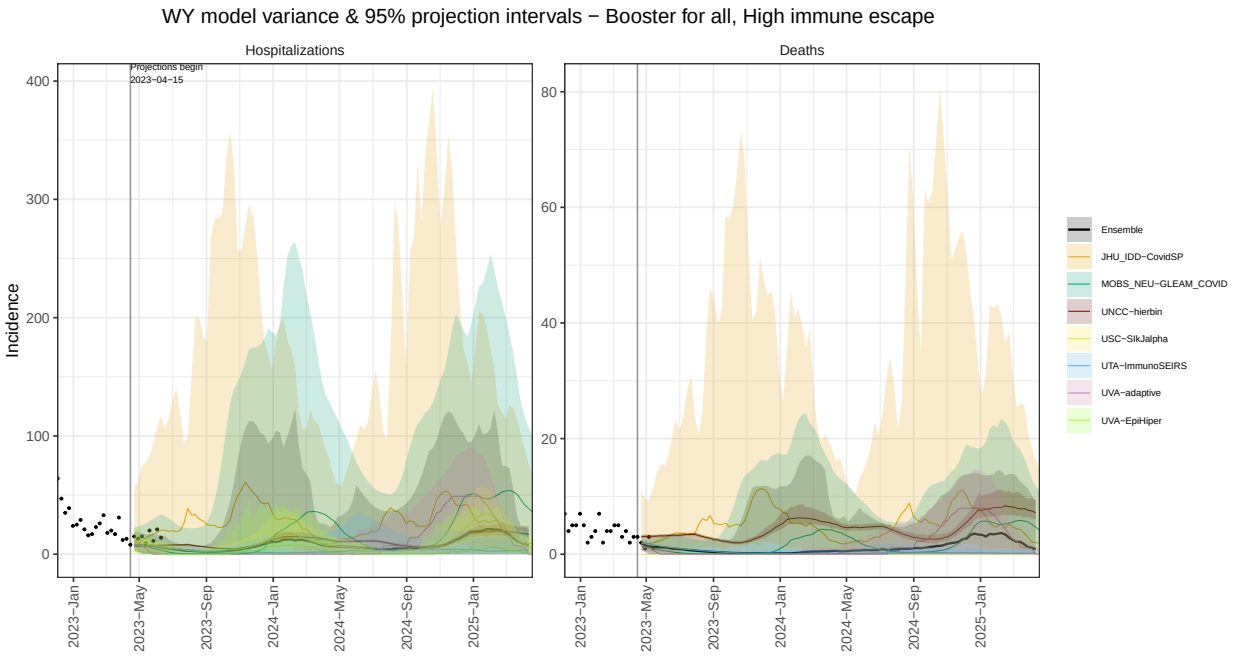


WV model variance & 95% projection intervals − Booster for all, High immune escape



WI model variance & 95% projection intervals − Booster for all, High immune escape




WY model variance & 95% projection intervals − Booster for all, High immune escape
Hospitalizations
Deaths
Projections begin
2023−04−15
Incidence
400
300
200
100
0
80
60
40
20
0
2023−Jan
2023−May
2023−Sep
2024−Jan
2024−May
2024−Sep
2025−Jan
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

Total seasonal hospitalizations, by model and scenario

Total hospitalizations - low immune escape				
Model	**Warm season 2023**	**Cold season 2023-24**	**Warm season 2024**	**Cold season 2024-25**
Booster for 65+ Low immune escape				
UVA-adaptive	149,098 (126,522- 183,565)	566,668 (497,370- 688,170)	120,496 (90,775- 151,923)	683,412 (638,346- 774,729)
UVA-EpiHiper	56,817 (20,940- 101,605)	339,255 (179,800- 482,711)	46,814 (19,817- 83,711)	316,548 (171,693- 438,127)
UTA-ImmunoSEIRS	164,778 (134,448- 207,951)	643,770 (405,886- 875,939)	197,620 (107,987- 345,350)	581,257 (332,544- 904,775)
USC-SIkJalpha	227,340 (102,465- 340,837)	588,274 (266,240- 862,745)	259,526 (109,720- 427,716)	667,972 (426,185-1,048,518)
UNCC-hierbin	251,774 (246,313- 256,673)	403,249 (373,922- 479,702)	158,319 (154,173- 163,549)	325,148 (292,722- 387,482)
MOBS_NEU-GLEAM_COVID	113,804 (74,203- 163,782)	838,363 (711,615- 936,327)	176,931 (102,698- 245,363)	830,016 (687,444- 937,765)
JHU_IDD-CovidSP	267,443 (147,334- 388,131)	875,672 (551,887-1,122,396)	215,937 (114,065- 583,610)	844,686 (533,214-1,123,446)
Ensemble	165,215 (34,888- 341,695)	590,318 (254,152-1,000,375)	158,893 (31,320- 412,896)	668,699 (243,368-1,042,558)
Booster for all Low immune escape				
UVA-adaptive	149,098 (126,522- 183,565)	449,418 (374,235- 557,070)	127,734 (98,513- 153,912)	582,062 (531,191- 664,158)
UVA-EpiHiper	56,458 (22,151- 103,371)	304,528 (167,599- 442,741)	32,682 (15,211- 60,037)	237,090 (136,559- 333,788)
UTA-ImmunoSEIRS	164,844 (134,351- 204,785)	386,506 (177,595- 623,810)	255,420 (135,052- 401,098)	376,341 (174,761- 617,898)
USC-SIkJalpha	227,339 (193,823- 374,080)	566,311 (252,162- 834,717)	155,102 (68,347- 262,632)	559,095 (328,794- 953,099)
UNCC-hierbin	249,297 (243,406- 256,220)	371,899 (349,896- 453,433)	154,627 (147,936- 161,470)	311,392 (282,491- 385,564)
MOBS_NEU-GLEAM_COVID	107,529 (67,501- 160,243)	693,216 (540,243- 799,298)	185,272 (113,745- 269,727)	719,254 (604,526- 812,300)
JHU_IDD-CovidSP	265,714 (155,087- 391,803)	721,317 (454,114- 929,577)	197,901 (105,139- 417,252)	703,391 (497,117- 934,138)
Ensemble	166,302 (35,525- 351,669)	449,368 (212,127- 839,525)	154,892 (22,331- 348,810)	544,274 (180,423- 890,862)
No booster Low immune escape				
UVA-adaptive	149,098 (126,522- 183,565)	635,284 (565,160- 758,290)	111,188 (83,329- 144,708)	739,926 (703,802- 840,921)
UVA-EpiHiper	56,267 (21,873- 102,294)	368,888 (195,663- 538,390)	51,210 (22,244- 96,523)	358,444 (191,575- 522,550)
UTA-ImmunoSEIRS	166,392 (132,318- 203,400)	731,942 (385,195-1,080,775)	209,356 (118,303- 385,948)	736,095 (378,823-1,133,260)
USC-SIkJalpha	225,112 (177,420- 367,809)	705,843 (327,182-1,024,995)	418,672 (224,692- 681,101)	779,799 (519,164-1,208,591)
UNCC-hierbin	257,801 (252,608- 264,915)	478,293 (448,992- 558,131)	169,894 (164,759- 175,440)	383,386 (360,613- 445,031)
MOBS_NEU-GLEAM_COVID	107,305 (72,623- 156,526)	980,230 (803,402-1,093,399)	184,080 (118,323- 244,352)	976,710 (797,167-1,081,275)
JHU_IDD-CovidSP	266,518 (149,723- 386,375)	1,028,989 (691,978-1,317,838)	257,531 (118,480- 629,585)	1,015,008 (668,891-1,322,834)
Ensemble	168,862 (36,650- 343,503)	672,052 (281,065-1,183,296)	170,718 (35,449- 578,048)	740,872 (277,435-1,208,708)

Each value represnts the median with the 95% projection interval

Total hospitalizations - high immune escape				
Model	**Warm season 2023**	**Cold season 2023-24**	**Warm season 2024**	**Cold season 2024-25**
Booster for 65+ High immune escape				
UVA-adaptive	150,842 (128,376- 187,777)	829,154 (772,195- 967,592)	149,399 (114,893- 177,700)	866,628 (847,294-1,041,702)
UVA-EpiHiper	86,280 (31,470- 148,919)	469,917 (234,779- 673,918)	84,304 (35,231- 148,861)	446,994 (226,564- 641,880)
UTA-ImmunoSEIRS	186,312 (149,992- 227,918)	685,913 (427,608- 931,723)	211,368 (109,024- 356,655)	650,342 (311,675- 956,930)
USC-SIkJalpha	247,915 (167,294- 312,618)	834,426 (556,548-1,130,571)	463,119 (376,773- 624,391)	1,159,026 (925,136-1,401,798)
UNCC-hierbin	261,054 (253,950- 266,428)	453,726 (417,995- 531,702)	188,826 (182,452- 205,745)	409,403 (368,035- 495,093)
MOBS_NEU-GLEAM_COVID	222,607 (159,513- 299,082)	1,764,885 (1,557,202-1,931,401)	636,231 (511,327- 759,183)	1,992,563 (1,783,728-2,154,307)
JHU_IDD-CovidSP	437,870 (319,052- 619,453)	1,347,950 (1,100,723-1,610,485)	510,412 (366,540- 714,972)	1,371,039 (1,100,498-1,614,894)
Ensemble	208,792 (52,889- 535,339)	811,702 (344,714-1,833,616)	208,646 (56,040- 718,202)	868,426 (324,919-2,067,489)
Booster for all High immune escape				
UVA-adaptive	150,842 (128,376- 187,777)	695,914 (633,464- 814,180)	151,002 (119,717- 175,832)	760,421 (727,014- 916,717)
UVA-EpiHiper	84,985 (31,931- 152,486)	423,440 (223,164- 622,205)	64,406 (27,077- 118,260)	352,508 (191,471- 520,579)
UTA-ImmunoSEIRS	181,590 (155,252- 228,198)	465,660 (252,064- 697,992)	297,740 (139,176- 435,272)	445,397 (190,288- 668,749)
USC-SIkJalpha	247,960 (186,395- 318,812)	806,746 (522,930-1,100,686)	334,312 (252,566- 463,346)	1,112,226 (905,316-1,409,015)
UNCC-hierbin	258,665 (253,649- 263,343)	426,613 (395,119- 518,536)	185,105 (178,132- 194,265)	397,104 (356,125- 492,981)
MOBS_NEU-GLEAM_COVID	215,453 (147,616- 285,949)	1,659,382 (1,431,913-1,812,368)	628,634 (510,060- 759,918)	1,900,545 (1,681,892-2,065,435)
JHU_IDD-CovidSP	451,227 (316,650- 641,384)	1,208,903 (927,085-1,482,569)	480,824 (307,708- 667,129)	1,222,061 (914,886-1,495,996)
Ensemble	210,150 (57,275- 552,459)	678,164 (301,733-1,765,626)	272,541 (45,596- 689,922)	757,908 (237,538-2,006,681)
No booster High immune escape				
UVA-adaptive	150,842 (128,376- 187,777)	899,671 (840,602-1,045,824)	145,470 (112,141- 179,100)	921,032 (903,637-1,106,992)
UVA-EpiHiper	85,594 (31,907- 150,176)	505,832 (253,352- 737,378)	92,106 (36,141- 167,170)	499,770 (247,283- 740,052)
UTA-ImmunoSEIRS	181,444 (147,076- 215,157)	751,081 (463,815-1,038,495)	213,481 (112,682- 375,519)	708,361 (353,364-1,079,554)
USC-SIkJalpha	247,381 (175,321- 300,827)	967,505 (658,855-1,325,947)	657,132 (546,008- 903,230)	1,333,788 (1,076,332-1,660,914)
UNCC-hierbin	267,232 (261,911- 274,591)	534,899 (501,845- 625,396)	202,589 (196,415- 209,183)	480,722 (451,847- 558,846)
MOBS_NEU-GLEAM_COVID	214,519 (165,375- 313,920)	1,919,743 (1,642,105-2,123,746)	625,599 (520,118- 777,503)	2,127,764 (1,864,481-2,352,802)
JHU_IDD-CovidSP	446,305 (313,912- 639,995)	1,550,868 (1,245,827-1,794,268)	593,622 (406,965- 834,802)	1,583,751 (1,252,381-1,812,420)
Ensemble	205,538 (56,200- 538,726)	885,708 (383,426-2,005,045)	210,563 (62,978- 810,008)	927,209 (371,378-2,222,141)
Each value represnts the median with the 95% projection interval				

Total seasonal deaths, by model and scenario

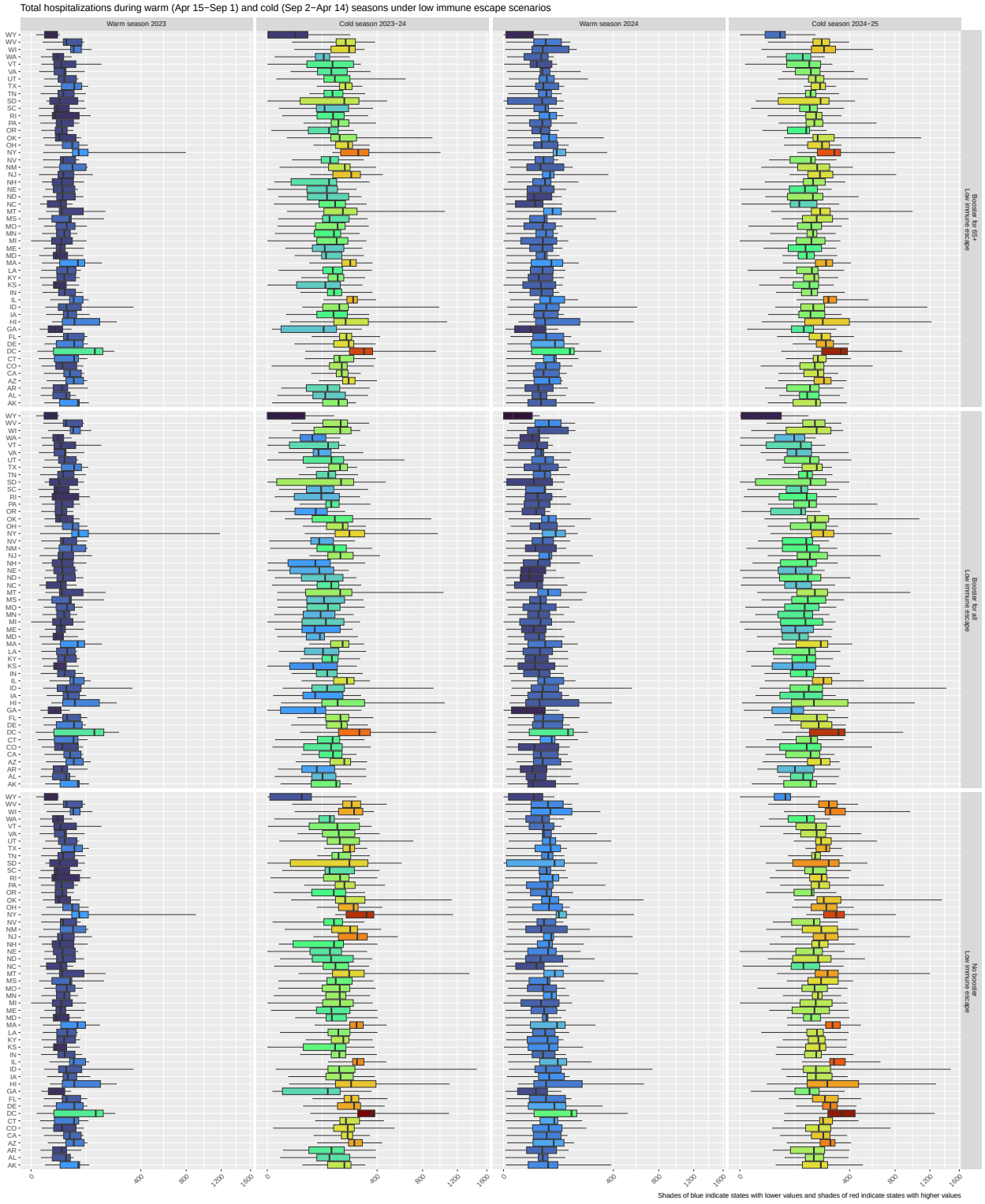
Total deaths - low immune escape				
Model	**Warm season 2023**	**Cold season 2023-24**	**Warm season 2024**	**Cold season 2024-25**
Booster for 65+ Low immune escape				
UVA-adaptive	14,661 (12,441- 18,050)	55,720 (48,906- 67,668)	11,848 (8,926- 14,939)	67,200 (62,769- 76,179)
UTA-ImmunoSEIRS	16,521 (14,971- 18,591)	32,279 (18,655- 44,216)	12,136 (7,253- 19,078)	23,900 (13,904- 40,310)
USC-SIkJalpha	13,320 (10,078- 16,127)	32,749 (16,863- 52,982)	13,512 (5,308- 24,596)	41,260 (23,655- 73,441)
UNCC-hierbin	24,141 (23,728- 24,761)	38,743 (35,785- 46,151)	15,240 (14,762- 15,696)	31,363 (28,238- 37,381)
MOBS_NEU-GLEAM_COVID	13,236 (9,273- 18,029)	83,294 (71,119- 92,638)	19,463 (11,502- 27,079)	83,625 (68,765- 93,833)
JHU_IDD-CovidSP	26,937 (16,069- 38,302)	76,887 (45,488-102,403)	20,221 (11,714- 50,989)	76,567 (46,542-101,684)
Ensemble	16,219 (10,365- 35,169)	49,996 (20,870- 94,079)	15,116 (7,203- 30,768)	62,521 (17,002- 93,447)
Booster for all Low immune escape				
UVA-adaptive	14,661 (12,441- 18,050)	44,191 (36,799- 54,777)	12,560 (9,687- 15,134)	57,234 (52,232- 65,307)
UTA-ImmunoSEIRS	16,490 (14,906- 18,262)	18,684 (9,199- 30,776)	9,606 (5,007- 14,511)	13,107 (6,762- 21,906)
USC-SIkJalpha	13,564 (11,184- 16,127)	32,381 (17,306- 52,094)	9,153 (3,409- 17,213)	34,403 (18,373- 65,512)
UNCC-hierbin	23,924 (23,421- 24,352)	36,364 (33,578- 42,777)	14,839 (14,403- 15,493)	30,150 (27,284- 37,378)
MOBS_NEU-GLEAM_COVID	12,541 (8,460- 17,780)	70,041 (55,137- 80,632)	19,808 (12,067- 27,950)	73,023 (61,052- 83,568)
JHU_IDD-CovidSP	27,053 (15,972- 38,083)	68,780 (44,757- 91,718)	20,183 (10,975- 41,173)	69,450 (50,160- 92,737)
Ensemble	16,148 (9,954- 32,544)	42,318 (12,202- 80,379)	14,501 (4,776- 27,905)	53,125 (9,298- 83,473)
No booster Low immune escape				
UVA-adaptive	14,661 (12,441- 18,050)	62,467 (55,572- 74,563)	10,933 (8,194- 14,229)	72,757 (69,205- 82,688)
UTA-ImmunoSEIRS	16,511 (14,579- 18,109)	46,202 (23,900- 67,035)	17,660 (10,653- 26,606)	38,562 (20,853- 63,112)
USC-SIkJalpha	13,336 (10,893- 16,127)	37,181 (21,383- 59,730)	27,025 (13,800- 50,162)	46,015 (27,847- 80,801)
UNCC-hierbin	24,794 (24,192- 25,300)	46,100 (42,912- 53,821)	16,337 (15,856- 16,721)	37,056 (34,327- 43,103)
MOBS_NEU-GLEAM_COVID	12,453 (9,069- 17,018)	100,661 (82,985-110,326)	20,394 (13,618- 27,060)	100,353 (83,011-110,137)
JHU_IDD-CovidSP	27,460 (16,436- 37,451)	107,614 (65,754-139,113)	28,303 (14,371- 65,982)	109,506 (65,612-139,381)
Ensemble	16,226 (10,243- 33,939)	59,626 (24,573-124,859)	17,372 (9,382- 47,675)	70,543 (26,003-124,211)

Each value represnts the median with the 95% projection interval

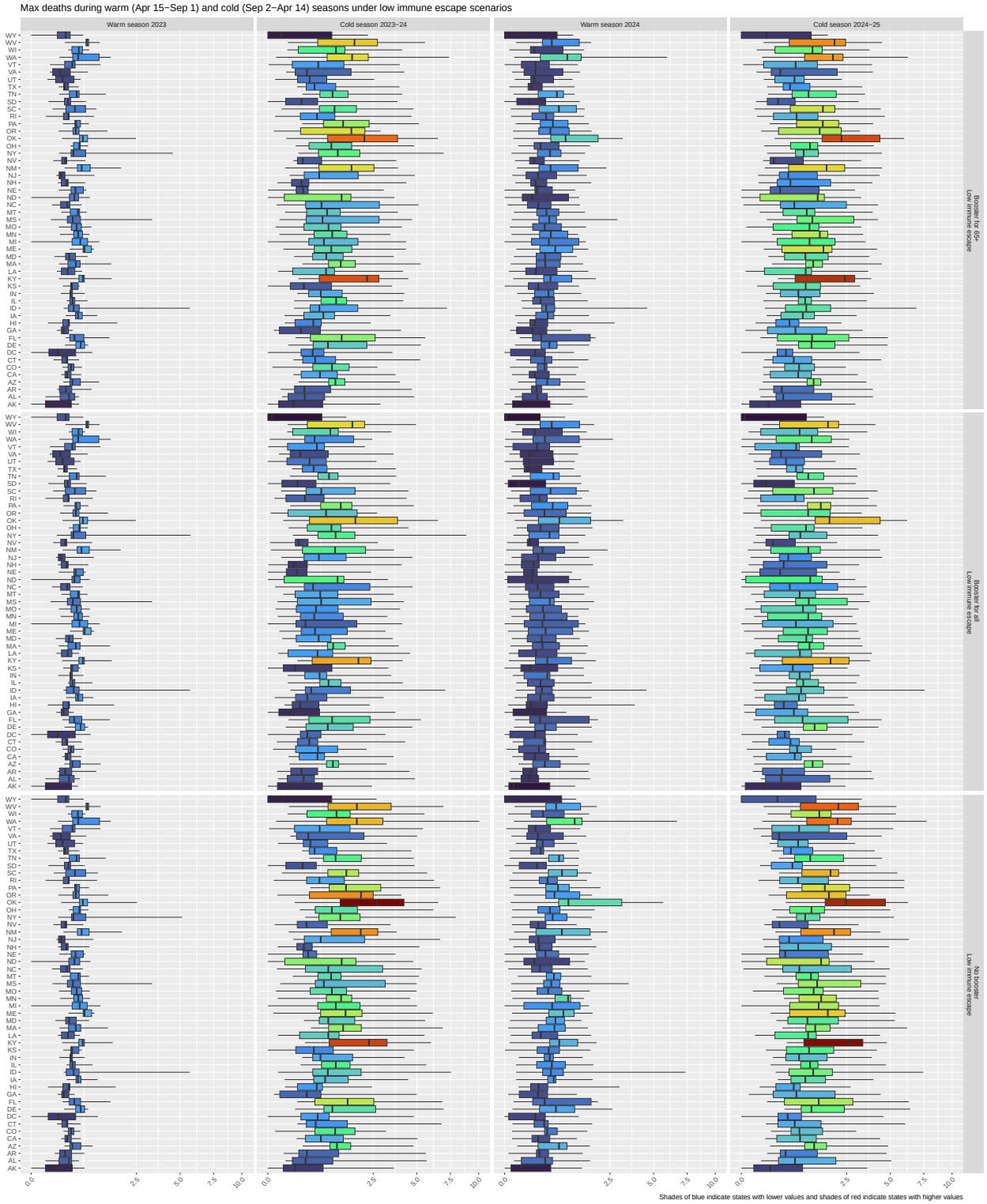
Total deaths - high immune escape				
Model	**Warm season 2023**	**Cold season 2023-24**	**Warm season 2024**	**Cold season 2024-25**
Booster for 65+ High immune escape				
UVA-adaptive	14,512 (12,351- 18,065)	79,770 (74,290- 93,088)	14,373 (11,053- 17,096)	83,375 (81,515-100,218)
UTA-ImmunoSEIRS	20,190 (18,135- 22,613)	39,372 (23,092- 55,511)	15,753 (9,376- 24,384)	32,067 (14,125- 49,900)
USC-SIkJalpha	14,294 (11,140- 18,950)	47,320 (29,548- 68,999)	24,248 (17,421- 37,066)	69,946 (53,562- 93,352)
UNCC-hierbin	25,038 (24,523- 25,559)	44,034 (40,370- 51,606)	18,145 (17,530- 18,687)	39,943 (35,720- 47,237)
MOBS_NEU-GLEAM_COVID	23,485 (17,092- 31,073)	175,797 (154,365-192,115)	67,228 (55,040- 80,110)	203,659 (181,404-220,598)
JHU_IDD-CovidSP	41,680 (30,246- 56,022)	124,299 (101,146-153,629)	44,420 (30,017- 60,695)	128,298 (102,027-154,842)
Ensemble	21,029 (12,419- 49,817)	74,763 (30,178-185,742)	20,099 (11,336- 74,922)	82,505 (21,896-212,180)
Booster for all High immune escape				
UVA-adaptive	14,512 (12,351- 18,065)	66,951 (60,943- 78,329)	14,527 (11,517- 16,916)	73,157 (69,943- 88,194)
UTA-ImmunoSEIRS	20,019 (18,463- 22,451)	25,387 (14,372- 39,174)	15,717 (8,595- 23,563)	21,499 (9,892- 31,667)
USC-SIkJalpha	14,371 (11,543- 19,275)	46,769 (28,720- 68,293)	18,465 (12,304- 29,223)	67,663 (51,967- 92,435)
UNCC-hierbin	24,790 (24,378- 25,293)	40,531 (37,667- 48,802)	17,683 (17,065- 18,425)	37,806 (34,010- 47,409)
MOBS_NEU-GLEAM_COVID	22,784 (16,015- 29,635)	166,106 (142,461-183,092)	68,027 (55,116- 79,095)	195,041 (172,102-212,275)
JHU_IDD-CovidSP	43,992 (28,441- 57,209)	120,080 (90,538-148,688)	47,074 (28,712- 64,109)	120,450 (89,987-151,516)
Ensemble	21,030 (12,675- 51,284)	62,498 (19,722-176,591)	18,052 (11,260- 73,645)	72,649 (13,970-205,578)
No booster High immune escape				
UVA-adaptive	14,512 (12,351- 18,065)	86,554 (80,871-100,615)	13,995 (10,789- 17,230)	88,609 (86,935-106,499)
UTA-ImmunoSEIRS	19,761 (18,206- 21,615)	56,174 (35,259- 76,615)	21,244 (12,813- 32,582)	40,799 (19,086- 69,008)
USC-SIkJalpha	14,283 (11,285- 16,920)	52,380 (33,490- 76,576)	42,551 (32,726- 62,807)	78,082 (60,228- 97,926)
UNCC-hierbin	25,710 (25,074- 26,232)	51,565 (47,963- 60,290)	19,483 (18,909- 19,941)	46,473 (43,013- 54,121)
MOBS_NEU-GLEAM_COVID	22,534 (18,001- 32,280)	194,282 (167,247-216,308)	66,462 (56,495- 80,435)	219,571 (192,060-243,204)
JHU_IDD-CovidSP	41,660 (29,534- 57,806)	163,443 (131,884-203,217)	61,056 (41,860- 87,204)	168,737 (137,759-211,402)
Ensemble	20,839 (12,545- 51,563)	81,623 (37,515-208,468)	31,098 (12,167- 77,889)	87,824 (28,615-233,760)

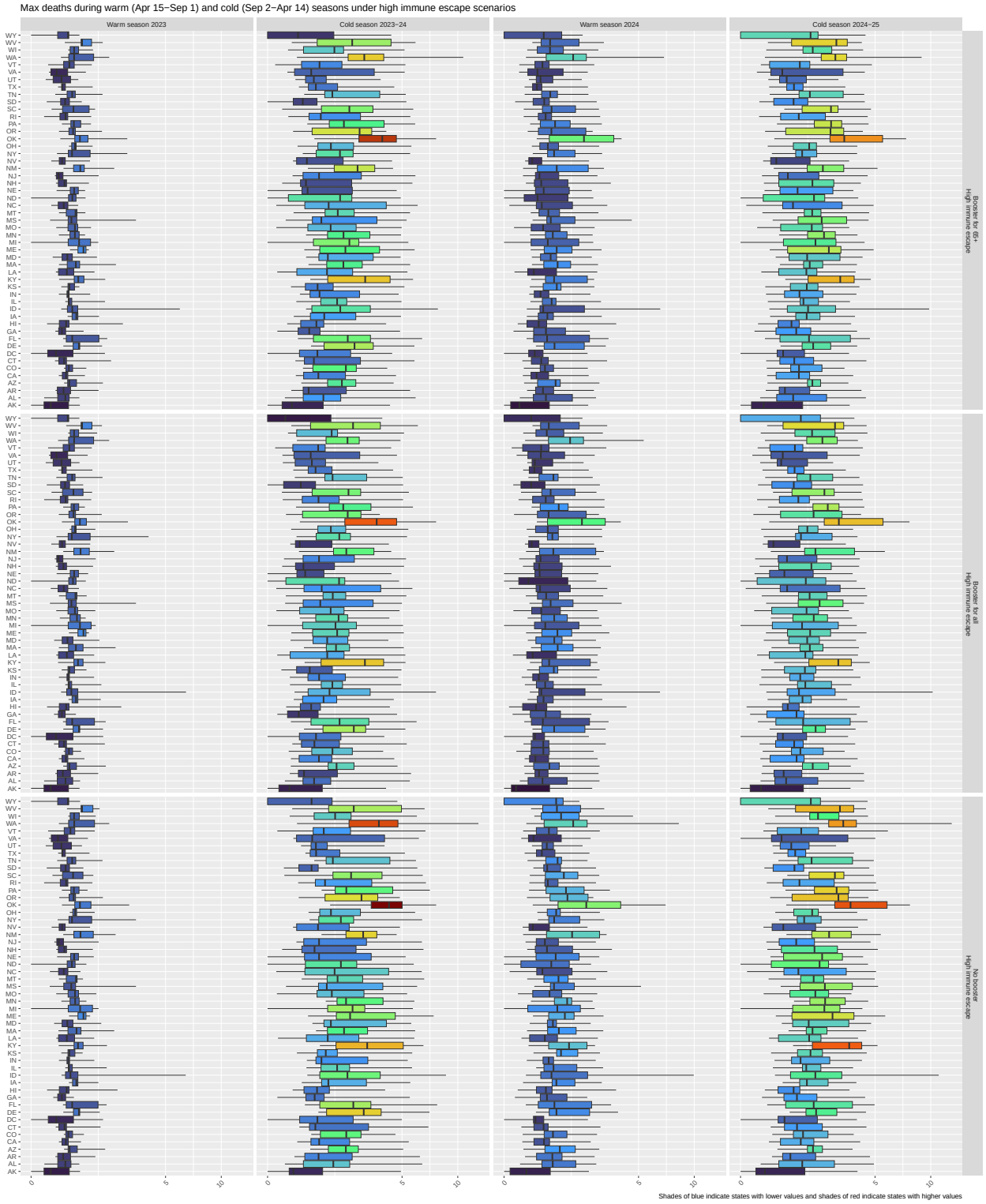
Each value represnts the median with the 95% projection interval

Additional state-level seasonal plots




Total hospitalizations during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under high immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Booster + flu
High immune escape
Booster + flu
High immune escape
No booster
High immune escape
0
1000
2000
Shades of blue indicate states with lower values and shades of red indicate states with higher values


Max deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under low immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Booster + flu
Booster only
No booster
Low immune escape
0.0
2.5
5.0
7.5
10.0
Shades of blue indicate states with lower values and shades of red indicate states with higher values


Max deaths during warm (Apr 15−Sep 1) and cold (Sep 2−Apr 14) seasons under high immune escape scenarios
Warm season 2023
Cold season 2023−24
Warm season 2024
Cold season 2024−25
Booster for all
Booster for 18+
No booster
High immune escape
0
5
10
Shades of blue indicate states with lower values and shades of red indicate states with higher values

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