COVID-19 Scenario Modeling Hub Report

13 April, 2022
Scenario Modeling Hub Team[1]

Executive Summary

This report presents the results of the thirteenth round of projections from the COVID-19 Scenario Modeling Hub. A consortium of nine modeling groups convened to generate week ahead projections of COVID-19 cases, deaths, and hospitalizations for a period of twelve months (weeks ending 2022-03-19 to 2023-03-11), given four scenarios of waning and emergence of an immune escape variant. A full list of contributors is included at the end of the report. See the table on the next page for an overview of the scenarios included in this round. Detailed scenario descriptions and setting assumptions are provided here.

Key Takeaways from the Thirteenth Round

- The COVID-19 Scenario Modeling Hub considered 4 scenarios based on waning immunity (median of 4 months vs. 10 months) and the hypothetical emergence of a 30% immune escape variant in May 2022. Our results indicate considerable uncertainty in the future trajectory of the pandemic during the 52-week projection period March 2022-March 2023, although outbreaks are projected to be less intense than in the acute phase of the pandemic.
- Ensemble case incidences are projected to remain fairly constant in all scenarios based on the 50% projection interval, although periods of heightened incidence are plausible based on the 80, 90, and 95% projection intervals. The timing of these periods of higher incidence depends on the scenario. Ensemble projections of hospitalizations and deaths are consistent with moderate rises in the next year, relative to the early March 2022 levels, without strong support for a particular period of increased burden. The lack of a well-defined shape for the weekly ensemble trajectories is driven by the considerable heterogeneity seen between, and sometimes within, models.
- Divergence between models is more pronounced in faster waning scenarios, both in weekly and cumulative projections. One model identifies up to 3 epidemic cycles over the 52-week projection period (MOBS-2, fast waning), while other models are consistent with 2 epidemic cycles (JHU, UVA-adaptive), 1 cycle (USC, MOBS-1), or no cycle (MOBS-1 slow waning, UNCC, Epihyper). Typically, multiplicity of epidemics is driven by a higher proportion of the population losing immunity faster (e.g., compare fast vs slow waning scenarios; exponential vs gamma distributed waning in MOBS-1 vs MOBS-2). Models that project multiple epidemic cycles also tend to have higher incidence levels.
- Three of the four models that include some aspects of BA.2 Omicron rise and/or post-Omicron relaxation of interventions project a small to moderate peak in incidences between April-June 2022.
- Absent the emergence of a new variant, the United States is projected to cross 1 million deaths in June or early July 2022, with a 50% projection interval spanning May 6 and November 14 2022 for the non-variant scenarios. This range captures both uncertainty of individual models, uncertainty within models, and uncertainty about the timescale of waning. The emergence of a new variant in Spring 2022 does not change the median date estimate but suggests that crossing would be likely to occur in the earlier part of the projection interval.
- In the most pessimistic scenario, which considers fast waning and the emergence of a new variant, there is a greater than 5% risk that hospitalization will exceed peak levels reported during the Delta wave in 10 of the 52 projection weeks (19%). The peak of the Delta wave was 89,000 weekly national hospitalizations. In the most optimistic scenario of slow waning and no new variant, the 5% risk threshold is not exceeded. Exceedance estimates are intermediate for the other two scenarios (4-5 weeks, 8-10% of the projection period).
- During March 2022- 2023, 95,800 cumulative deaths (95% PI 9,000 to 324,000) are projected to occur in the most optimistic scenario (slow waning and absent a new variant). This corresponds to 1.06M

[1] Compiled by Justin Lessler, Rebecca Borchering, Emily Howerton, and Claire Smith.

cumulative deaths (95% PI 0.98-1.29M) since the start of the pandemic, March 2020-March 2023. In the most pessimistic scenario (fast waning and with emergence of an immune escape variant), 211,000 cumulative deaths would occur during March 2022-2023 (95% PI 52,000-466,000). The cumulative number of hospitalizations during the 52-week projection period is 0.75M (0.14 - 4.04M) in the most optimistic scenario and 1.50M (0.39 - 3.49M) in the most pessimistic scenario.

- Key caveats:
  - There is considerable uncertainty between and within models, leading to heterogeneity in the timing of individual outbreak simulations. The median ensemble is not necessarily an accurate depiction of possible trajectories.
  - Projections are highly sensitive to the choice of waning distribution and data used for calibration. Further, in the calibration process, modeling teams have identified collinearity between waning parameters and the transmissibility of variants.
  - There is considerable uncertainty about the evolutionary dynamics of SARS-CoV-2 in the next year. Here, we consider the case of a moderate immune escape variant that arises in May 2022. This only covers a subset of possible variant scenarios.
  - Case ascertainment is likely to change in the next year; our projections assume the same level of ascertainment as seen during Omicron. We would expect changes to be more moderate in hospitalizations and deaths, although they will exist.
  - Projections of the date at which COVID-19 official deaths will reach 1M are sensitive to reporting issues, including review of the etiology of past COVID-19 deaths. Because of death ascertainment issues, it is likely that the number of "excess" deaths directly and indirectly attributable to COVID19 has already passed 1M.

Note: The CU-AGE_ST model is not included in the ensemble as it does not precisely recreate the waning scenarios specified in the definition, capturing only differential timing, but not changes in waning level. One group submitted two models (the two MOBS models) which are included in the ensemble with 50% weight each.

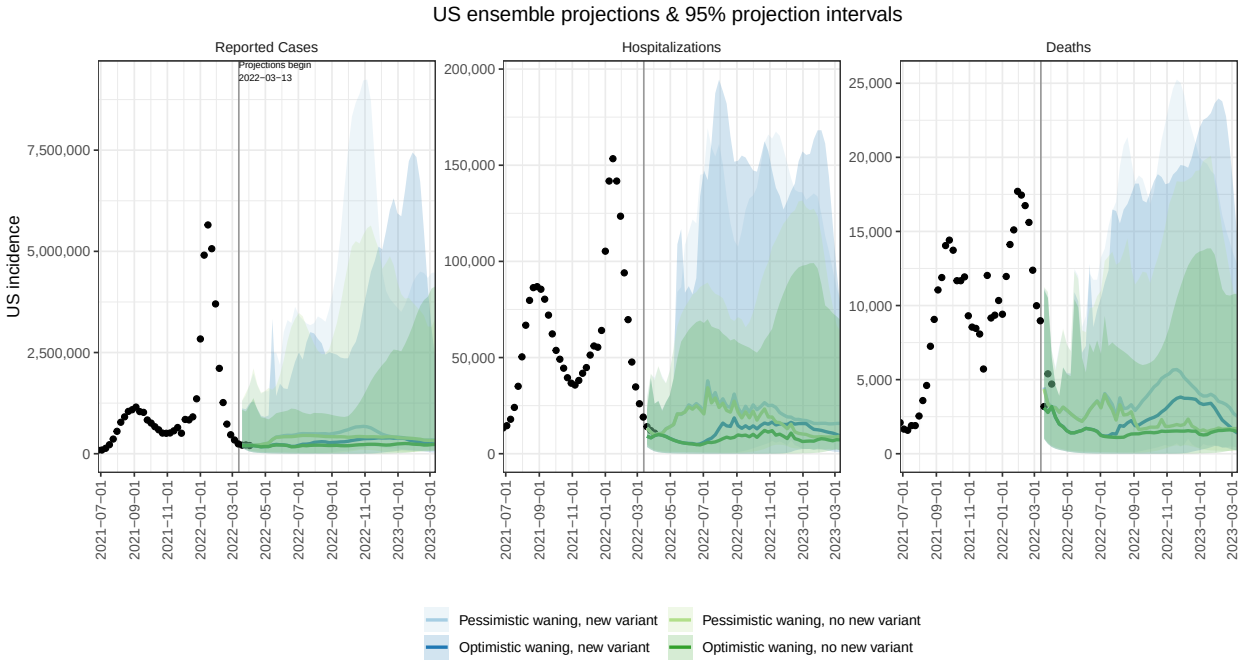
Round 13 Scenario Specifications

See detailed notes on each scenario below	**No new variant.** Projections are initialized with the mix of strains circulating at the start of the projection period.	**New variant X** emerges on **May 1st, 2022.** There is a **continuous influx of 50 weekly infections** of variant X for the following **16 wks.** Variant X has **30% immune escape**, and the **same intrinsic transmissibility and severity** as Omicron.
Optimistic waning of protection against infection: ● **Slow immune waning, median** transition time to partially immune state **= 10 months** ● In the partially immune state, there is a **40% r**eduction in protection from baseline levels reported immediately after exposure (vaccination or infection)	**Scenario A**	**Scenario B**
Pessimistic waning of protection against infection: ● **Fast immune waning, median** transition time to partially immune state **= 4 months** ● In the partially immune state, there is a **60%** reduction in protection from baseline levels reported immediately after exposure (vaccination or infection).	**Scenario C**	**Scenario D**

Figure 1: Round 13 Scenario Specifications

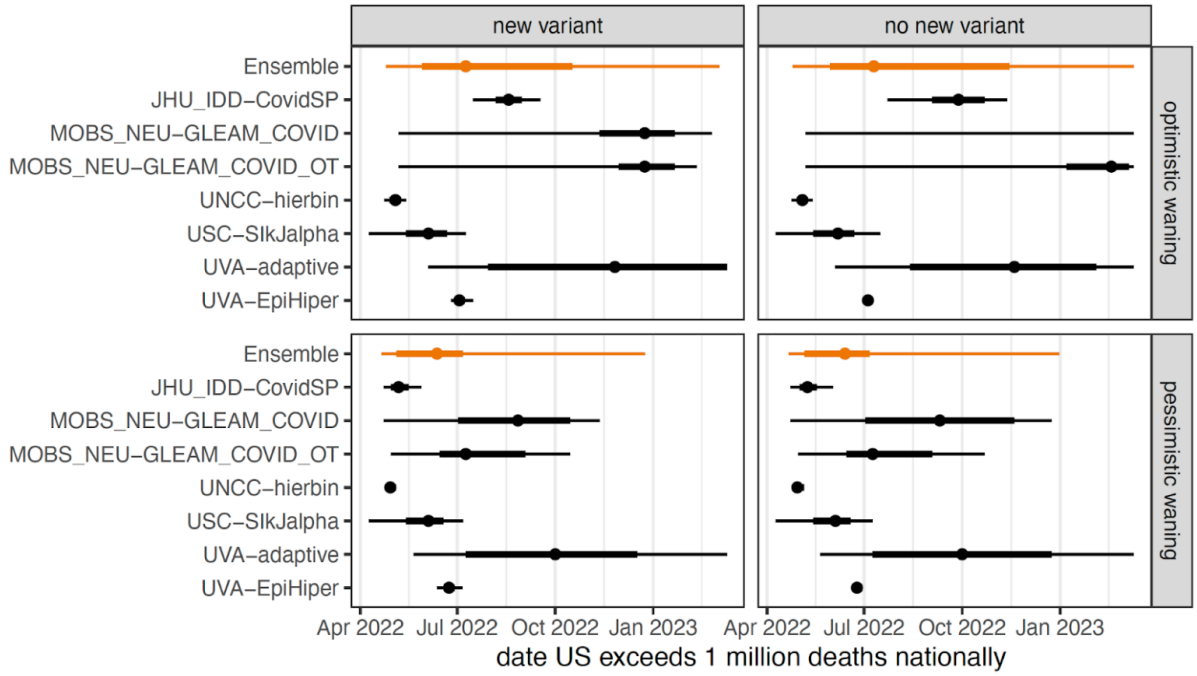
National ensemble projections

Ensemble projections for national cases, hospitalizations and deaths separated by scenario.

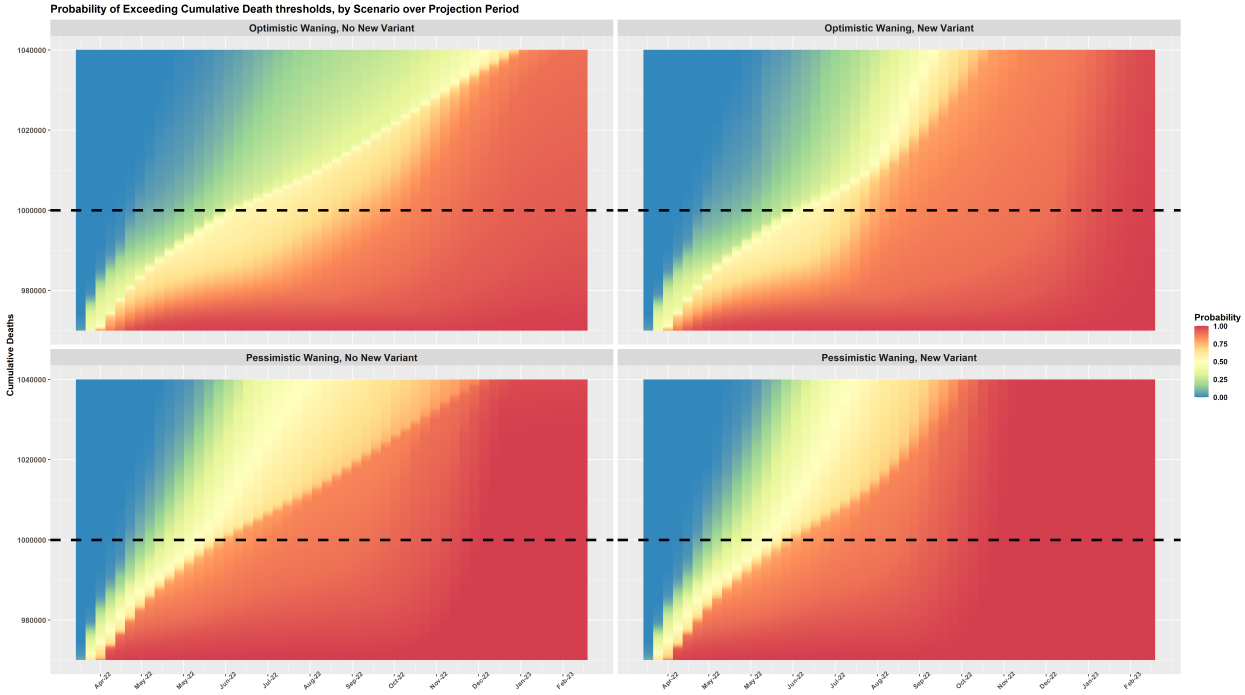


Time to reach 1 million deaths

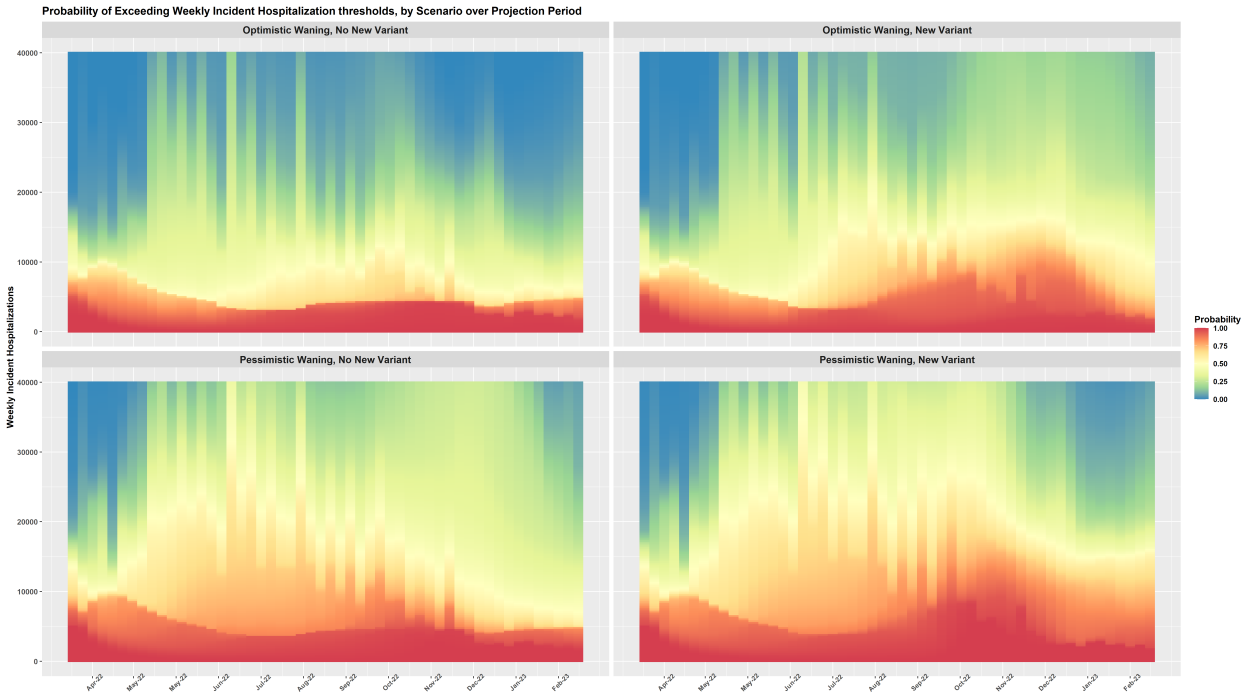
Estimates of the date at which the United States crosses one million cumulative deaths nationally.



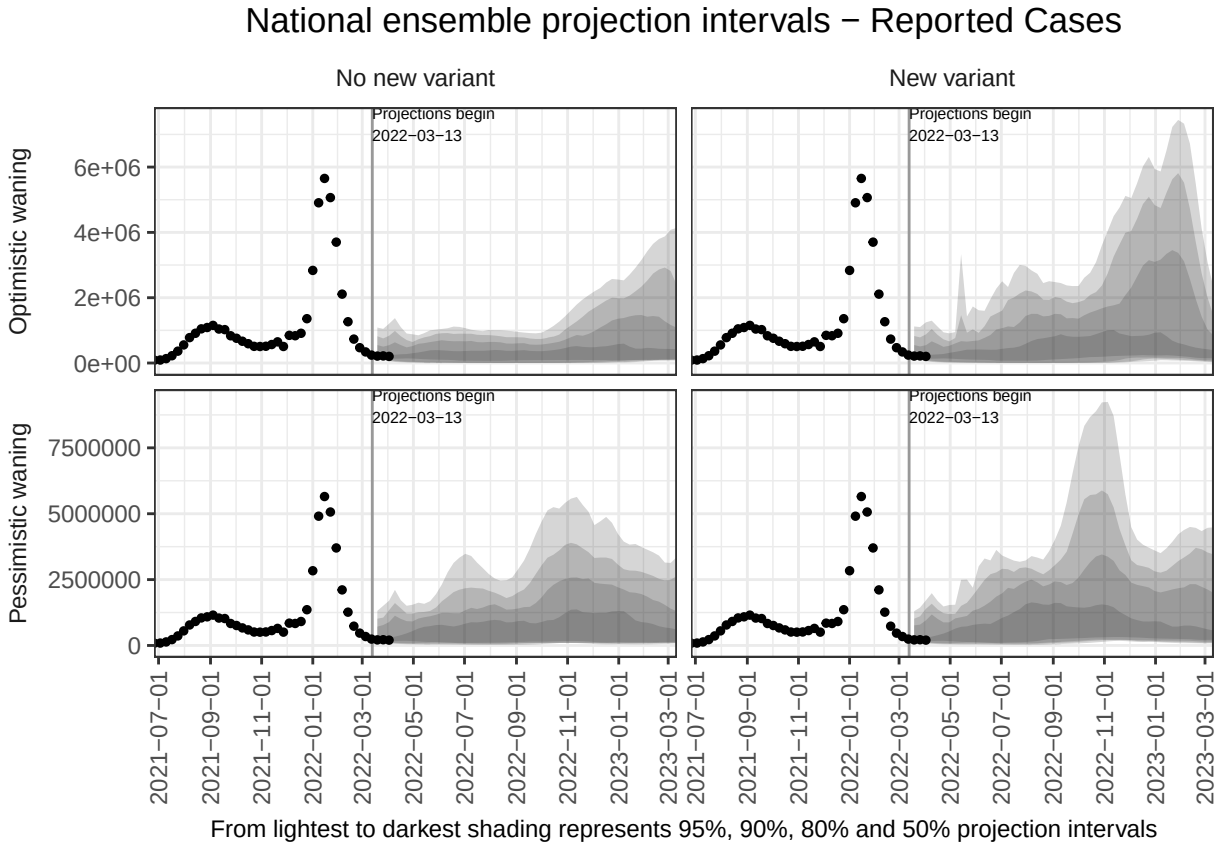
Probability of exceeding one million cumulative death threshold by scenario

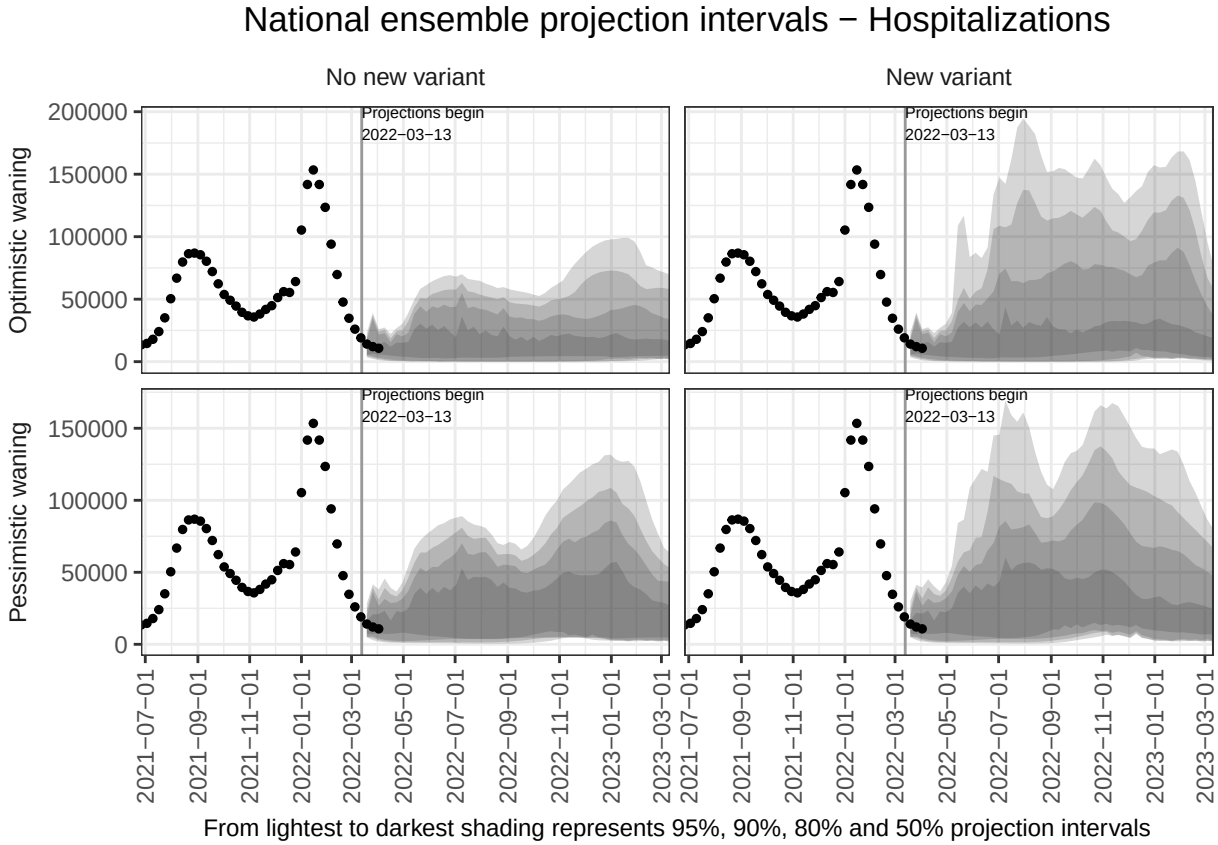


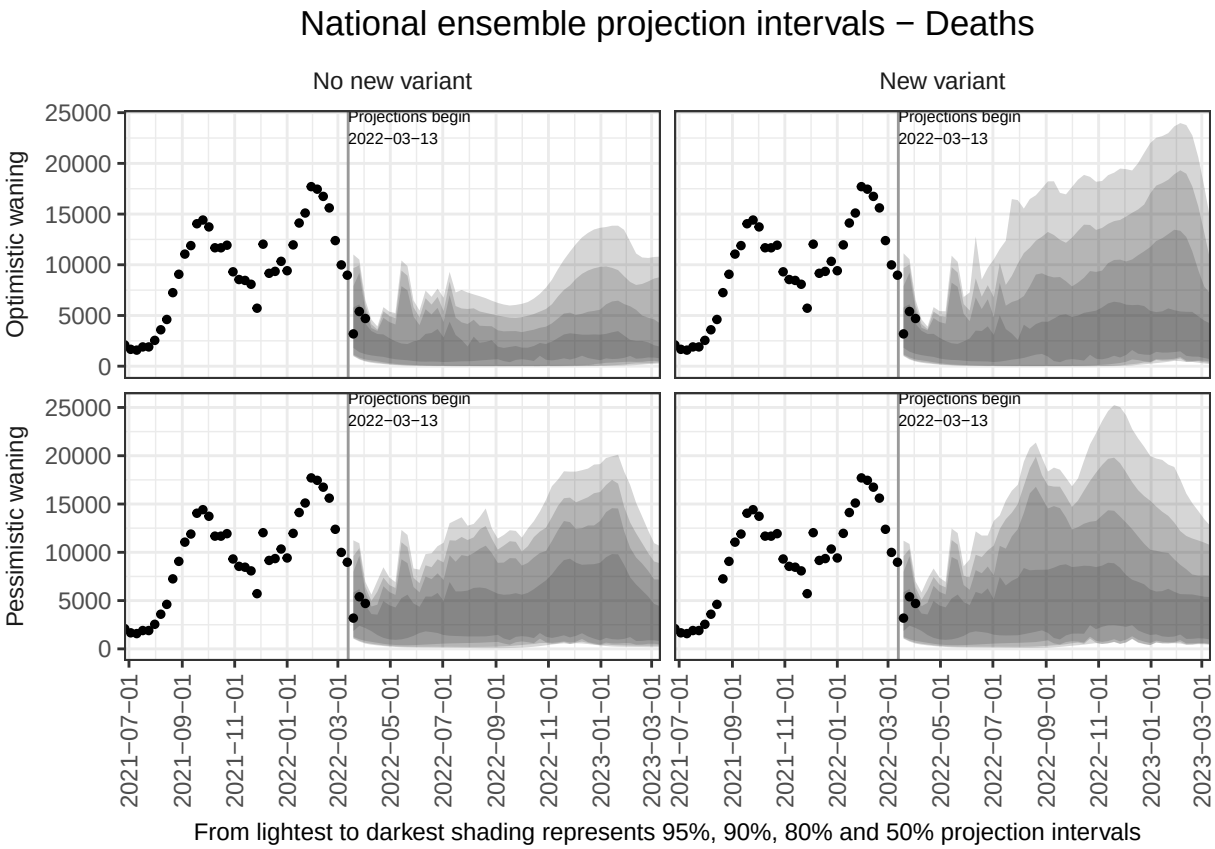
Probability of exceeding incident hospitalization threshold by scenario



Ensemble projection intervals

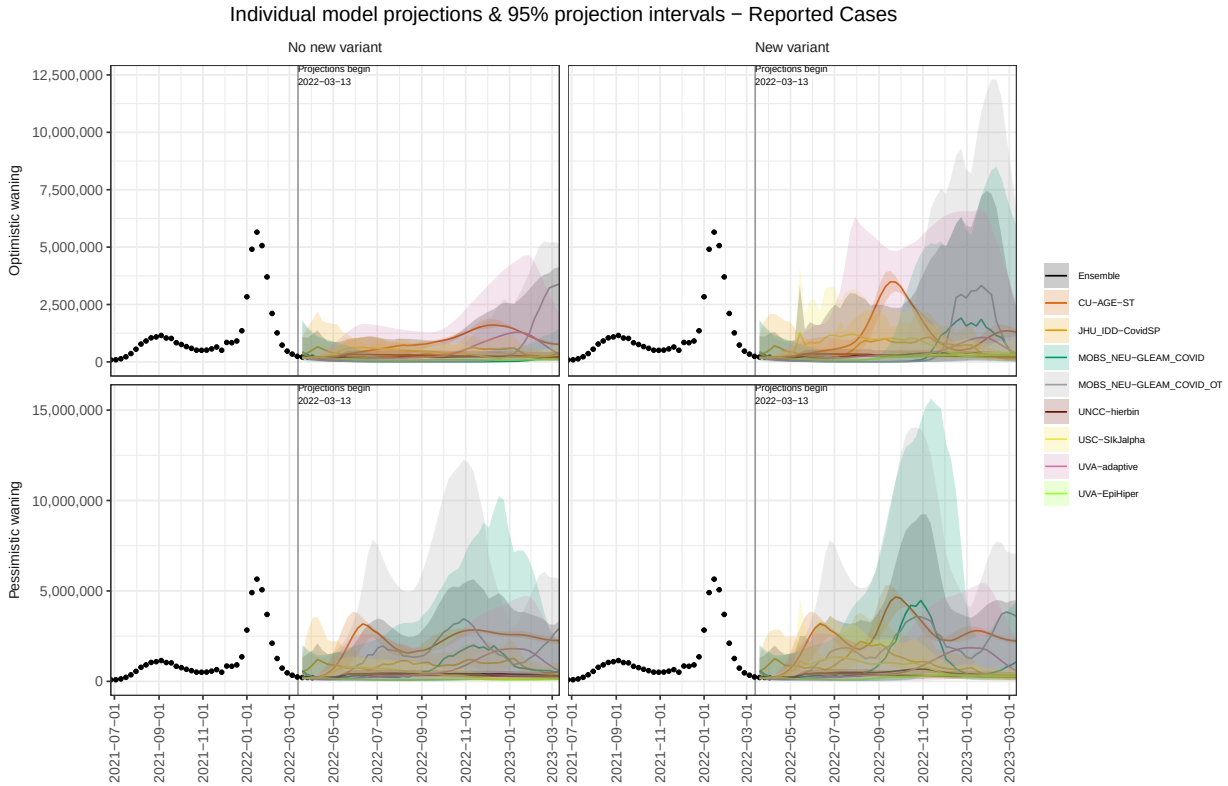


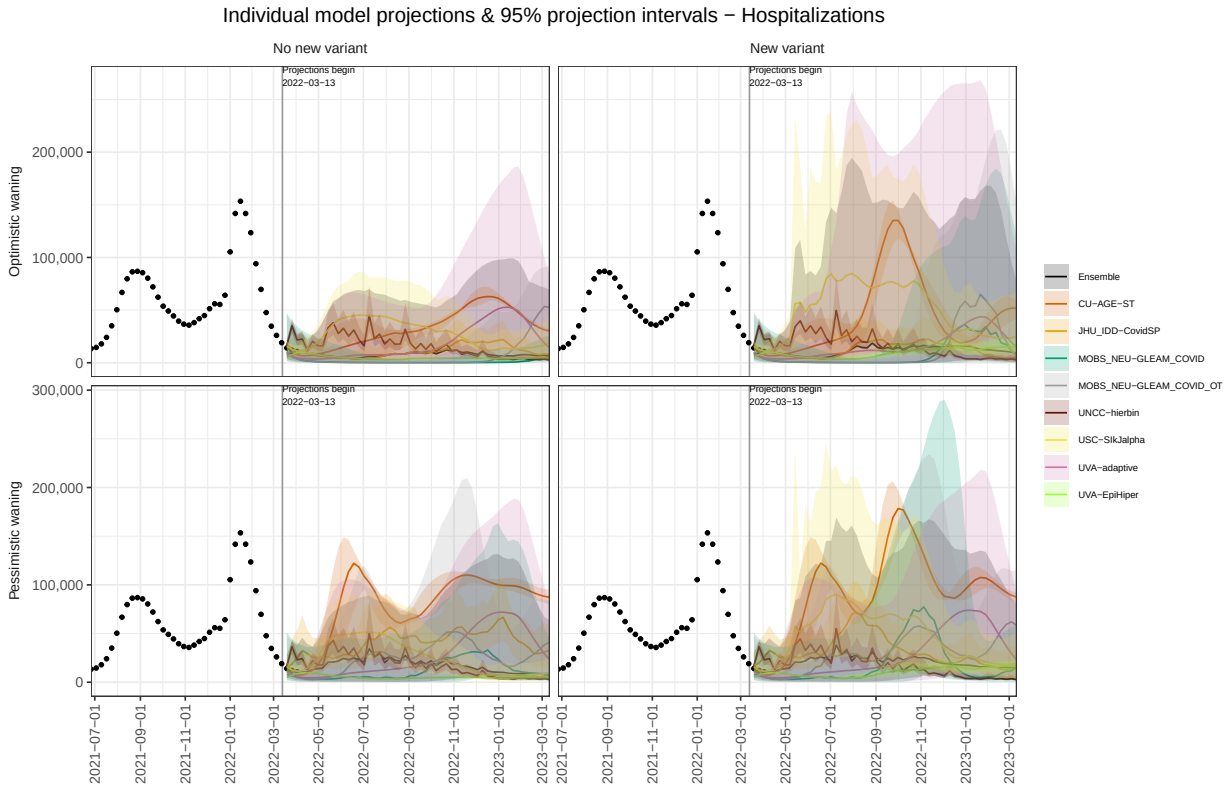


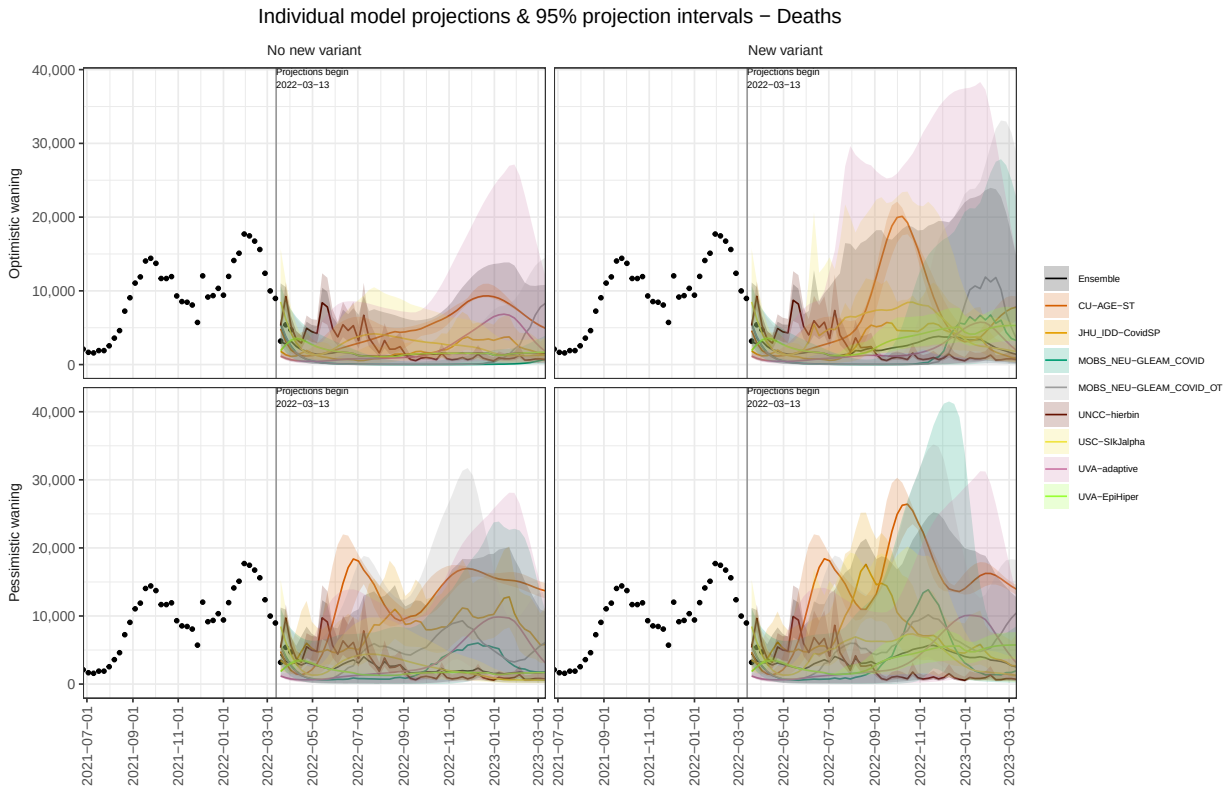

National ensemble projection intervals − Deaths
No new variant
New variant
Optimistic waning
Pessimistic waning
Projections begin
2022−03−13
25000
20000
15000
10000
5000
0
2021−07−01
2021−09−01
2021−11−01
2022−01−01
2022−03−01
2022−05−01
2022−07−01
2022−09−01
2022−11−01
2023−01−01
2023−03−01
From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals

National individual model projections

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

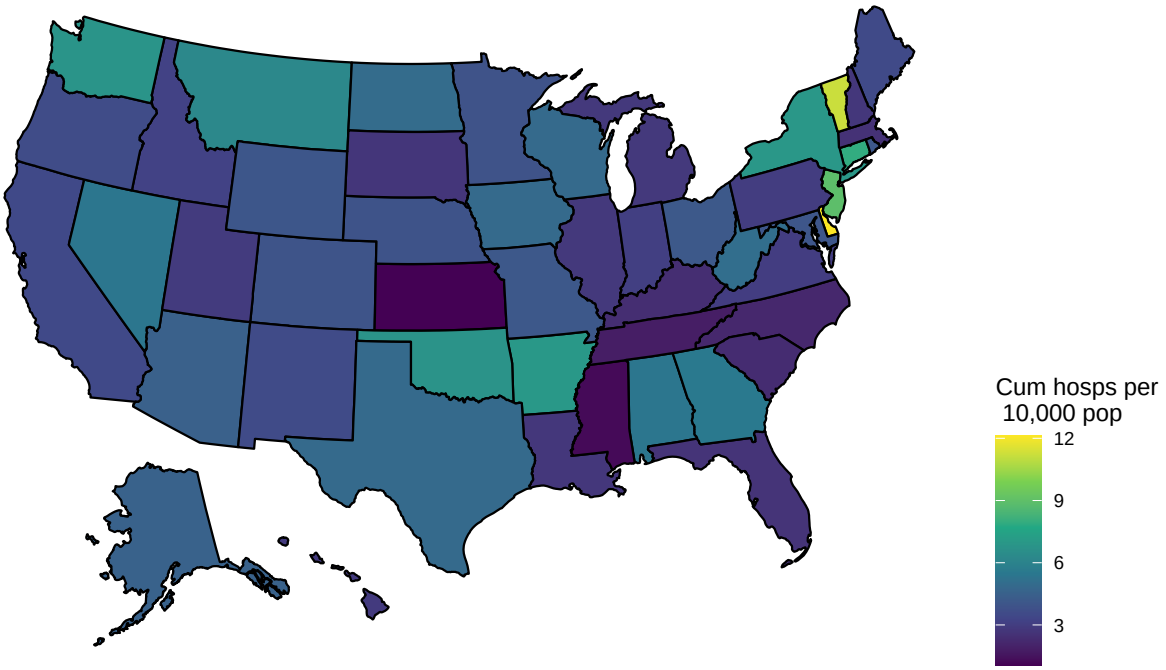




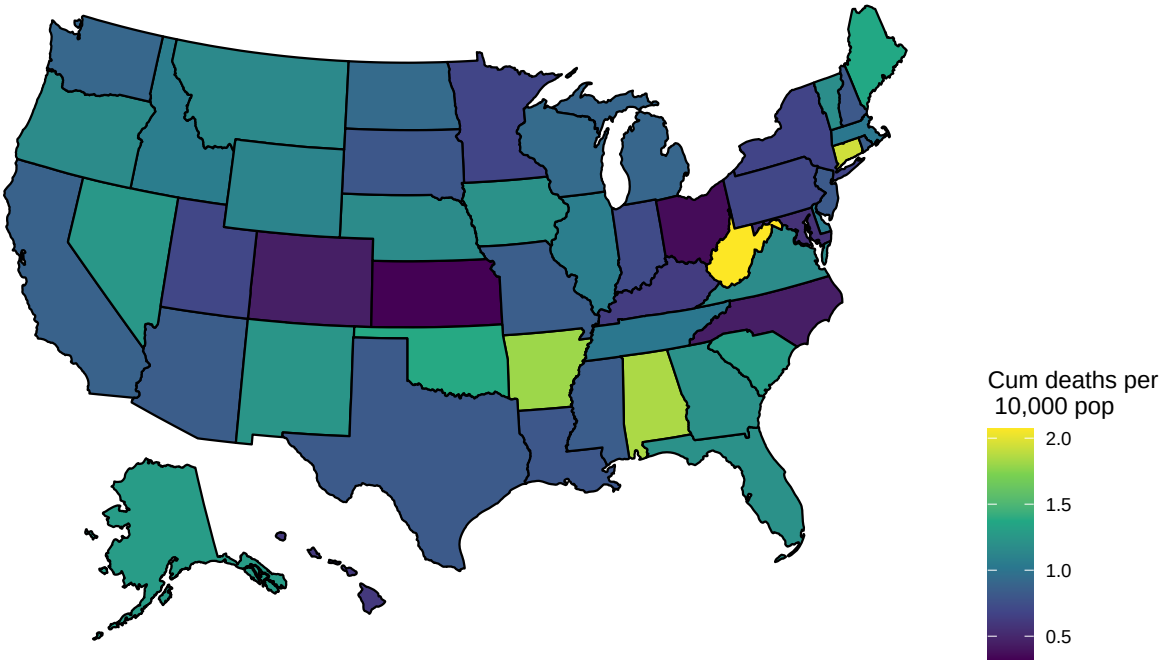

Individual model projections & 95% projection intervals − Deaths
No new variant
New variant
Projections begin
2022−03−13
Optimistic waning
Pessimistic waning
40,000
30,000
20,000
10,000
0
2021−07−01
2021−09−01
2021−11−01
2022−01−01
2022−03−01
2022−05−01
2022−07−01
2022−09−01
2022−11−01
2023−01−01
2023−03−01
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

Risk maps

Cumulative reported hospitalizations per 10,000 population in scenario with pessimistic severity, and high immune escape & low transmissibility: March 13, 2022 to March 11, 2023

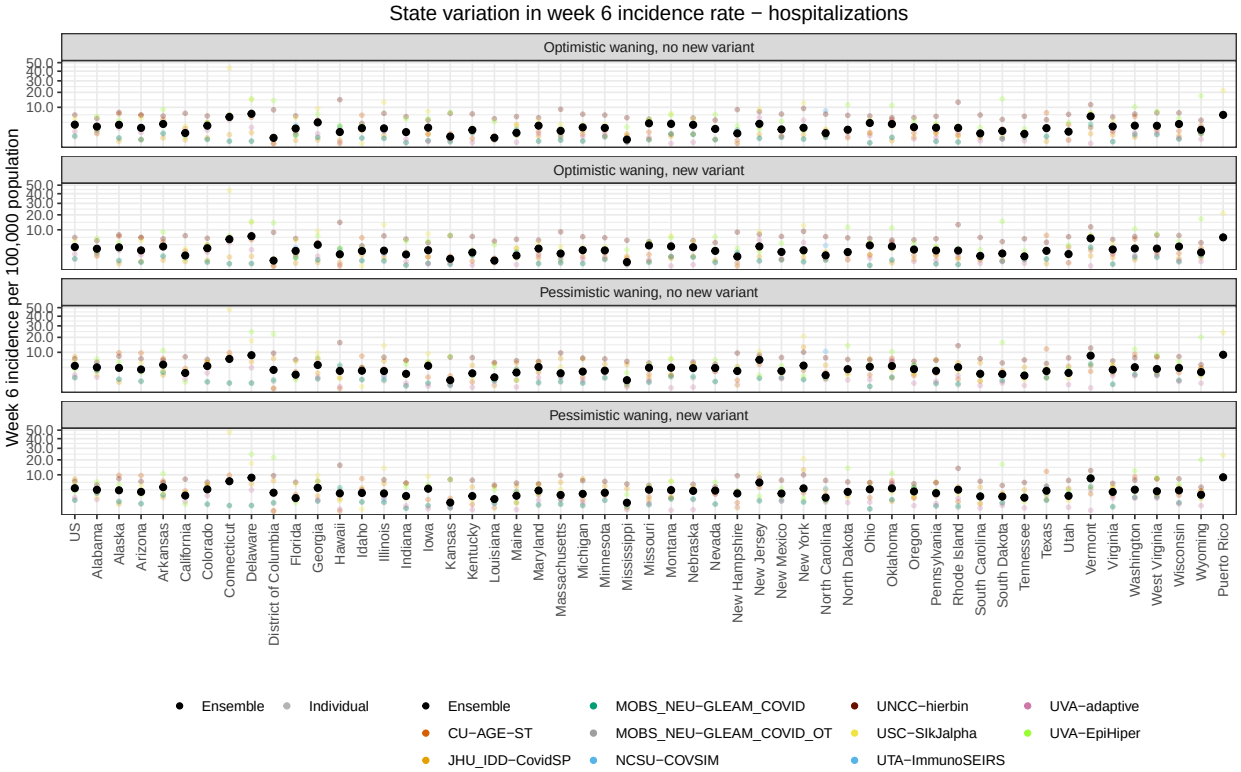


Cumulative deaths per 10,000 population in scenario with pessimistic severity, and high immune escape & low transmissibility: March 13, 2022 to March 11, 2023

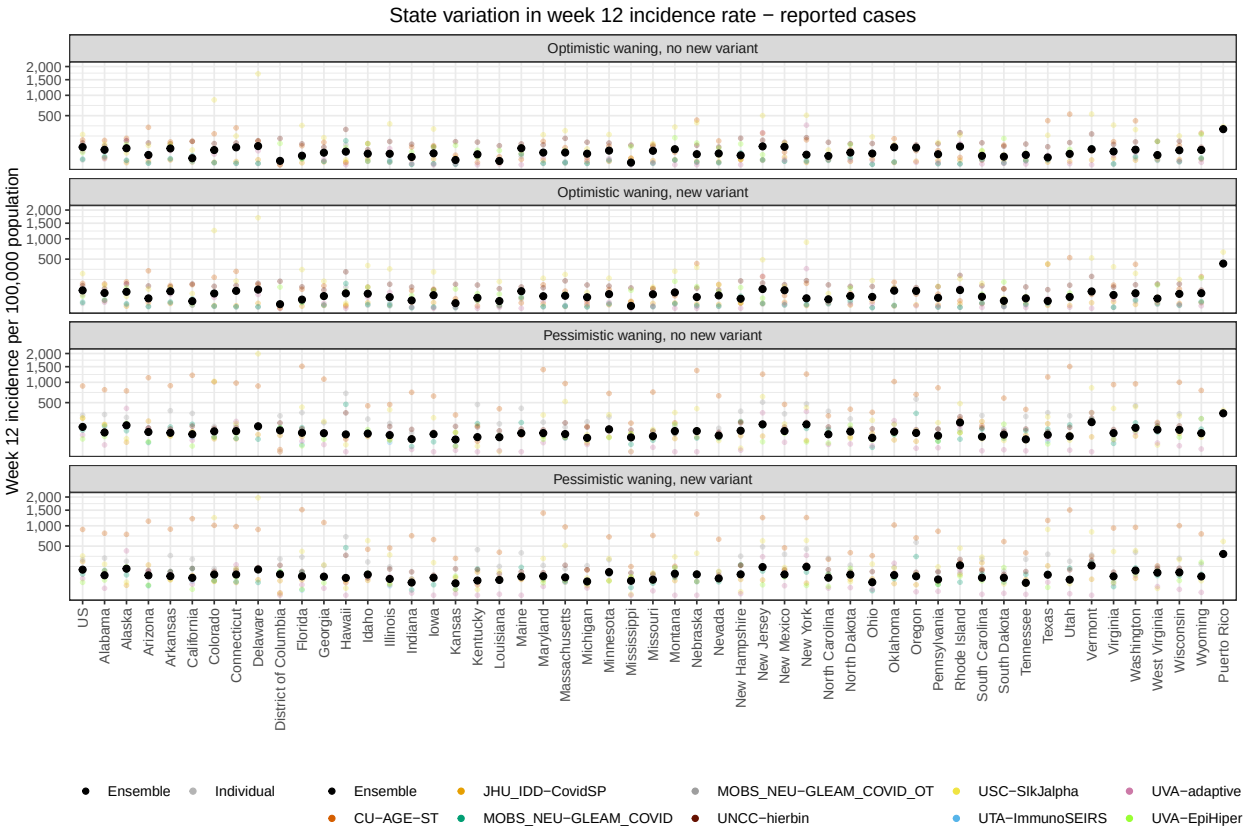


State-level deviation from national

Individual model and ensembles projections for state-level hospitalization incidence per 100,000 population at week 6.

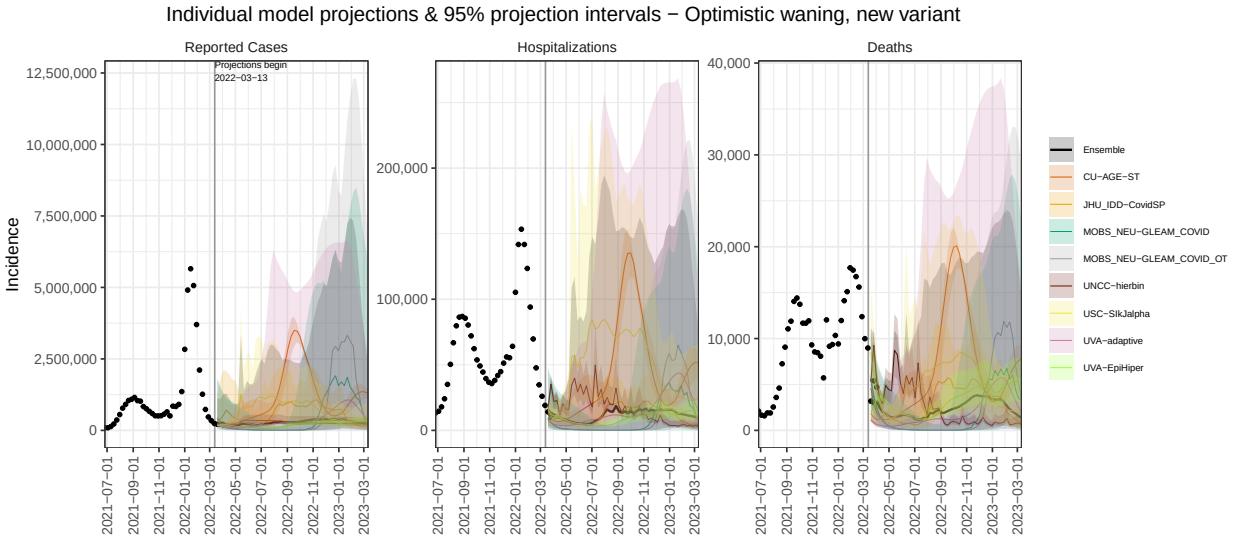


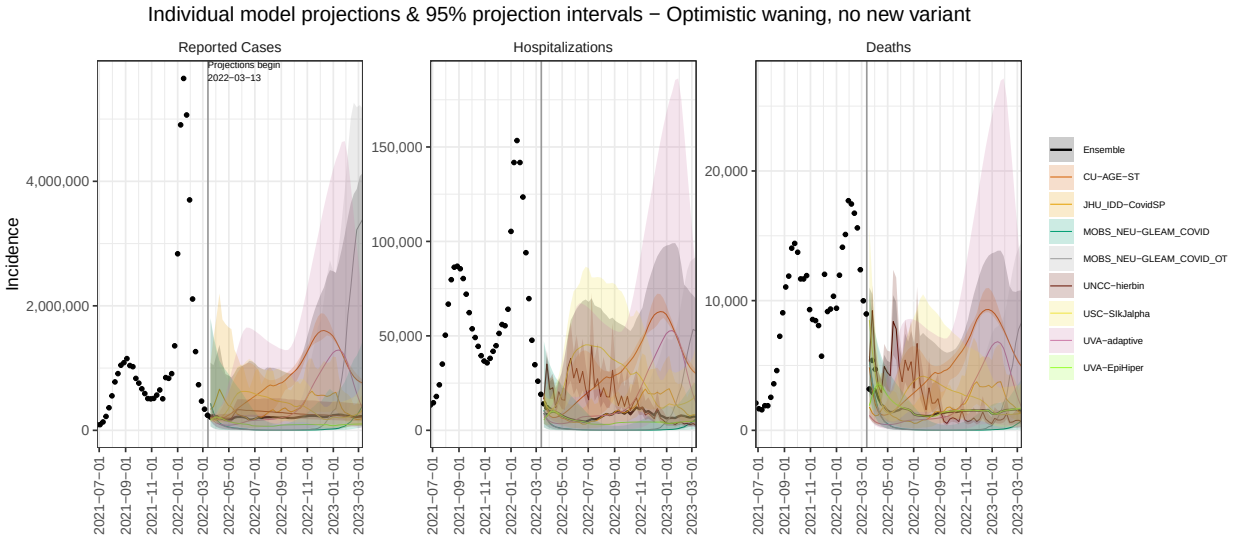
Individual model and ensembles projections for state-level incidence per 100,000 population at week 12.

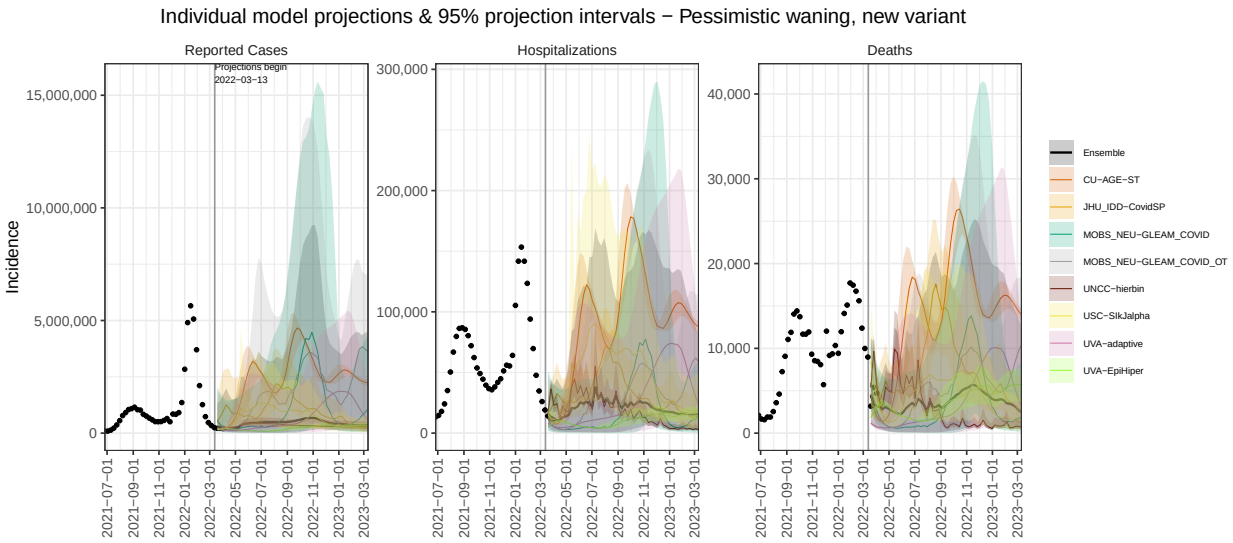


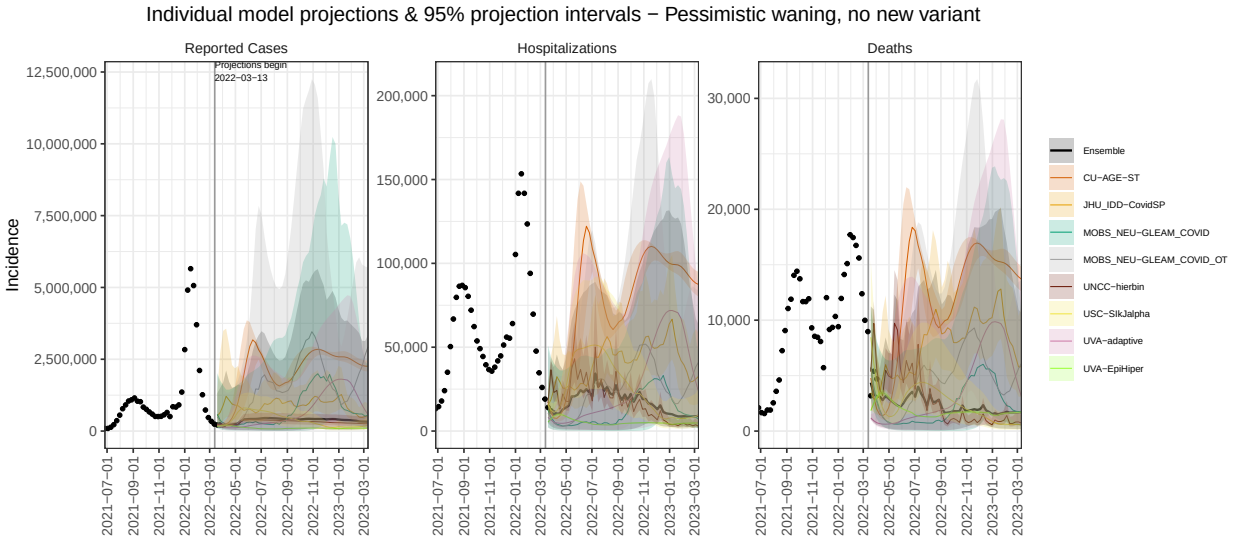
National model variation

Individual model projections for national incident cases, hospitalizations and deaths.

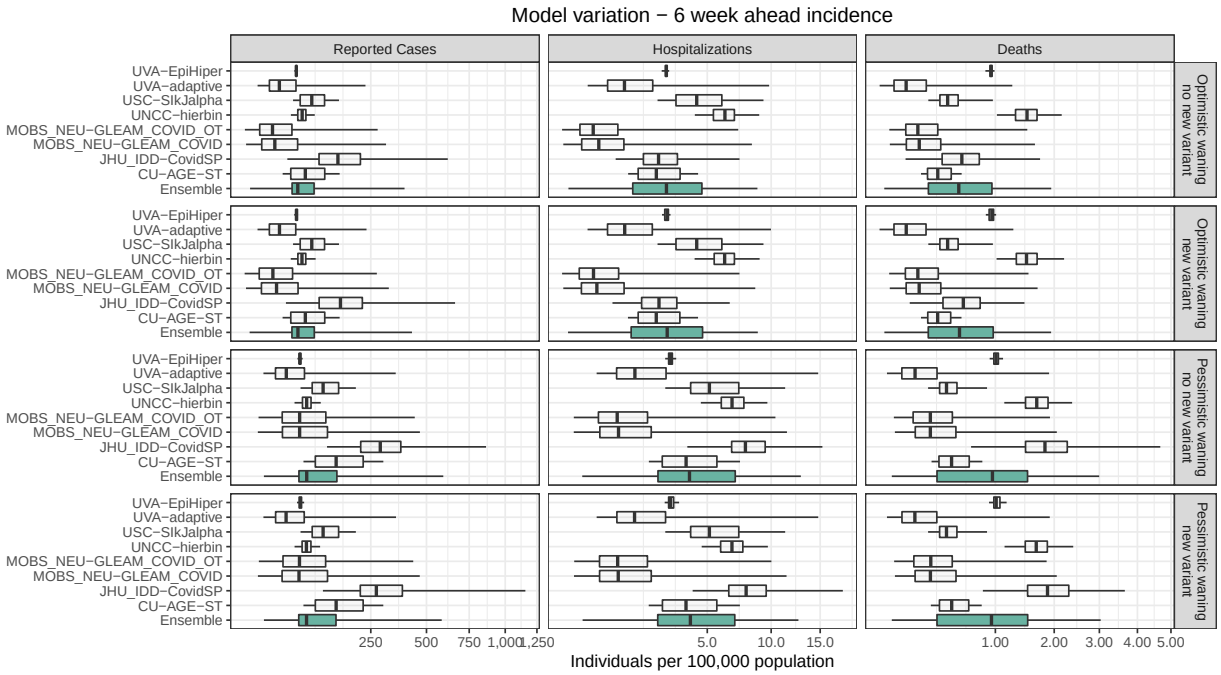


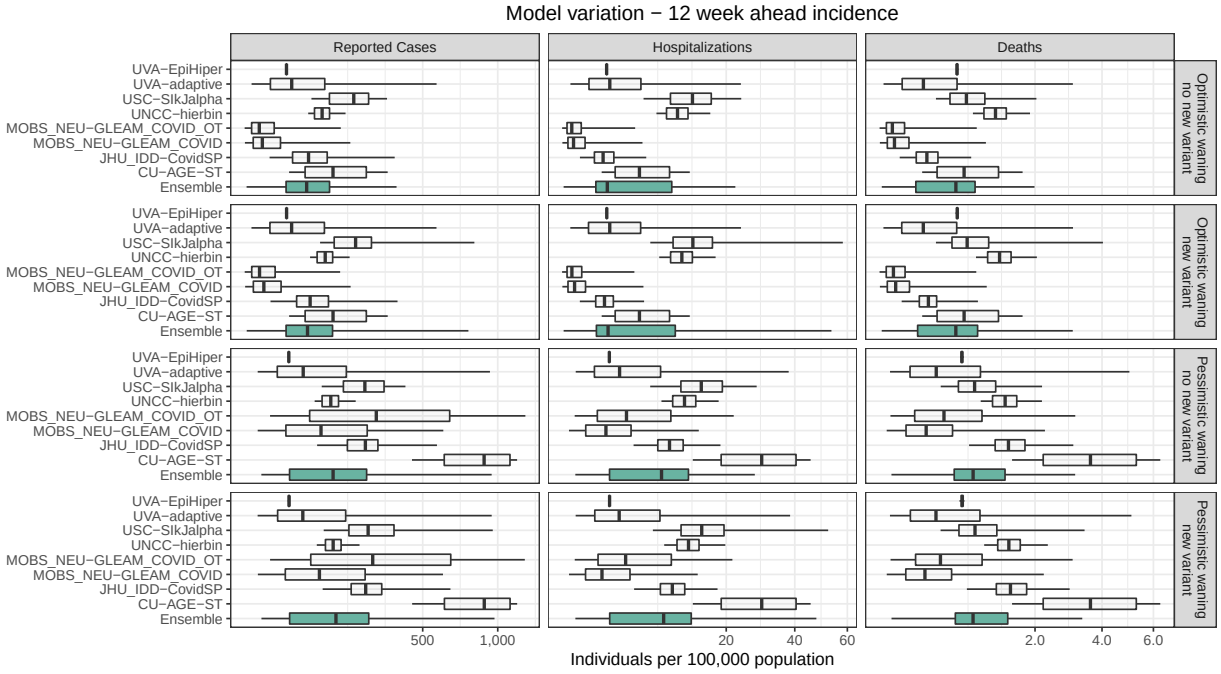


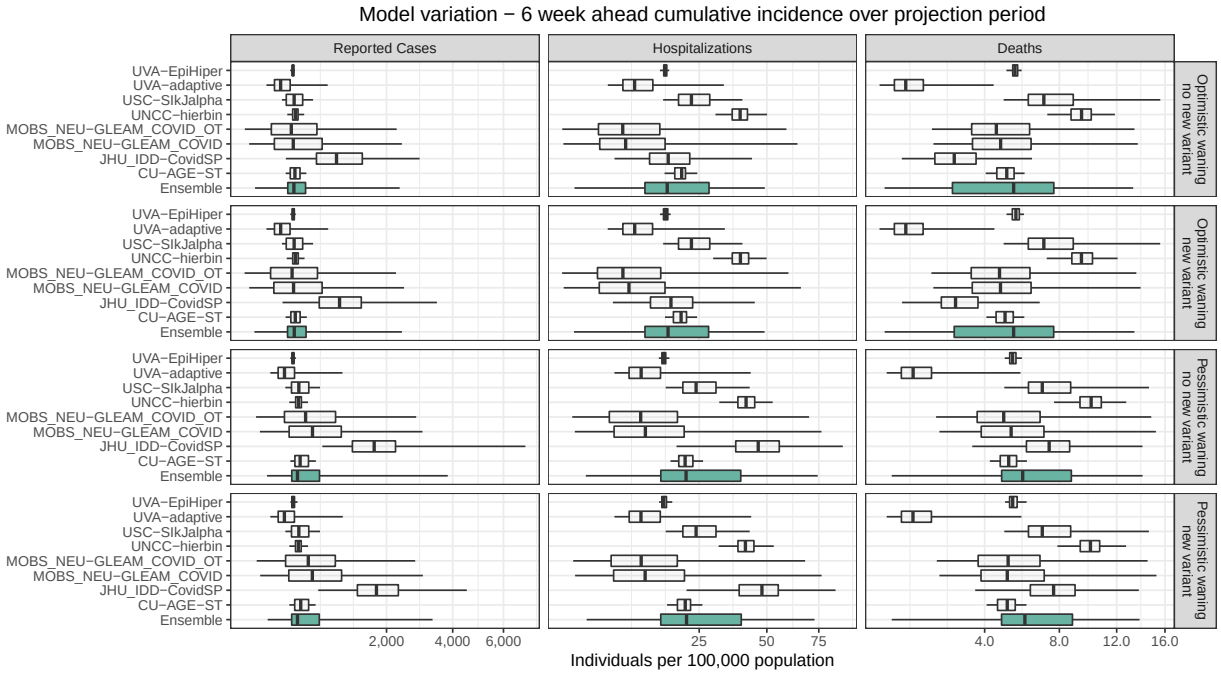

Individual model projections & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

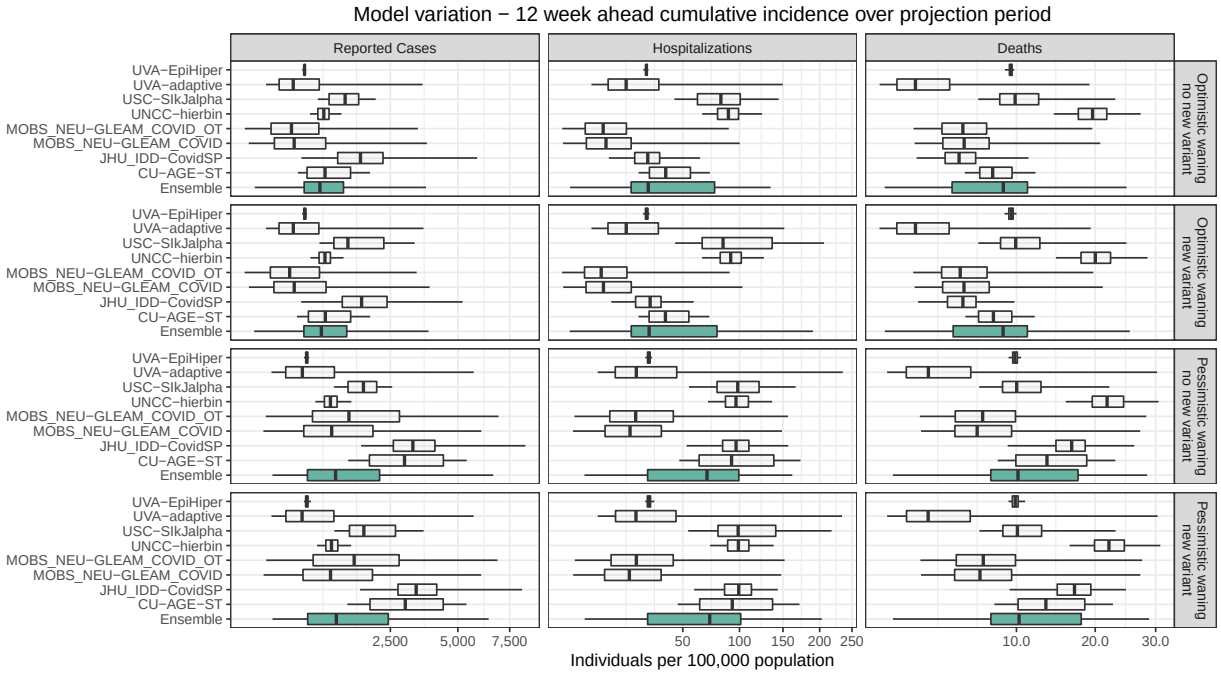

Individual model projections & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

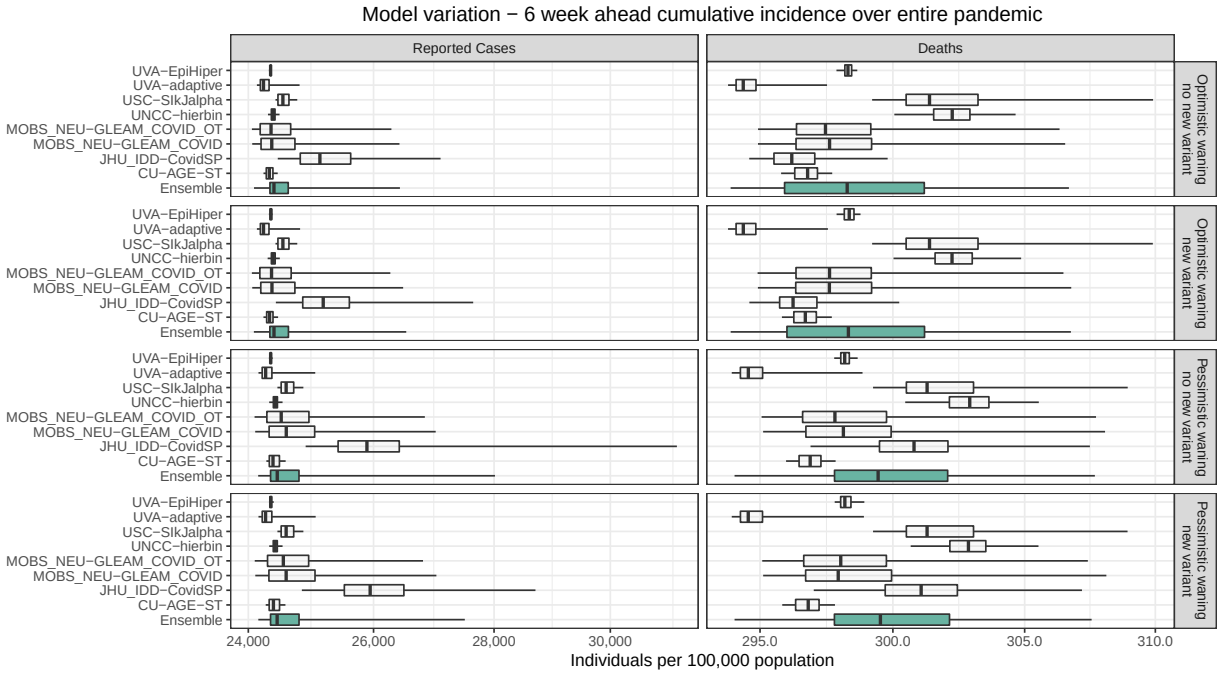
Projection distributions

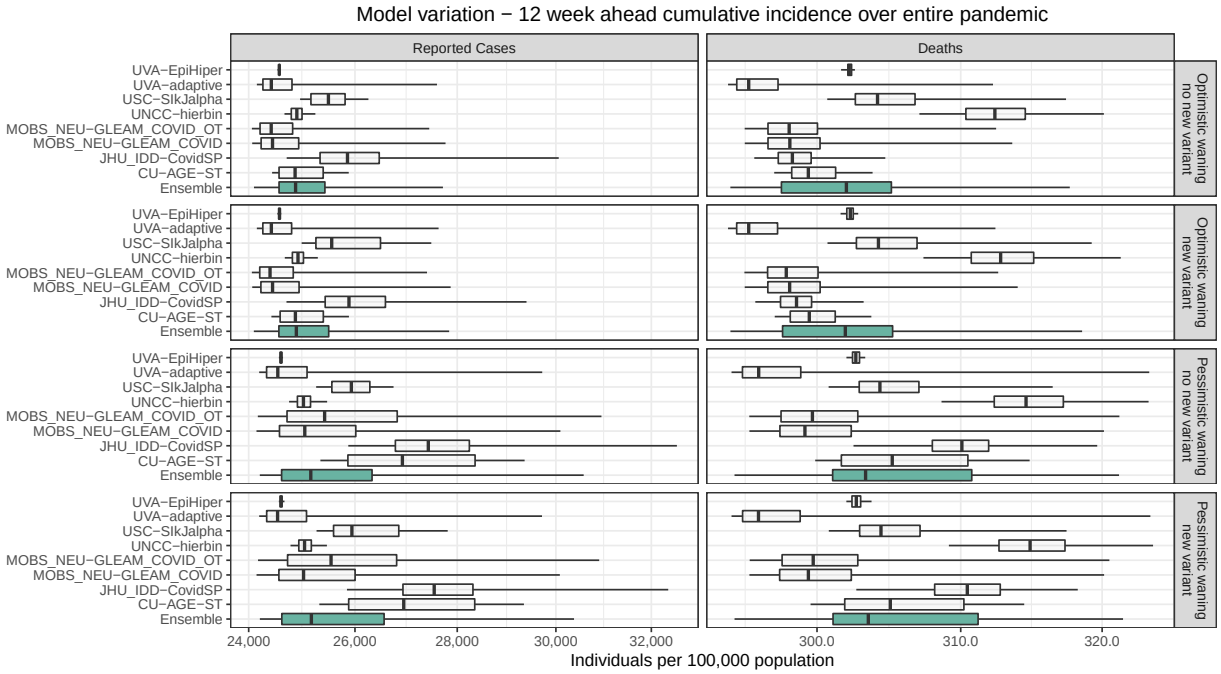




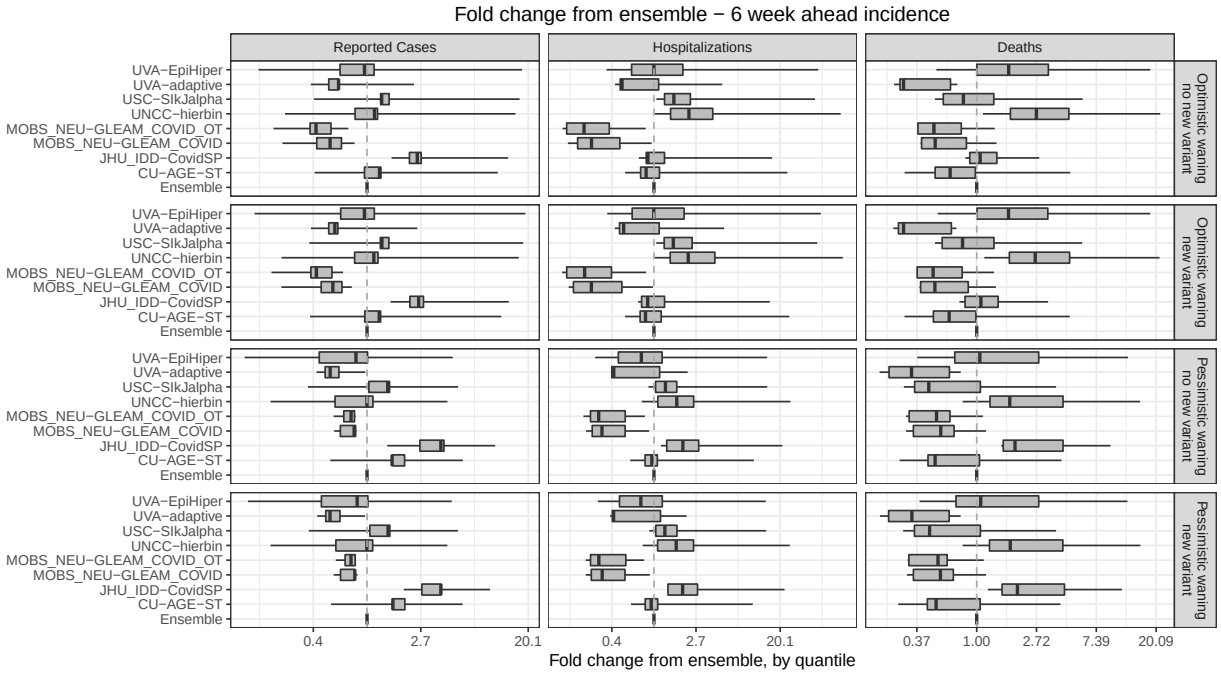

Model variation − 6 week ahead cumulative incidence over projection period
Reported Cases
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
2,000
4,000
6,000
25
50
75
4.0
8.0
12.0
16.0
Individuals per 100,000 population

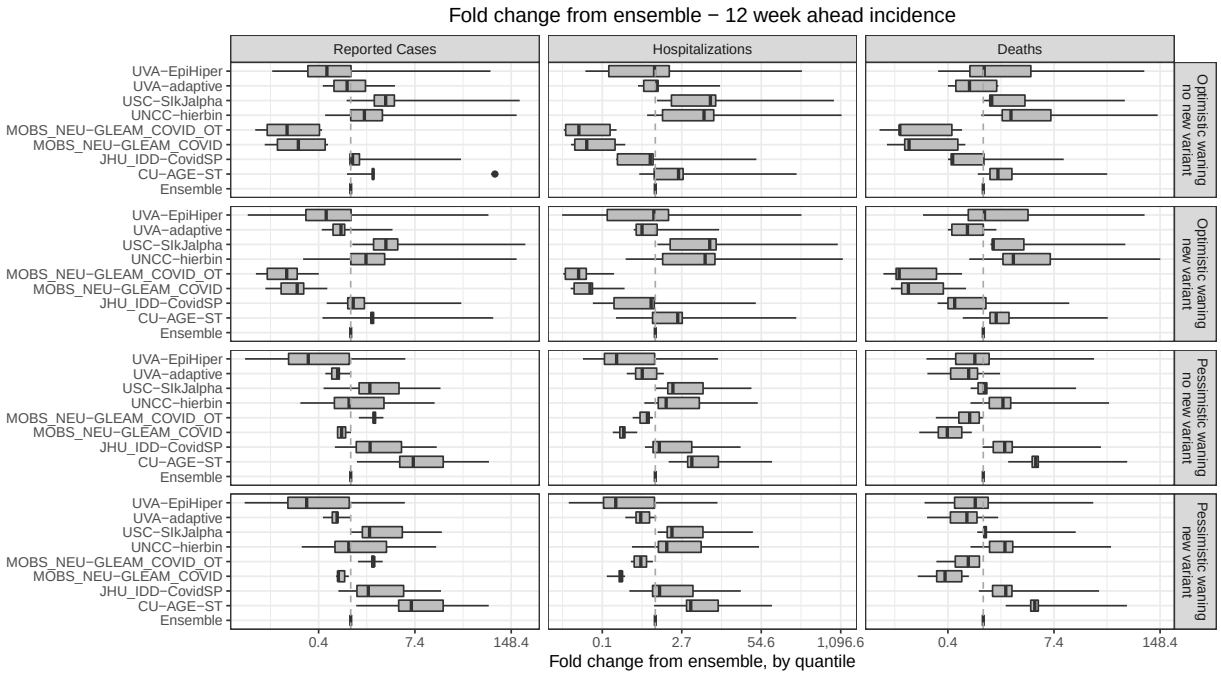

Model variation − 12 week ahead cumulative incidence over projection period
Reported Cases
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
2,500
5,000
7,500
50
100
150
200
250
10.0
20.0
30.0
Individuals per 100,000 population

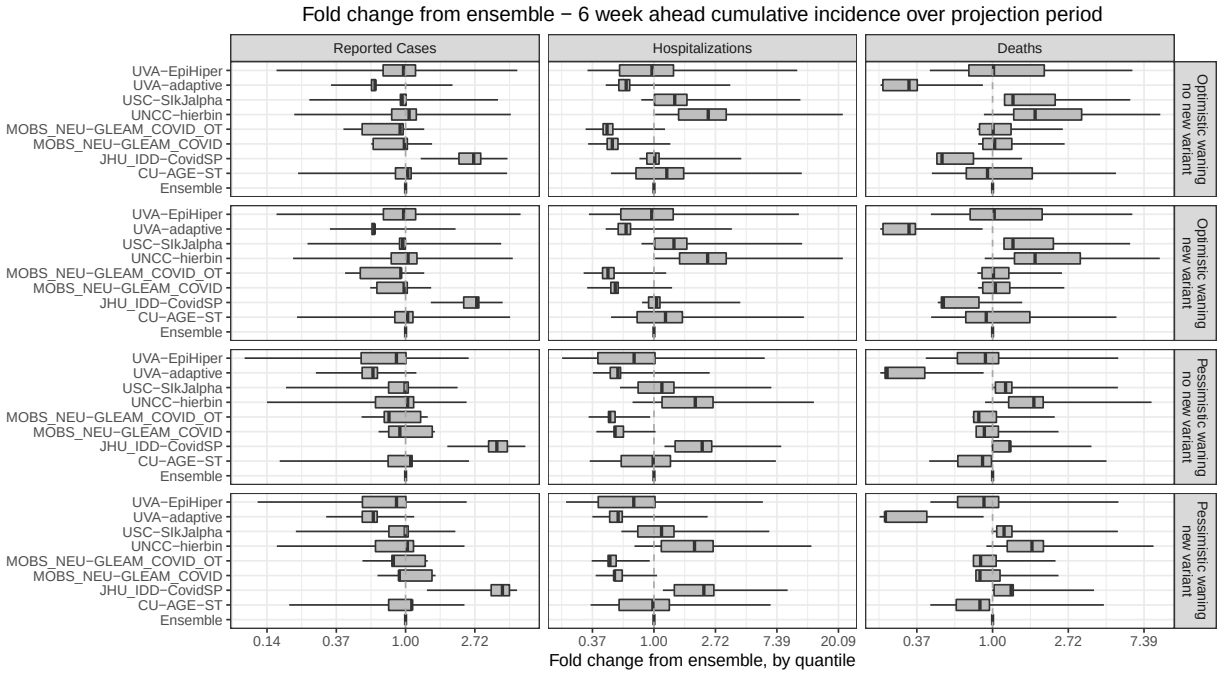

Model variation − 6 week ahead cumulative incidence over entire pandemic
Reported Cases
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
24,000
26,000
28,000
30,000
295.0
300.0
305.0
310.0
Individuals per 100,000 population

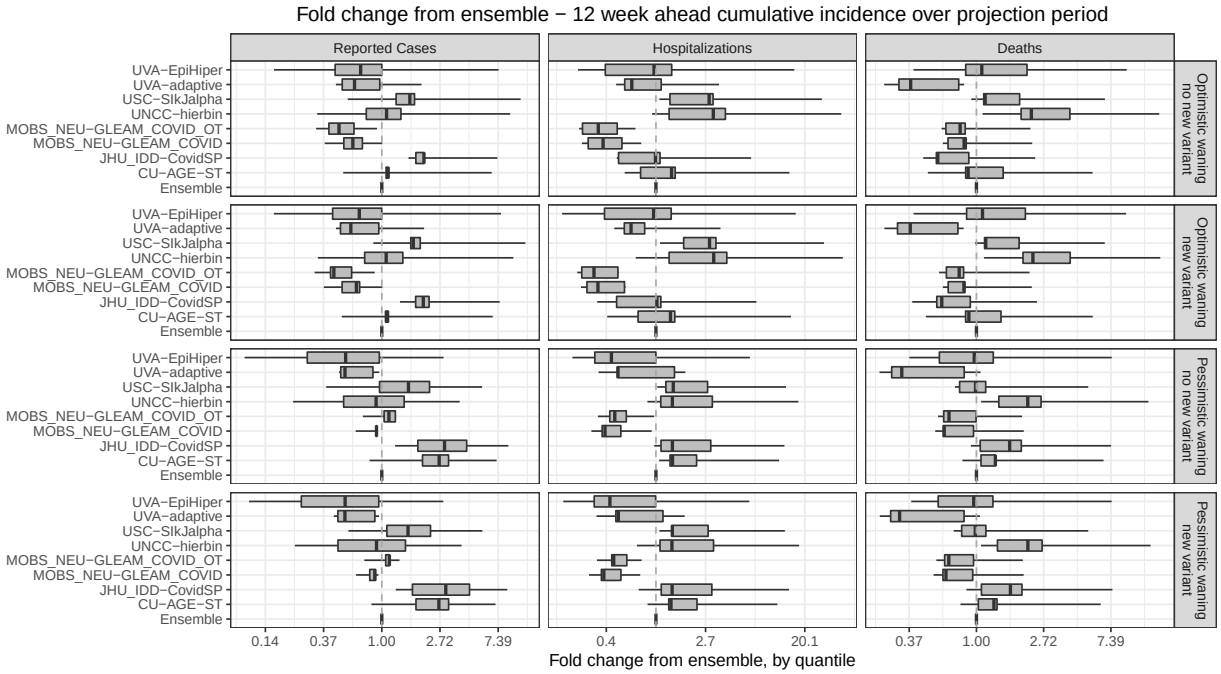

Model variation − 12 week ahead cumulative incidence over entire pandemic
Reported Cases
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
24,000
26,000
28,000
30,000
32,000
300.0
310.0
320.0
Individuals per 100,000 population

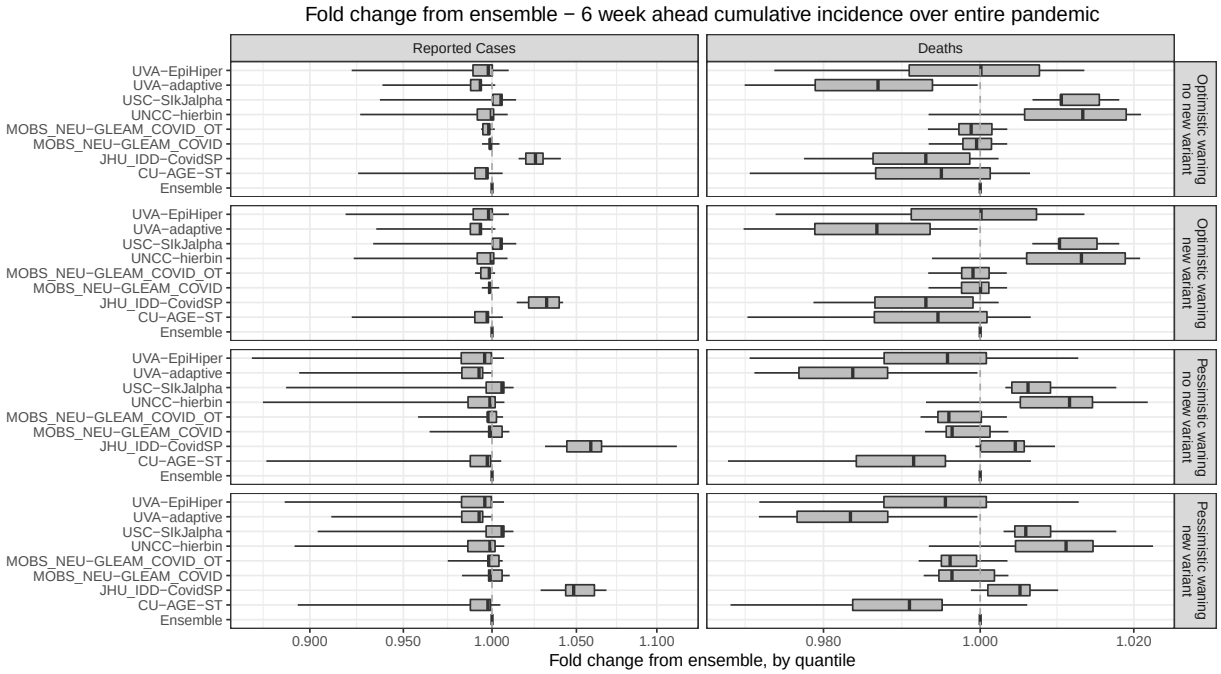
Difference between model and ensemble distributions

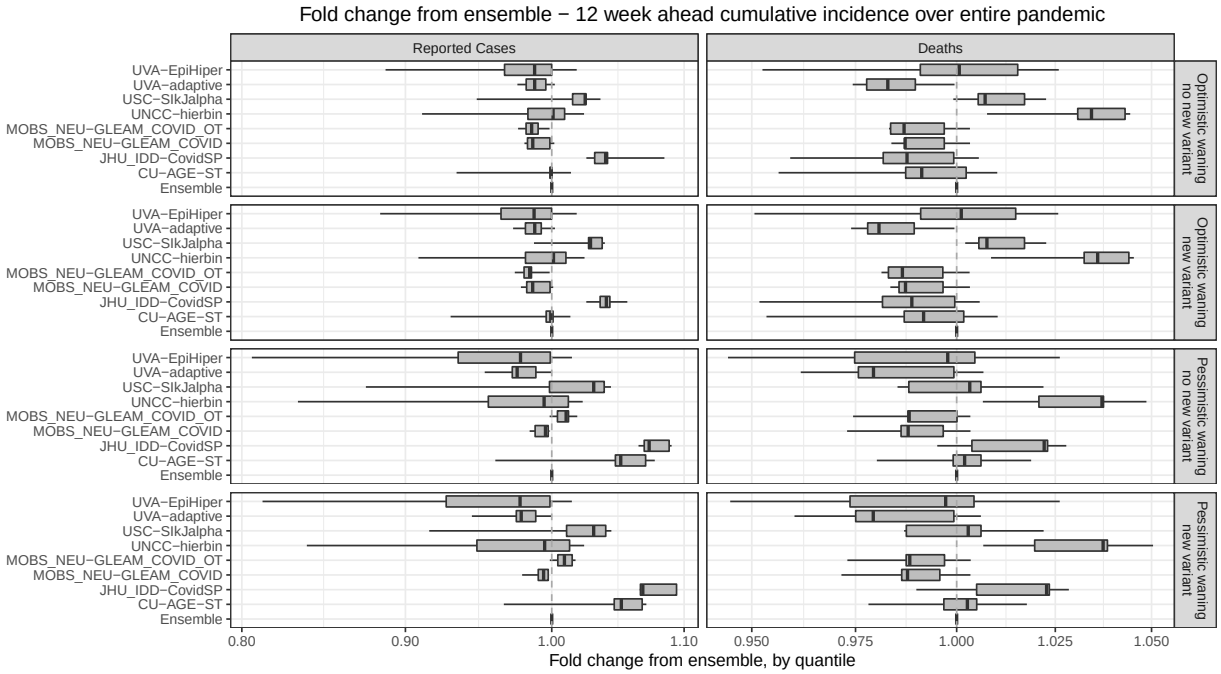





Fold change from ensemble − 6 week ahead cumulative incidence over projection period
Reported Cases
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
0.14
0.37
1.00
2.72
0.37
1.00
2.72
7.39
20.09
0.37
1.00
2.72
7.39
Fold change from ensemble, by quantile


Fold change from ensemble − 12 week ahead cumulative incidence over projection period
Reported Cases
Hospitalizations
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
0.14
0.37
1.00
2.72
7.39
0.4
2.7
20.1
0.37
1.00
2.72
7.39
Fold change from ensemble, by quantile


Fold change from ensemble − 6 week ahead cumulative incidence over entire pandemic
Reported Cases
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
0.900
0.950
1.000
1.050
1.100
0.980
1.000
1.020
Fold change from ensemble, by quantile


Fold change from ensemble − 12 week ahead cumulative incidence over entire pandemic
Reported Cases
Deaths
UVA−EpiHiper
UVA−adaptive
USC−SIkJalpha
UNCC−hierbin
MOBS_NEU−GLEAM_COVID_OT
MOBS_NEU−GLEAM_COVID
JHU_IDD−CovidSP
CU−AGE−ST
Ensemble
Optimistic waning no new variant
Optimistic waning new variant
Pessimistic waning no new variant
Pessimistic waning new variant
0.80
0.90
1.00
1.10
0.950
0.975
1.000
1.025
1.050
Fold change from ensemble, by quantile

Johns Hopkins ID Dynamics COVID-19 Working Group — COVID Scenario Pipeline

Summary of results

As part of the thirteenth round of scenario projections from the COVID-19 Scenario Modeling Hub in the United States, the Johns Hopkins Infectious Disease Dynamics (JHU-IDD) team produced one-year projections according to a set of four scenarios definitions. Under these four scenarios, designed to capture the uncertainty in both the immune waning and emergence of a new immune escape variant. The impact of waning is larger than the impact of a new variant, with the pessimistic waning scenarios (C and D) projecting more cases, hospitalizations, and deaths at the national level than the optimistic waning scenarios. In the most pessimistic scenario, we project a substantial peak in all outcomes in August 2022. We project signficant state-level heterogeneity in both the magnitude and timing of the peaks.

Explanation of observed dynamics given model assumptions

The dynamics we observe are driven by the confluence of built up immunity, waning immunity, geographic spread. We see two waves in some locations pertaining to the rapid waning of immunity, but limited severity due to residual protection from severe outcomes. Because substantial waning produces continued infection prior to Variant X, there is a limited susceptible pool for Variant X to infect with pessimistic waning.

Model assumptions

Initial distribution of susceptibility

The JHU-IDD model refits the entire pandemic in every state across the US for each round of scenarios. We fit to daily incident reported deaths (not variant-specific) and variant-specific case data, estimated by multiplying the state-specific proportions of circulating wild-type, Alpha, Delta, and Omicron variants by the reported number of cases by state. Through this we produce a history of infections over time. Vaccination is incorporated into the model using state-specific, reported vaccination by age group and dose. Vaccination is assumed to saturate at either asymptotic fits to current vaccination saturation curves or the level estimated by surveys from the US Census Bureau and Facebook, adjusted for sampling bias, whichever is lower. Booster uptake was assumed to saturate at 70% of the saturation coverage limits of dose 2 for each age group, unless this level has already been surpassed.

Transmissibility

Intrinsic transmissibility is defined though a global R0, with relative adjustments applied to account for transmissibility changes for each major variant. This results in starting transmissibility parameters for wild type (R0=2.3), Alpha (R0=3.45), and Delta (5.52). From these starting values, state-specific transmissibility adjustments are fit to the data. For Omicron, the starting value for transmissibility is similar to Delta for each state (base value R0=5.52), but is further fit to the case and death data, setting immune escape at 50%. Seasonal terms for each month in each state are also fit and shared across years. Non-pharmaceutical interventions and behavior (NPIs) impact is estimated within the model as changes in transmissibility during periods of time defined by changes in official or otherwise specific changes in control and behavior (including school year start and holiday periods).

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Each variant has specific transmissibility, severity, immune escape, waning, and reinfection characteristics. Transmissibility is described above. For Omicron, immune escape is assumed to be 50% against vaccination and previous infection, taking into account waning. Each variant is assume to provide complete protection from reinfection with itself prior to waning. Wild, Alpha, Omicron, and Variant X are assumed to have the same inherent risk of severity, while Delta is assumed to be twice as severe. Only transmissibity for Omicron is individually fit, otherwise overall, location-specific transmissibility adjustment is shared across varaints, and no fitting of severity or immune escape is done.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

Both probability of death and hospitalization given infection are adjusted for previous infection history, vaccination status, and waning, starting from base age-adjusted probabilites. Deaths are calibrated to the data within the model, while hospitalizations are calibrated post-hoc to the most recent 8 weeks of data.

Waning immunity details (e.g., distribution used)

We assuming that time to waning follows an exponential distribution with a median of either 4 or 10 months in accordance with the scenario specifications. Waning of protection from severity (e.g., hospitalization and death) is assume lower than that for infection and cases. For the optimistic waning scenario, conditional protection from hospitalization and death (assuming infection) is assumed to reduce by 15% and 7.5%, while in the pessimistic scenario it reduces by 25% and 15%.

Seasonality implementation

Monthly seasonality interventions are fit, with shared estimates across years.

Emerging variant details (including introduction process)

The emerging Variant X is seeded probabilistically into states based on international arrival airline data. We use binomial sampling to assign the 50 weekly infections a day of the week and state. Variant X is assumed to have the same transmissibility as Omicron that was fit by the model and 30% immune escape as compared to Omicron, applied to vaccine effectiveness, waning, and cross-protection. Severity of Variant X is assumed the same as Omicron for naive individuals.

Nonpharmaceutical interventions

Non-pharmaceutical intervention effectiveness is fit through the start of the projection period. On March 19, all NPIs are assumed to end, meaning we do not include any adjustment of the transmissibility other than seasonality and variant-specific changes after this date.

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes due to Omicron)

We assume there are distinct periods where reporting rates change. These reporting rates are fit, based on reported cases and deaths. These shifts are assumed to occur in summer 2020, at the start of vaccination

in winter 2020, at the start of the Delta wave (July 11, 2021), and at the start of Omicron (Dec 01, 2021). The last period of reporting is assumed to continue through the end of the projection period. Each period is fit at the state level.

Model Abstracts

Northeastern University MOBS Lab — GLEAM COVID

Summary of results

The model indicates a large variability of the results as a function of the waning time and the level of protection after waning. Overall patterns observed: - The long waning scenario (10 months) appears to provide a slow replenishment of the susceptible pool after the major january/February 2022 Omicron wave. Surges of cases/hosp/deaths are not observed until late fall/winter.
- The short waning scenario generates possible surges starting in the US summer of 2022 and more sizable synchronized surges in the fall/winter. - In all scenarios, the emergence of variant X is increasing the surge peak. This effect is more marked in the long waning scenario. - Differences and heterogeneity across states are observed.

Explanation of observed dynamics given model assumptions

It appears that the major driver of the epidemic in the future months is the waning of protection. The large amount of infections generated by the Omicron wave built in the population considerable immunity. The waning of this protection is a key element in the timing and magnitude of future surges.

Model assumptions

Number/type of immune classes considered

We consider two classes for pre and post omicron exposure and a waned class.

Initial distribution of susceptibility if available

We define this through the calibration of the model on the Omicron wave data through an ABC approach. The distribution of the proportion of susceptible is depending on the scenario and geographic location.

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Omicron transmissibility is obtained from calibration and varies across scenarios. We use a prior on effective transmissibility that accounts also for residual NPIs, seasonality and vaccine/prior exposure protection.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

Calibrated by looking at deaths and hospitalizations during the Omicron wave.

Waning immunity details (e.g., distribution used)

We use an exponential distribution for transitioning to the waned class. Waned protection measured with respect to prior Omicron infection.

Seasonality implementation

We use seasonal modulation of transmissibility. School calendars are also included in the model.

Emerging variant details (including introduction process)

We introduce the cases as indicated by the scenario specifications stochastically across counties according to international traffic. Domestic dispersion of cases is included mechanistically in the model through commuting patterns and domestic origin-destination traffic flows.

Nonpharmaceutical interventions

Status quo

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes, booster implementation)

- We do not assume changes in reporting outcomes.
- We do not consider additional boosters.
- We consider the emergence of the BA2 more transmissible variant with an effective increase of the Omicron transmissibility.

Northeastern University MOBS Lab — GLEAM COVID OT

Summary of results

The model indicates a large variability of the results as a function of the waning time and the level of protection after waning. Overall patterns observed: - The long waning scenario (10 months) appears to provide a slow replenishment of the susceptible pool after the major january/February 2022 Omicron wave. Surges of cases/hosp/deaths are not observed until late fall/winter.
- The short waning scenario has the potential to generate cyclic surges (every 3-4 months) starting in the US summer of 2022 and more sizable surges in the fall/winter. - In all scenarios, the emergence of variant X is increasing the surge peak. This effect is more marked in the long waning scenario. - Differences and heterogeneity across states are observed.

Explanation of observed dynamics given model assumptions

It appears that the major driver of the epidemic in the future months is the waning of protection. The large amount of infections generated by the Omicron wave built in the population considerable immunity. The waning of this protection is a key element in the timing and magnitude of future surges.

Model assumptions

Number/type of immune classes considered

We consider two classes for pre and post omicron exposure, and a "waned" class.

Initial distribution of susceptibility if available

We define this through the calibration of the model on the Omicron wave data through an ABC approach. The distribution of the proportion of susceptible is depending on the scenario and geographic location.

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Omicron transmissibility is obtained from calibration and varies across scenarios. We use a prior on effective transmissibility that accounts also for residual NPIs, seasonality and vaccine/prior exposure protection.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

Calibrated by looking at deaths and hospitalizations during the Omicron wave.

Waning immunity details (e.g., distribution used)

We use a gamma distribution for transitioning to the waned class. Waned protection measured with respect to post Omicron infection.

Seasonality implementation

We use seasonal modulation of transmissibility. School calendars are also included in the model.

Emerging variant details (including introduction process)

We introduce the cases as indicated by the scenario specifications stochastically across counties according to international traffic. Domestic dispersion of cases is included mechanistically in the model through commuting patterns and domestic origin-destination traffic flows.

Nonpharmaceutical interventions

Status quo

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes, booster implementation)

- We do not assume changes in reporting outcomes.
- We do not consider additional boosters.
- We consider the emergence of the BA2 more transmissible variant with an effective increase of the Omicron transmissibility.

North Carolina State University - COVSIM

Summary of results

We observed additional waves of hospitalizations and deaths only under scenarios with a new variant. We observed that the cumulative hospitalizations and deaths were close among all scenarios.

Explanation of observed dynamics given model assumptions

We believe that the short reinfection times, long time horizon, and highly infective nature of the disease are causing the convergence in cumulative hospitalizations and deaths.

Model assumptions

Number/type of immune classes considered

We consider two immune classes: fully immune and partially immune. Partial immunity is tracked with an indicator variable attached to each agent. This changes the transition probabilities when moving through the disease compartments.

Initial distribution of susceptibility if available

Proportion of people that were infected with Omicron before March 13

Not available ### Proportion of people that are naïve at start of projection (not vaccinated or infected) Not available ### Other Not available

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Omicron transmissibility was parameterized to be 1.33x more transmissible than seasonal Delta. Immune escape was parameterized to be 50%. These two results were identified from our Round 12 scenarios. The likelihood of hospitalization was parameterized to be 50% that of Delta. The probability of death was parameterized to be 66% that of Delta. The parameter space bounded by Round 12 scenarios was explored to parameterize the severity of omicron.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

These values were set by searching the parameter space established by Round 12 scenarios. Parameters that validated the metrics of "Current number of people hospitalized" and "cumulative deaths" were chosen to be used.

Waning immunity details (e.g., the distribution used)

When agents enter the recovered state, they are assigned a time until they return to the susceptible state. In general, this time follows the distribution min(60 days, exp(4 or 10 months)) depending on the scenario. When variants are emerging, agents according to the immune escape of the variant will wane uniformly across the variant emergence window; otherwise, they follow the general distribution.

Seasonality implementation

Seasonality was implemented to capture the delta and omicron waves.

Emerging variant details (including introduction process)

We introduce the emerging variant at a constant rate over the 16 weeks. Since we use a single strain simulation model, agents who will be susceptible to the new variant wane uniformly over the 16 weeks.

Nonpharmaceutical interventions

We assume that the masking level remains constant at the last observed value. Masks reduce infectivity and susceptibility by 50%.

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes, booster implementation)

We incorporated weekly incident hospitalizations and weekly incident deaths into our reporting.

University of North Carolina at Charlotte - UNCC-hierbin

Summary of results

We observed a steady drop of incident cases, hospitalization, and deaths in the 8-9 week, before the new variant comes in. The waning has caused a large 2nd wave from week 9 but gradually decline to the level at the beginning of simulation. Across all four simulated scenarios, pessimistic waning and introduction of new variant (scenario D) leads to the highest number of cases, hospitalization, and death, followed by pessimistic waning and no new variant (scenario C). Optimistic waning conditions do not differ much, regardless of new variant or not.

Explanation of observed dynamics given model assumptions

We suggest that waning immunity may have stronger effect on the overall dynamics that we observe (cases, hospitalization, and death) than introducing a new variant with higher immune escape.

Model assumptions

Number/type of immune classes considered

We considered a single immune class with continuous waning level instead of discrete full/partial immune classes.

Initial distribution of susceptibility if available

Proportion of people that were infected with Omicron before March 13

Not explicitly modeled; can be estimated from cumulative prevalence of infection on 03/22/2022.

Proportion of people that are naïve at start of projection (not vaccinated or infected)

Not explicitly modeled.

Other

NA

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Same transmissibility of Omicron as before. Other characteristics modeled as directed in the instruction.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

Last 7d hospitalization and death rates are used as starting point to calibrate the model.

Waning immunity details (e.g., distribution used)

Exponential distribution is used to model waning immunity.

Seasonality implementation

Seasonality is applied via transfer learning from 2021 data.

Emerging variant details (including introduction process)

Modeled as directed in the instruction.

Nonpharmaceutical interventions

NPI is modeled via transfer learning.

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes due to Omicron)

We do not explicitly consider under-reporting due to testing capacity or other constraints. Our model focuses on projecting reported cases, hospitalization, and death. We assume that hosptalization and death are more stable metrics of the COVID-19 pandemic. If necessary, "true incident cases" can be adjusted by applying an under-estimating rate from published studies.

University of Southern California — SI kJalpha

Summary of results

The projection shows a significant resurgence in scenarios B and D due to the introduced variants. However, at the national level, the peaks remain below the omicorn peak and is more comparable to the delta wave in cases. In the scenarios without the variant, the optimistic waning produces a flatter projection compared to the pessimistic scenario. A slight surge at the end of the projection period is more prominent in the optimistic waning scenario. The peaks in hospitalizations and deaths remain at or below the delta peak at the national level for all scenarios.

Explanation of observed dynamics given model assumptions

It is to be noted that the infection rates and death/hospitalization rates are estimated from the observed data by fixing the waning parameters. As a result, the estimated rates are different for optimistic and pessimistic scenarios. To fit the observation, optimistic waning would require a higher transmission rate compared to pessimistic waning. Hence, the projections do not differ only by the waning parameters but also have different infection and death/hospitalization rates.

Model assumptions

Number/type of immune classes considered

The model explicitly accounts for various paths to partial immunity and the time at which it was acquired. These include (1) 1st time infections, (2) 2nd+ time infections, (3) infection after first dose, (4) infection after 2-doses, (5) infections after a booster, (6) first with no prior infection, (7) 2-doses with no prior infection, (8) booster with no prior infection, (9) first dose with prior infection(s) (10) 2-doses with prior infection(s), and (11) booster with prior infection(s).

Initial distribution of susceptibility

Susceptibility is identified over the whole period since Jan 2020 by keeping track of each of the states listed above. Having these states over time, age groups and variants allows for precise computation of immunity in the population at a given time. As a result, we can track new infections among the observed data that have protection from a prior immunity (from vaccine/booster/infection), while accounting for waning immunity.

Proportion of people that were infected with Omicron before March 13

~39.77% of all infections

Proportion of people that are naïve at start of projection (not vaccinated or infected)

8.76% - 11.19% It is likely to be an overestimate as the reporting ratios are determined based on infection-induced seroprevalence data. These numbers are slightly higher than those observed in infection+vaccine induced seroprevalence from the CDC data. Further non-trivial changes in the model will be needed to calibrate with this data.

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

Four variants are considered to be categorized as "Omicron": BA.1, BA1.1, BA.2, and BA.3. They are all assumed to have 50% immune escape property from the pre-omicron variants (combined into a single variant called "pre-omicron"). Fixing the immune escape parameter, the model is able to learn the transmissibility of all the four omicron variants based on the observed data.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

Learned from observed data. The severity reduction of Omicron variants compared to the delta is considered to be 70%. Although, this choice does not impact the projections.

Waning immunity details

It is assumed that all waning happens through a time-dependent waning mechanism. The probability of transferring to a partially immune state by at time t is modeled as a gamma distribution such that: (i) the median is as per the scenario; (ii) the efficacy (given the partial immune protection against infection) after the first 60 days is the "initial" vaccine efficacy (e.g. 80% for 65+, 90% for <65). Protection against severe outcomes is derived from recently observed breakthrough surveillance data: < 65: protection against hospitalization 0.80, protection against death 0.91 65+ : protection against hospitalization 0.87, protection against death 0.93

Seasonality implementation

Contact rates changes over the year are derived from Cuebiq contact data.

Emerging variant details (including introduction process)

It is assumed that 50 new weekly cases of the new variants are introduced distributed uniformly over seven days and proportional to state populations.

Nonpharmaceutical interventions

None

Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes, booster implementation)

None.

University of Virginia - EpiHiper

Summary of results

1. The scenarios with new variant (B,D) have significantly larger number of cases/hospitalizations/deaths after summer 2022 than scenarios without (A,C).
2. There is only marginal difference between optimistic waning and pessimistic waning scenarios.
3. In the long run, incidence numbers remain at a level that depends on the scenario, with minor fluctuations.

Explanation of observed dynamics given model assumptions

1. Although the new variant has the same intrinsic transmissibility as Omicron, immune escape means a more susceptible population (more people can be infected with larger probabilities).
2. We calibrate our model seperately for the optimistic waning and pessimistic waning scenarios, towards the same confirmed cases data. The calibrated disease transmissibility is higher for the optimistic waning scenarios. This reduces the difference of waning between scenarios in the projection too.
3. With waning and without vaccination beyond the third dose (booster), infected people keep returning to the waned states and getting reinfected.

Model assumptions

Number/type of immune classes considered

We consider the following classes: vaccinated (with 1 dose, 2 doses, booster), exposed to Omicron or a previous variant, exposed to variant X, and a class with waned immunity.

Initial distribution of susceptibility if available

Initialization of susceptibility is based county level data of previous confirmed cases, age specific case ascertainment rate, state level data of prior vaccinations, and waning of immunity (from infection and/or vaccine). We initialize each individual to one of naively susceptible, vaccinated, partially susceptible (with waned immunity), and non-susceptible (currently or recently infected) states, depending on whether and when the individual is/was infected and/or vaccinated. The number of individuals in the partially susceptible state depends on the distribution of waning time which varies between scenarios.

Proportion of people that were infected with Omicron before March 13

We only assume that all infections are Omicron at the beginning of the simulation (mid-Feb. 2022). We do not distinguish the variants of prior infections.

Proportion of people that are naïve at start of projection (not vaccinated or infected)

The proportion of people that are naively susceptible at start of projection varies in different states. At national level, it is about 8%.

Initial variant characteristics (including Omicron transmissibility, immune escape, and how uncertainty or non-identifiability was handled)

We determine Omicron transmissibility by calibration, with noise added to the calibrated value to incorporate uncertainty. We implement immune escape as specified in the scenario description.

Process for setting/calibrating P(hosp given current infection) and P(death given current infection)

We set hospitalization rate and fatality rate in our disease model through probabilities of state transitions (from exposed to symptomatic to hospitalization to death).

Waning immunity details (e.g., distribution used)

We assume that immune waning has an exponential distribution with median of either 10 months or 4 months, depending on the scenario, for the time to transition to a partially susceptible state; the protection on nodes in the partially susceptible state is as specified in the scenario description.

Seasonality implementation

We do not explicitly consider seasonality.

Emerging variant details (including introduction process)

We divide 50 cases per week by the size of US population to get an individual level probability and use it in each state to sample the number of new variant cases introduced to that state in each week.

Nonpharmaceutical interventions

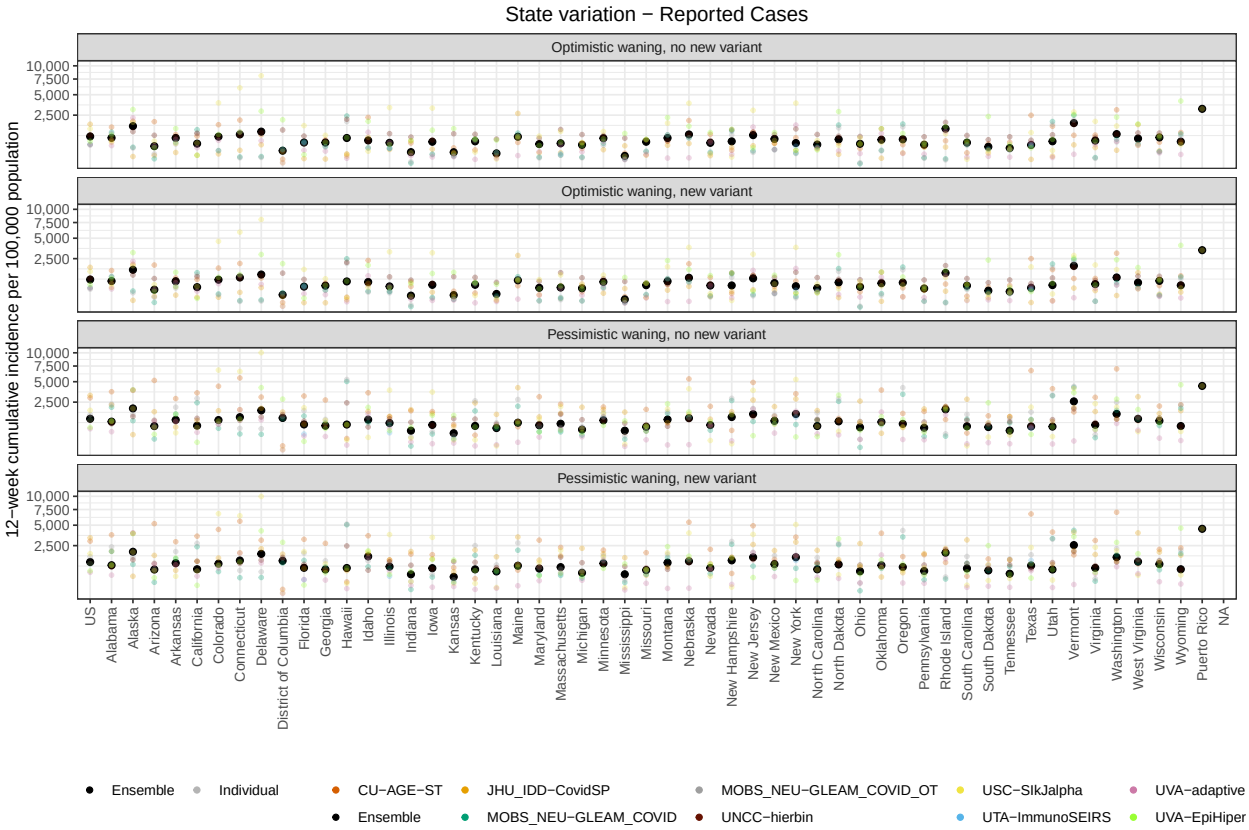
We have modeled the following NPIs: (i) A fraction of the population chooses to reduce non-essential (shopping, religion, and other) activities. (ii) All K-12 schools are closed from mid-June 2022 to mid-August 2022 and again from late-December 2022 to the beginning of 2023; and face masks are used in school while schools are open. (iii) A fraction of symptomatic people choose to self-isolate themselves at home. Compliances are 15% on average for (i), 100% for (ii), and 75% for (iii).

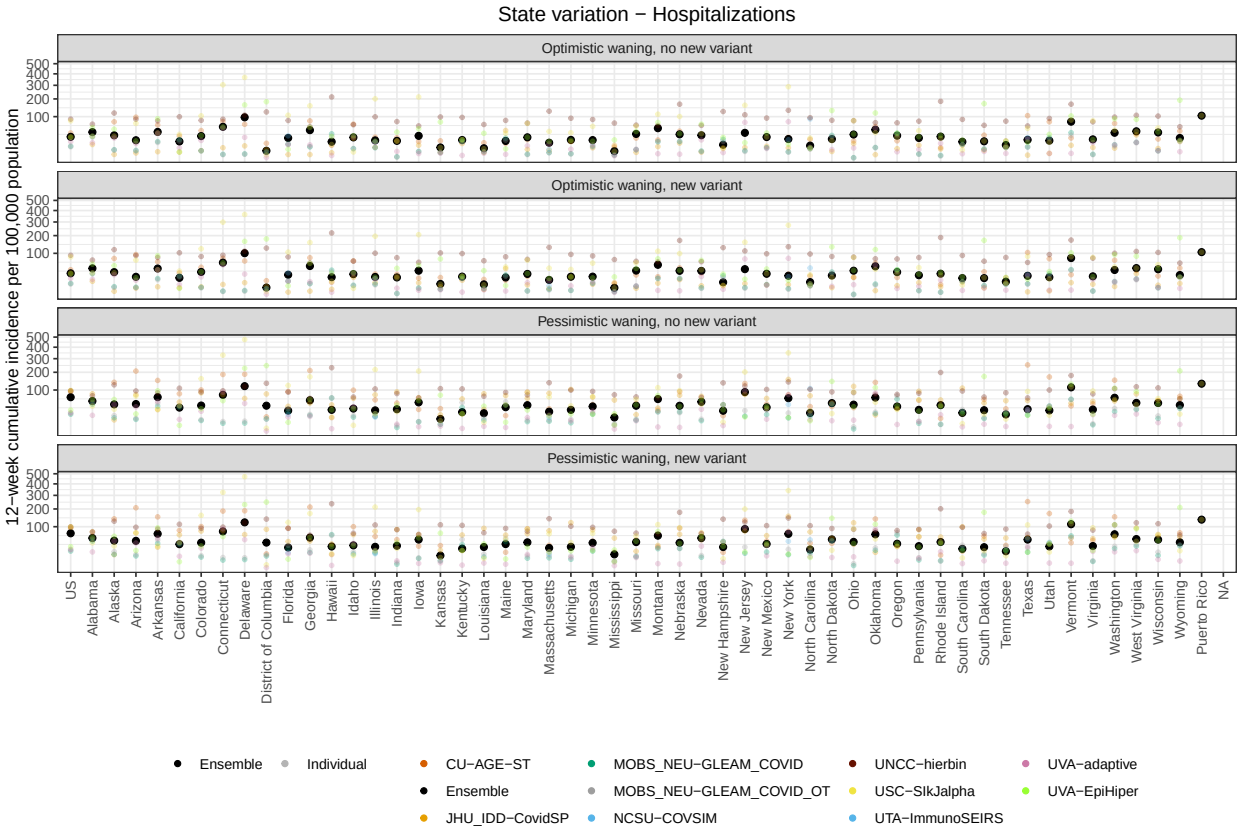
Other updates in model assumptions from previous rounds (e.g., changes in reporting outcomes, booster implementation)

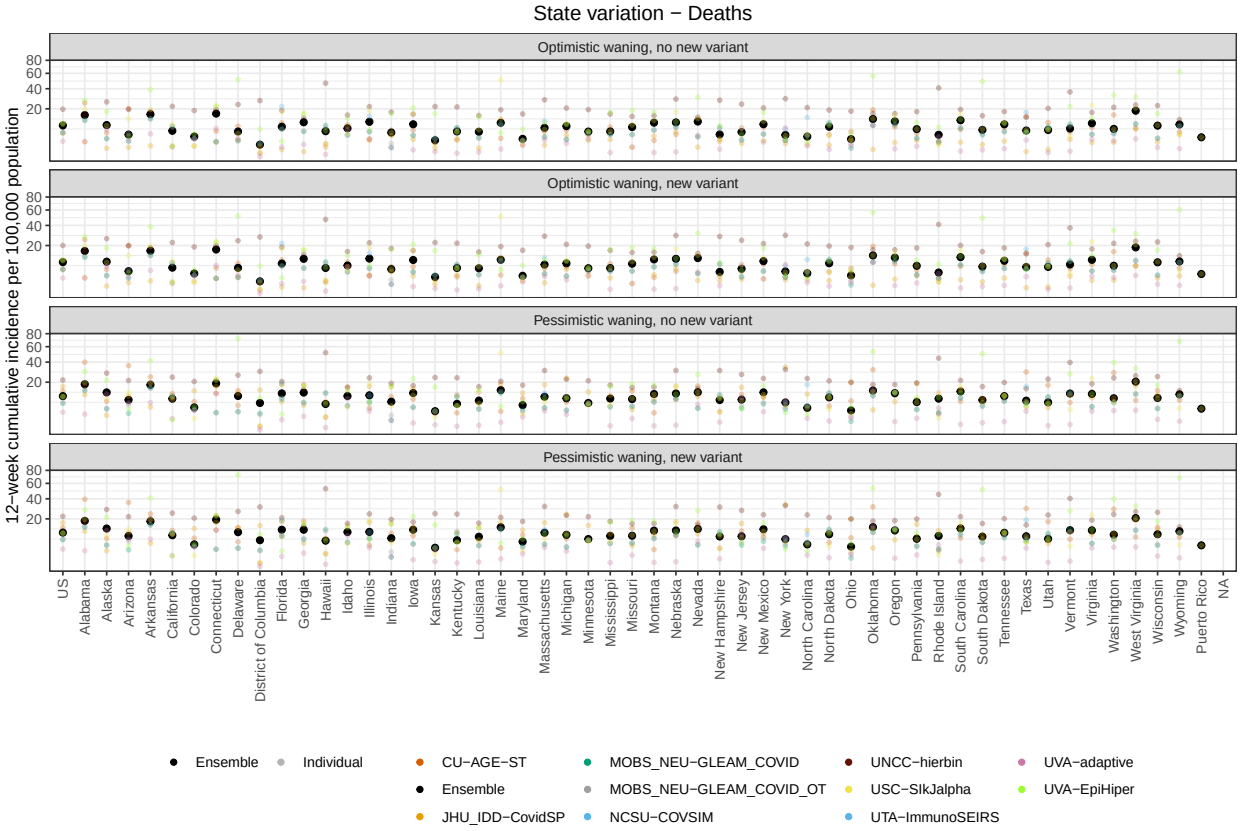
We do not assume changes in reporting outcomes. We assume booster is 50% of fully vaccinated people and at most one round of booster is administered to anyone.

Supplemental Plots

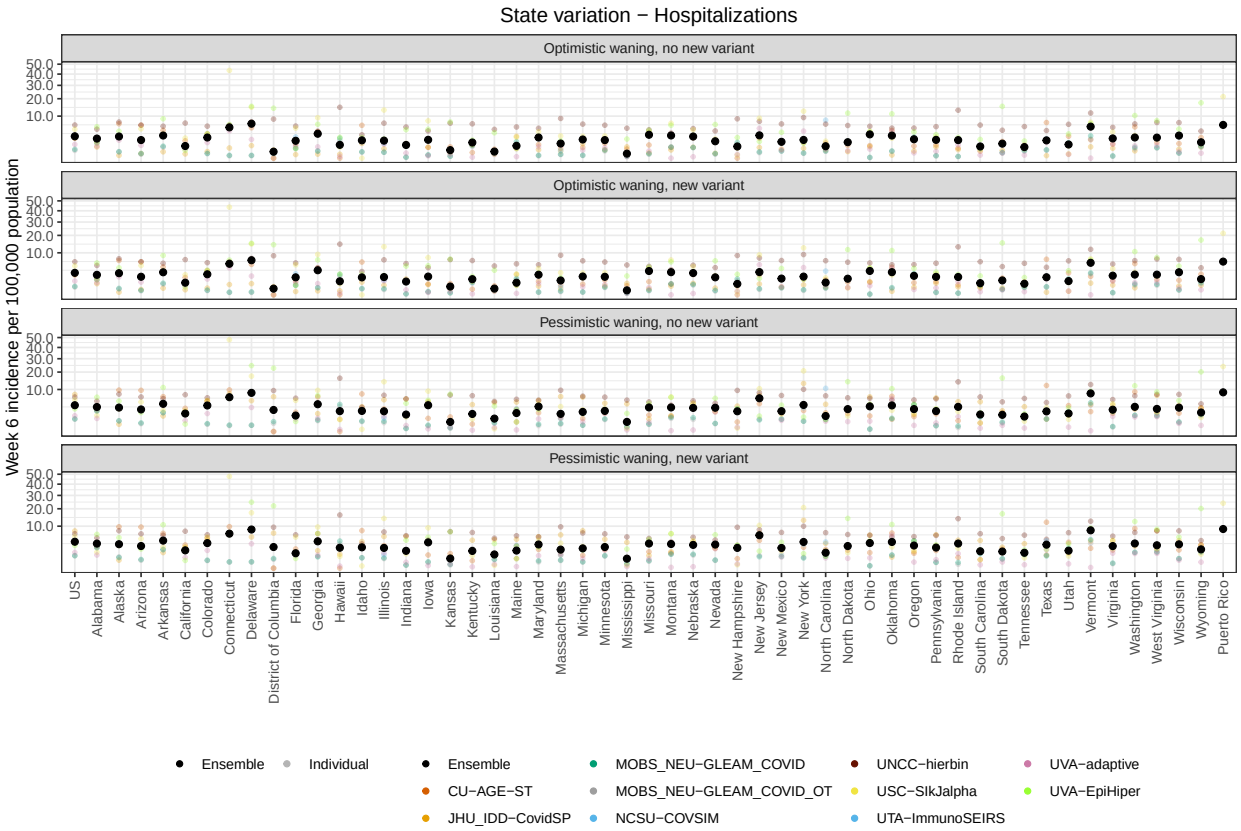
Individual model and ensembles projections for state-level cumulative incidence per 100,000 population over 12-week projection period.

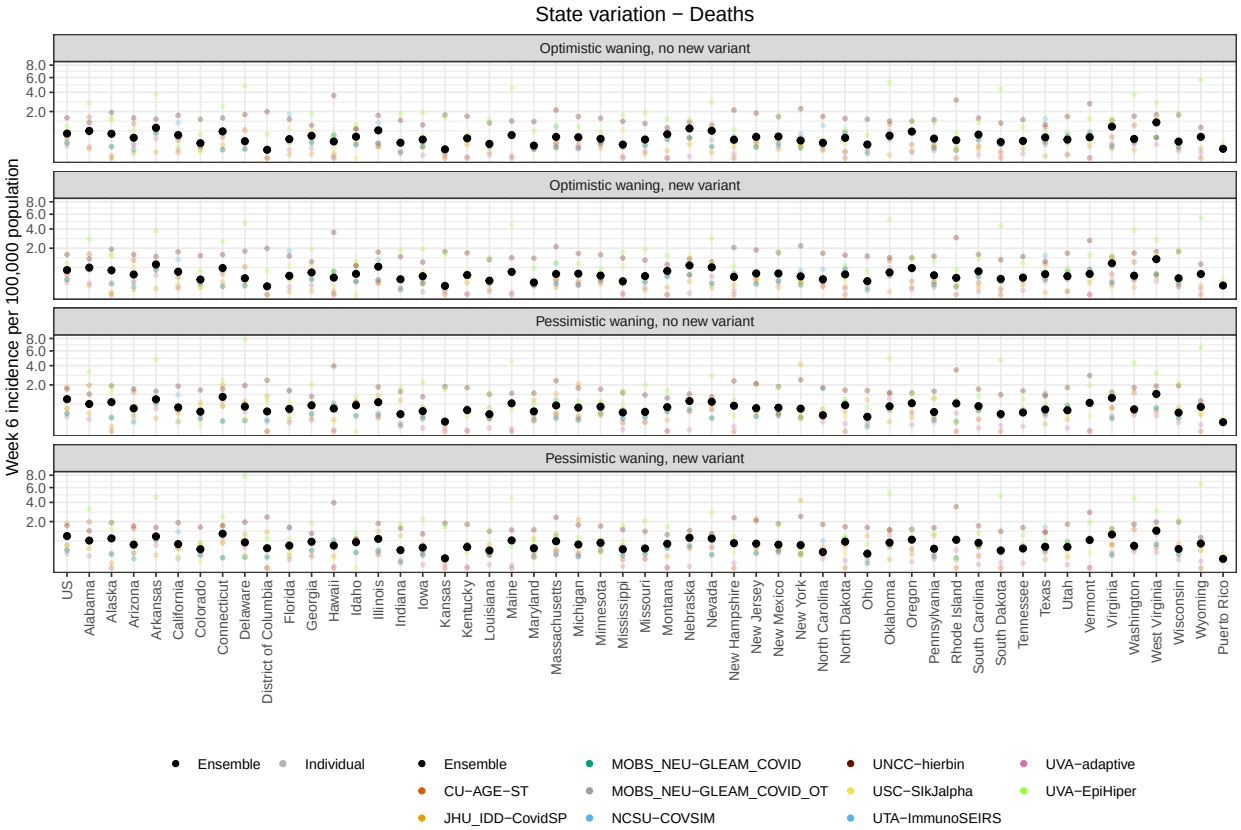



State variation − Hospitalizations
Optimistic waning, no new variant
Optimistic waning, new variant
Pessimistic waning, no new variant
Pessimistic waning, new variant
12−week cumulative incidence per 100,000 population
500
400
300
200
100
US
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Puerto Rico
NA
Ensemble
Individual
CU−AGE−ST
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

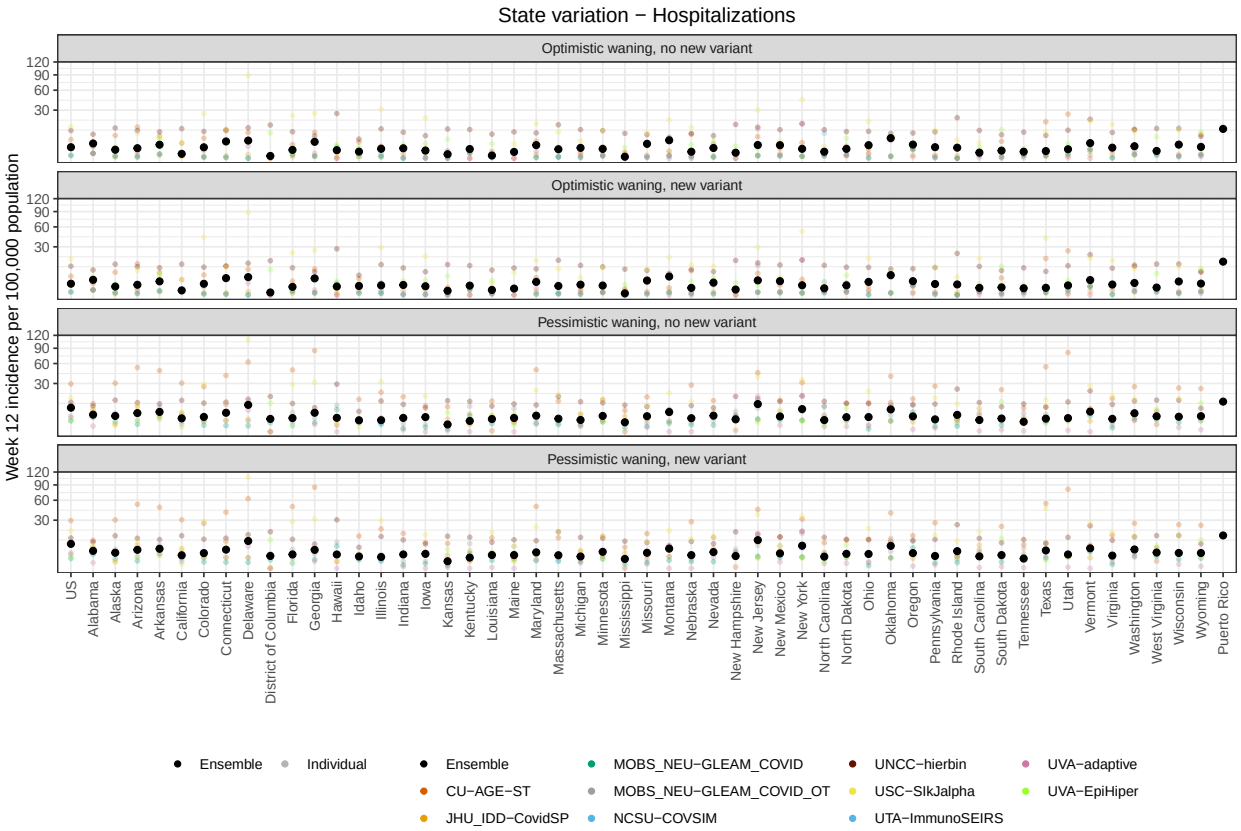

State variation − Deaths
Optimistic waning, no new variant
Optimistic waning, new variant
Pessimistic waning, no new variant
Pessimistic waning, new variant
12−week cumulative incidence per 100,000 population
80
60
40
20
US
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Puerto Rico
NA
Ensemble
Individual
CU−AGE−ST
Ensemble
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

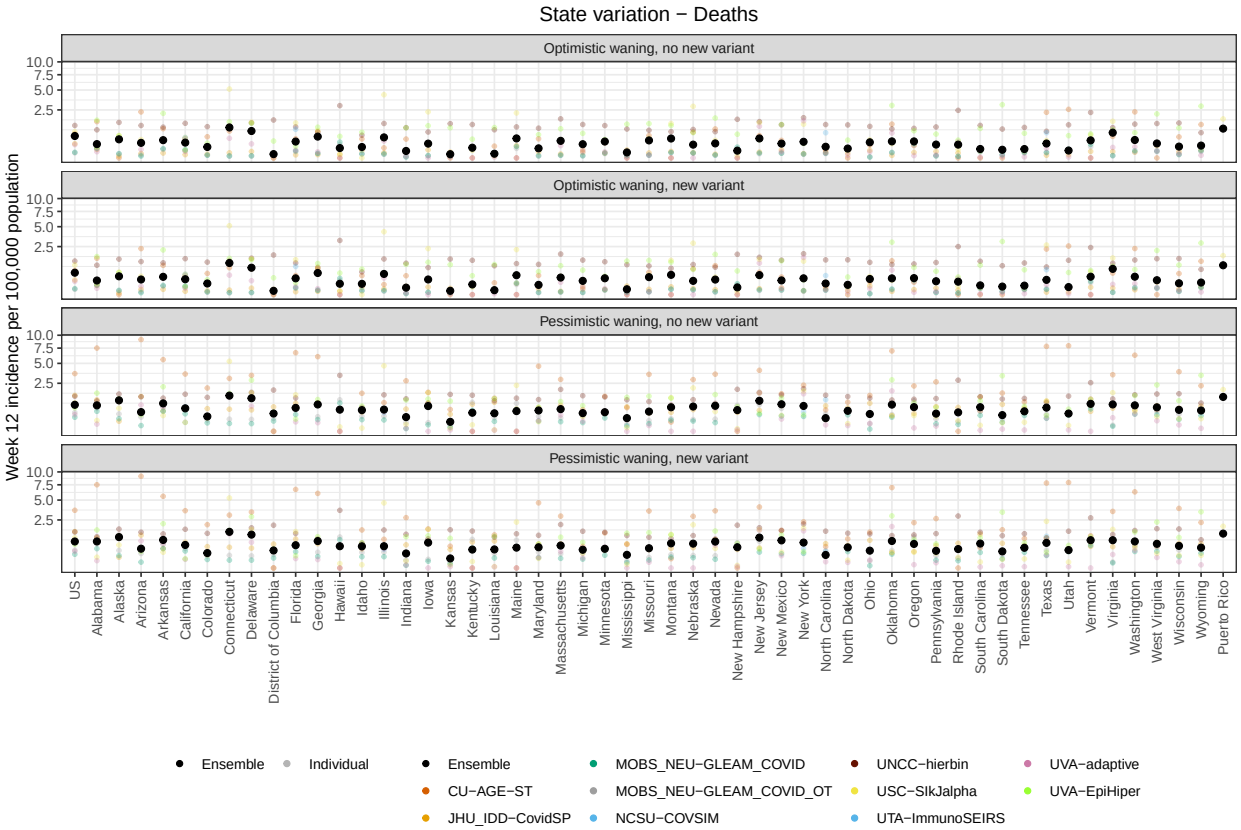
Individual model and ensembles projections for state-level death and hospitalization incidence per 100,000 population at week 6.



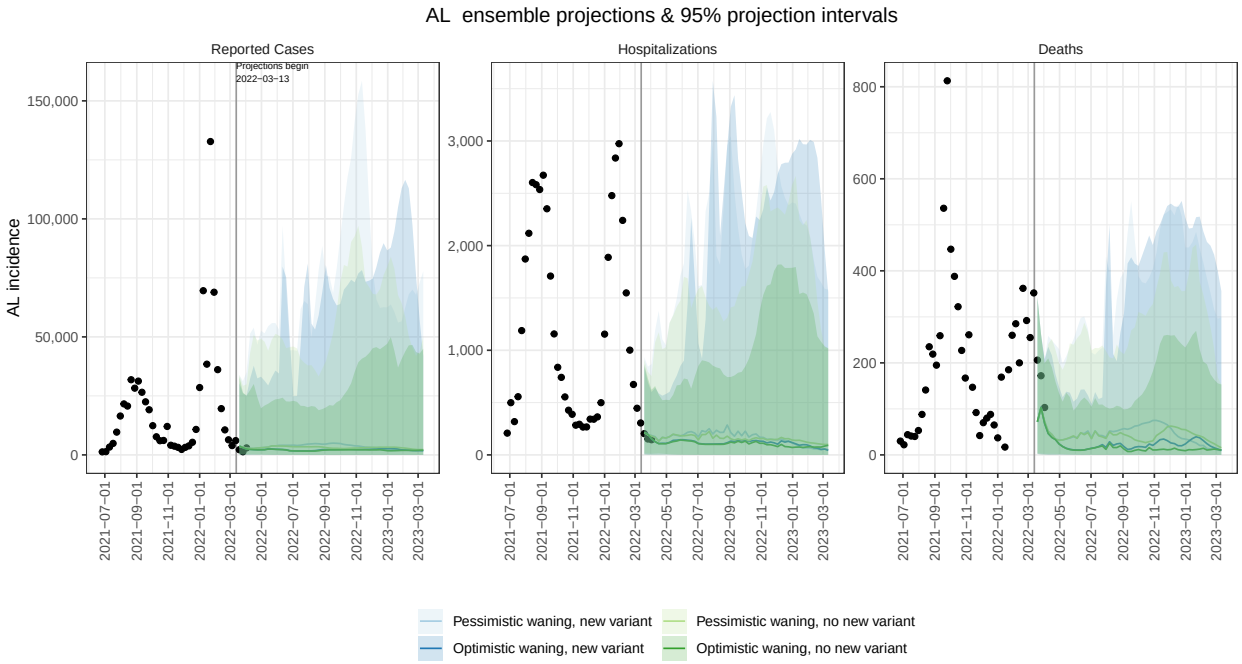

State variation − Deaths
Optimistic waning, no new variant
Optimistic waning, new variant
Pessimistic waning, no new variant
Pessimistic waning, new variant
Week 6 incidence per 100,000 population
8.0
6.0
4.0
2.0
US
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Puerto Rico
Ensemble
Individual
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

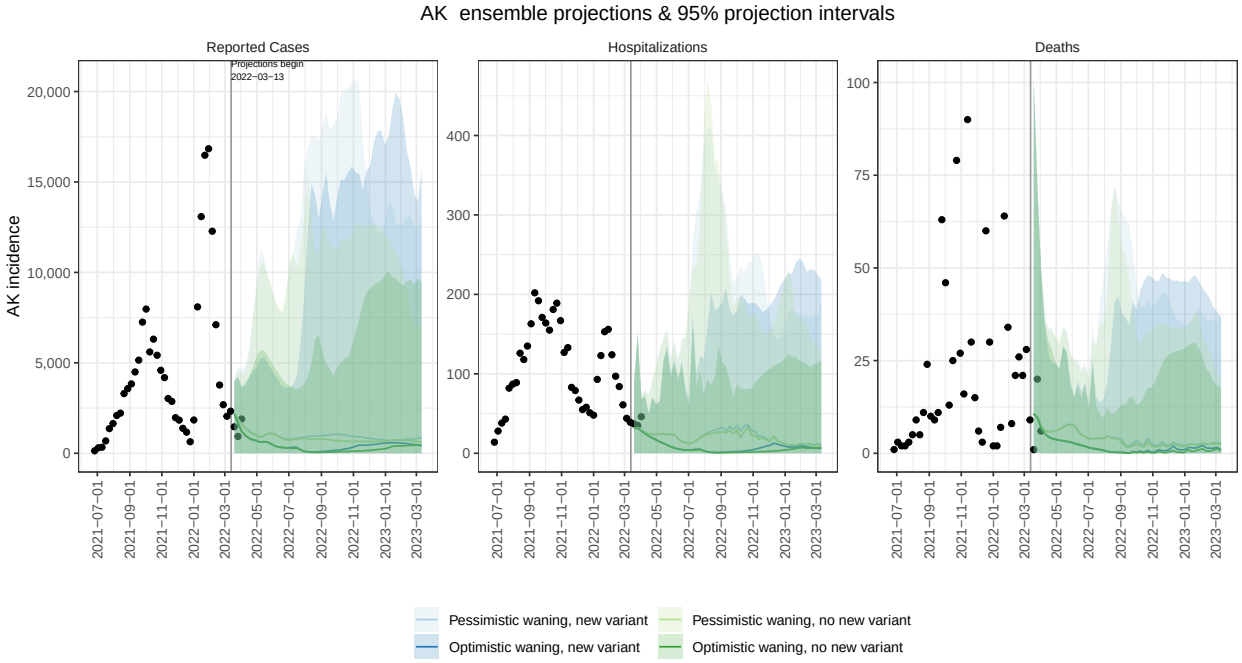
Individual model and ensembles projections for state-level incidence per 100,000 population at week 12.

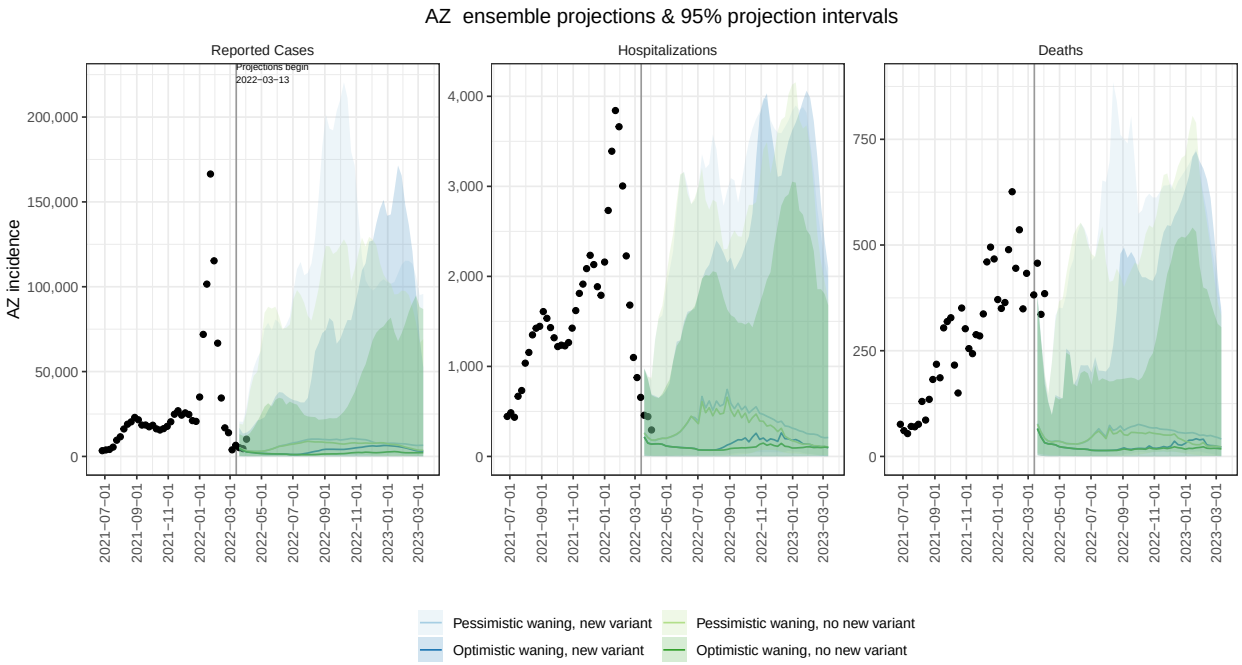


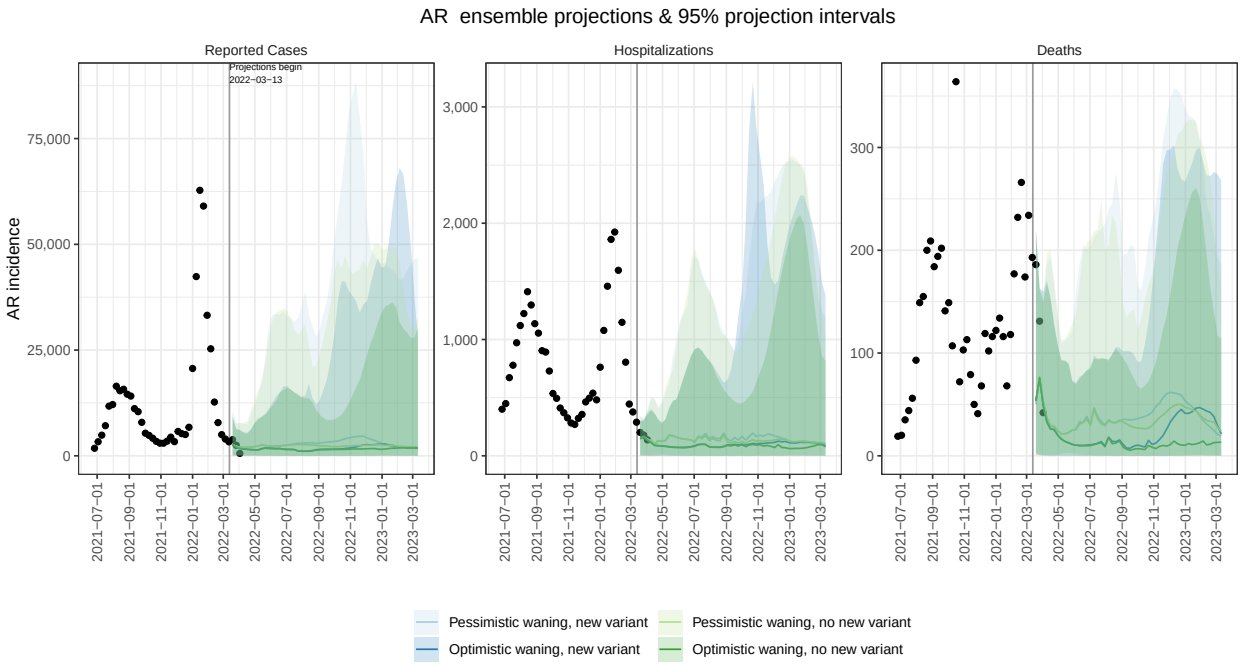

State variation − Deaths
Optimistic waning, no new variant
Optimistic waning, new variant
Pessimistic waning, no new variant
Pessimistic waning, new variant
Week 12 incidence per 100,000 population
10.0
7.5
5.0
2.5
US
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming
Puerto Rico
Ensemble
Individual
Ensemble
MOBS_NEU−GLEAM_COVID
UNCC−hierbin
UVA−adaptive
CU−AGE−ST
MOBS_NEU−GLEAM_COVID_OT
USC−SIkJalpha
UVA−EpiHiper
JHU_IDD−CovidSP
NCSU−COVSIM
UTA−ImmunoSEIRS

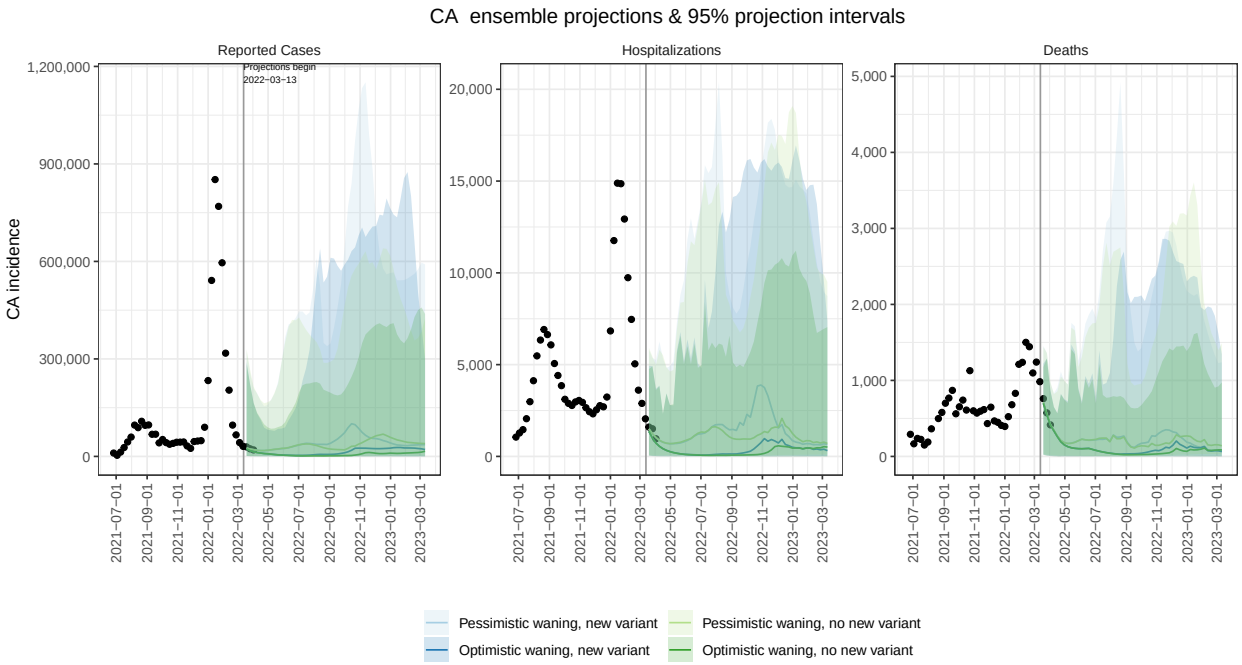
State-level ensemble plots

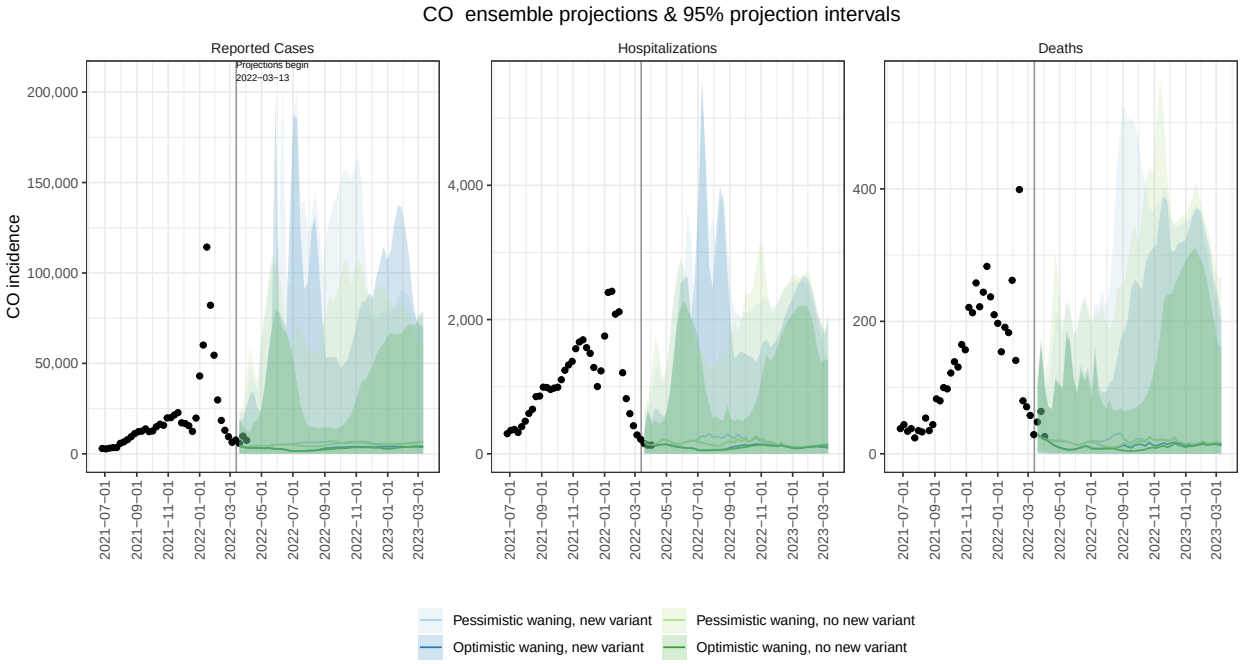


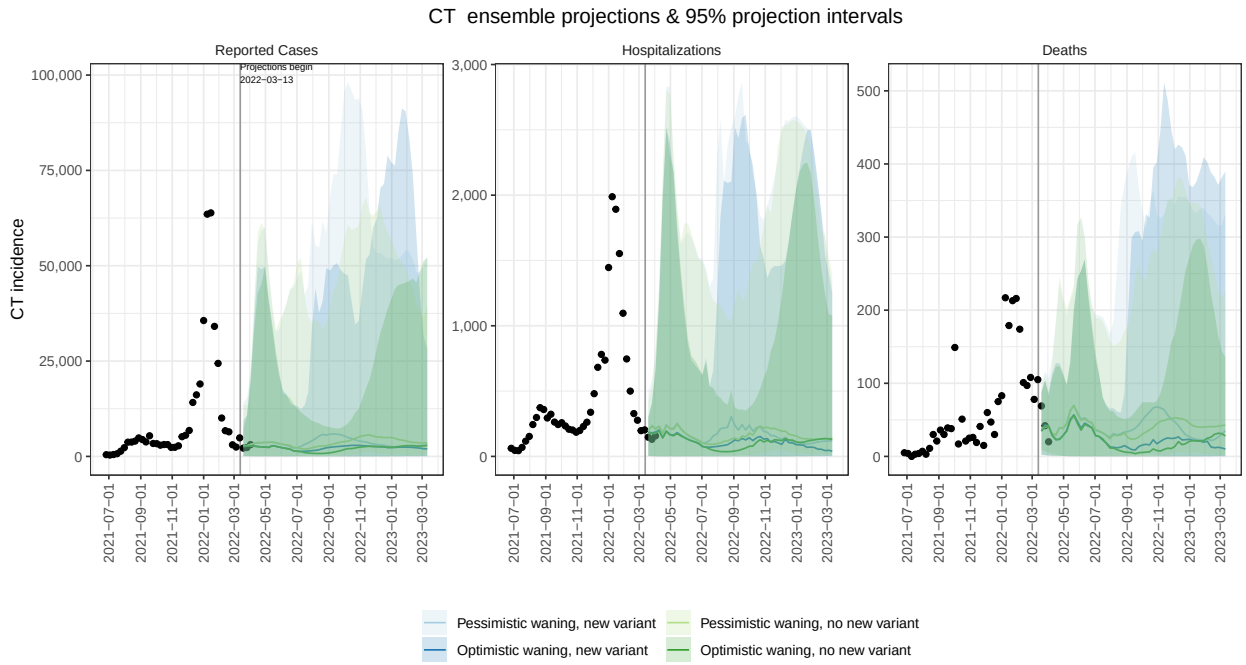


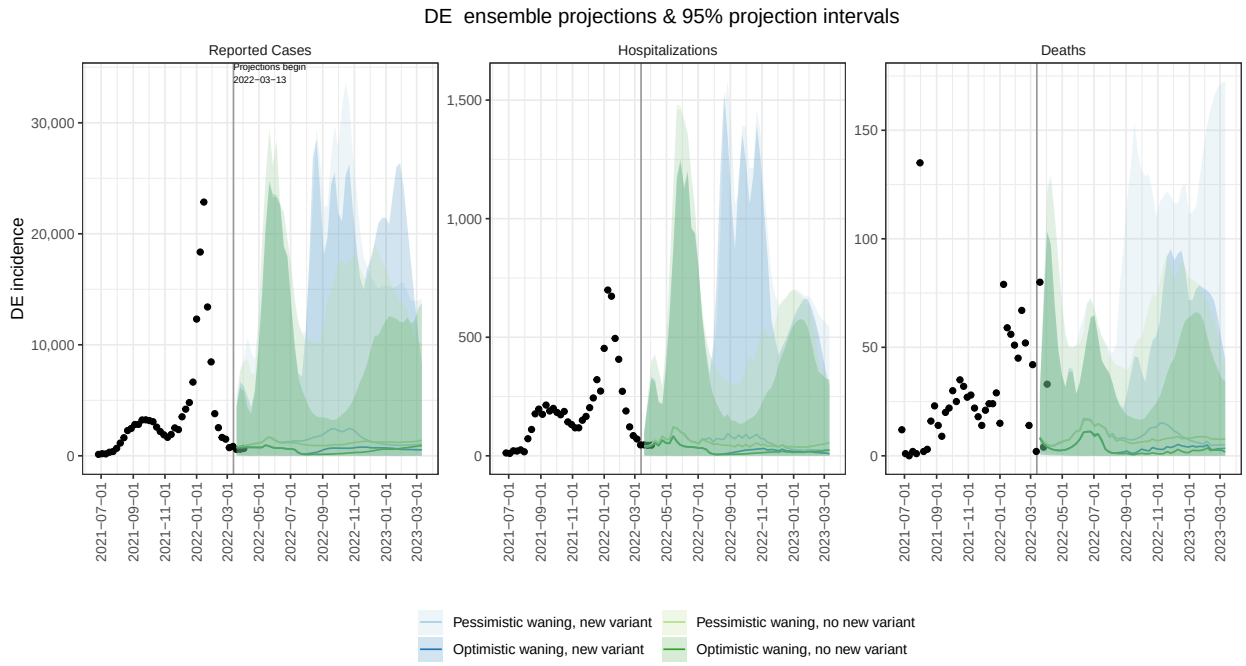

AZ ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
AZ incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

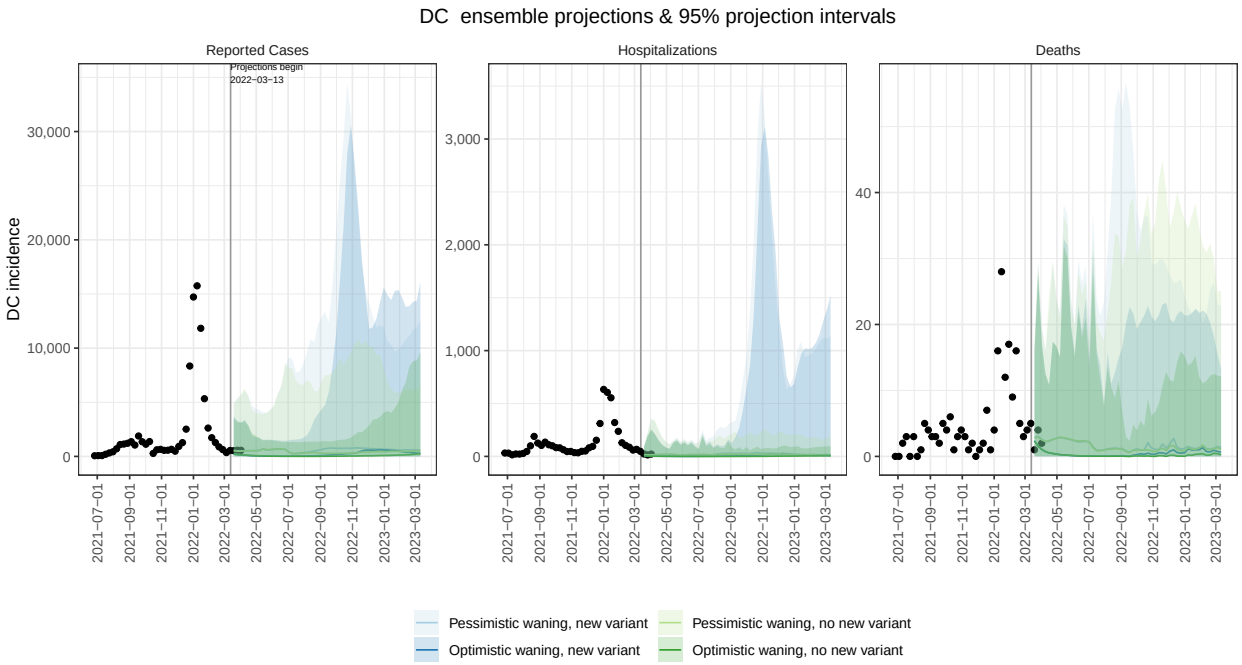

AR ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
AR incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

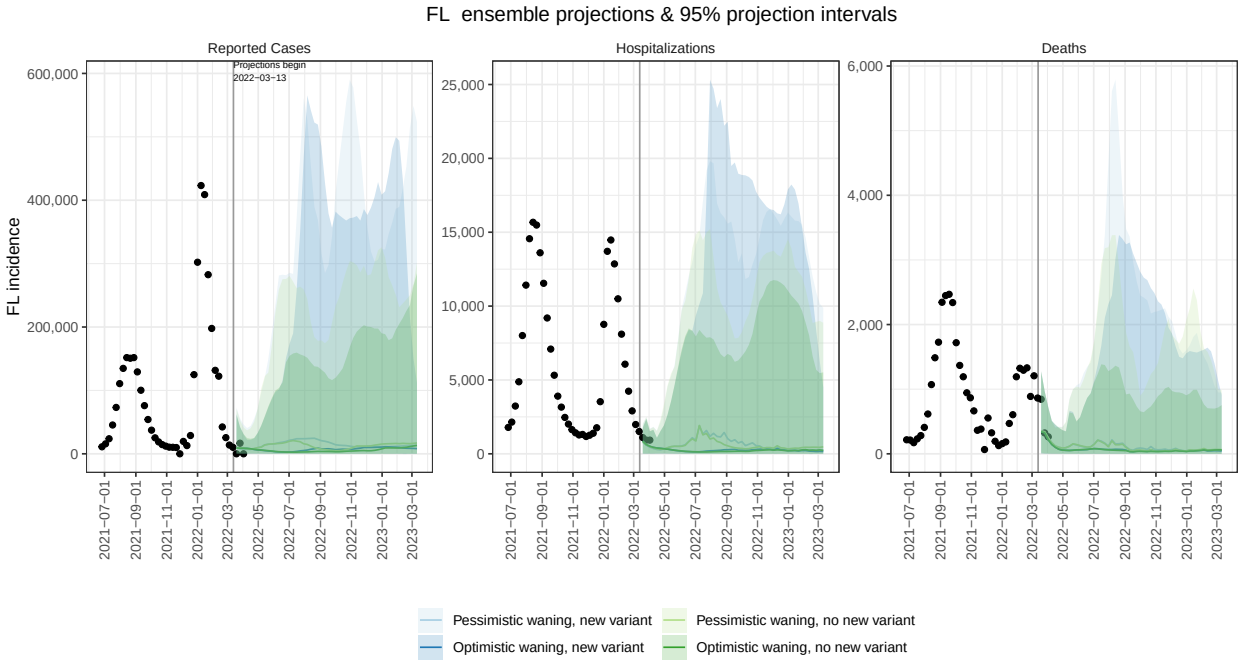

CA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
CA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

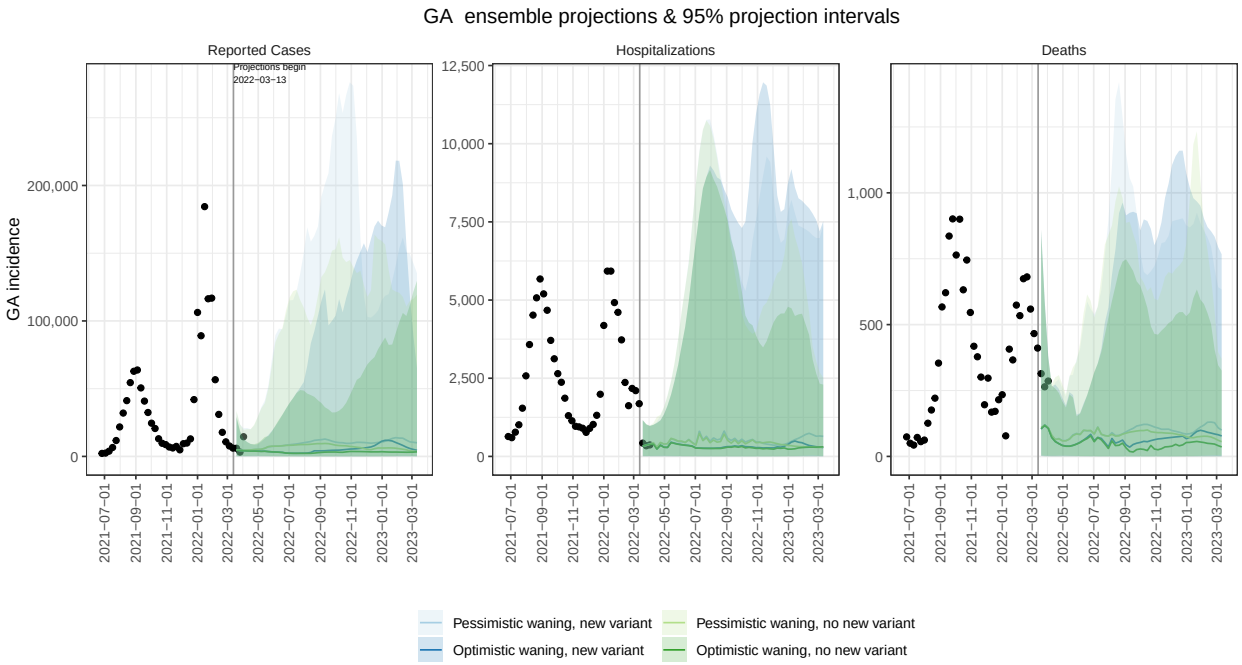

CO ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
CO incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

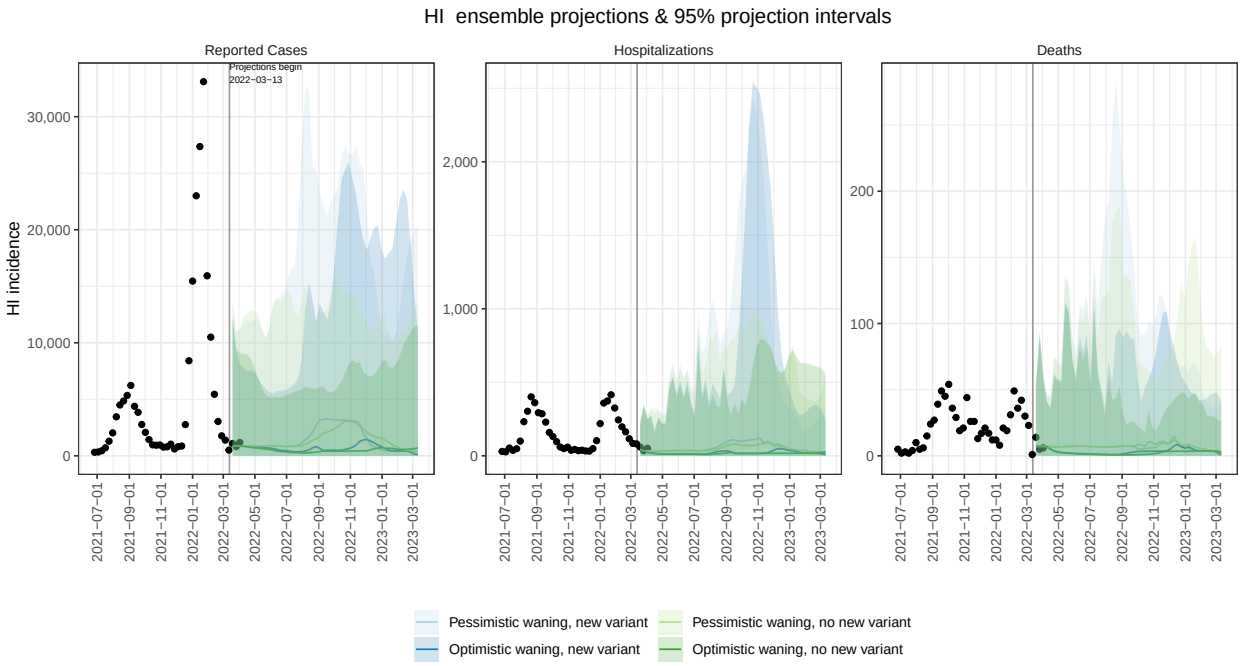

CT ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
CT incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

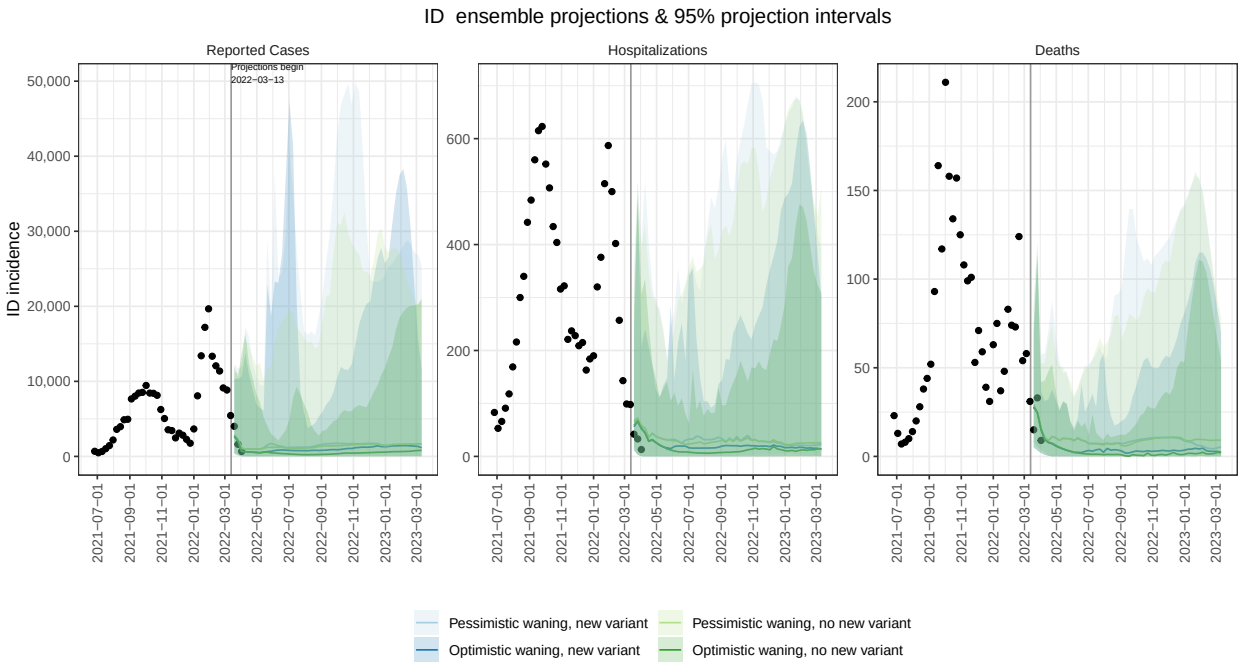

DE ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
DE incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

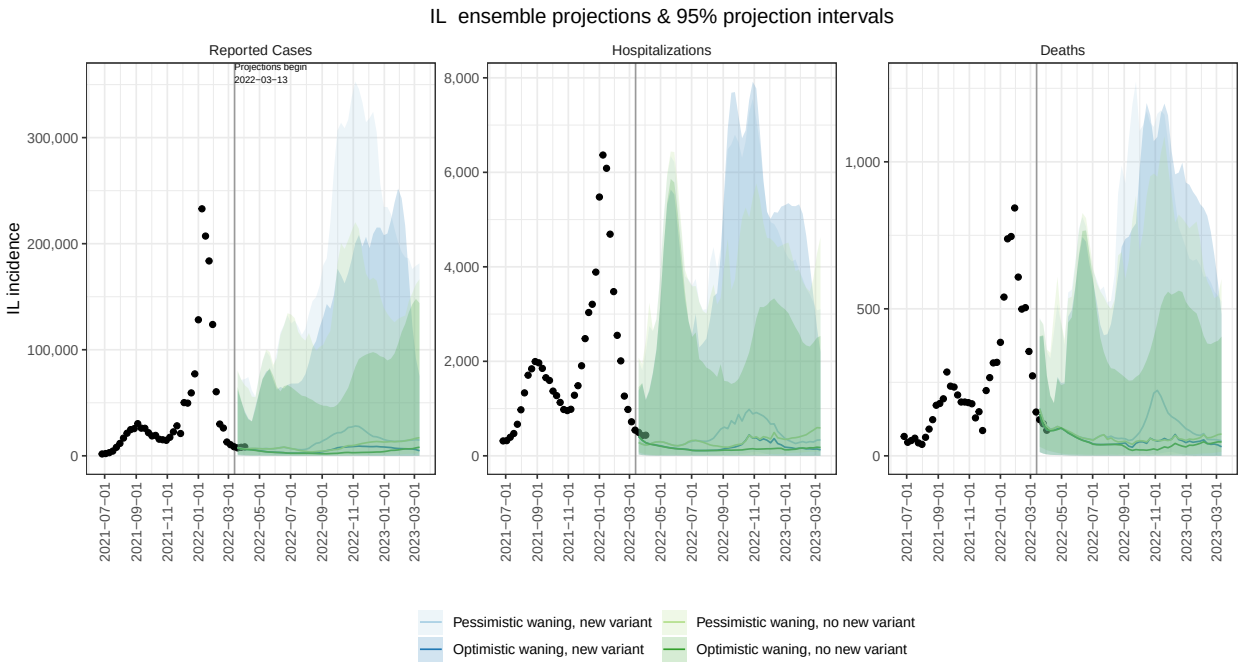

DC ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
DC incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

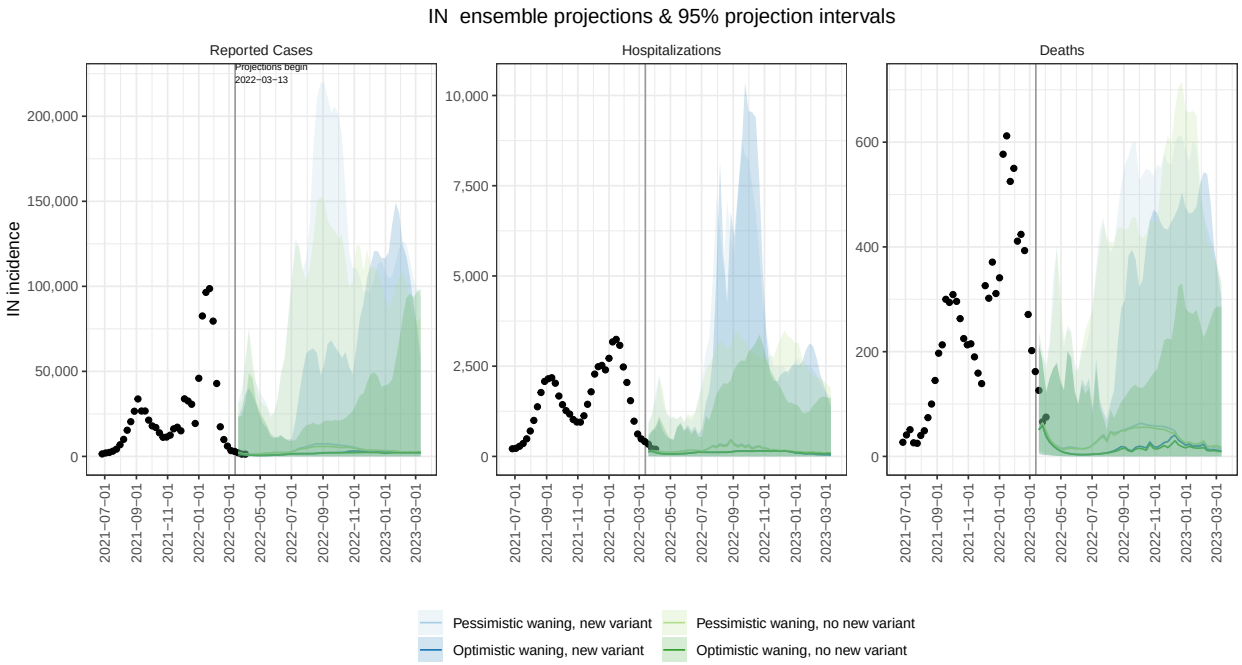

FL ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
FL incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

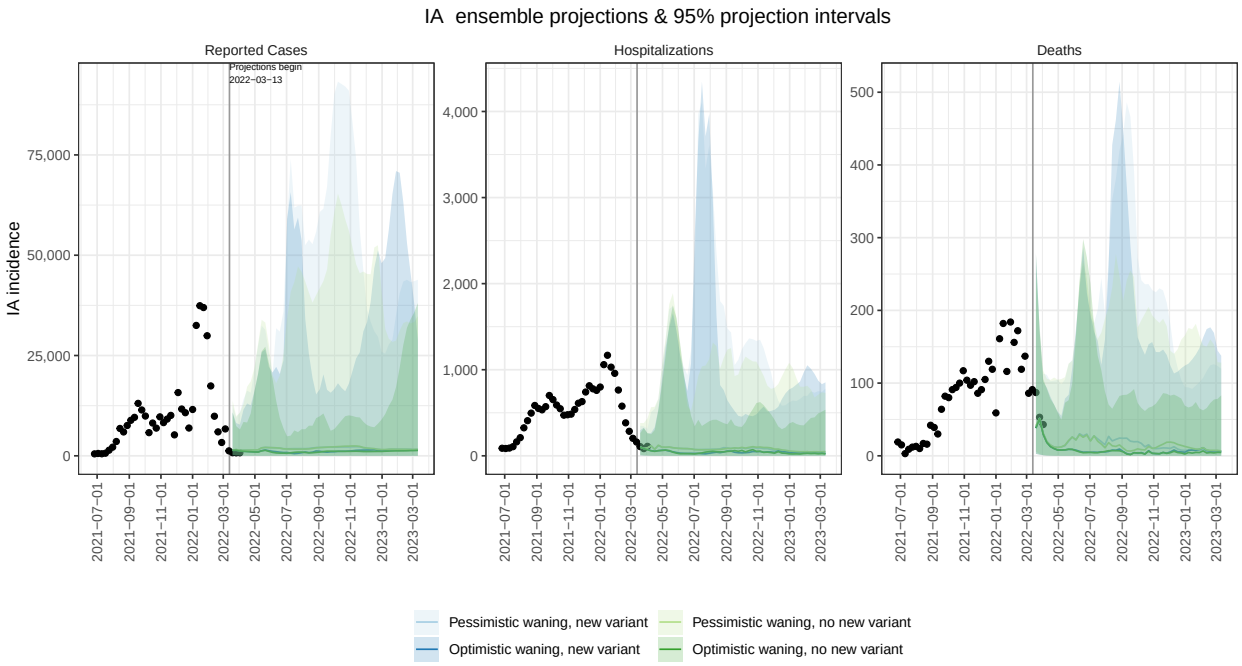

GA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
GA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

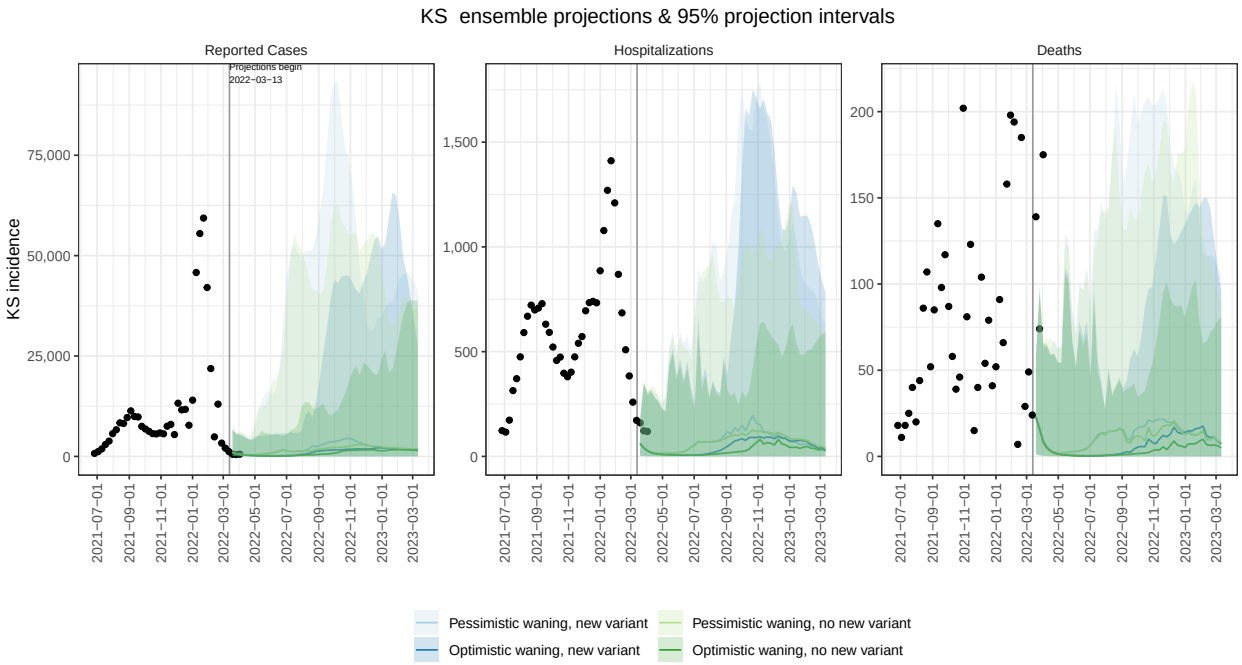

HI ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
HI incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

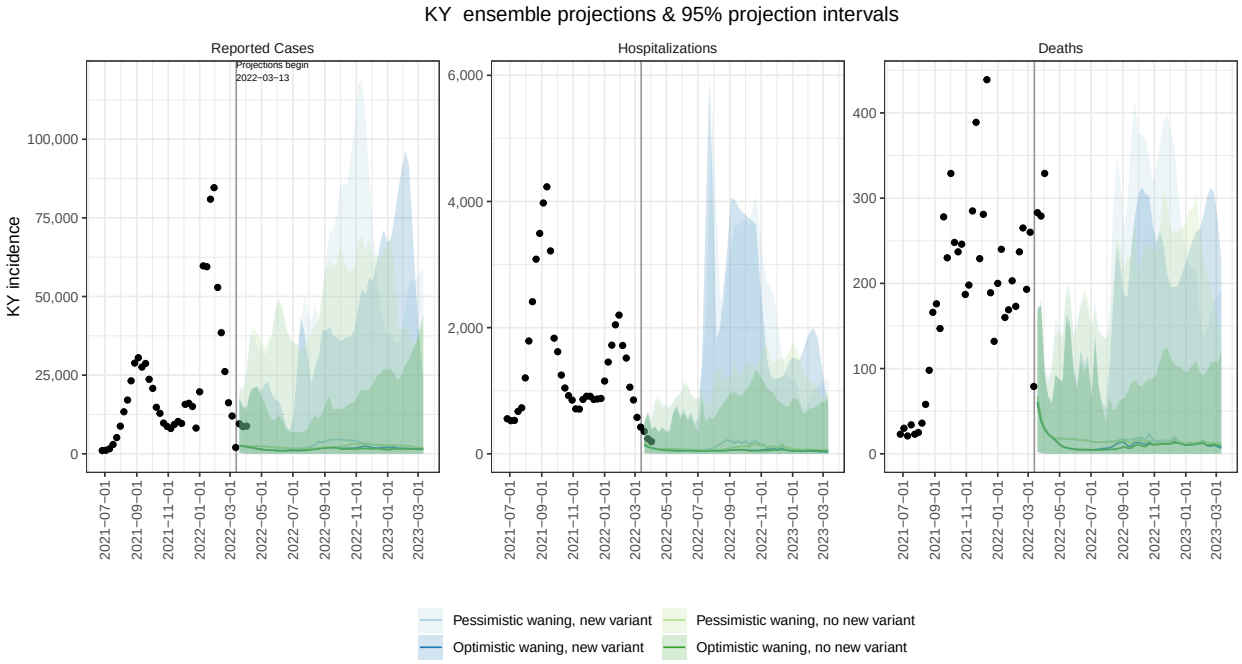

ID ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
ID incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

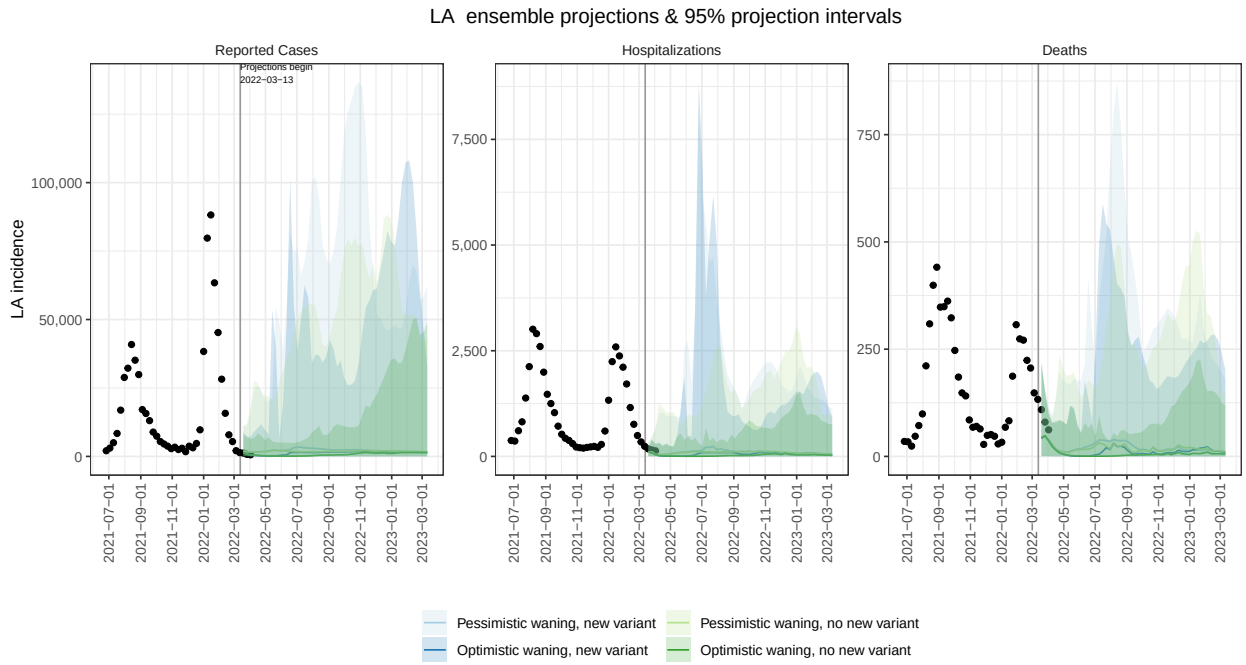

IL ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
IL incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

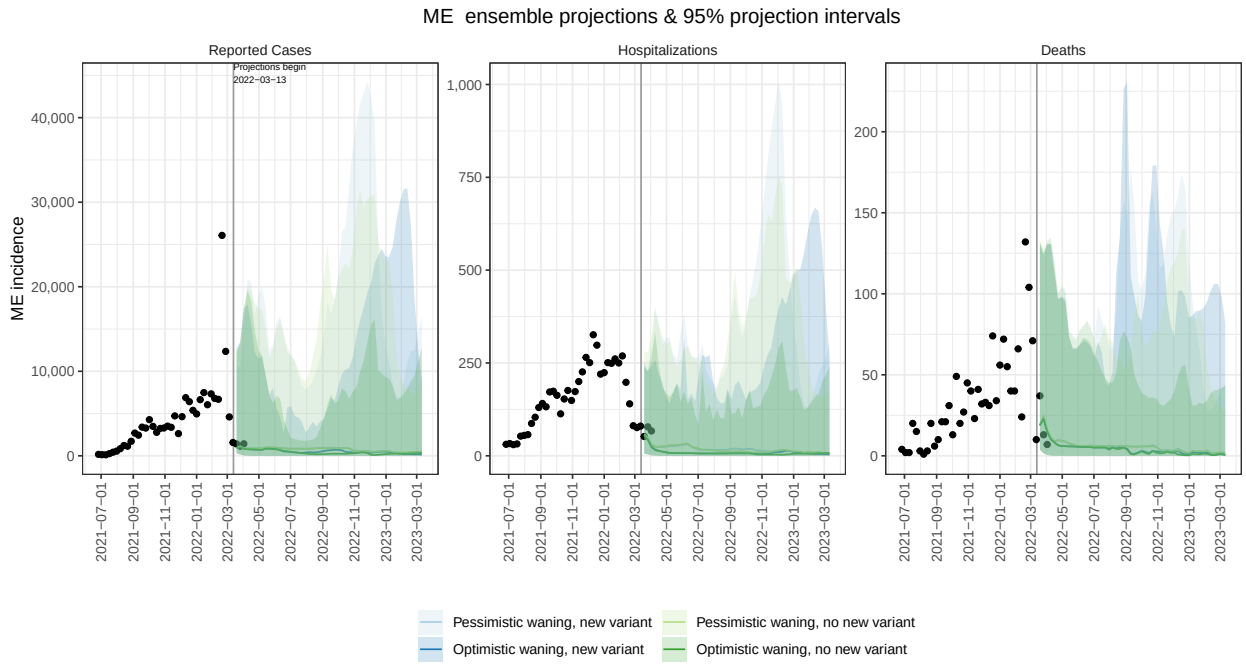

IN ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
IN incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

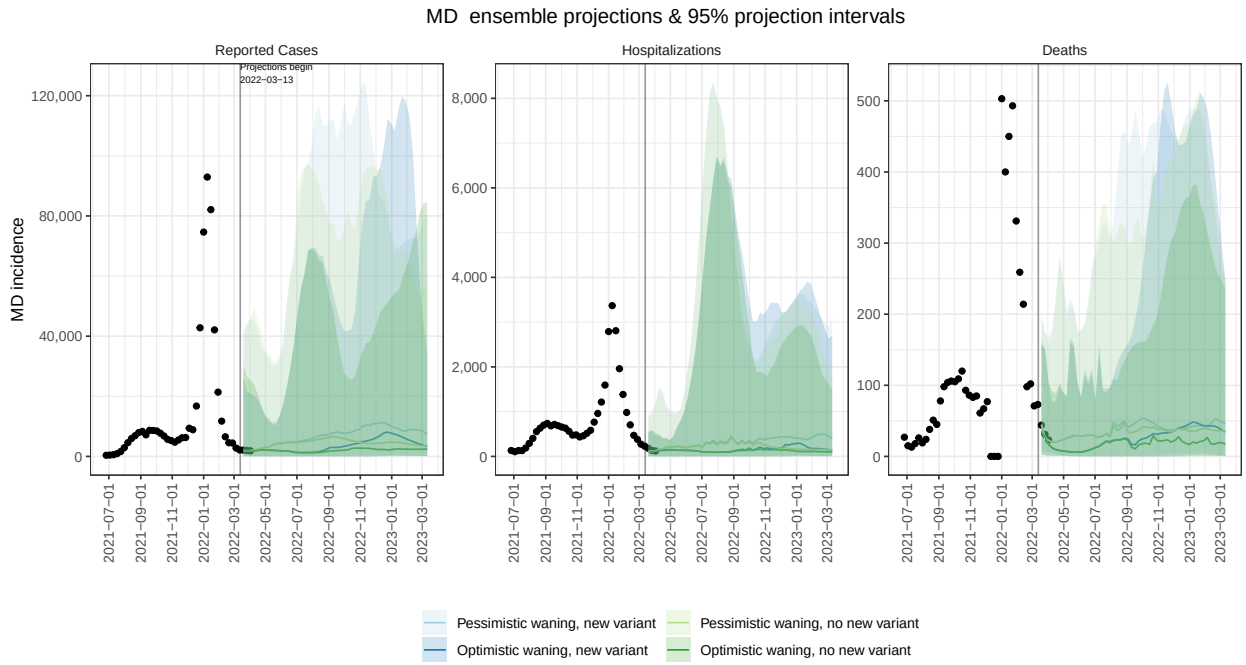

IA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
IA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

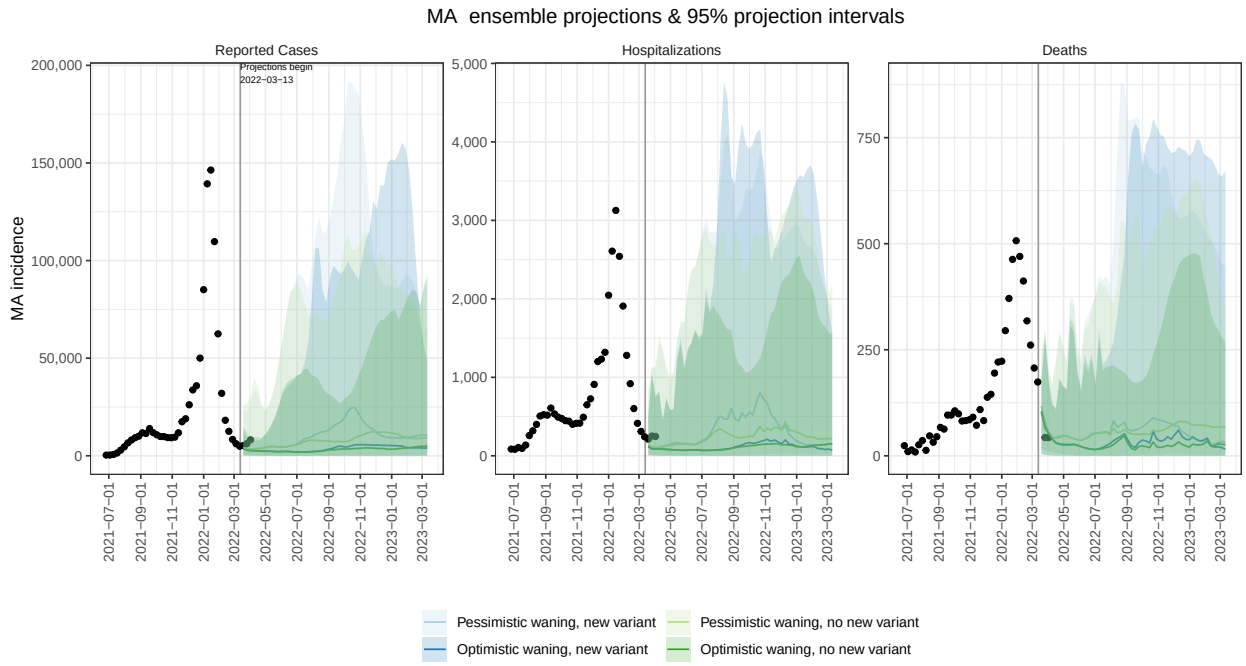

KS ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
KS incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

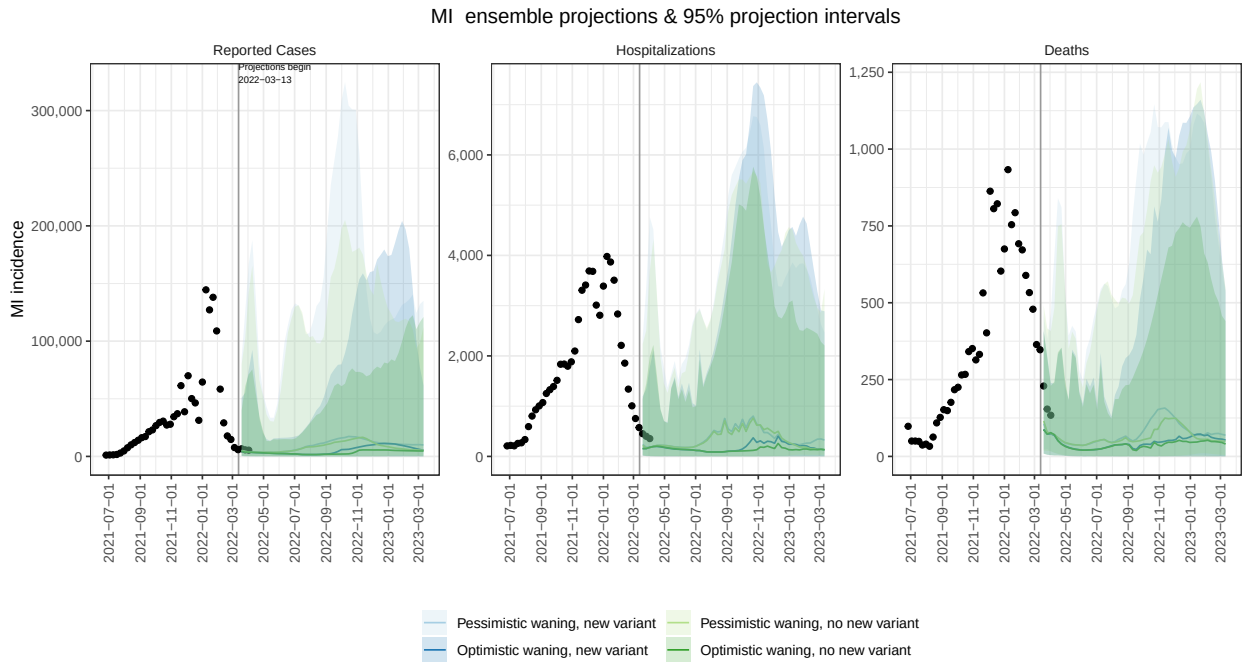

KY ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
KY incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

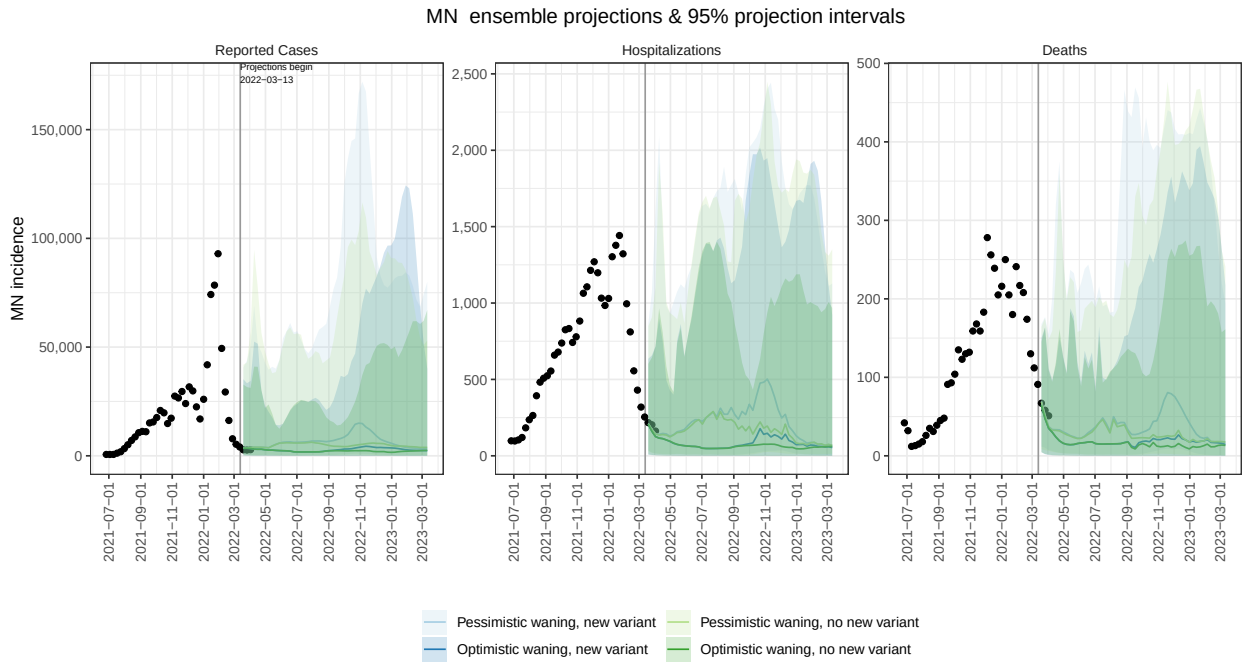

LA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
LA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

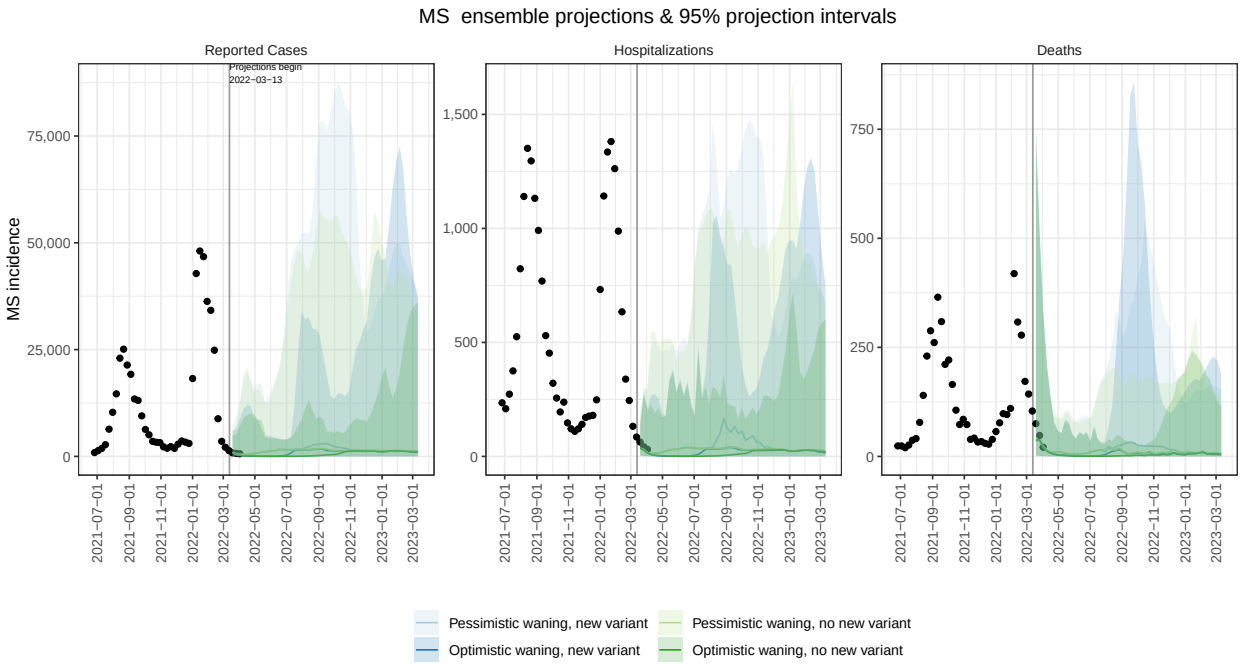

ME ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
ME incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

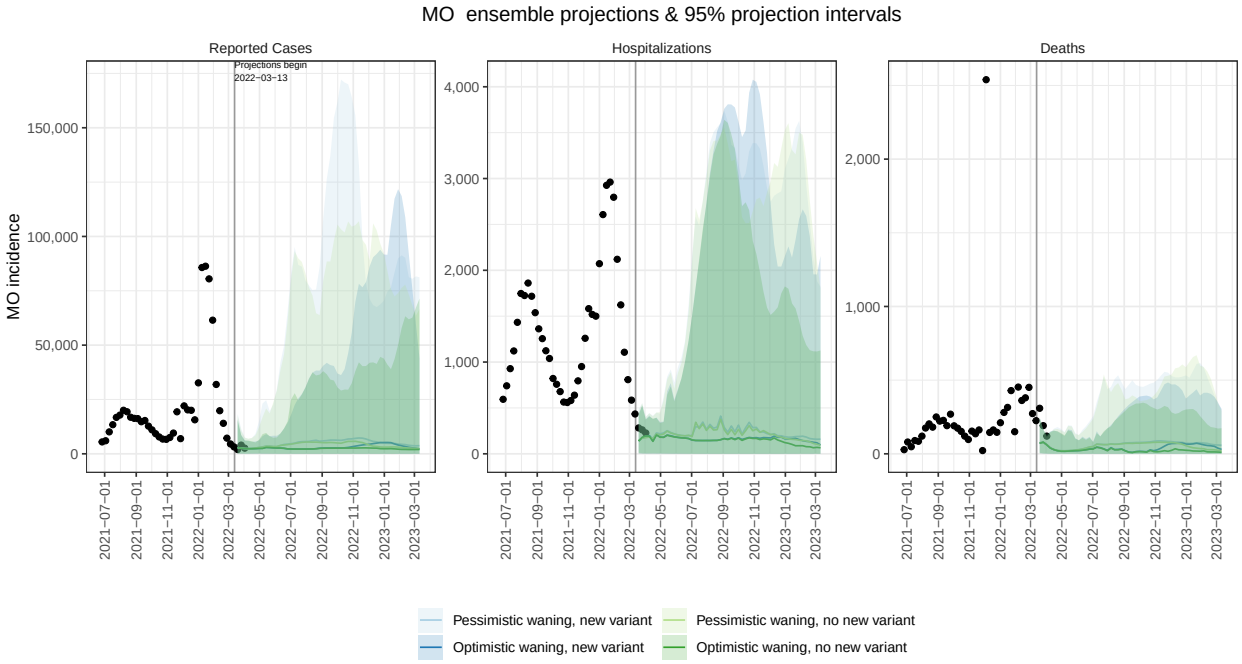

MD ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MD incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

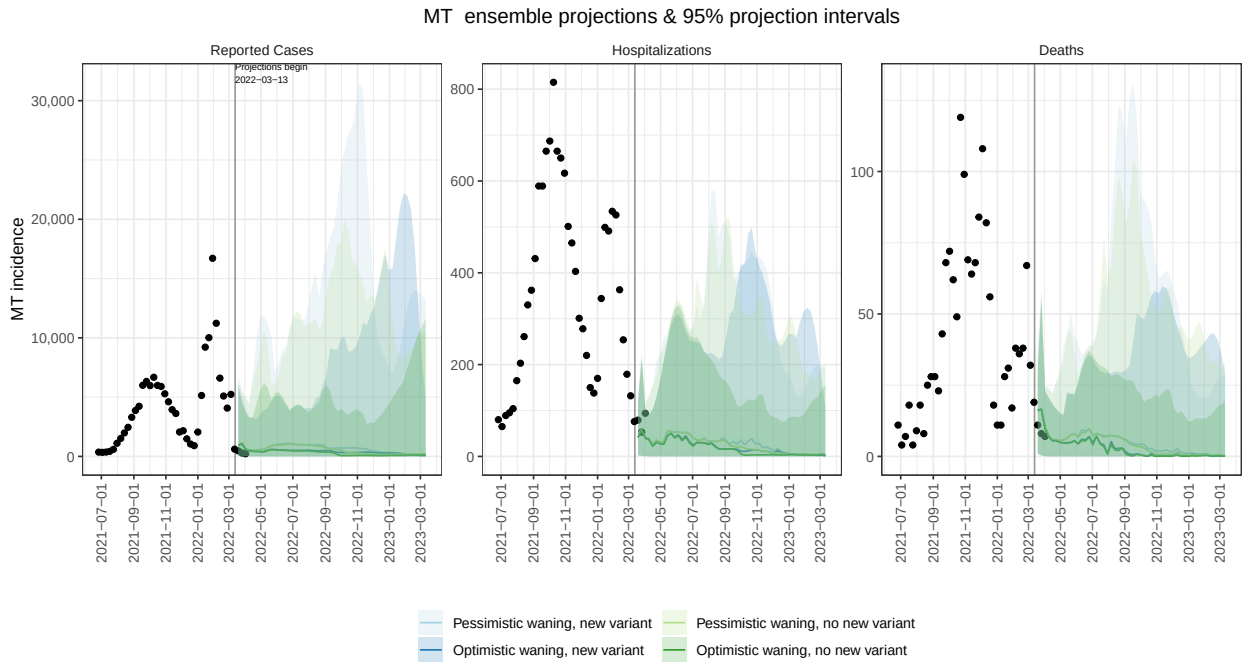

MA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

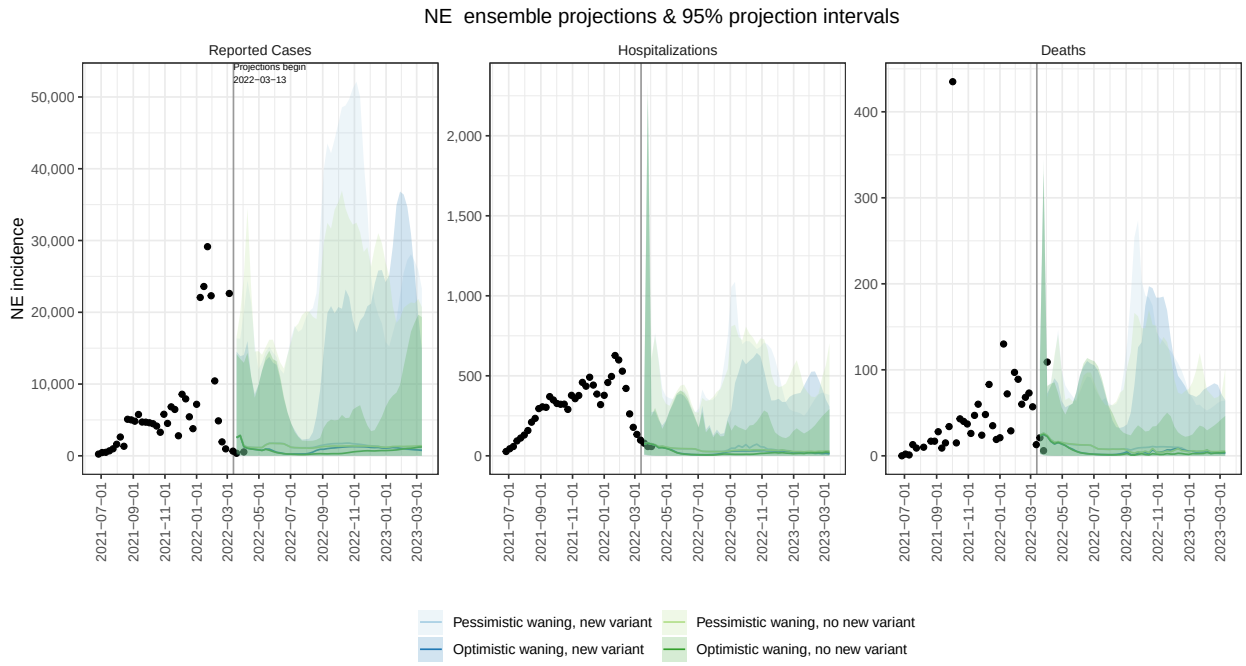

MI ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MI incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

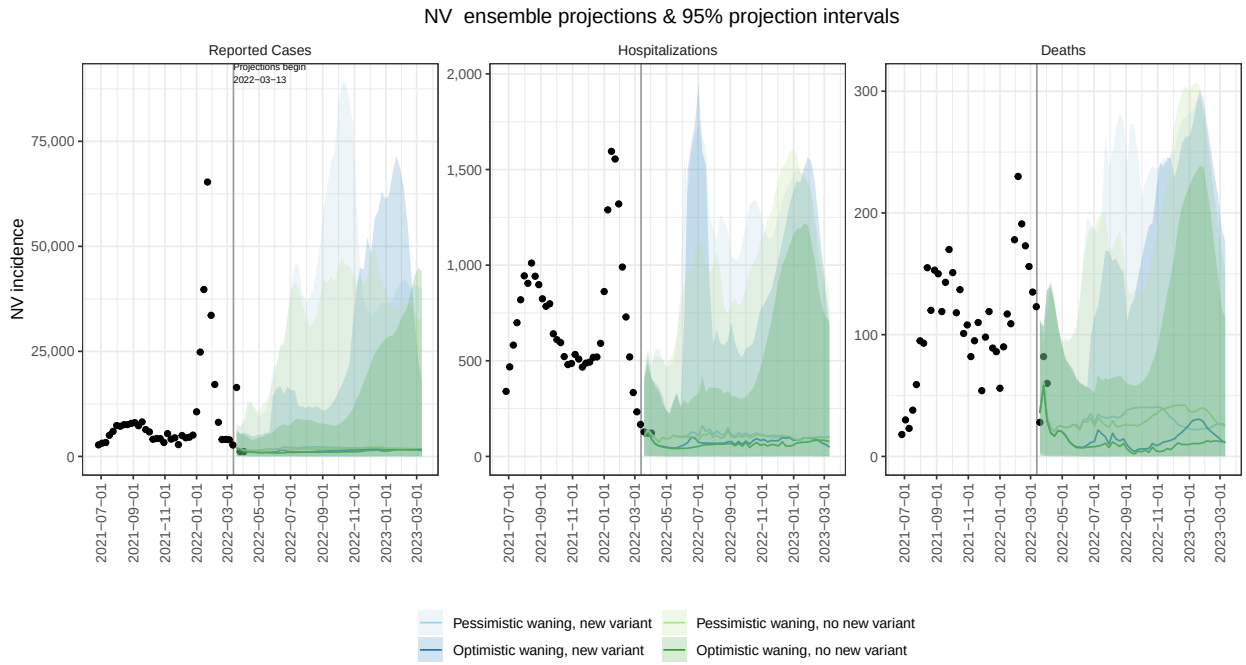

MN ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MN incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

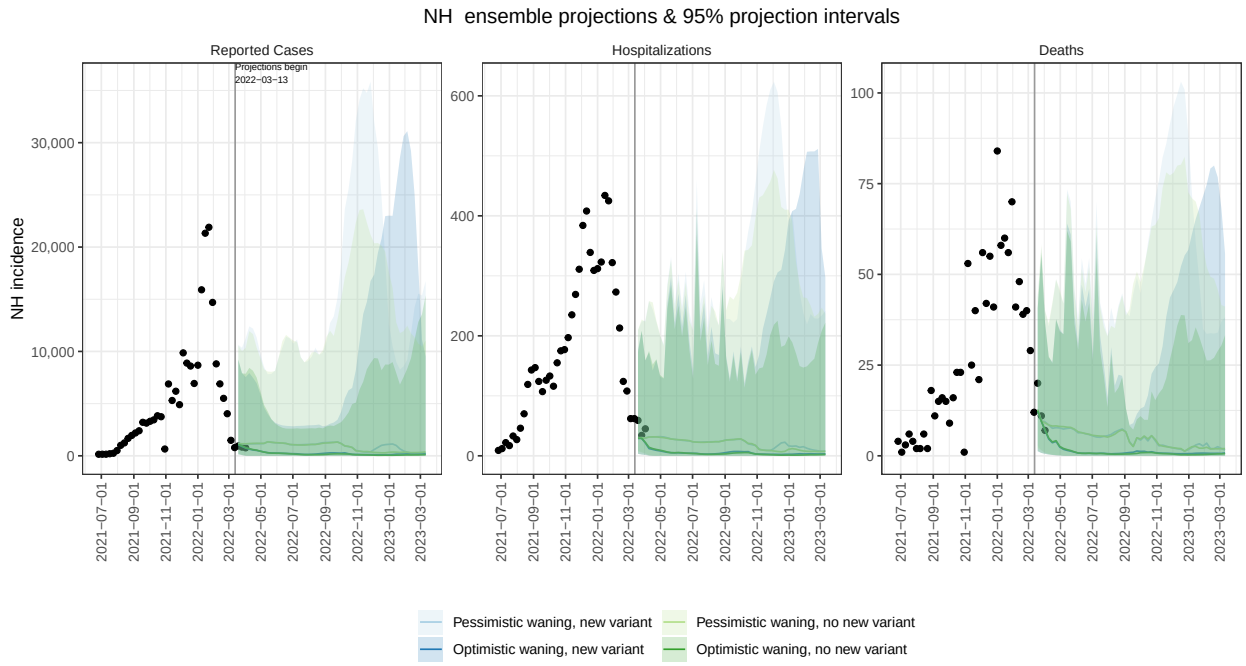

MS ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MS incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

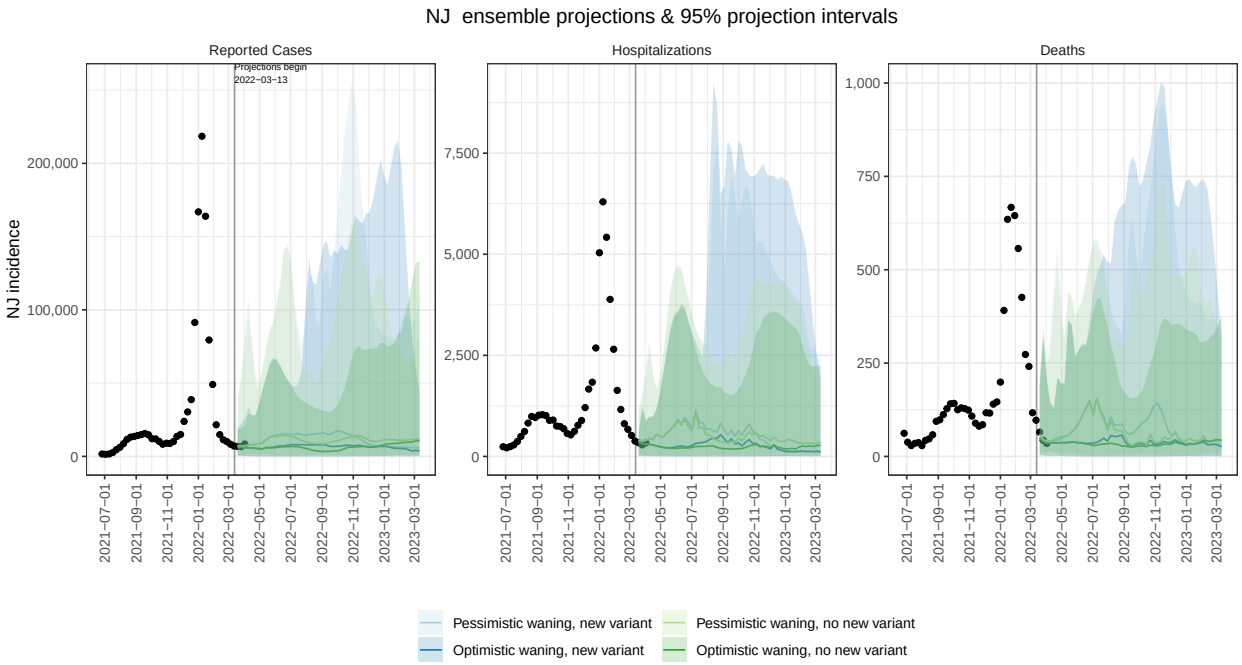

MO ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MO incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

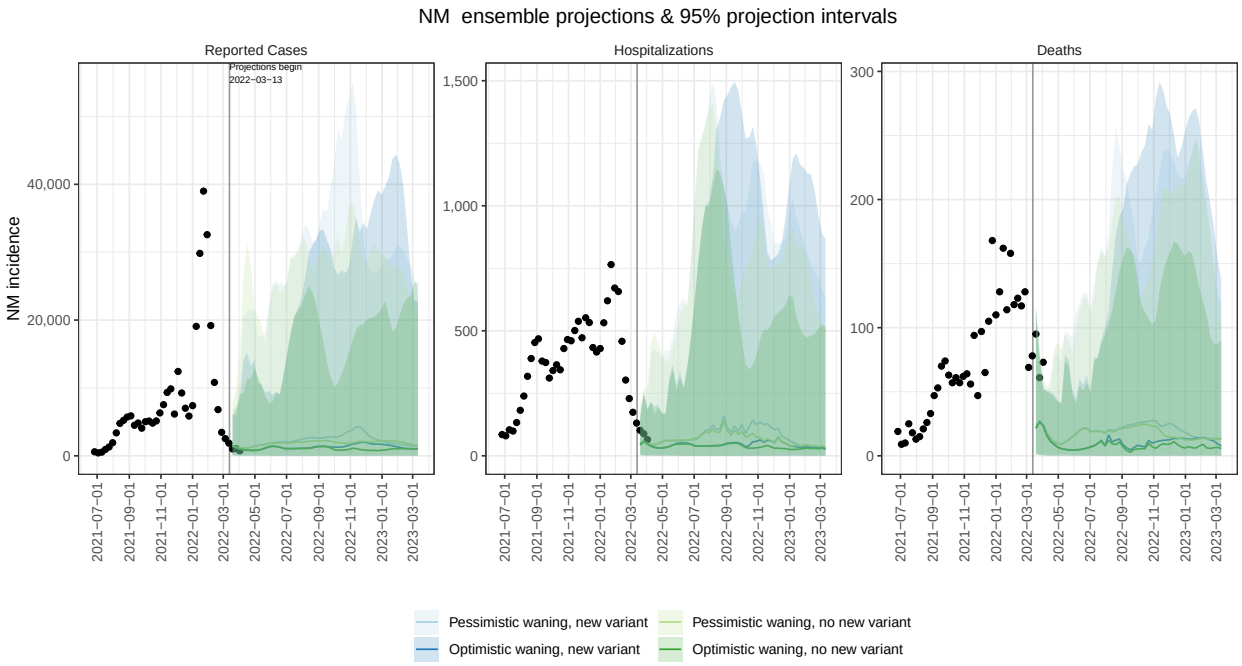

MT ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MT incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

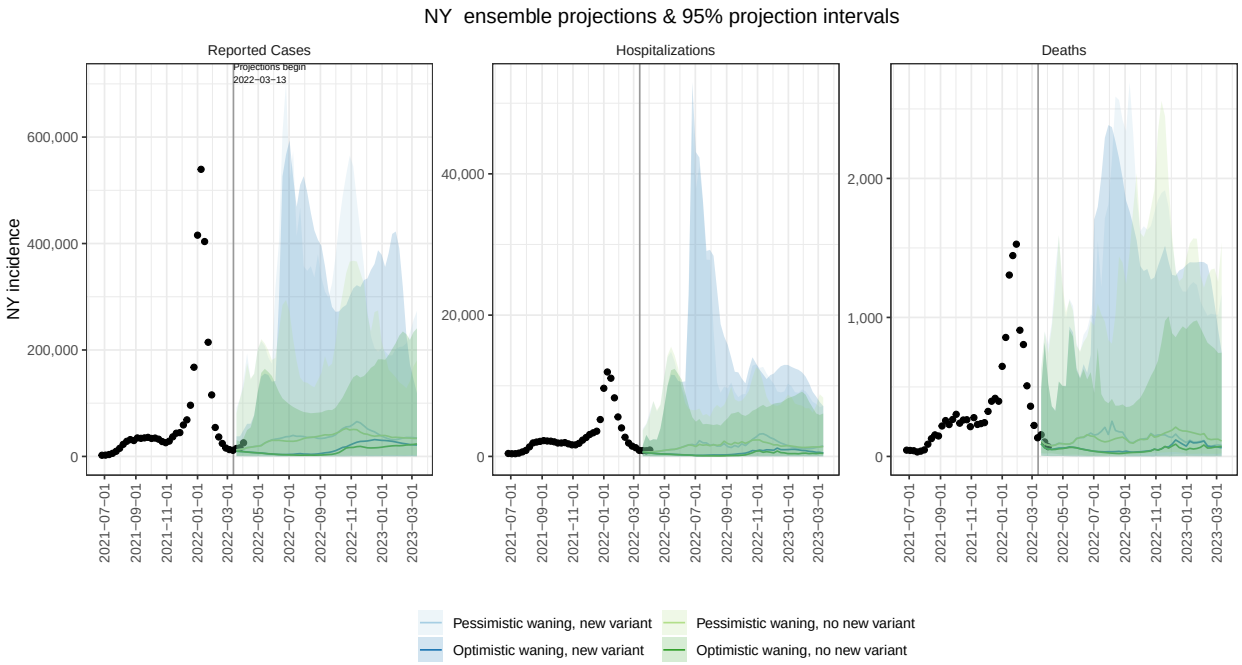

NE ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NE incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

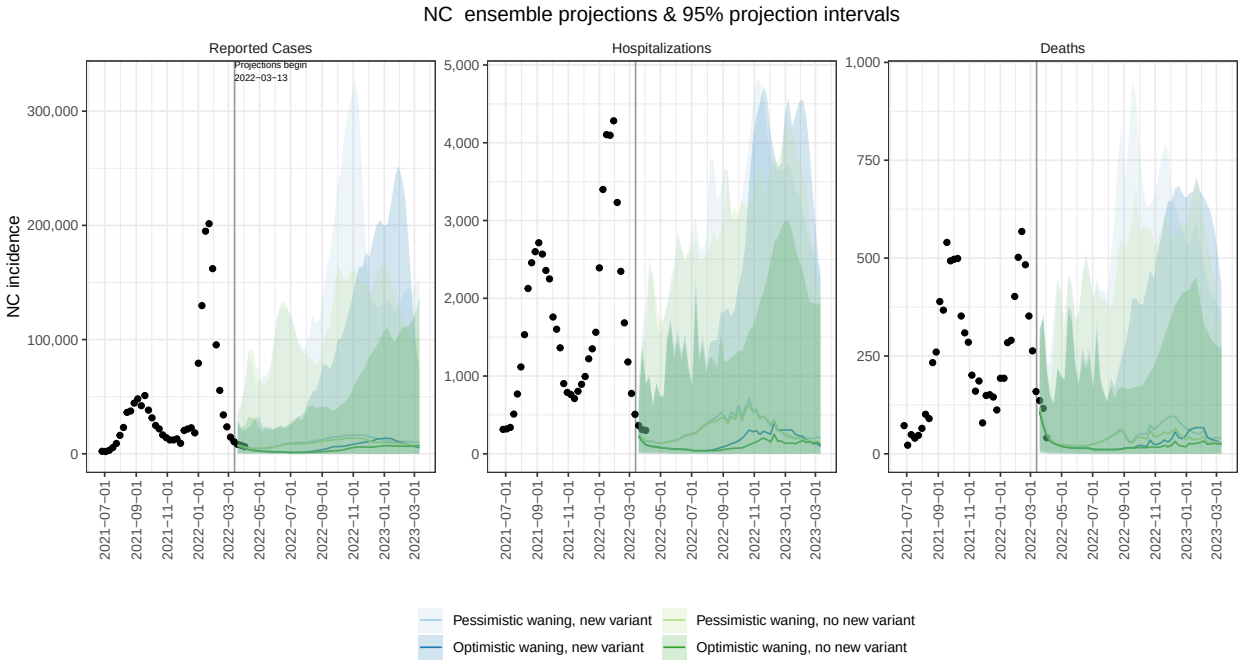

NV ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NV incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

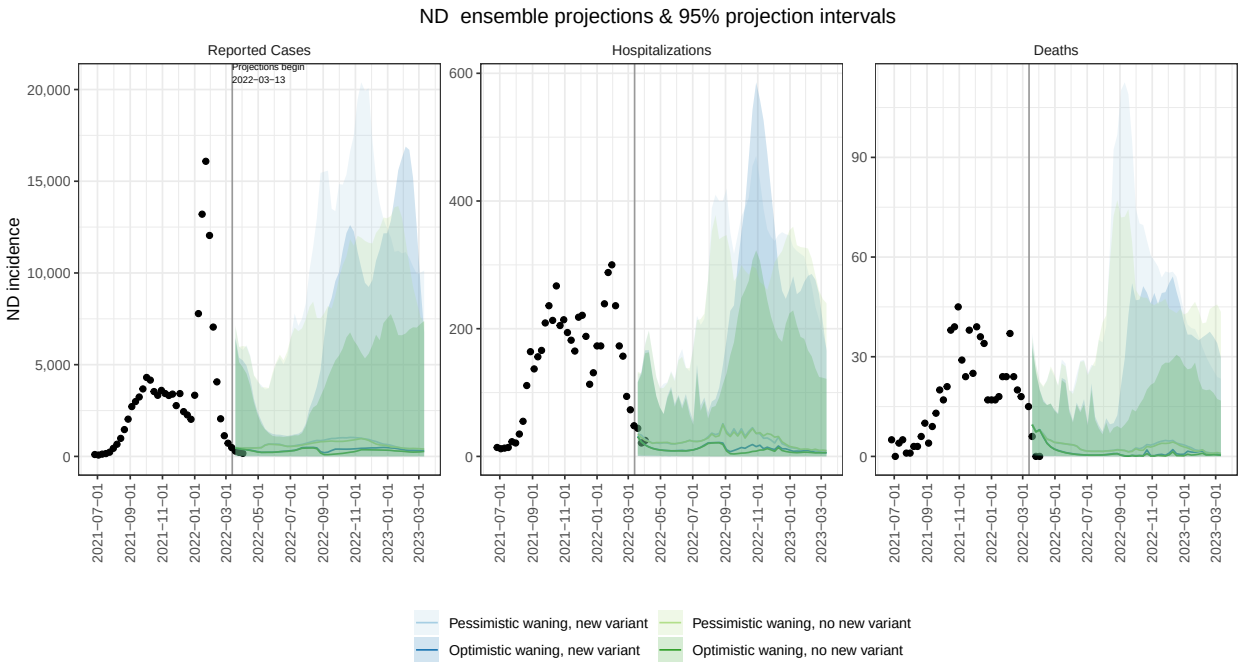

NH ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NH incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

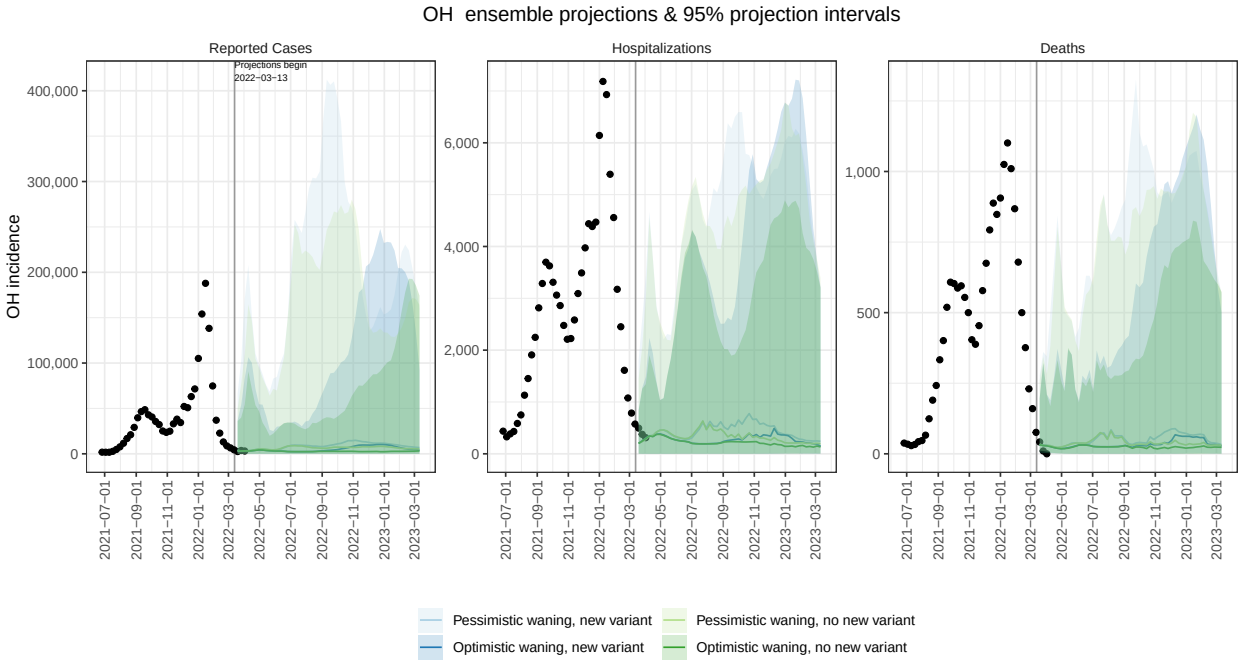

NJ ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NJ incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

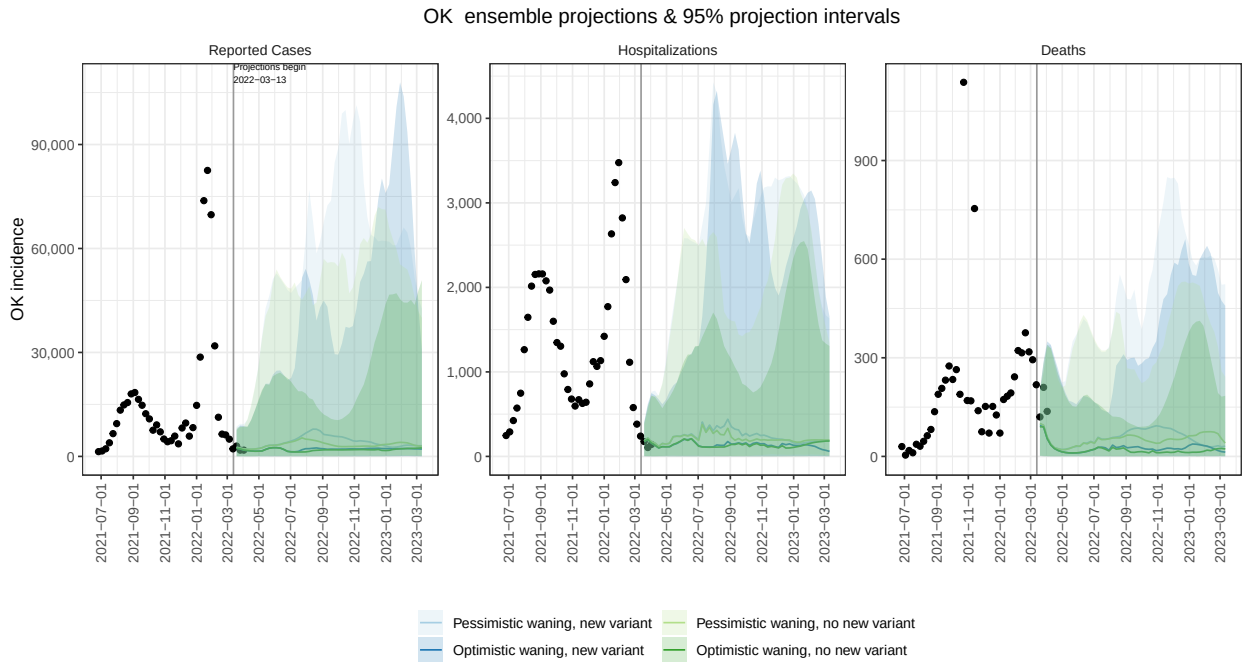

NM ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NM incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

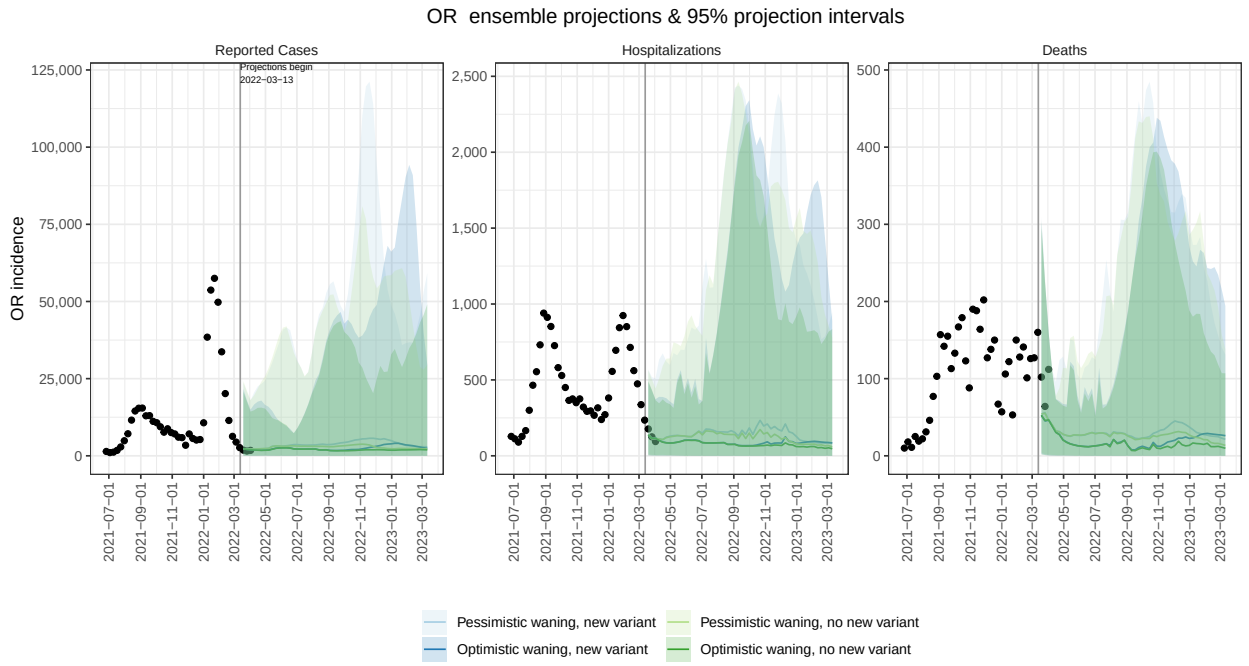

NY ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NY incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

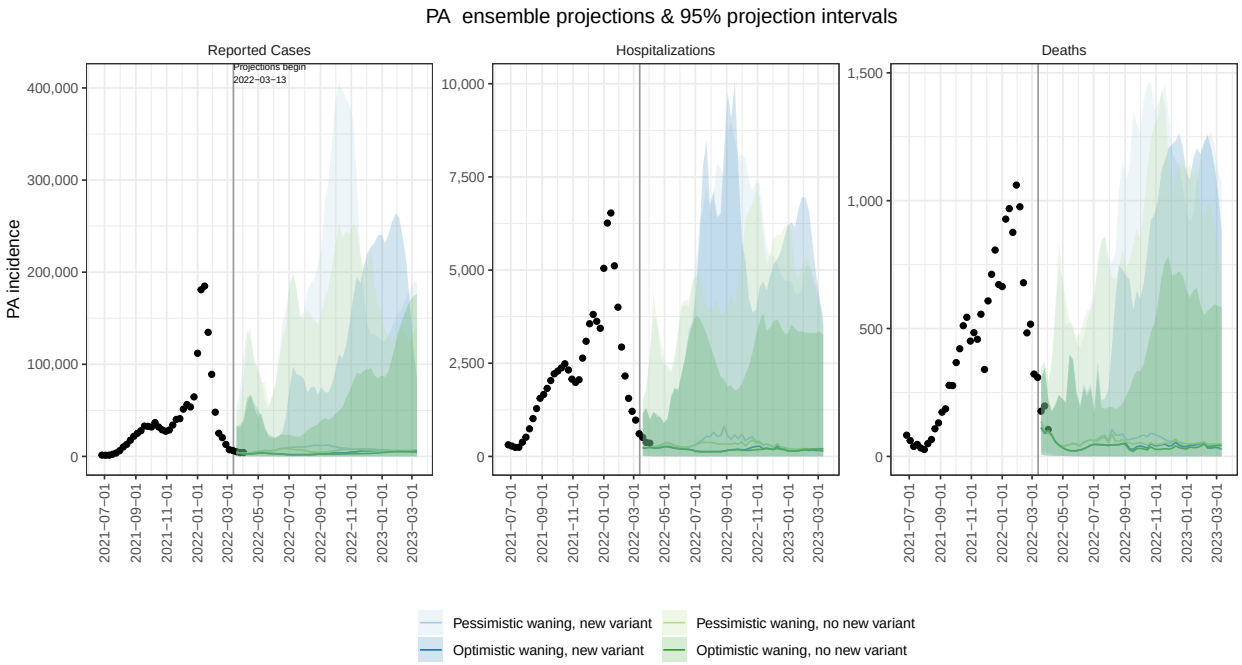

NC ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
NC incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

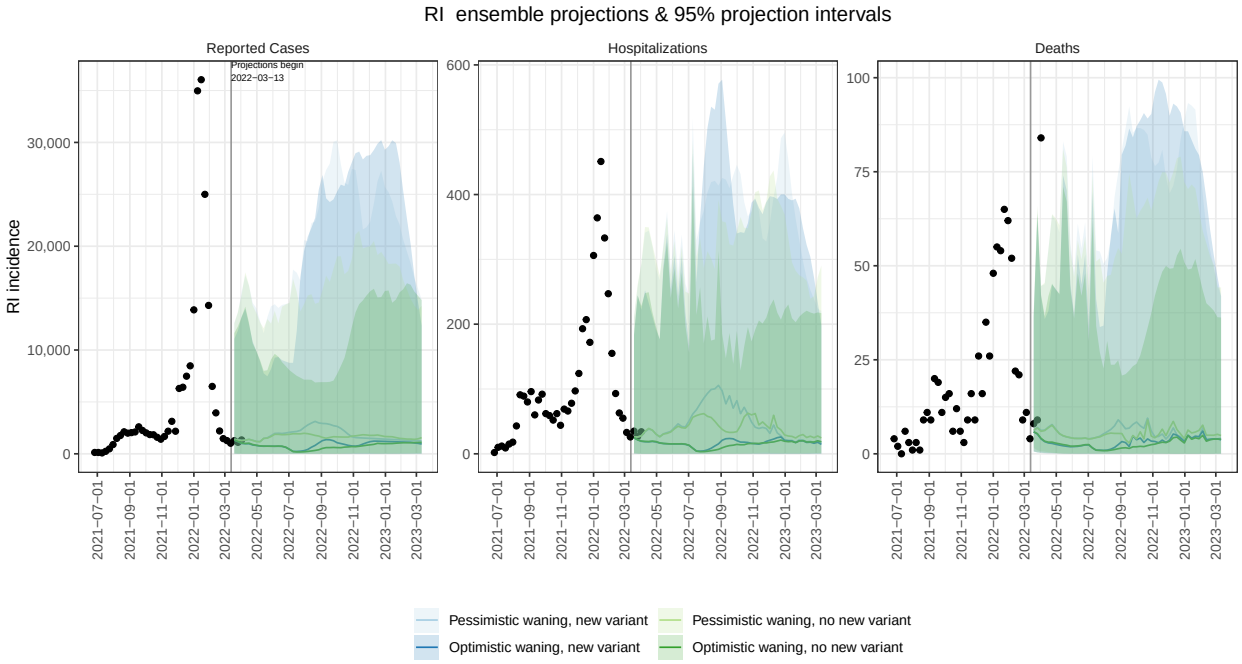

ND ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
ND incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

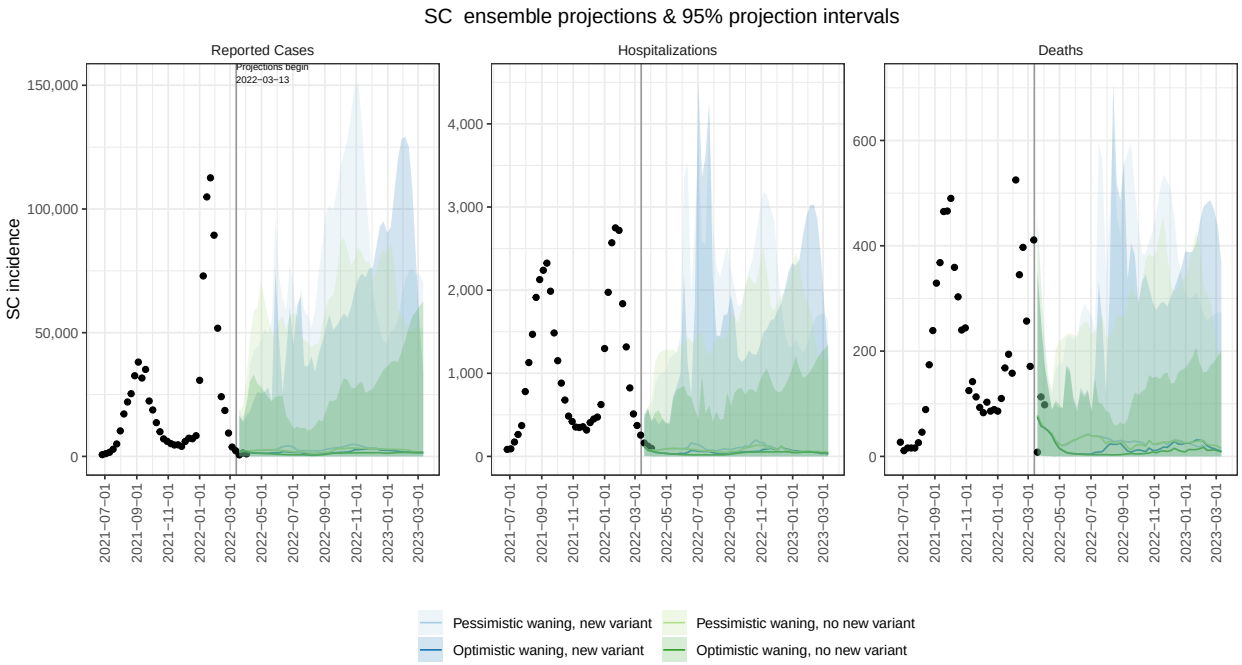

OH ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
OH incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

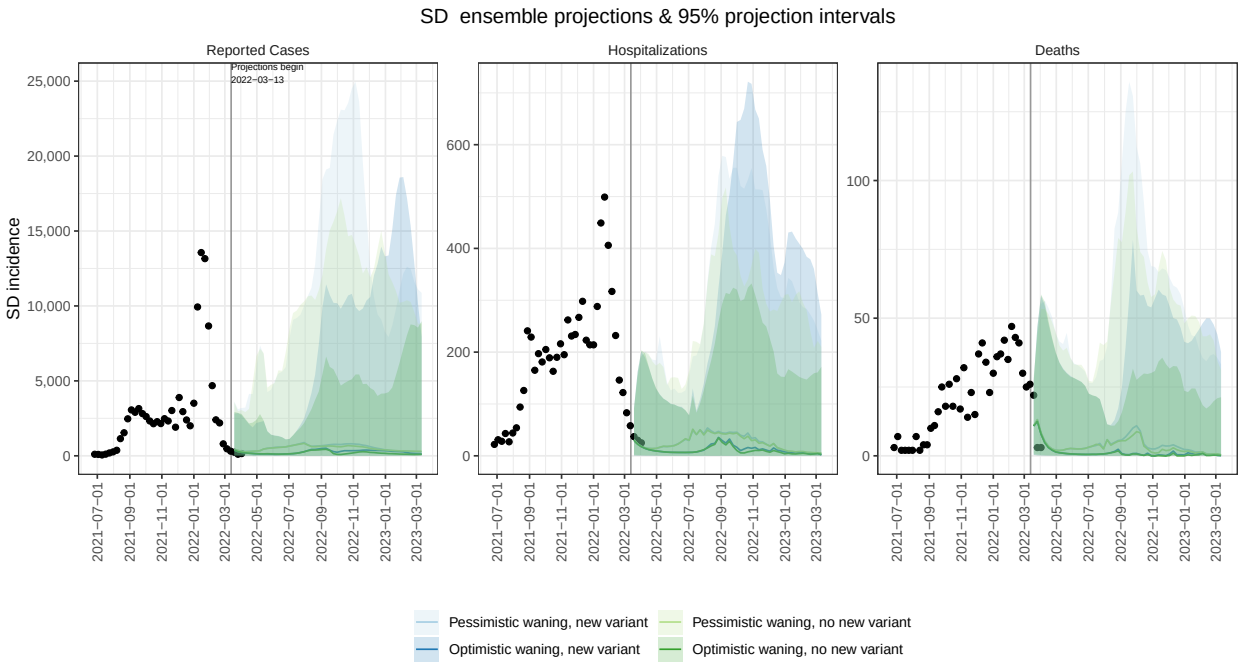

OK ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
OK incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

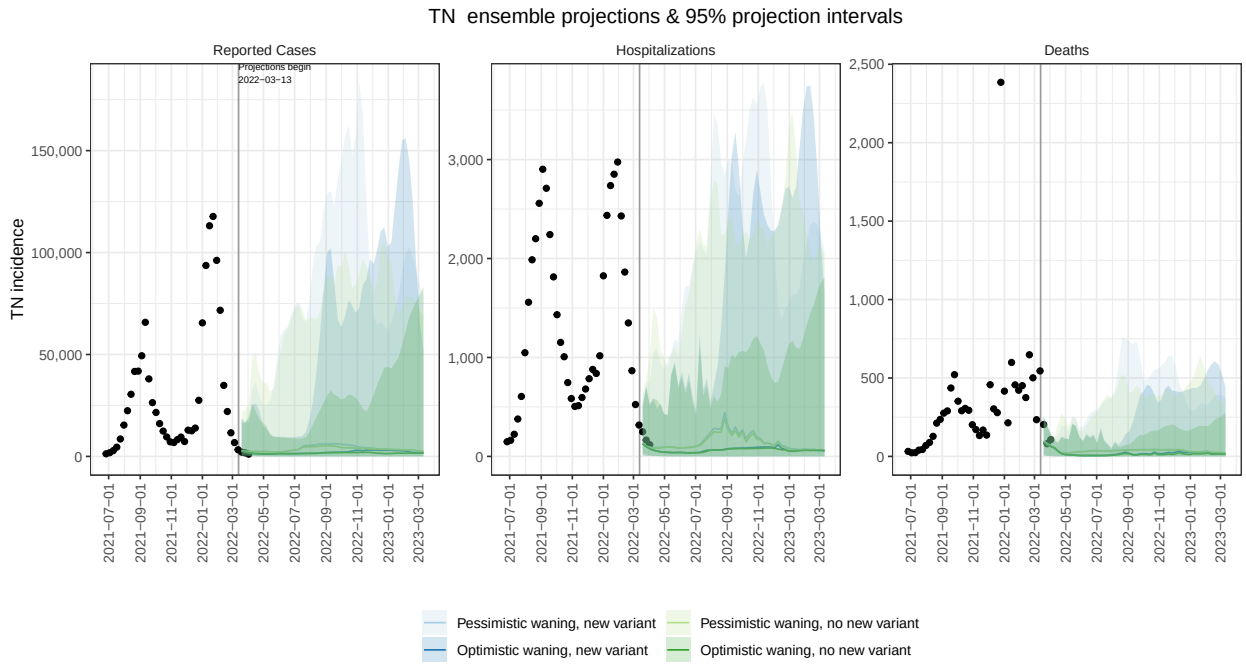

OR ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
OR incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

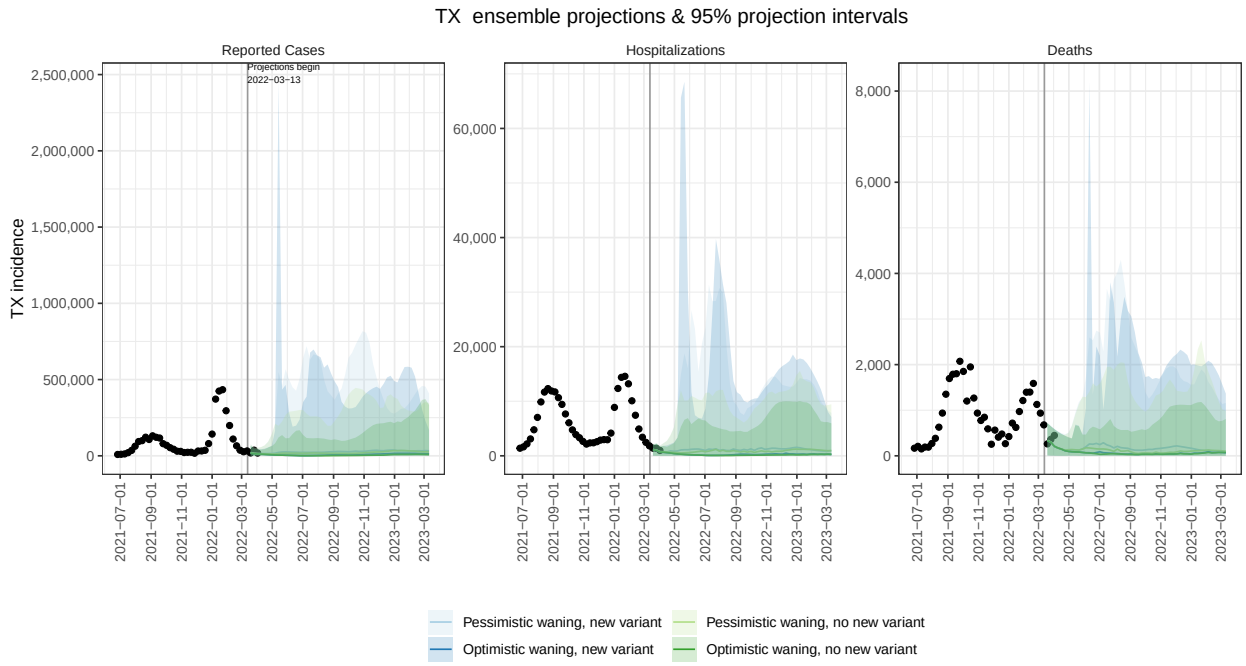

PA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
PA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

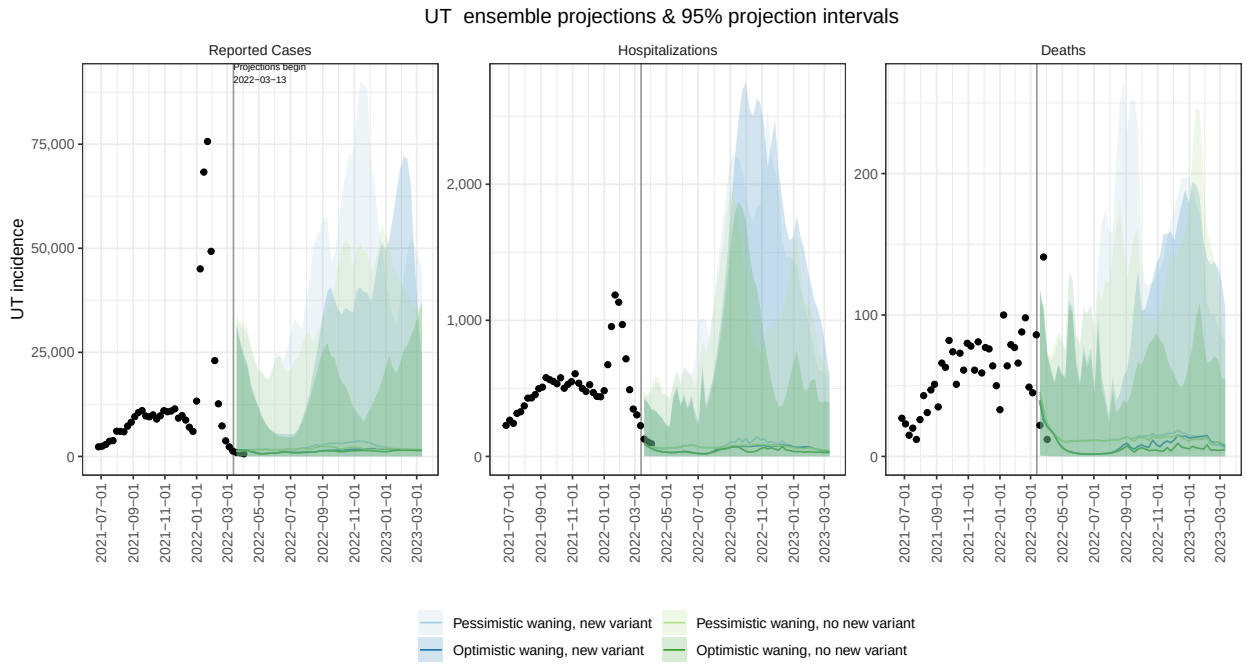

RI ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
RI incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

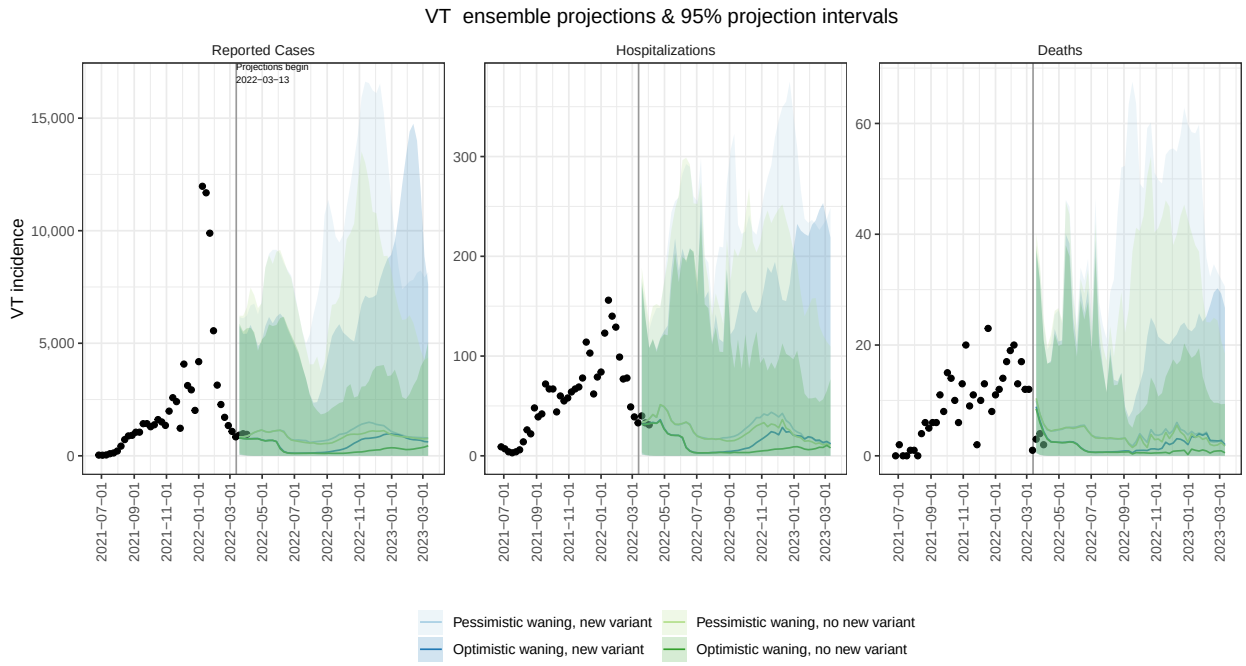

SC ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
SC incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

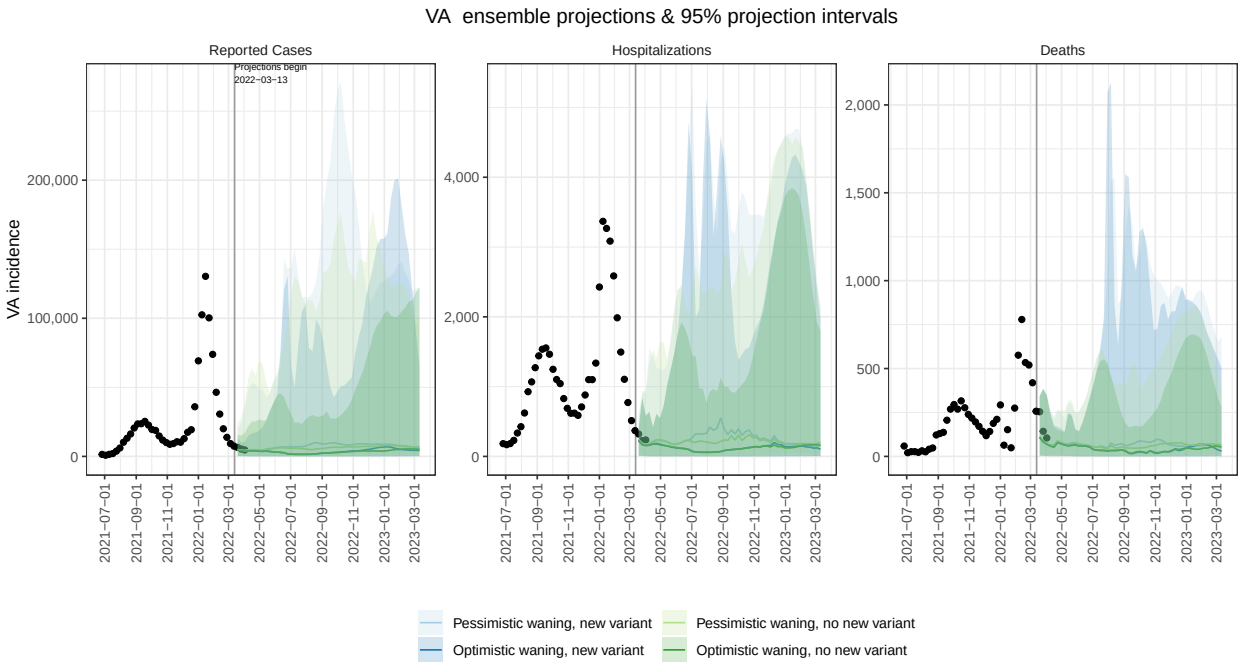

SD ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
SD incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

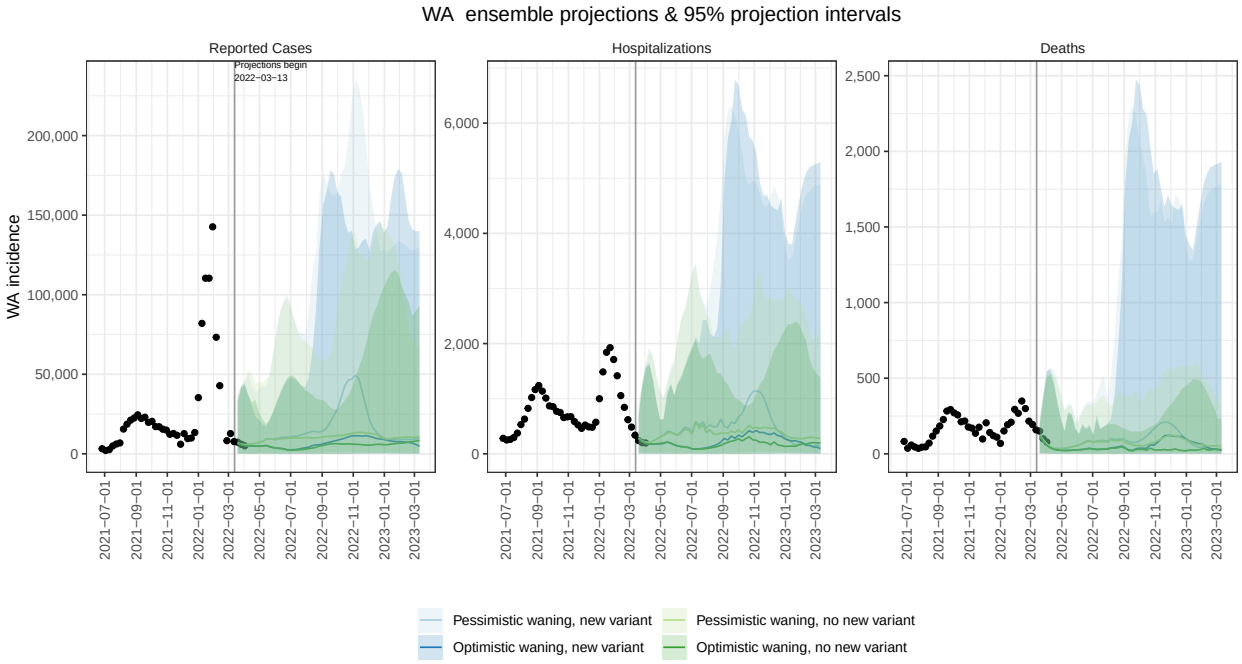

TN ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
TN incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

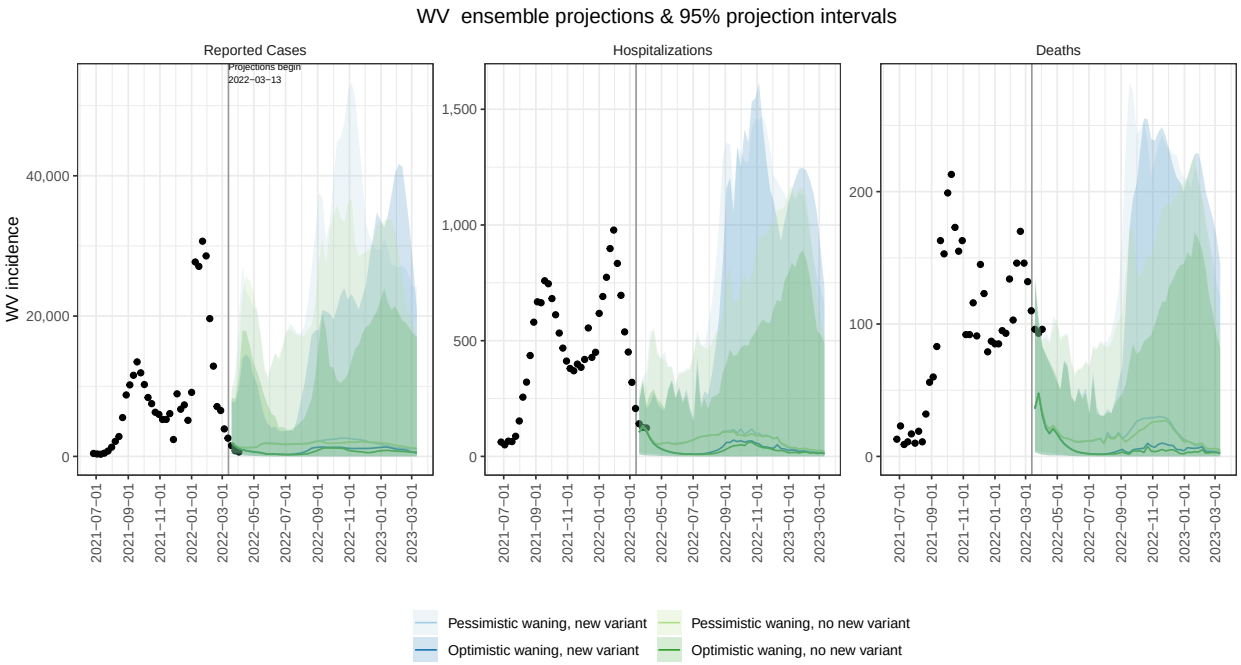

TX ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
TX incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

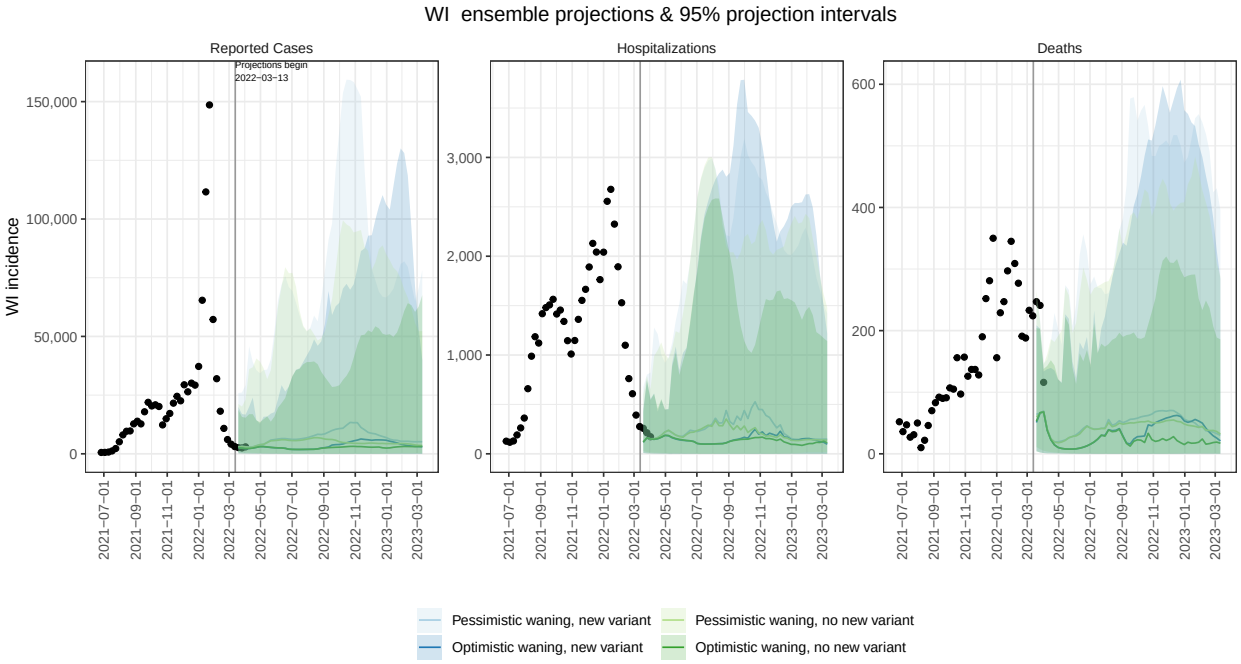

UT ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
UT incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

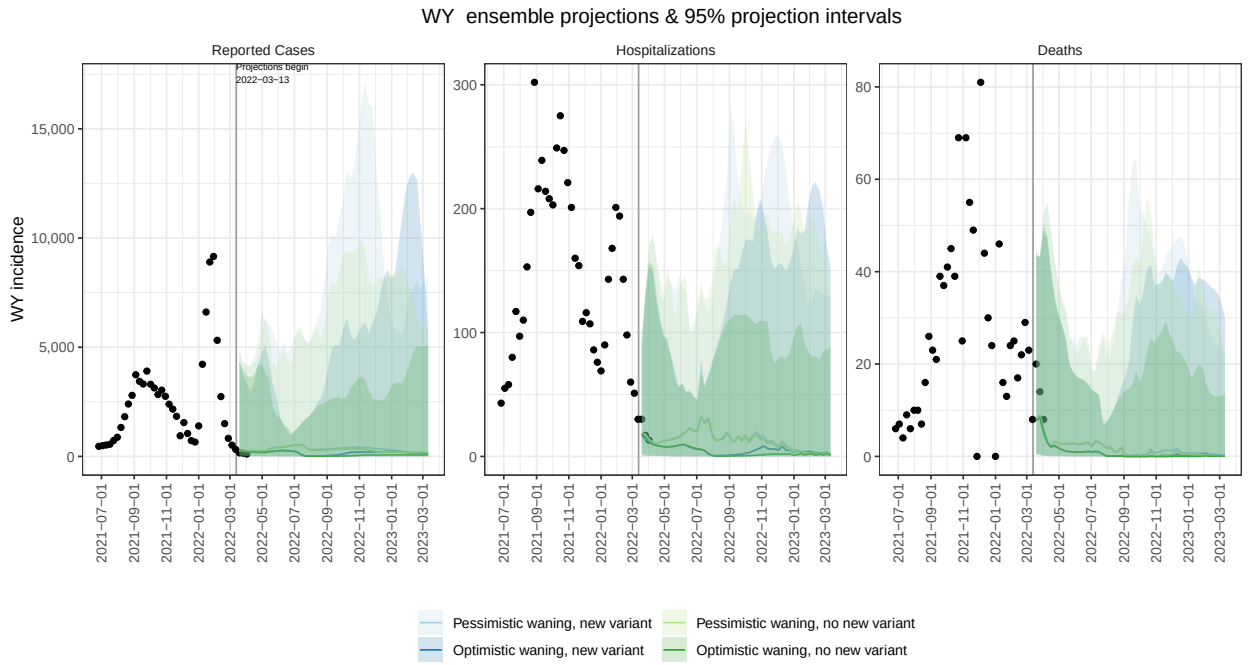

VT ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
VT incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

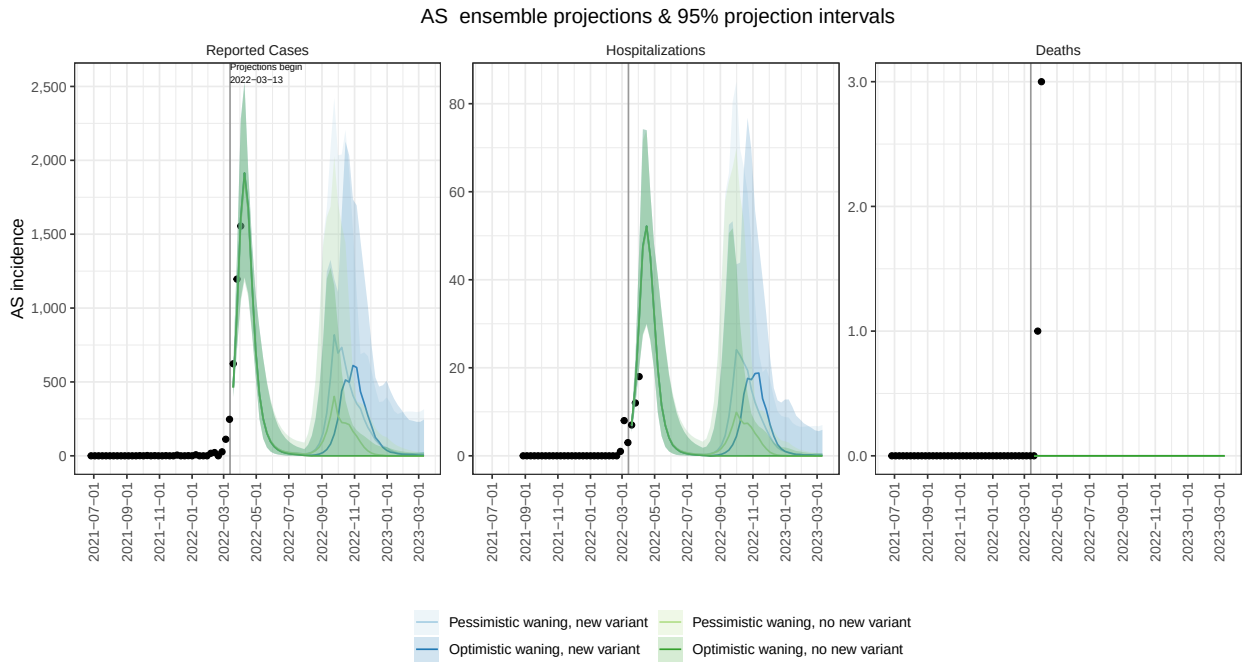

VA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
VA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

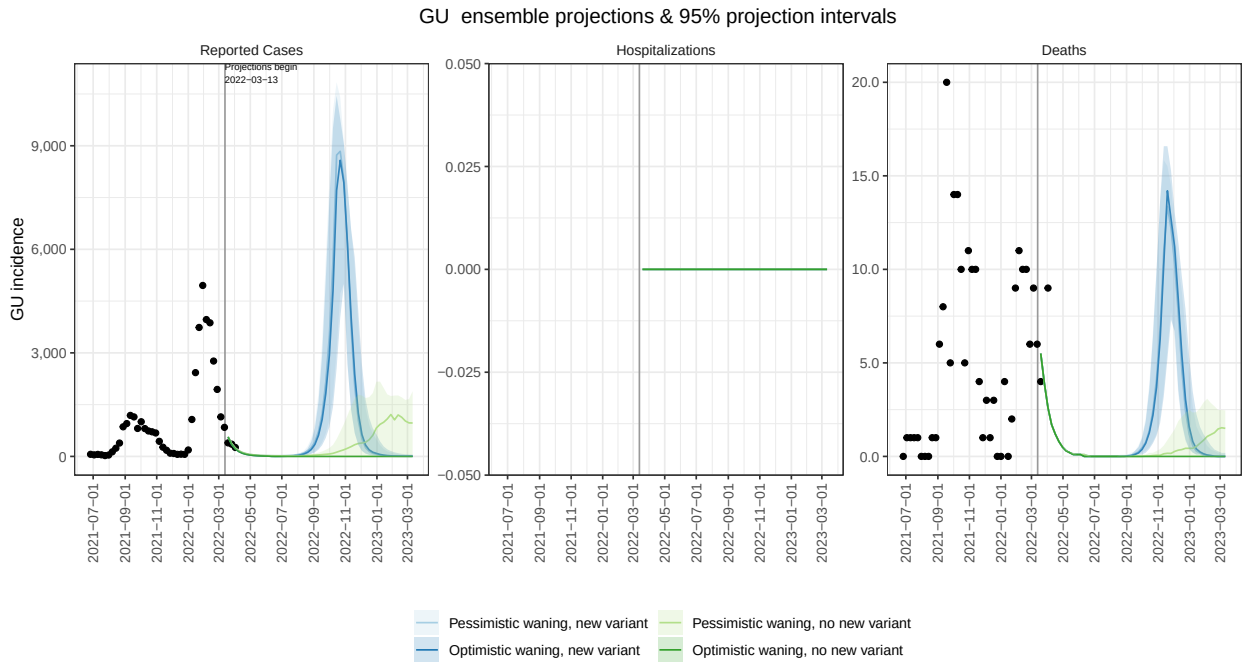

WA ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
WA incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

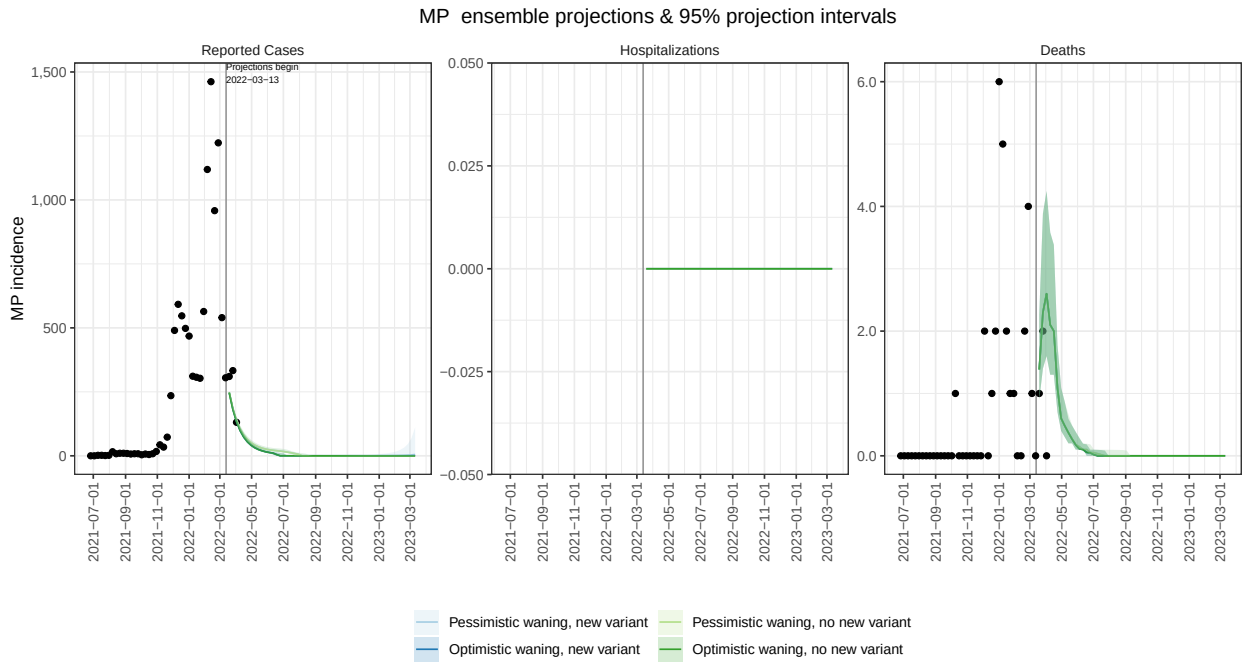

WV ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
WV incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

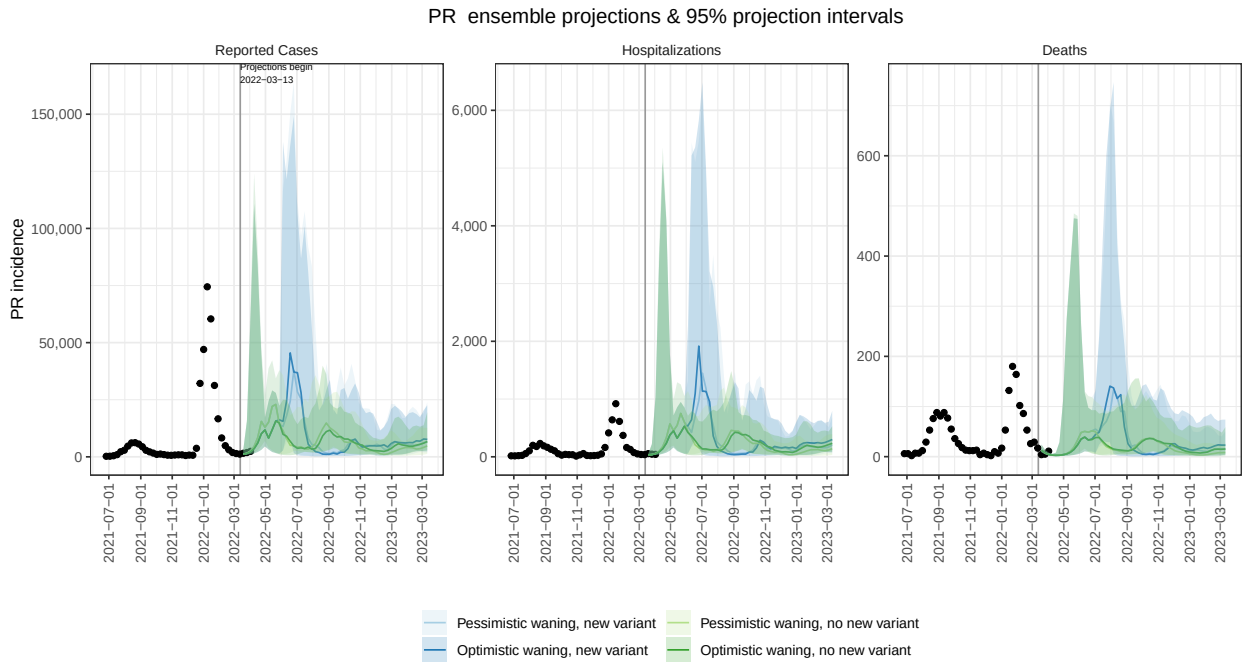

WI ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
WI incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

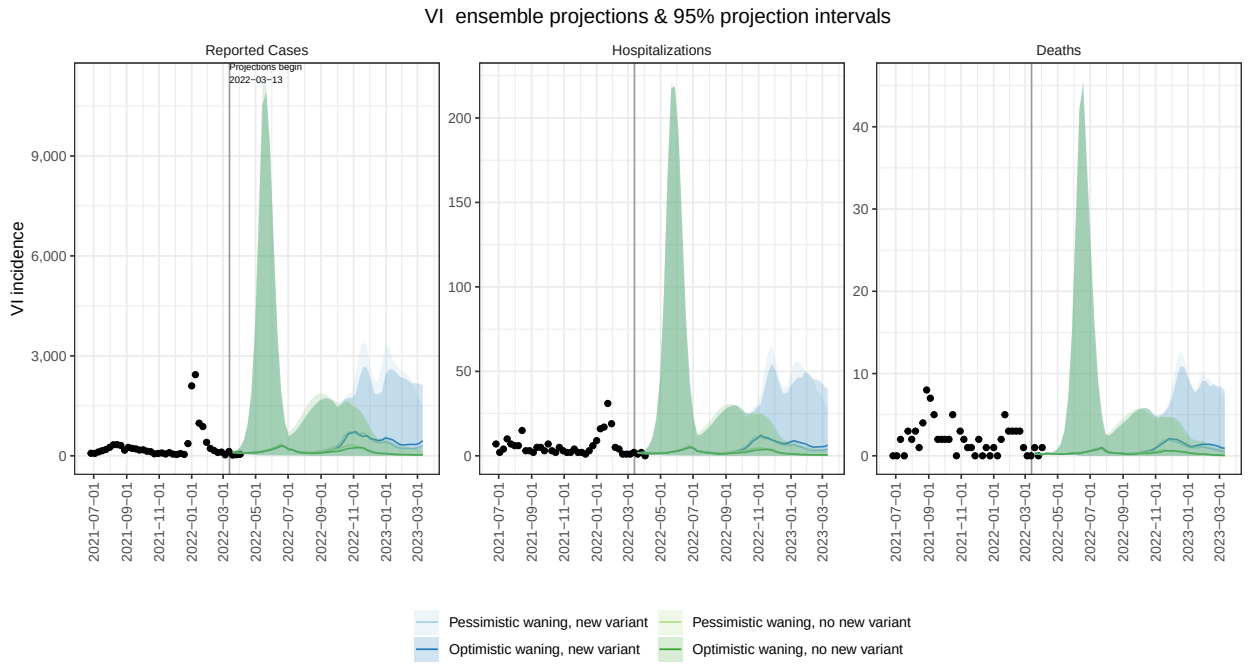

WY ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
WY incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant


AS ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
AS incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant


GU ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
GU incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

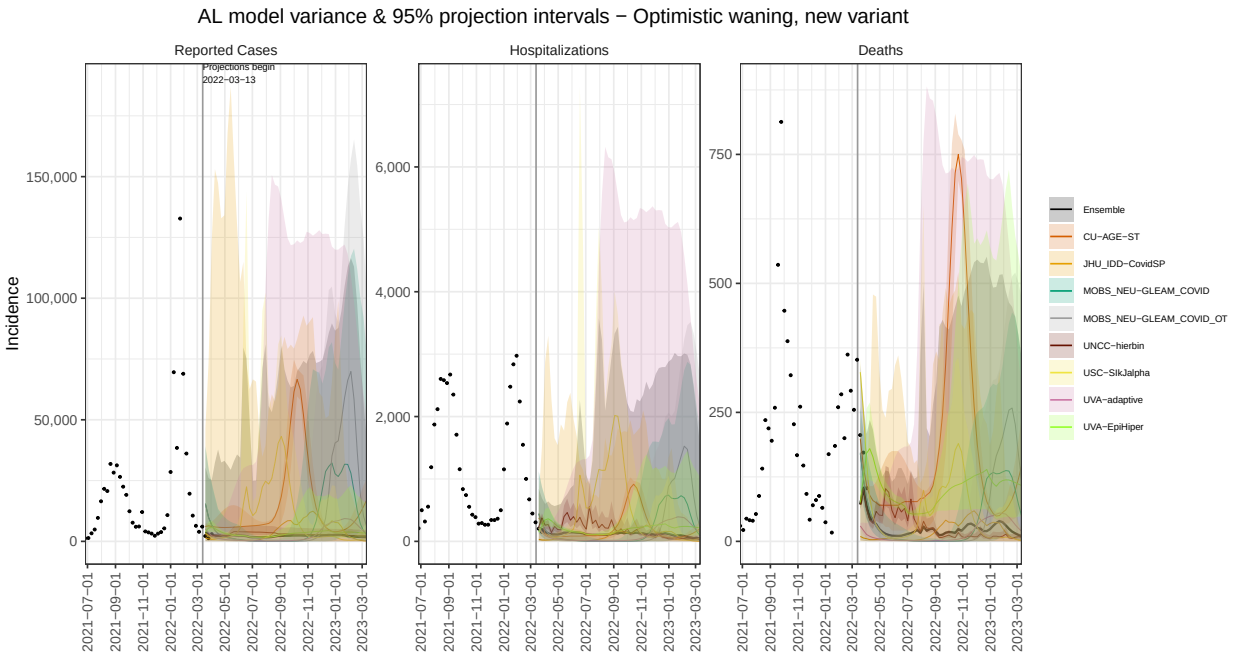

MP ensemble projections & 95% projection intervals
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
MP incidence
Pessimistic waning, new variant
Pessimistic waning, no new variant
Optimistic waning, new variant
Optimistic waning, no new variant

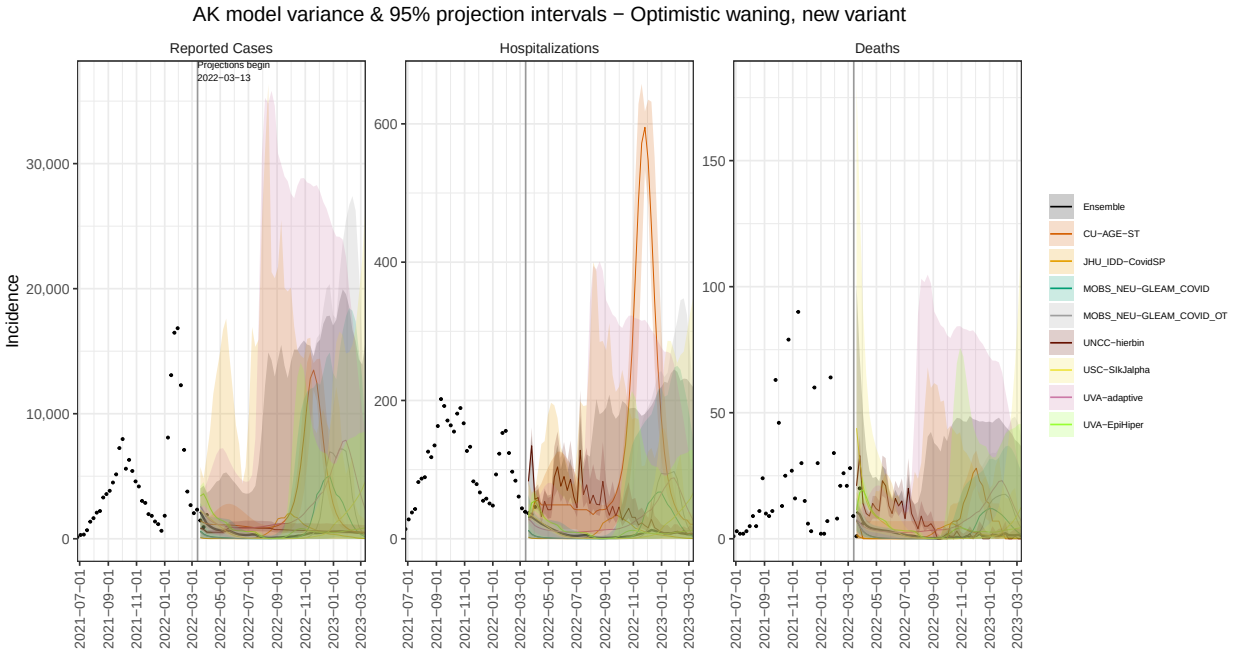


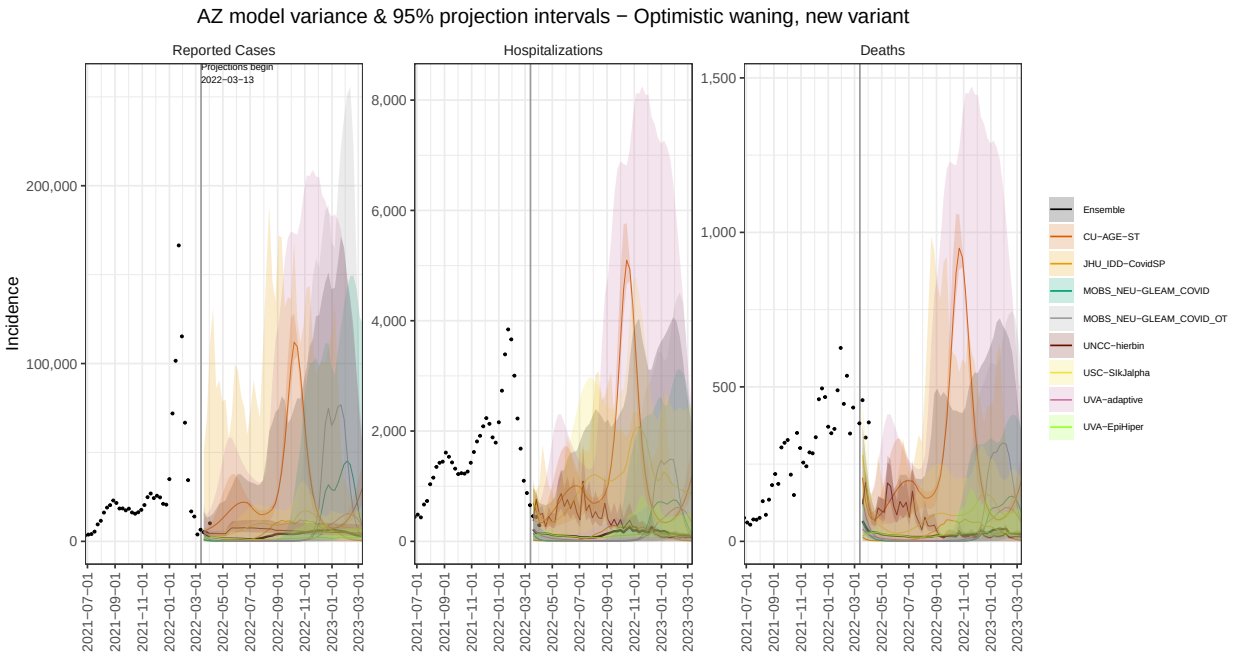


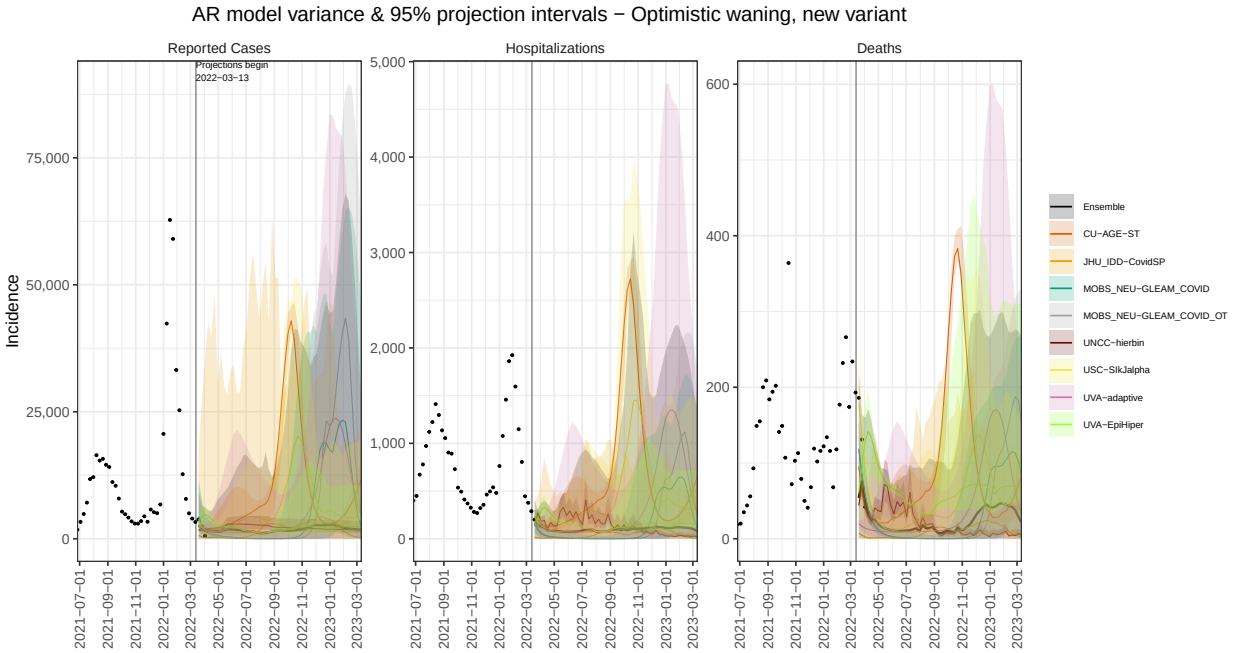
State-level model variation

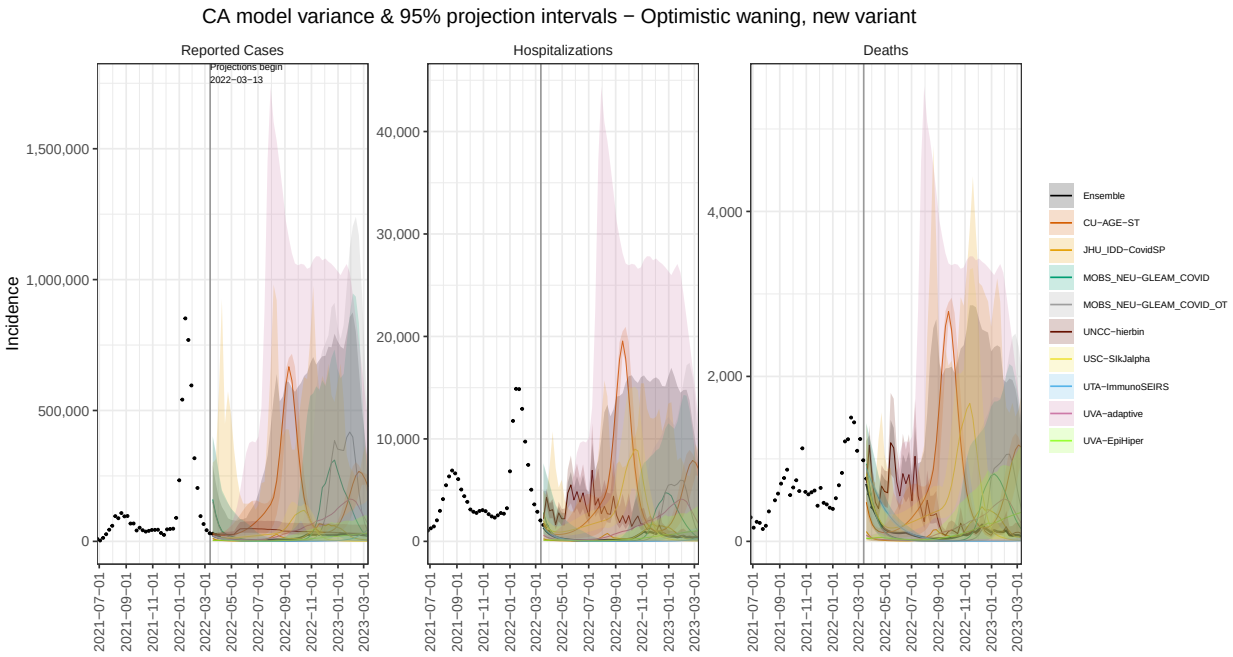
National model variation for optimistic waning, new immune escape variant scenario.

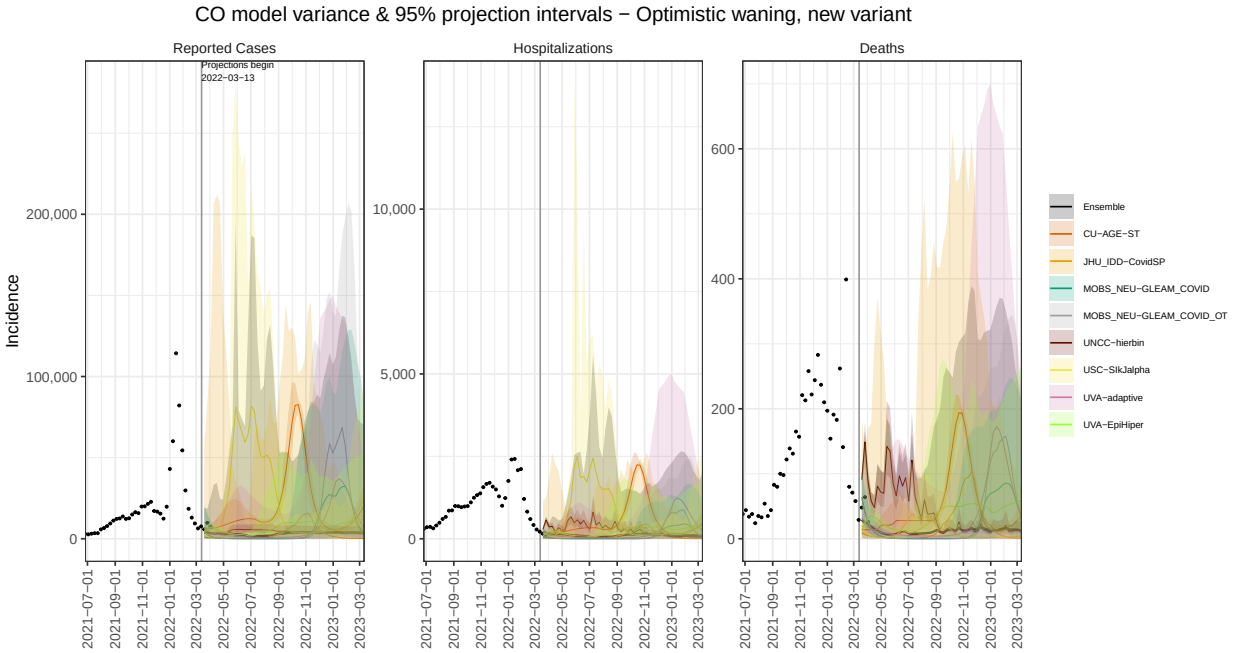

AL model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

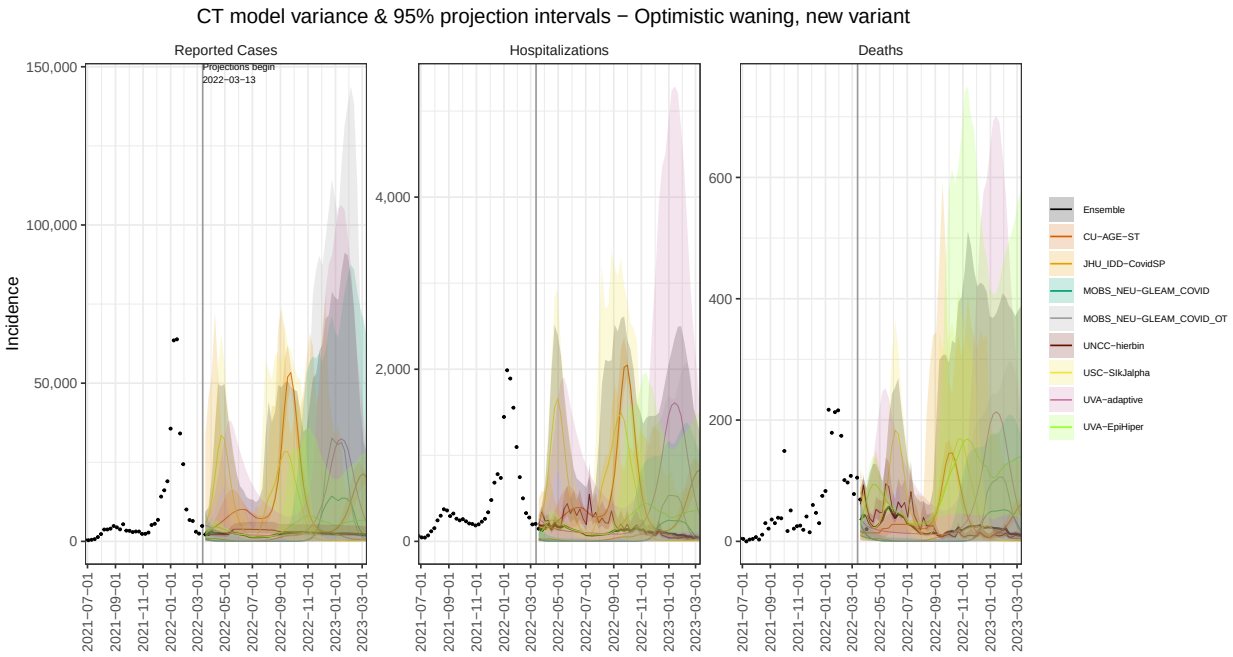

AK model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

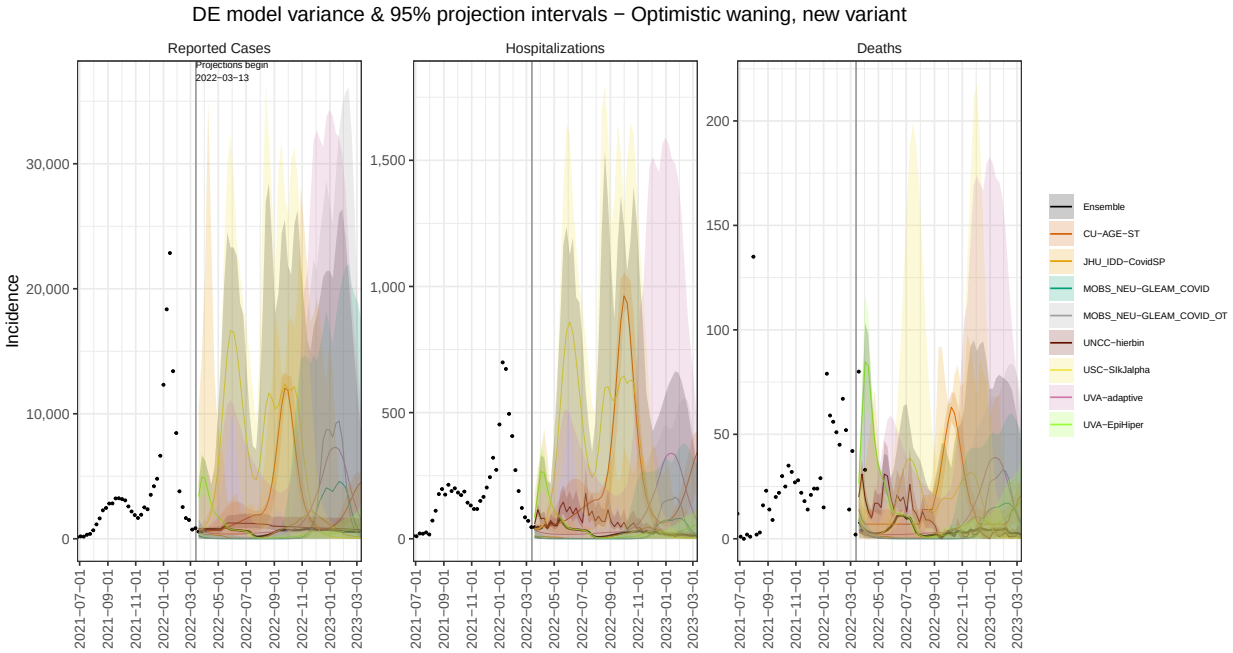

AZ model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

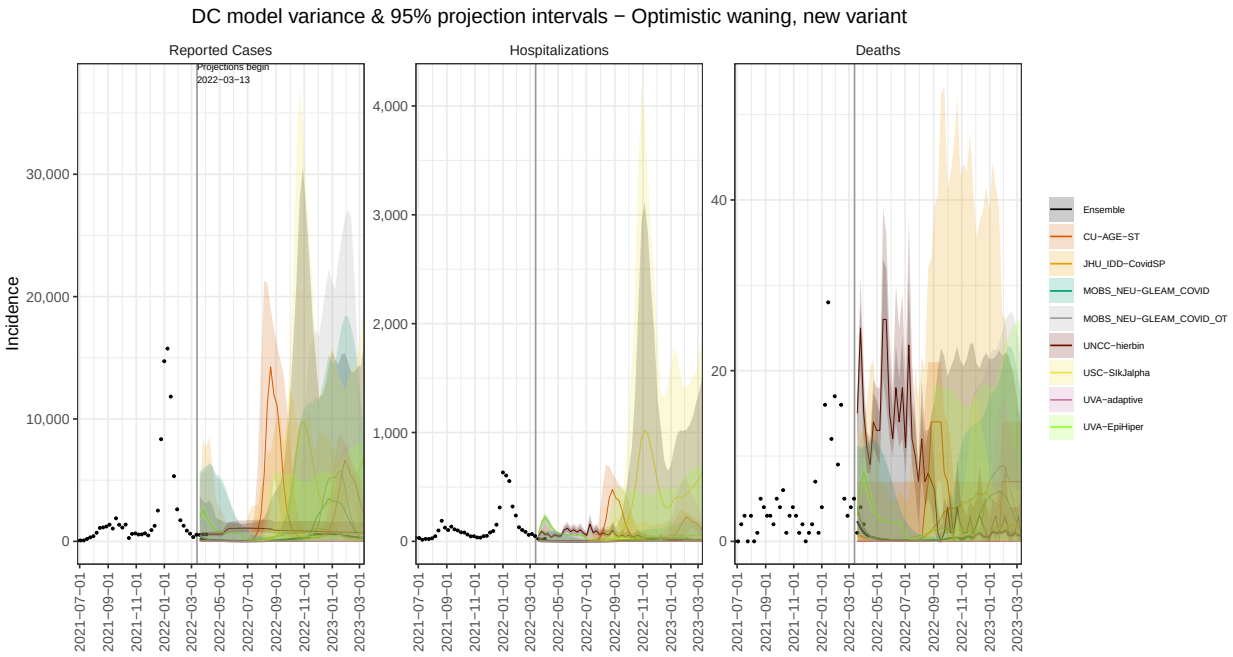

AR model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

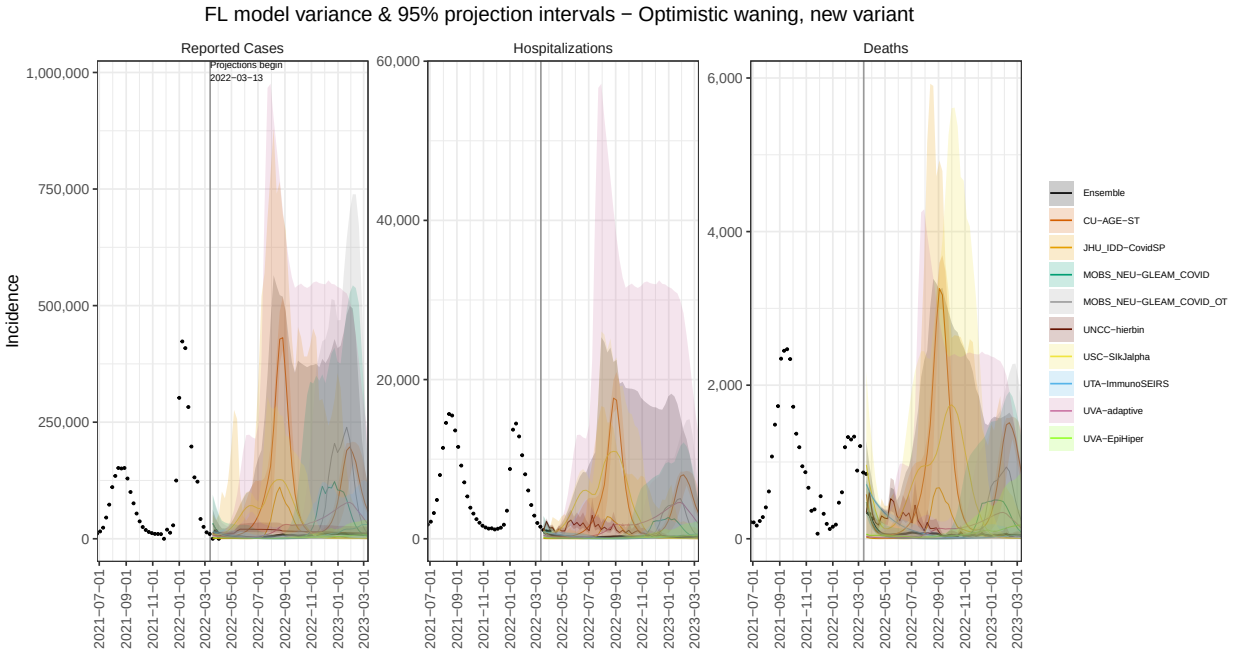

CA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

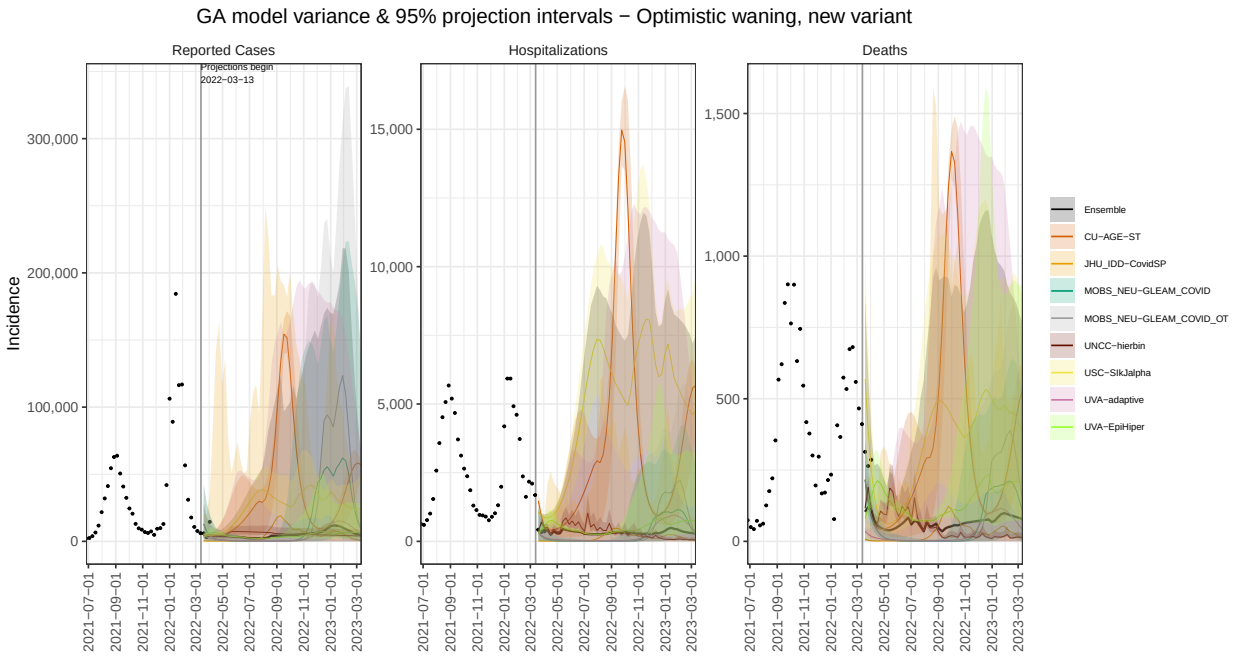

CO model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

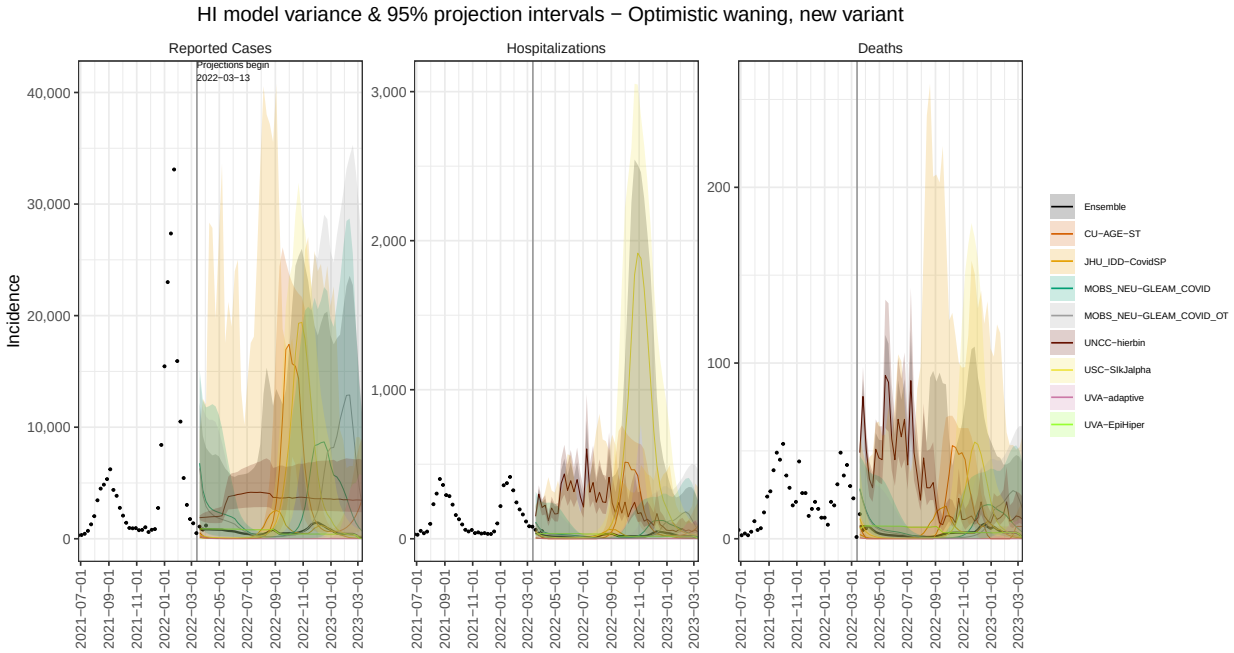

CT model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

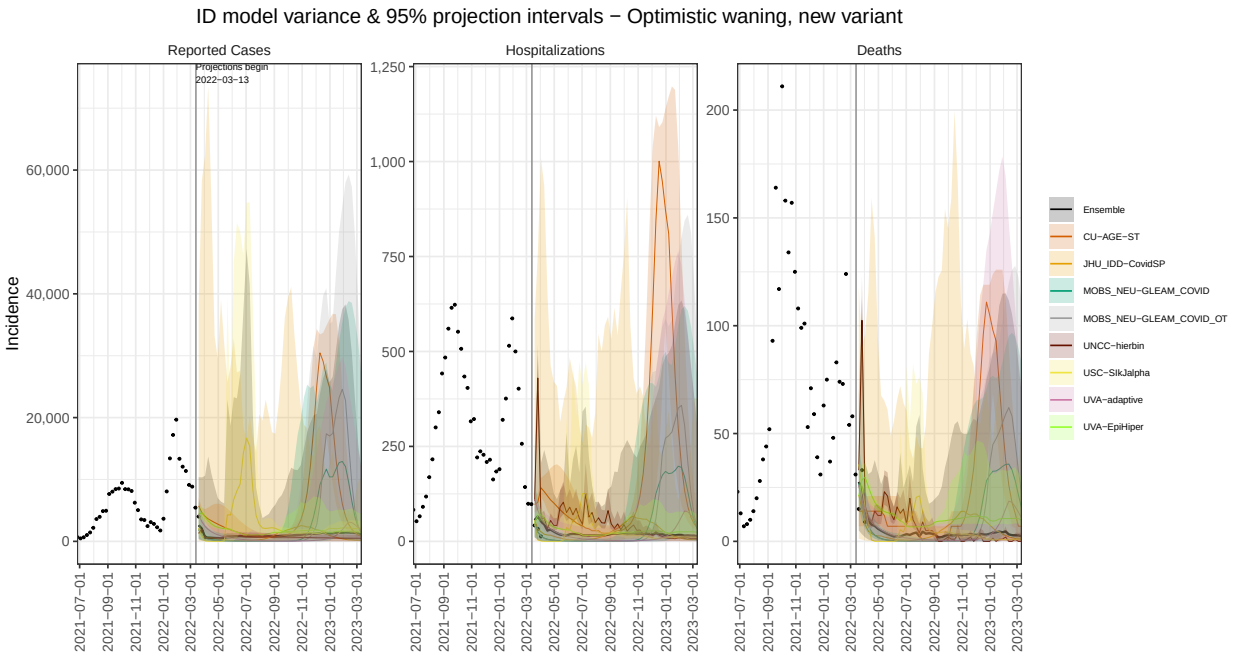

DE model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

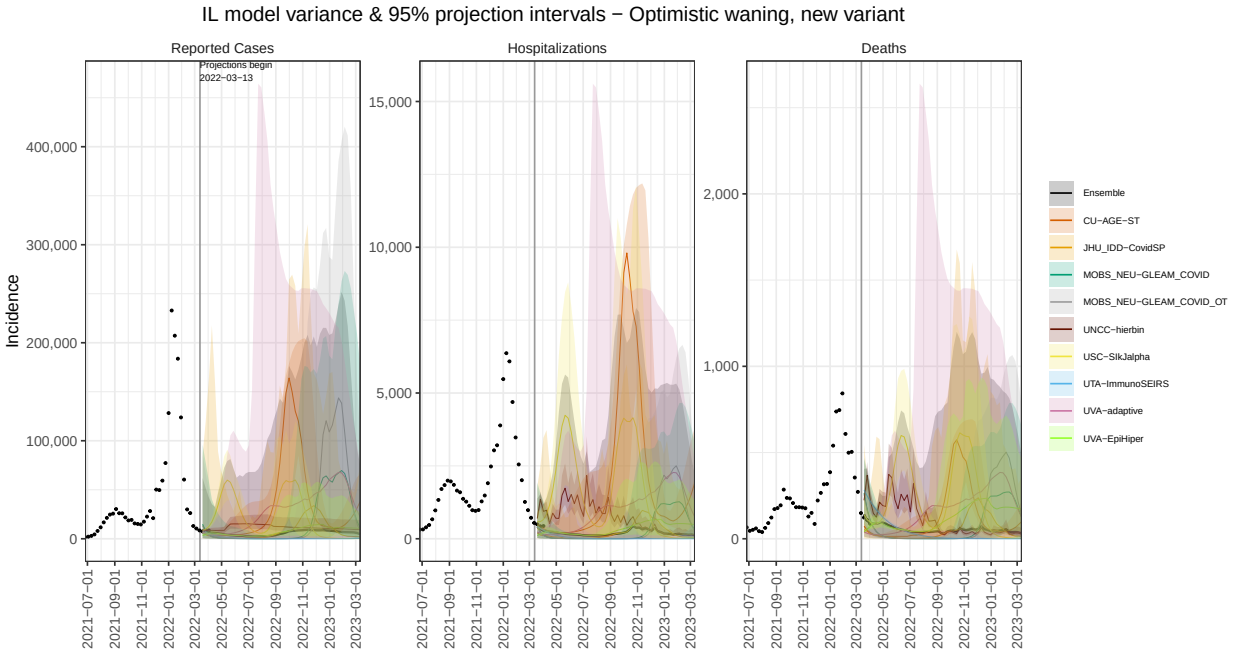

DC model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

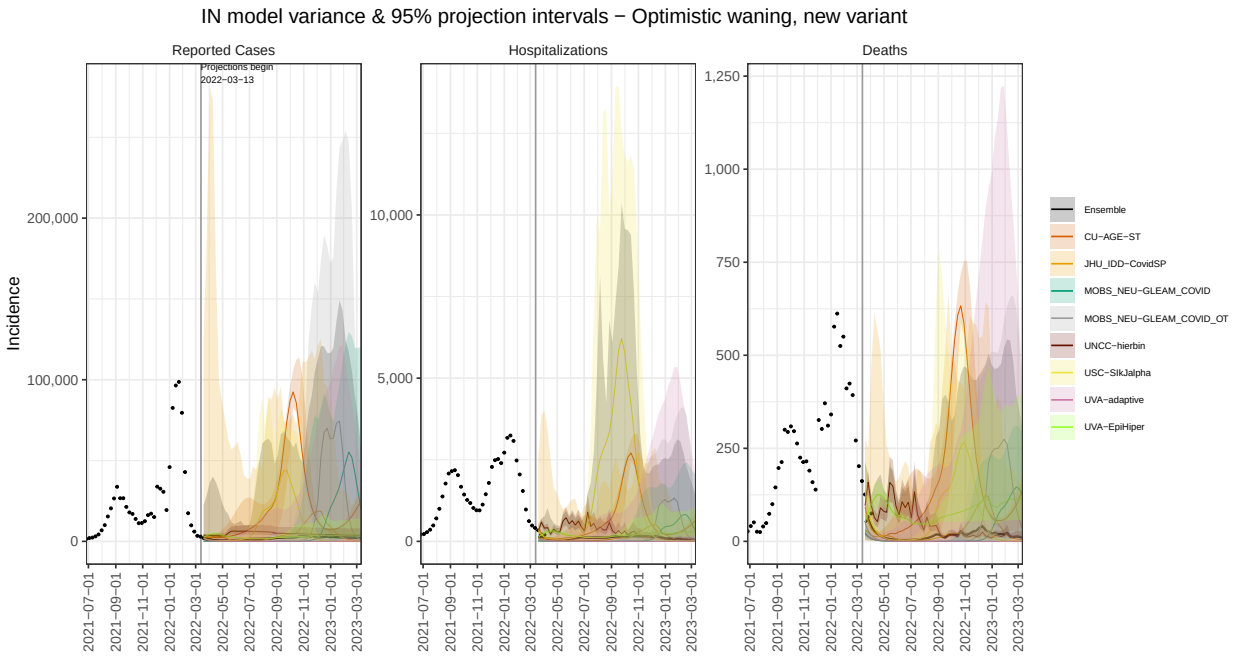

FL model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

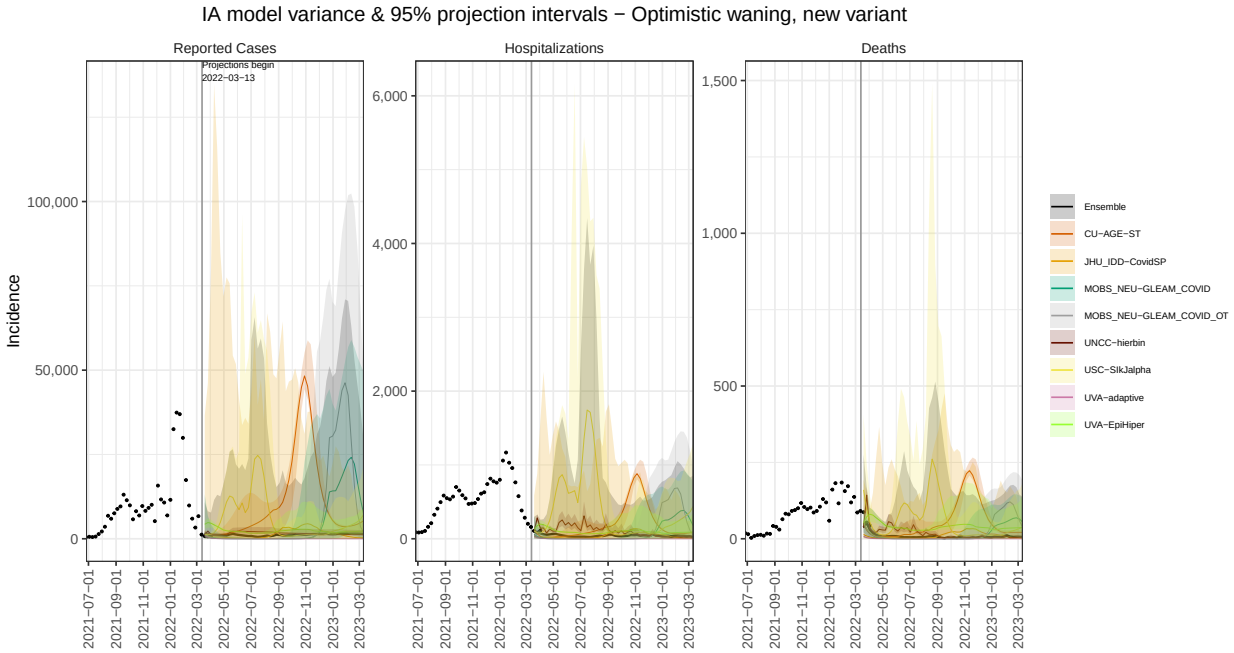

GA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


HI model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

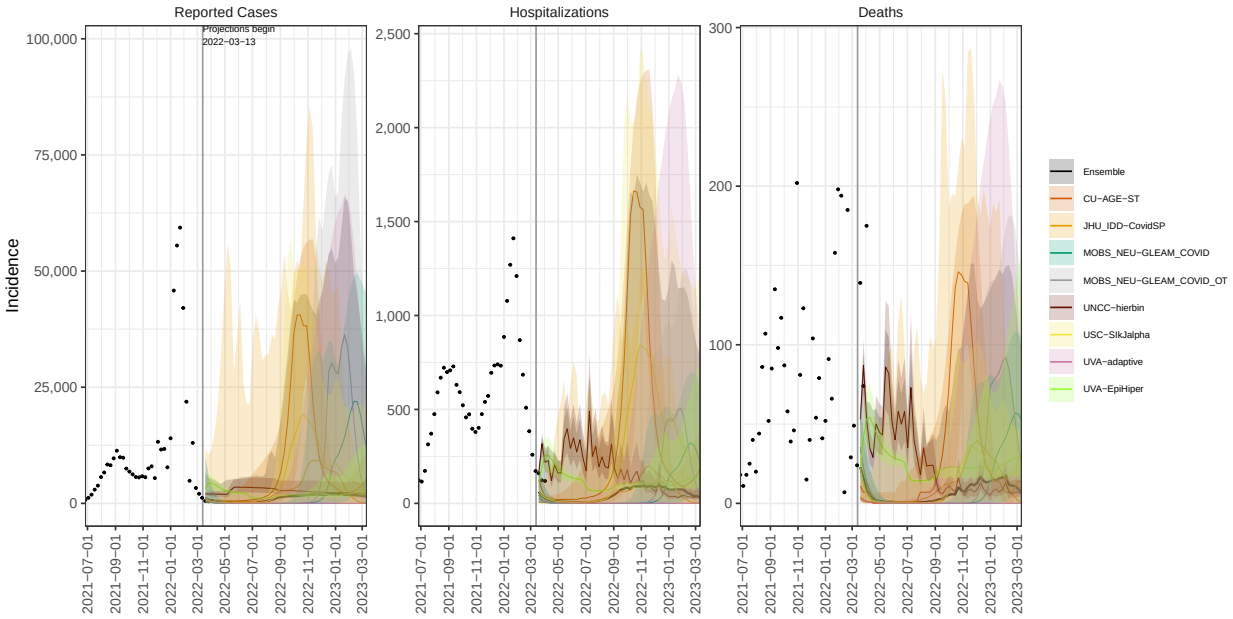

ID model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


IL model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

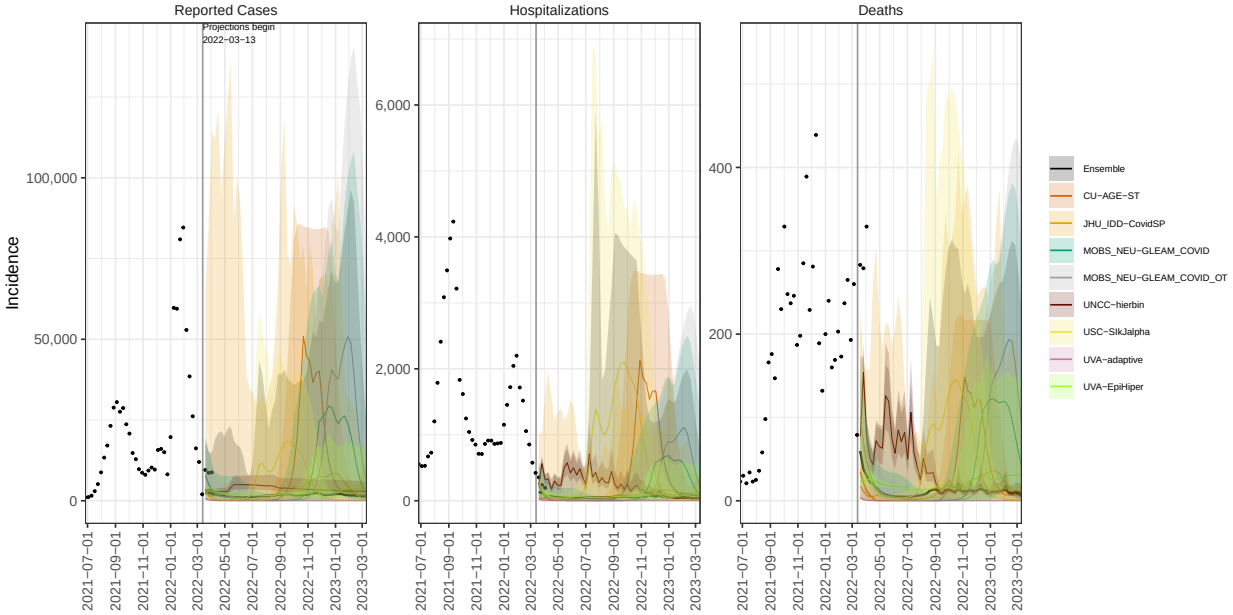

IN model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

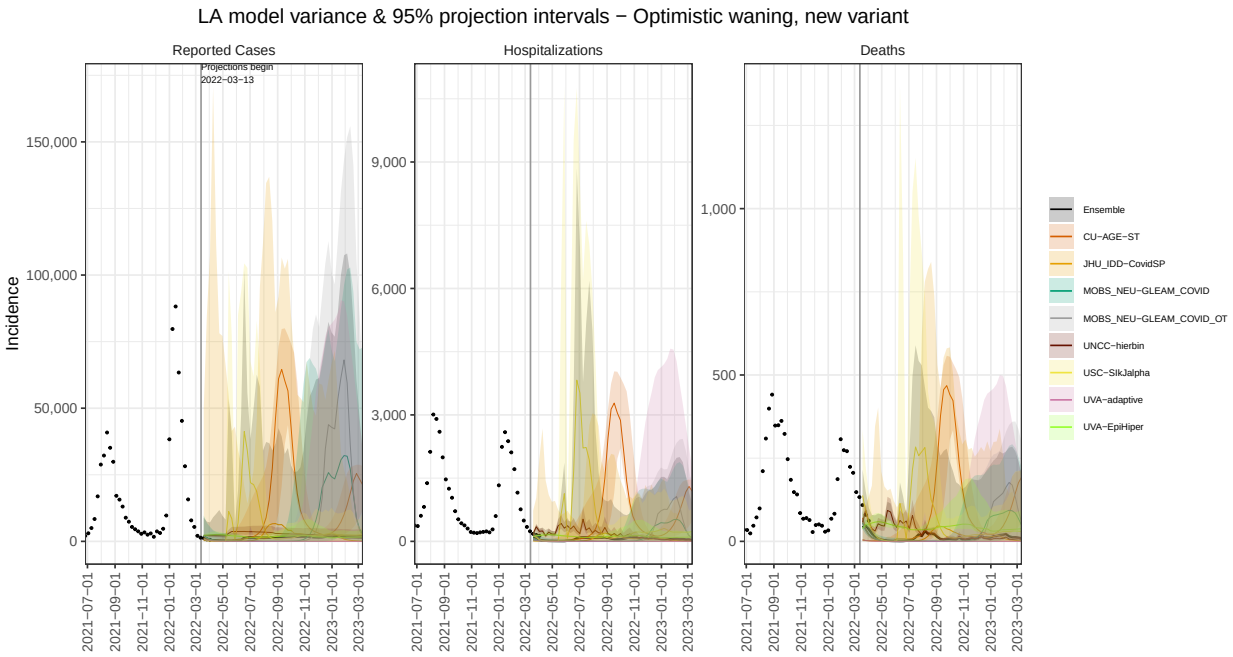

IA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

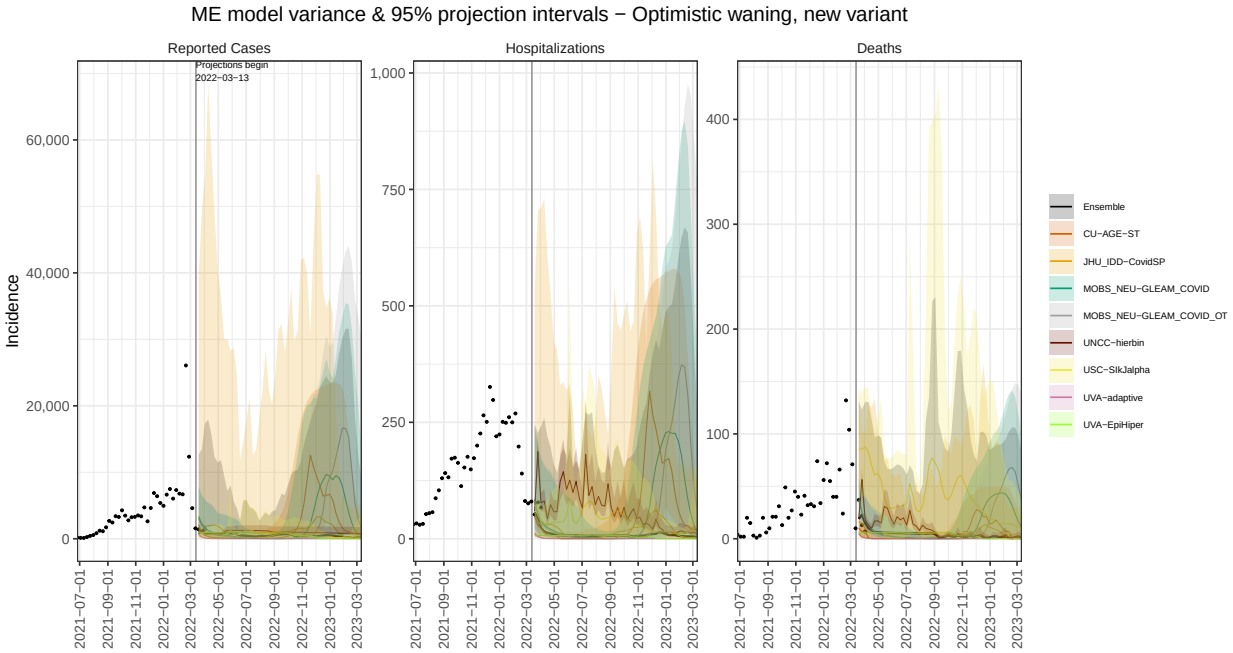
KS model variance & 95% projection intervals − Optimistic waning, new variant

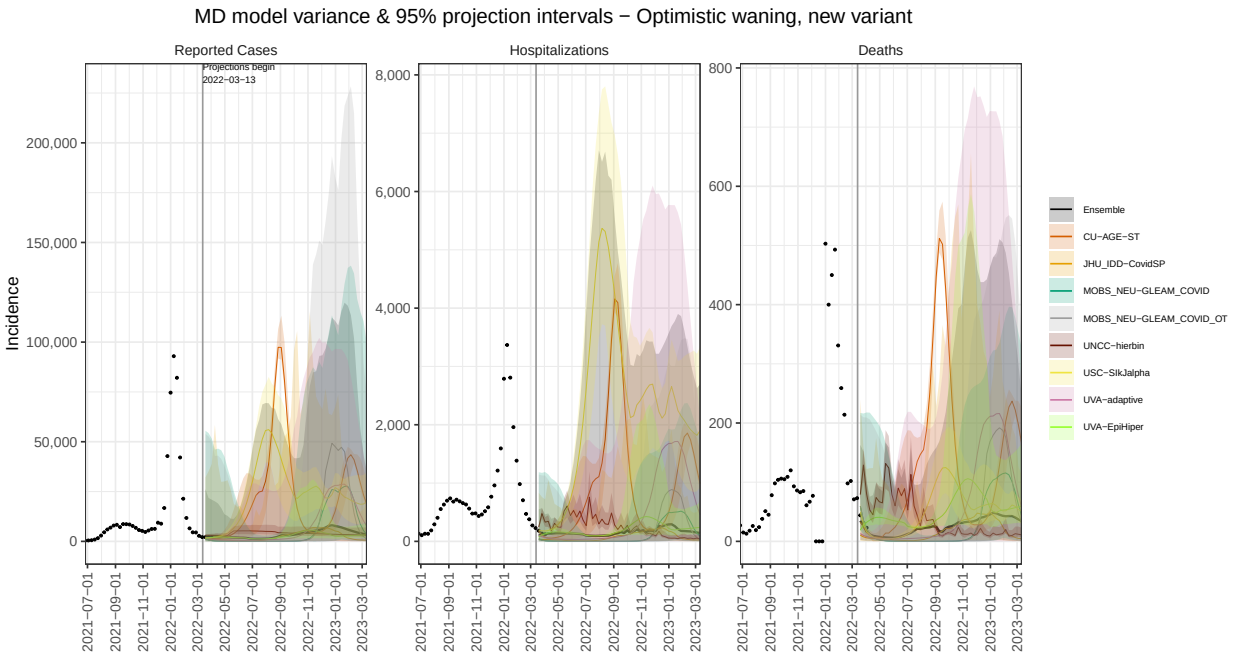


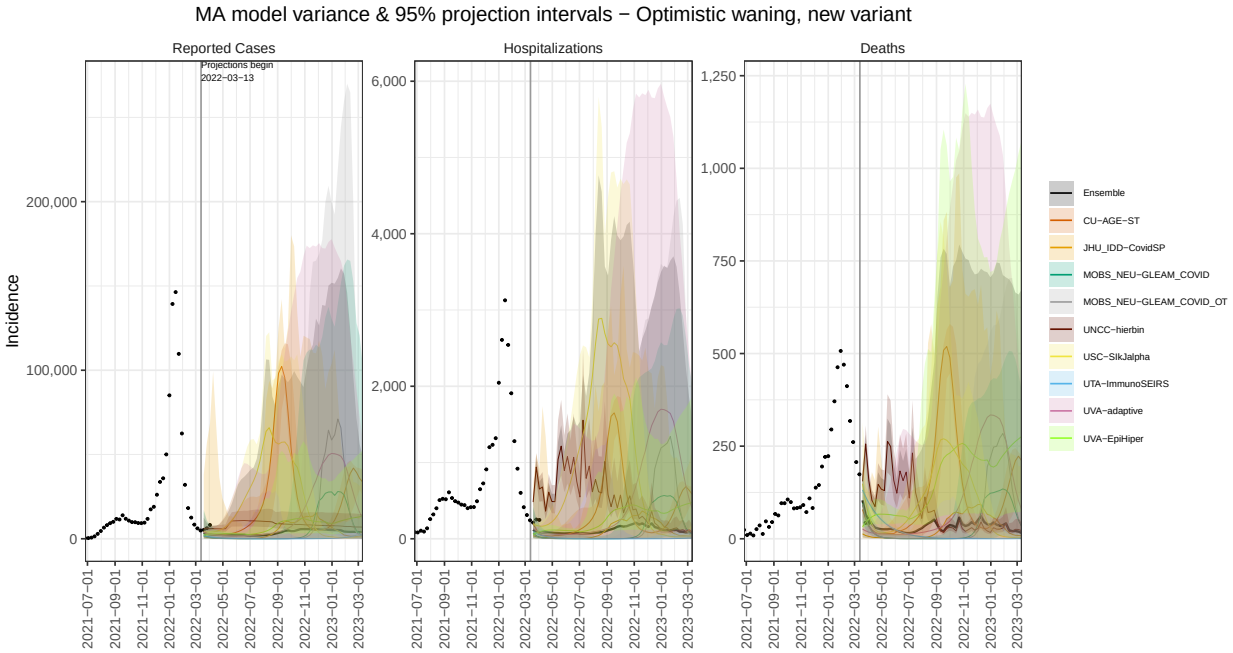
KY model variance & 95% projection intervals − Optimistic waning, new variant

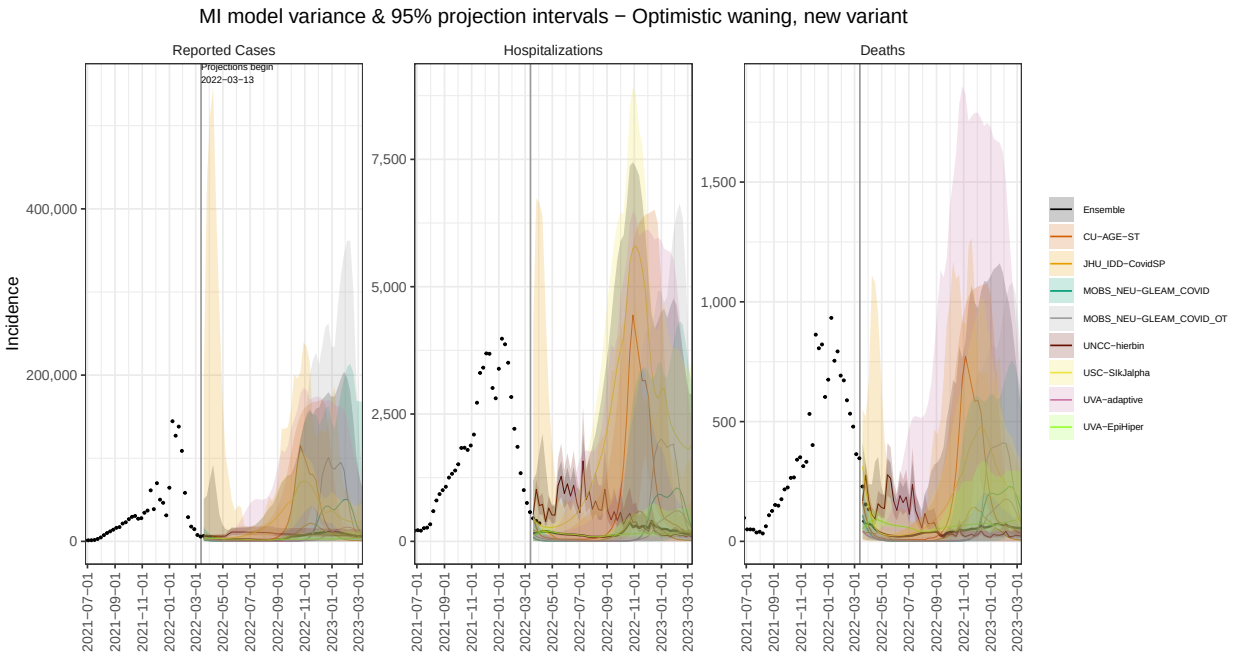


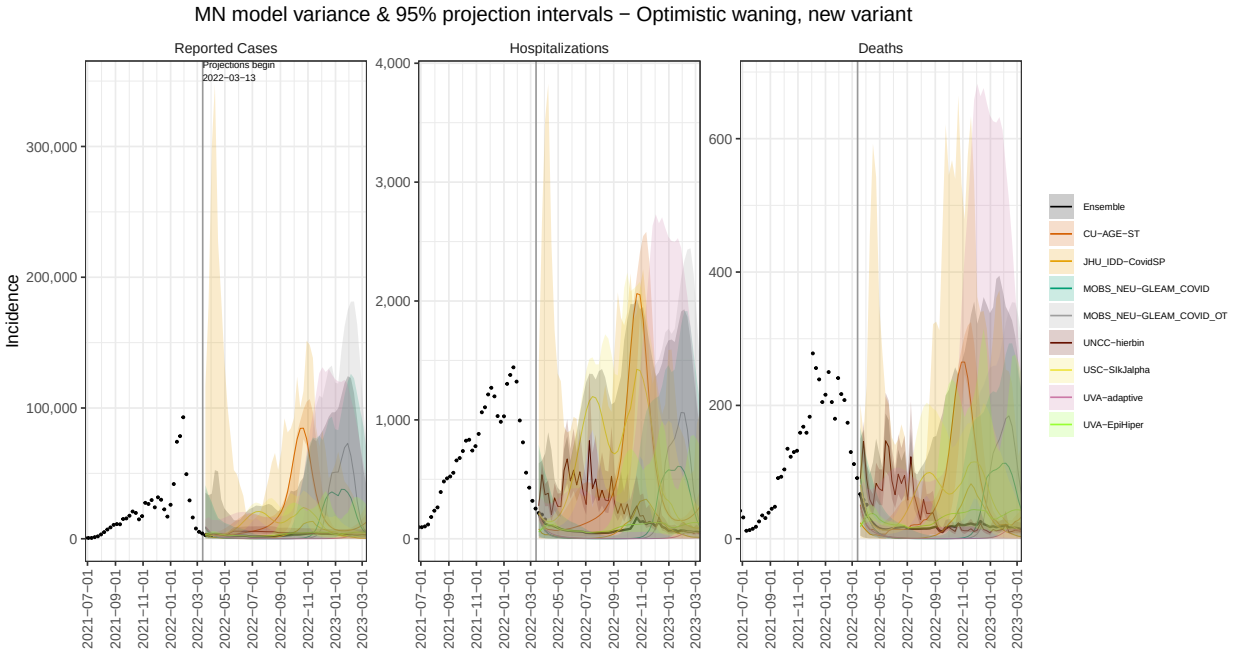

LA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

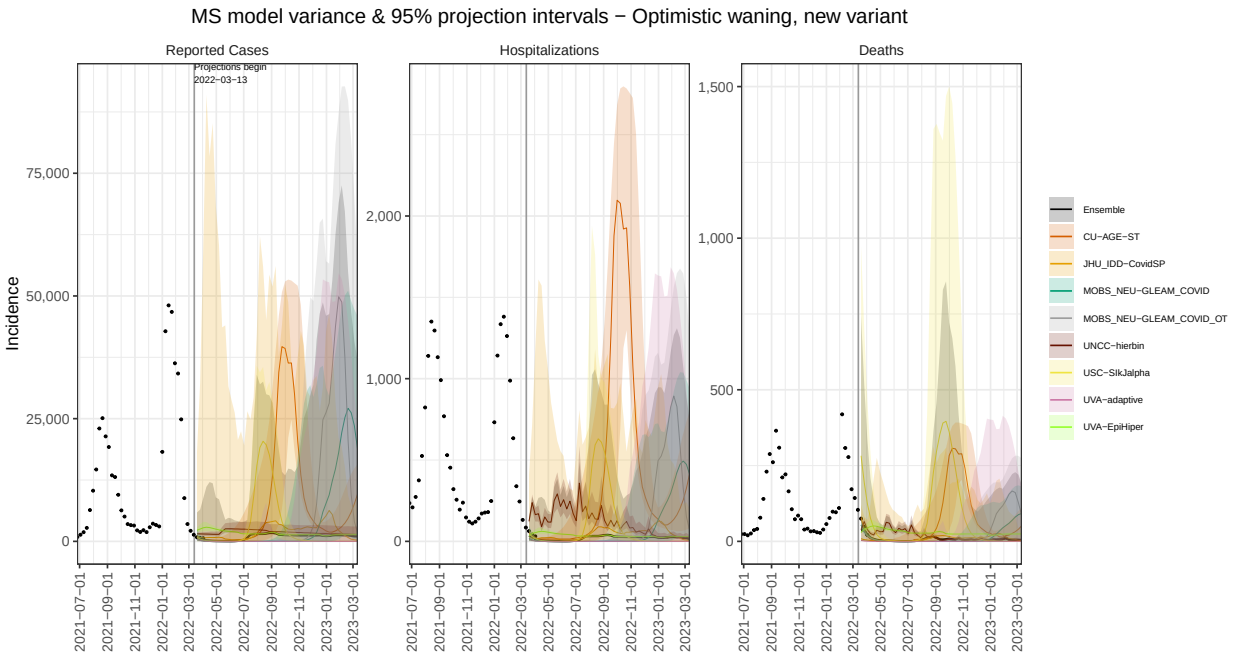

ME model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

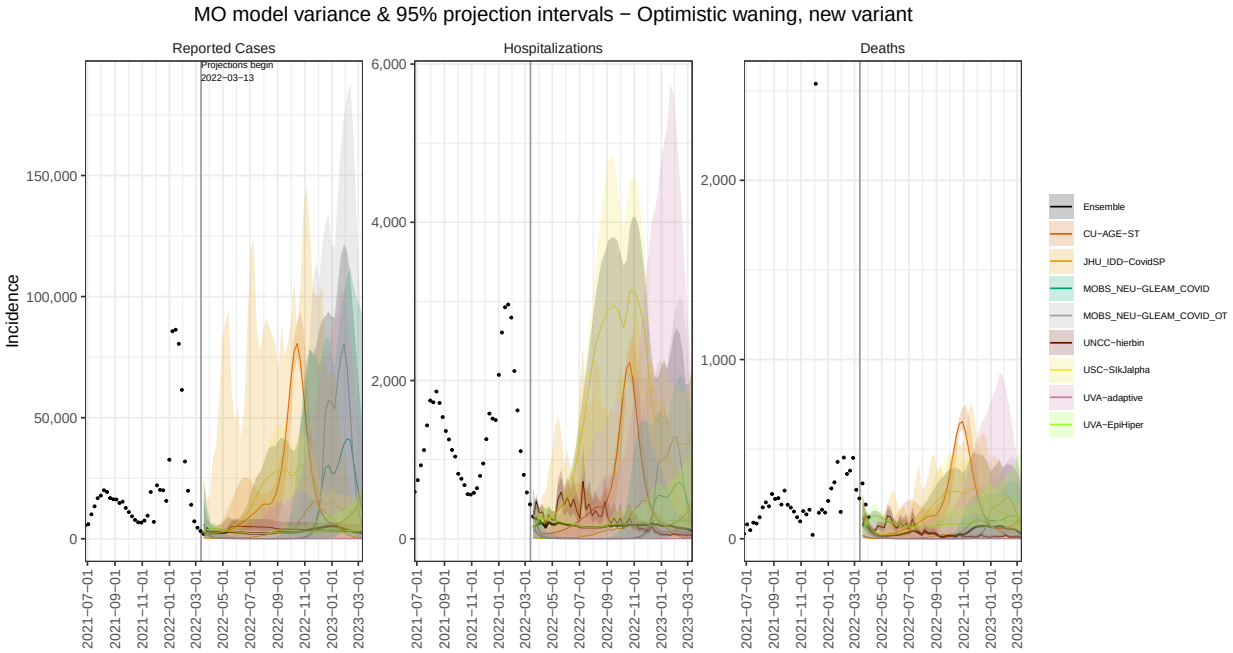

MD model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

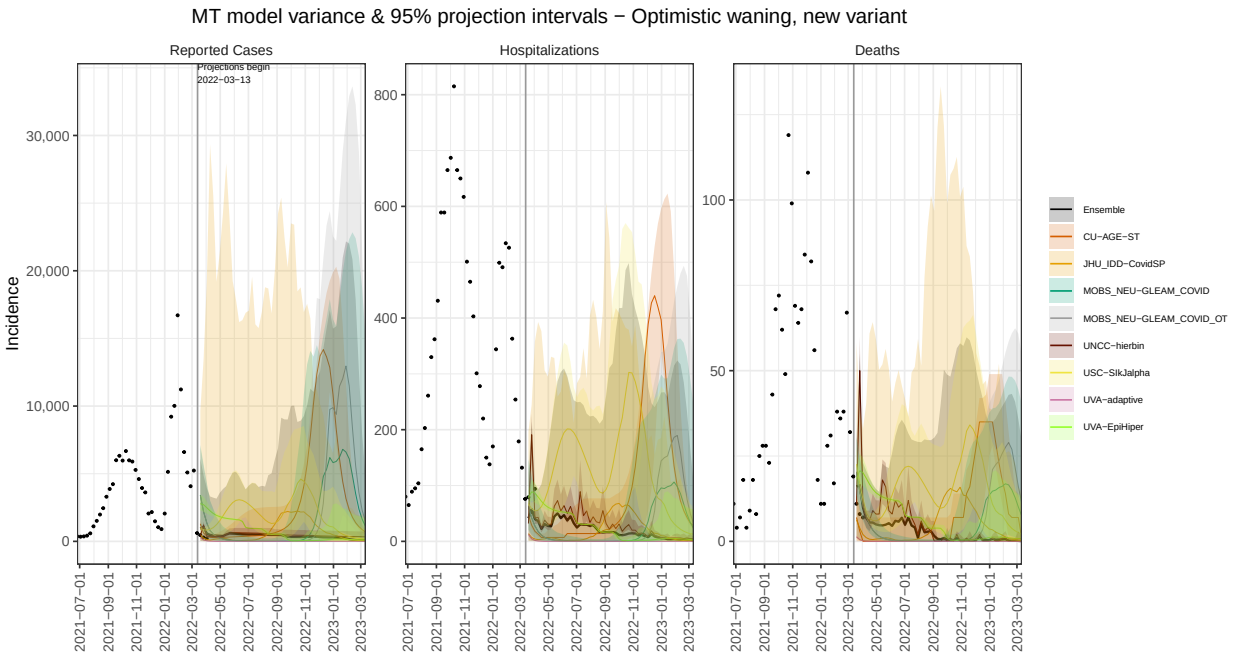

MA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

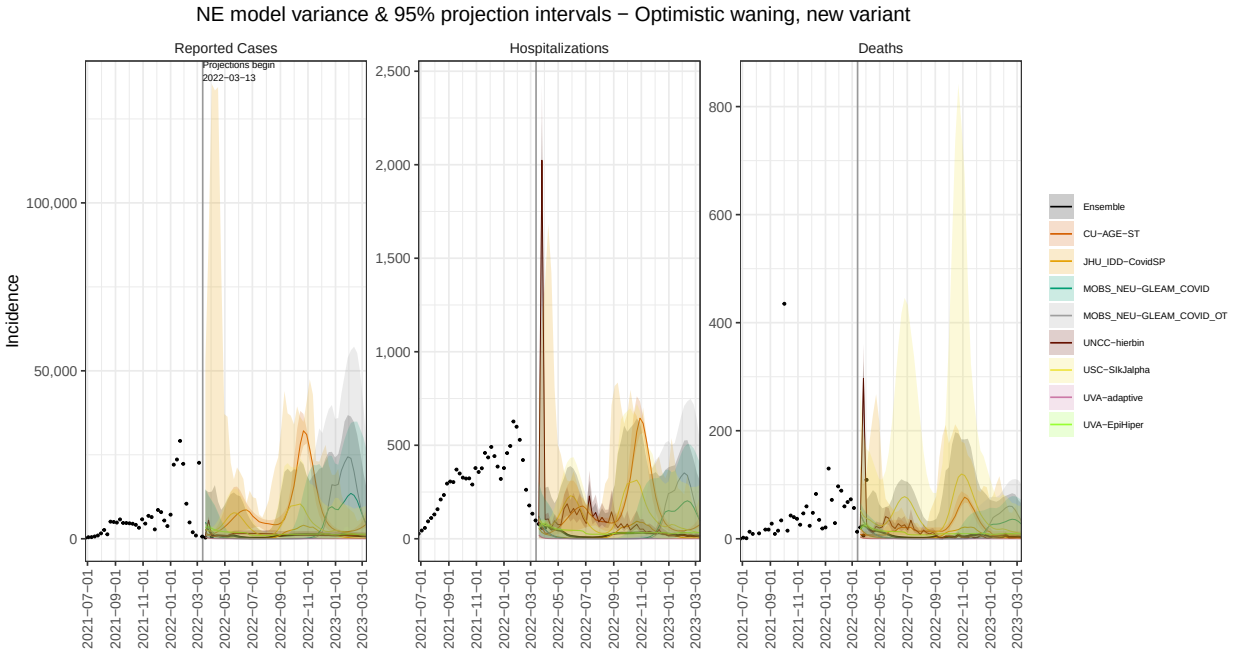

MI model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

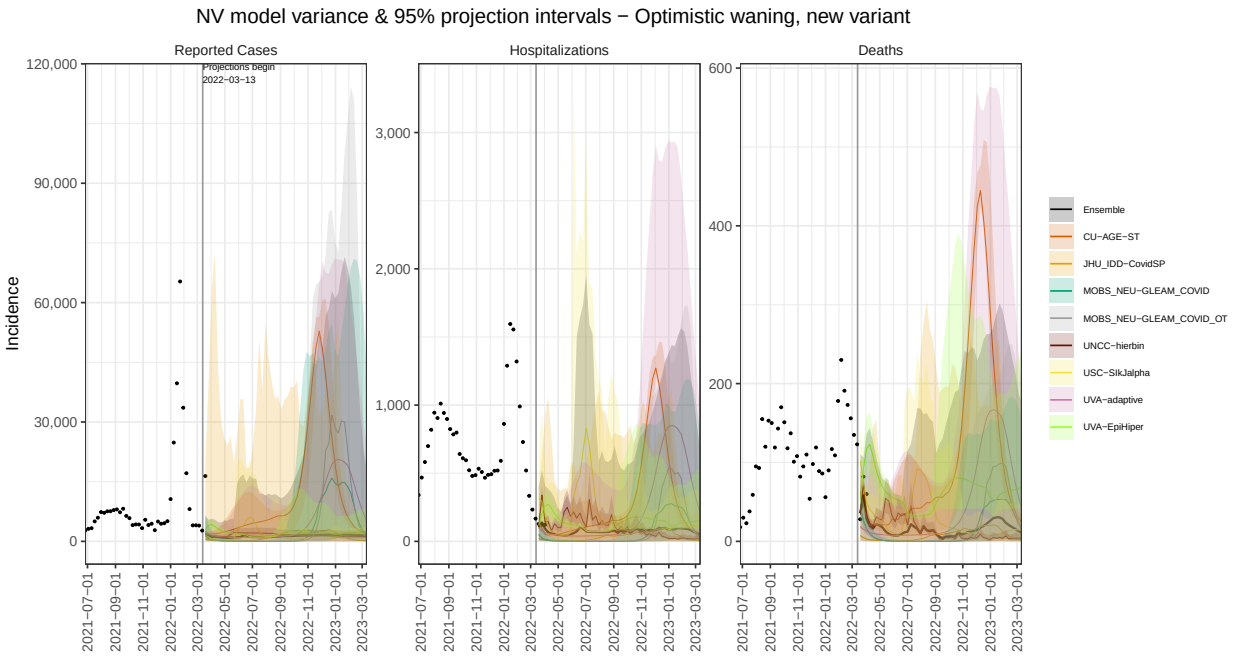

MN model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

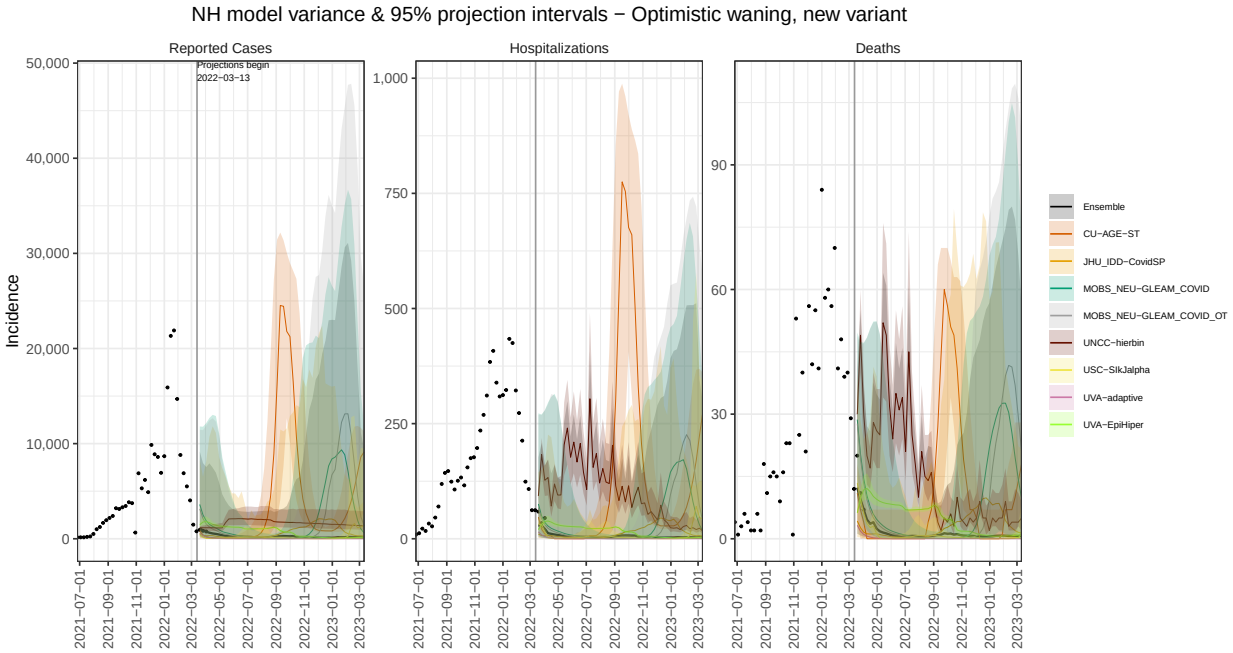

MS model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

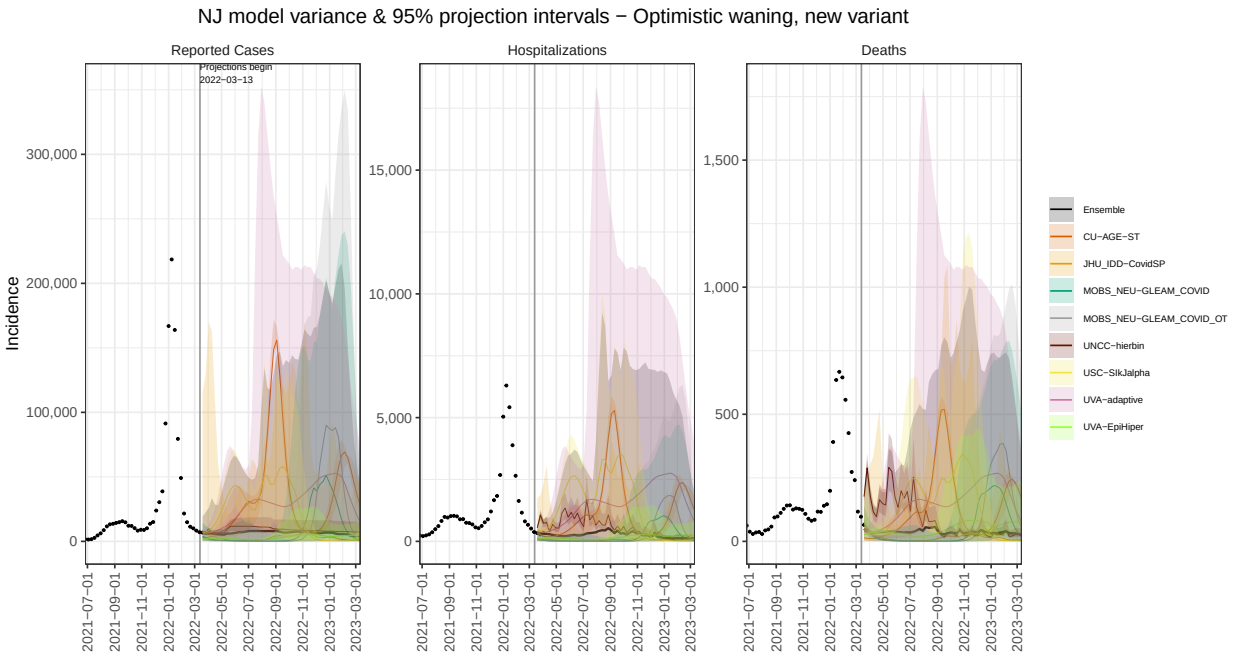

MO model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

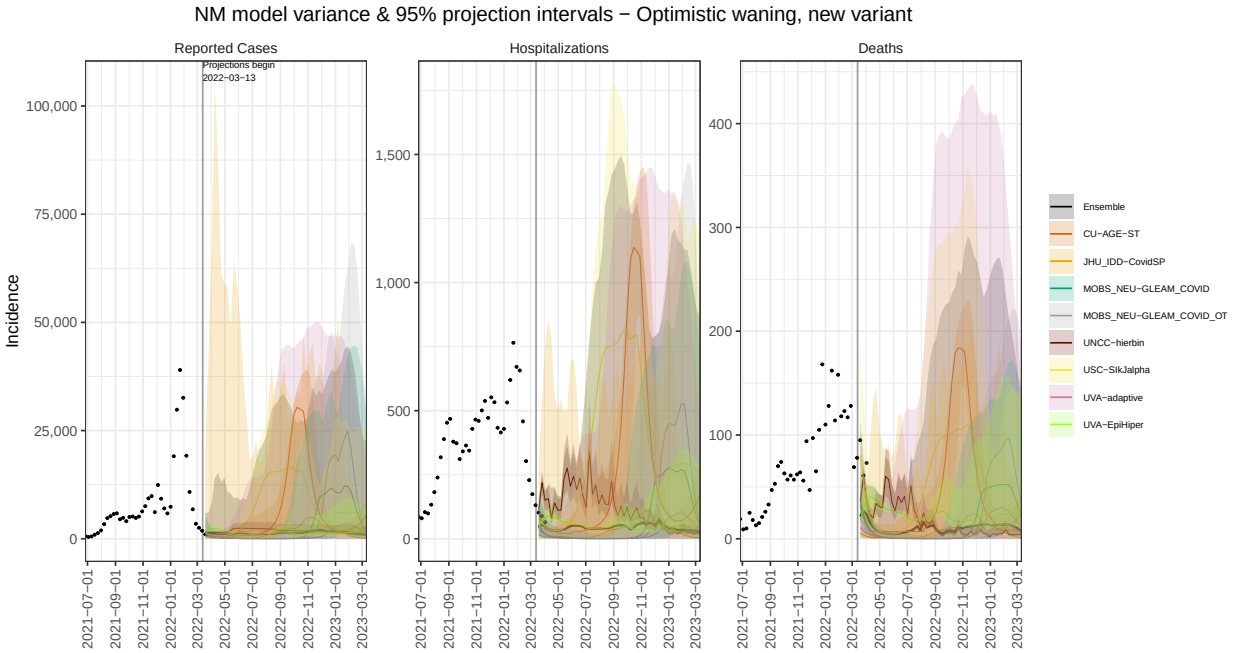

MT model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

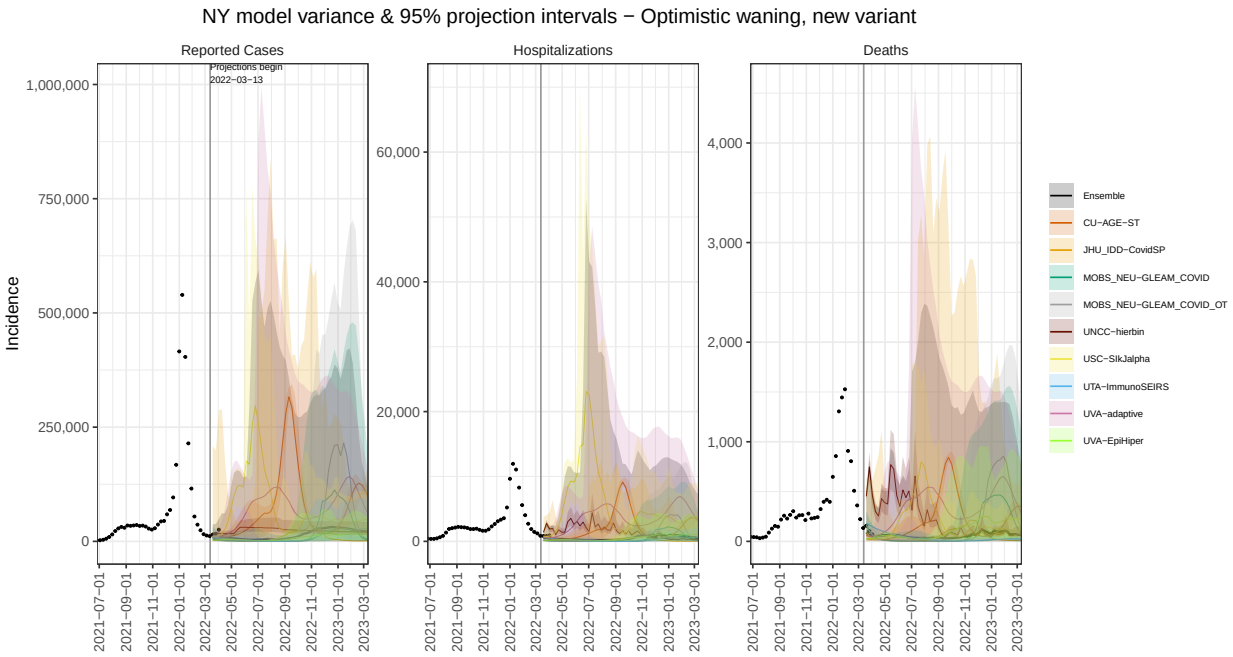

NE model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

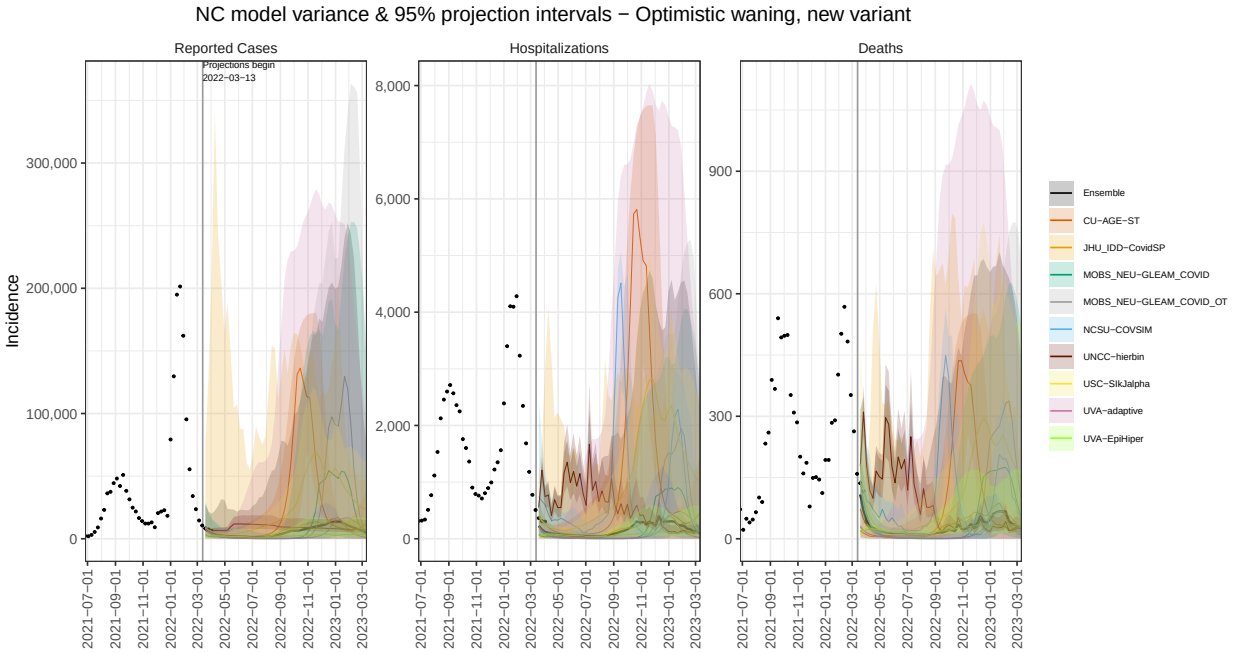

NV model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

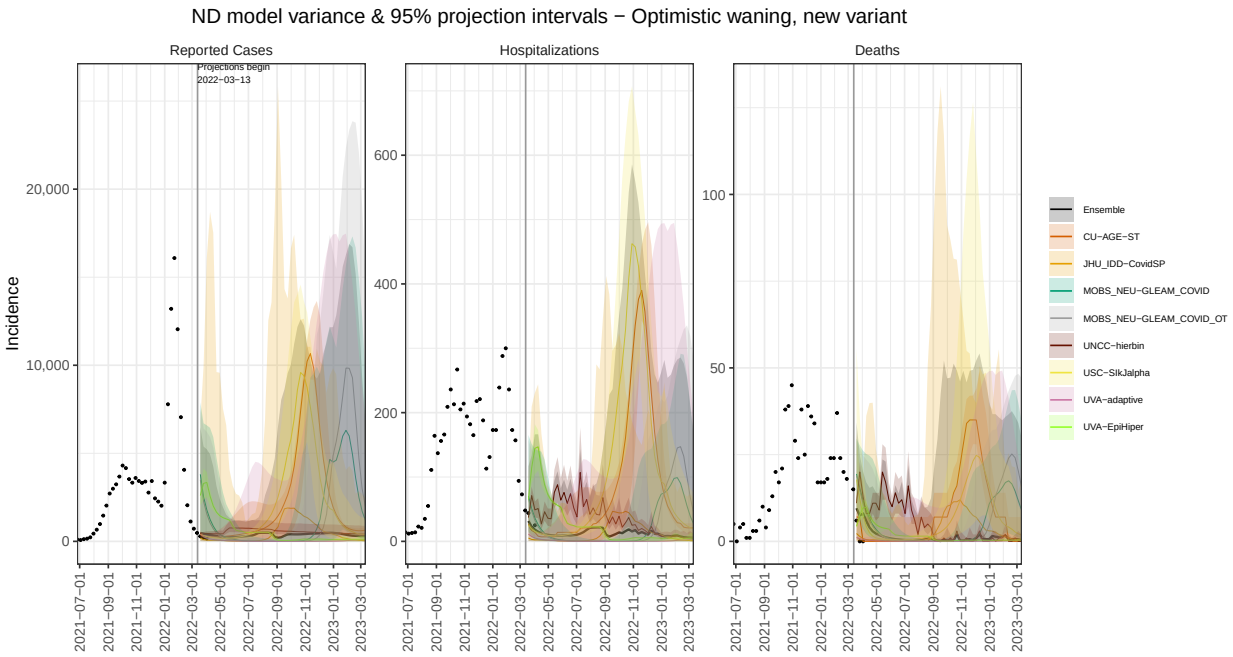

NH model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

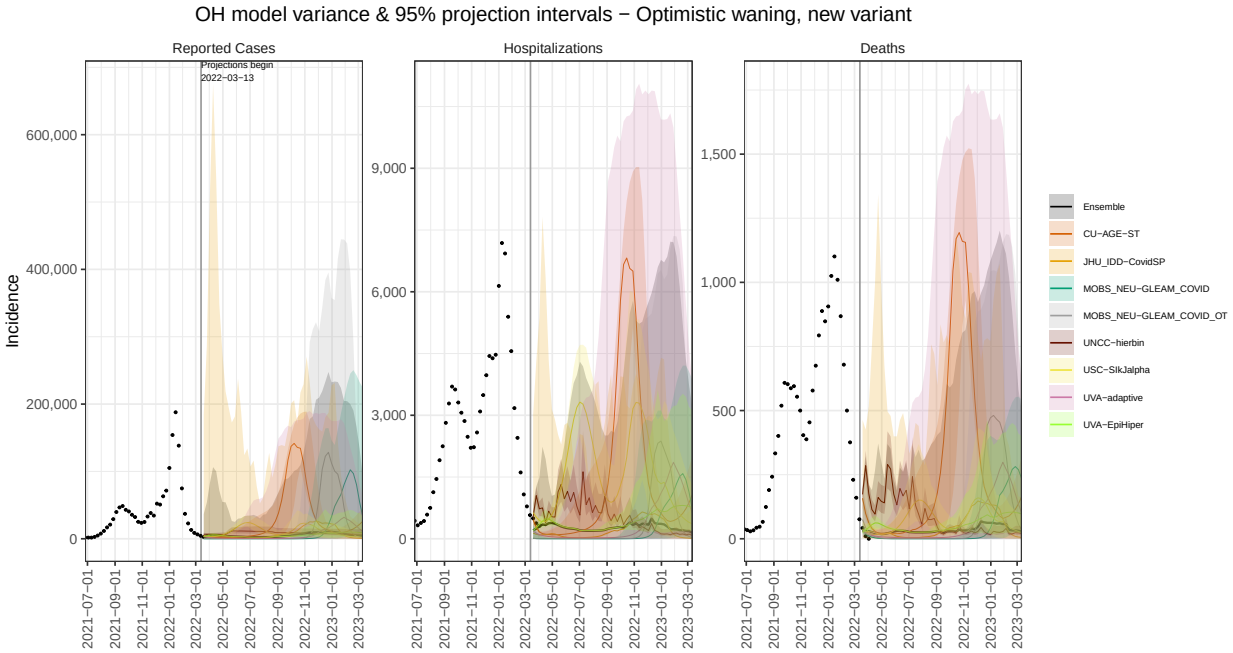

NJ model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

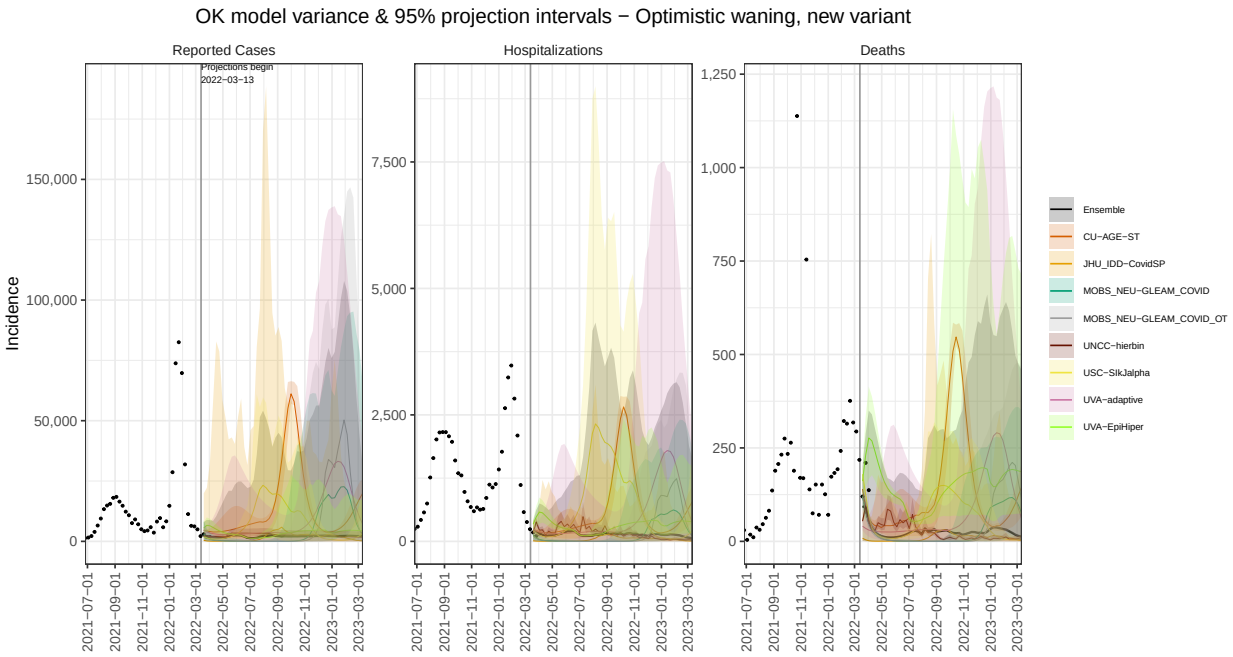

NM model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

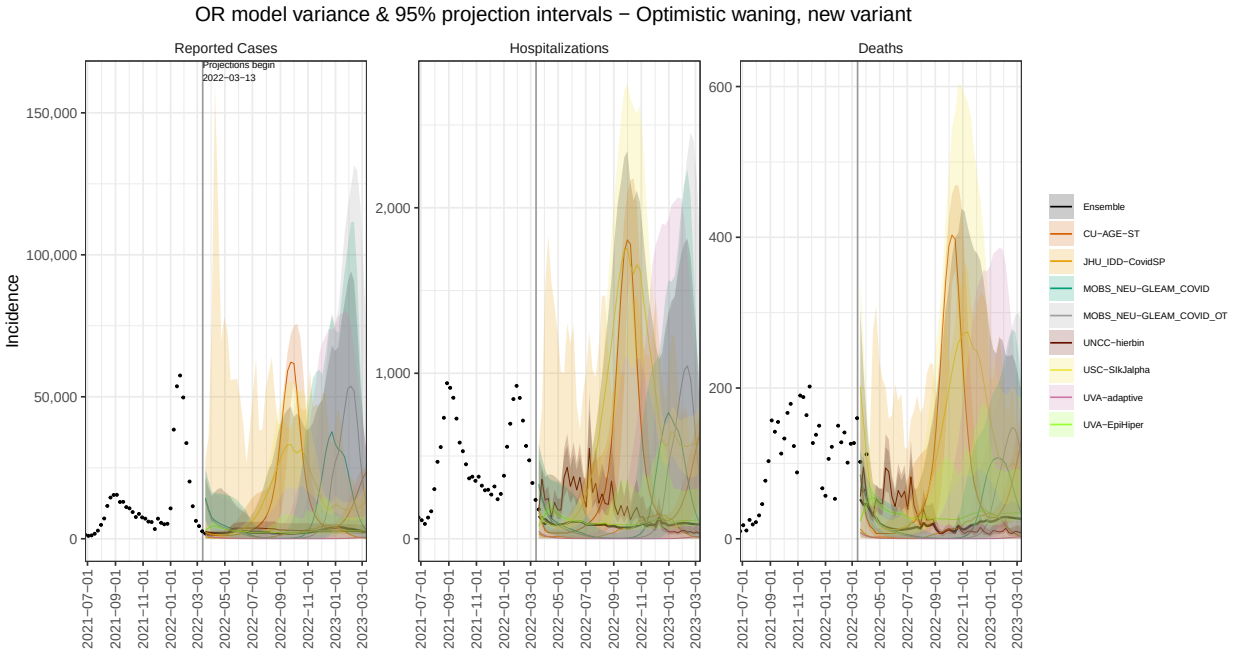

NY model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

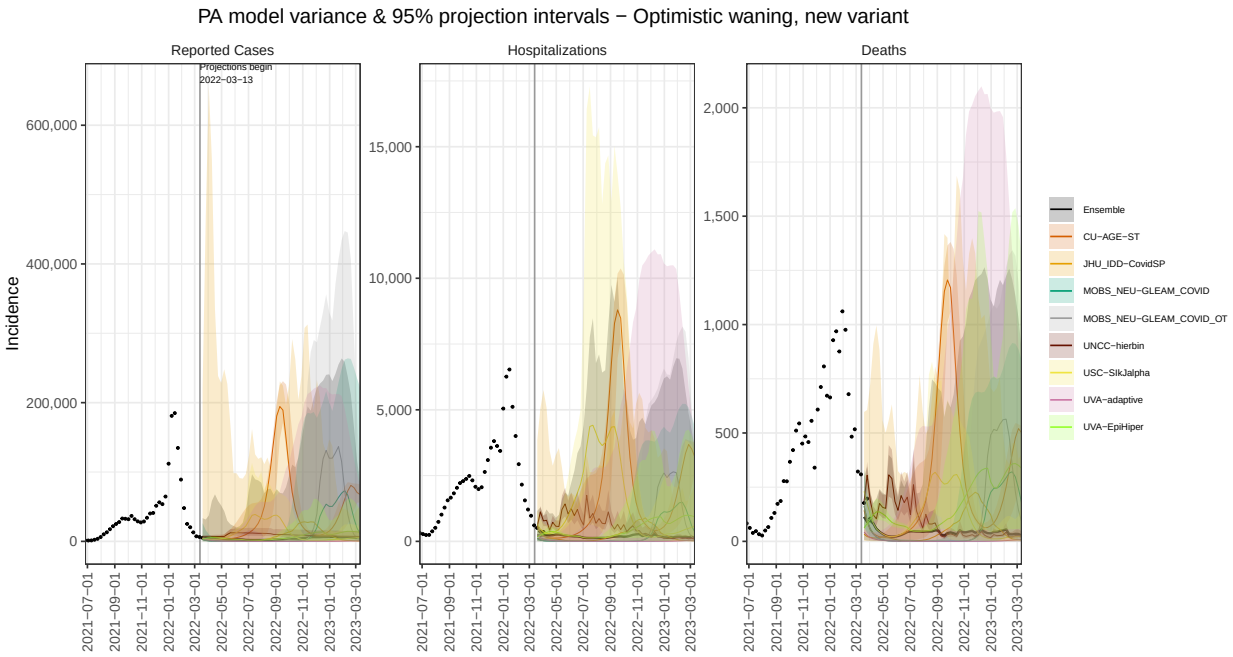

NC model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

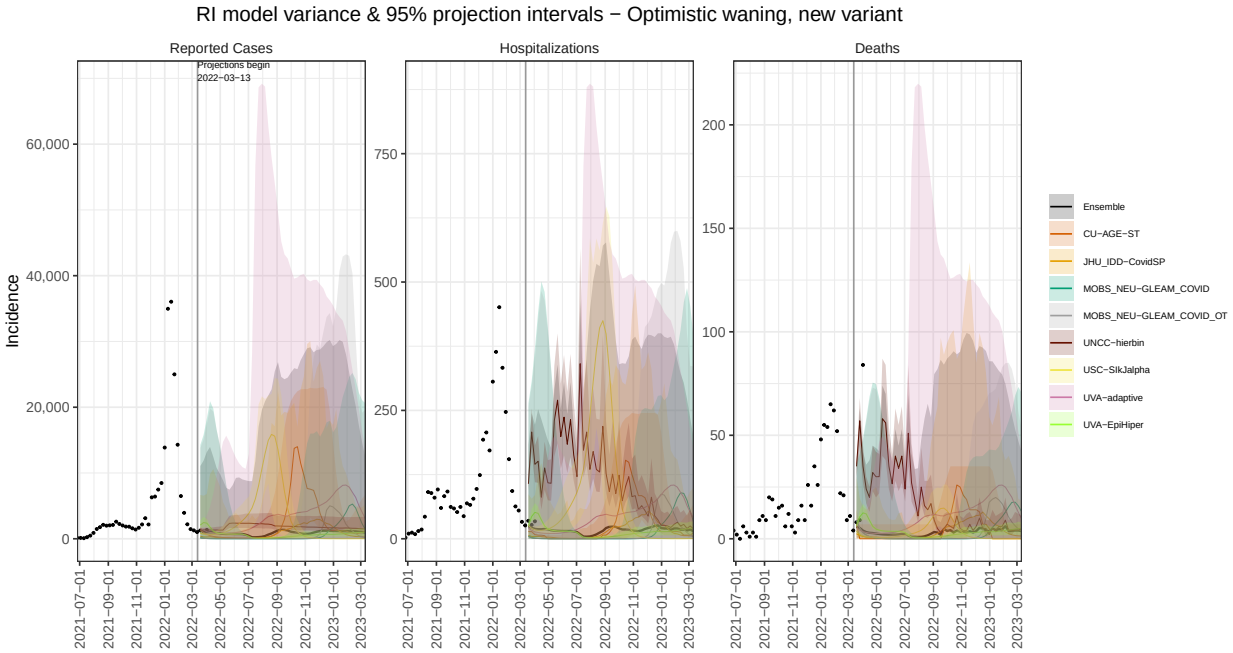

ND model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

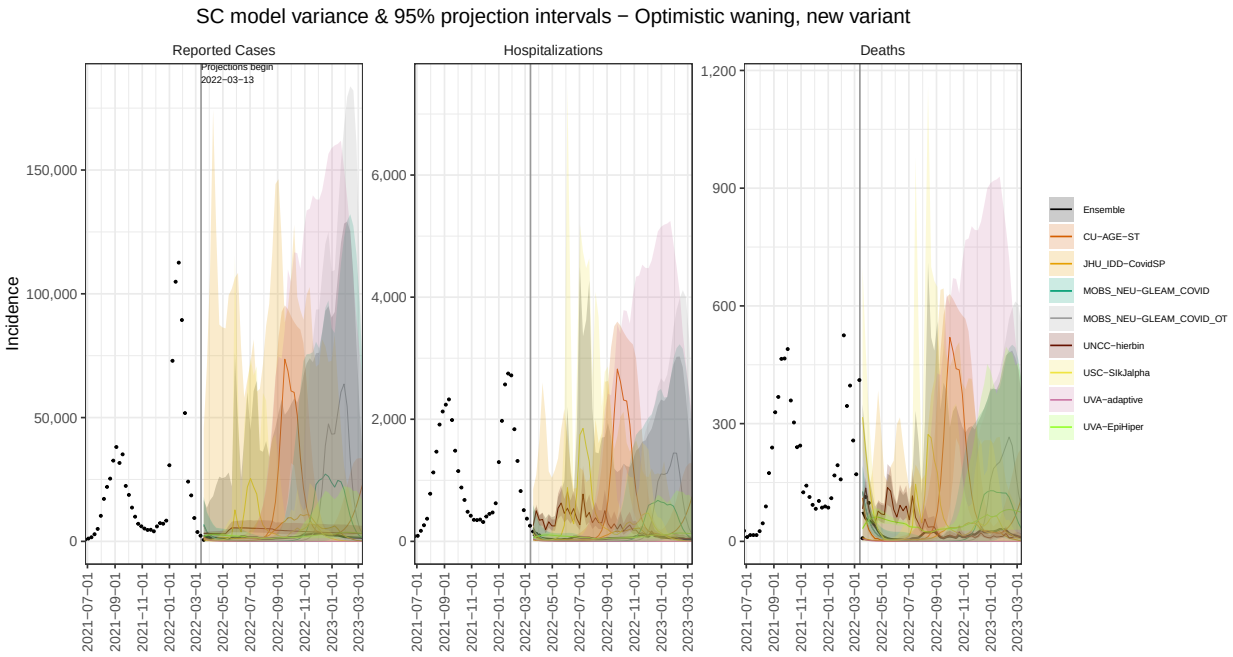

OH model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

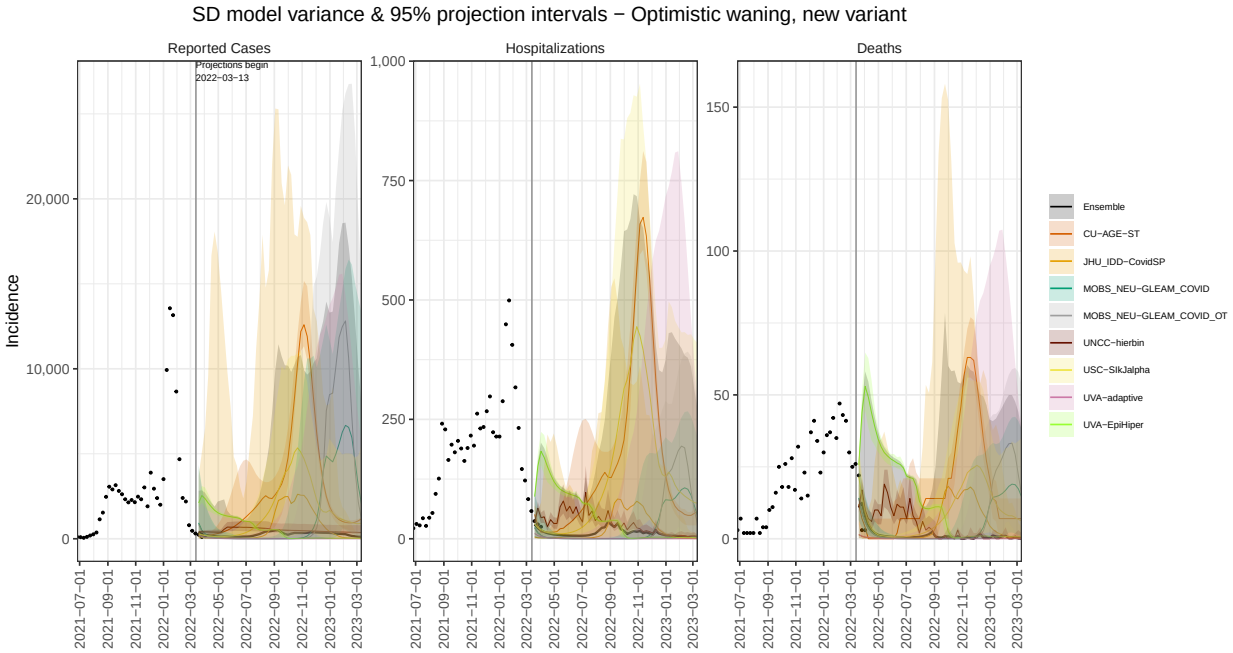

OK model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

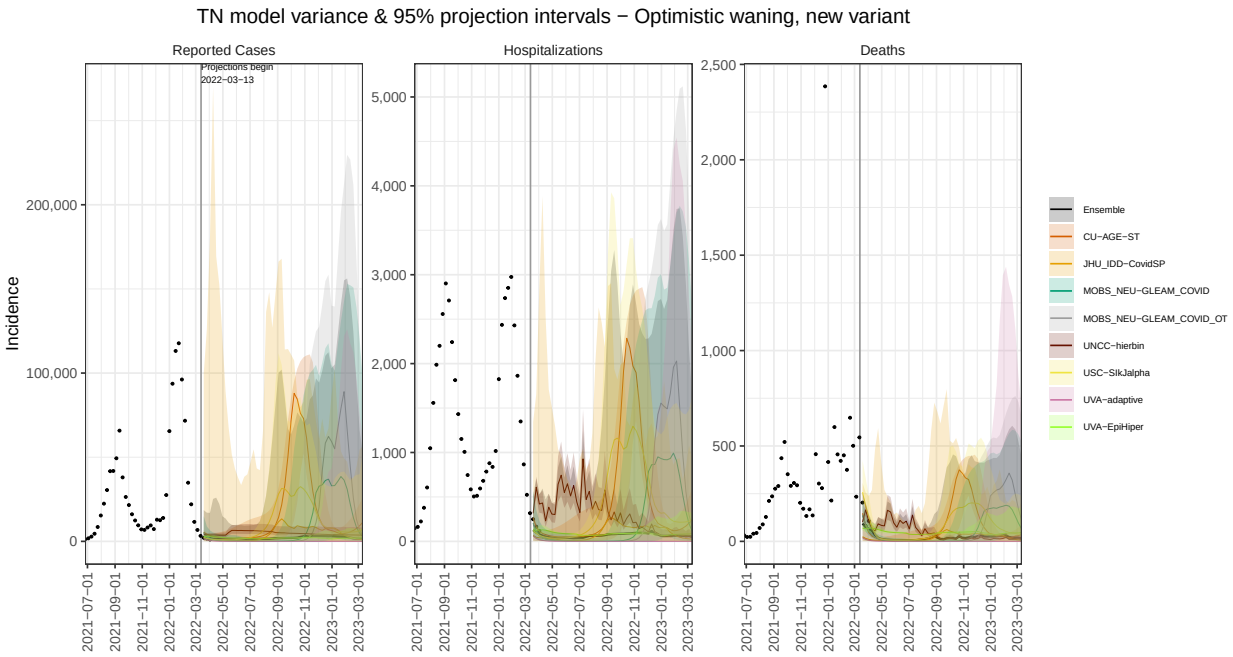

OR model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

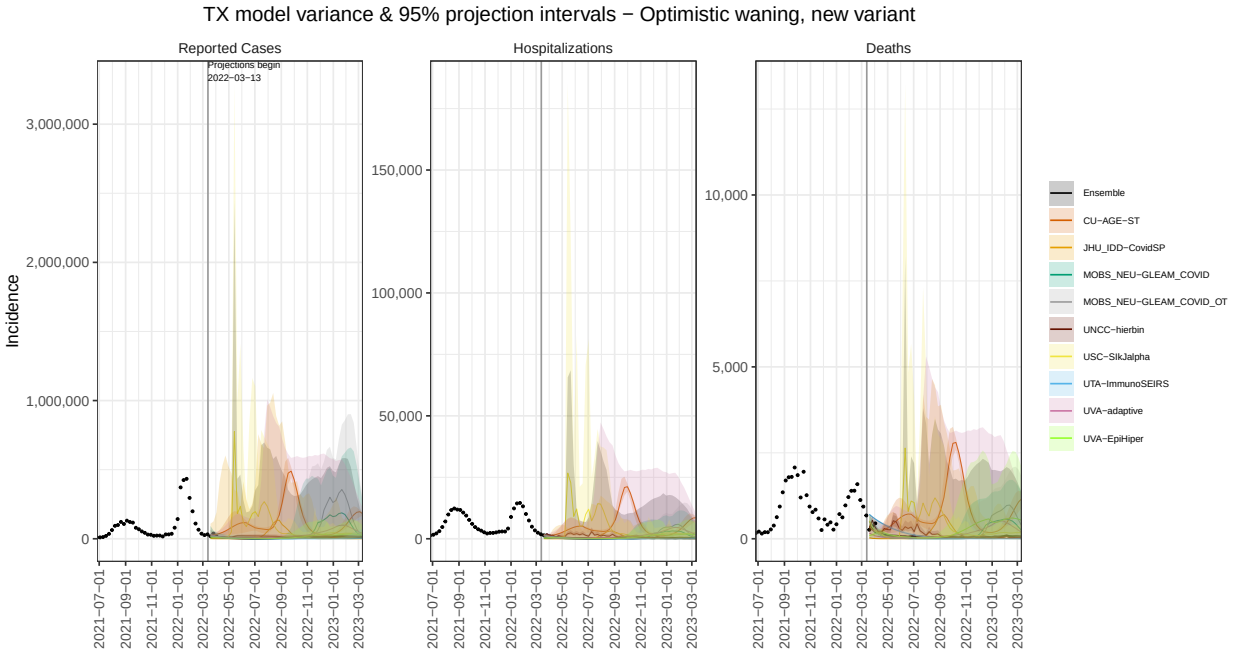

PA model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

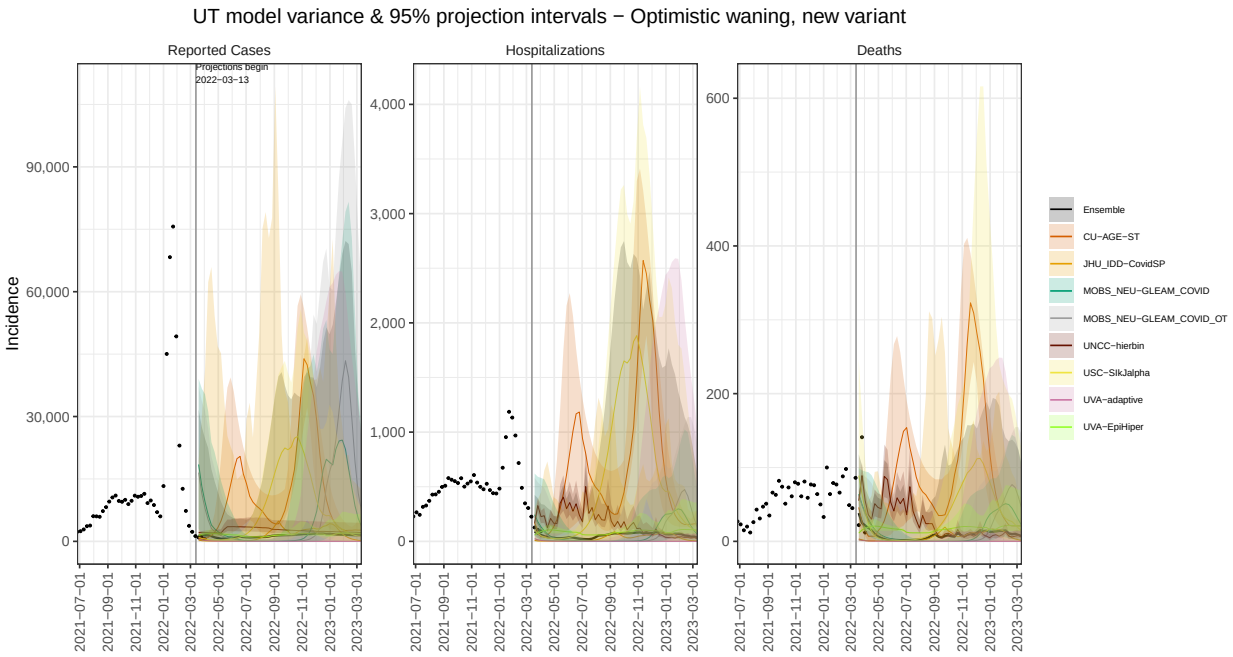

RI model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

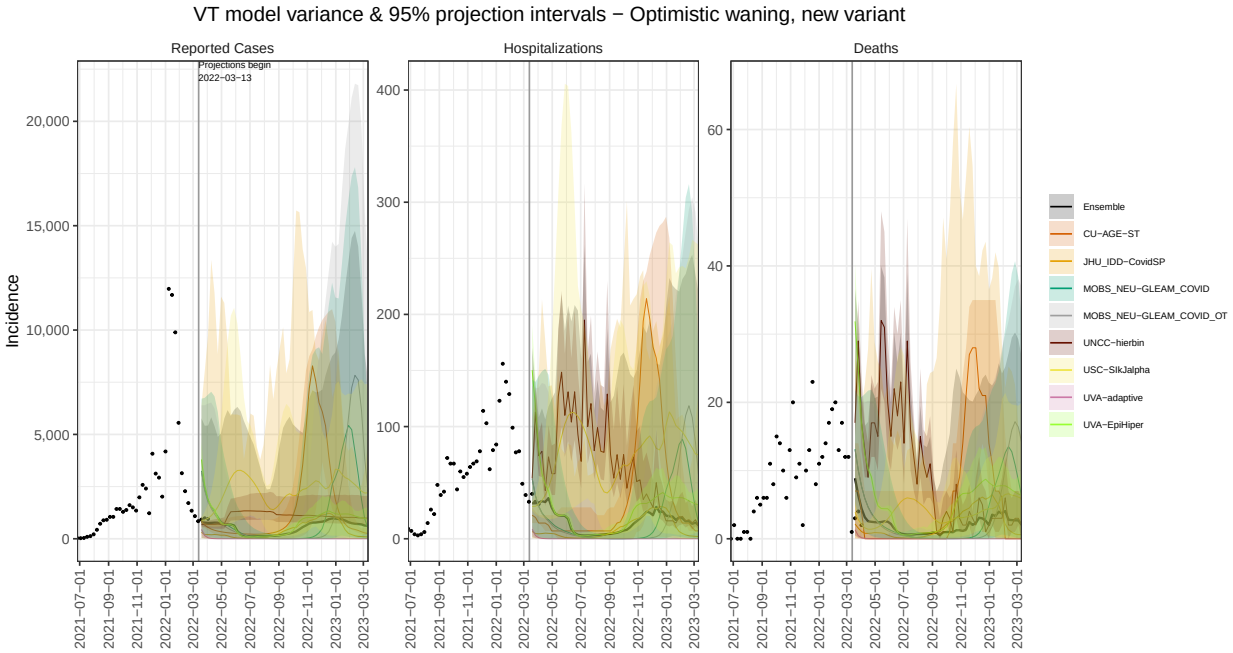

SC model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


SD model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

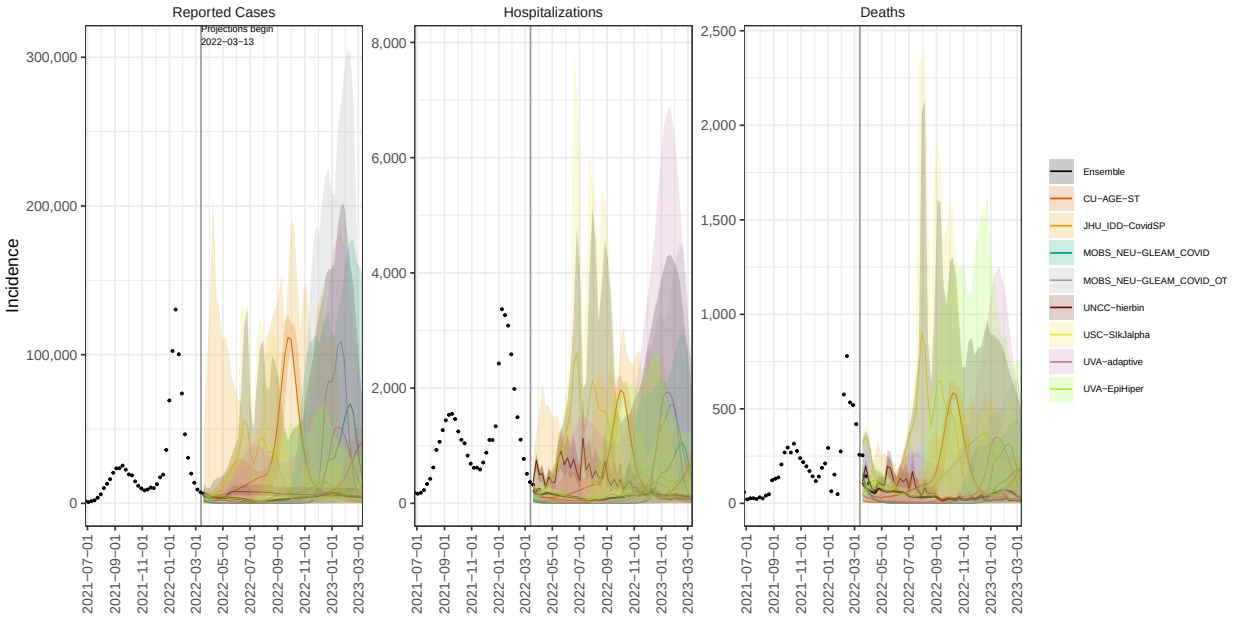

TN model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


TX model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

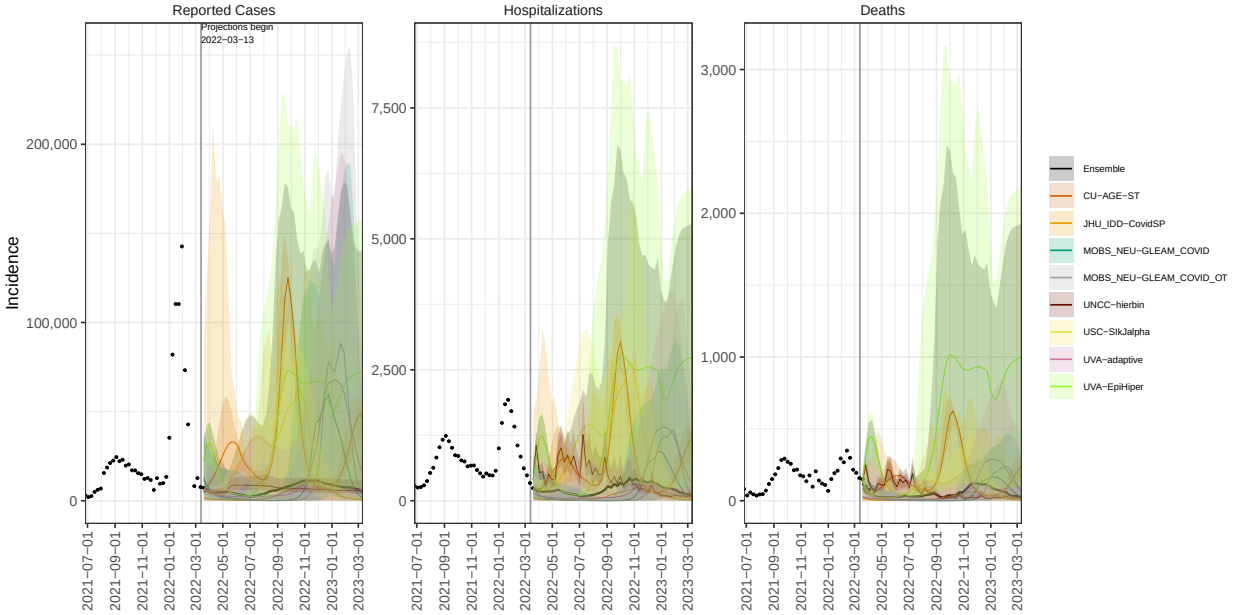

UT model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

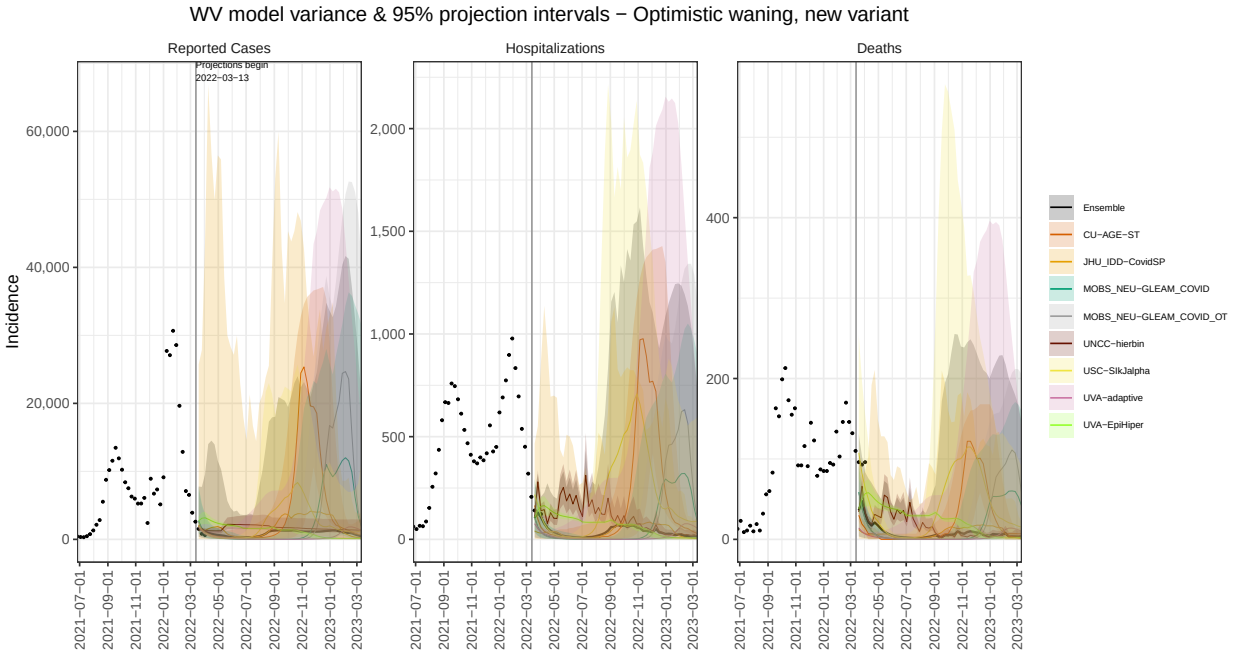

VT model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

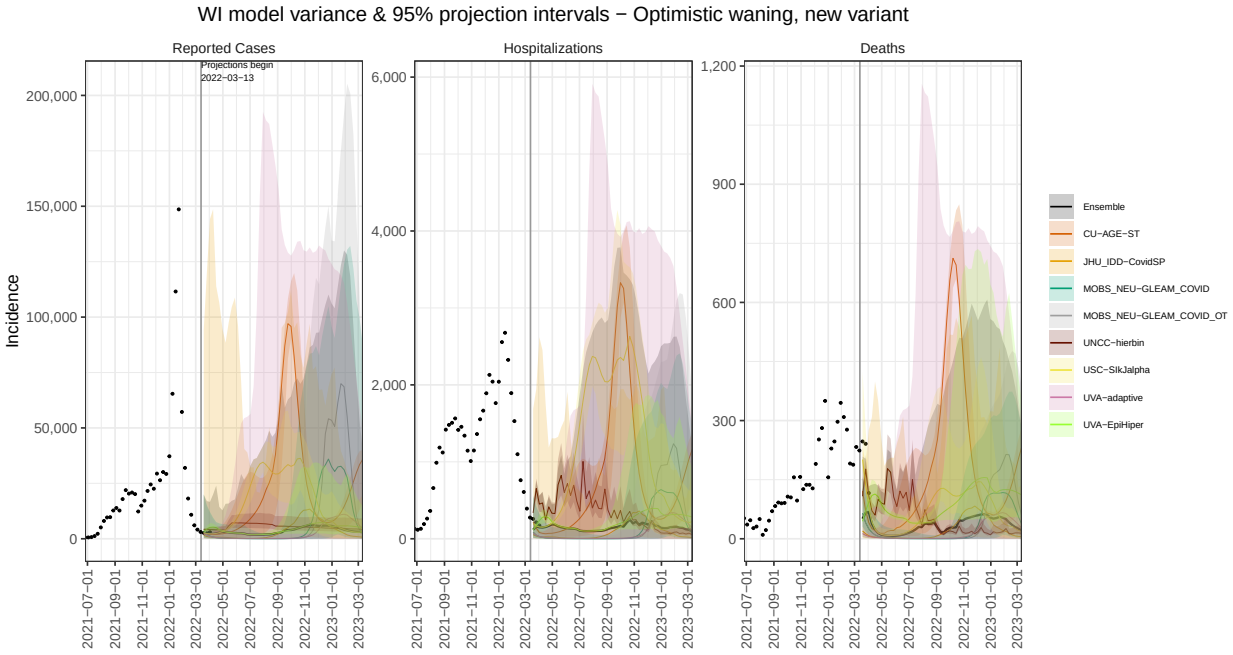
VA model variance & 95% projection intervals − Optimistic waning, new variant

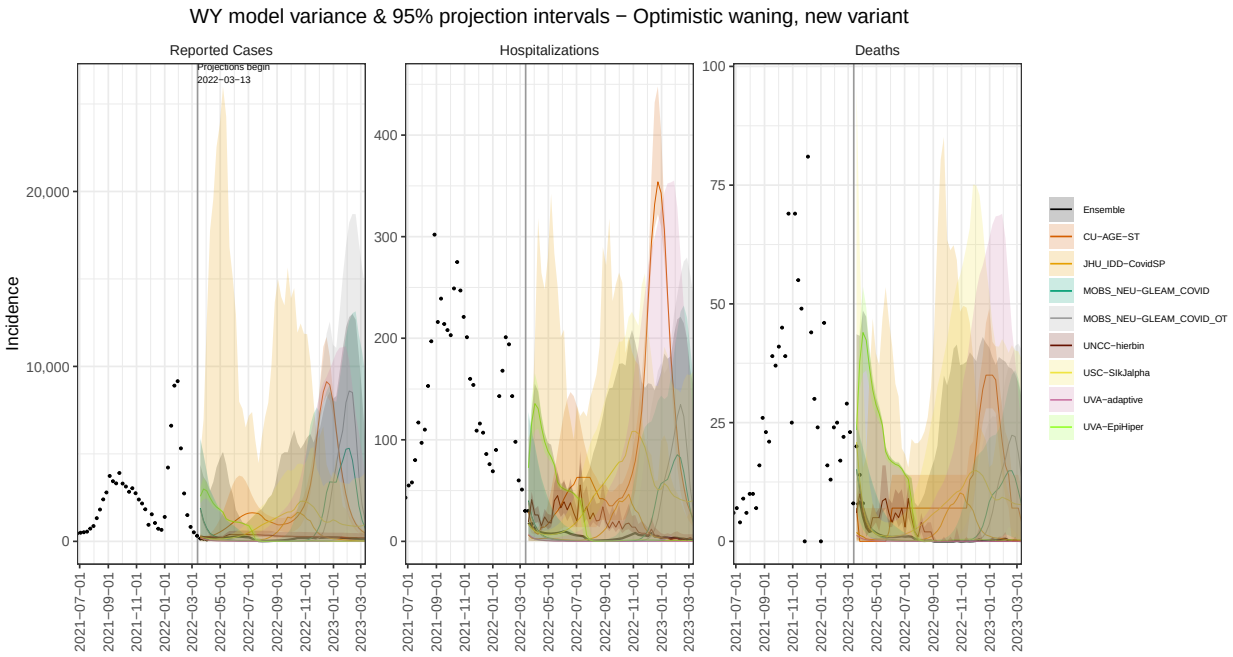


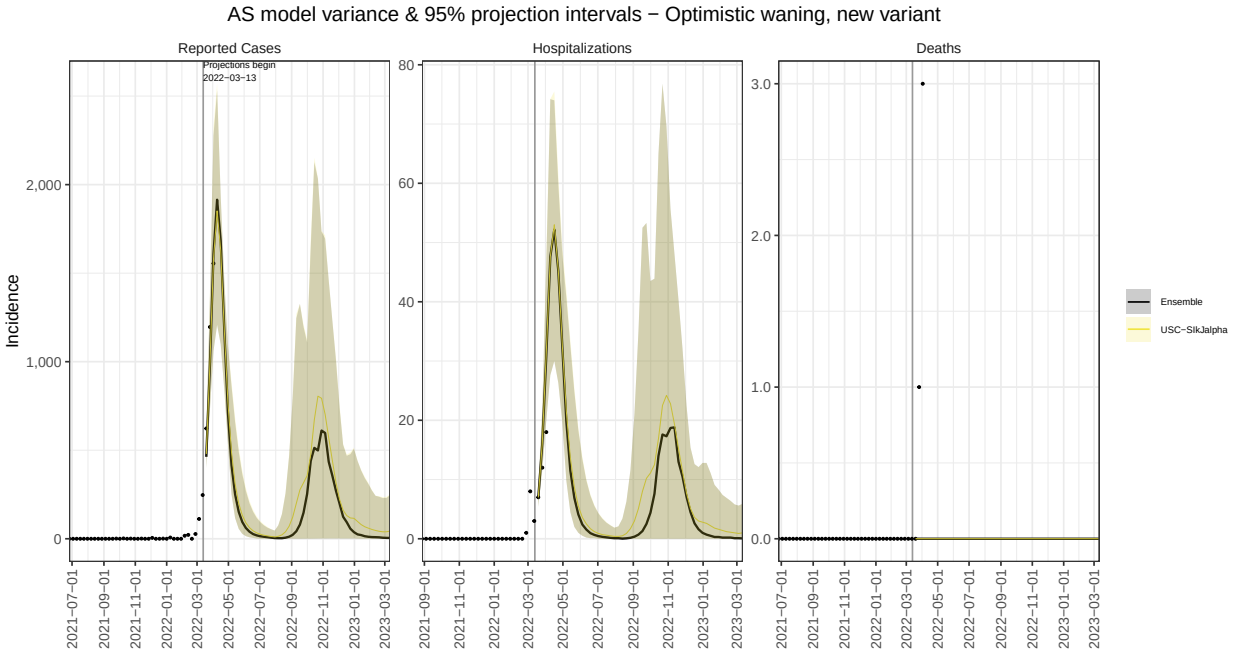
WA model variance & 95% projection intervals − Optimistic waning, new variant

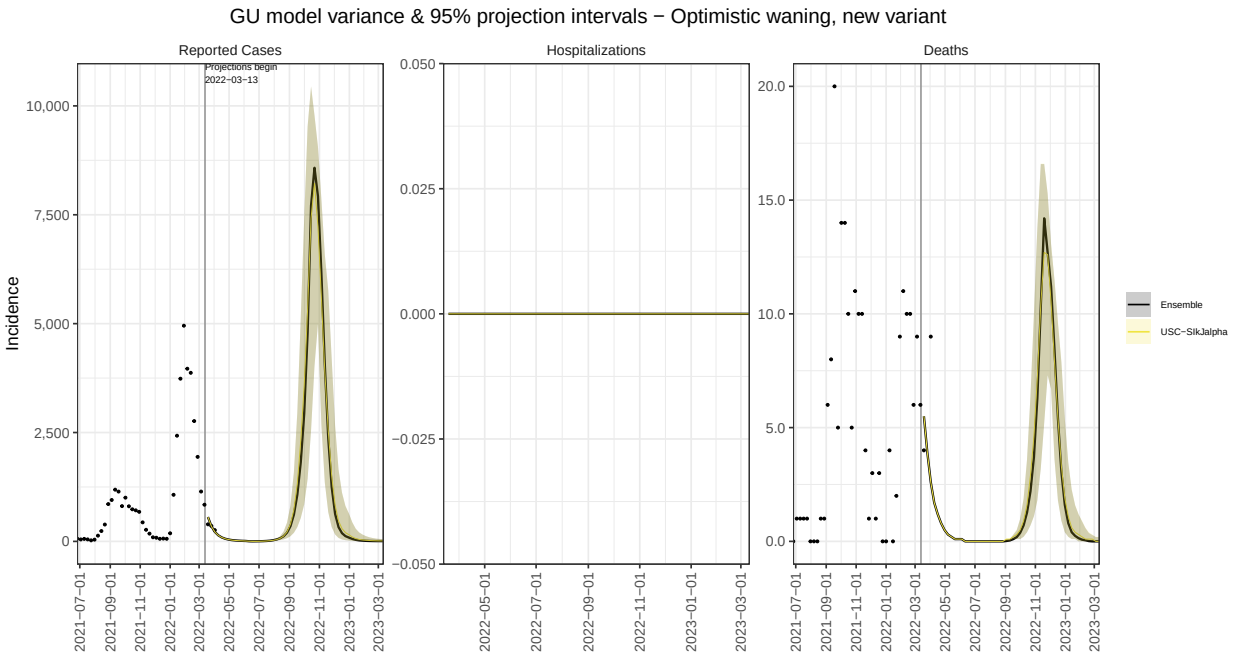


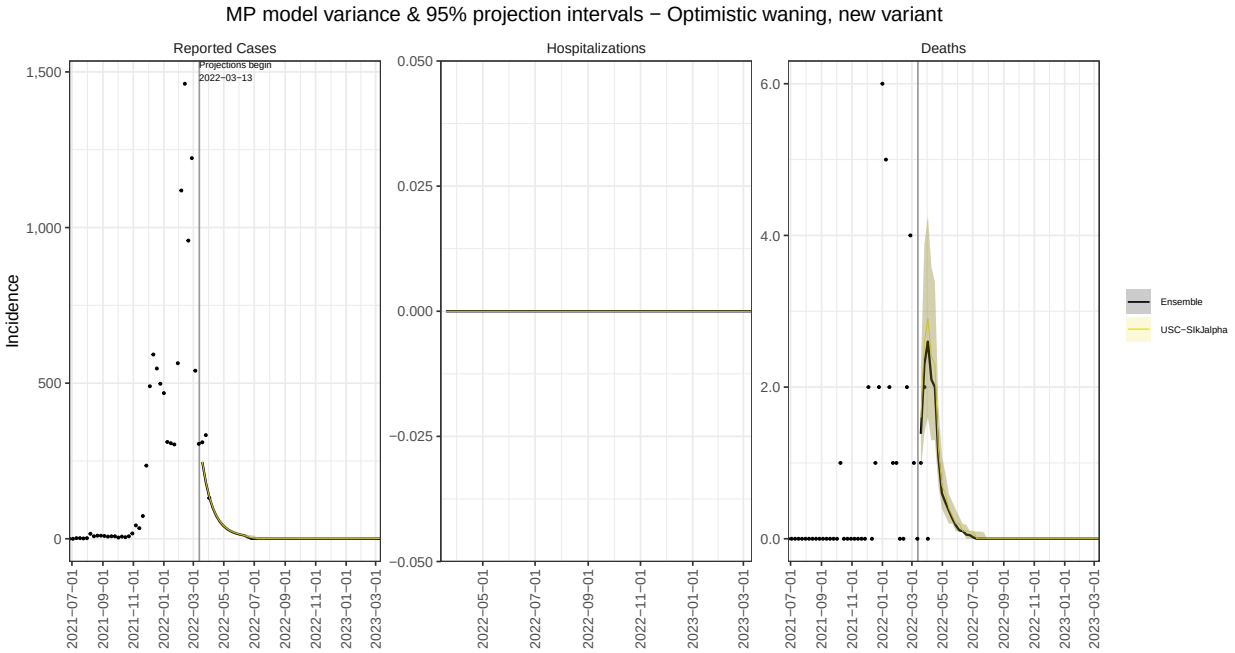

WV model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

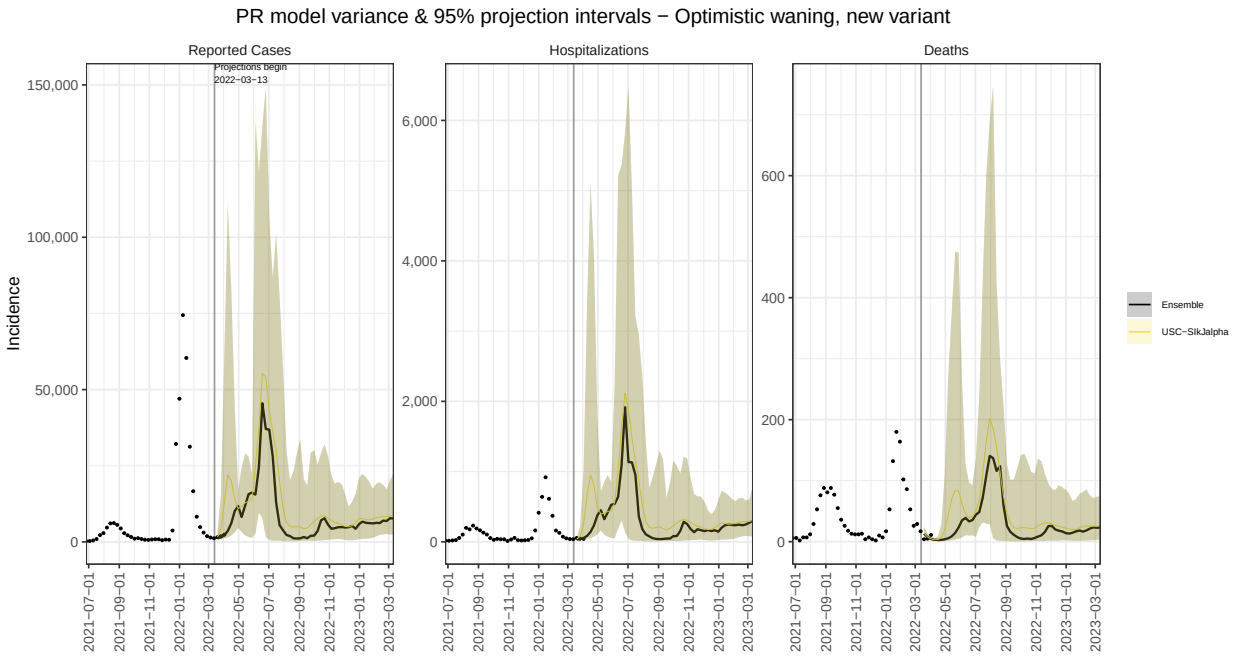

WI model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

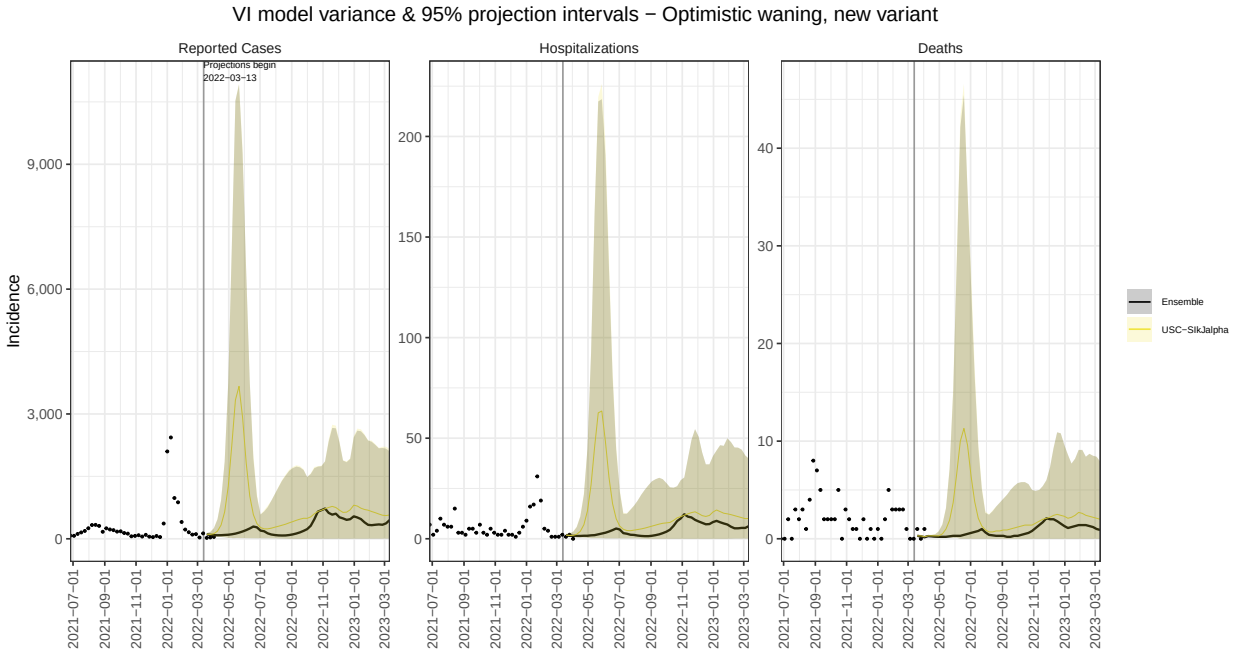

WY model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


AS model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

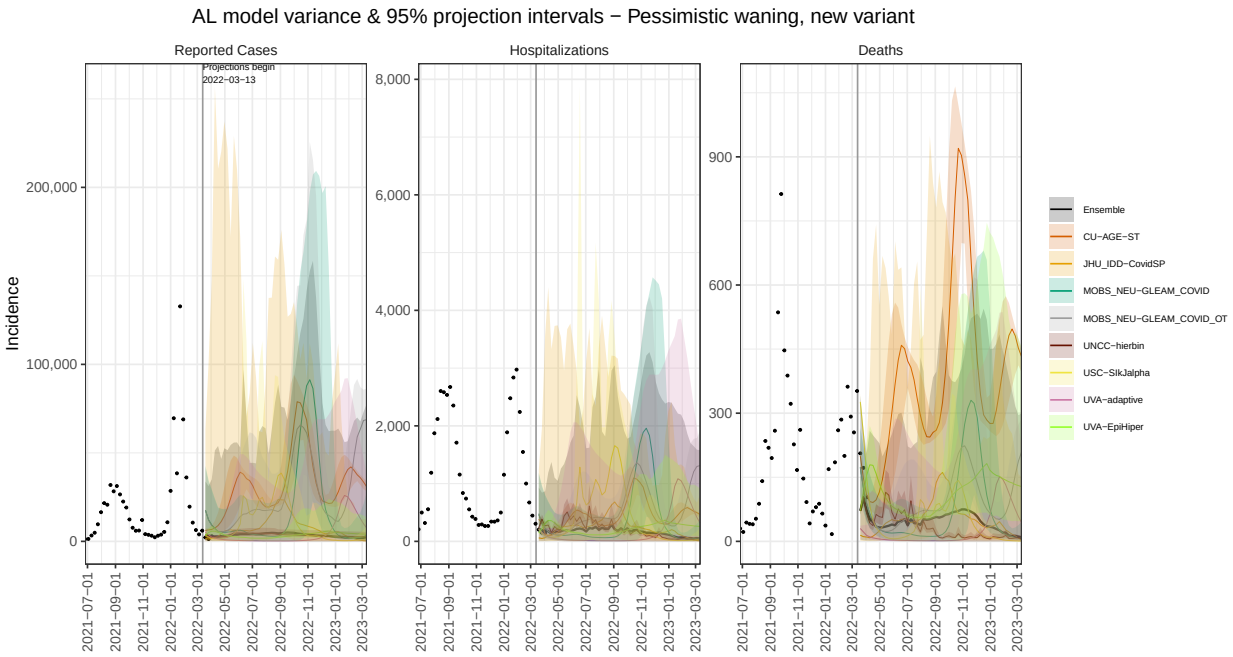

GU model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

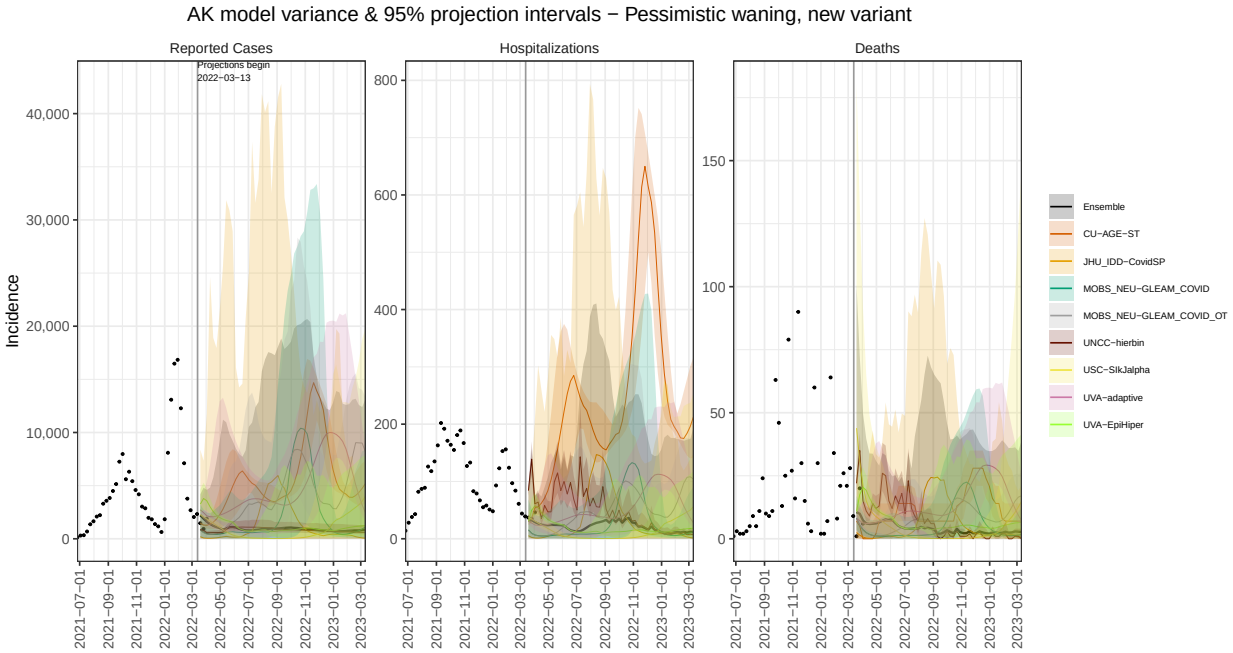

MP model variance & 95% projection intervals − Optimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

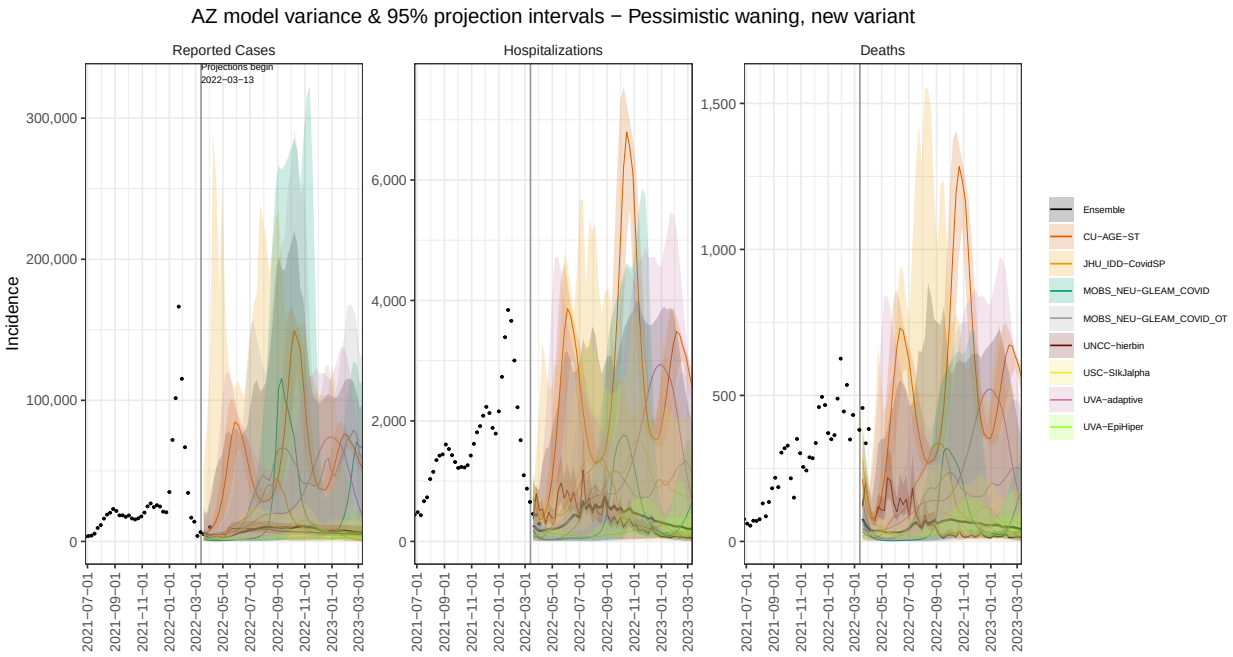


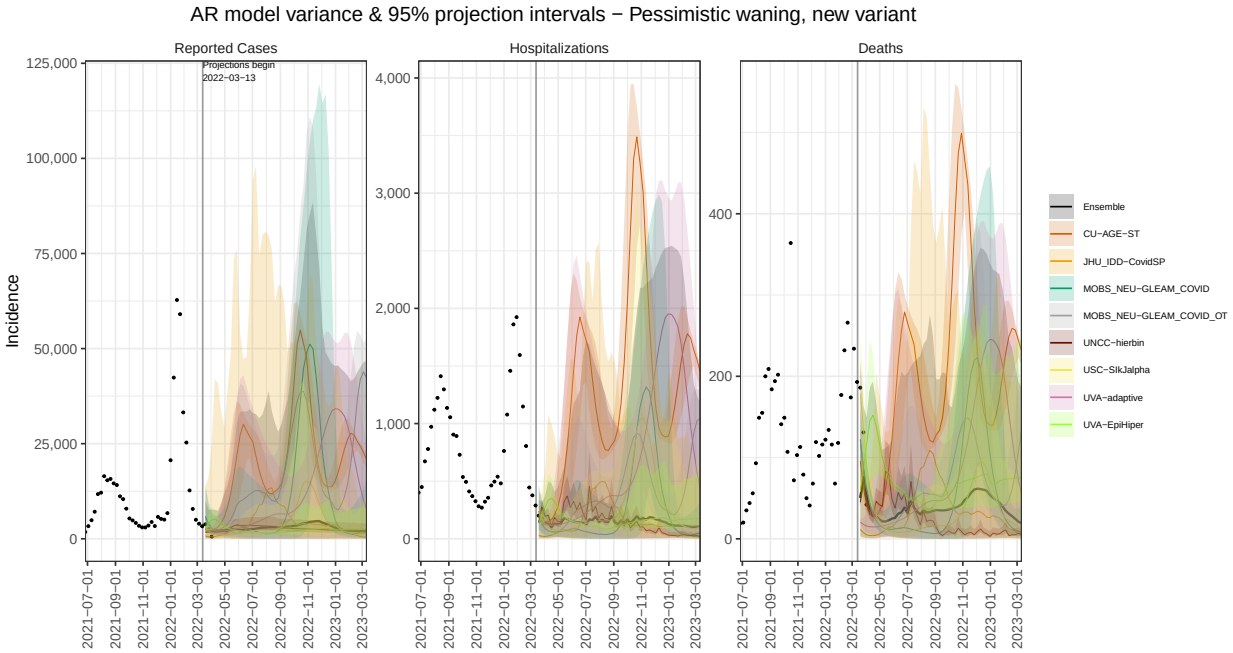


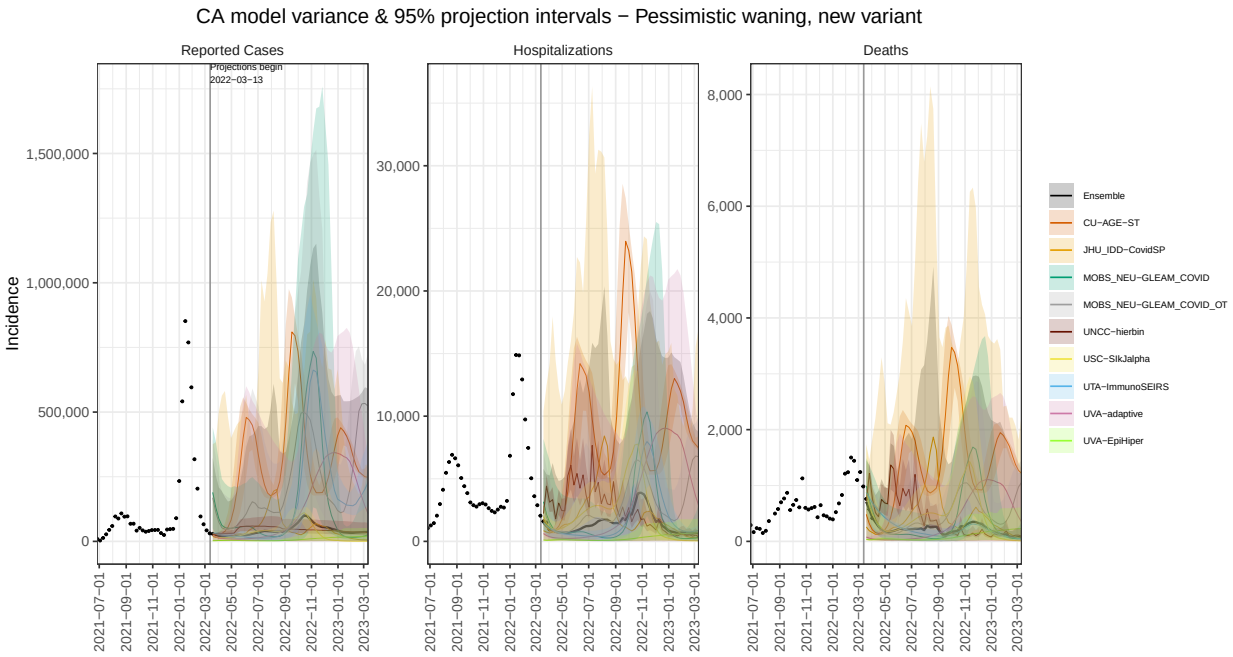
National model variation for pessimistic wanning, new immune escape variant scenario.

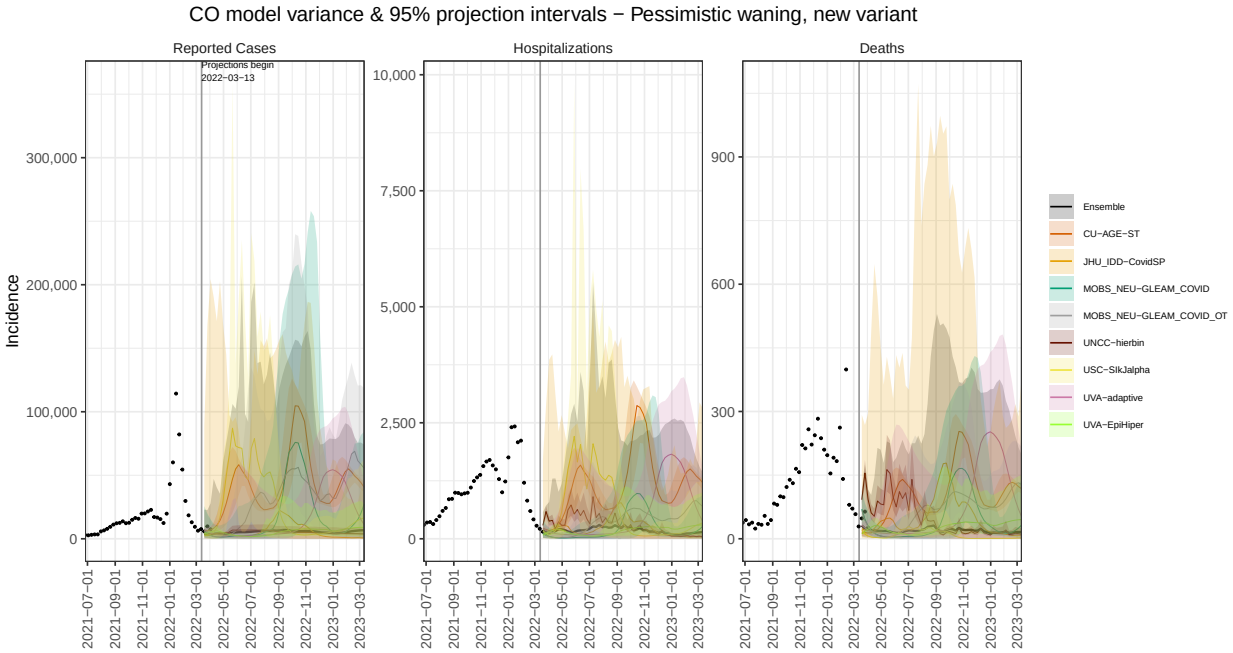

AL model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

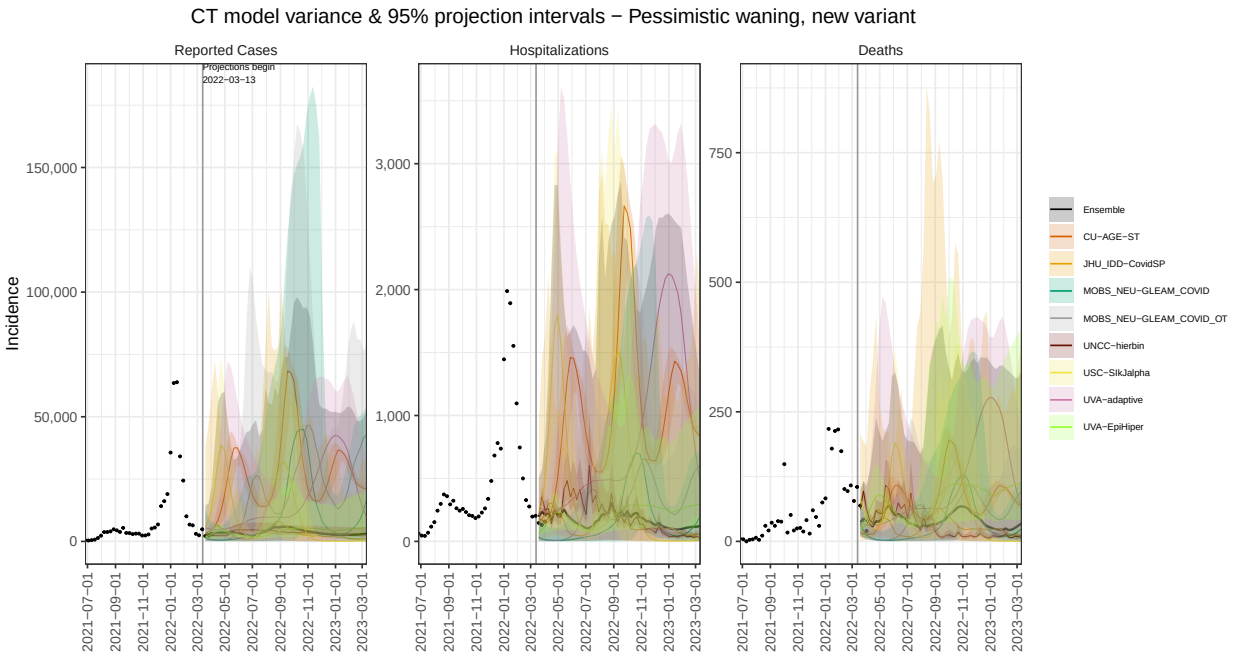

AK model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

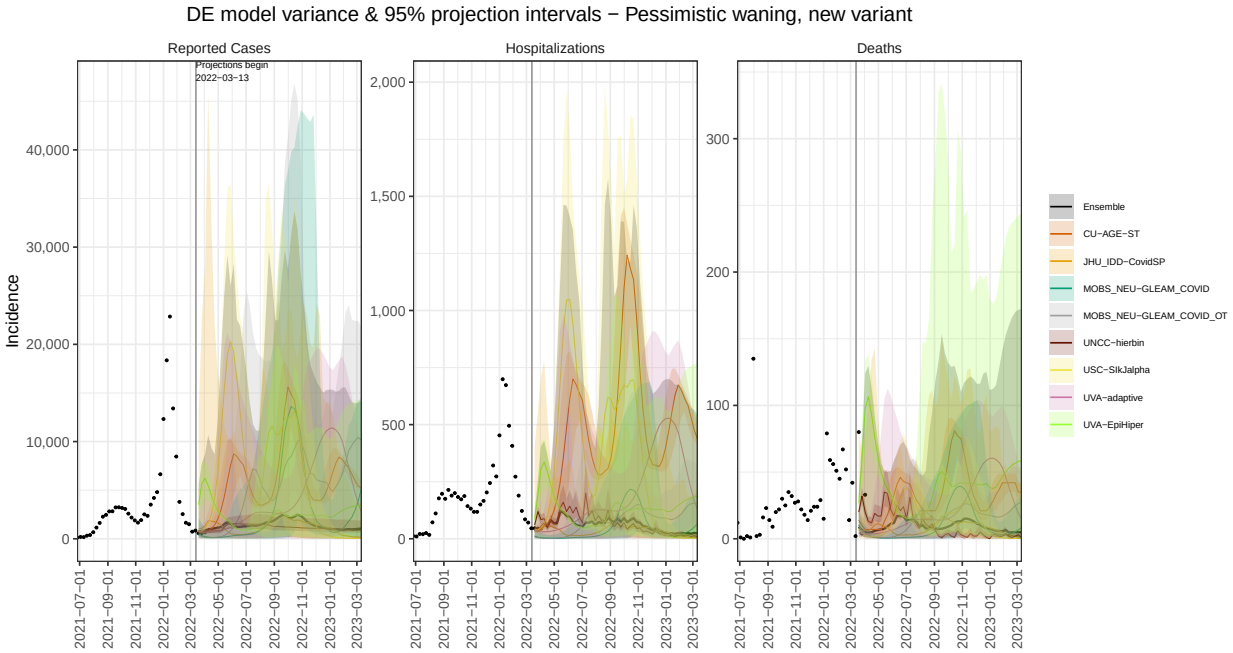

AZ model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

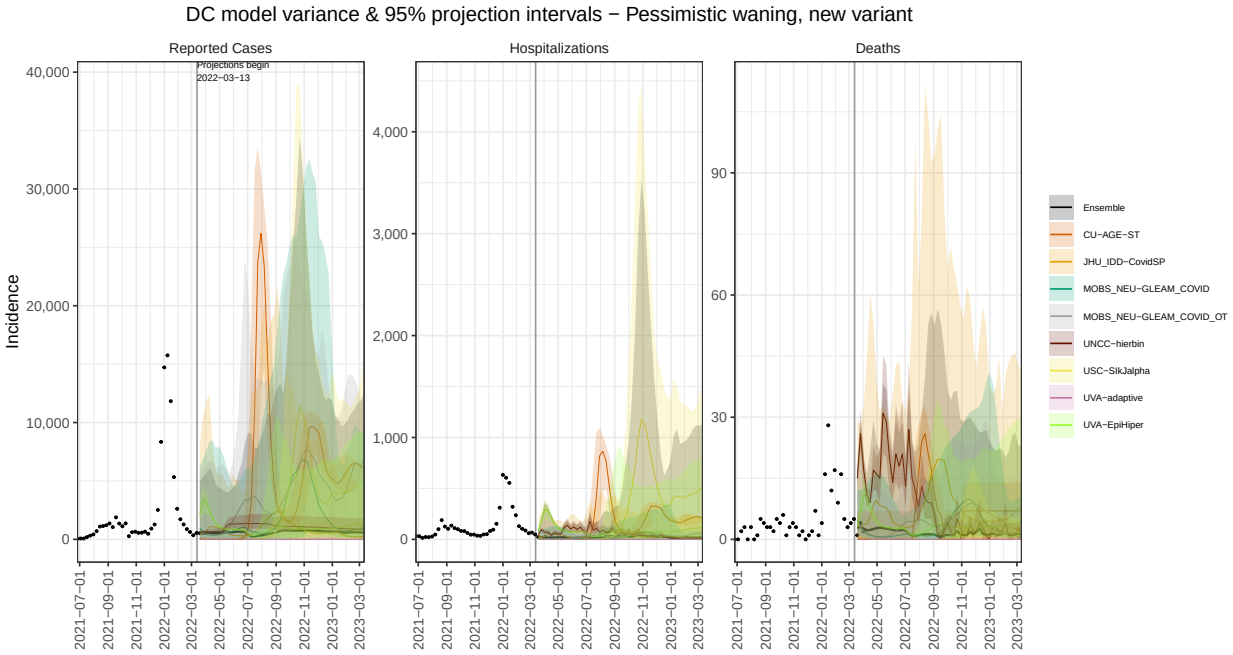

AR model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

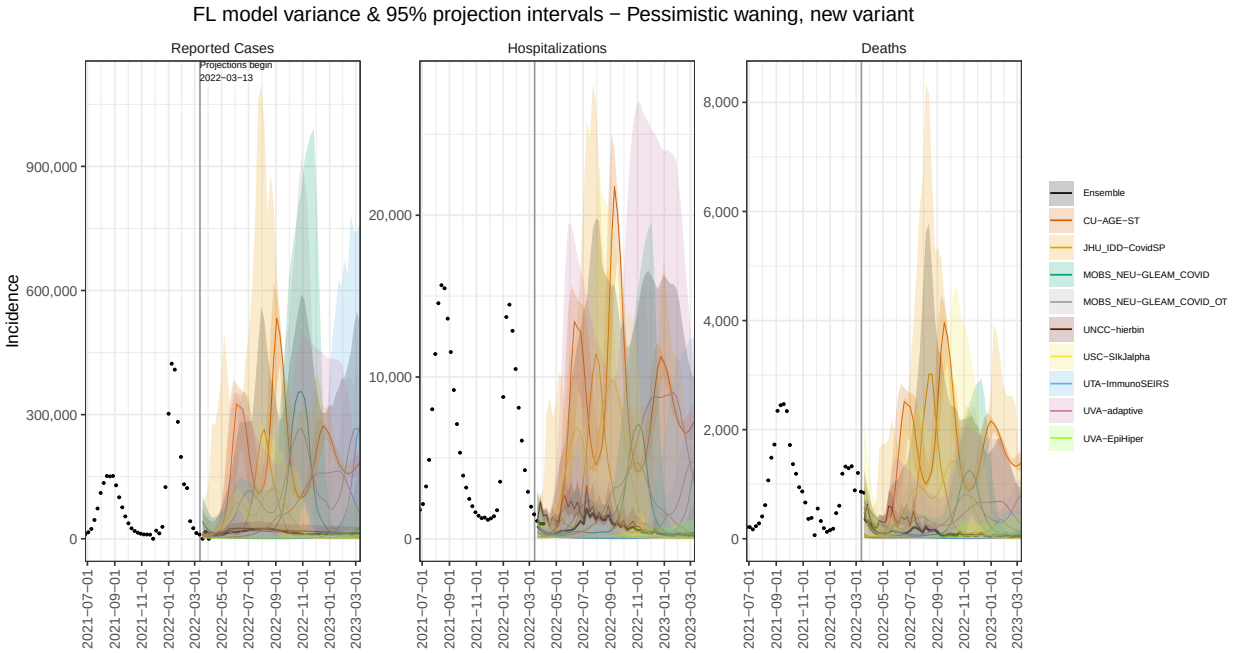

CA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

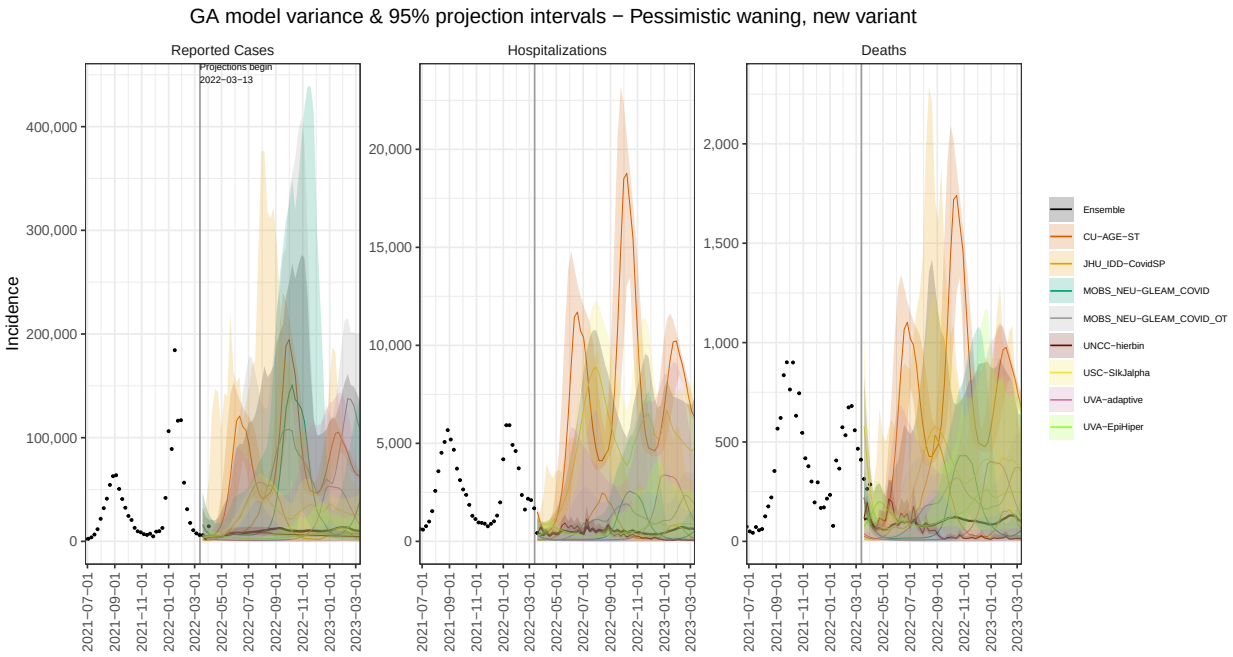

CO model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

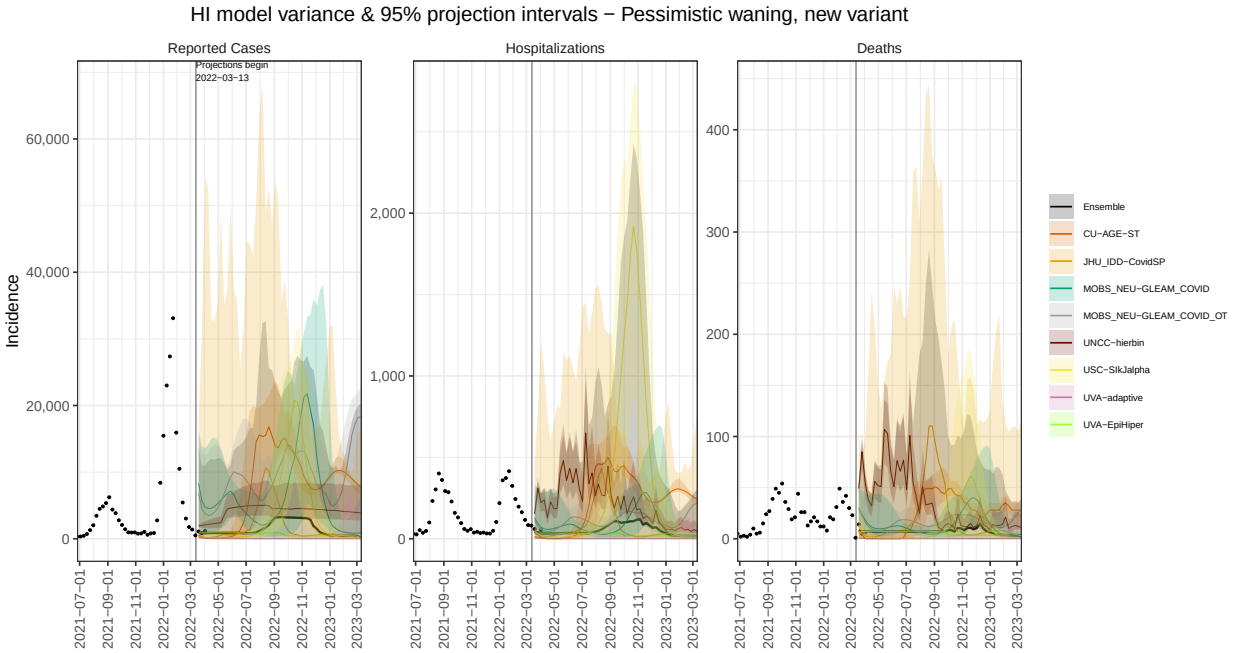

CT model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

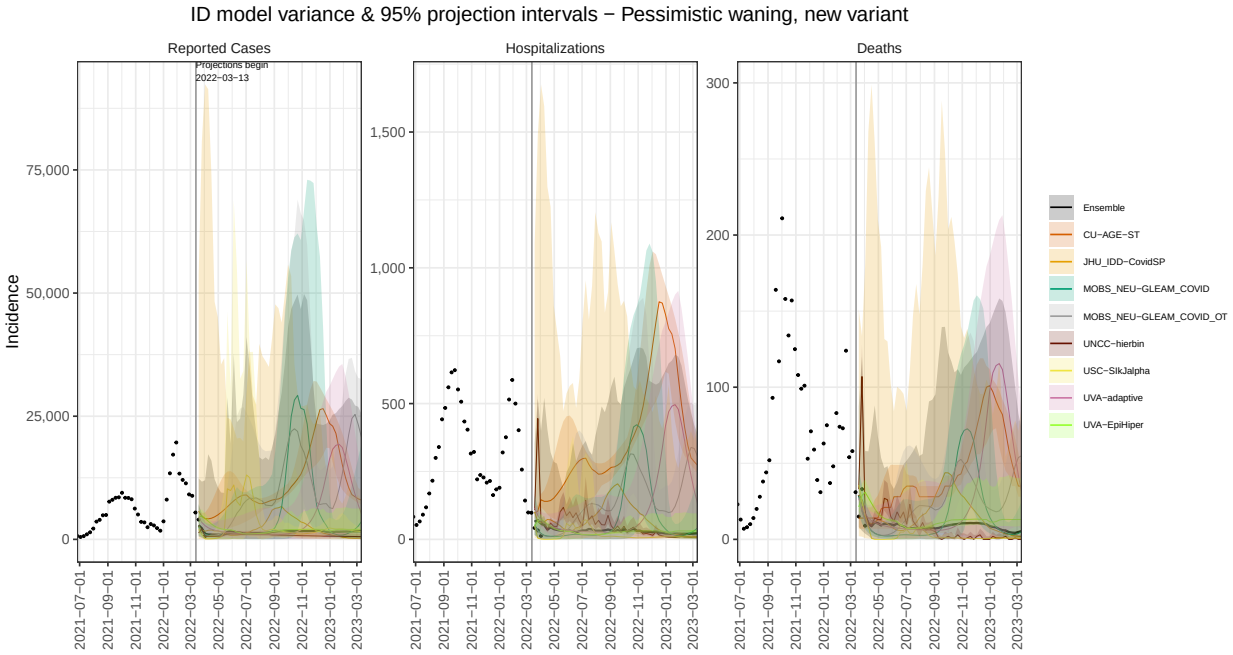

DE model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

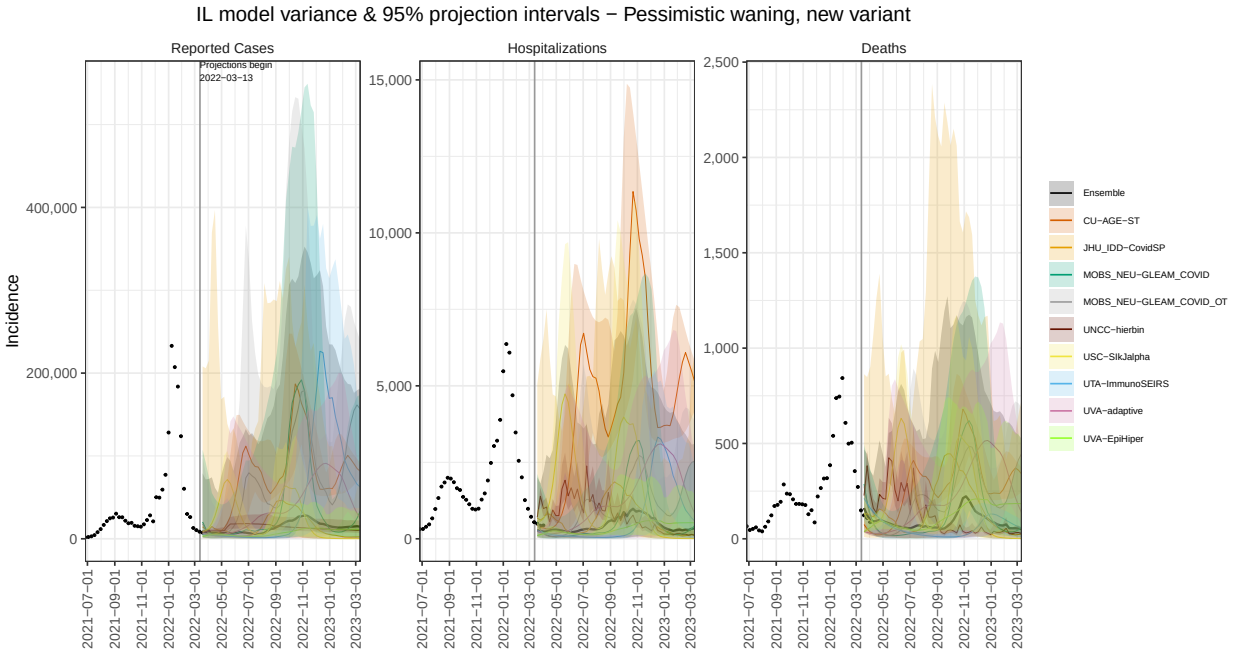

DC model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

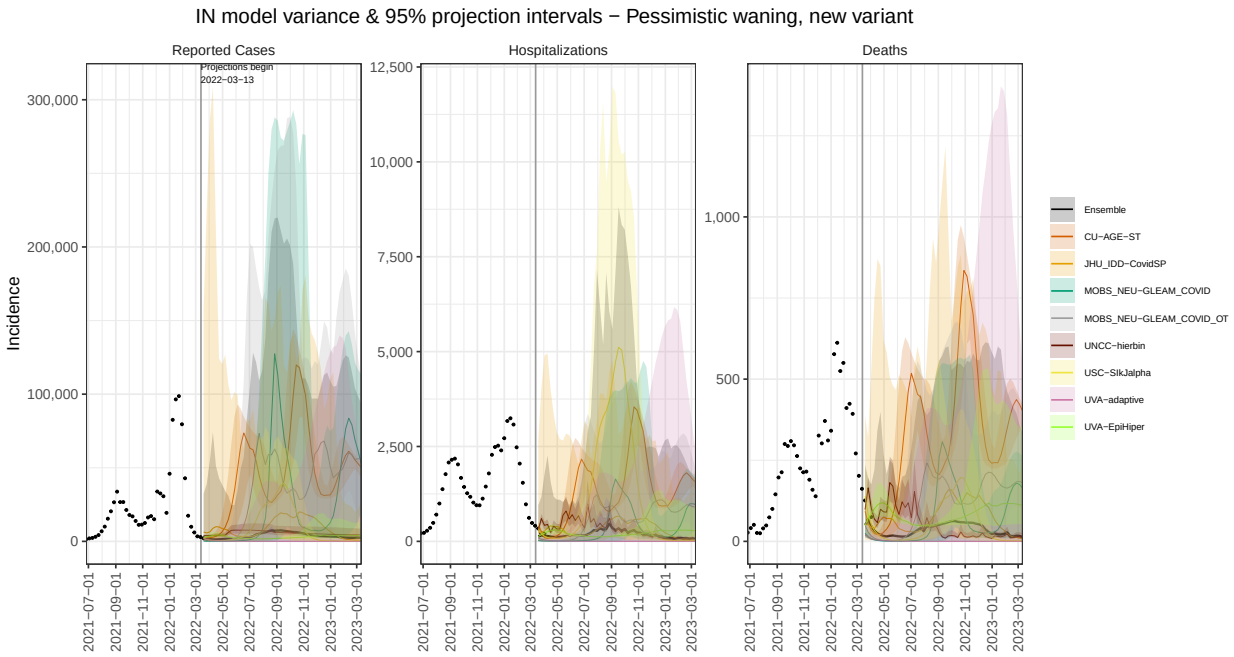

FL model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

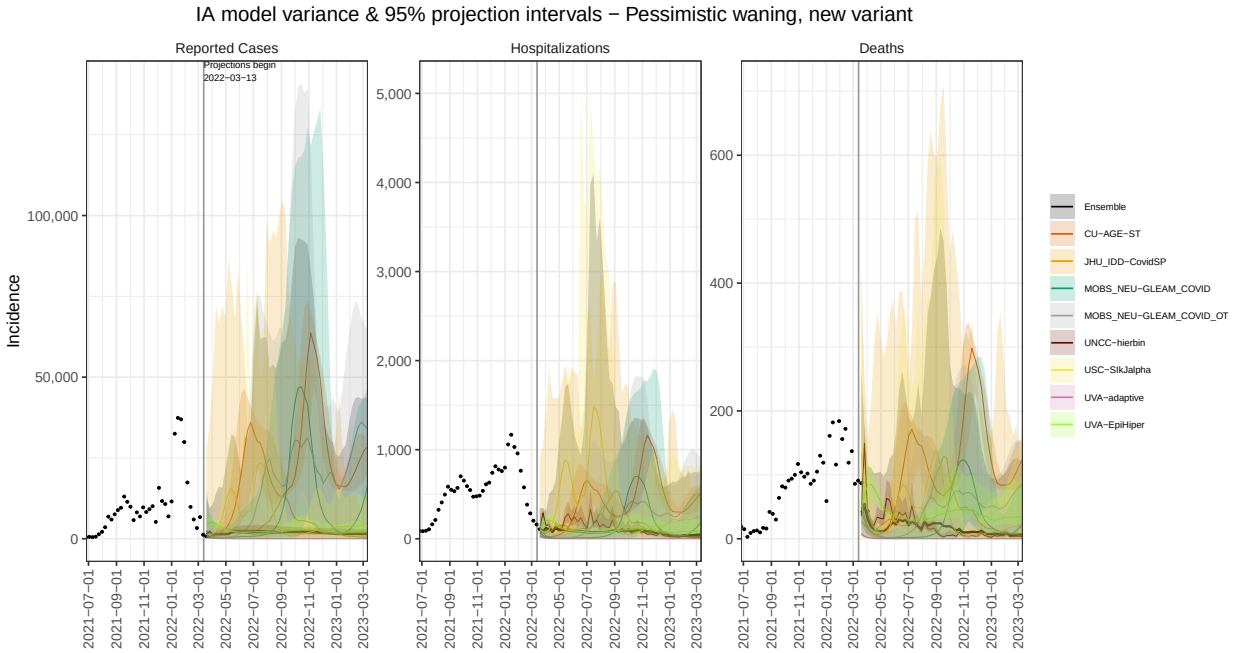

GA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

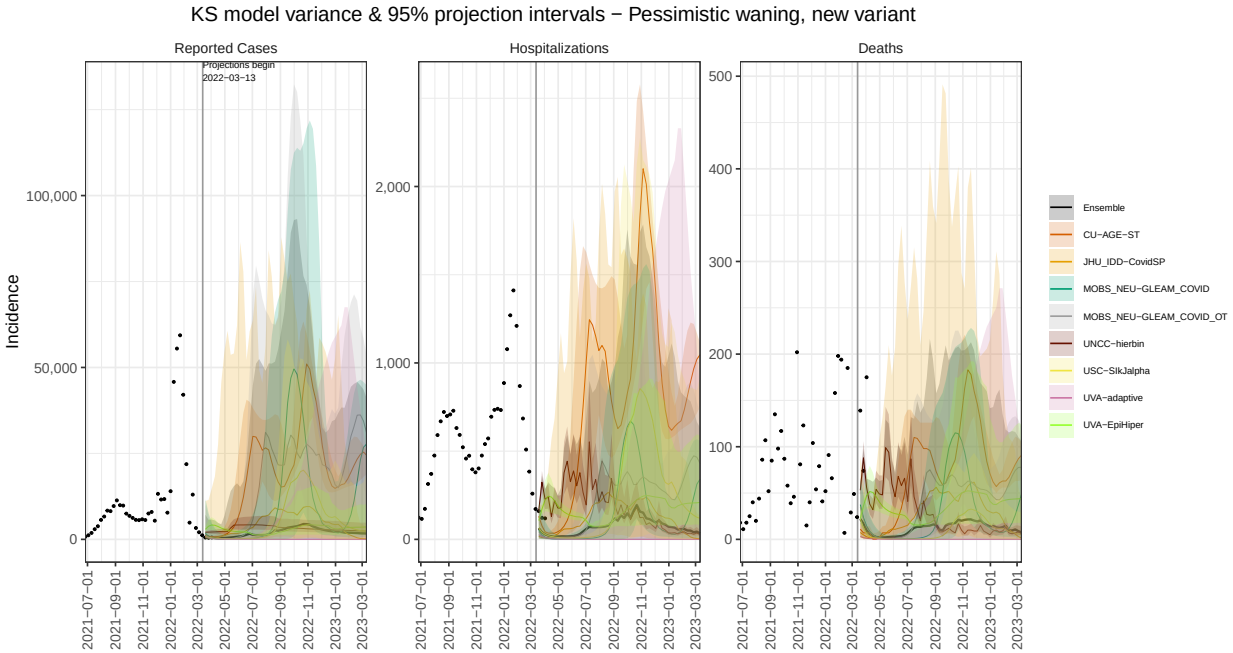

HI model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

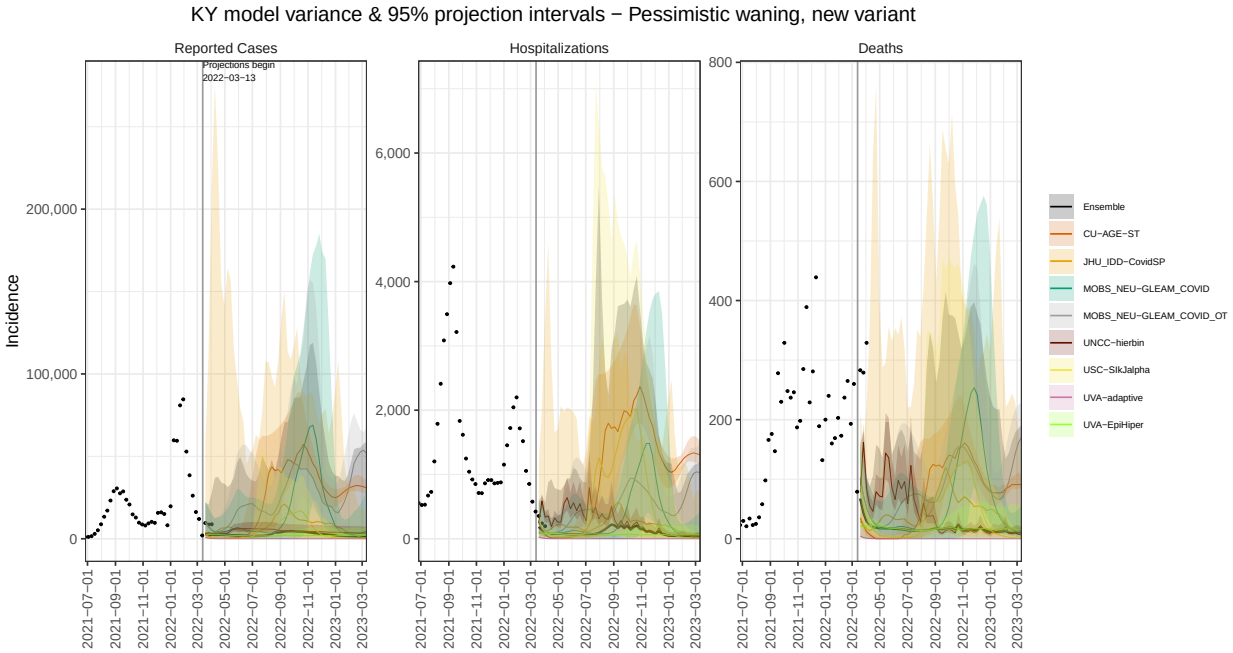

ID model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

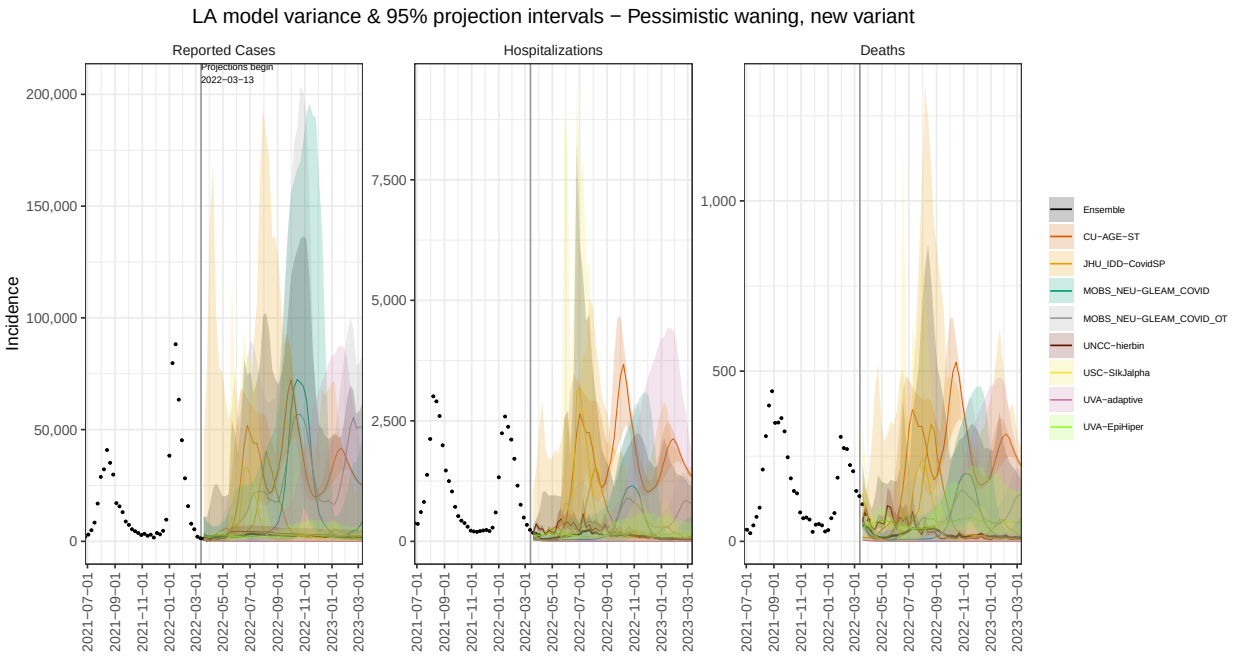

IL model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

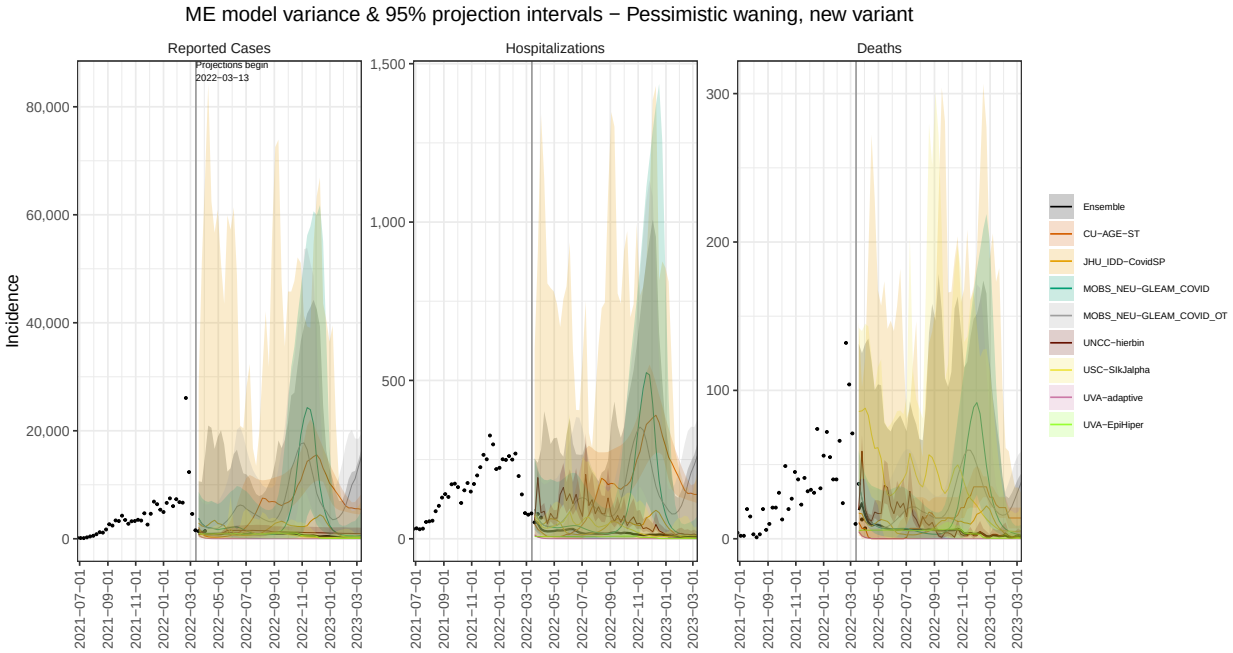

IN model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

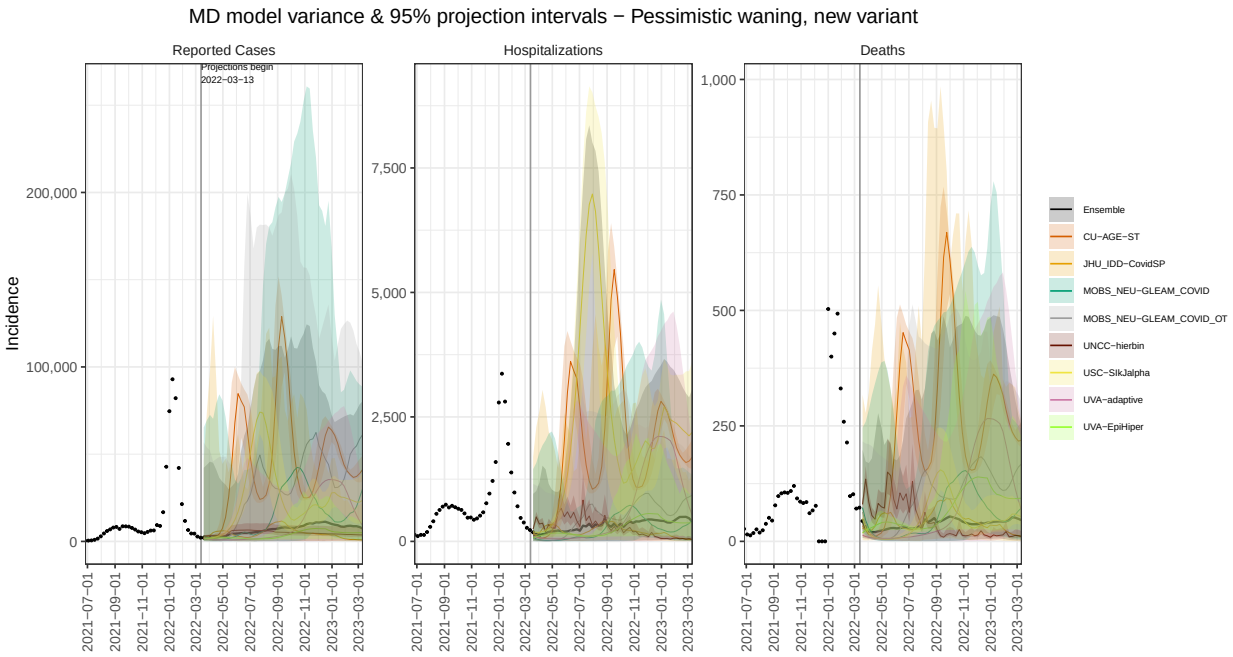

IA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

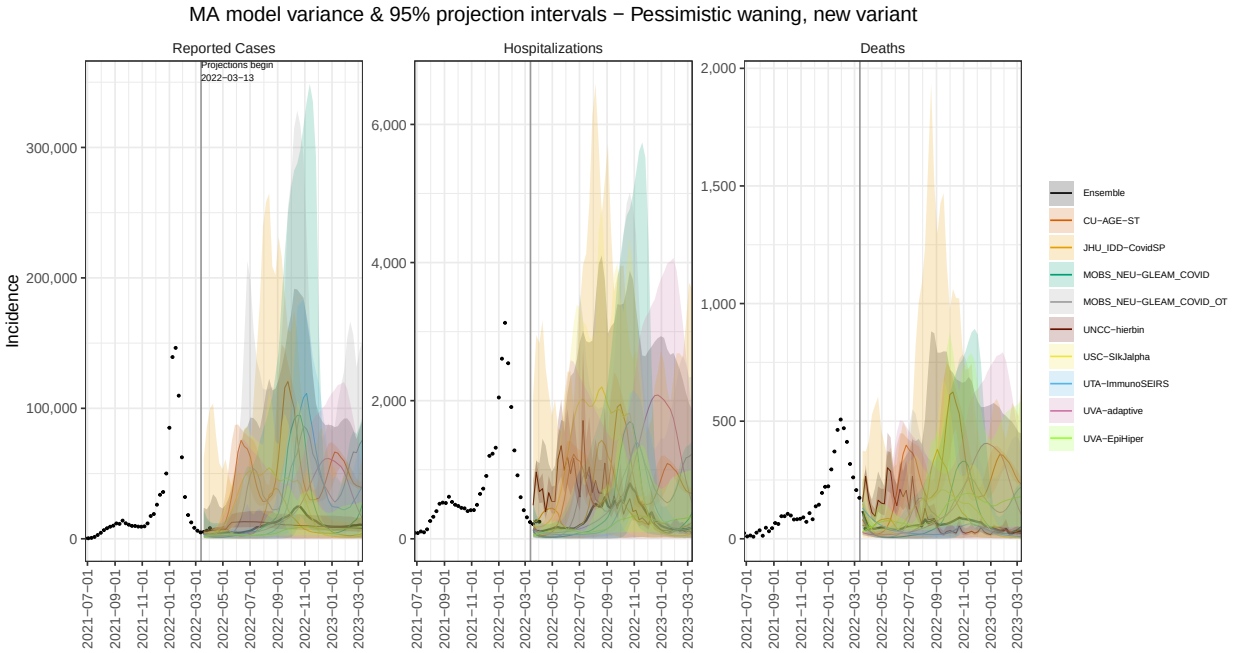

KS model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

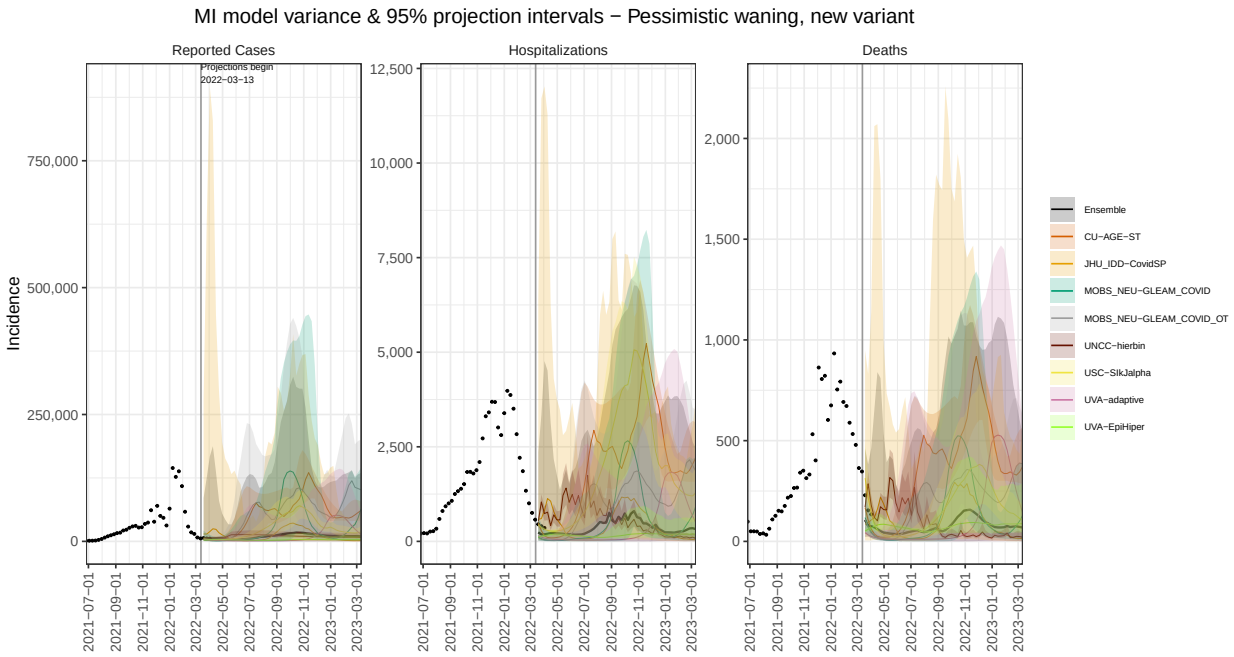

KY model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

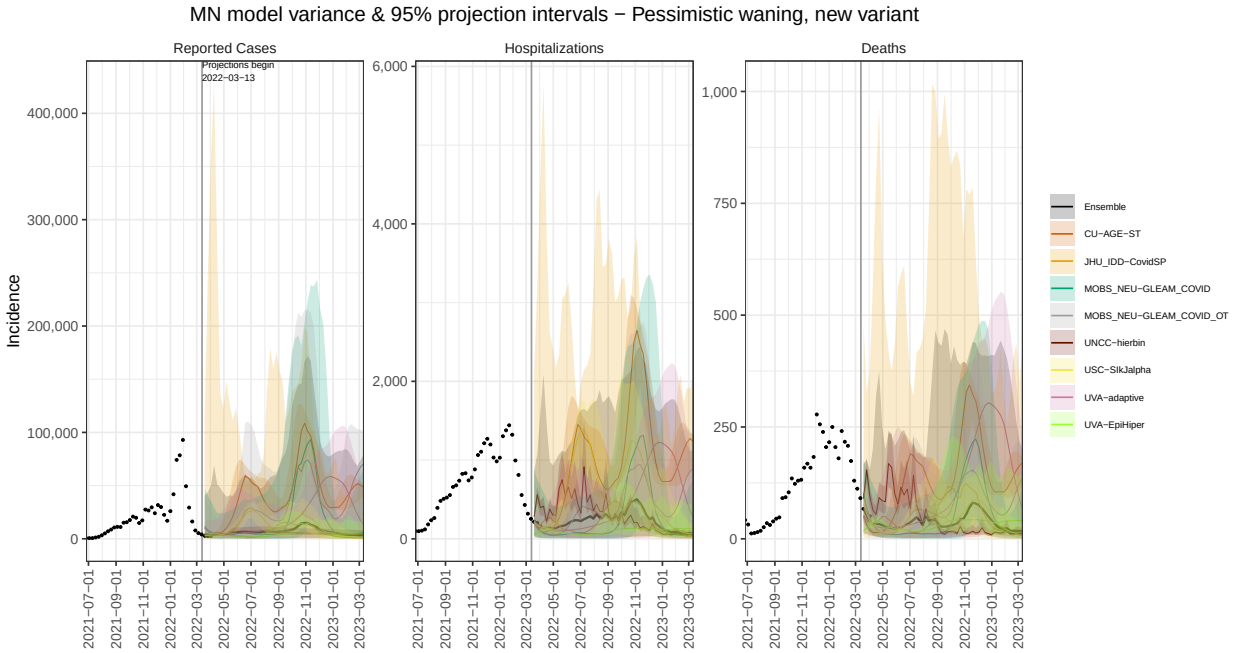

LA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

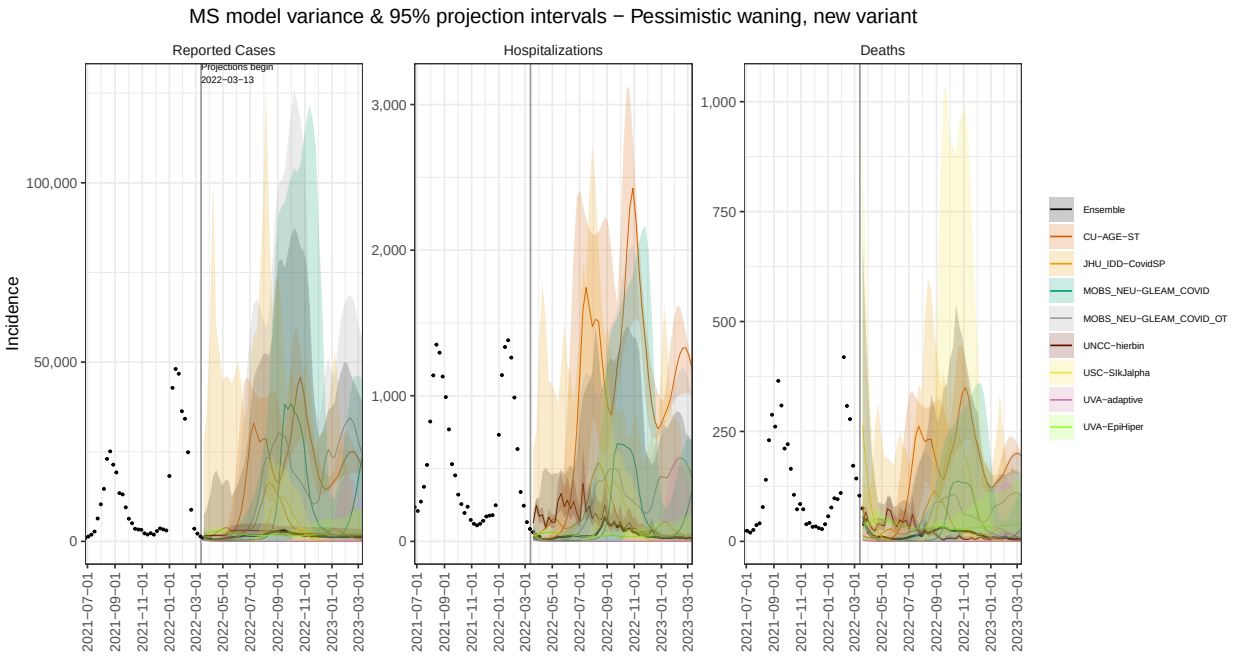

ME model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

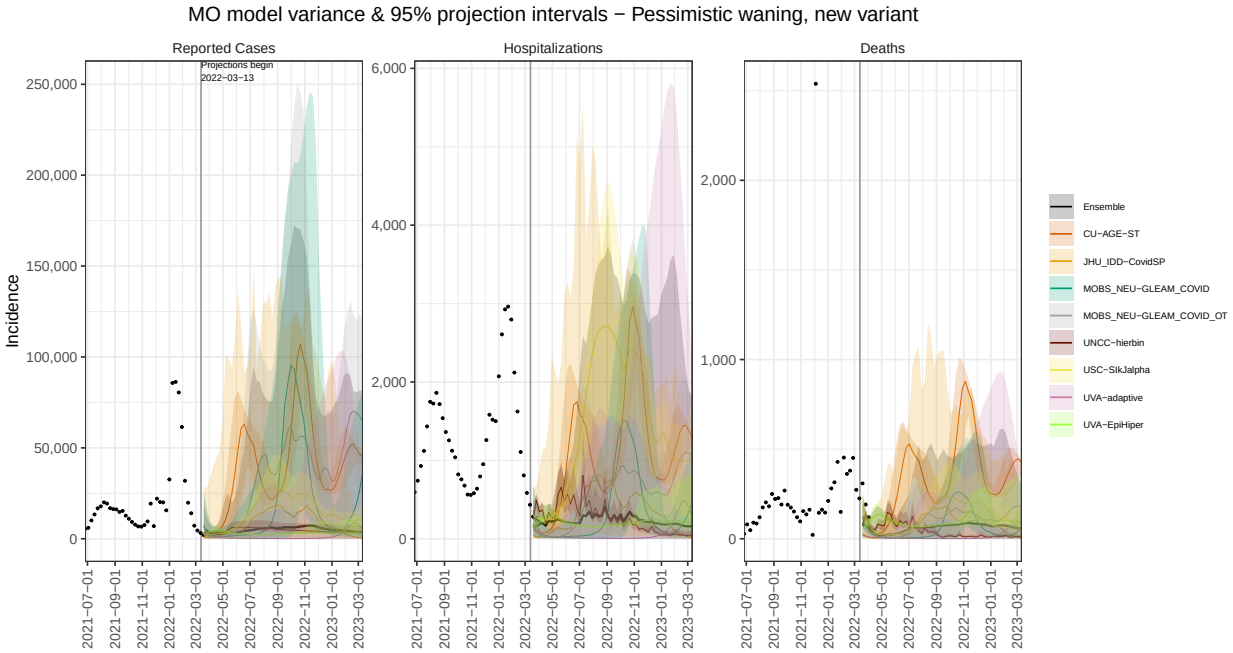

MD model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

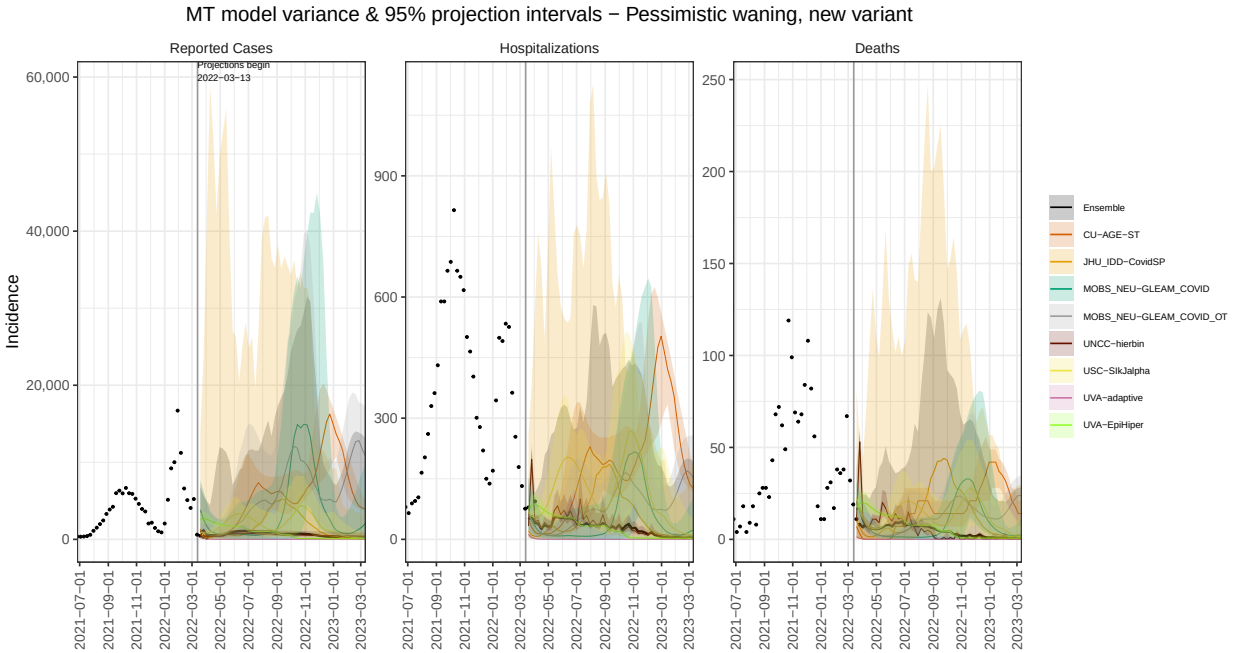

MA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

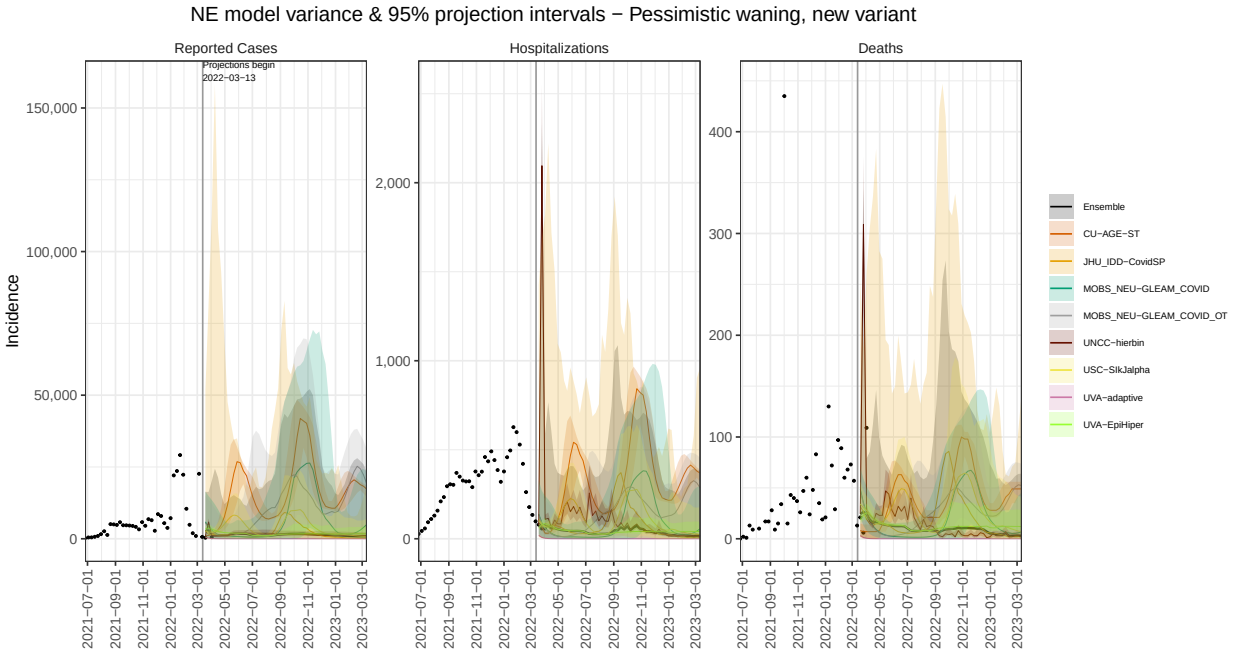

MI model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

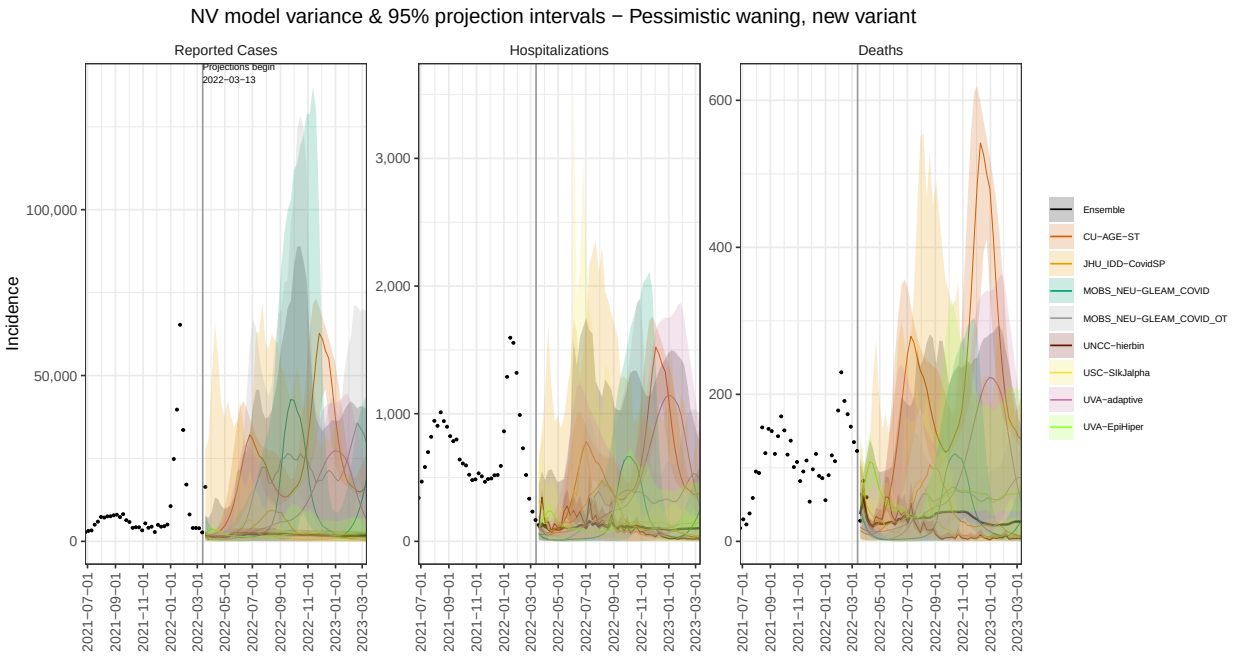

MN model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

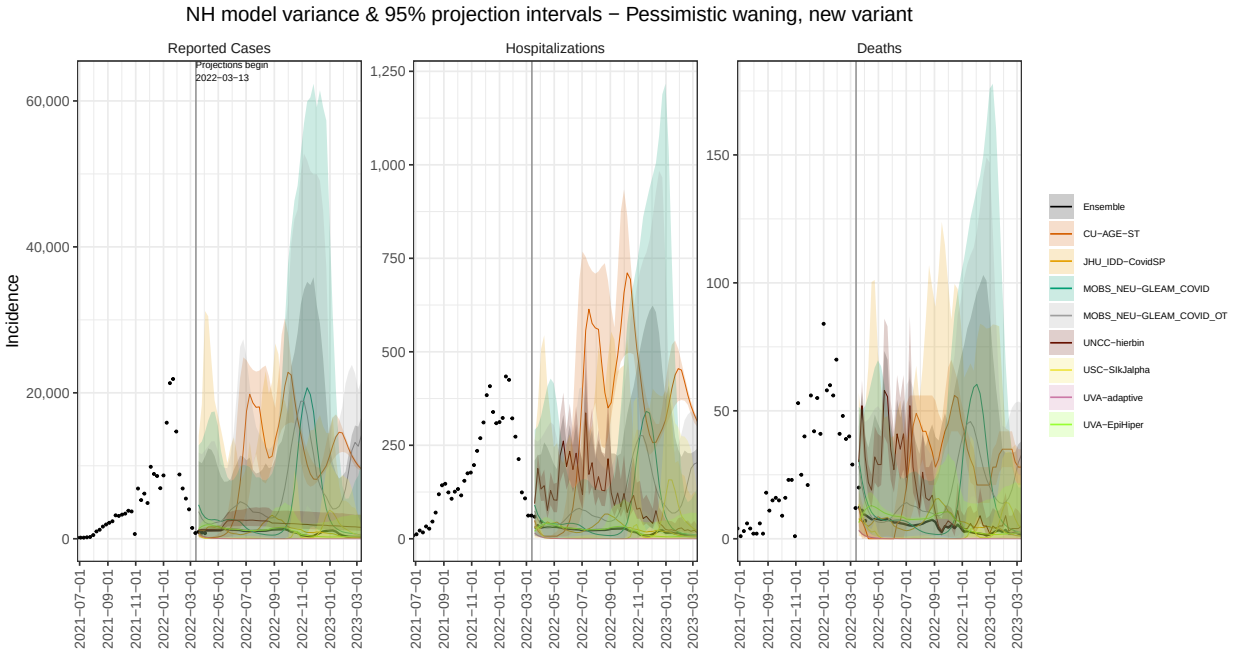

MS model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

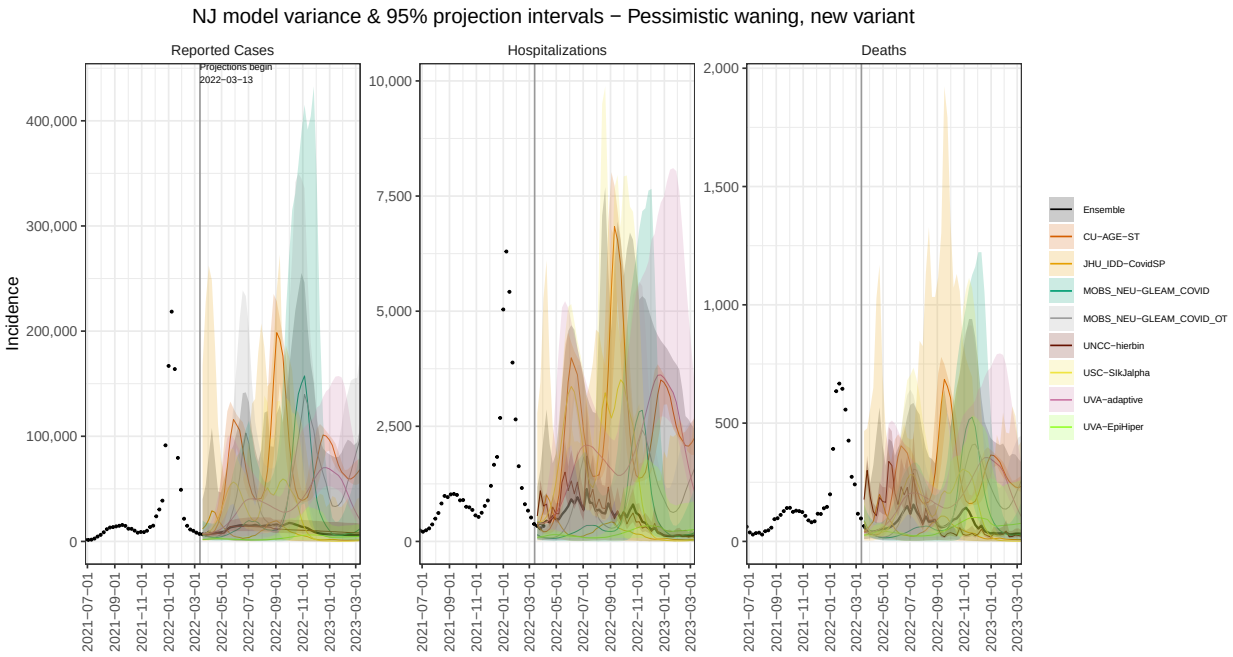

MO model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

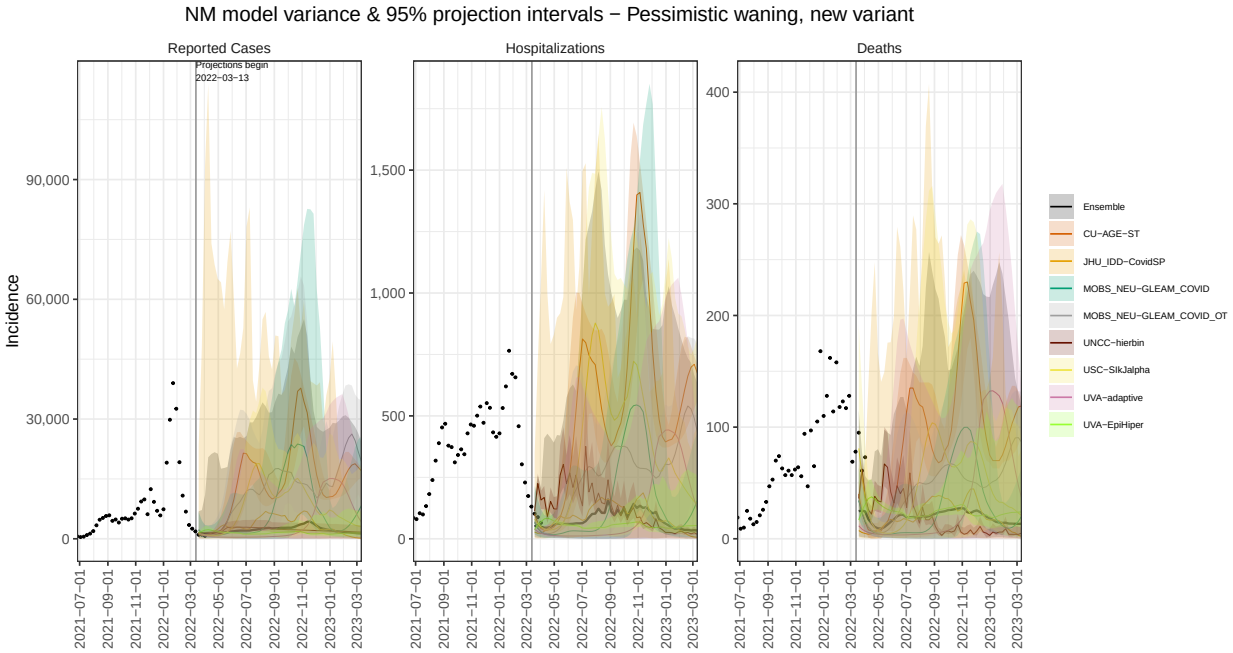

MT model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

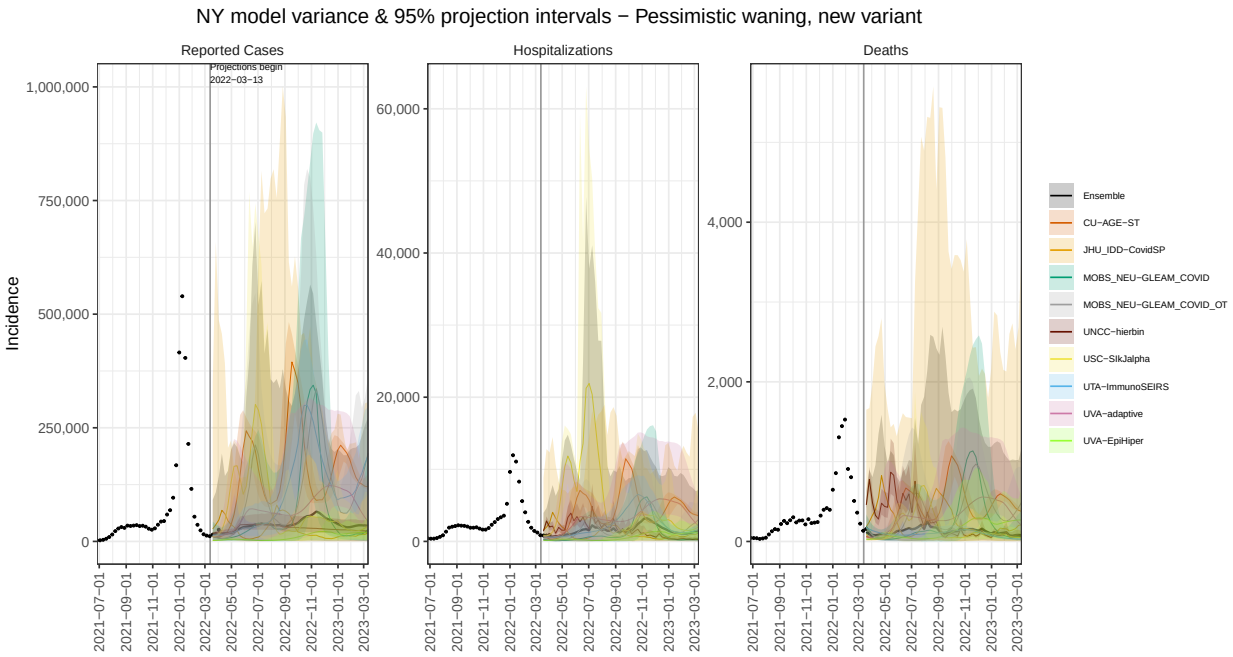

NE model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

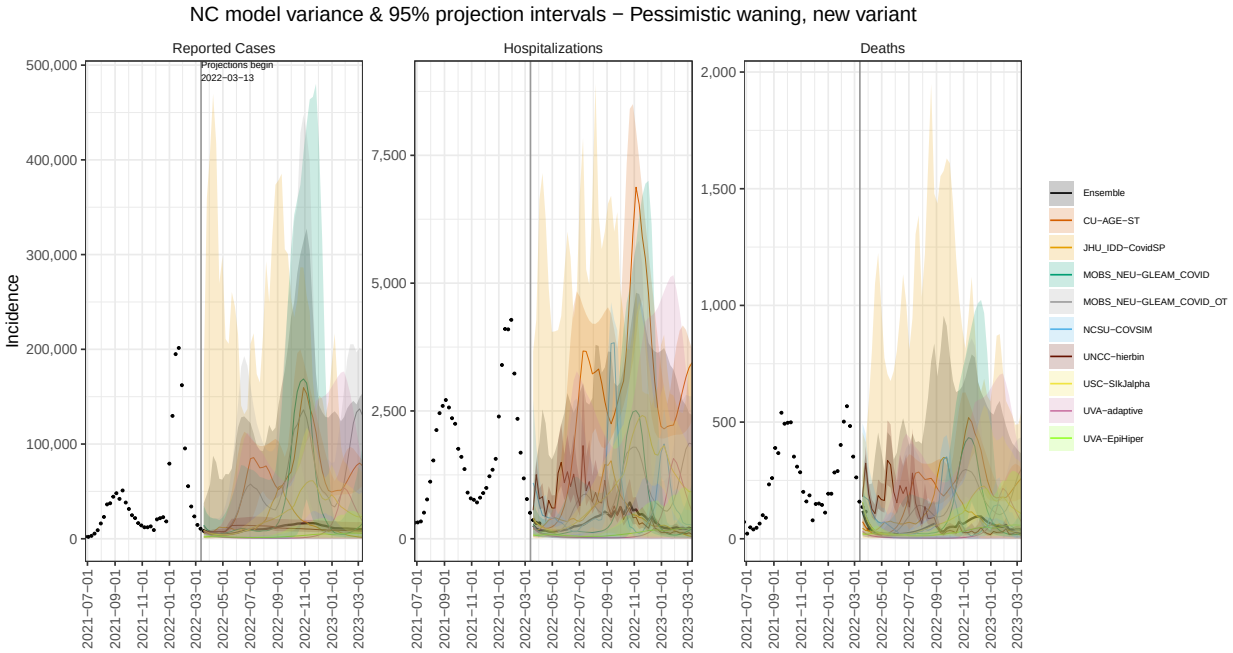

NV model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

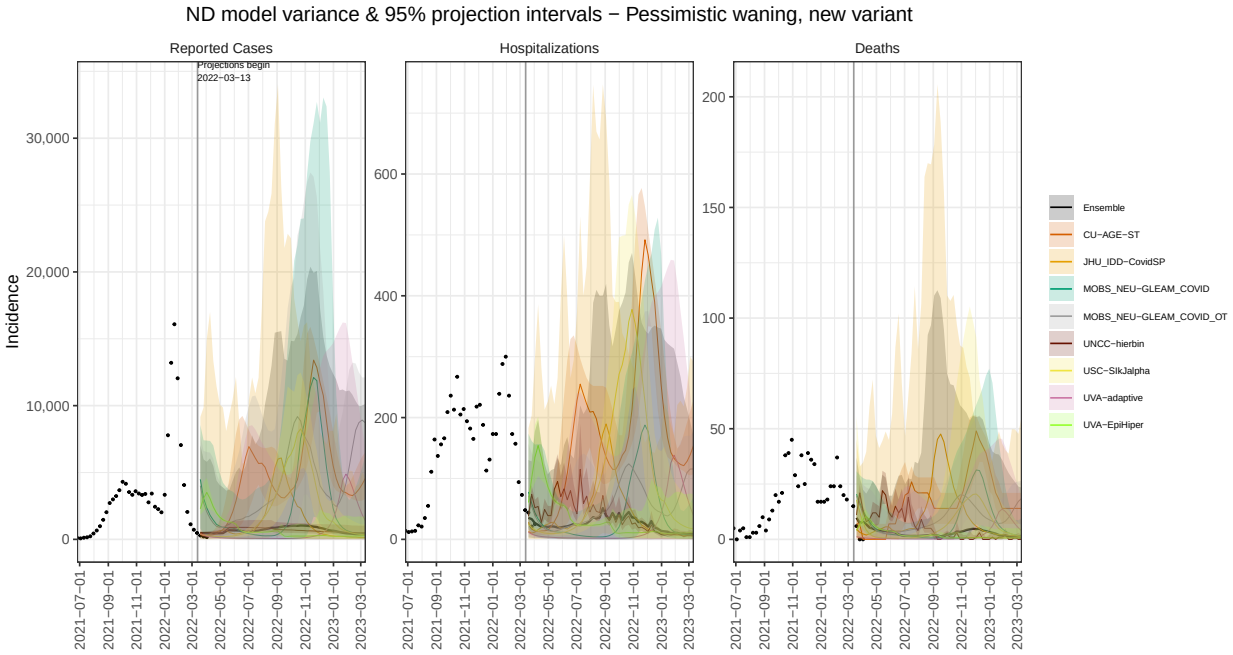

NH model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

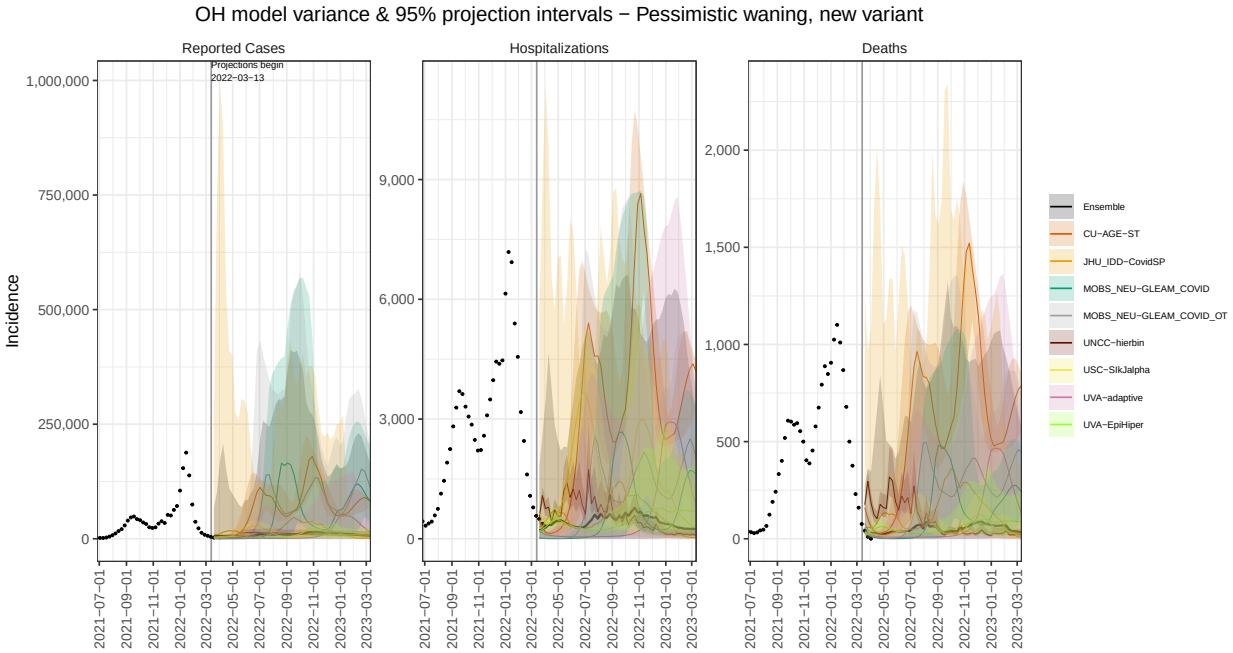

NJ model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

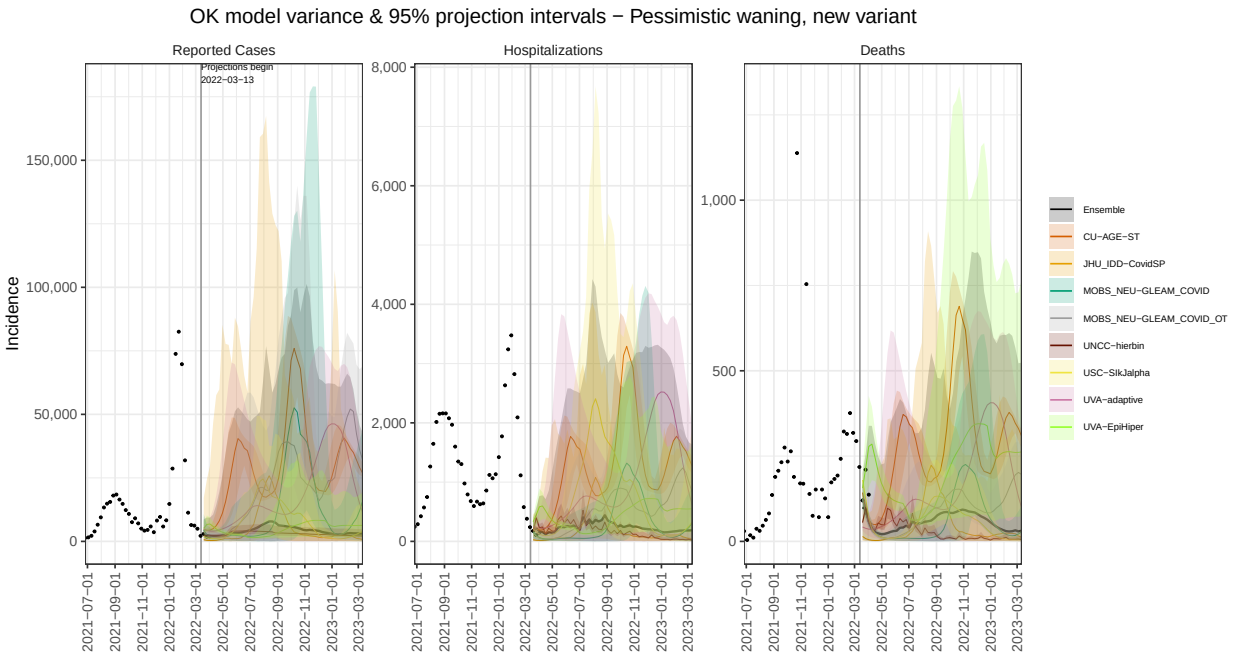

NM model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

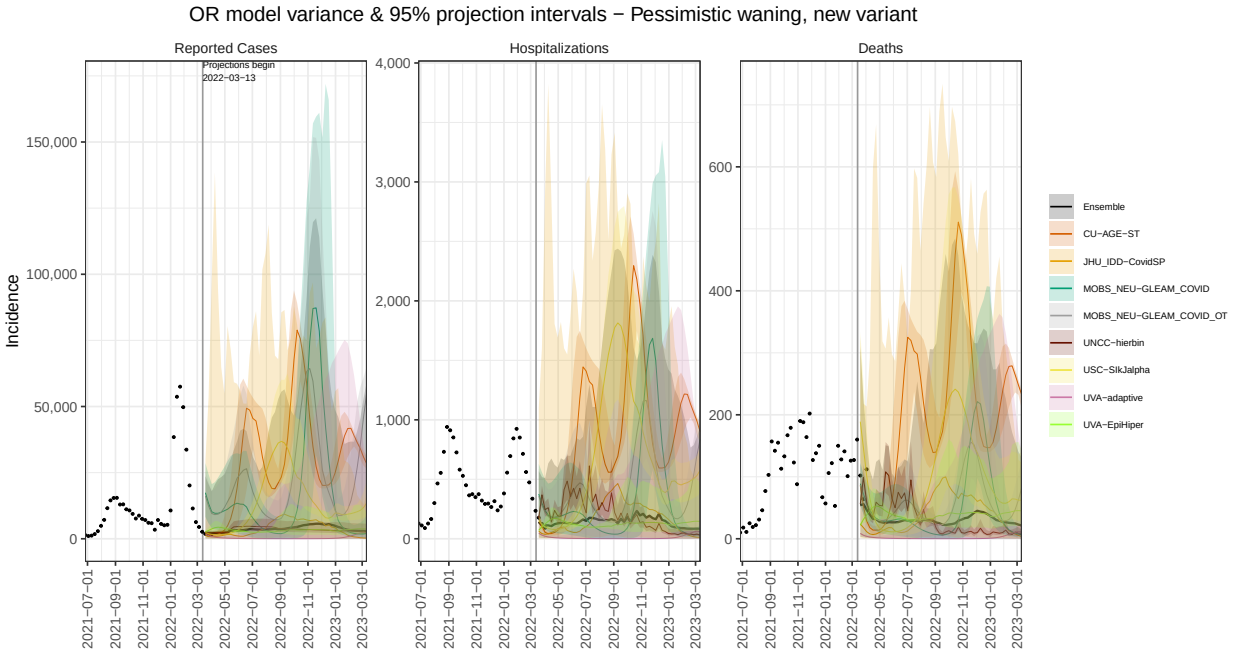

NY model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

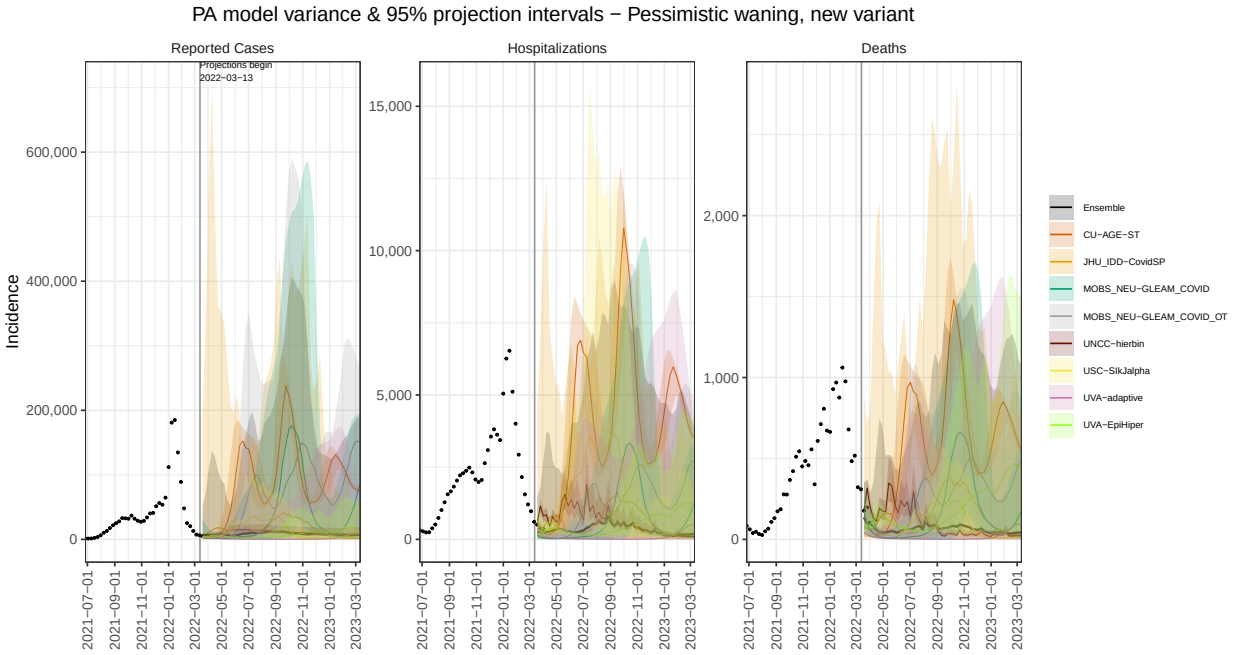

NC model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

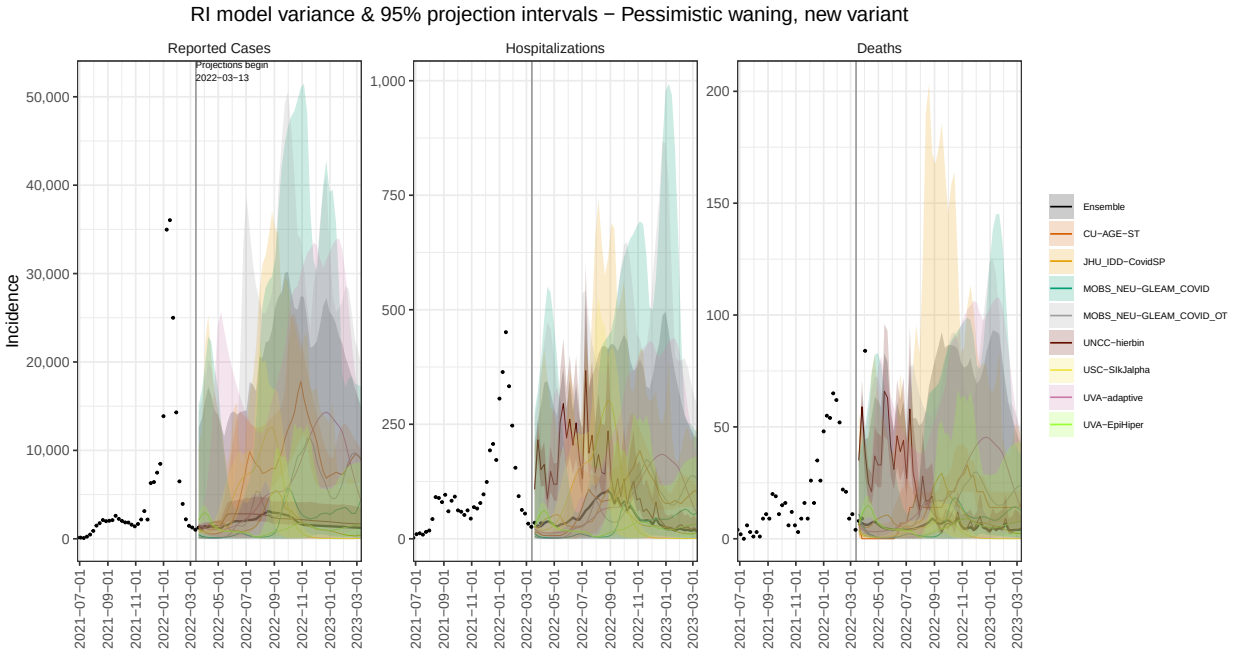

ND model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

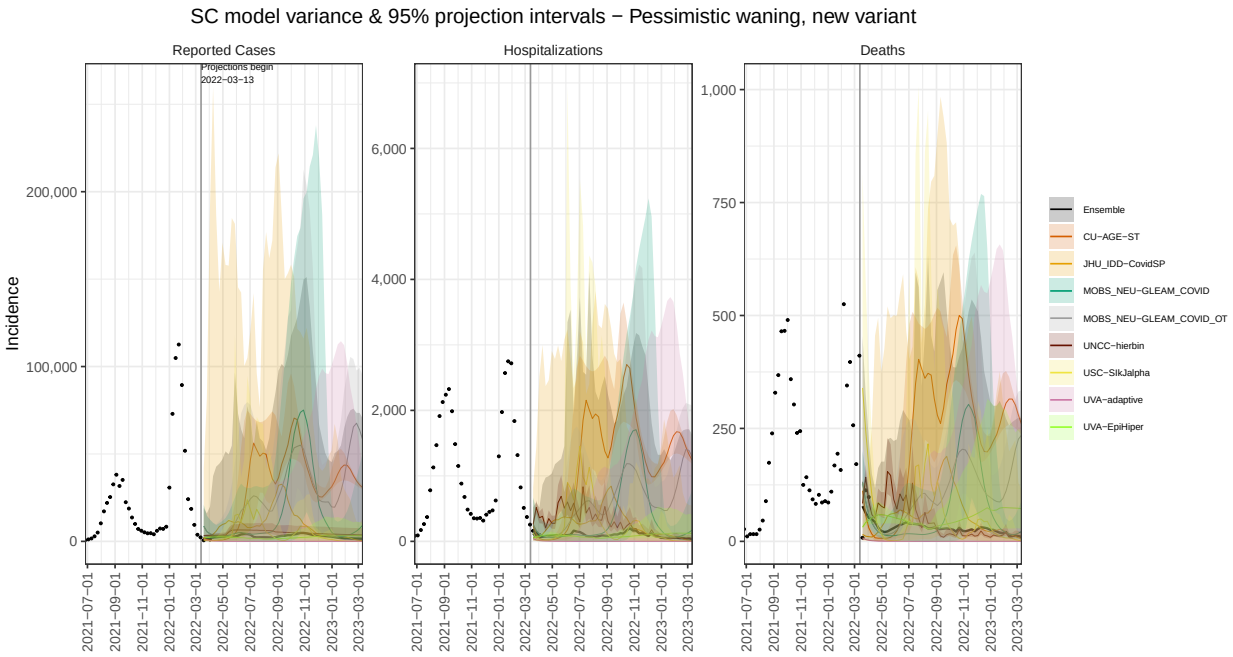

OH model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

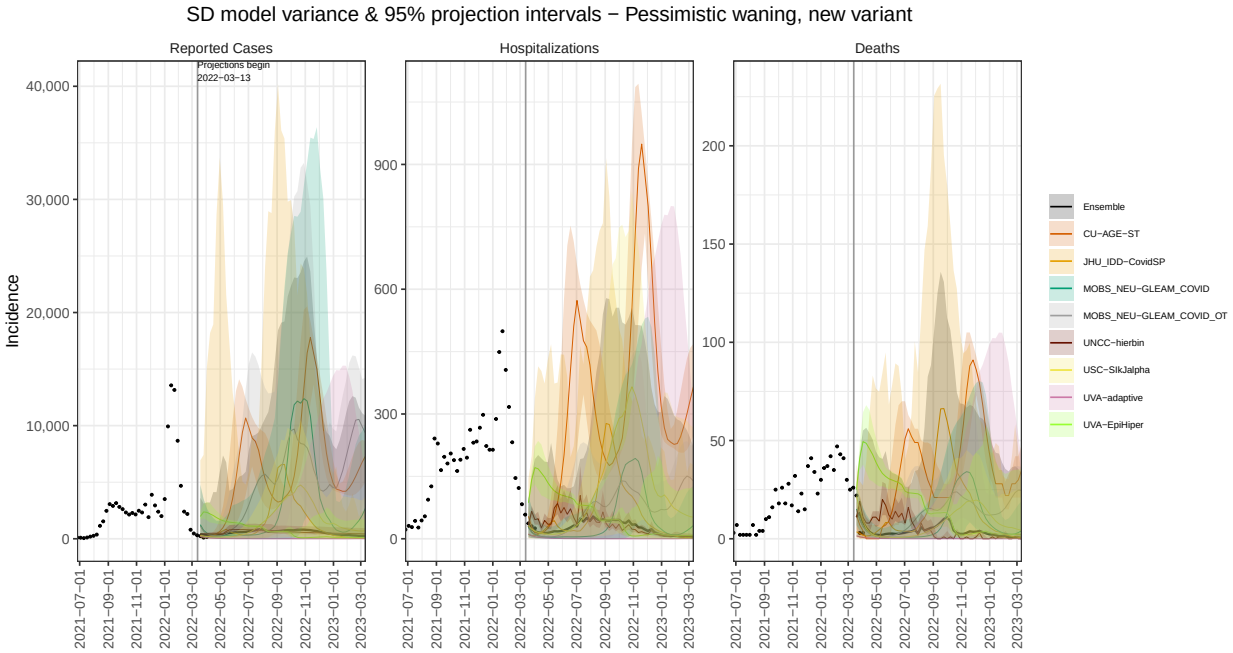

OK model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

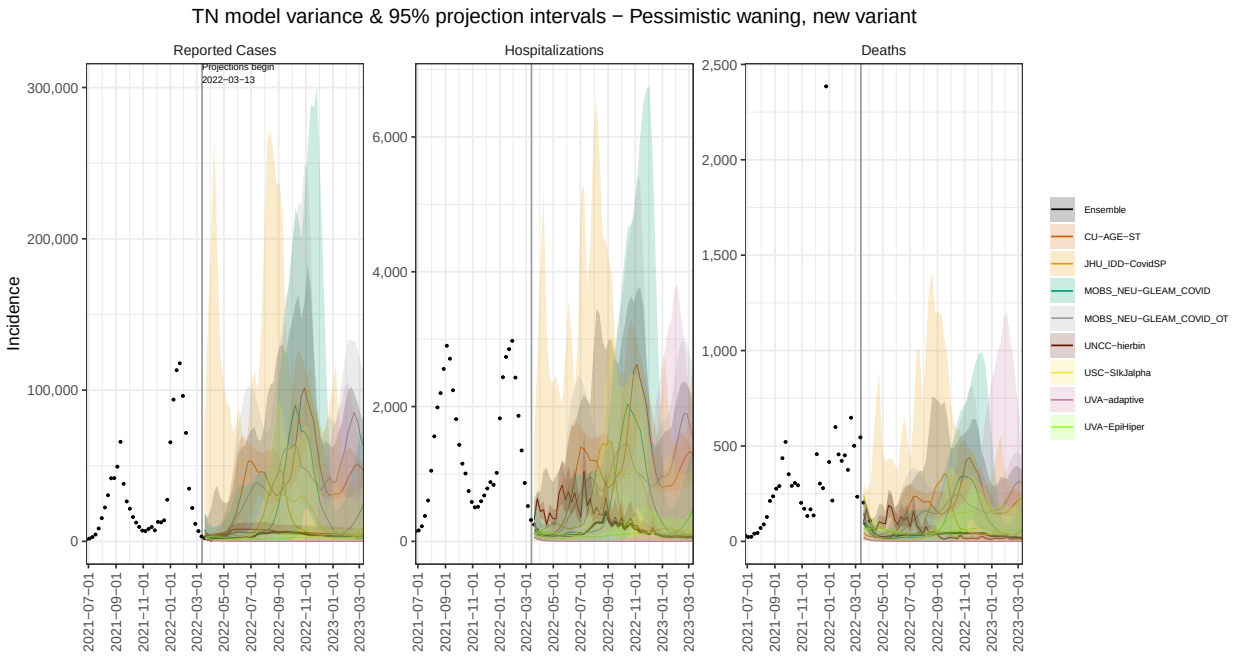

OR model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

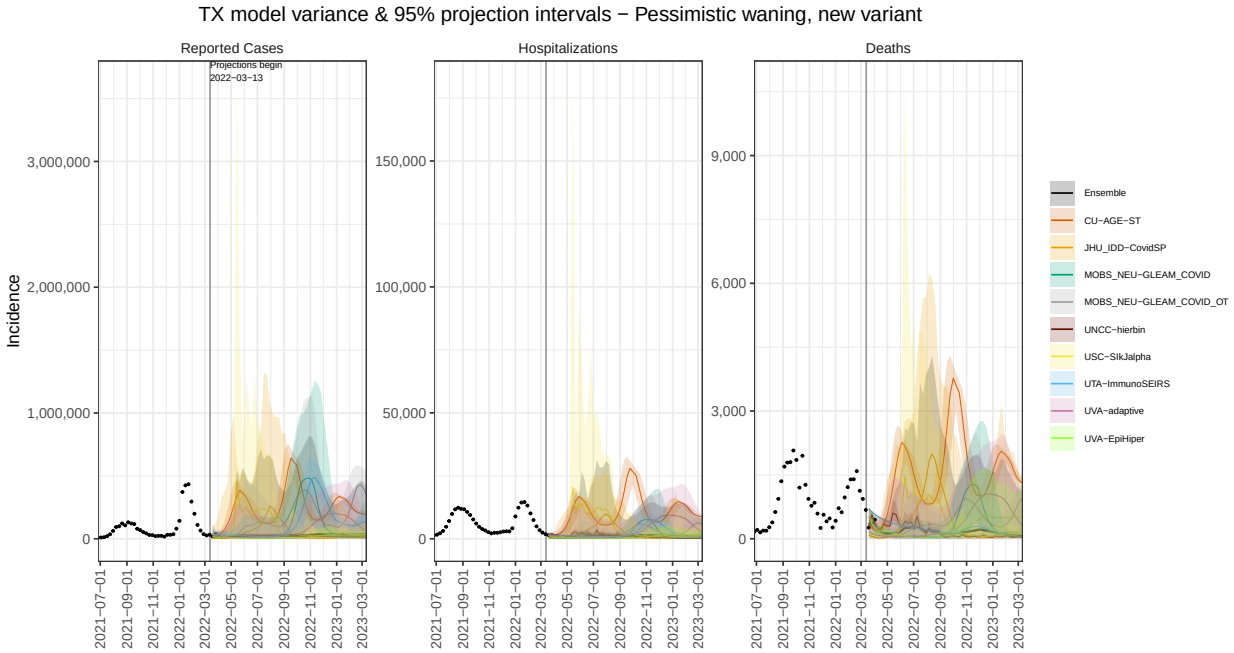

PA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

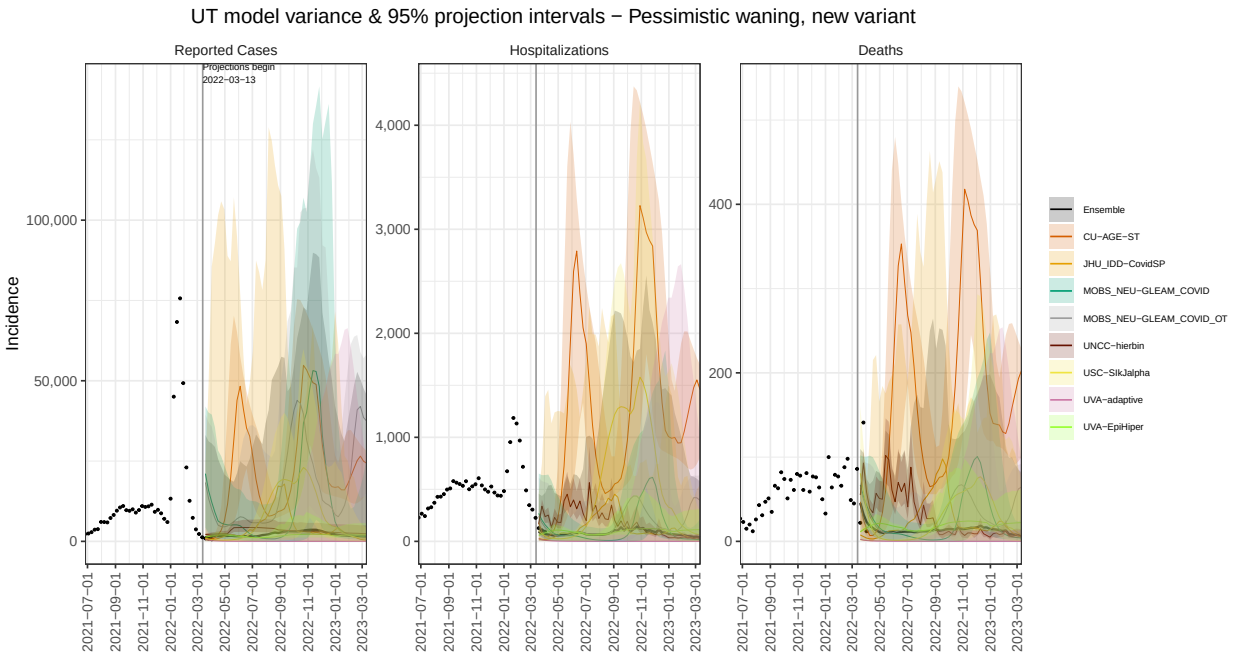

RI model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

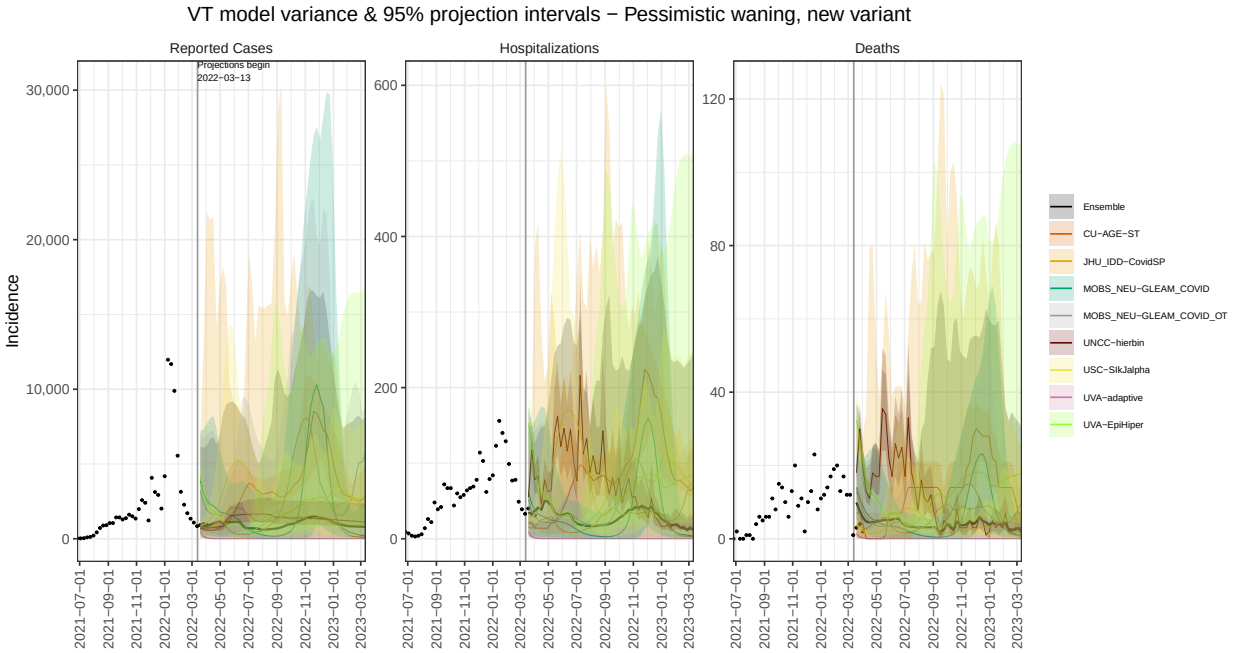

SC model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

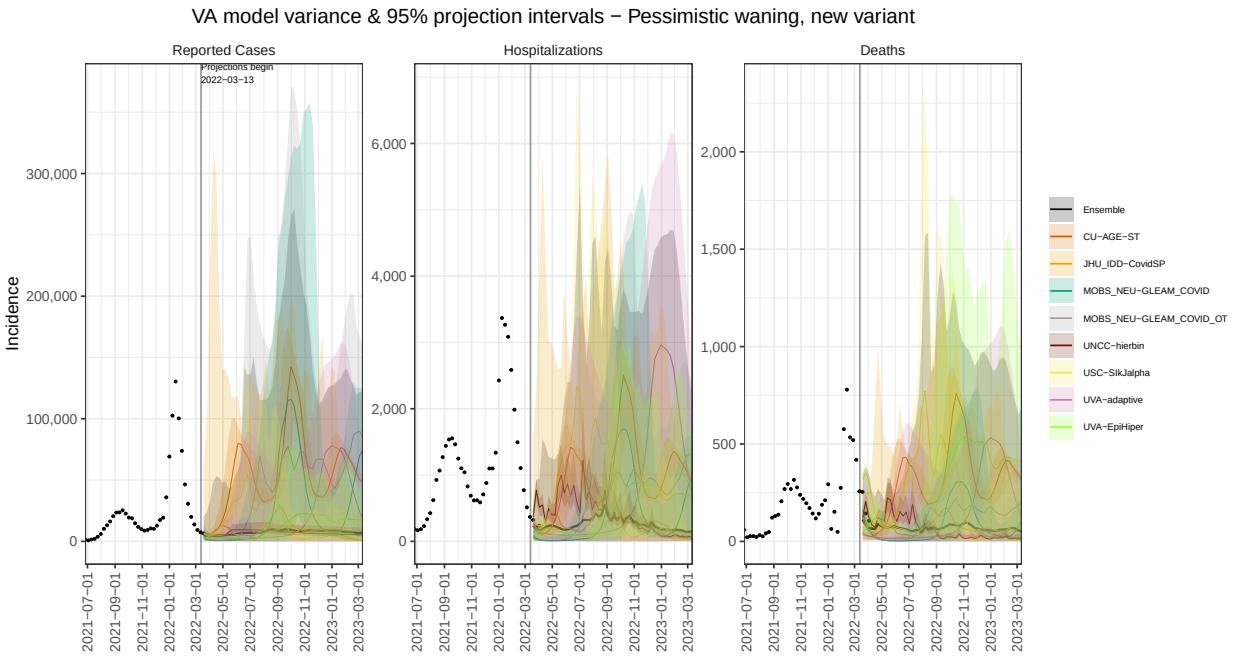

SD model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

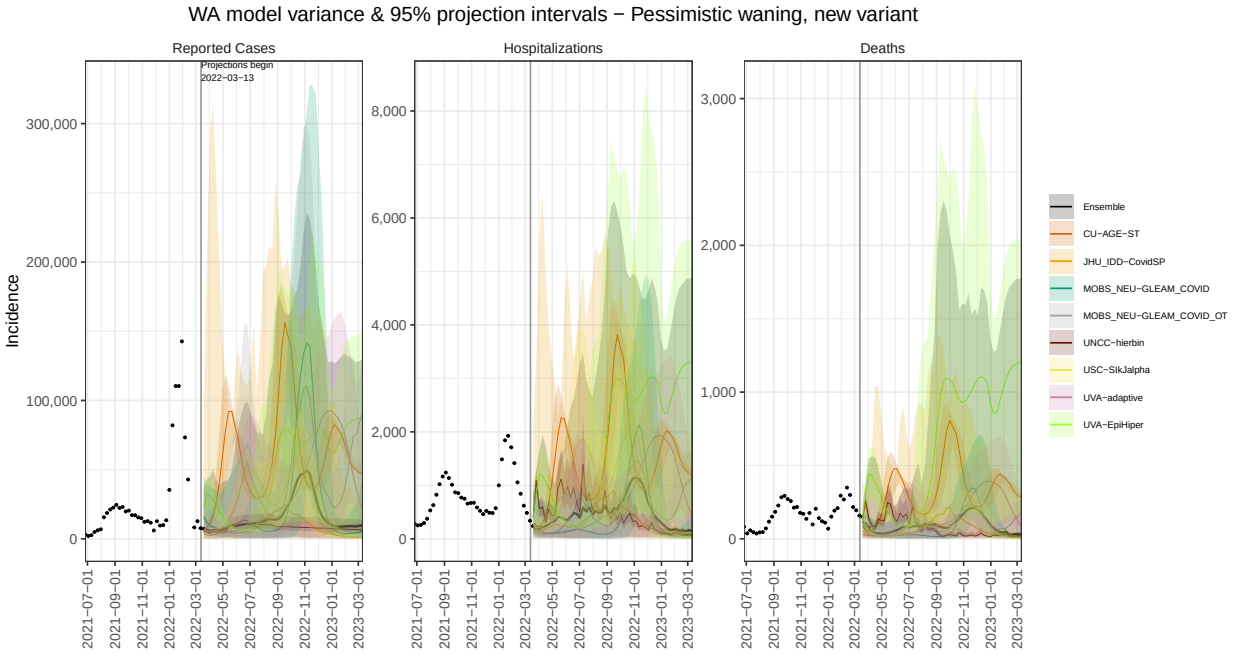

TN model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

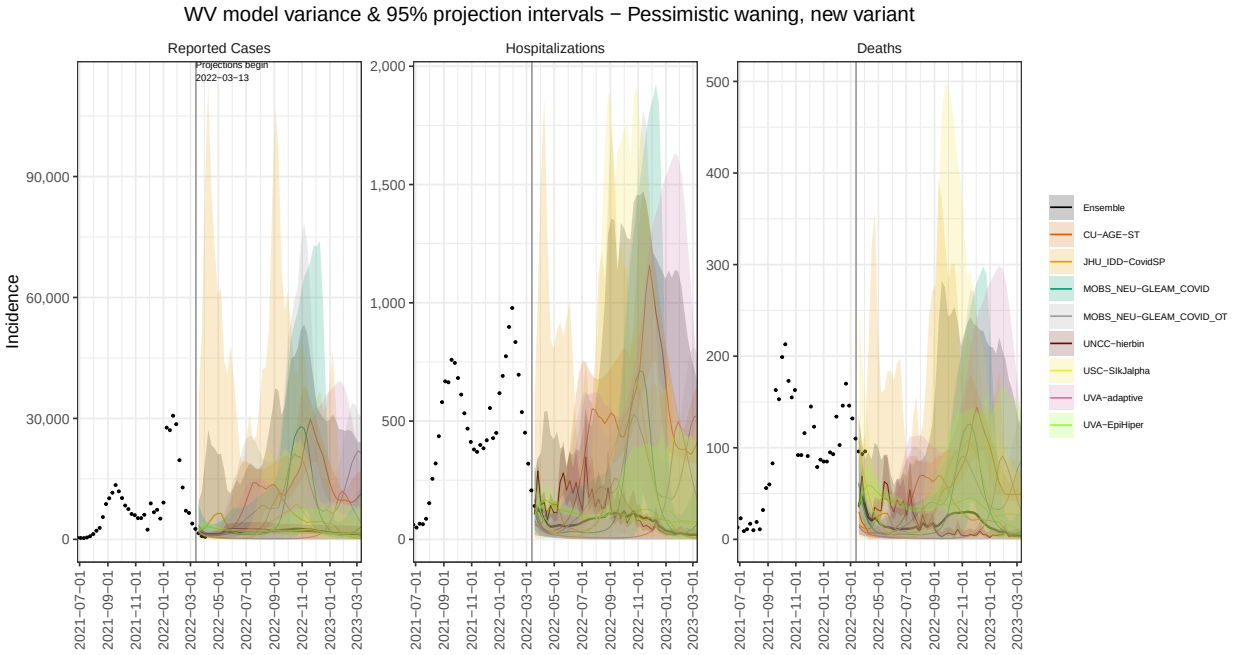

TX model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

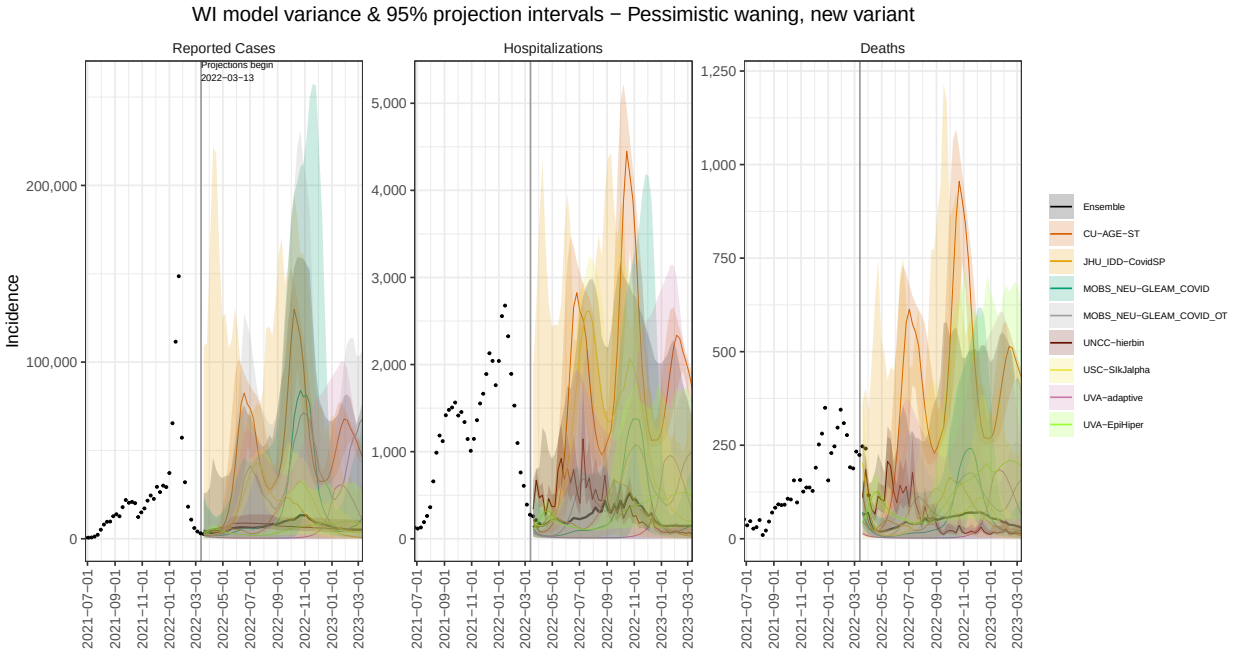

UT model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

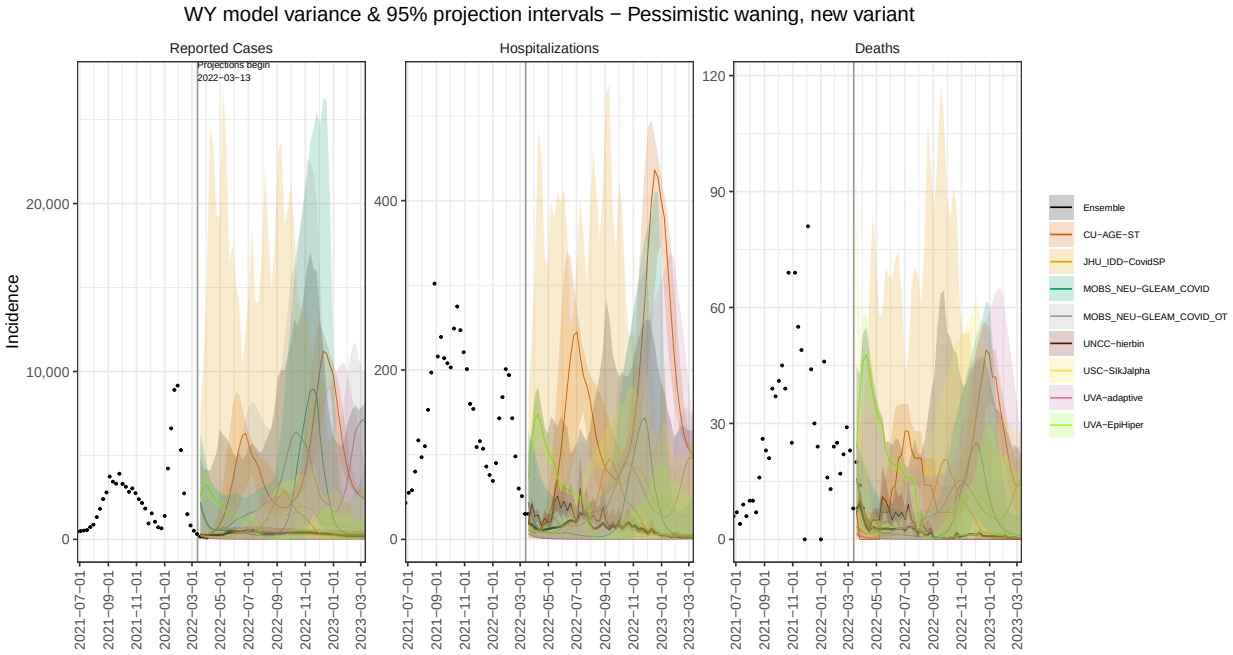

VT model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

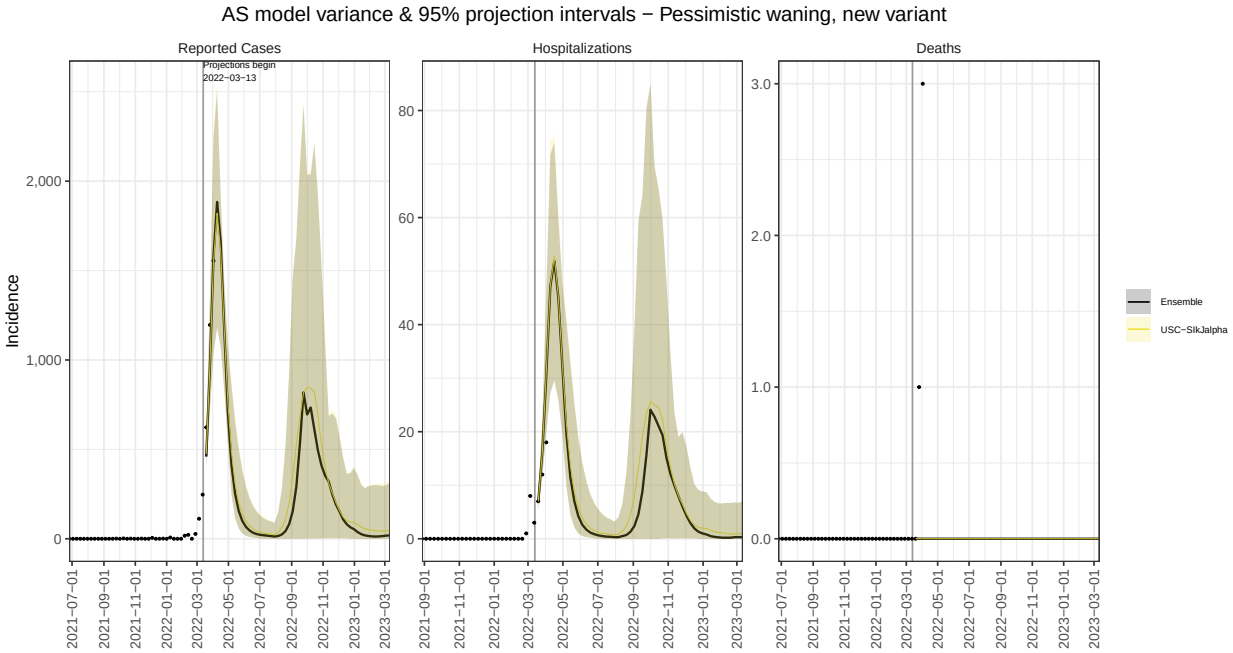

VA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


WA model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

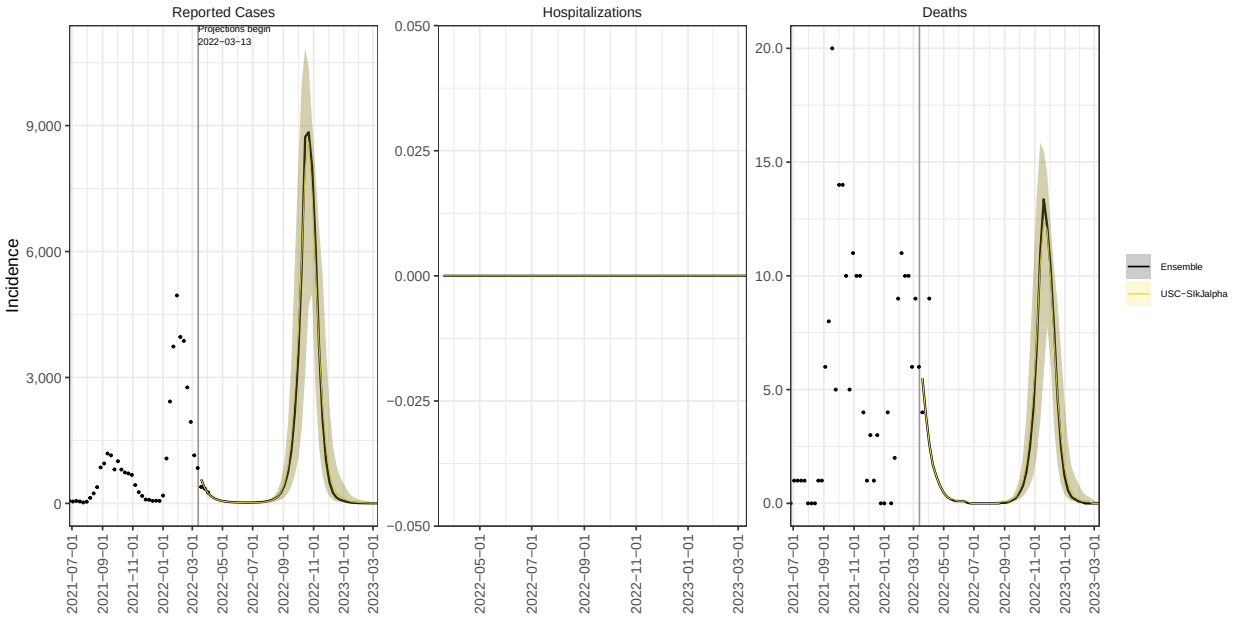

WV model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


WI model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

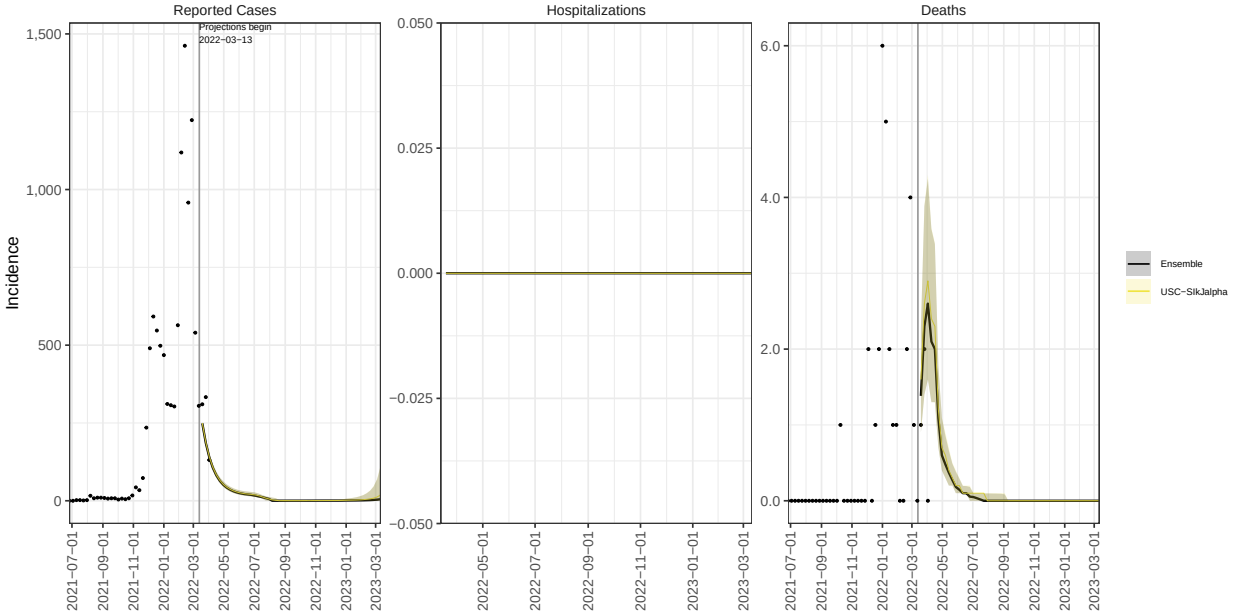

WY model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

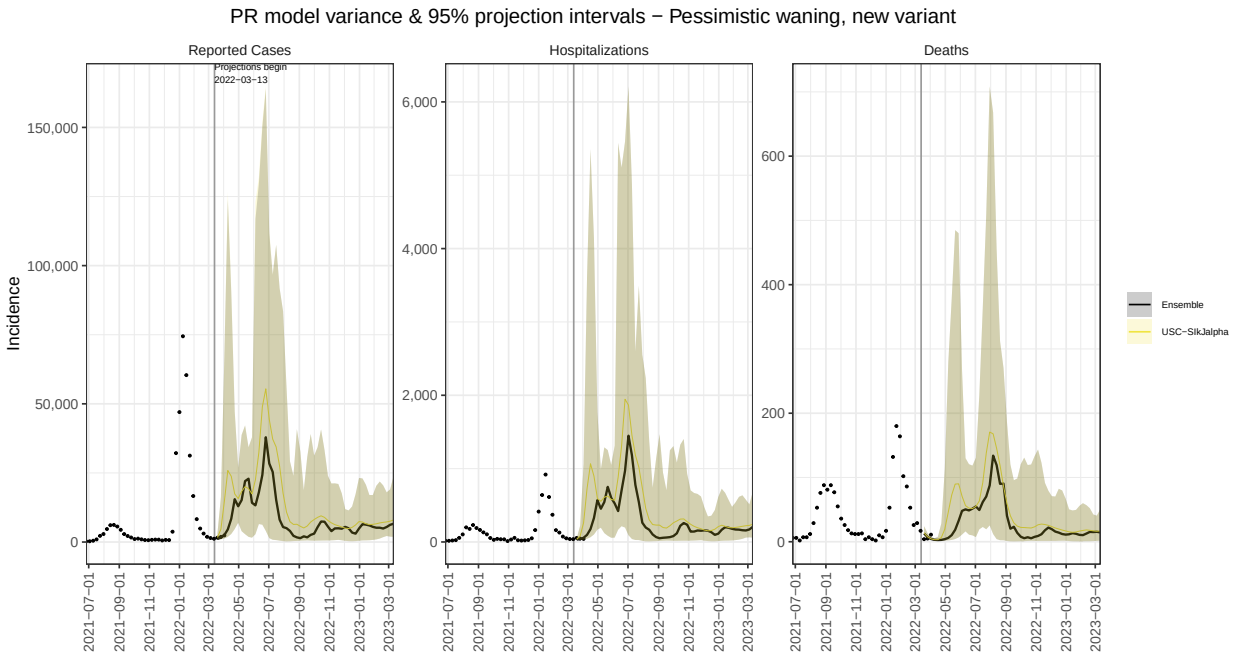

AS model variance & 95% projection intervals − Pessimistic waning, new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

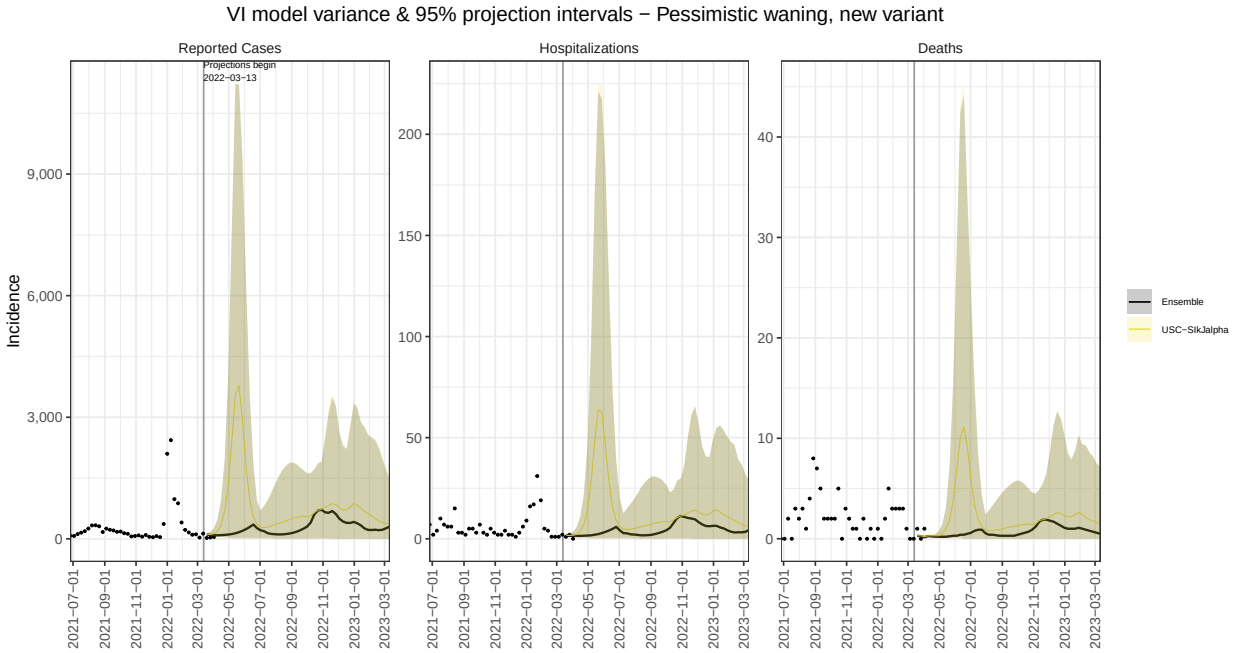
GU model variance & 95% projection intervals − Pessimistic waning, new variant



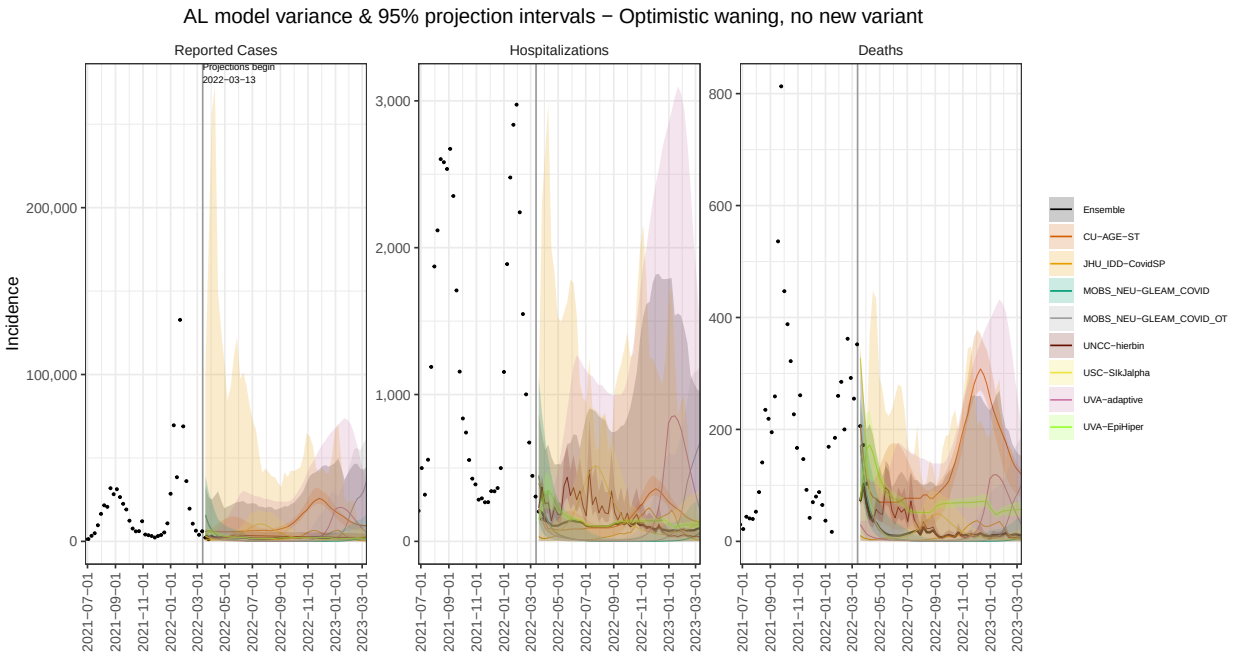
MP model variance & 95% projection intervals − Pessimistic waning, new variant

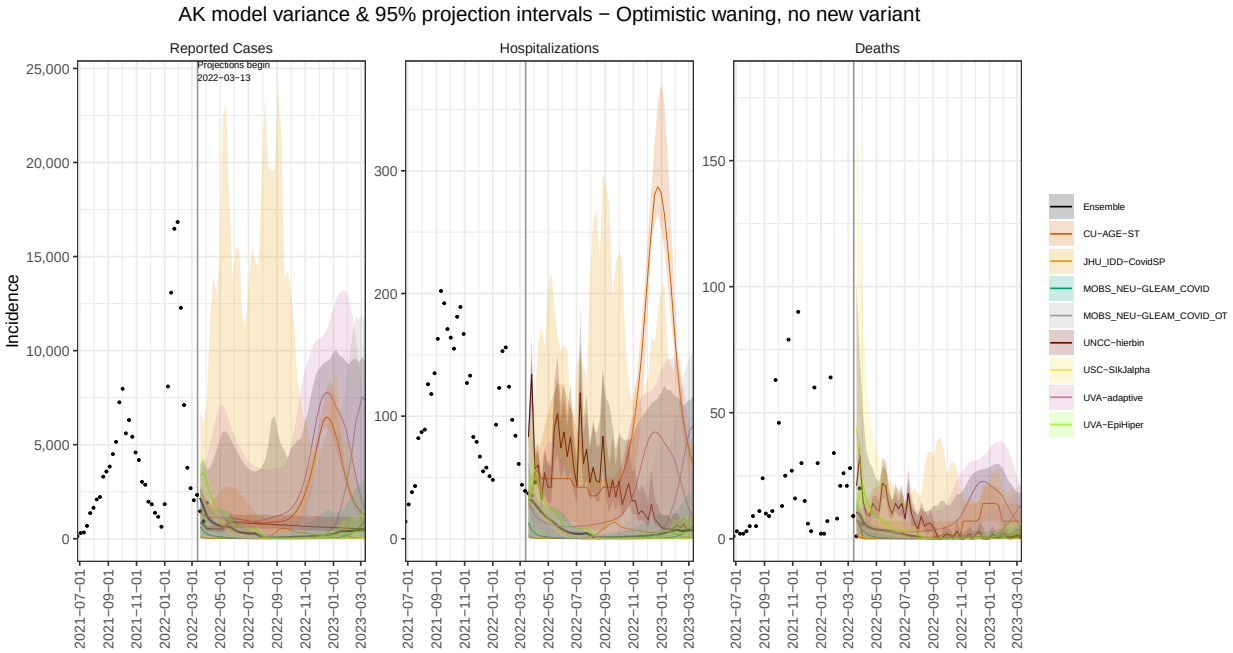


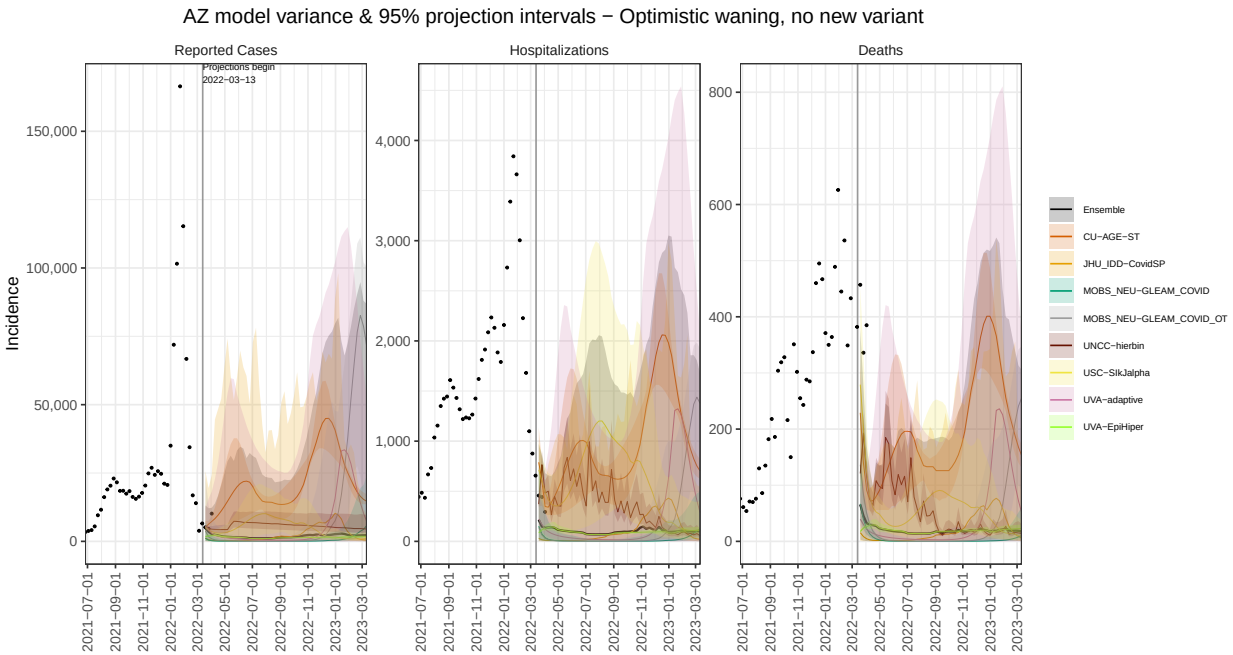


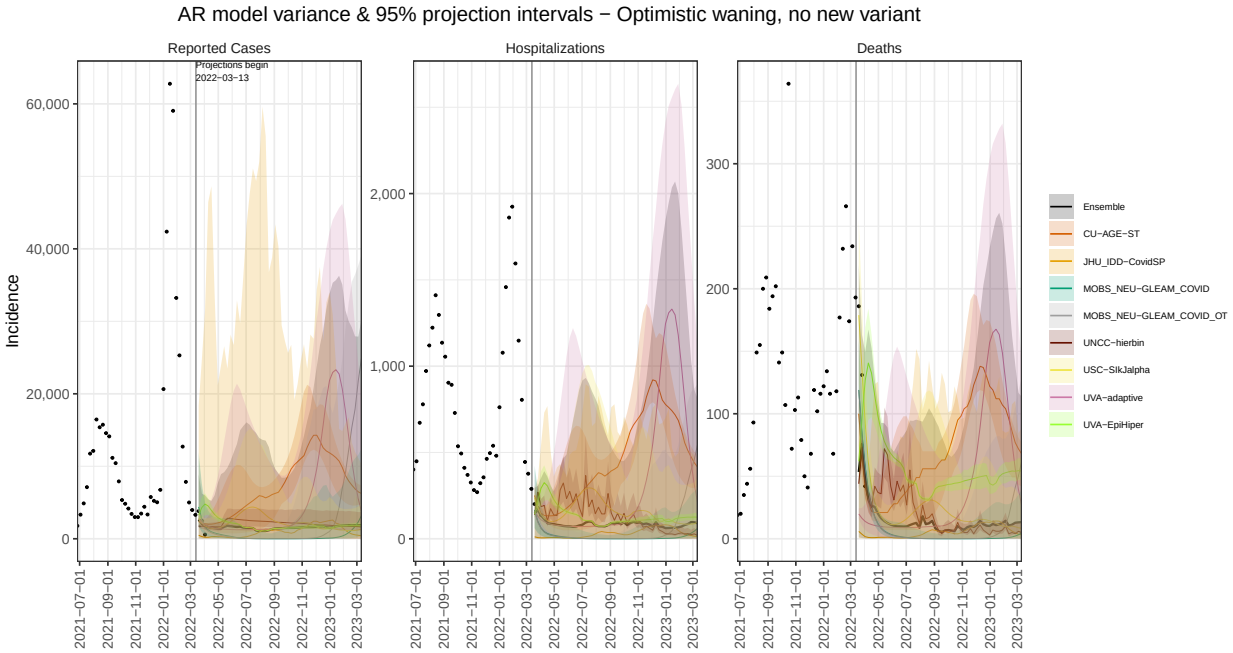


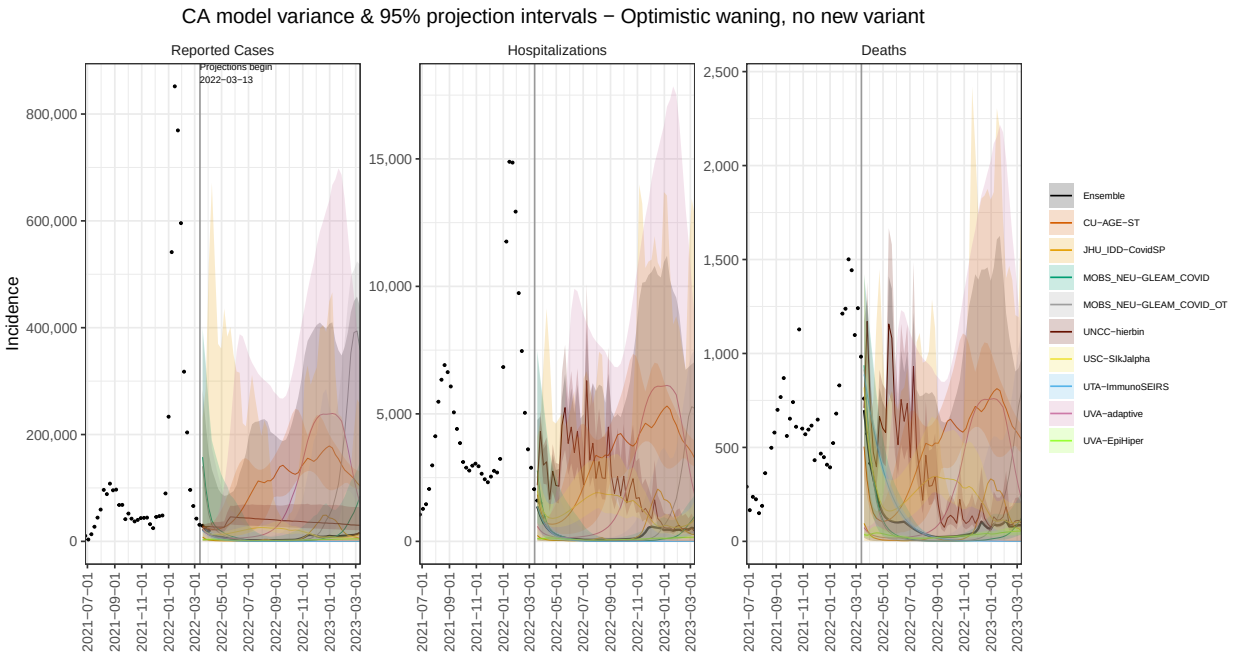
National model variation for the optimistic waning, no new immune escape variant scenario

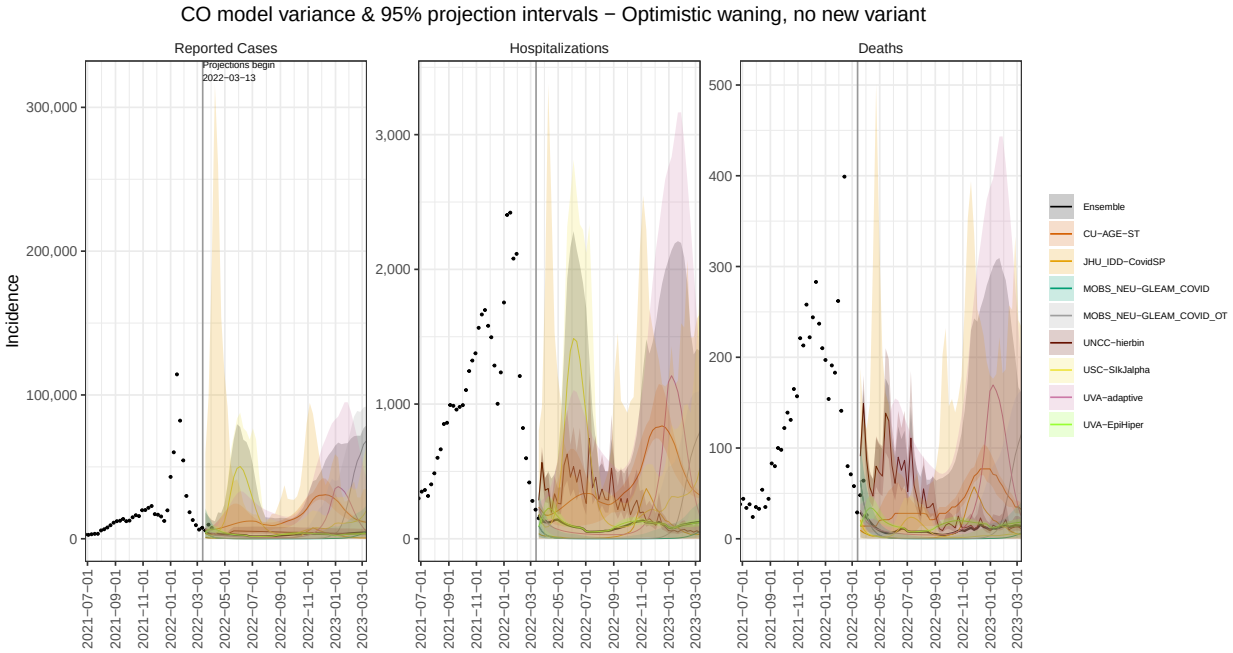

AL model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

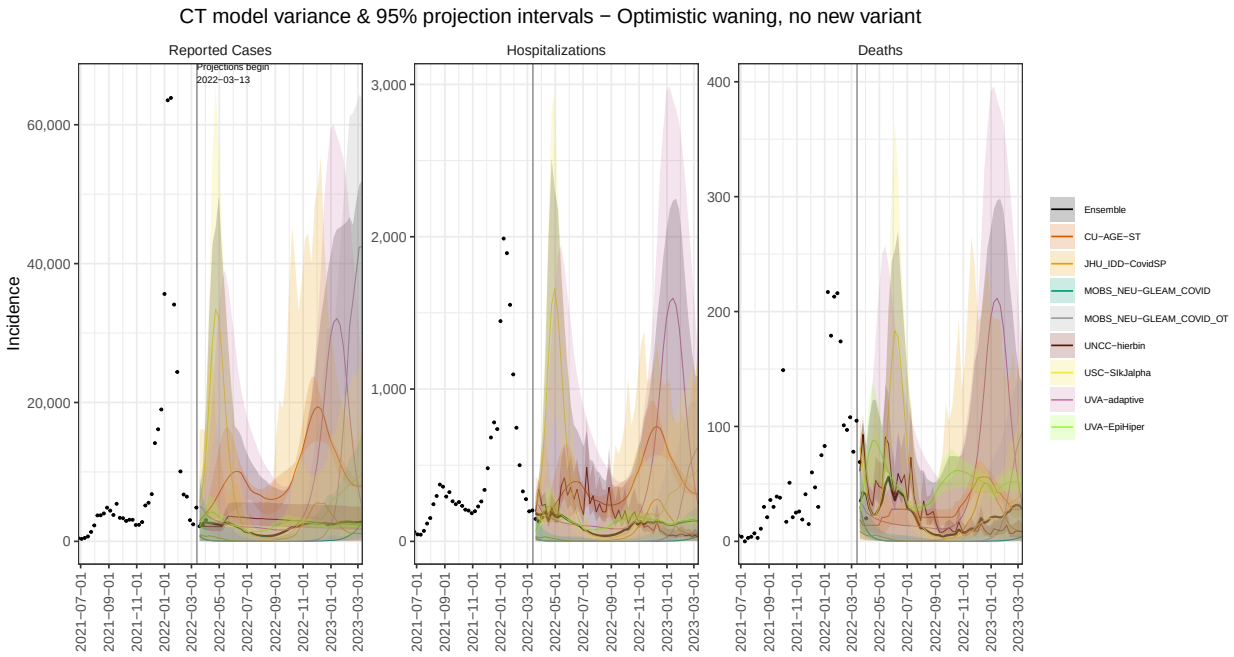

AK model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

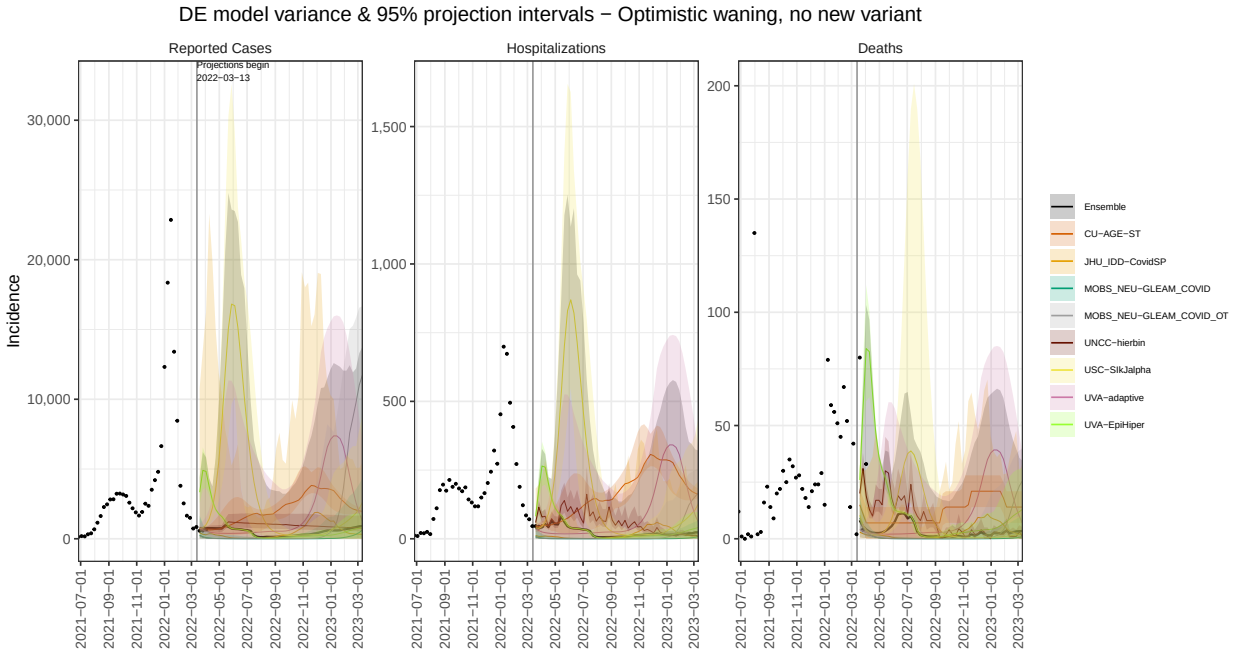

AZ model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

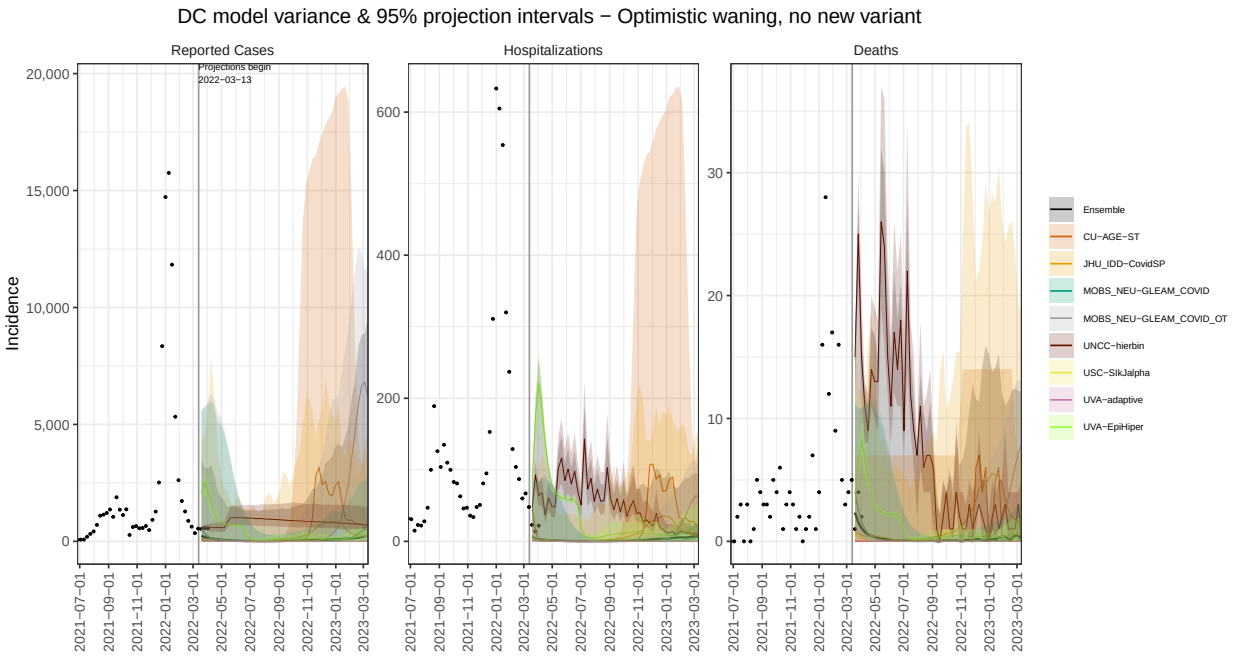

AR model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

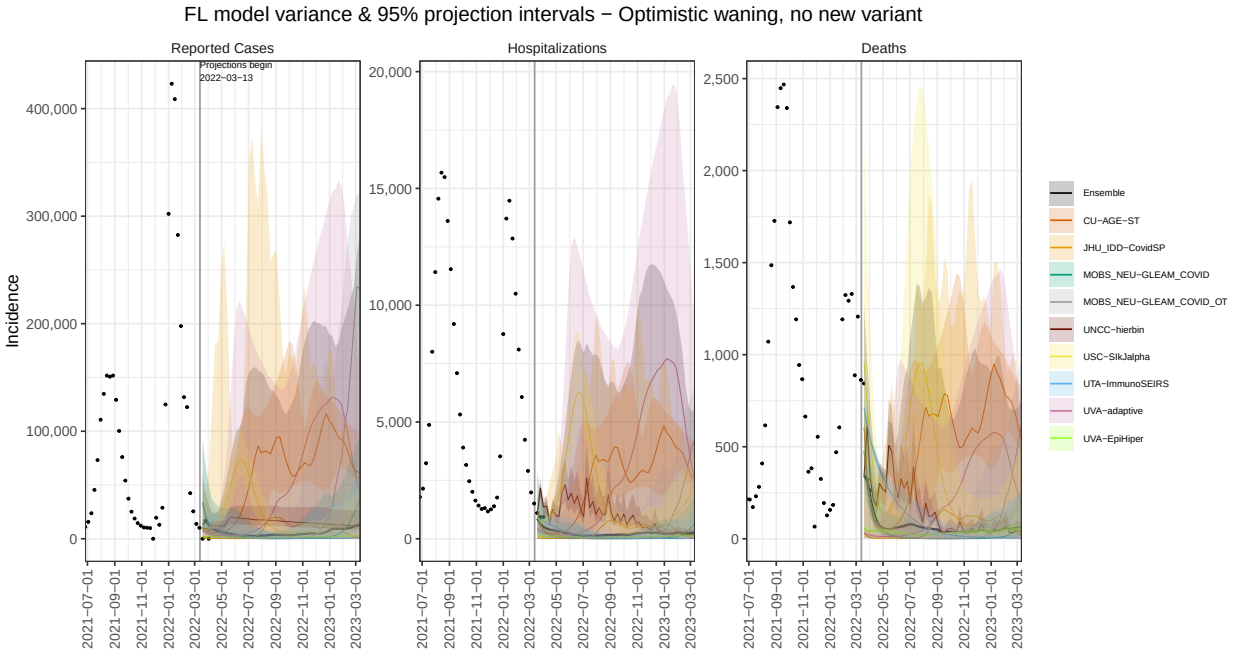

CA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

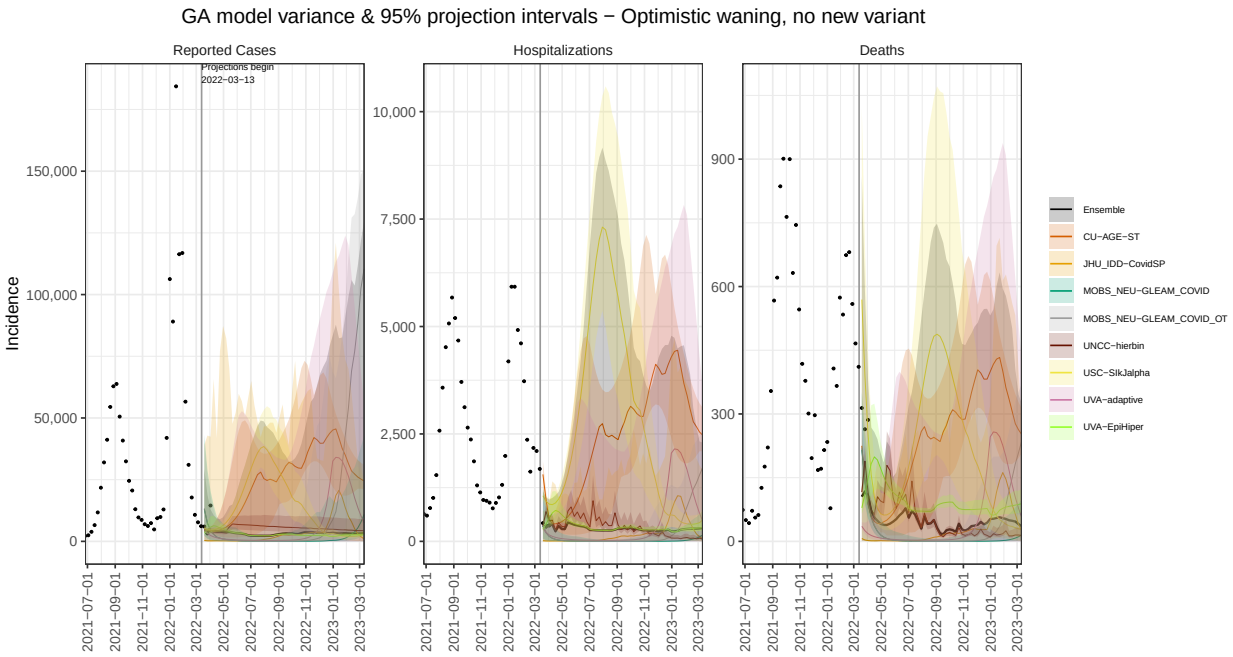

CO model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

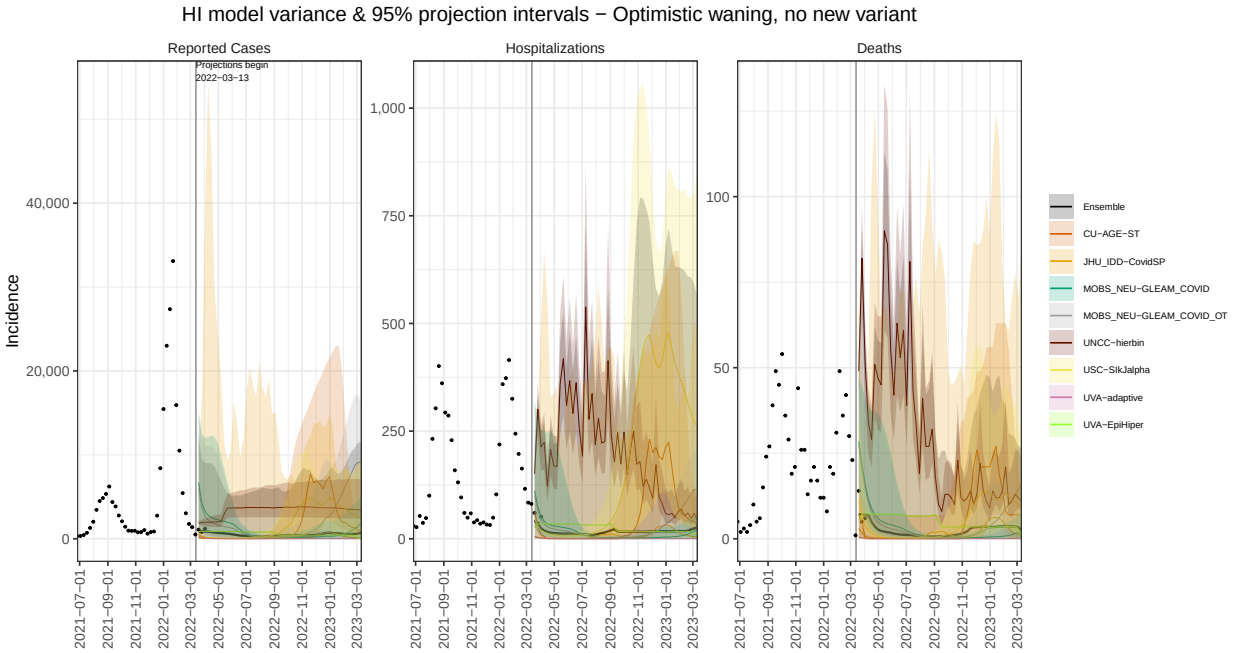

CT model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

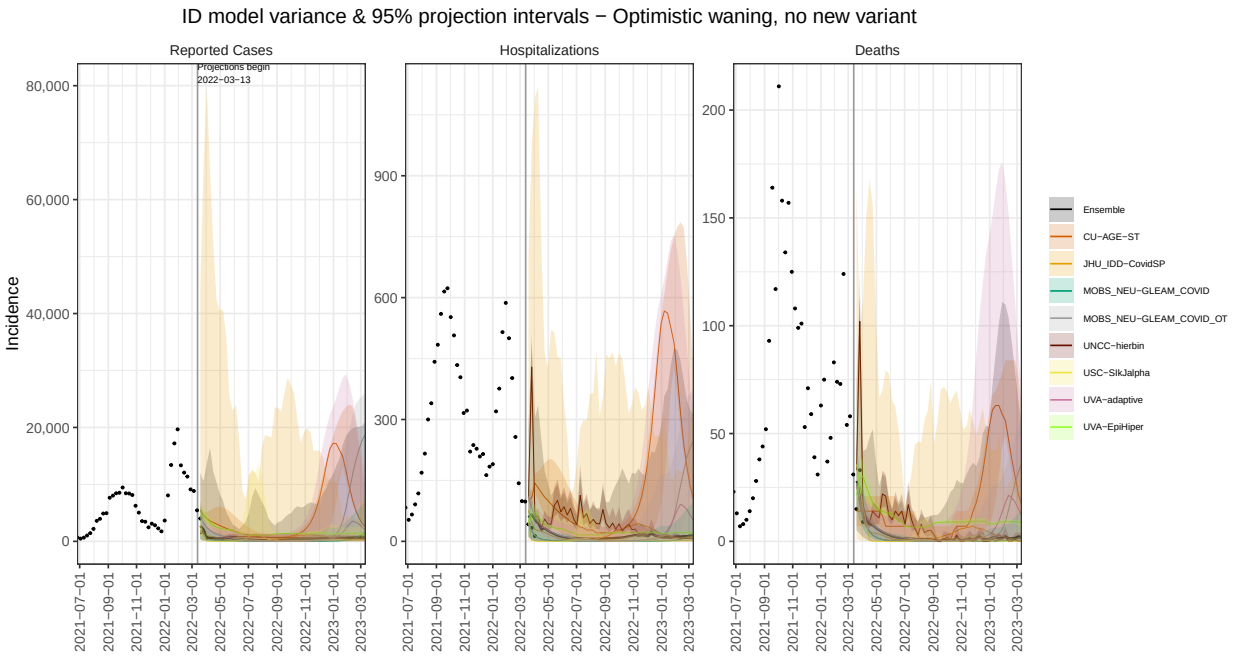

DE model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

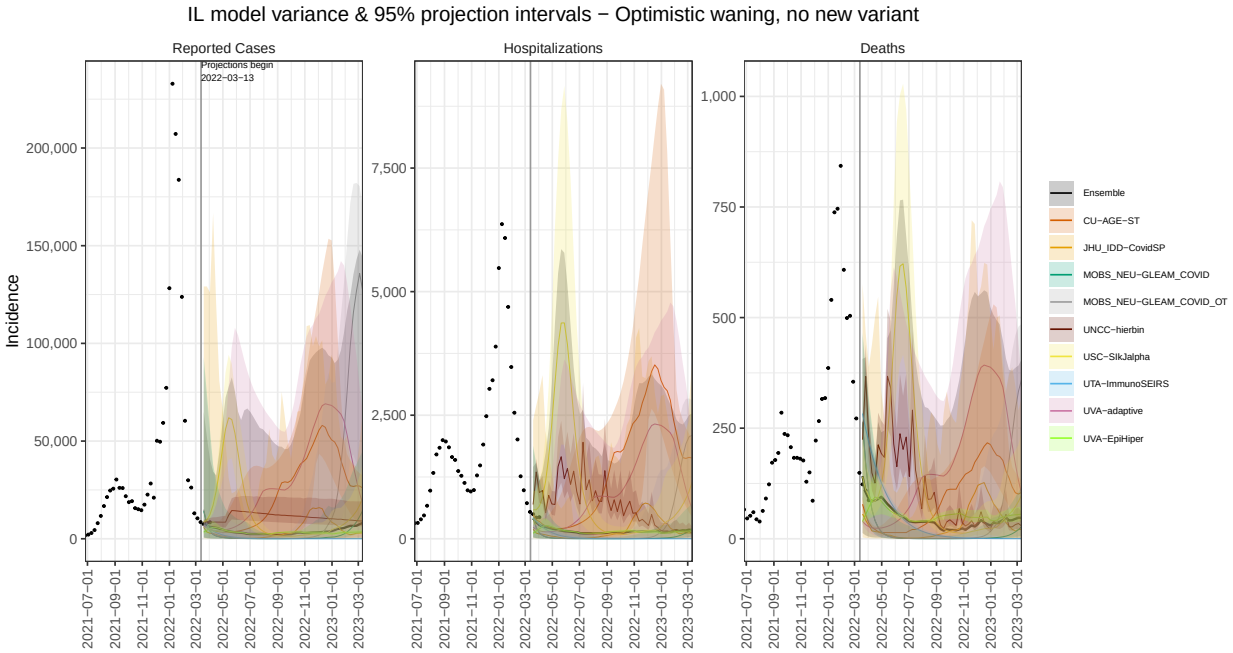

DC model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

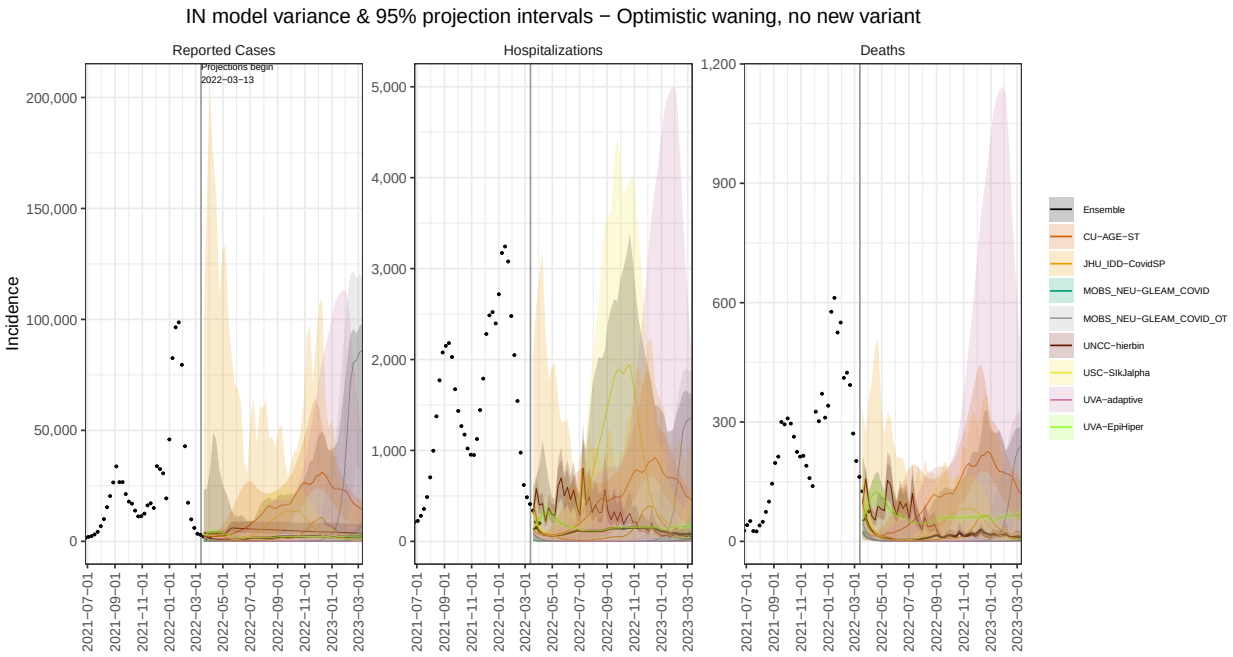

FL model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

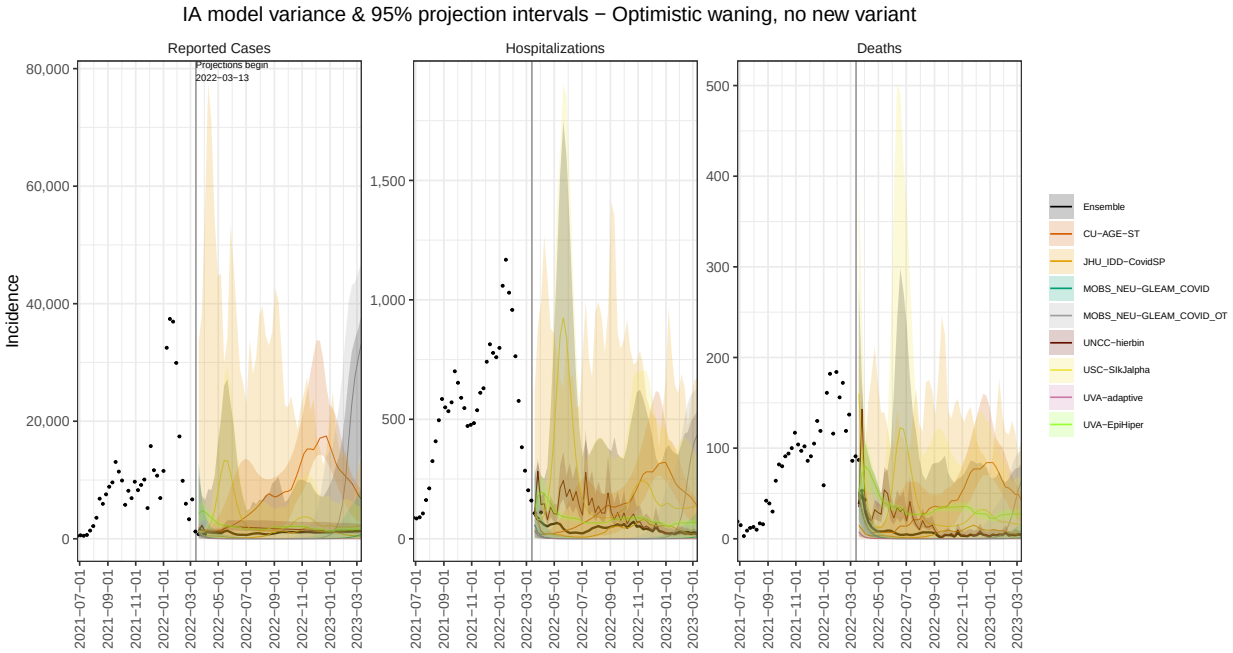

GA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

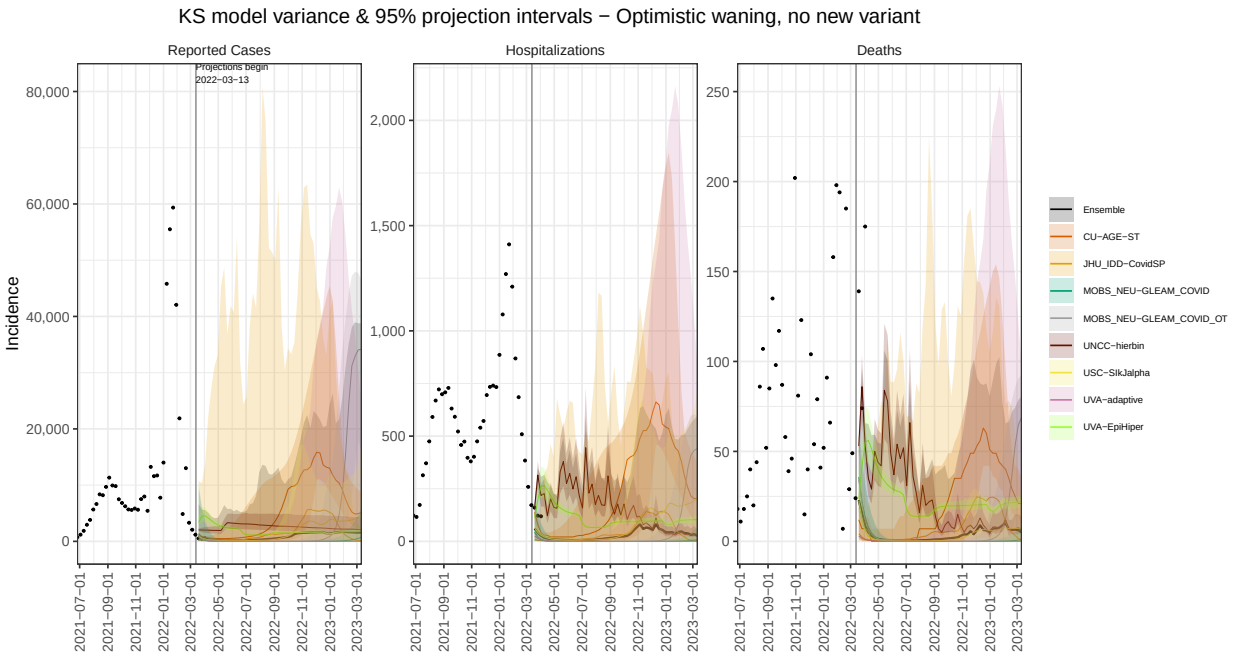

HI model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

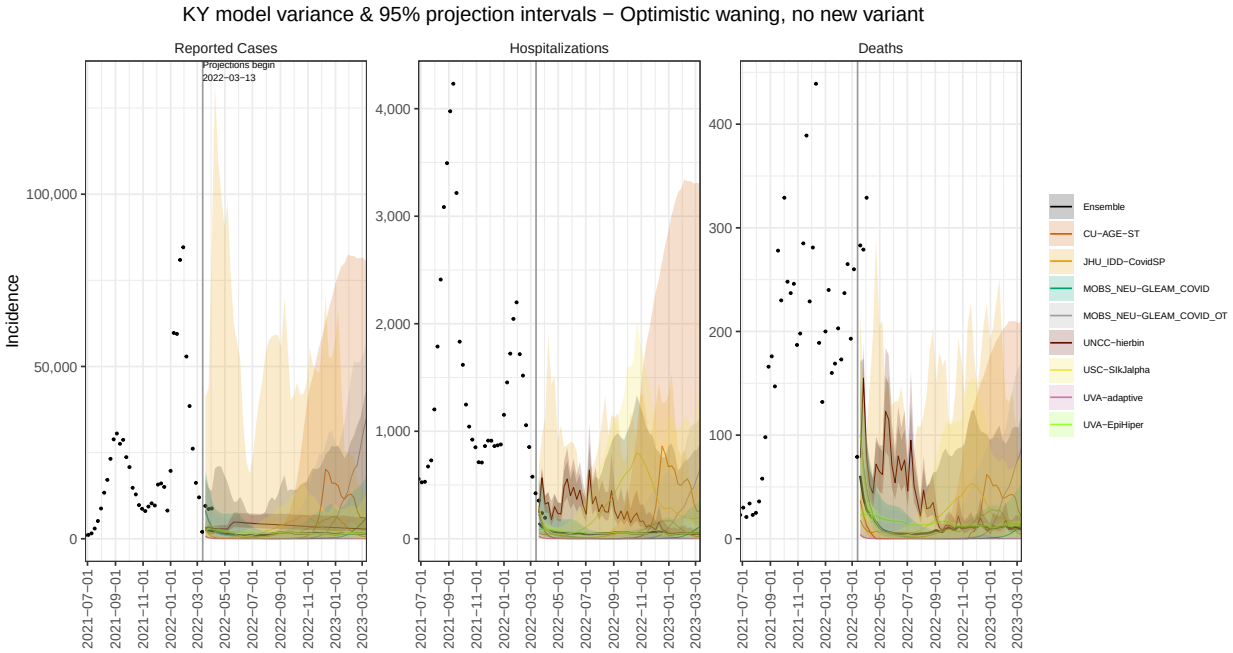

ID model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

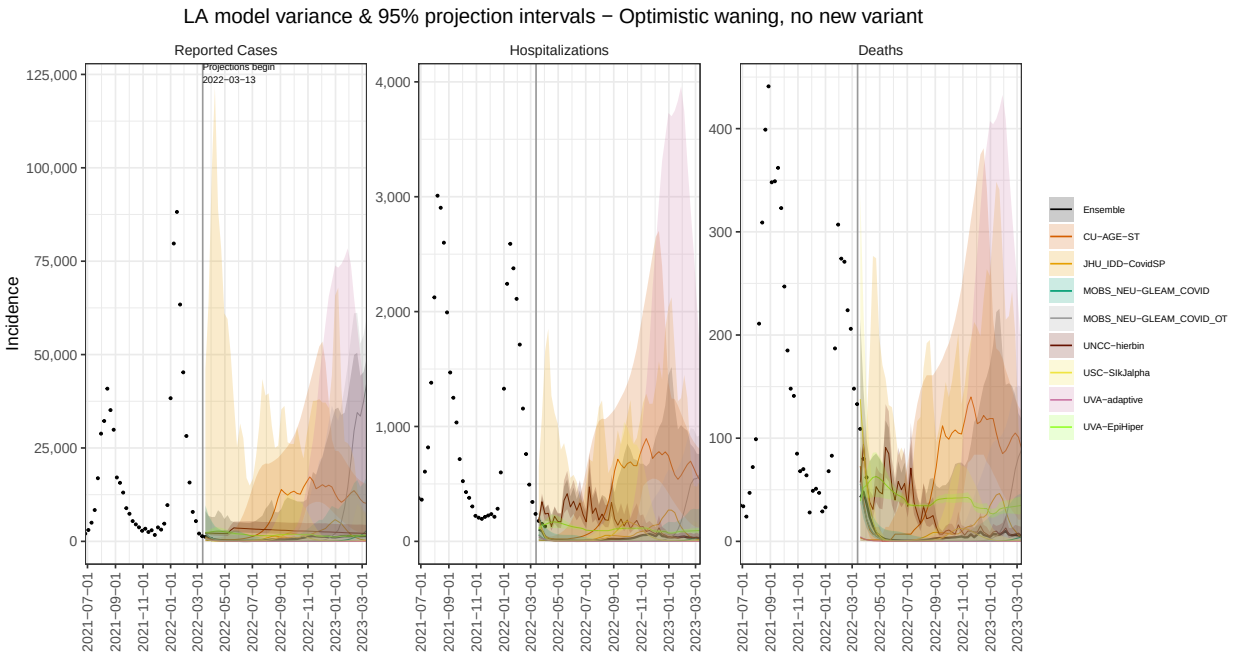

IL model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

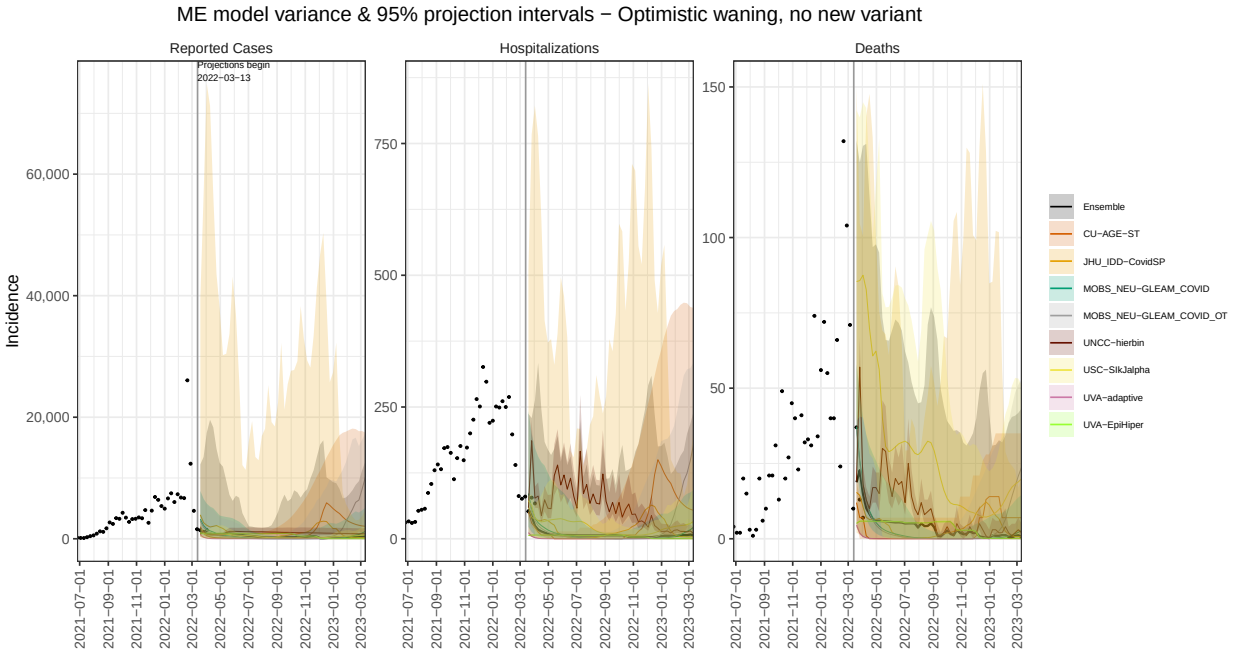

IN model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

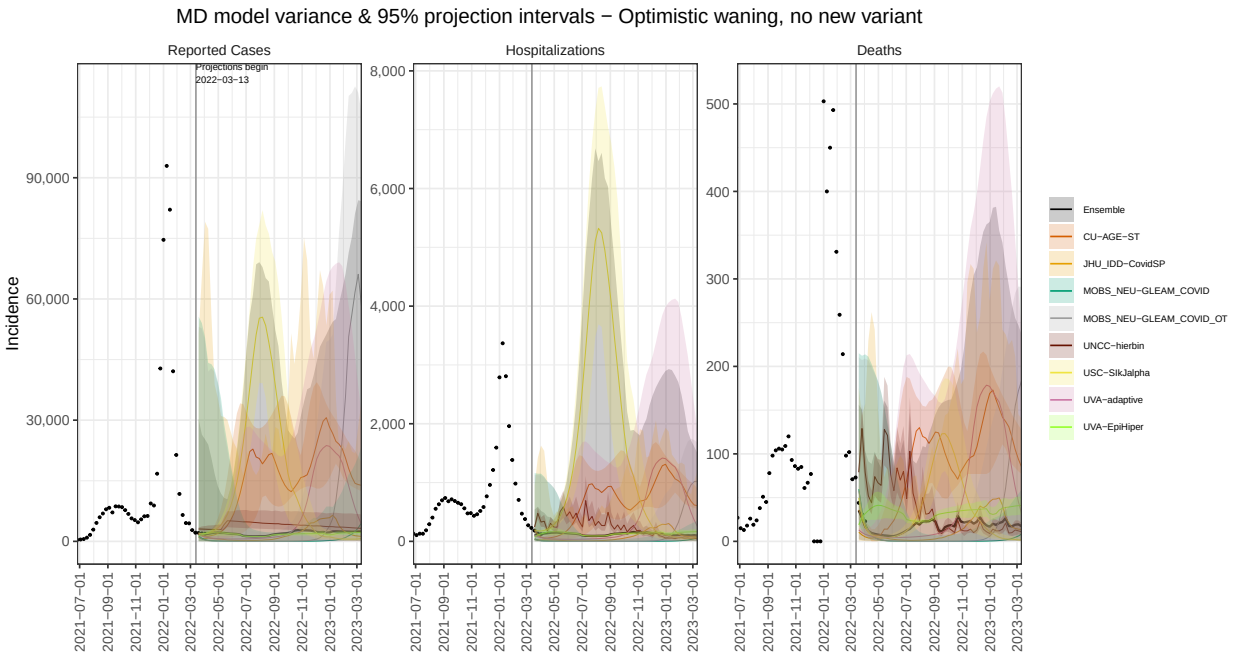

IA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

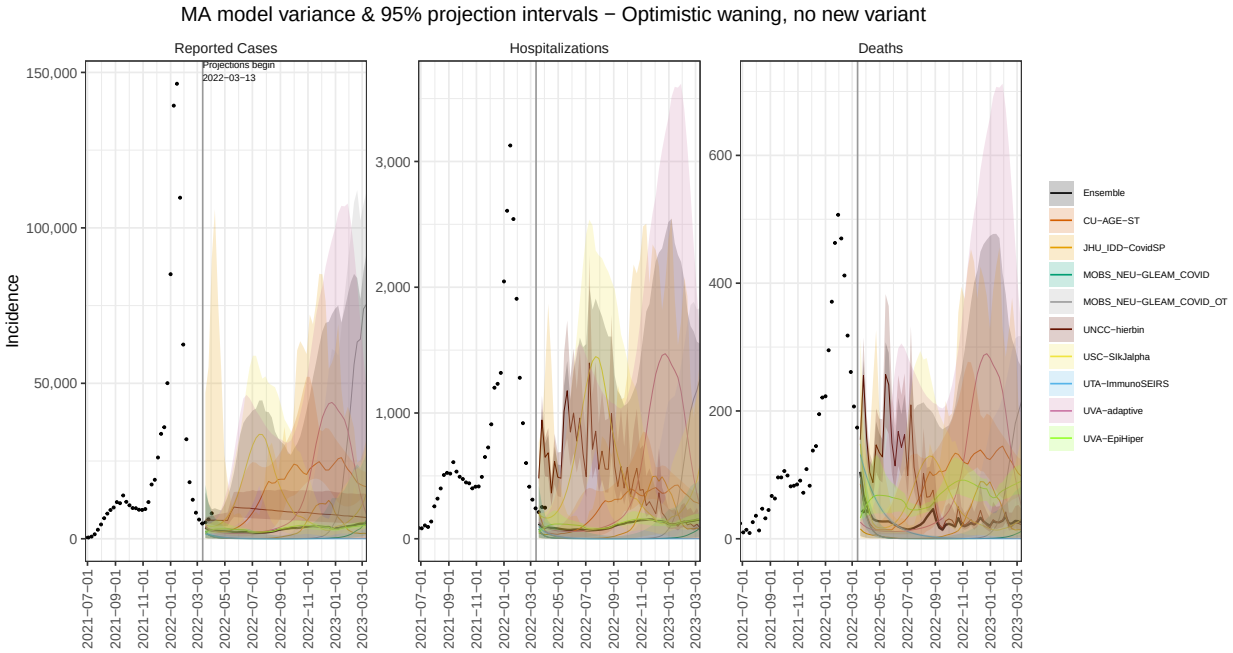

KS model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

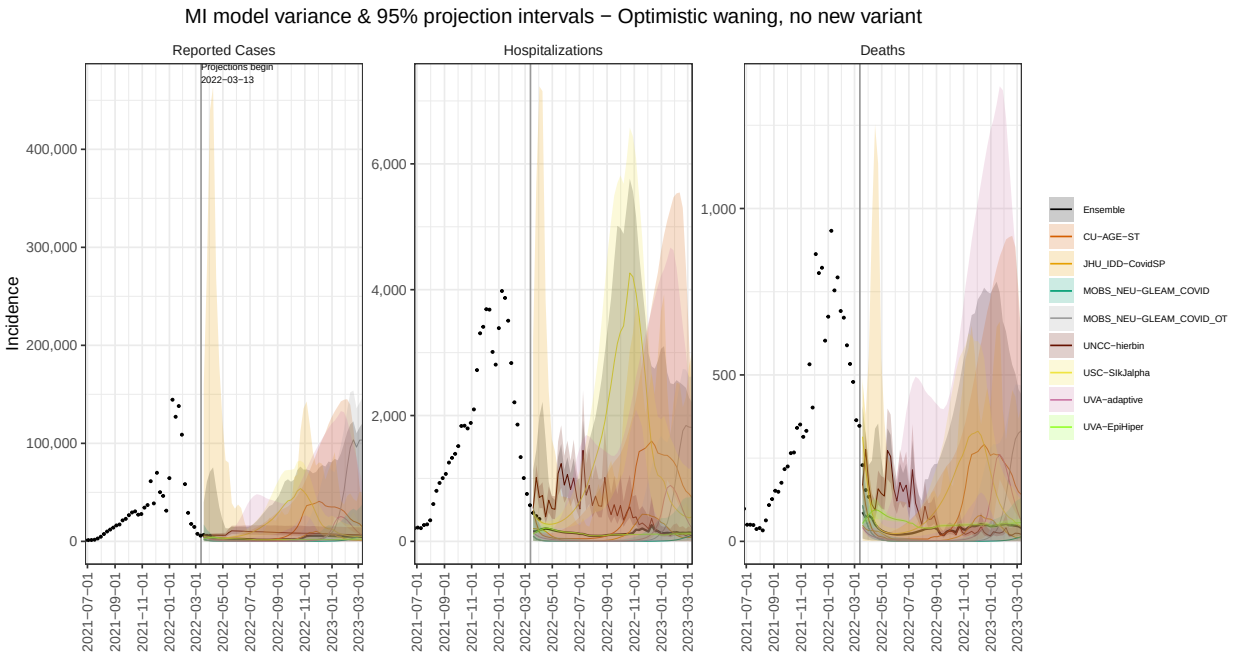

KY model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

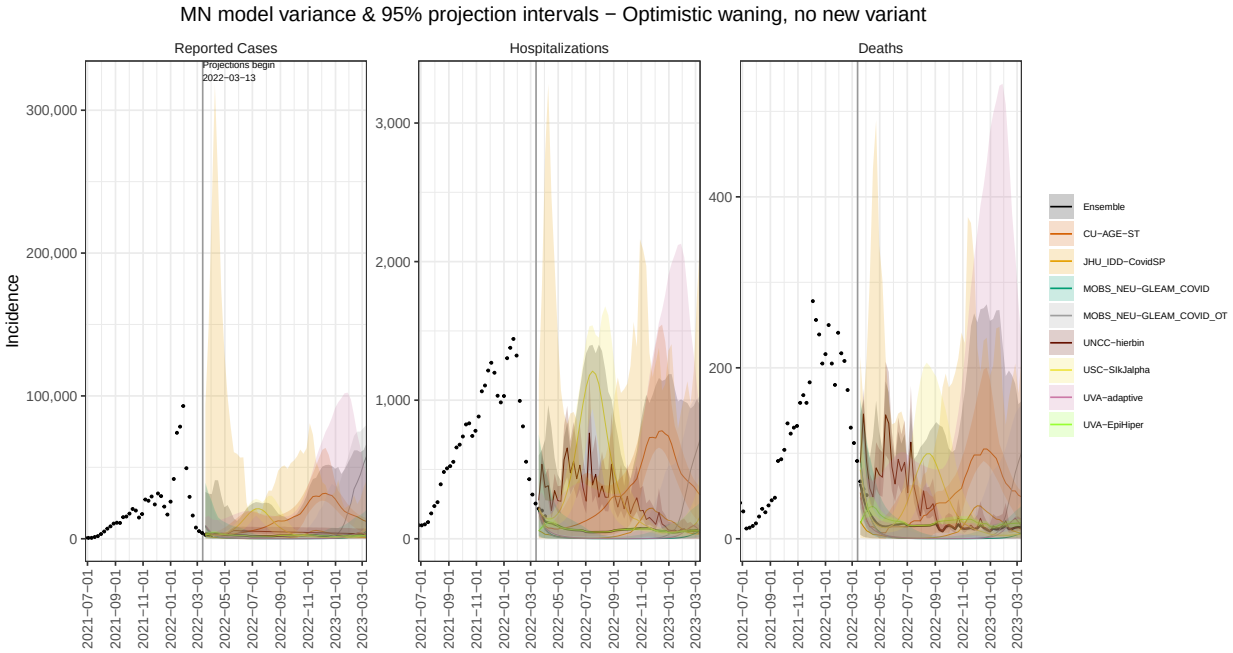

LA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

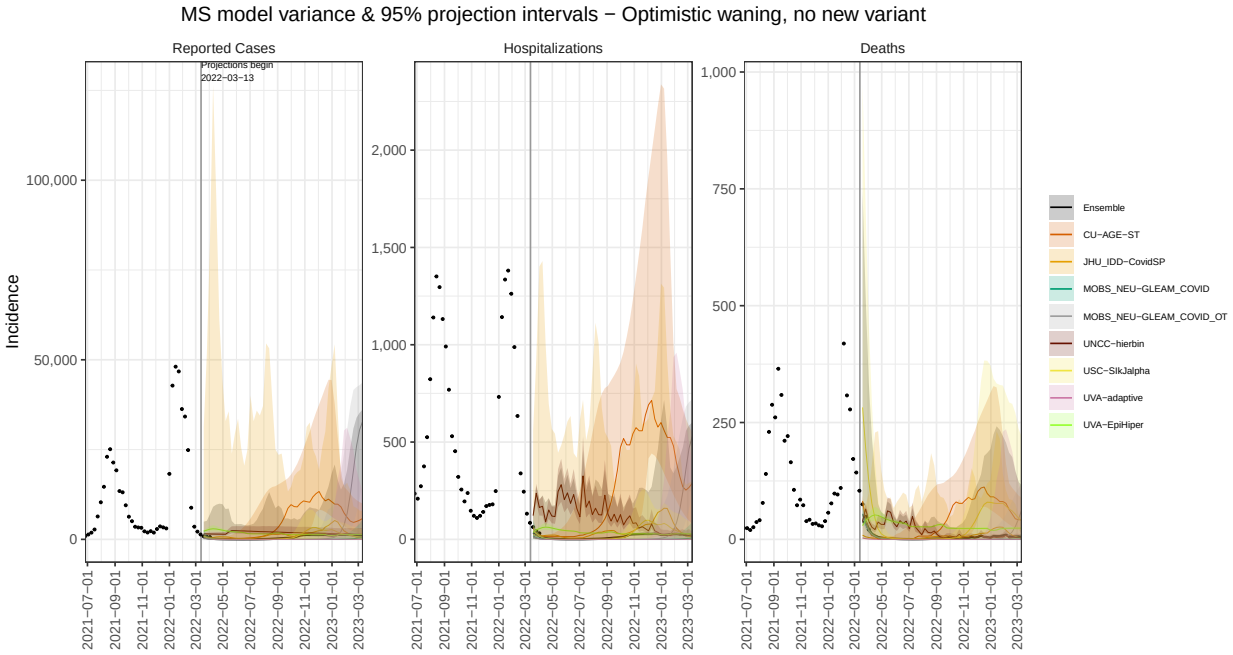

ME model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

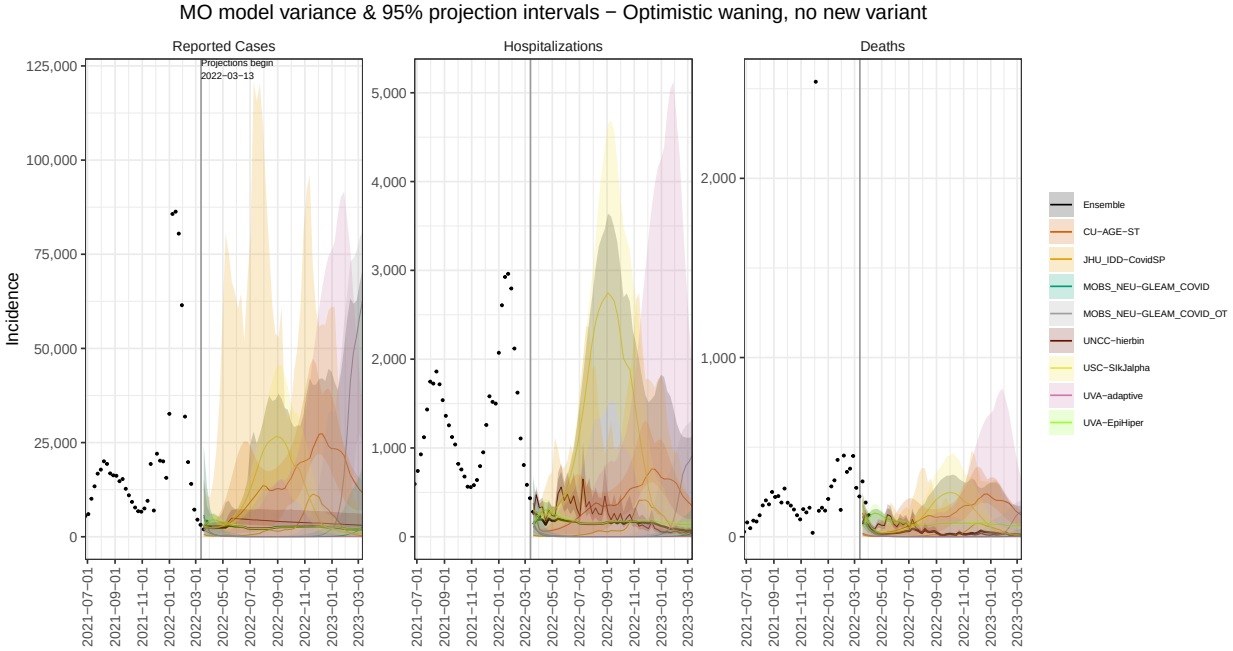

MD model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

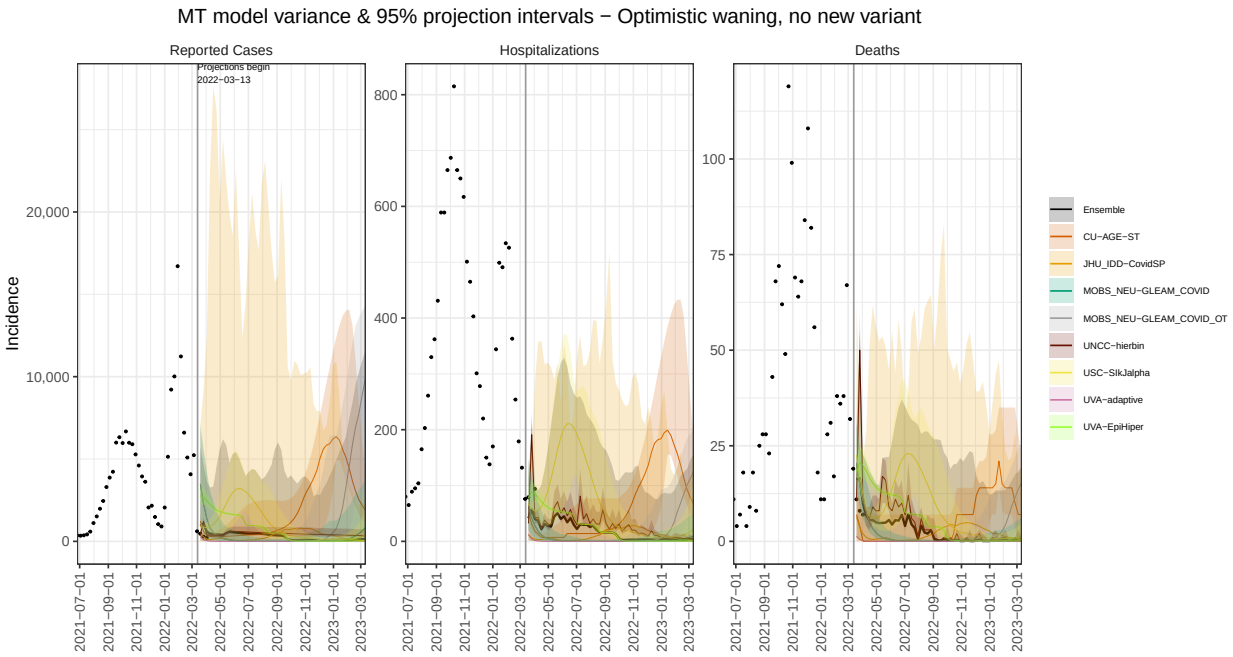

MA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

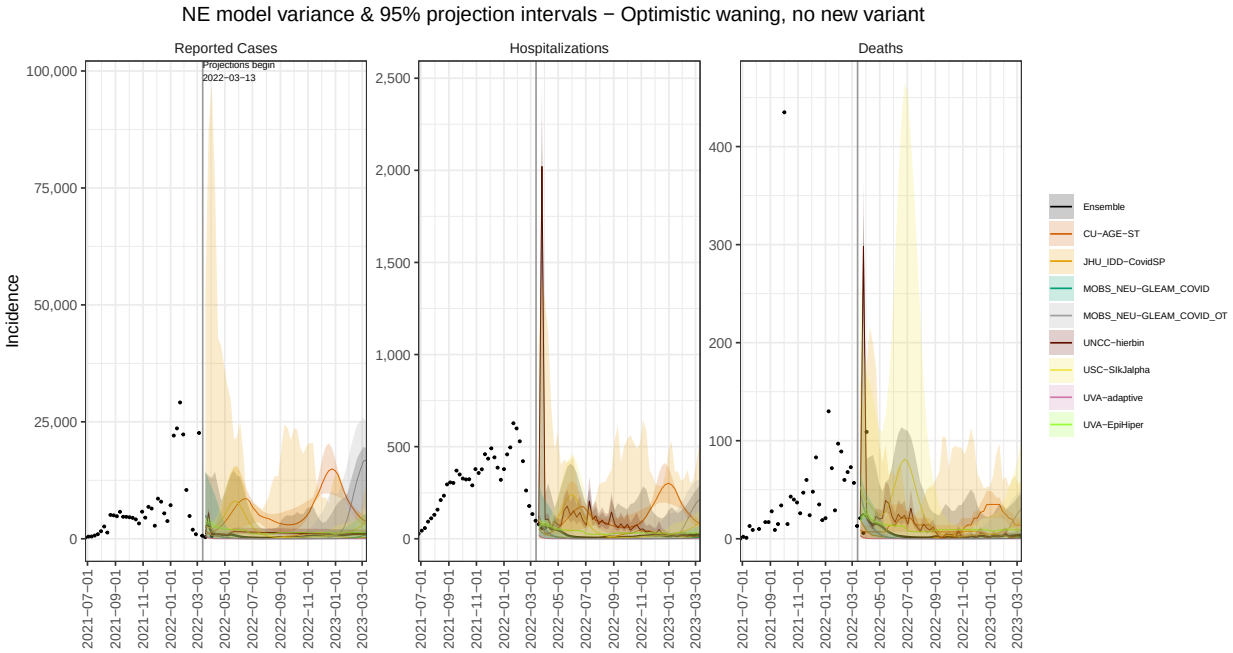

MI model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

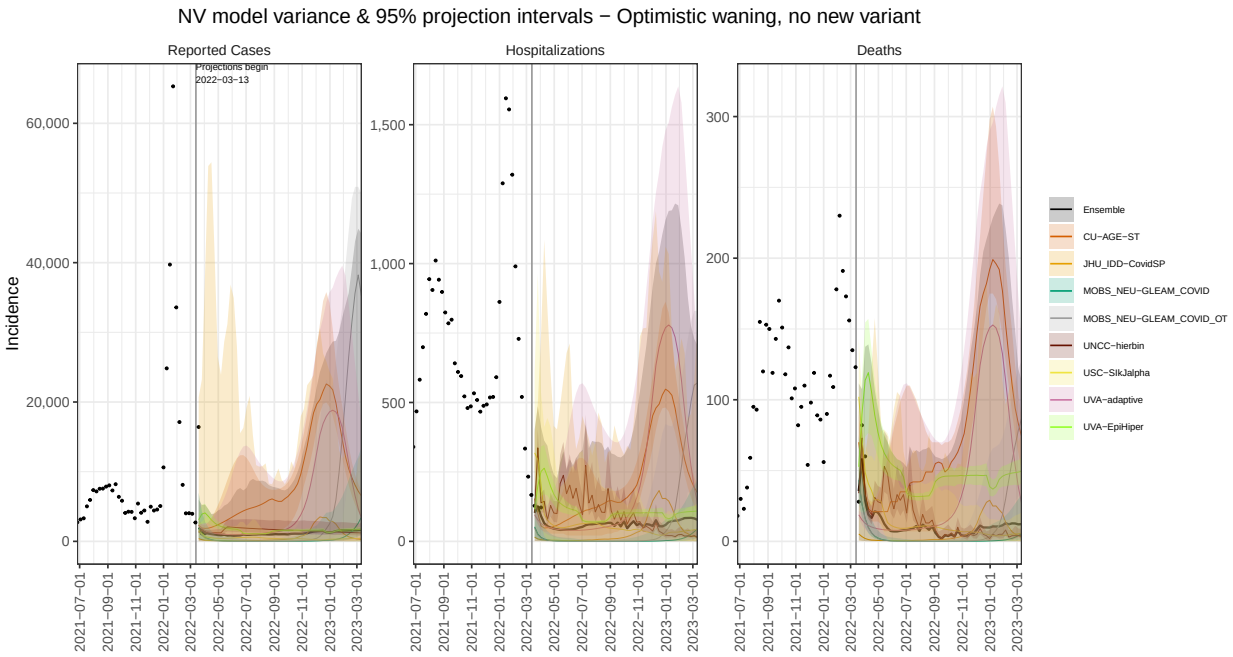

MN model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

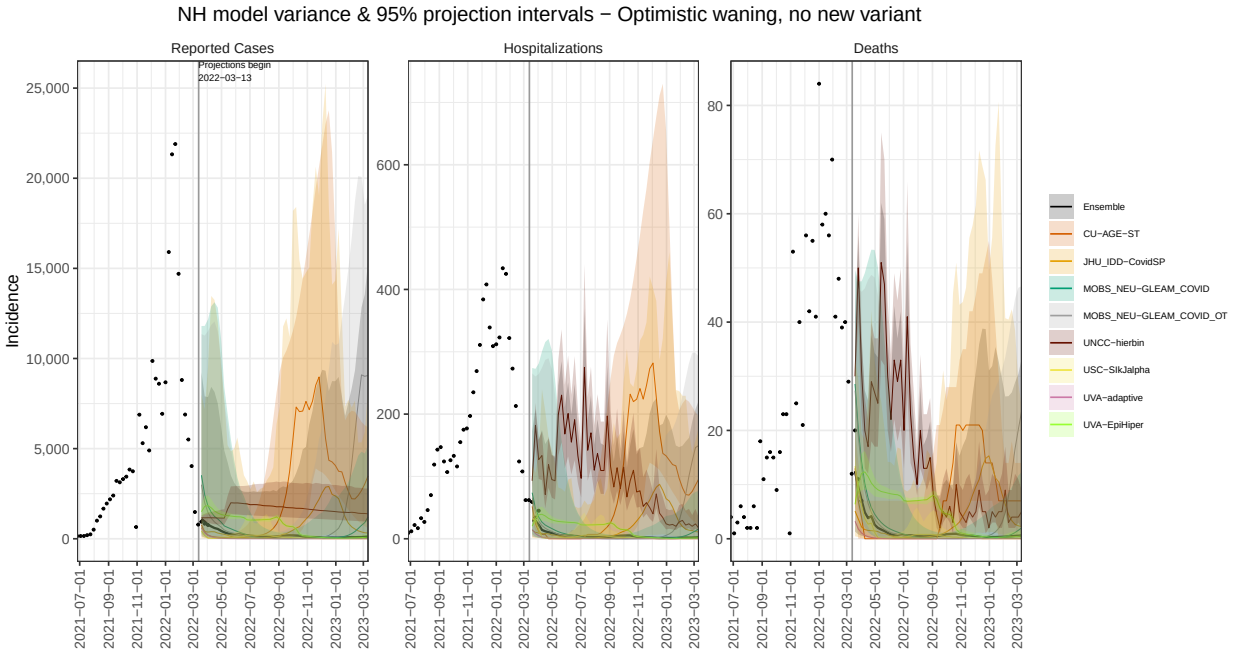

MS model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

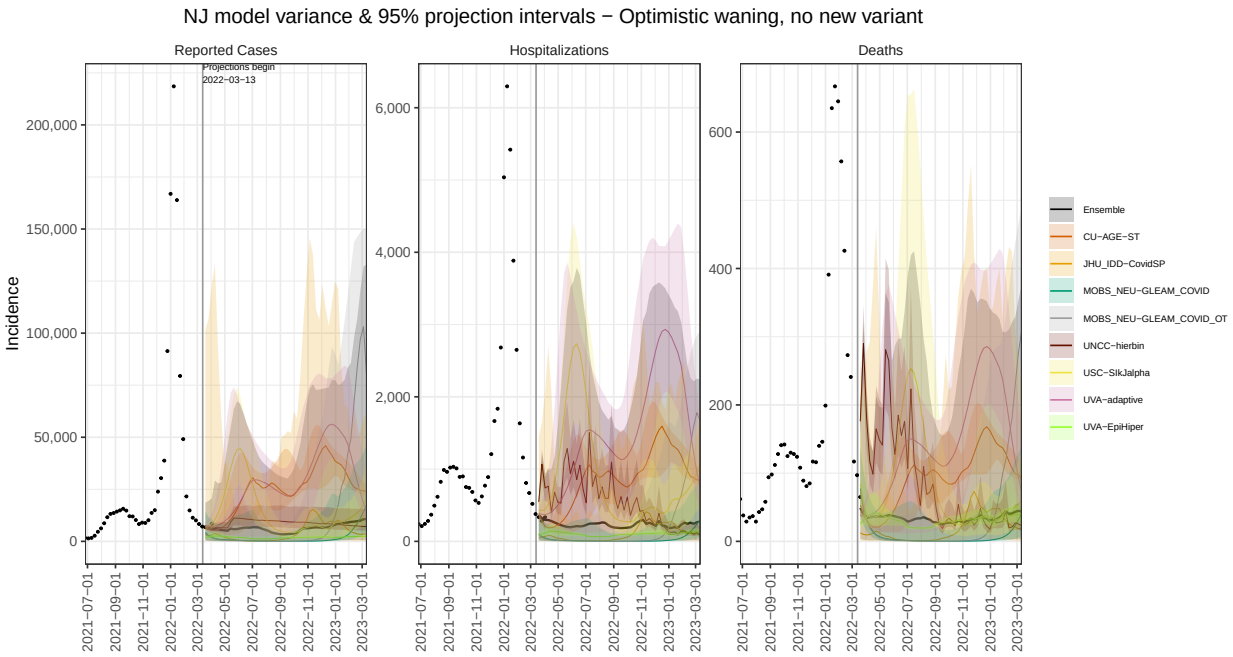

MO model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

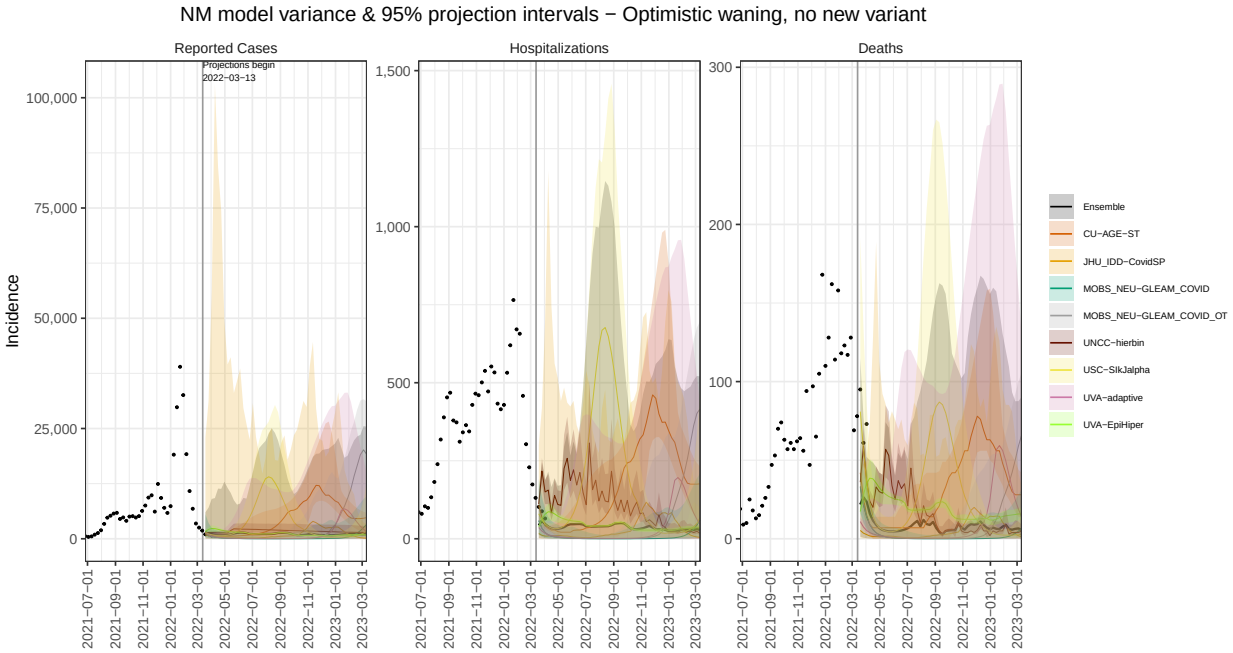

MT model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

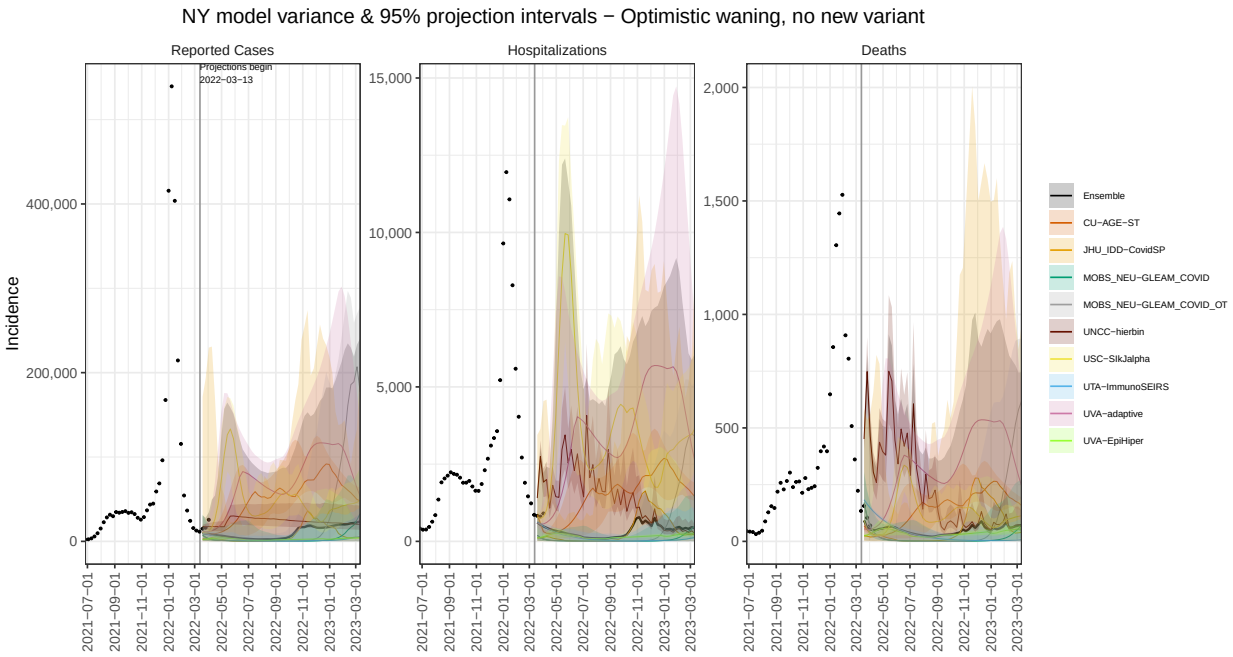

NE model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

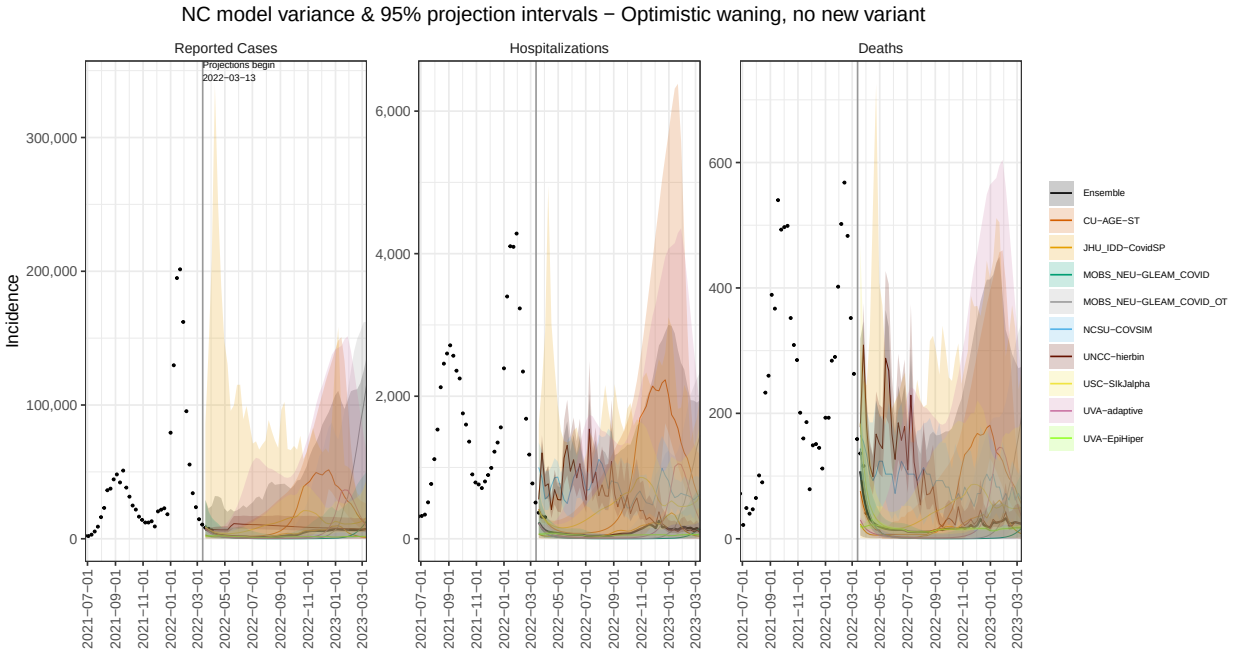

NV model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

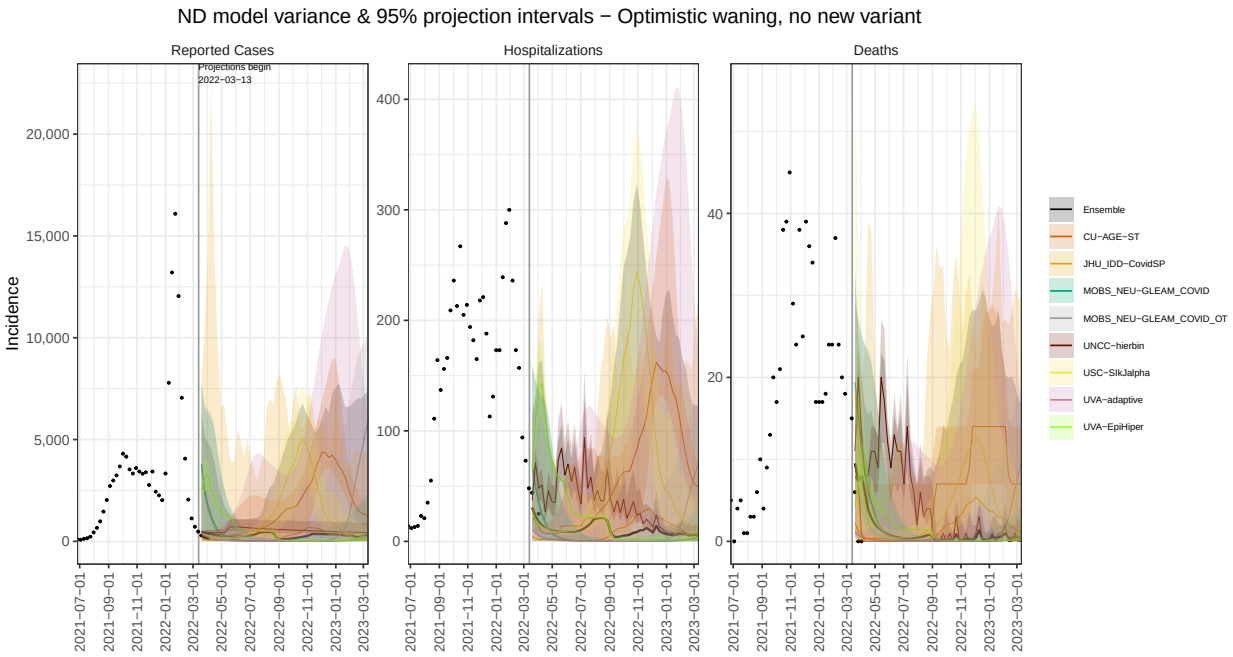

NH model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

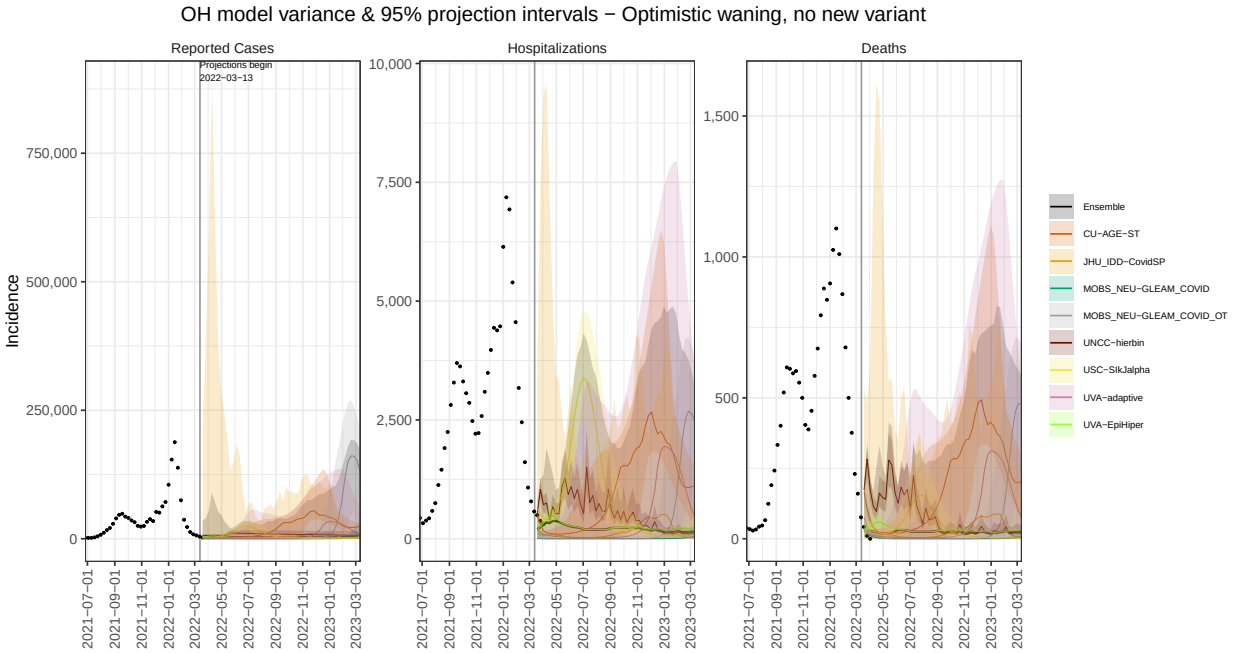

NJ model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

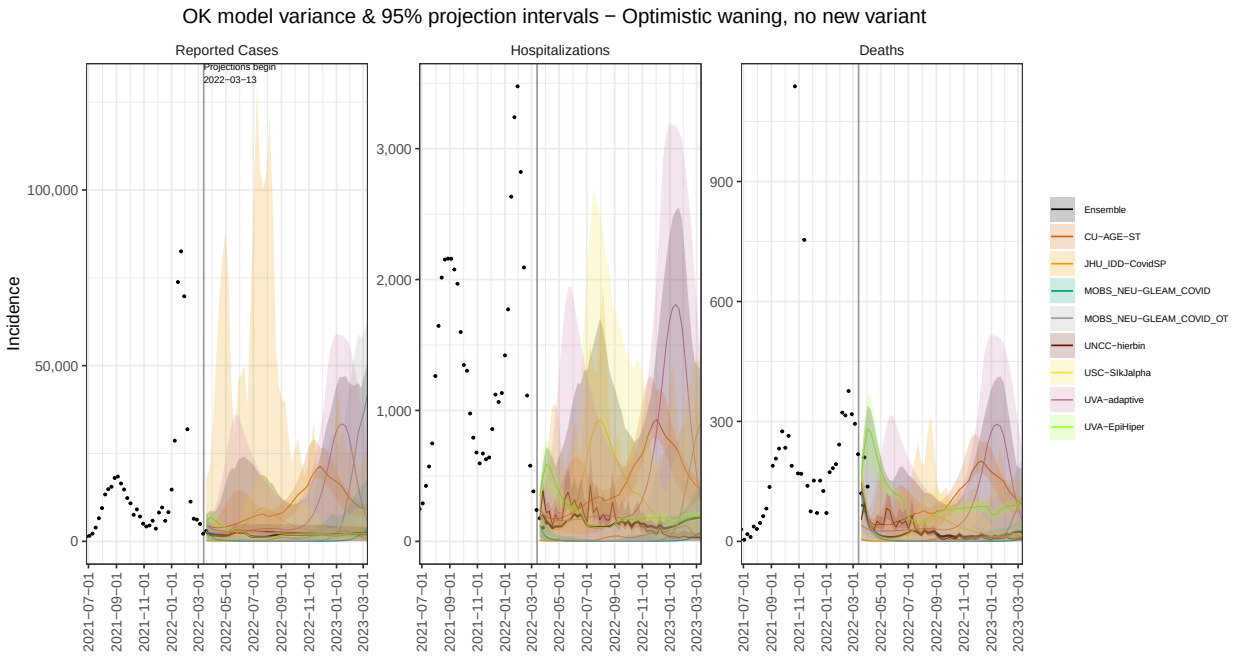

NM model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

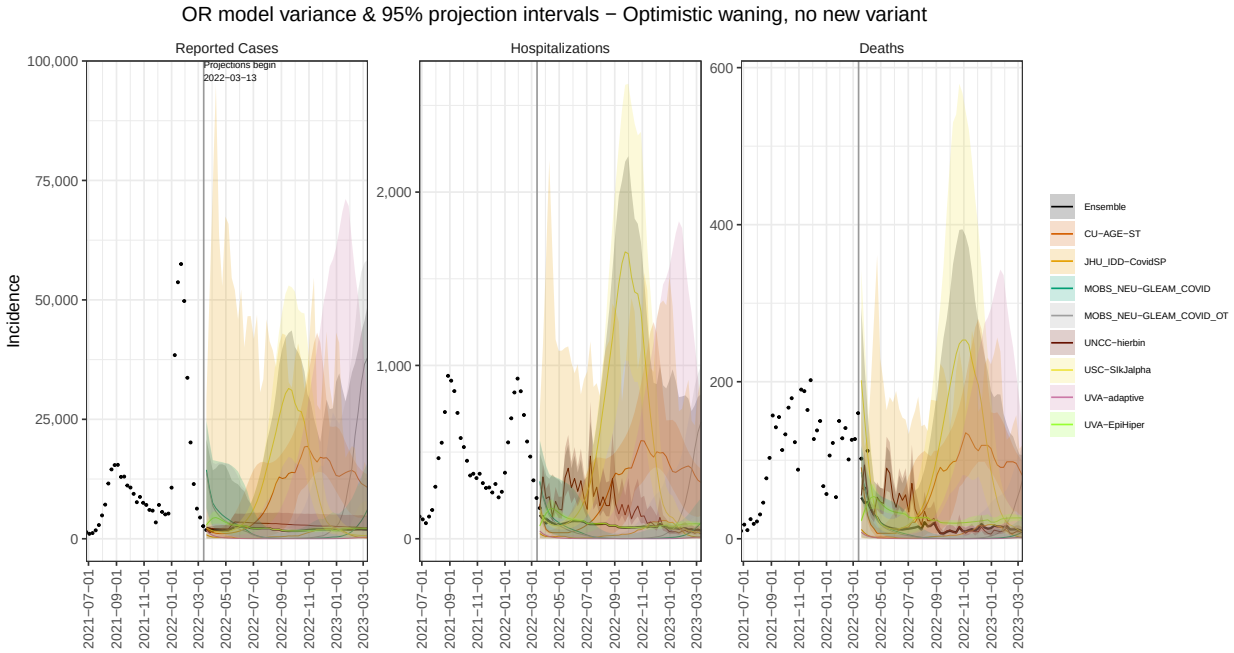

NY model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

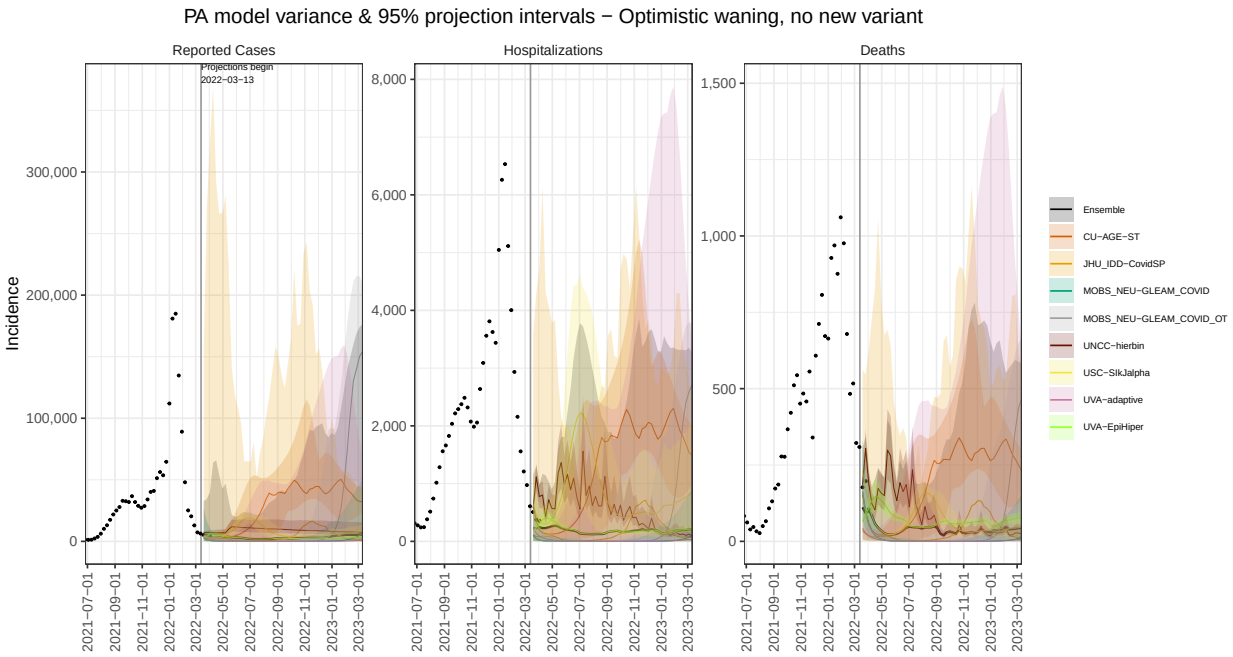

NC model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

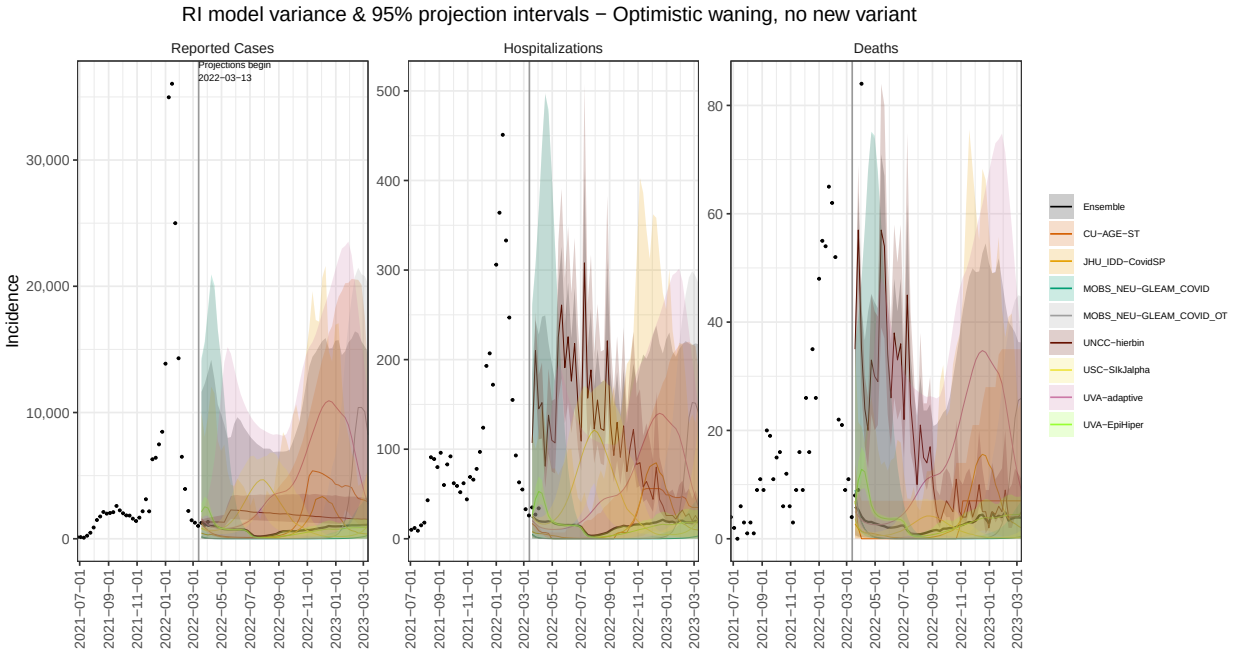

ND model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

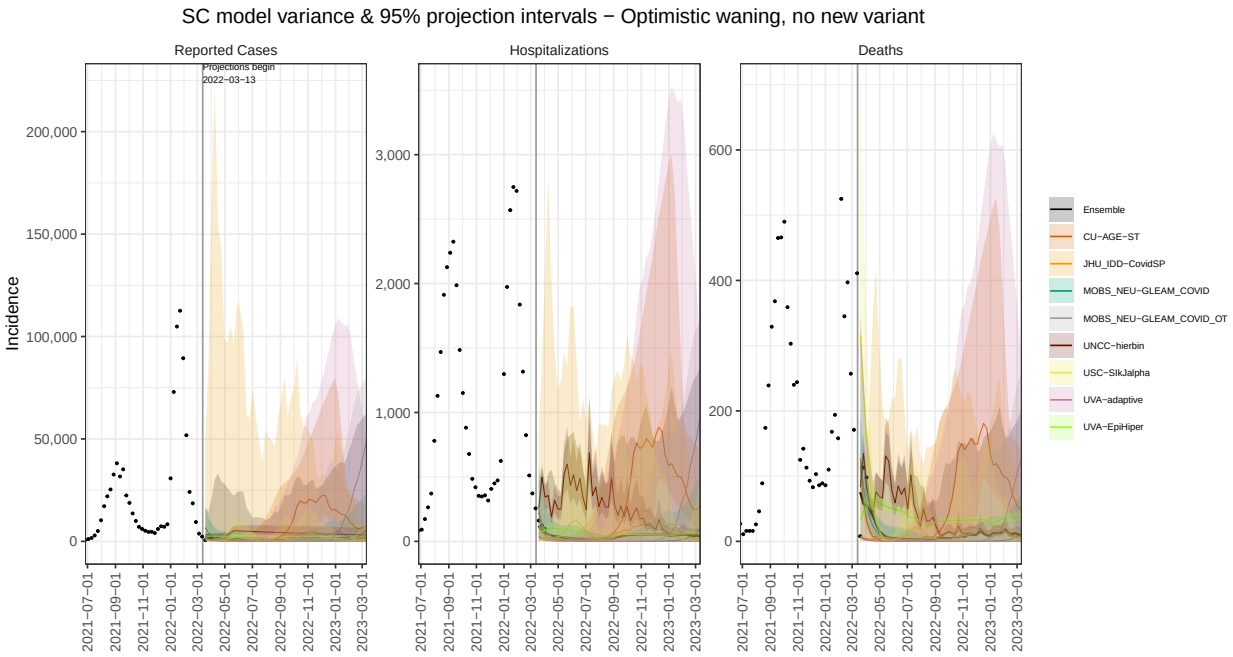

OH model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

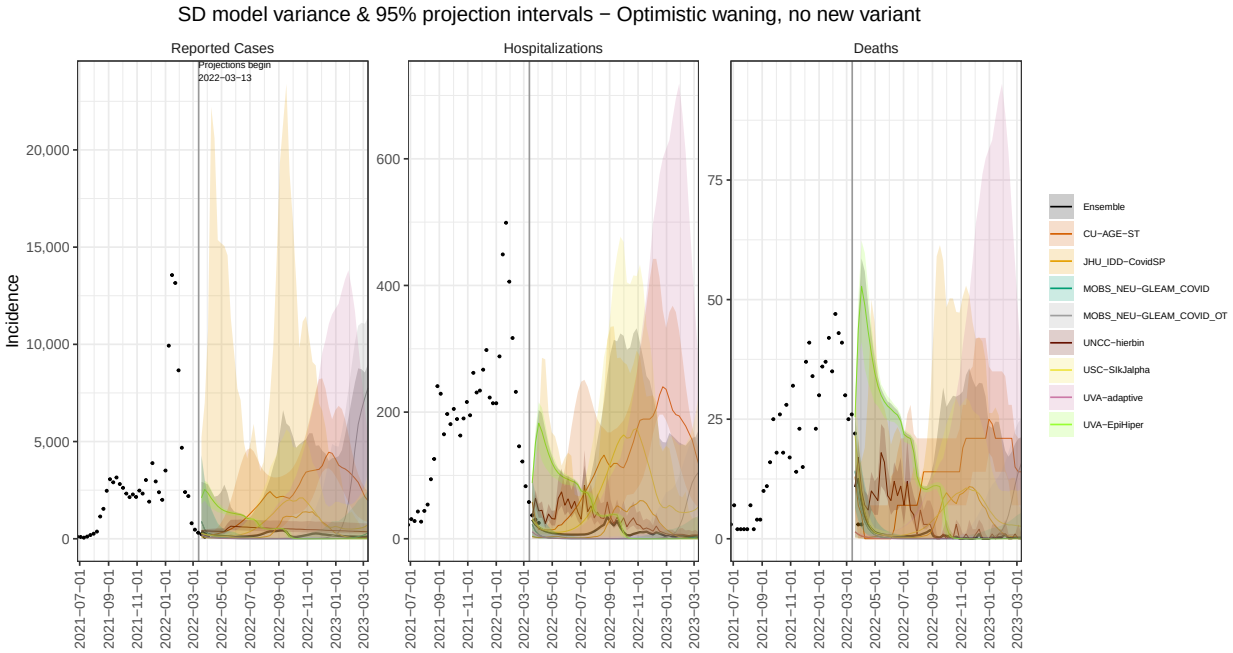

OK model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

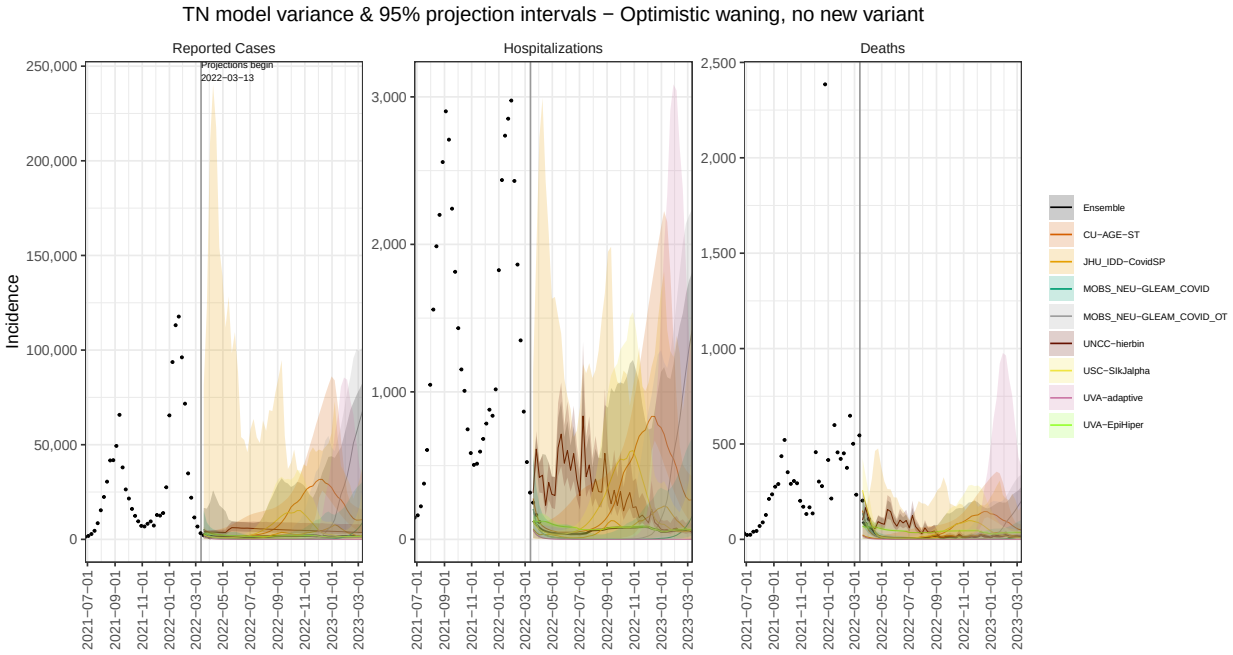

OR model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

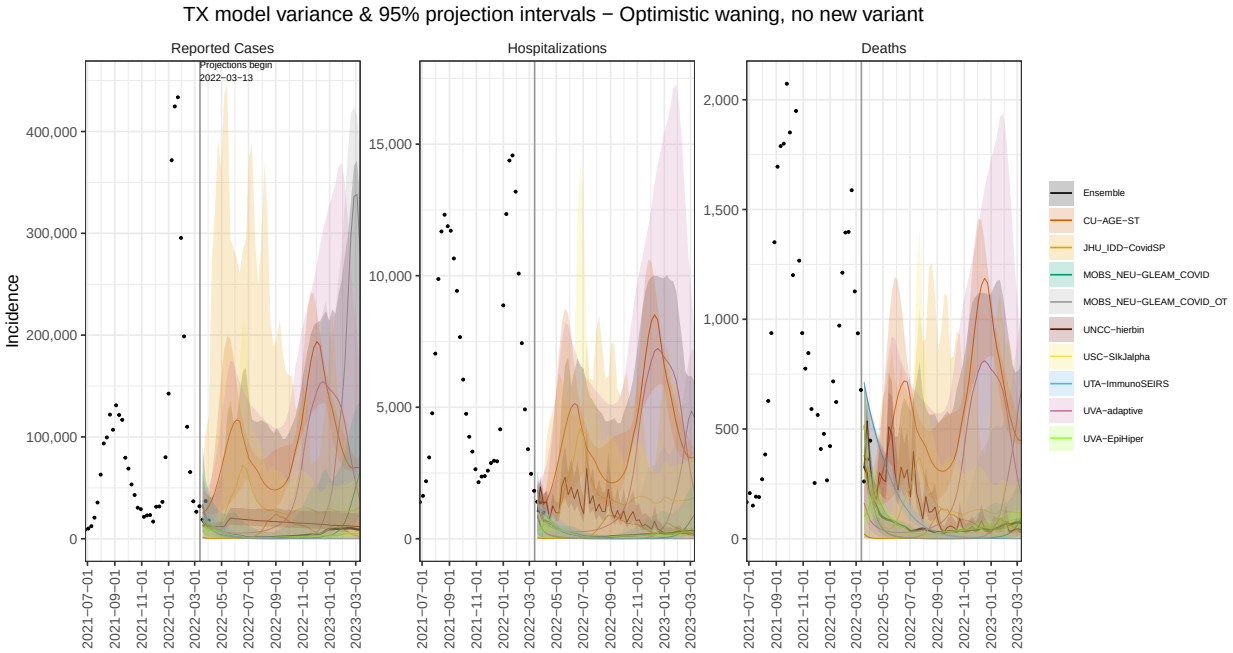

PA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

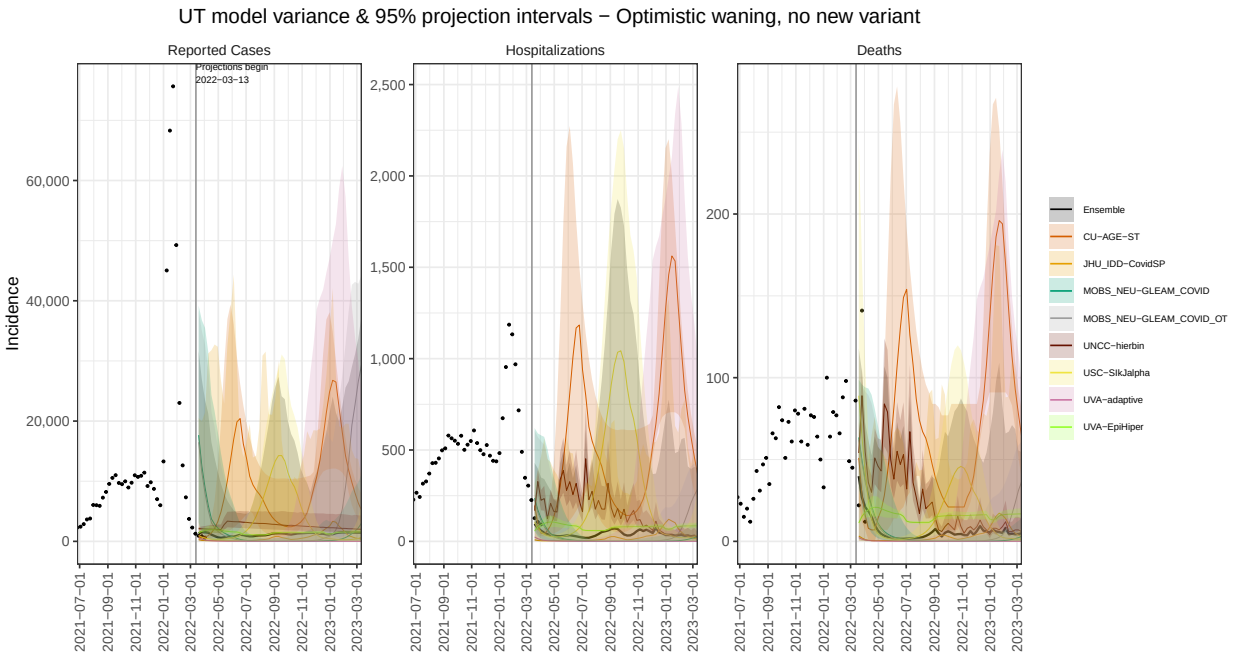

RI model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

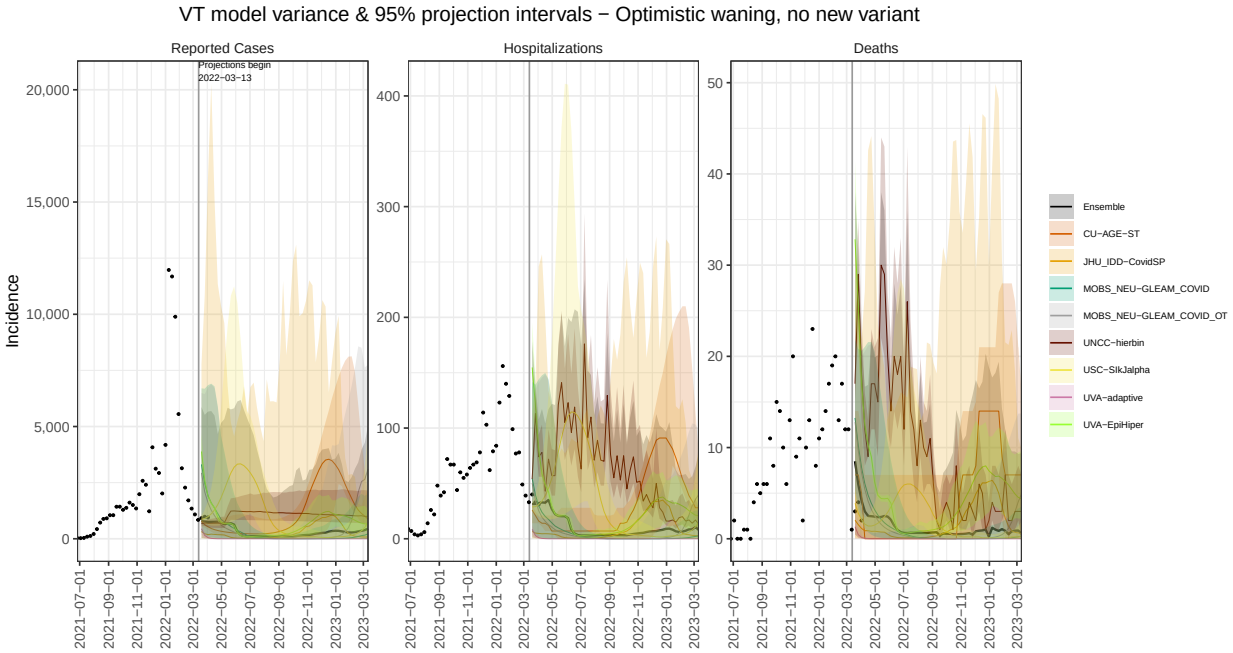

SC model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

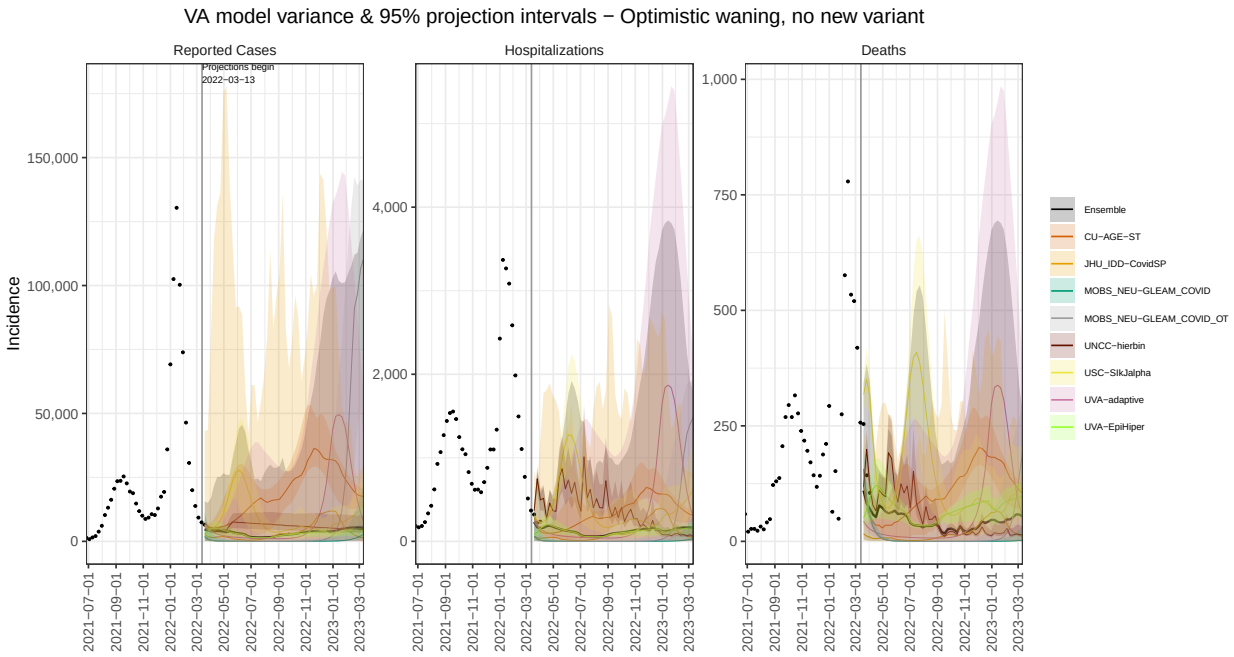

SD model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

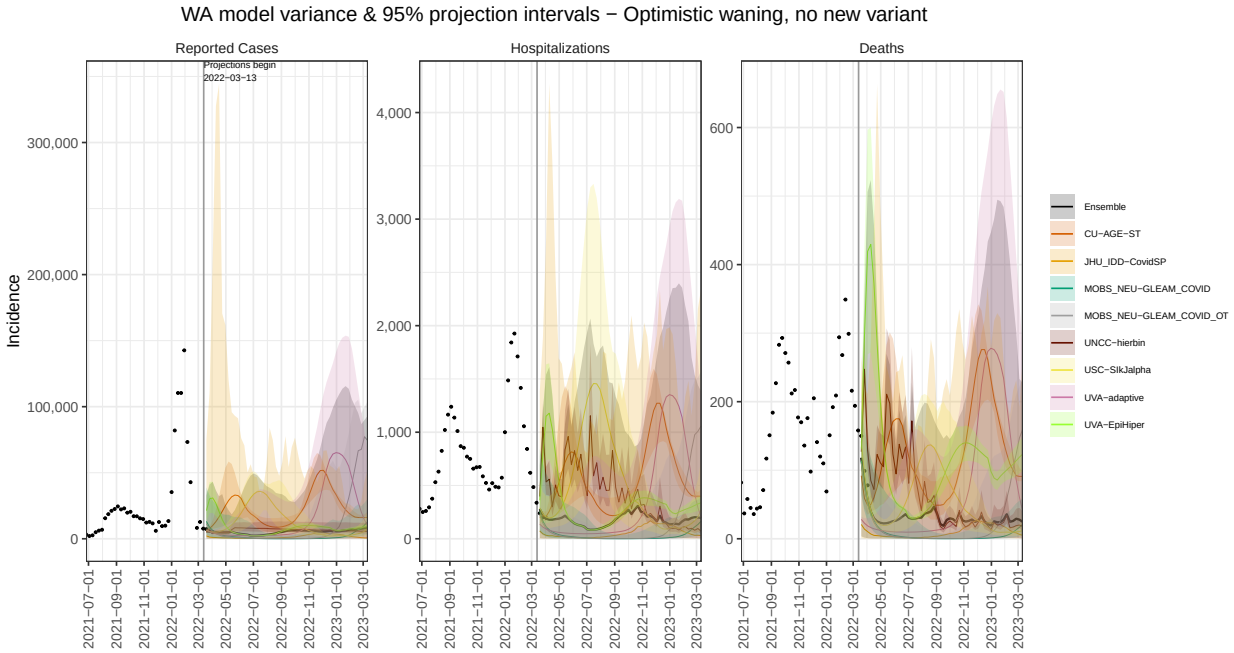

TN model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

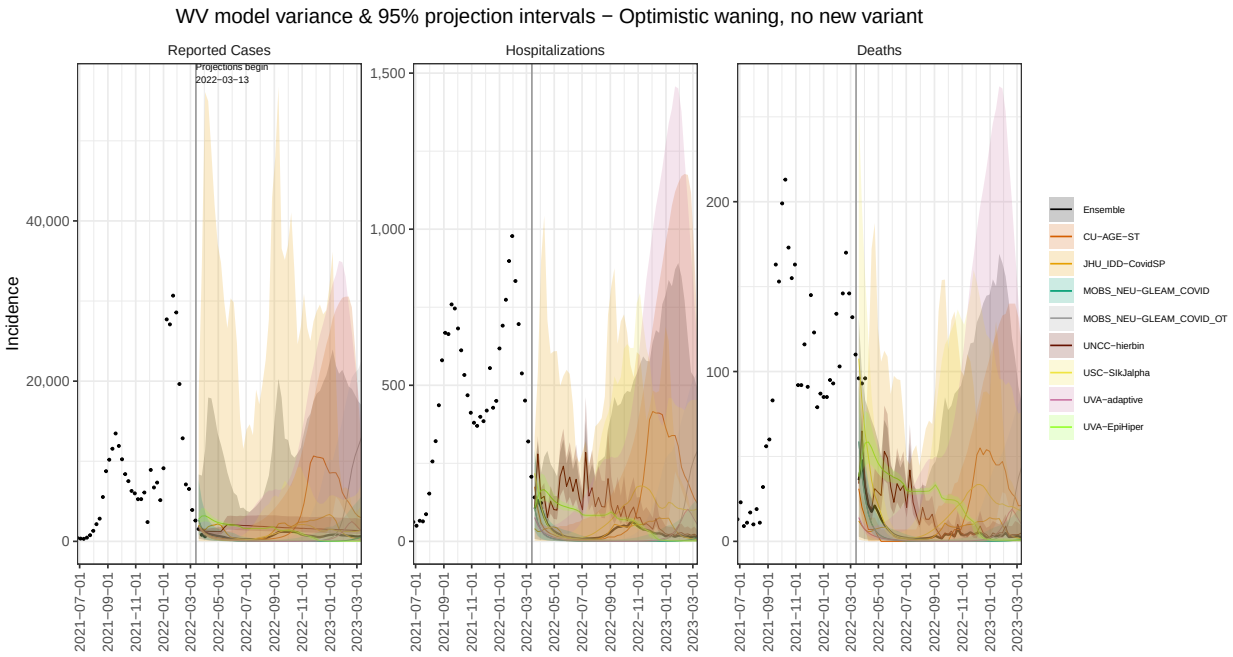

TX model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

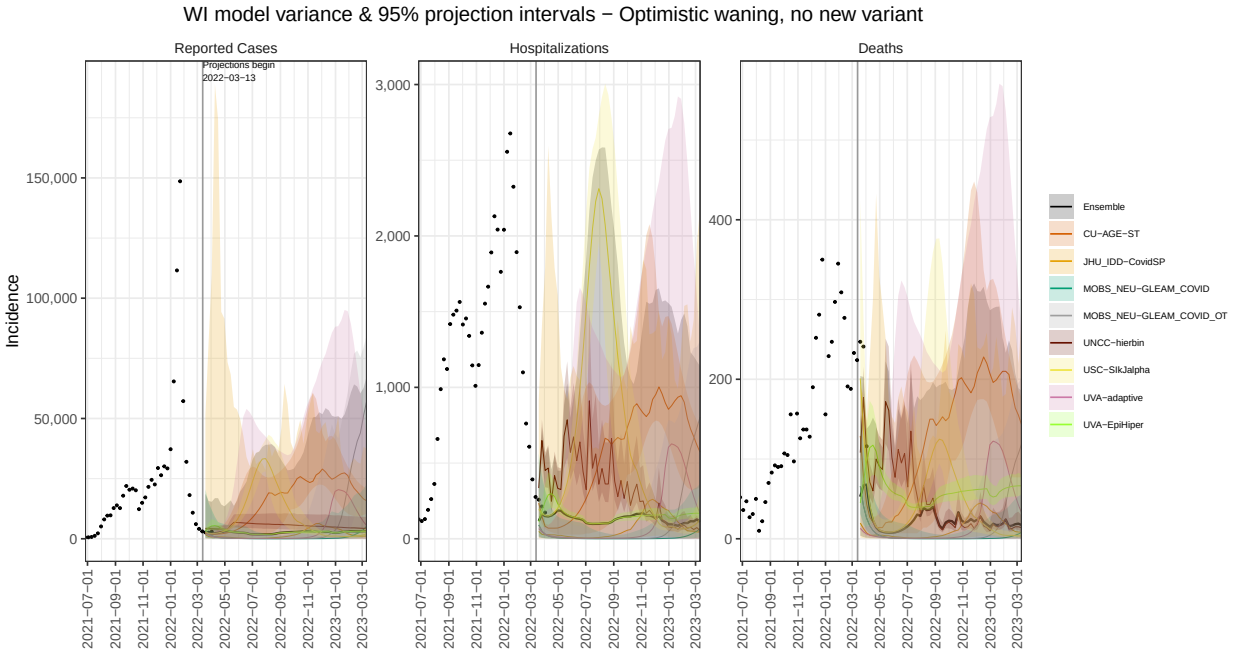

UT model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

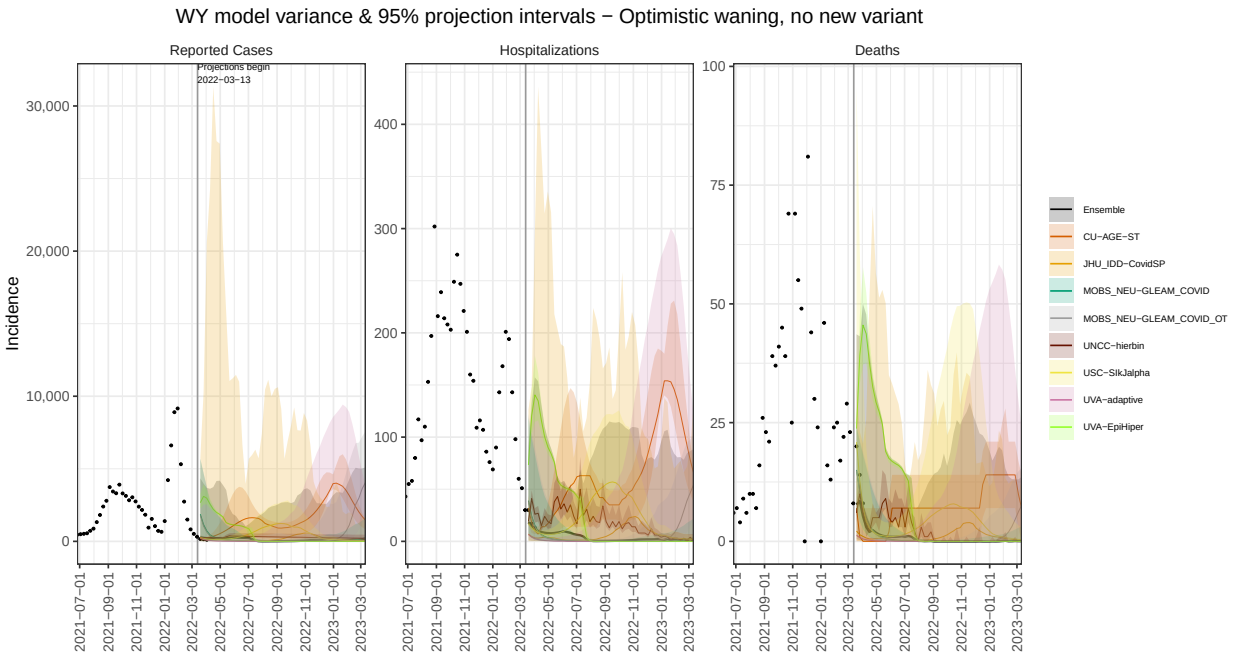

VT model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

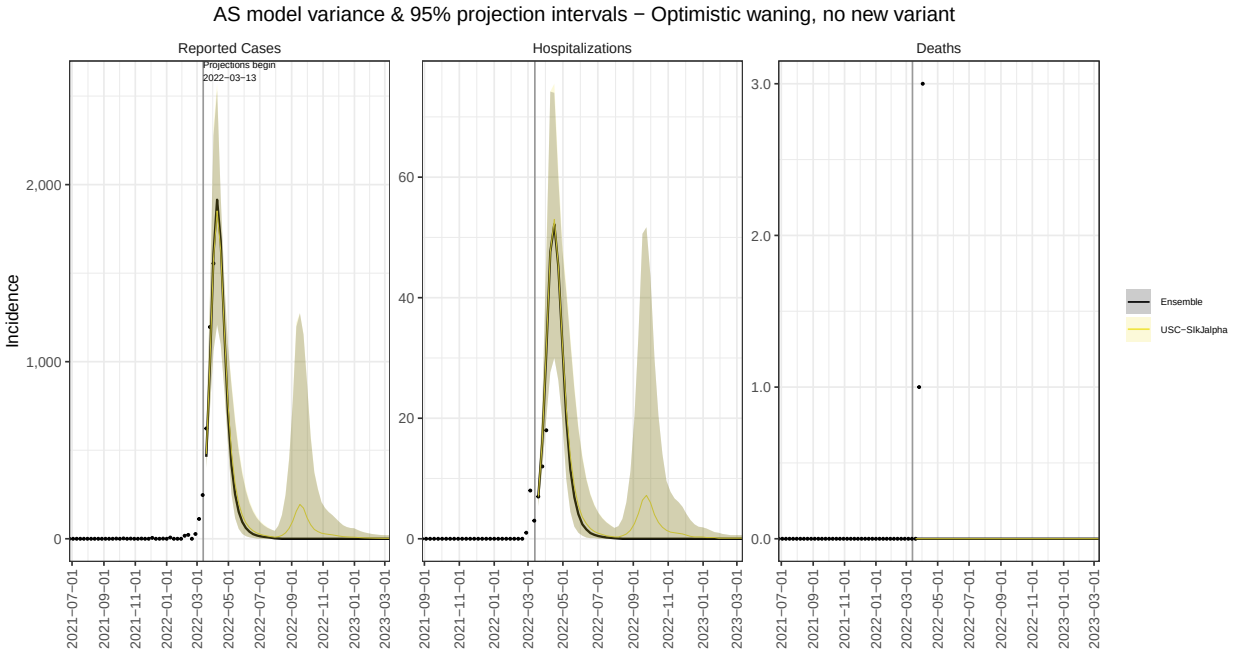

VA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

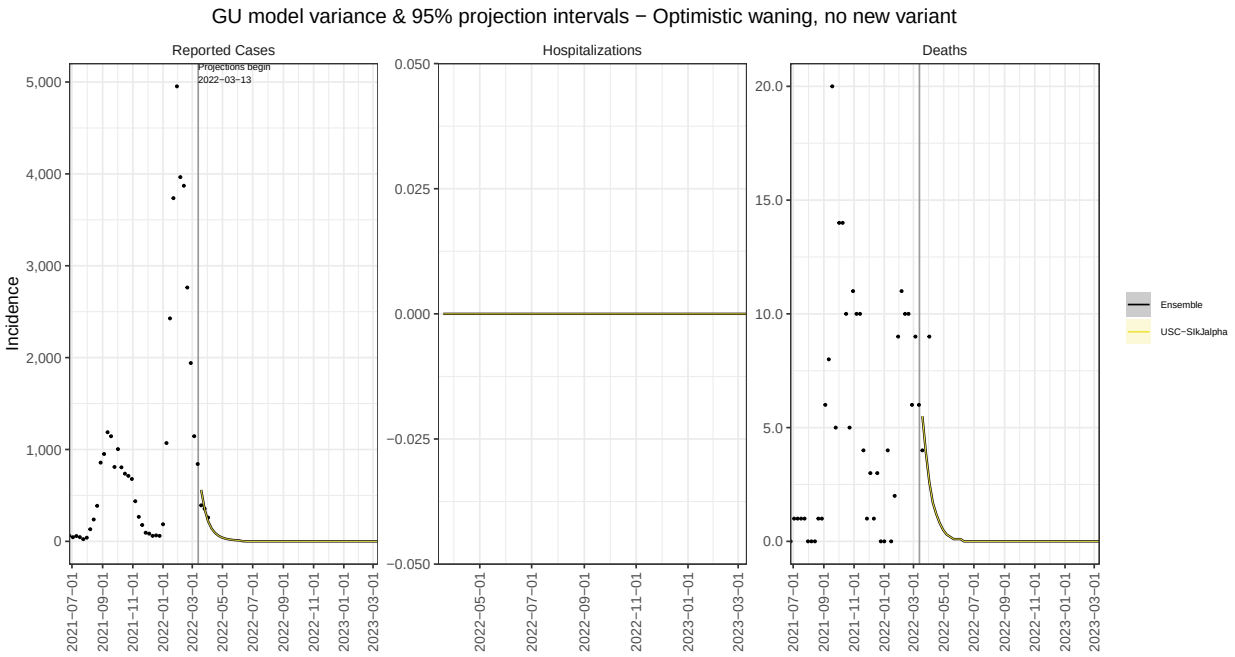

WA model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

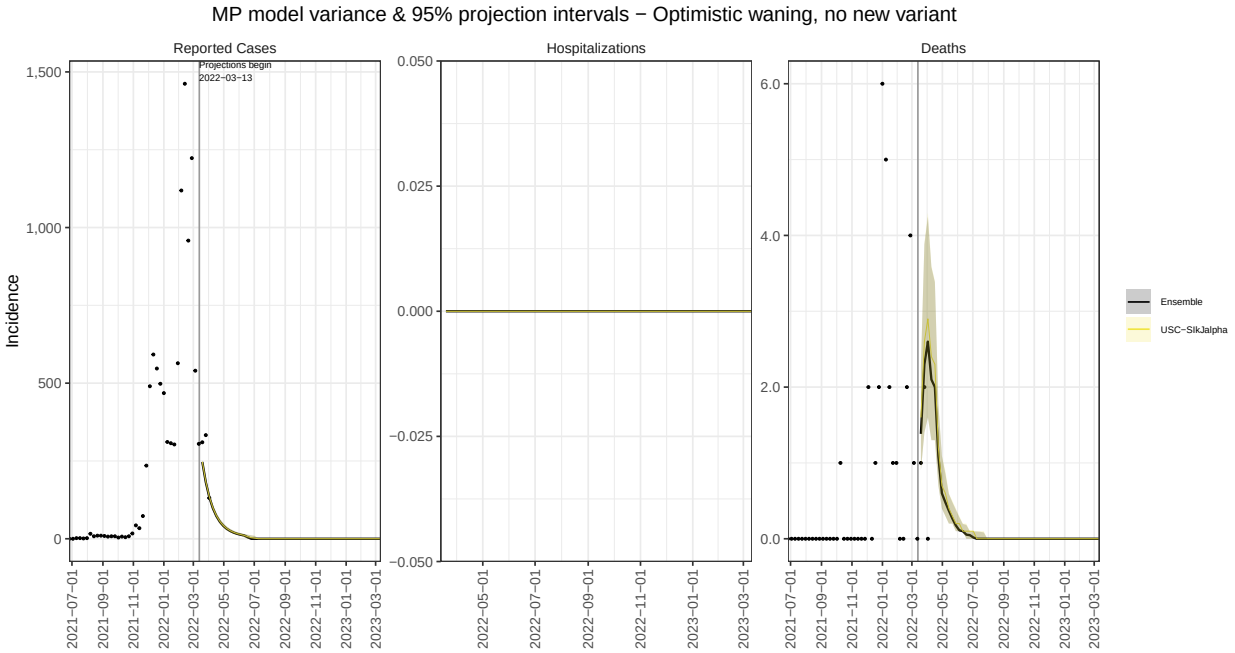

WV model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

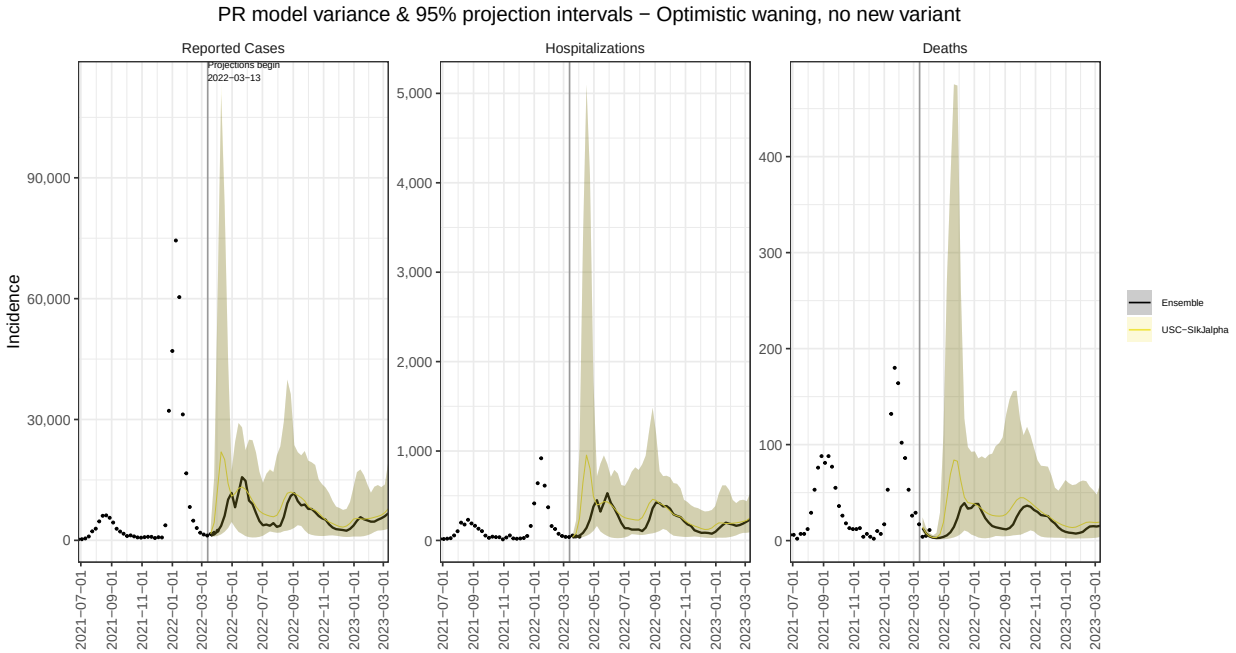

WI model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

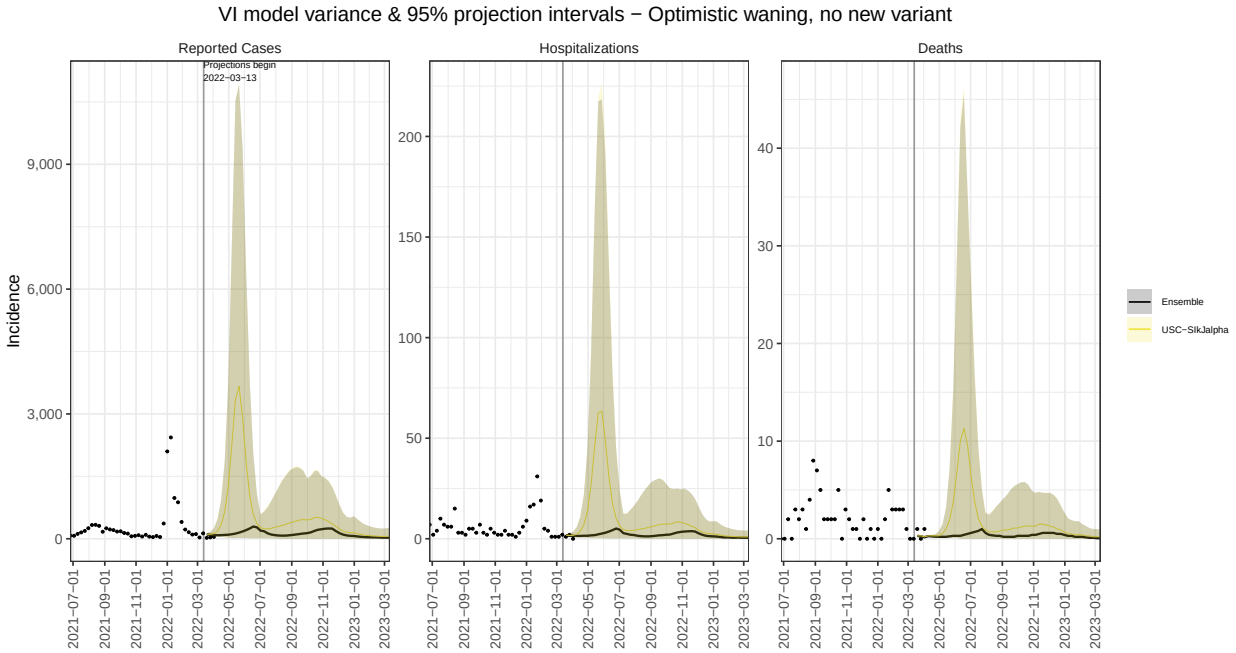

WY model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


AS model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

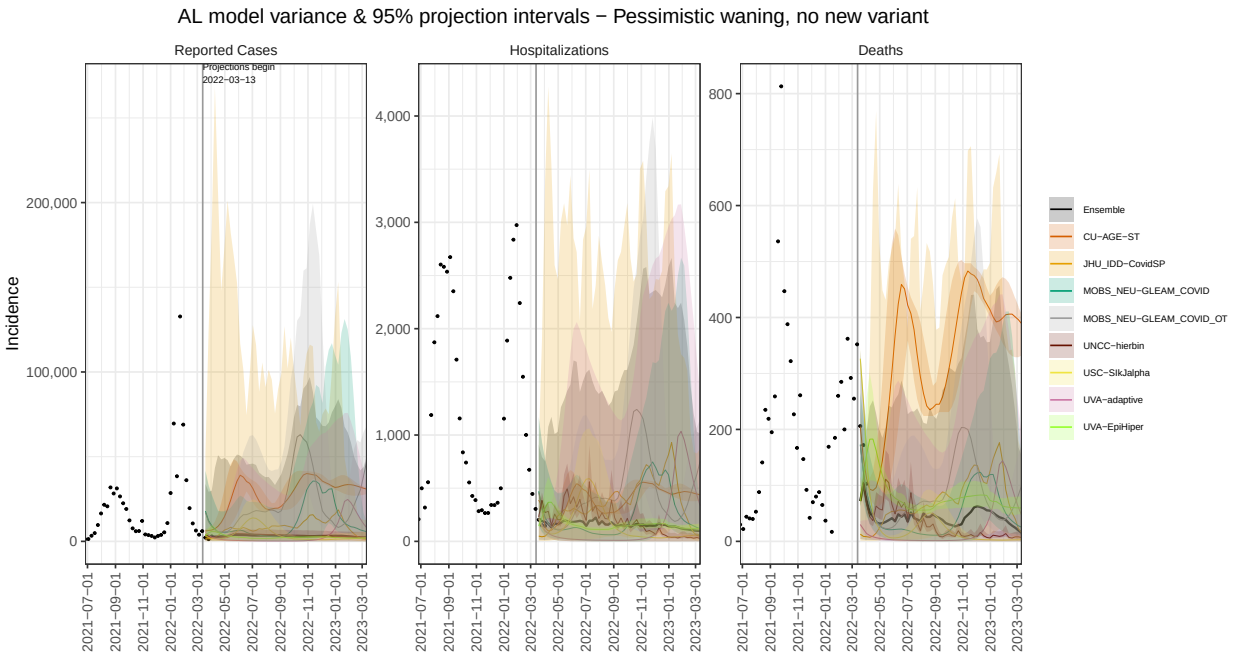

GU model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

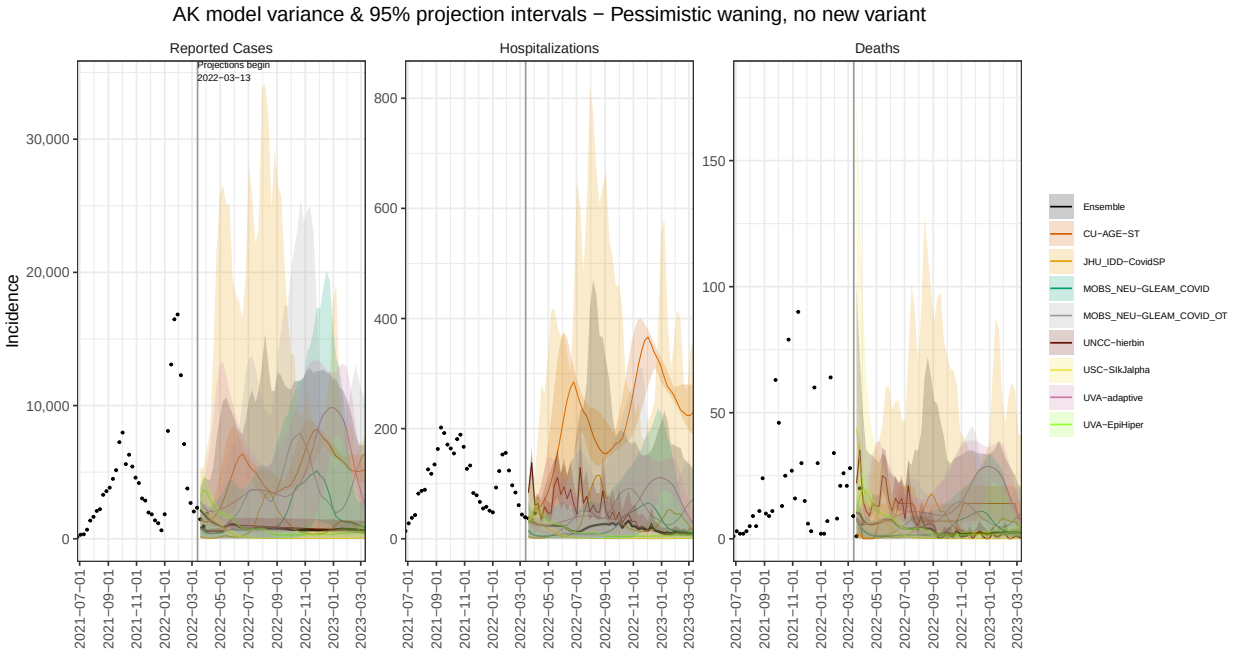

MP model variance & 95% projection intervals − Optimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

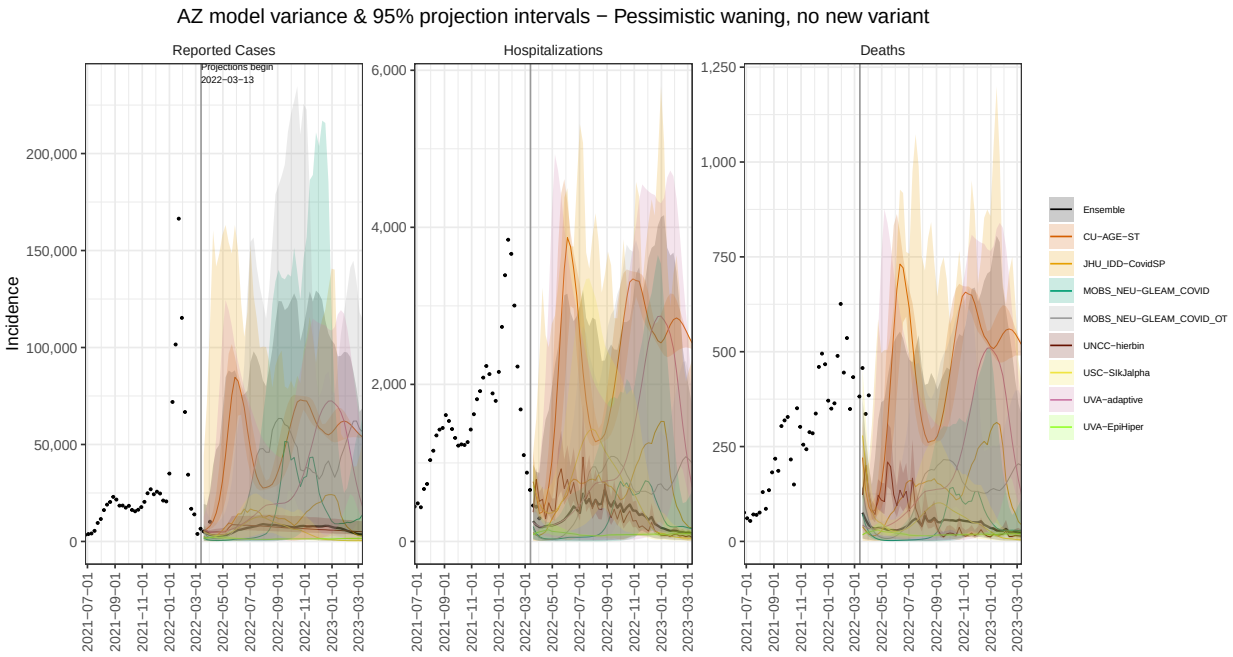


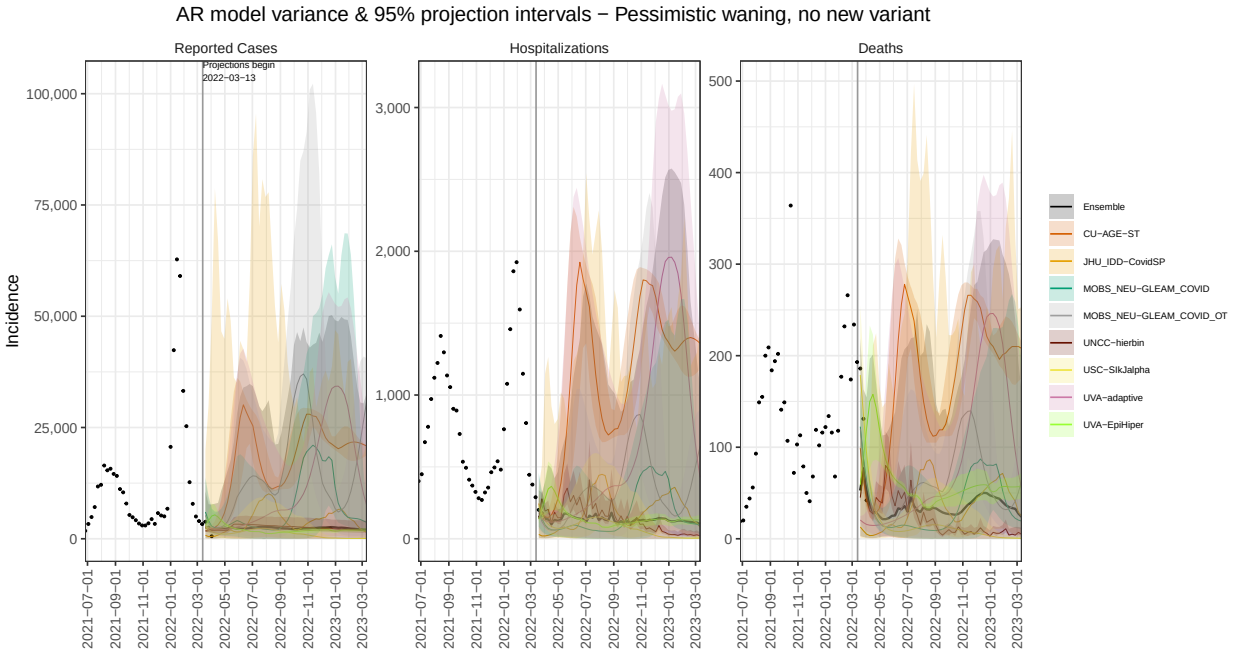


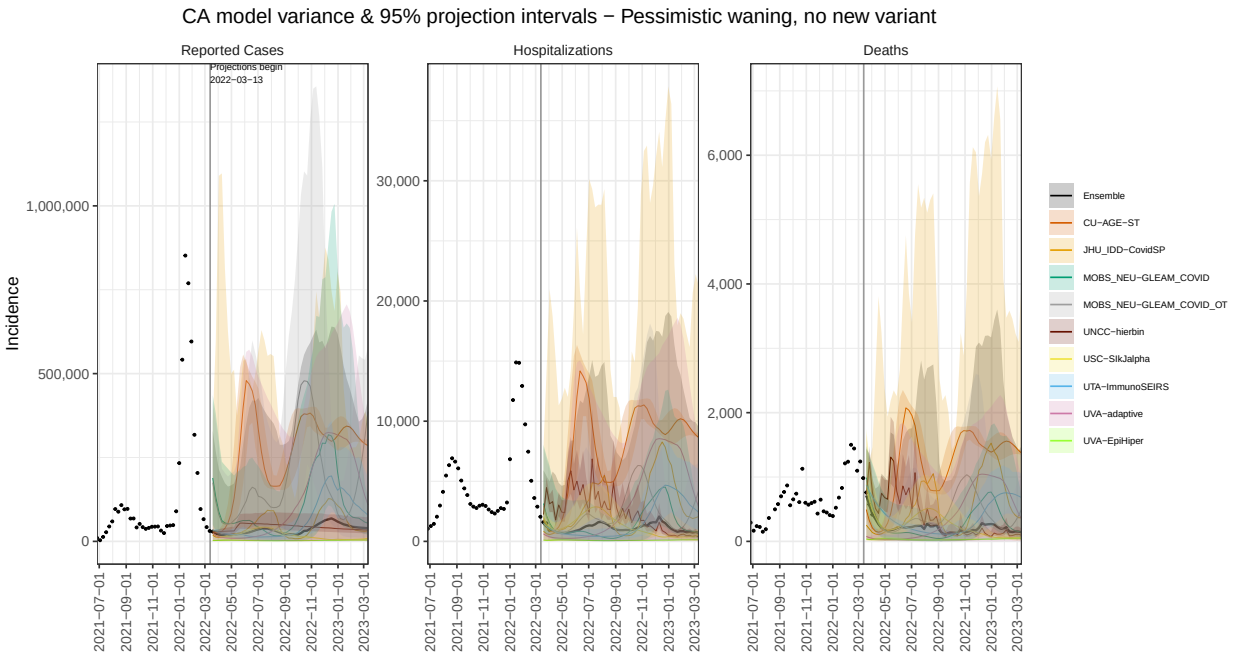
National model variation for the pessimistic waning, no new immune escape variant scenario.

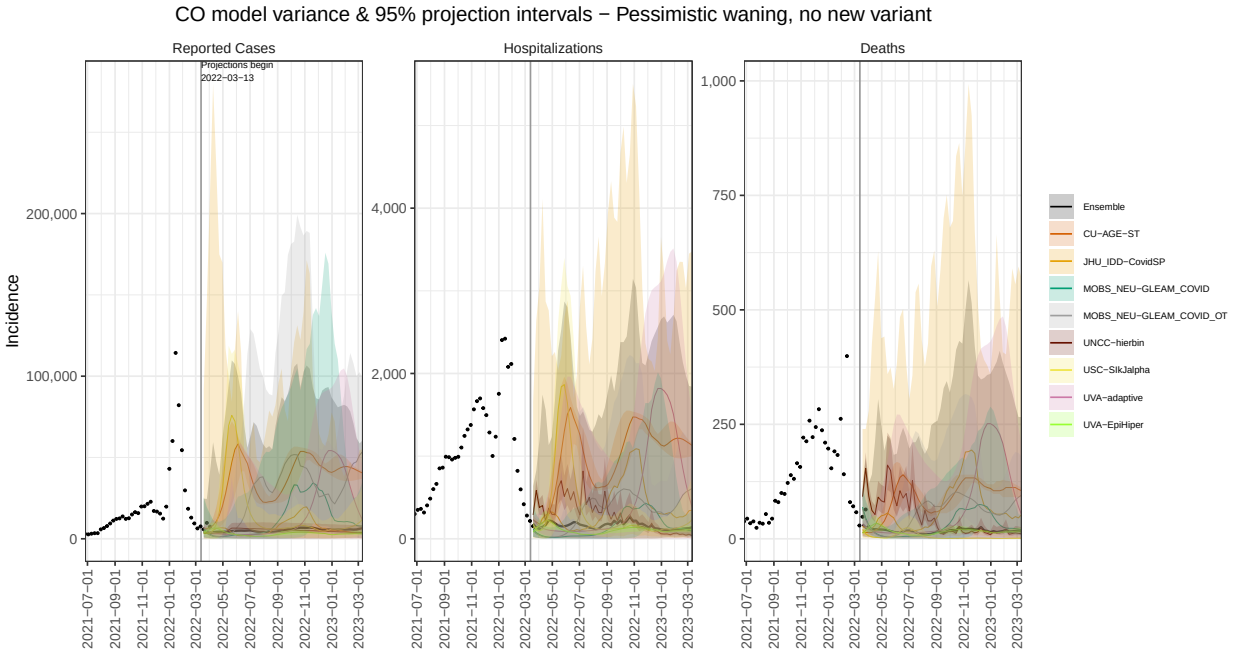

AL model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

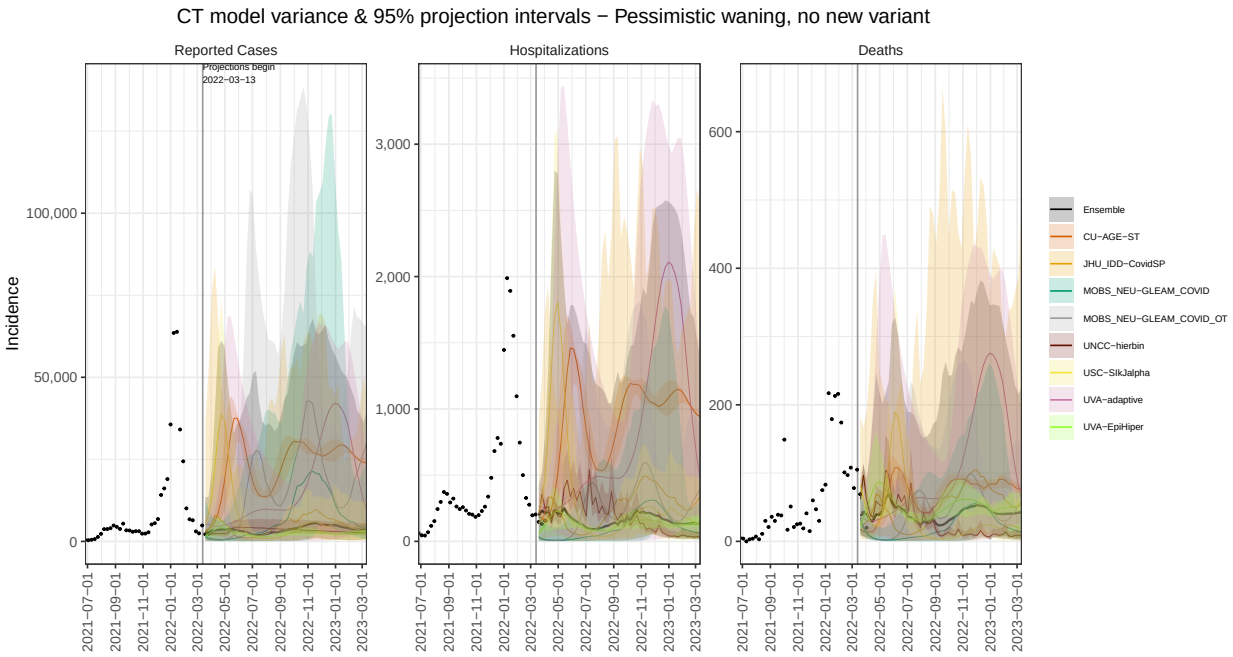

AK model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

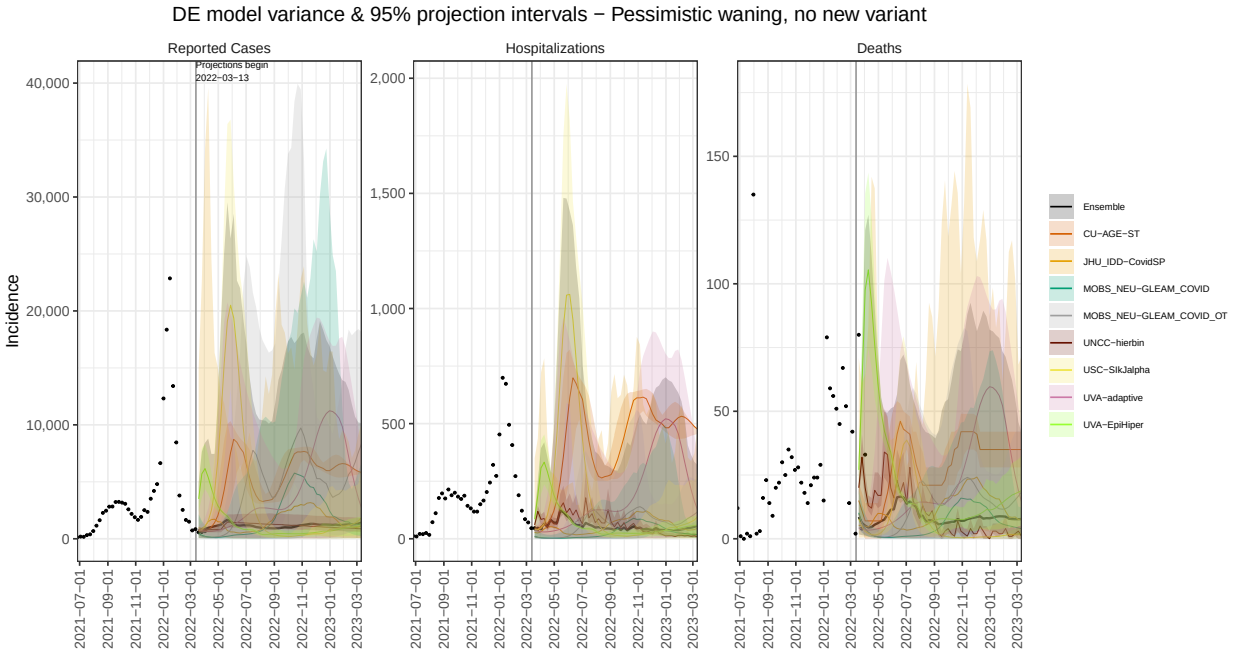

AZ model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

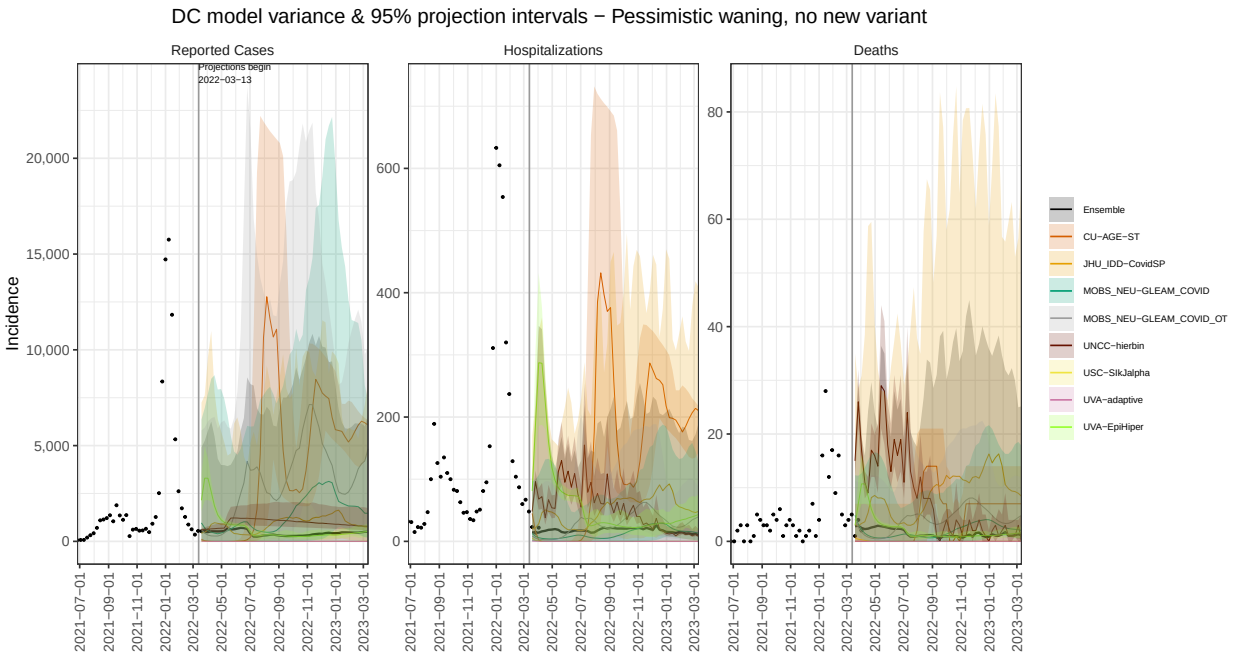

AR model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

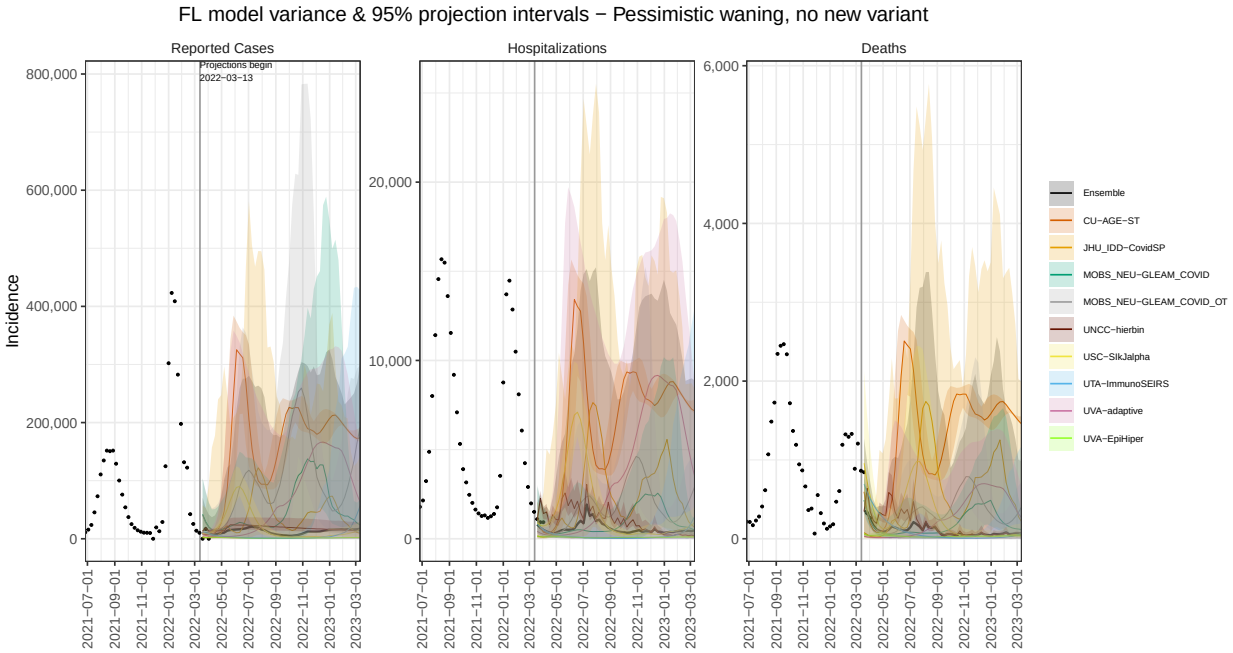

CA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper


CO model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

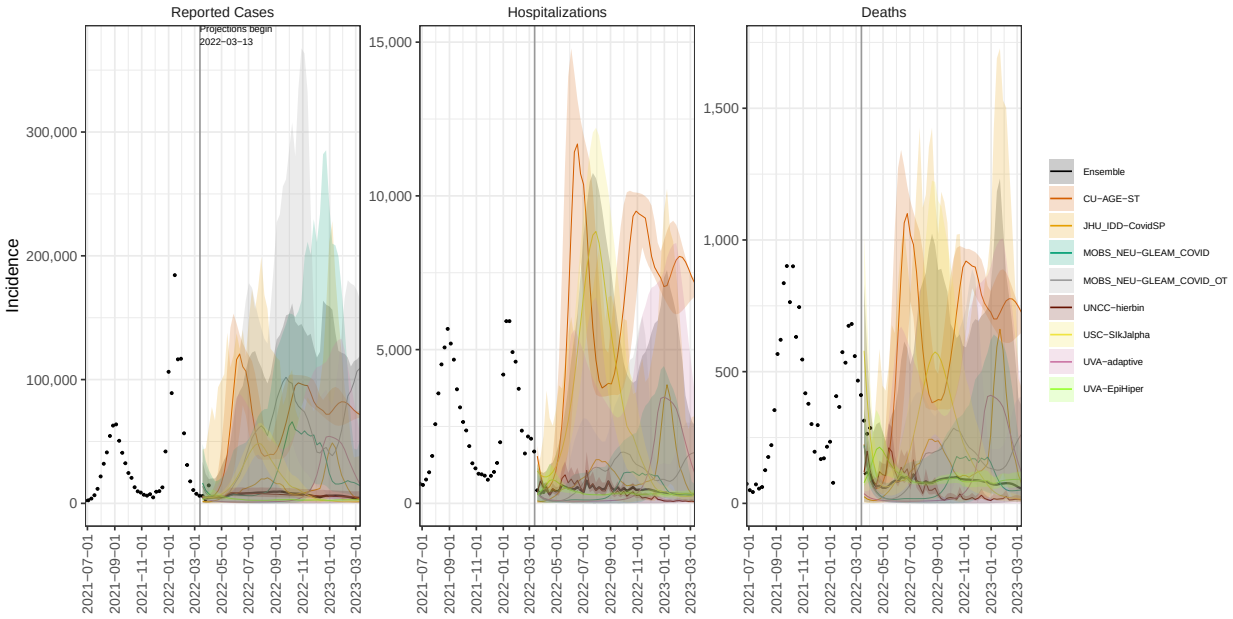

CT model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


DE model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

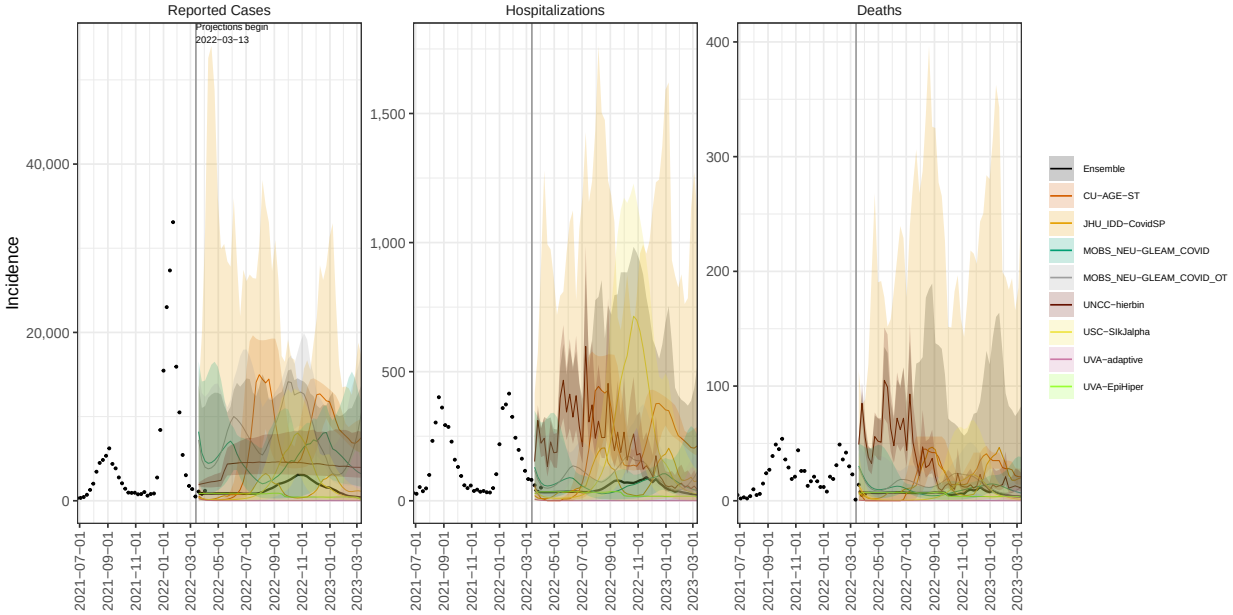

DC model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

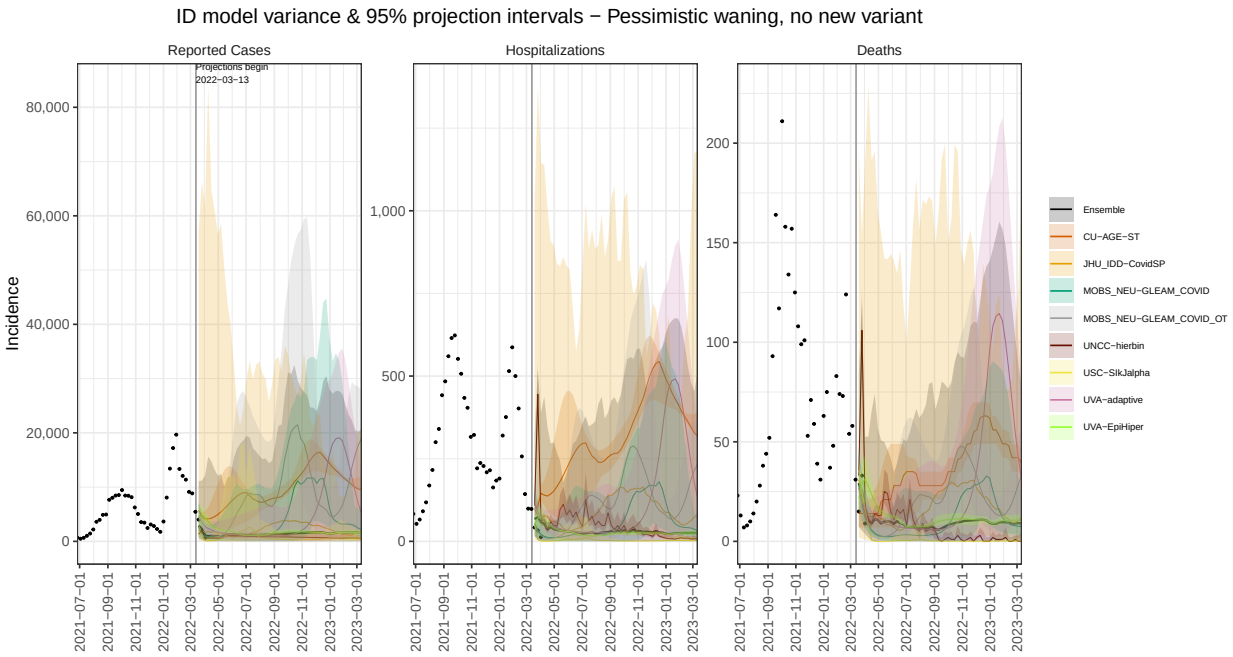

FL model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

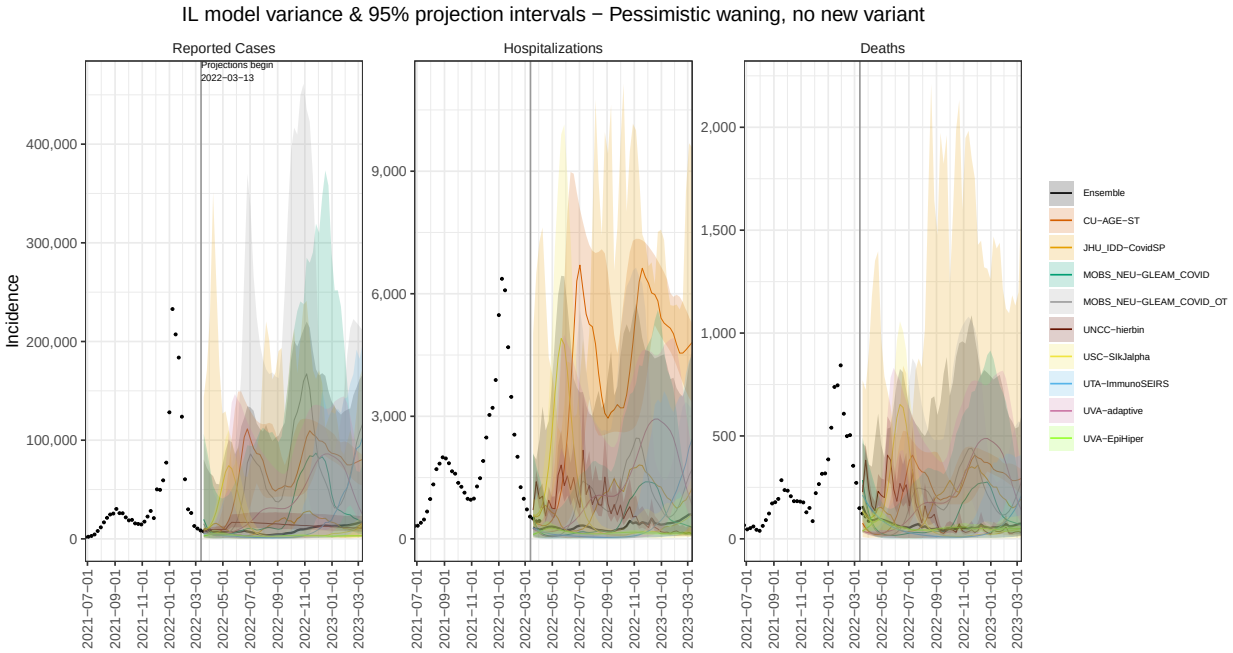
GA model variance & 95% projection intervals − Pessimistic waning, no new variant

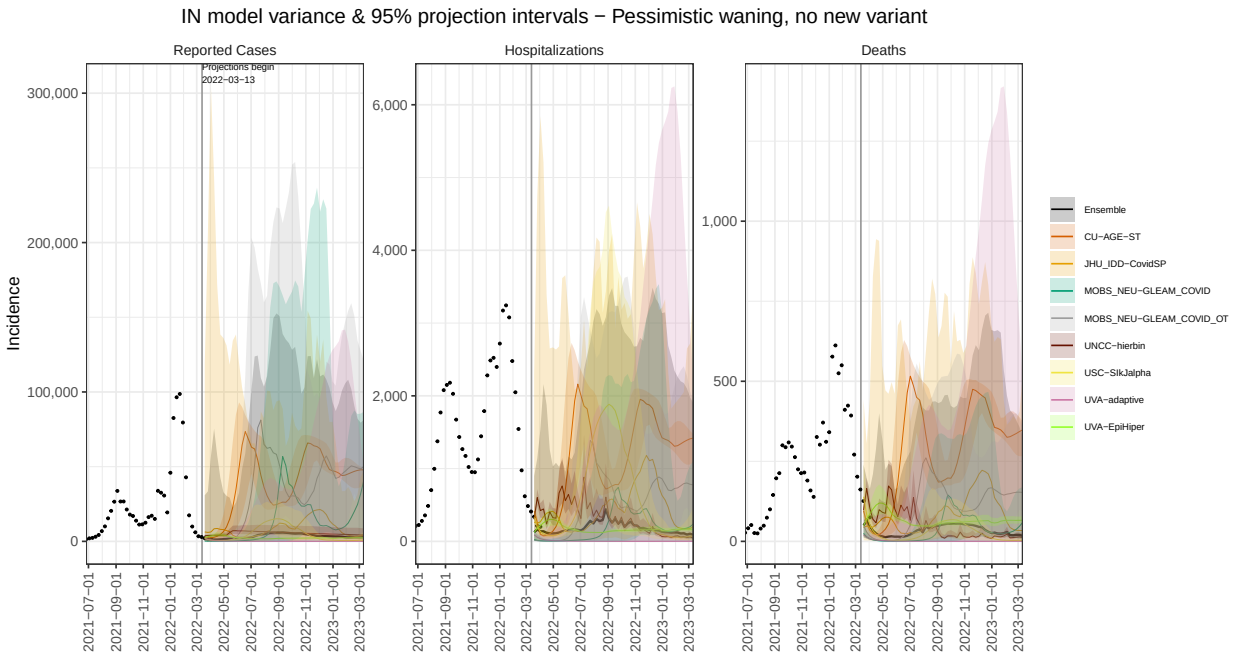


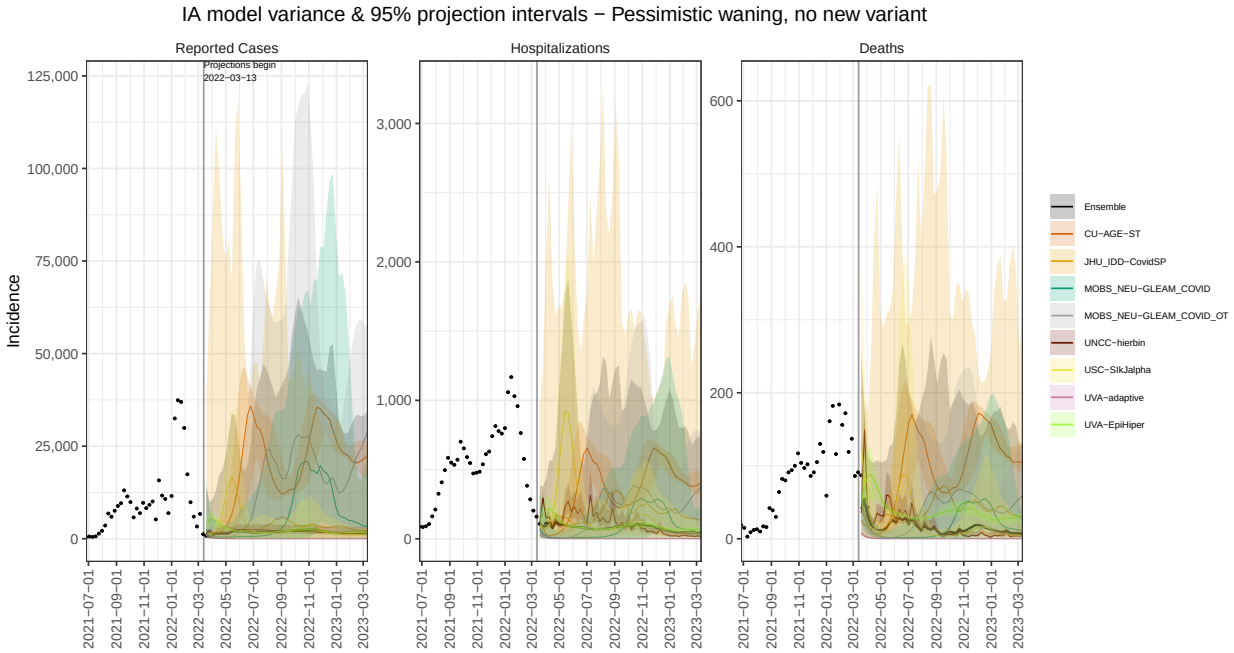
HI model variance & 95% projection intervals − Pessimistic waning, no new variant

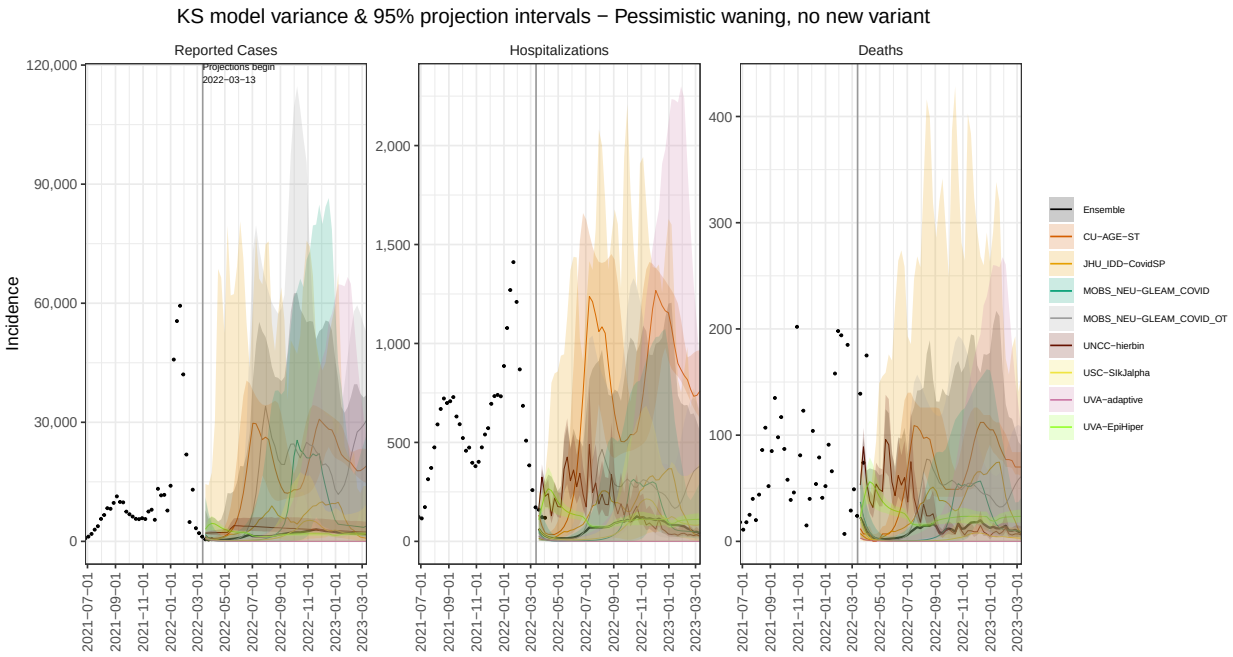


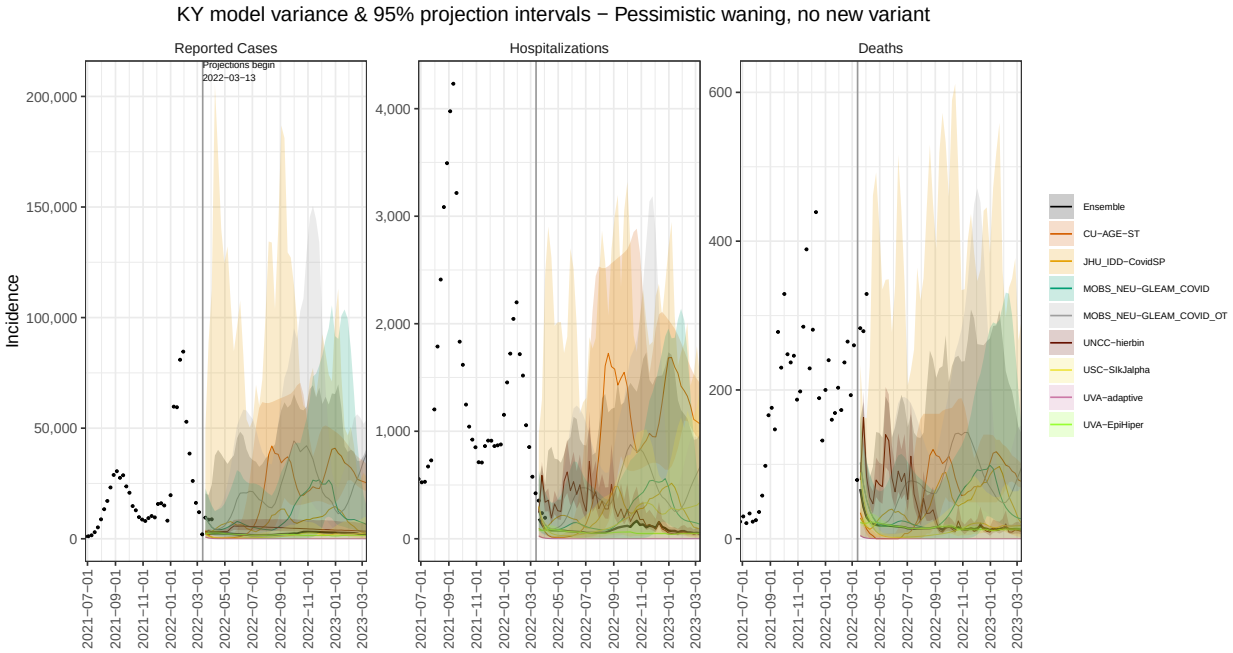

ID model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

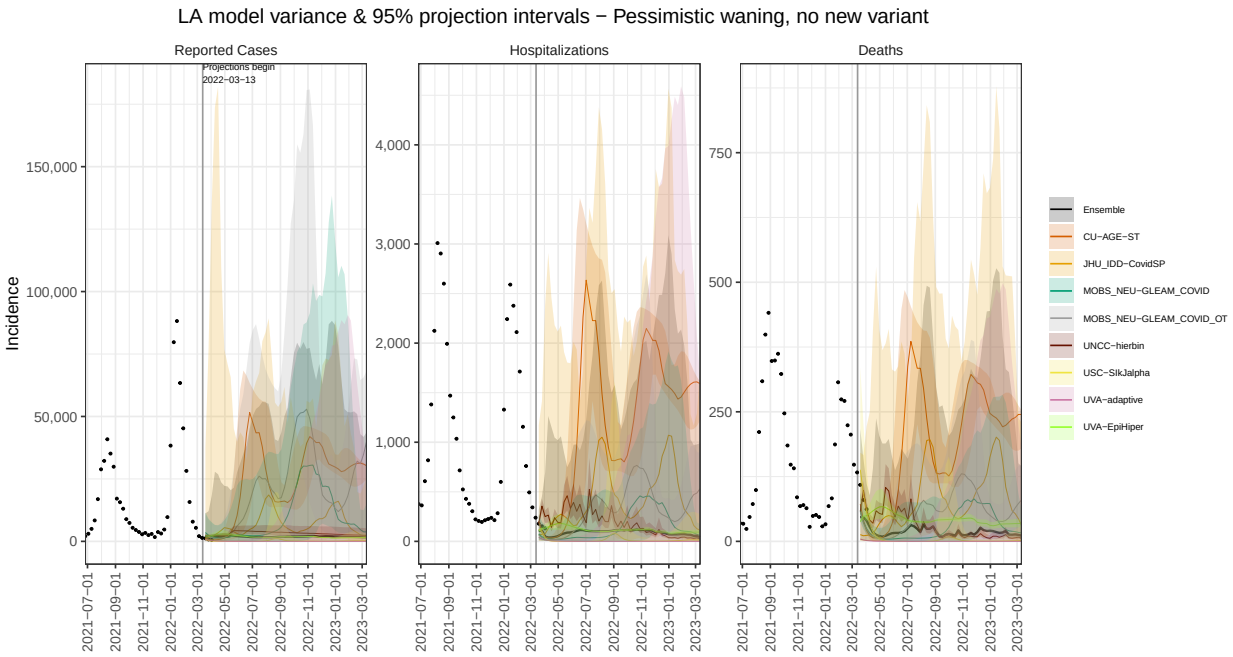

IL model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

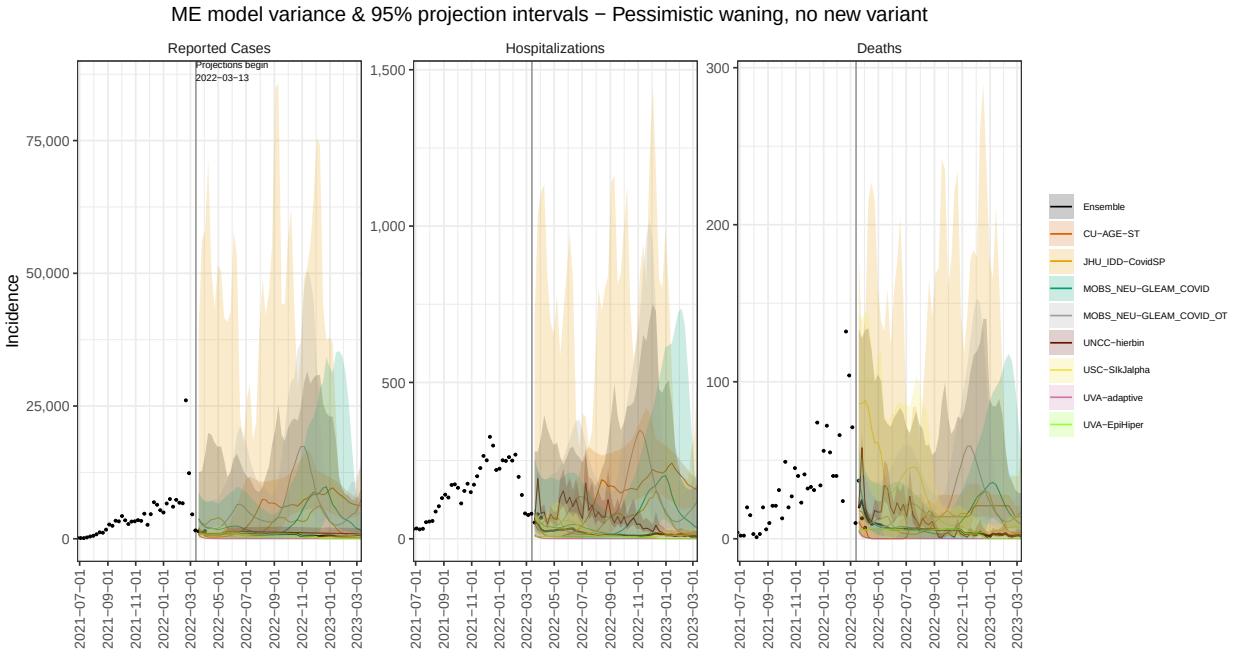

IN model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

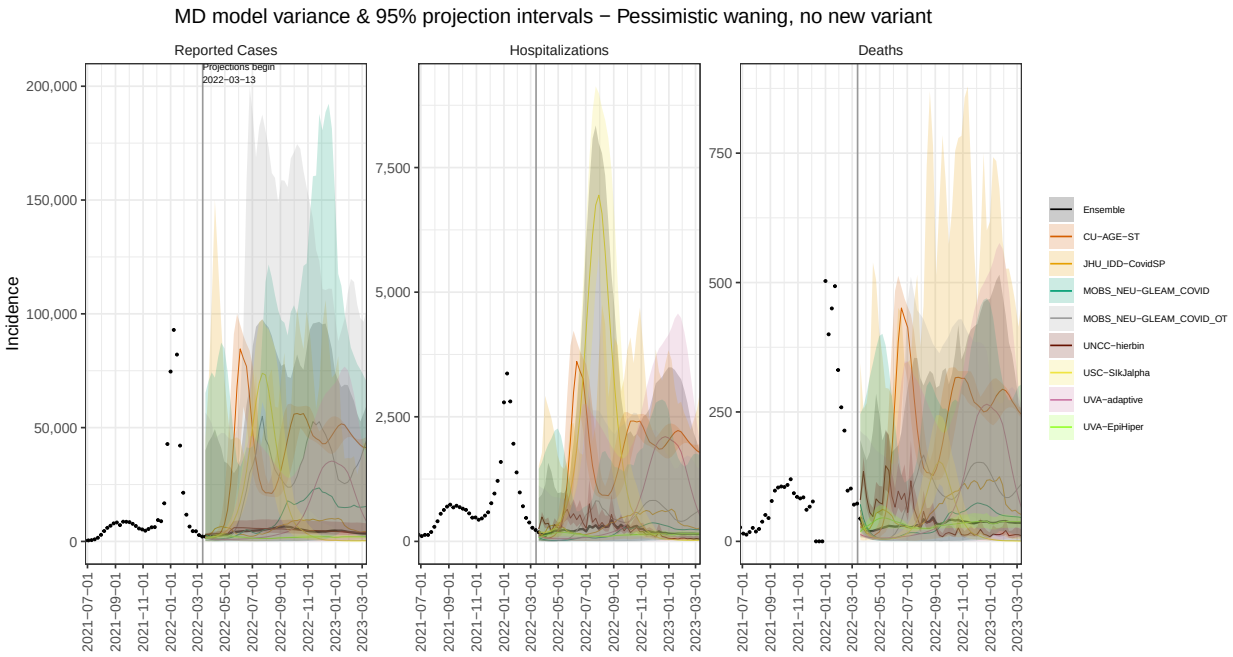

IA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

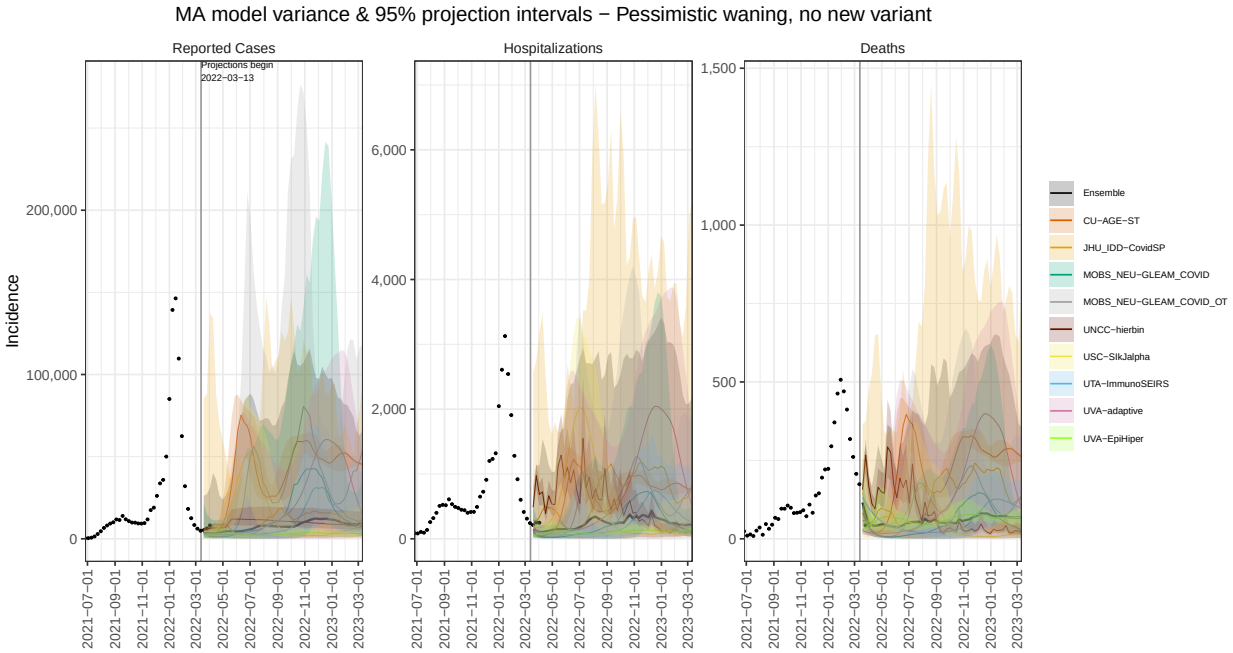

KS model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

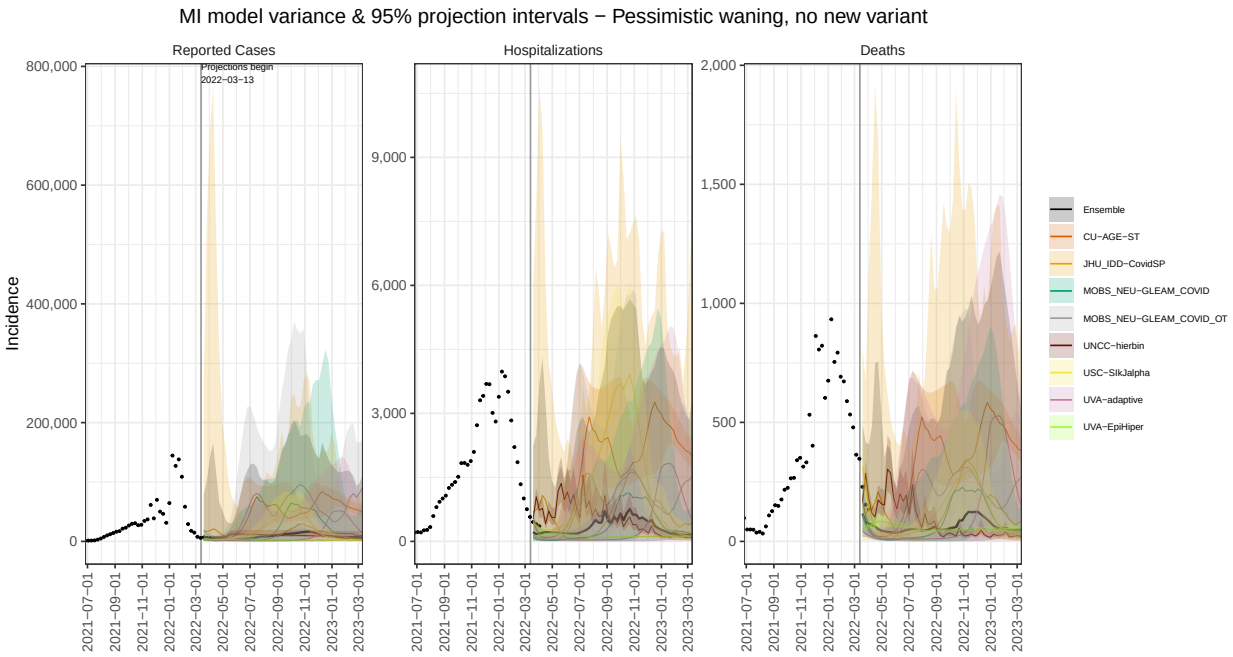

KY model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

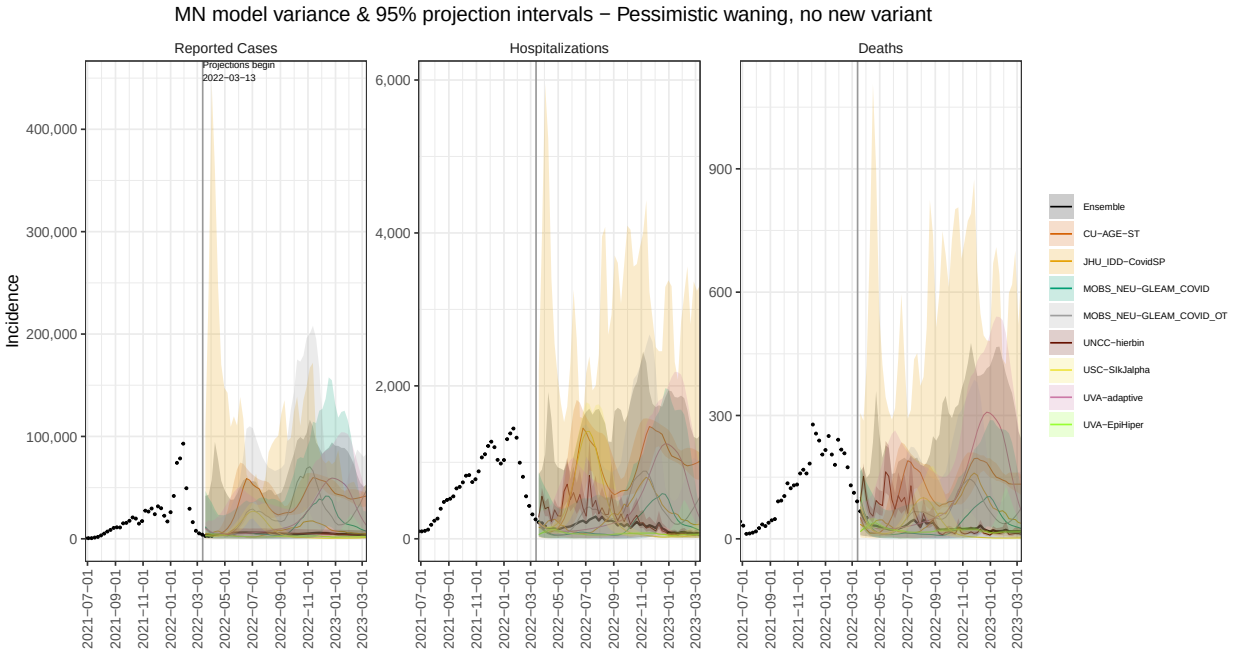

LA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

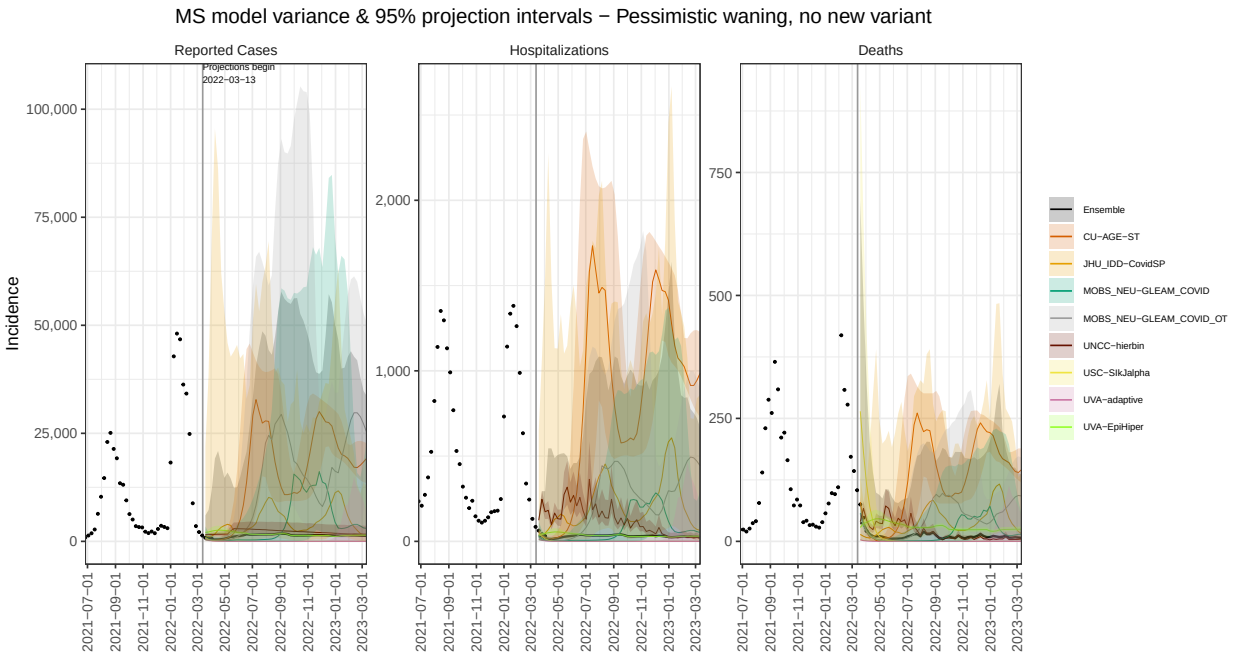

ME model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

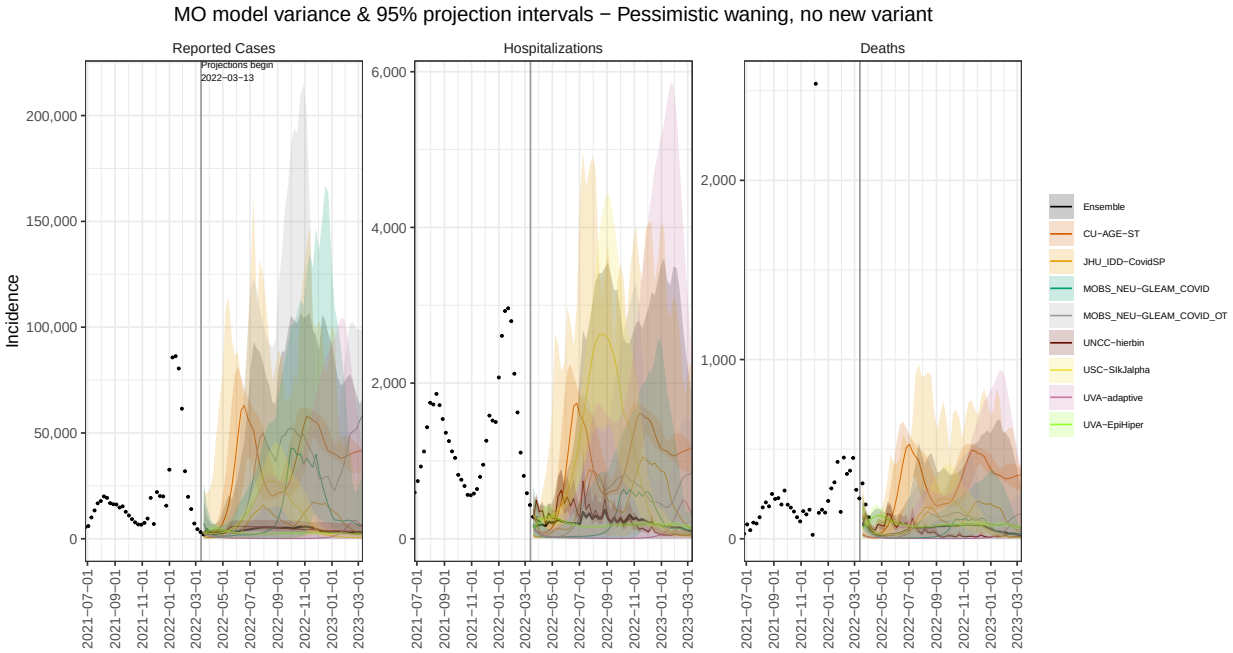

MD model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

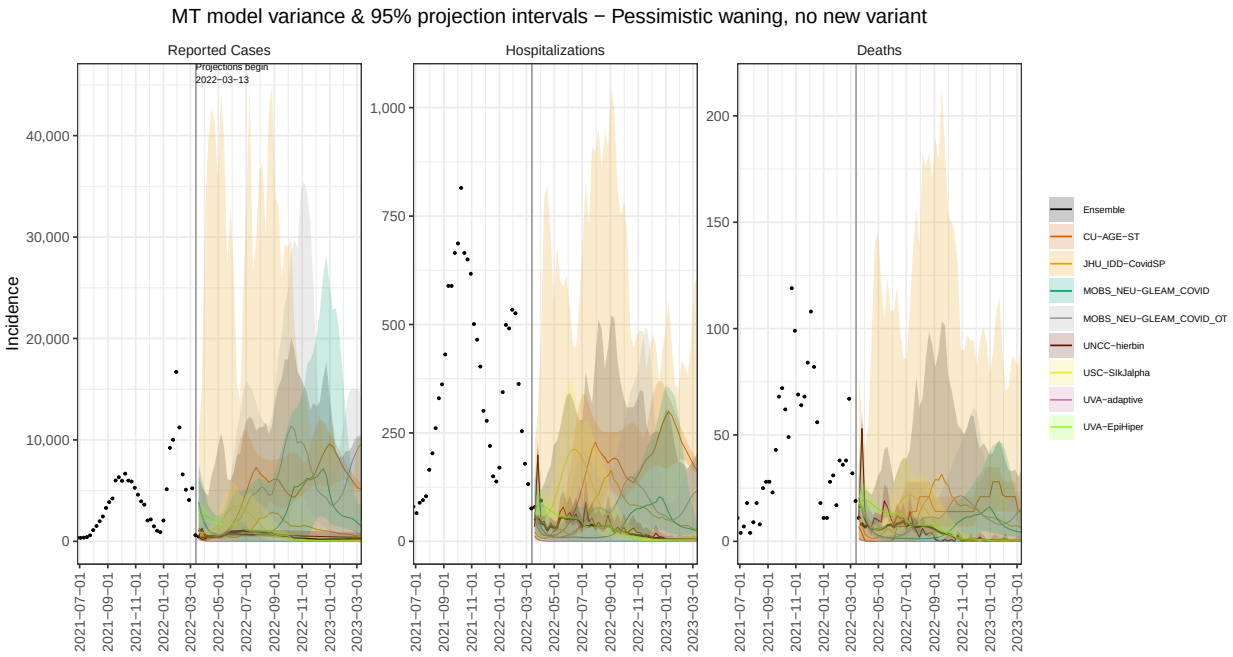

MA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

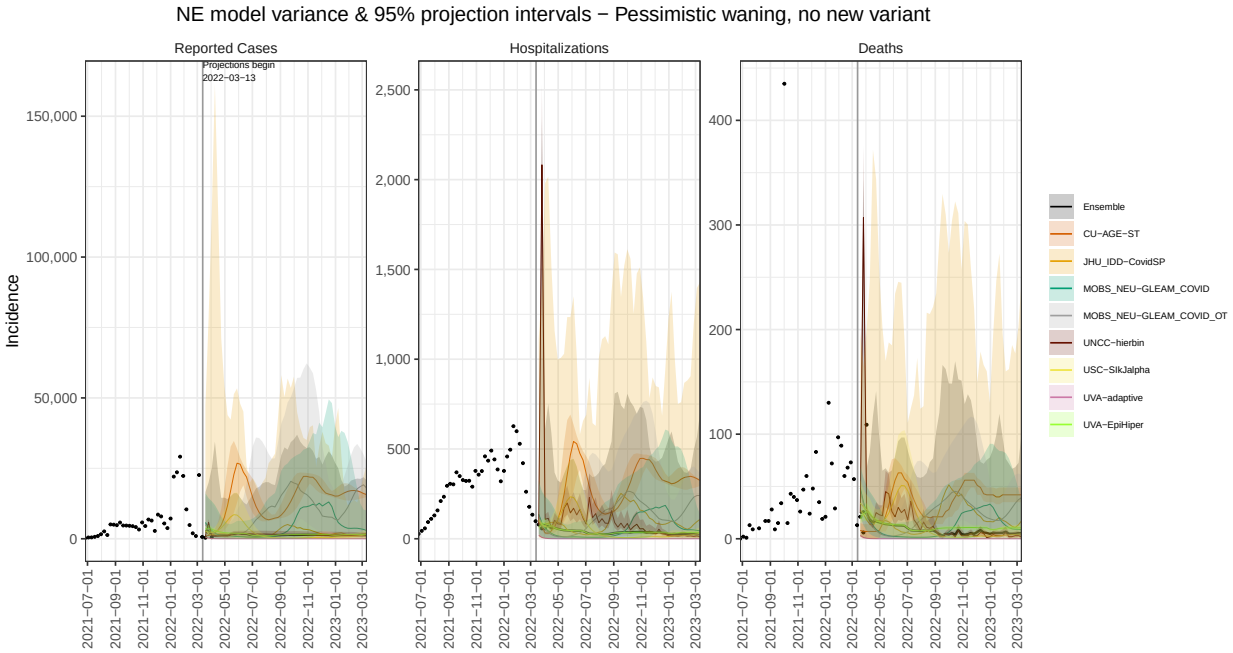

MI model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

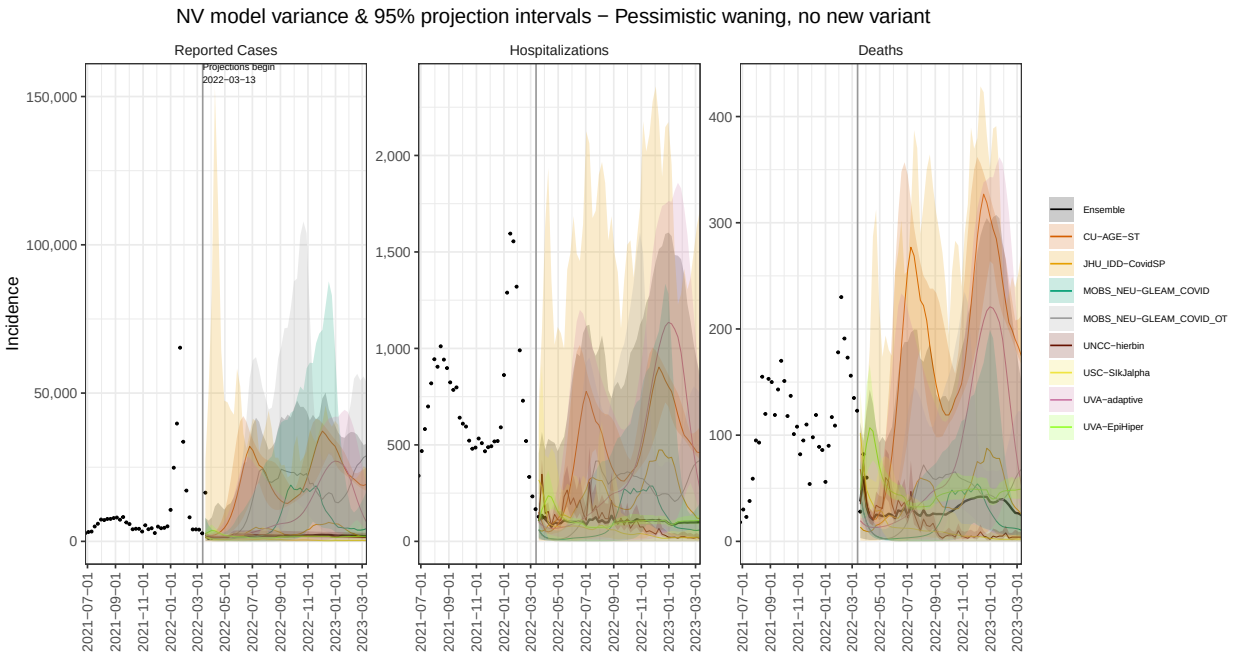

MN model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

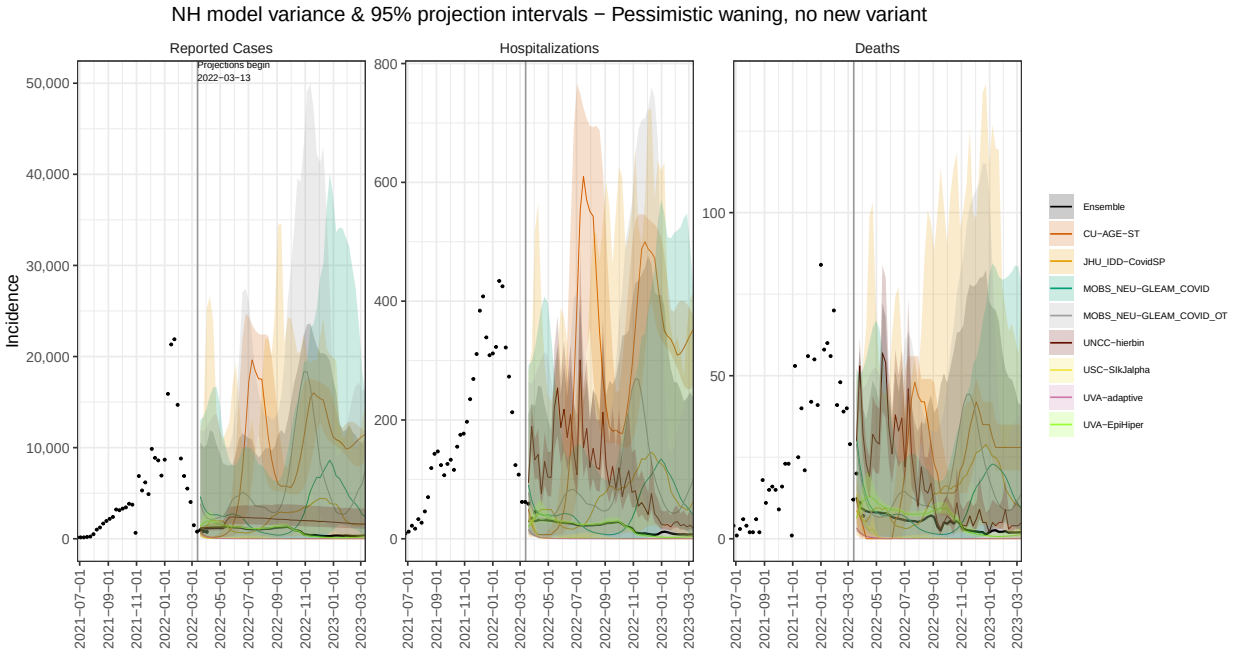

MS model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

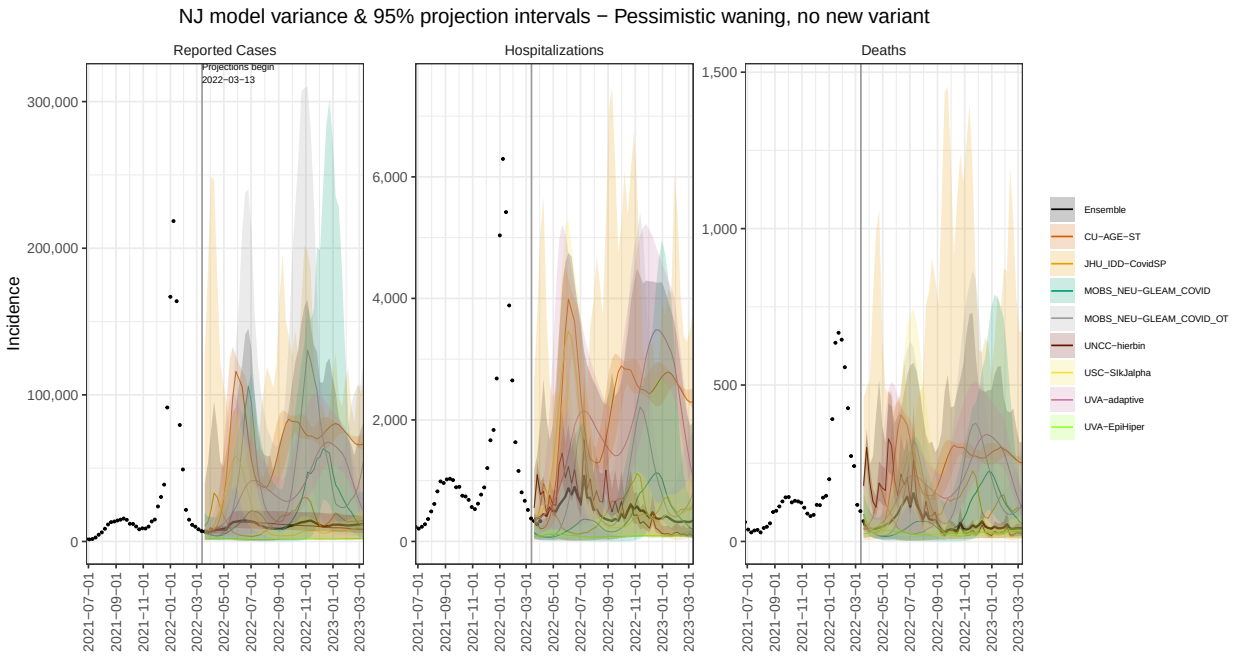

MO model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

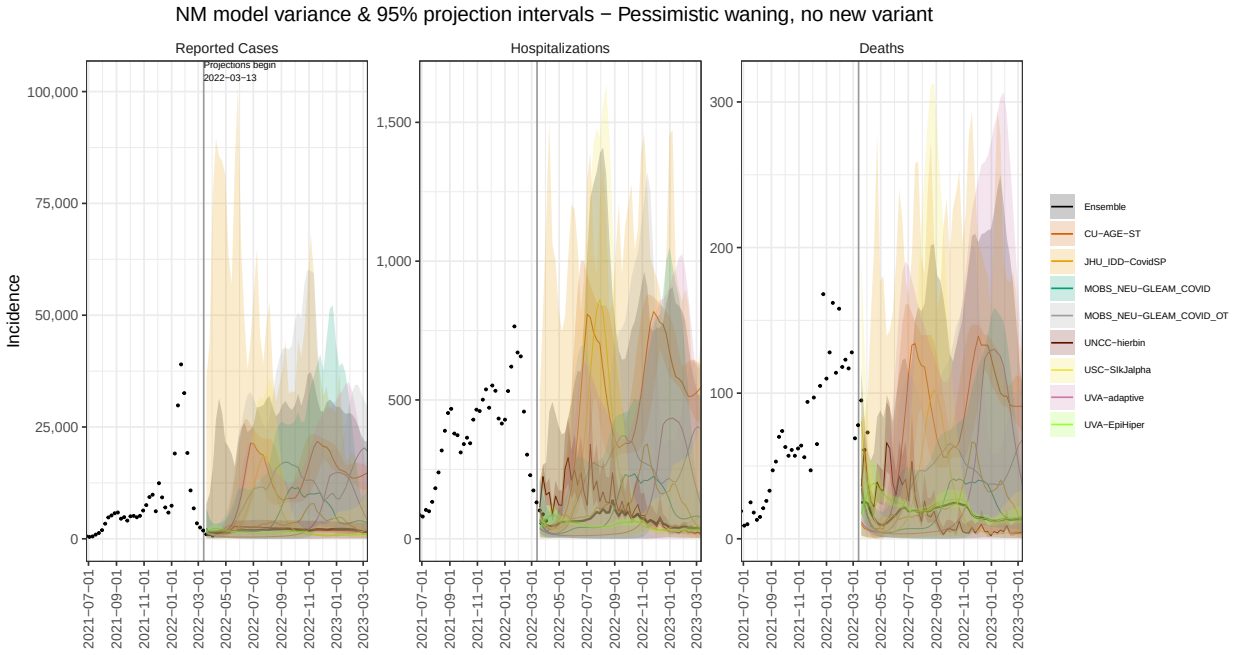

MT model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

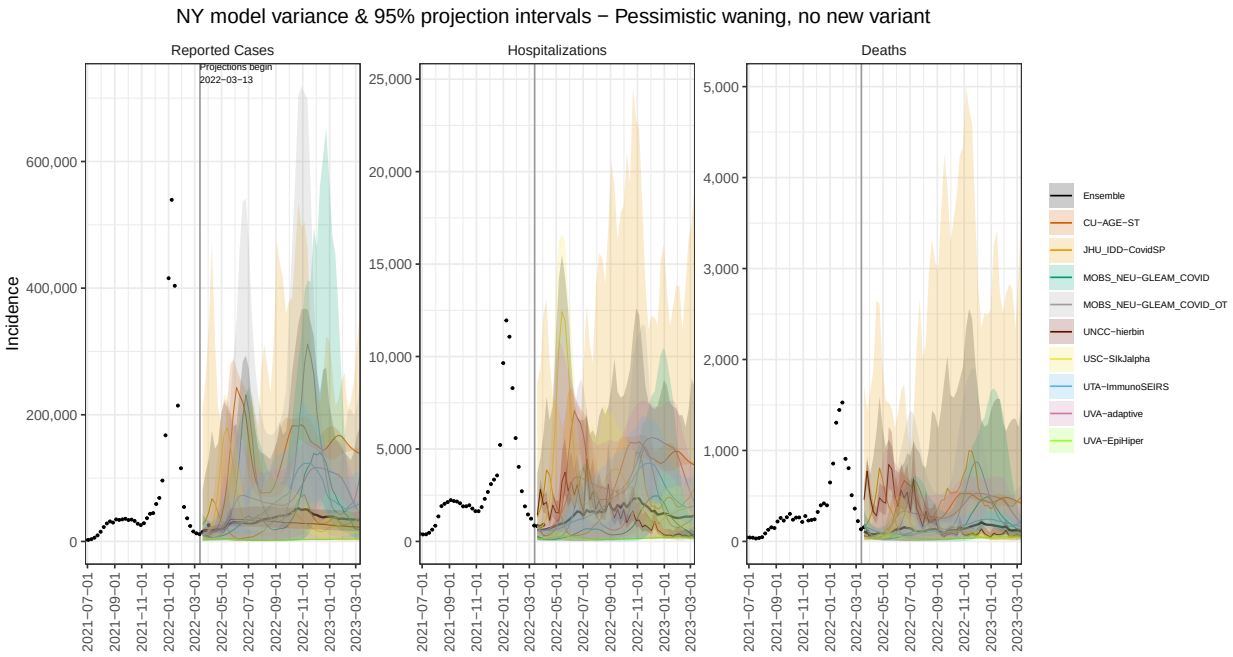

NE model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

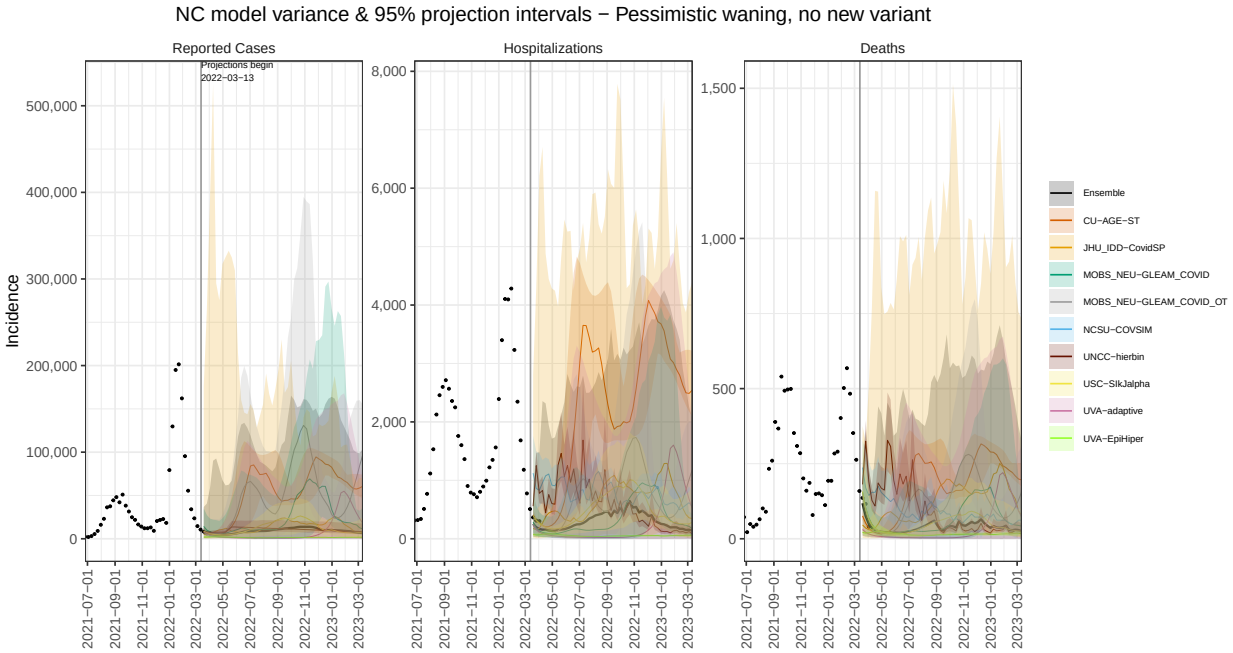

NV model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

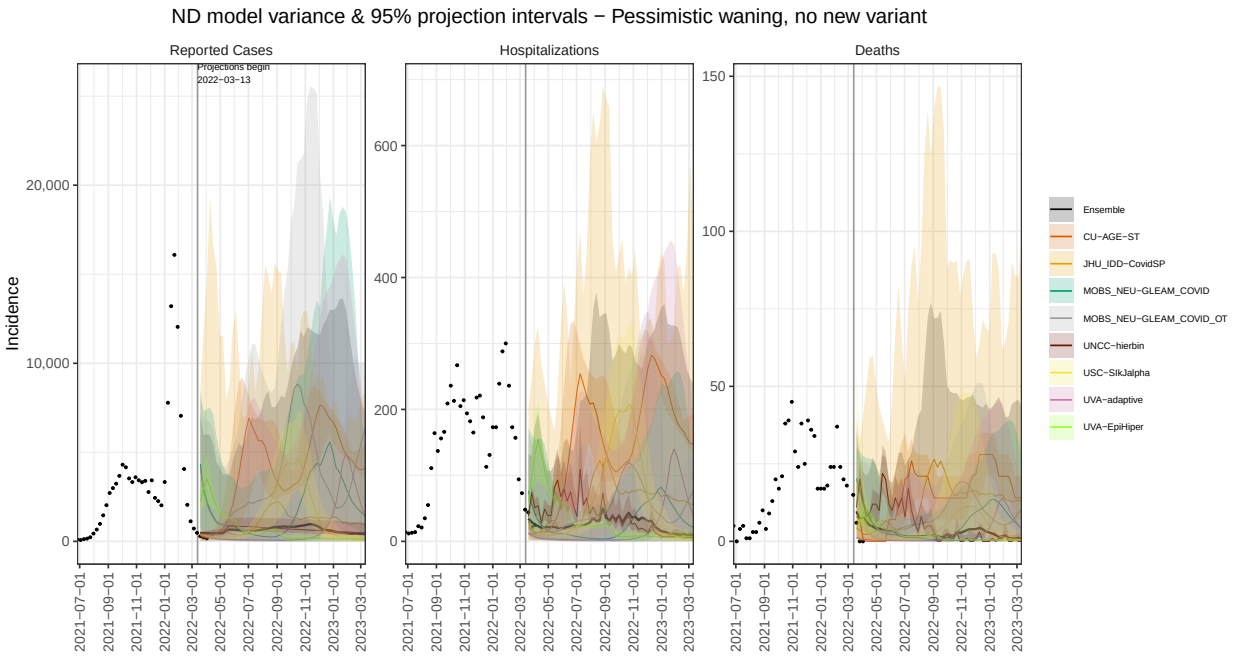

NH model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

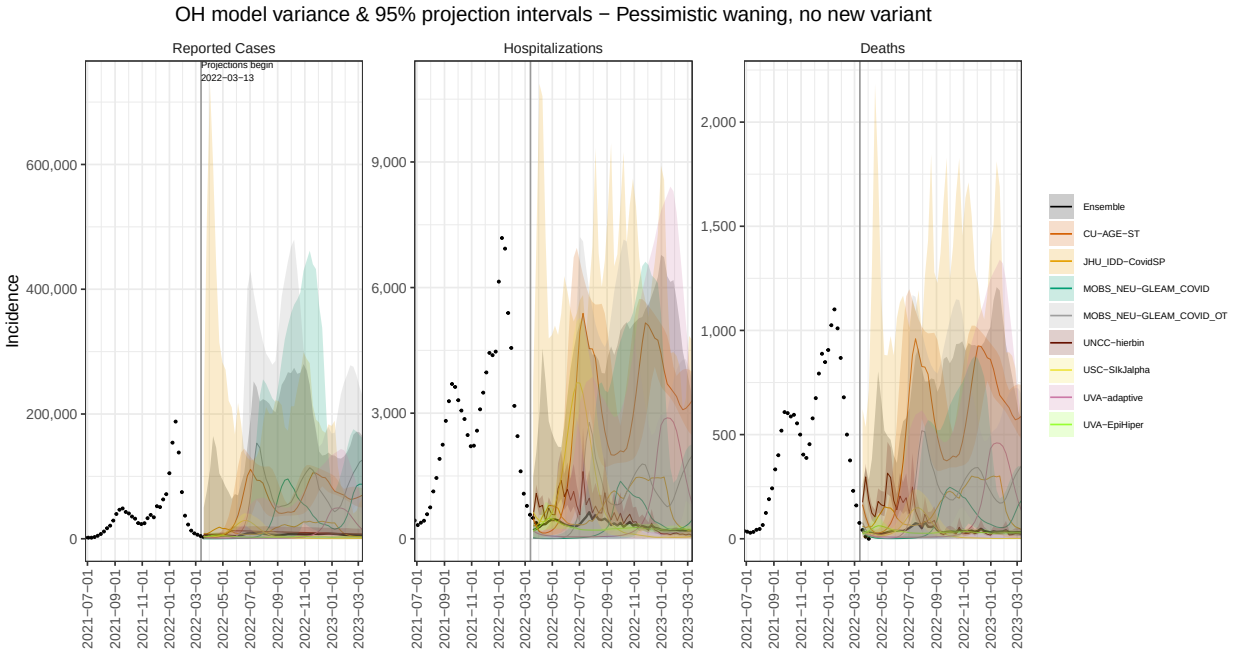

NJ model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

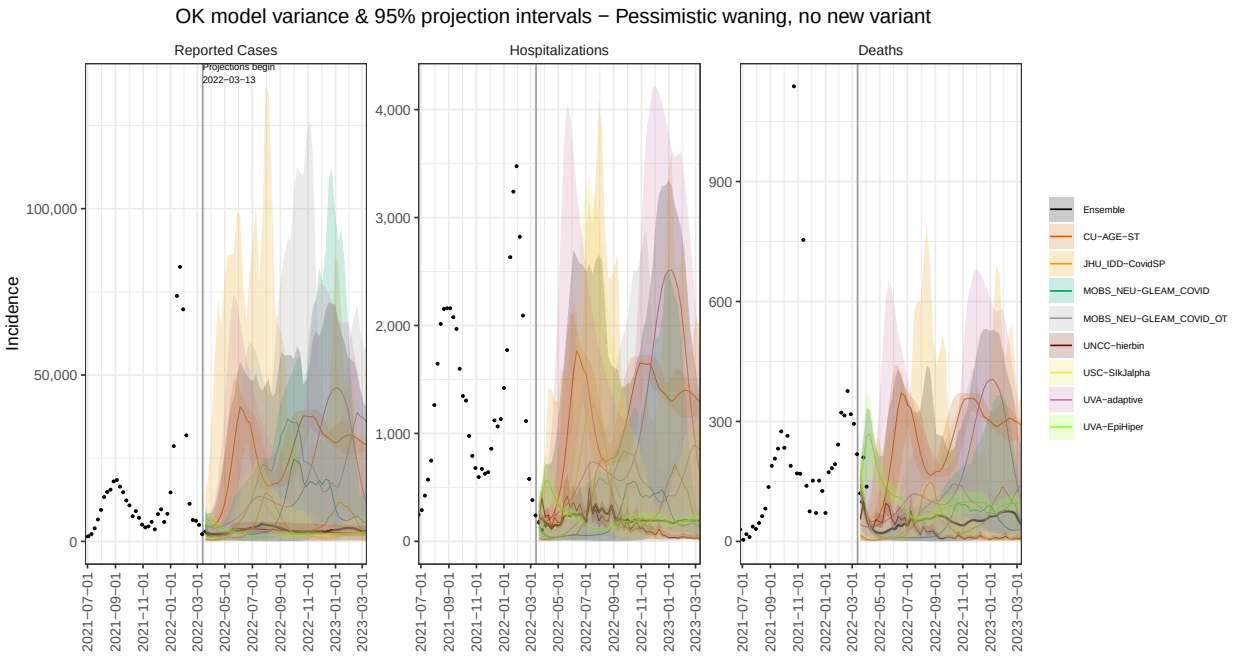

NM model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

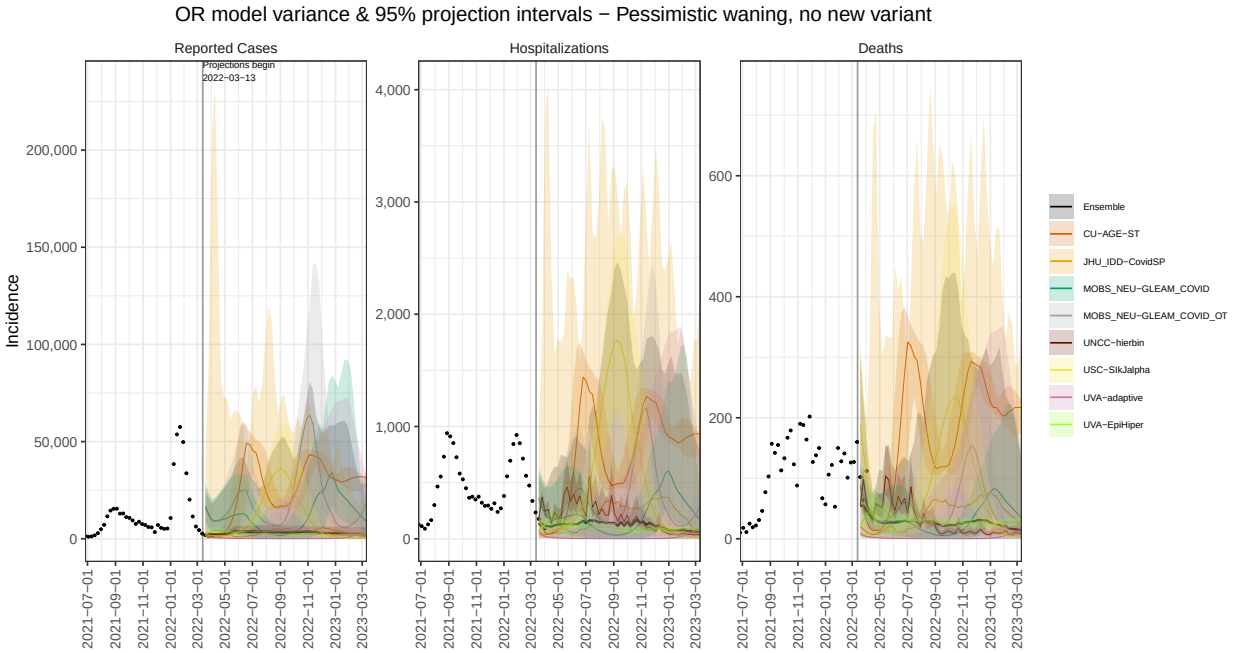

NY model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

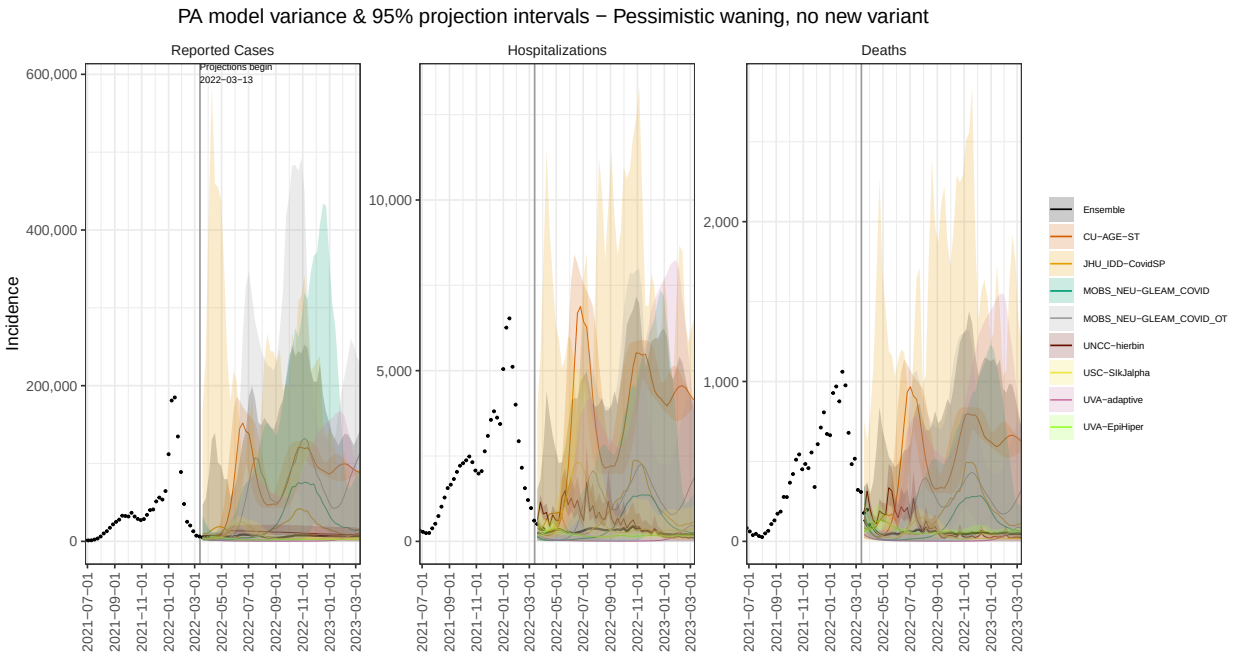

NC model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
NCSU−COVSIM
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

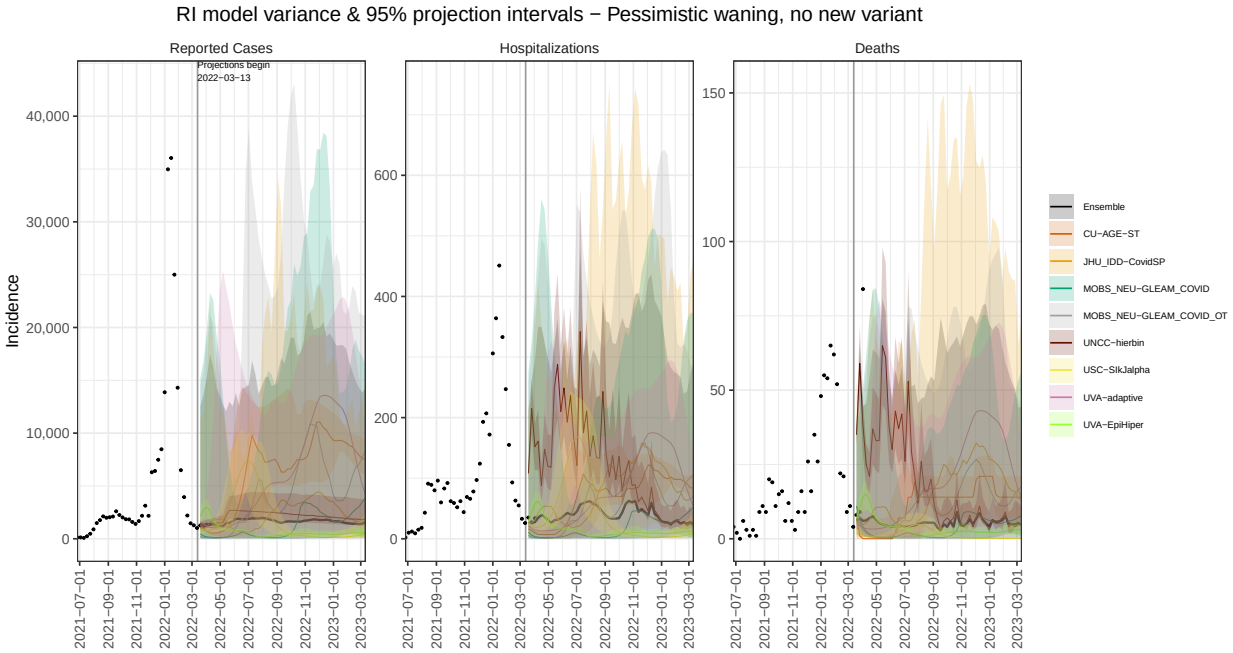

ND model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

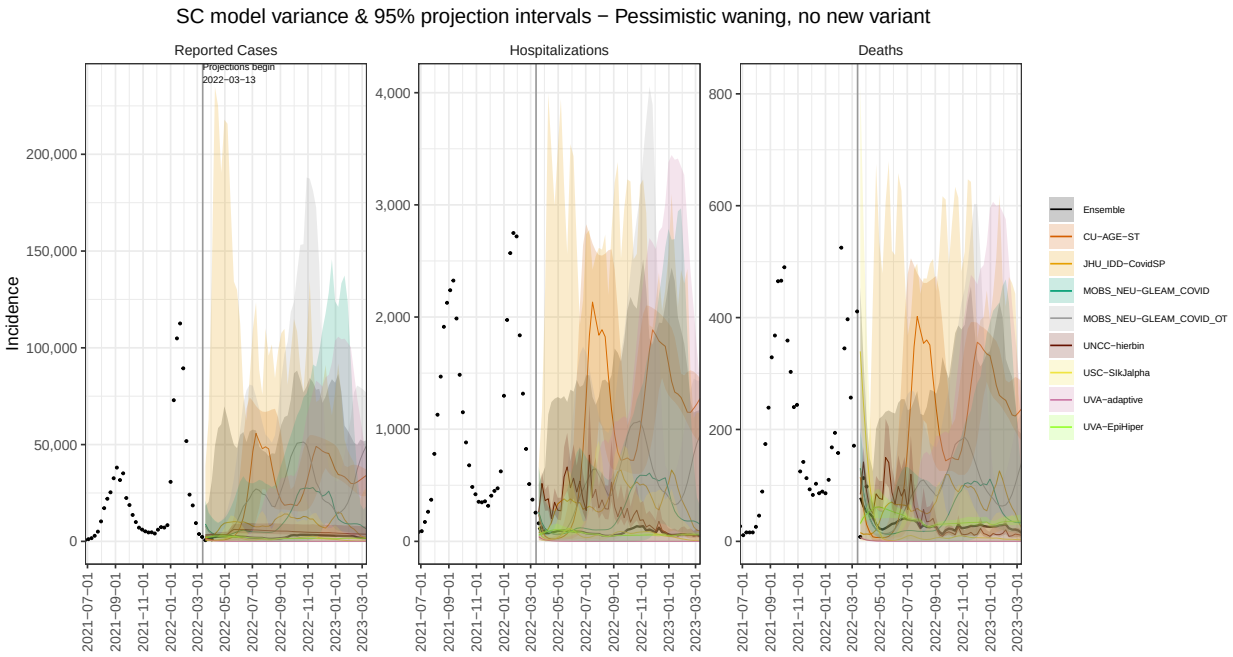

OH model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

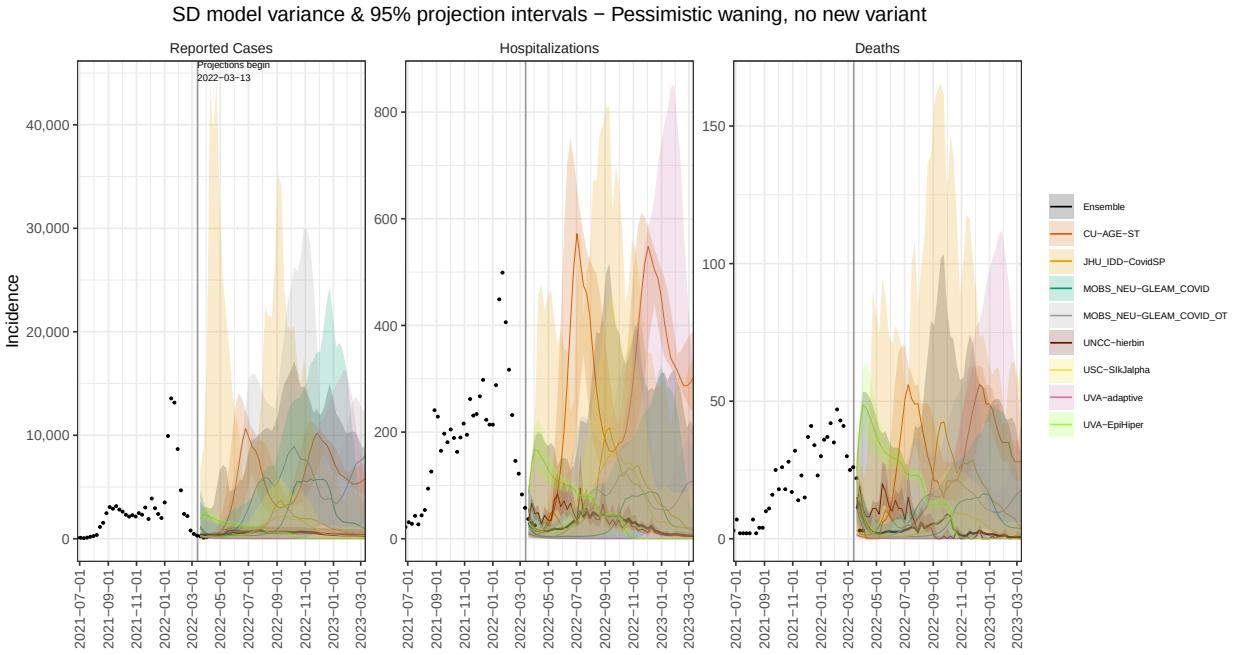

OK model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

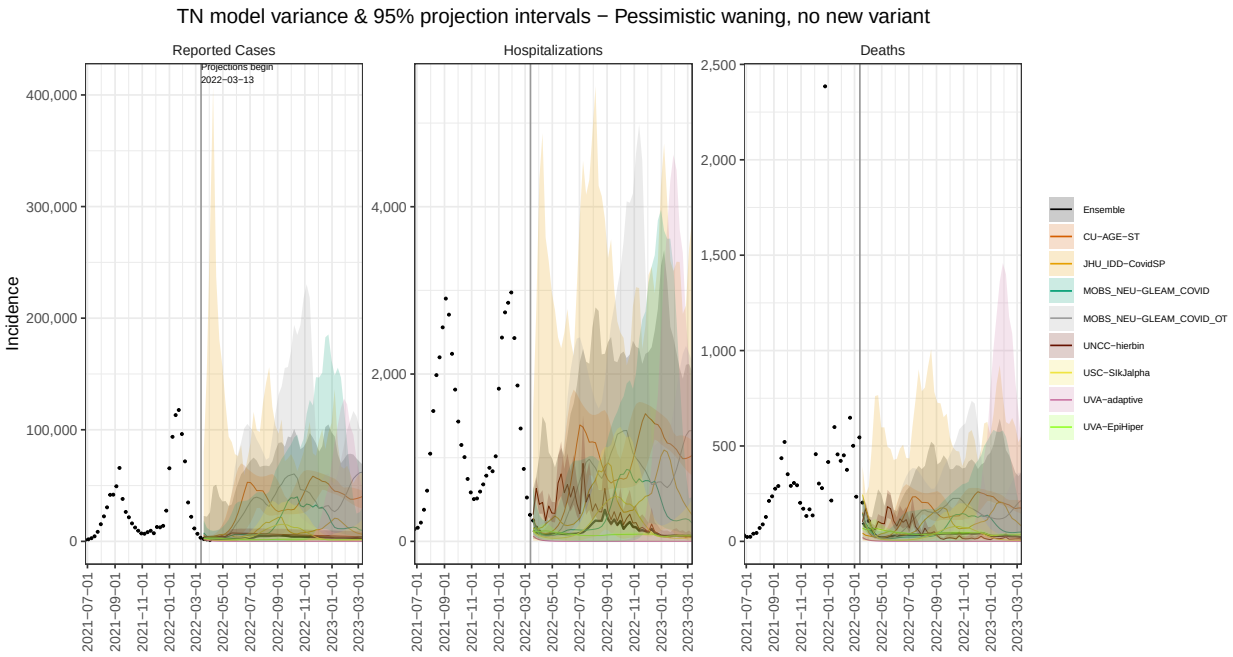

OR model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

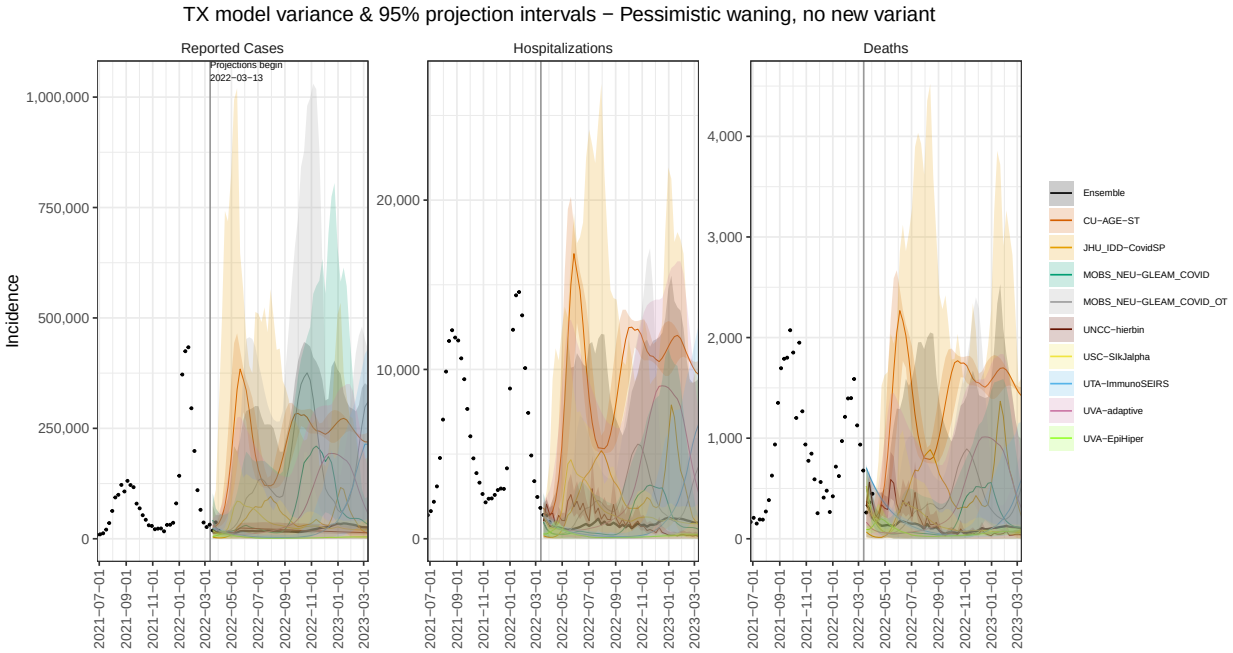

PA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

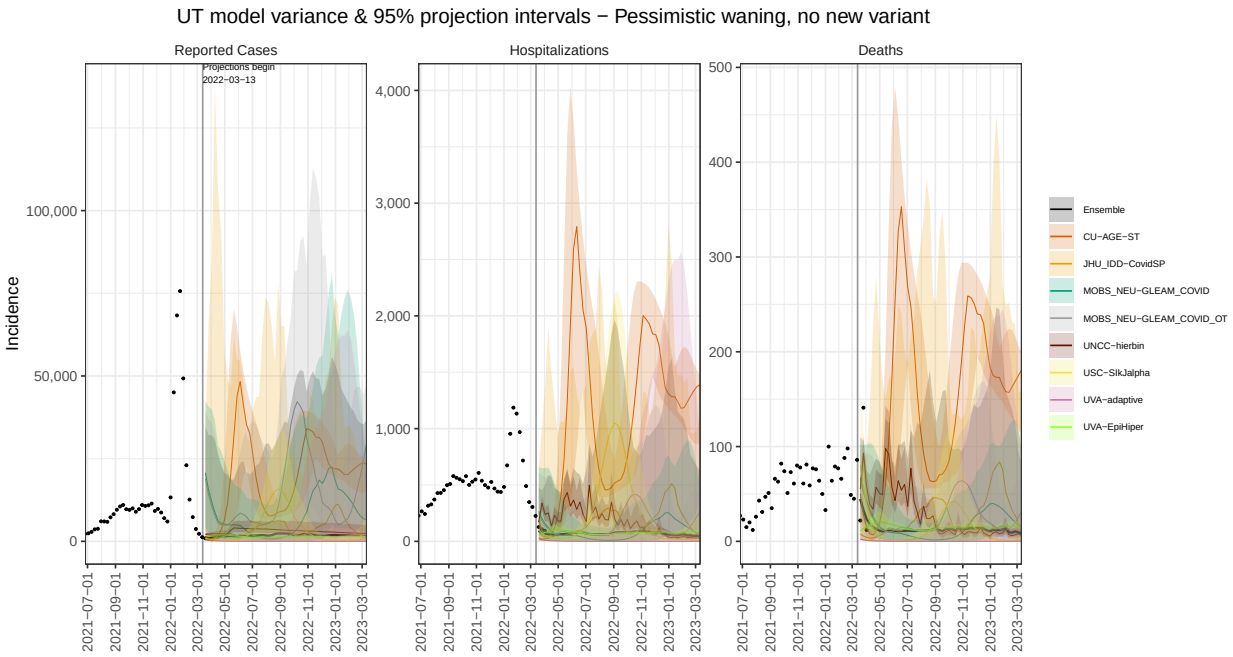

RI model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

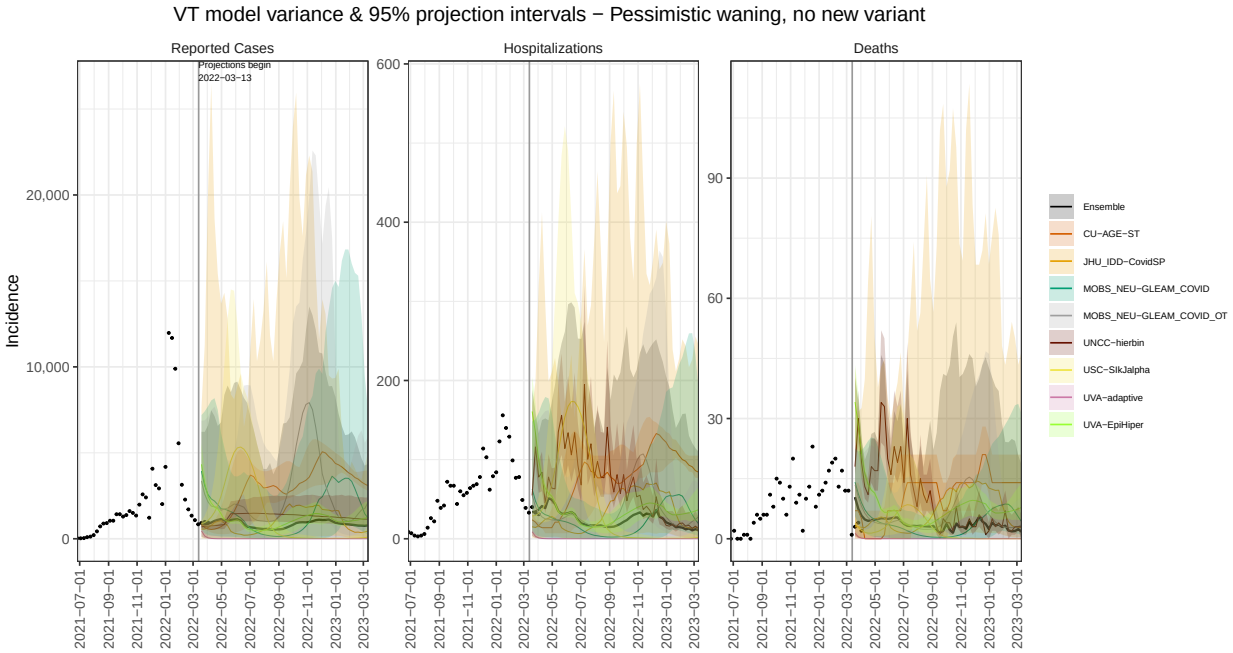

SC model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

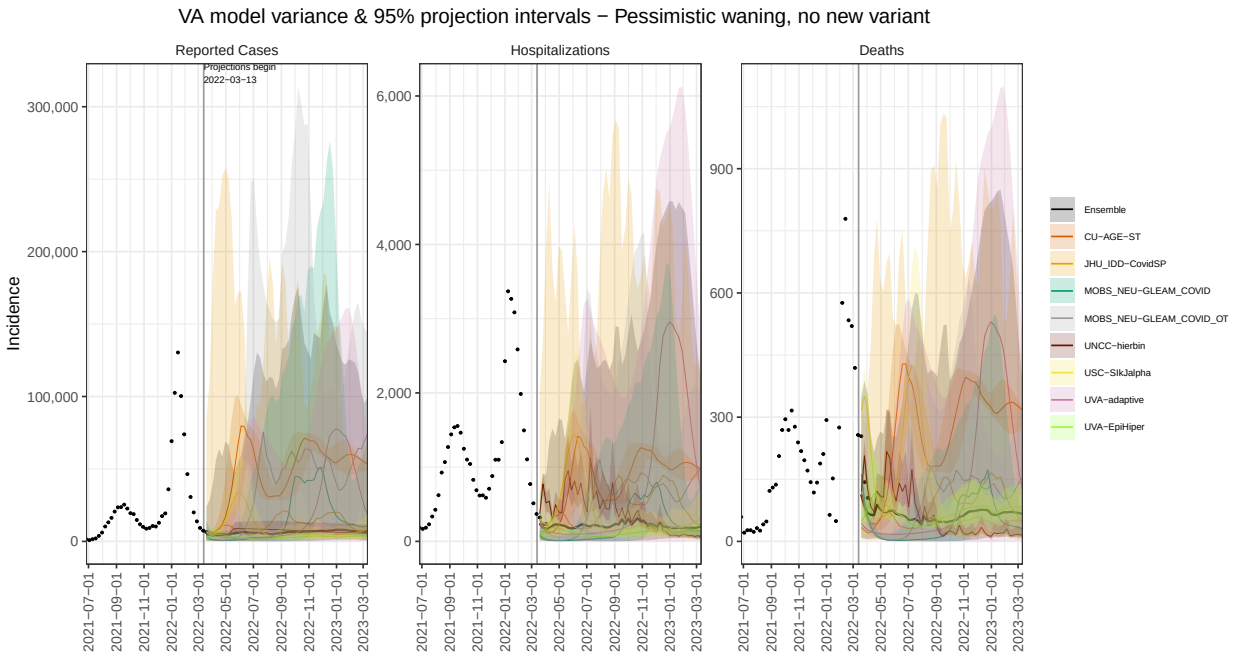

SD model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

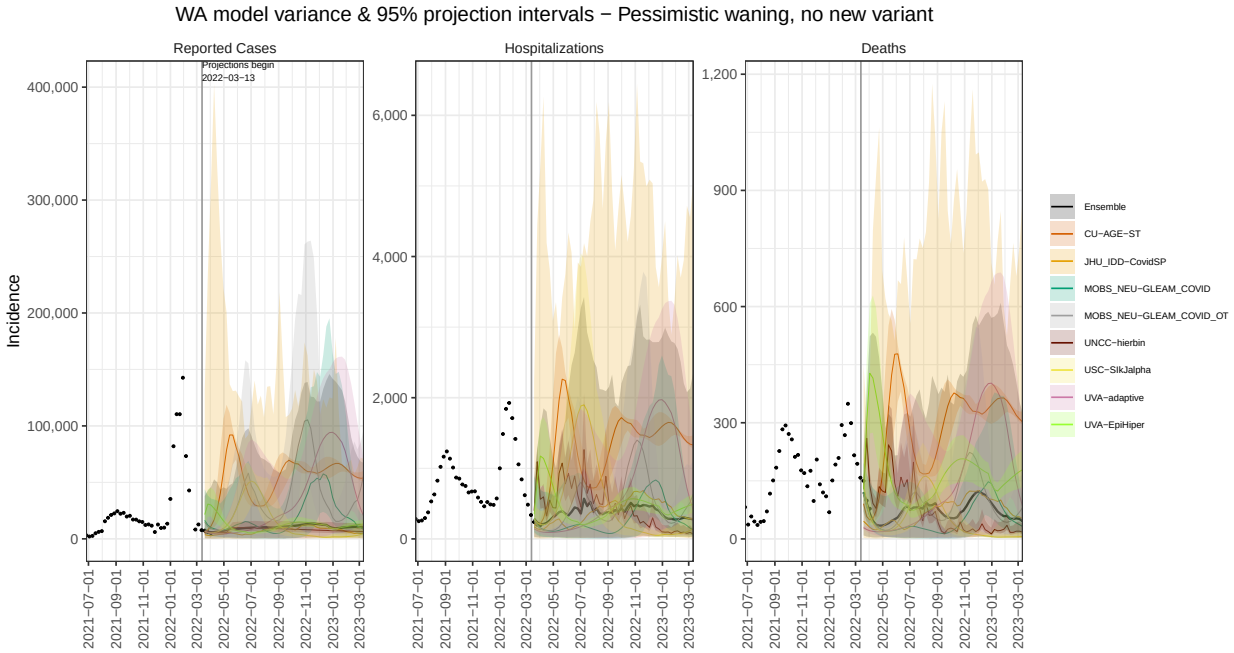

TN model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

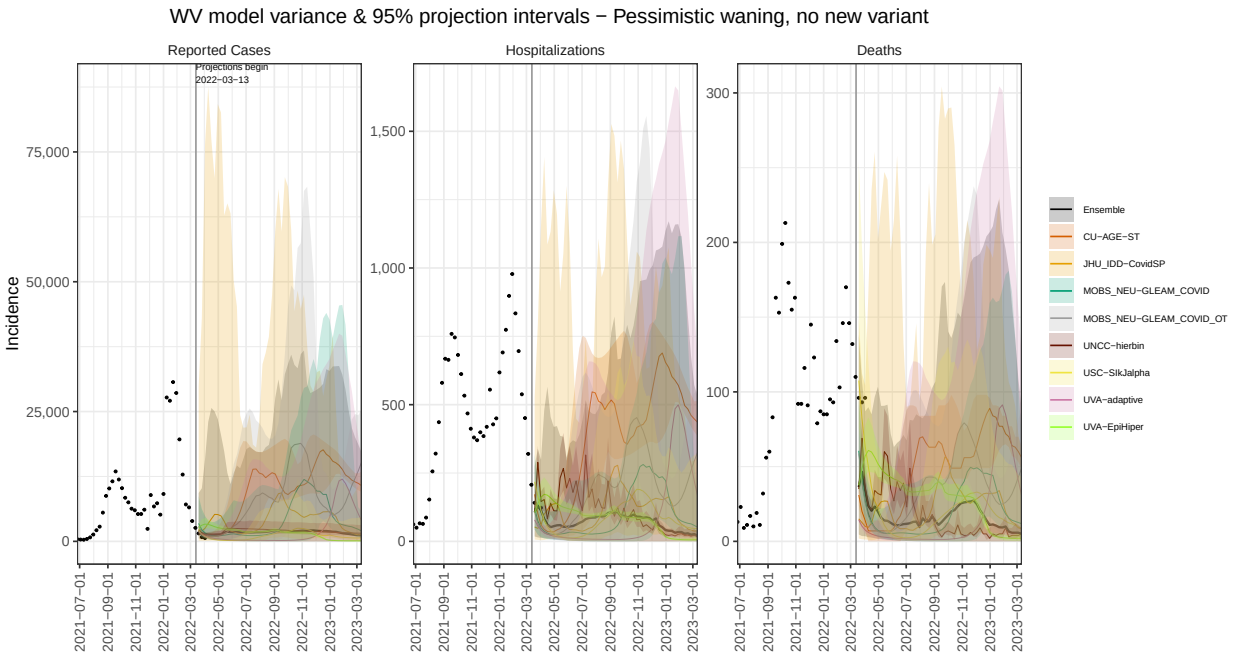

TX model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UTA−ImmunoSEIRS
UVA−adaptive
UVA−EpiHiper

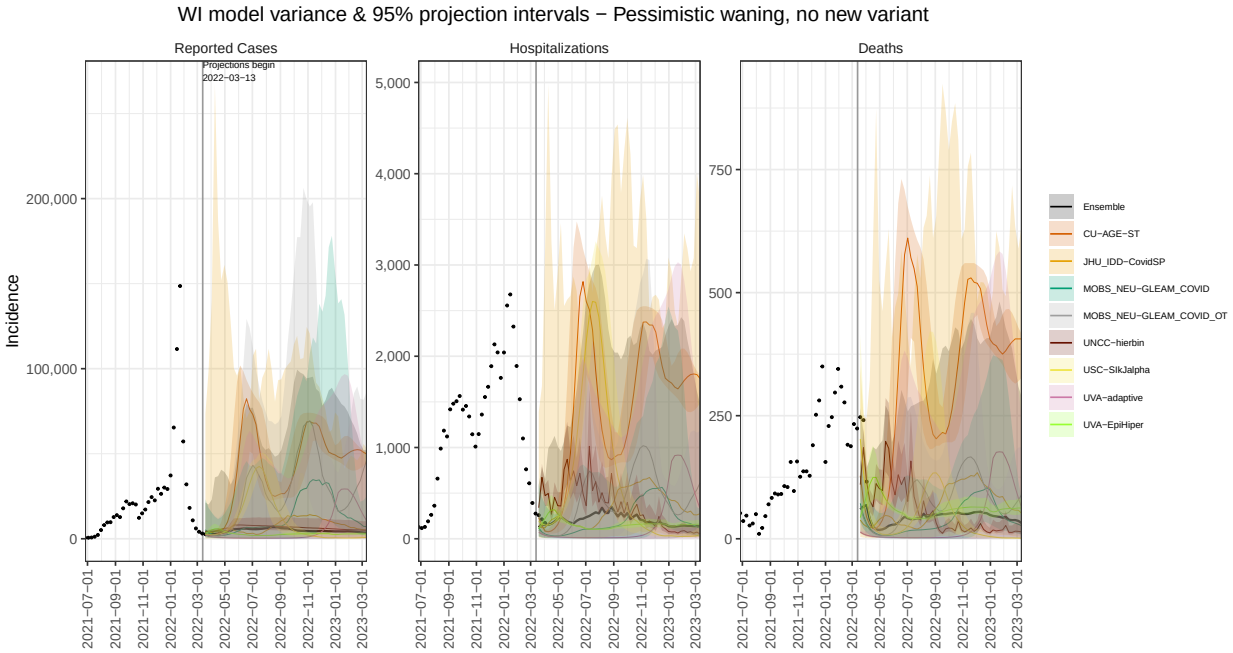

UT model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

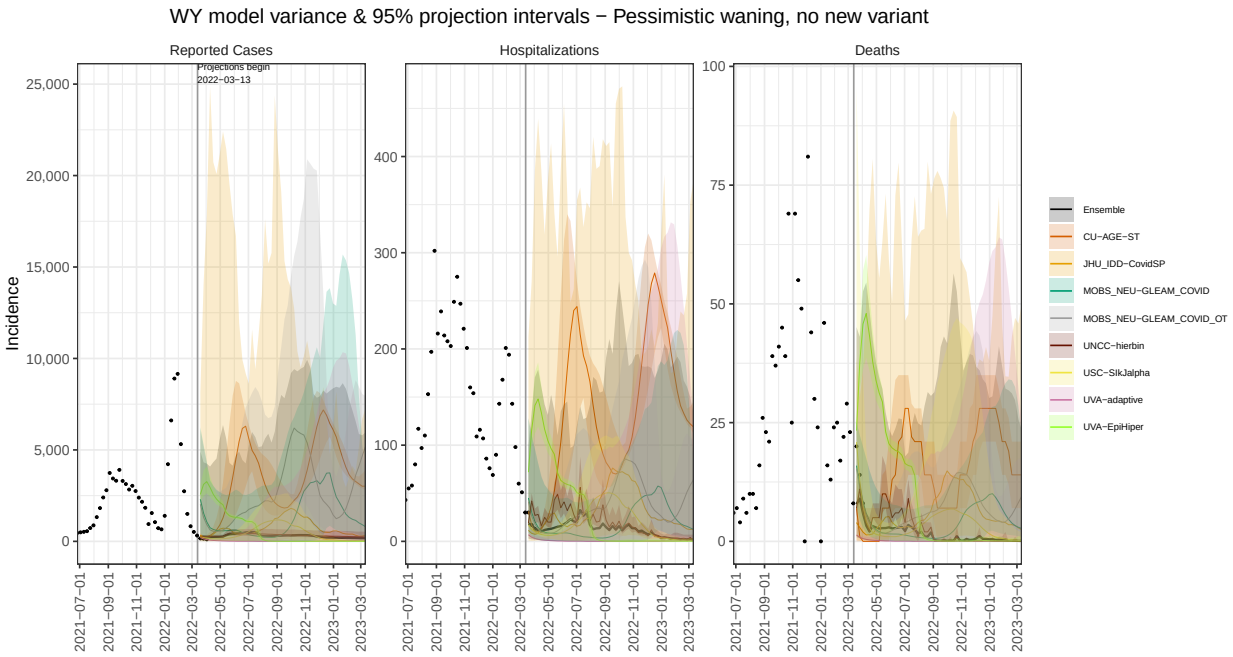

VT model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

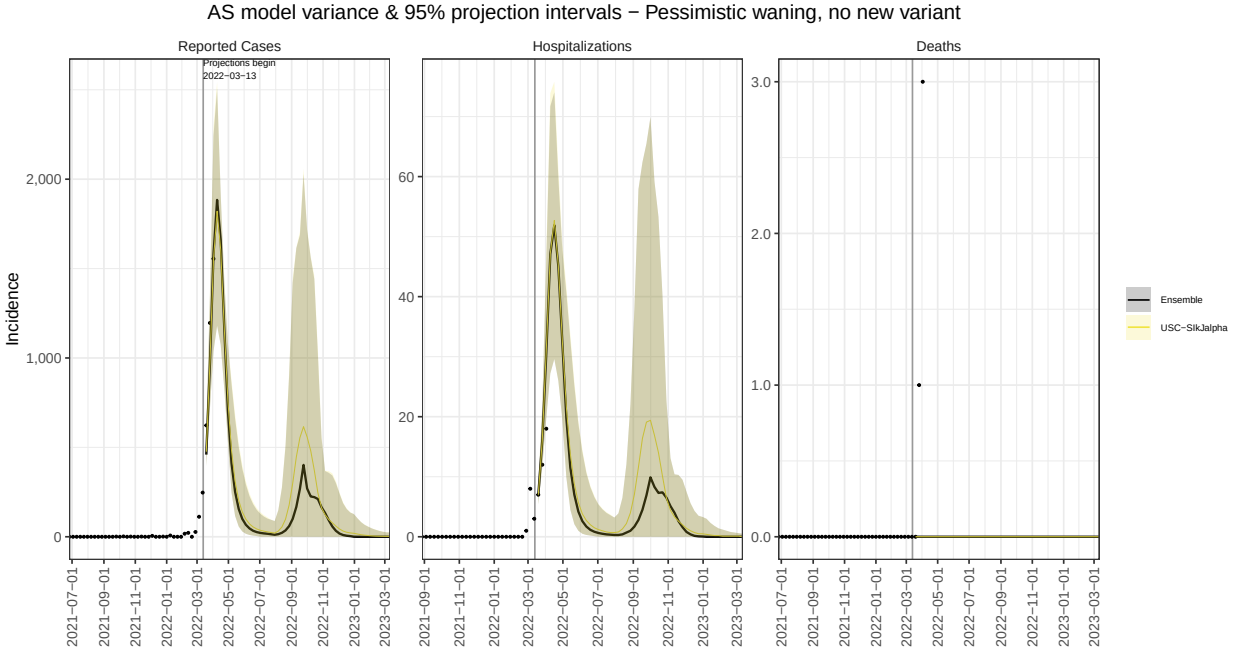

VA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


WA model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

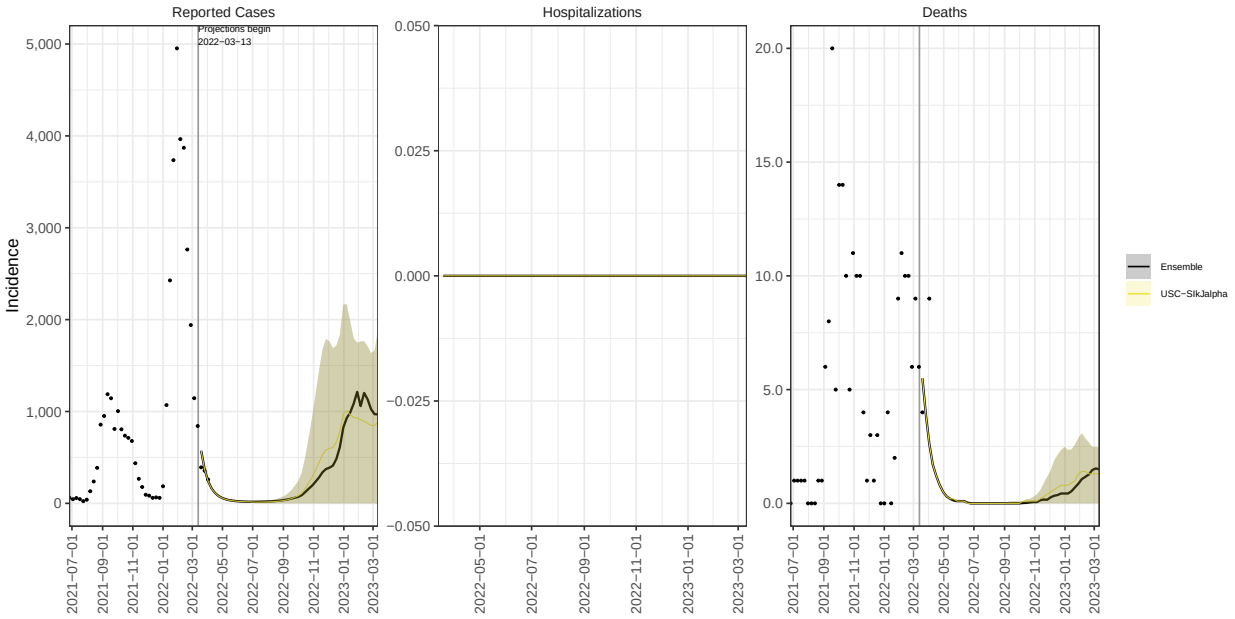

WV model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper


WI model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

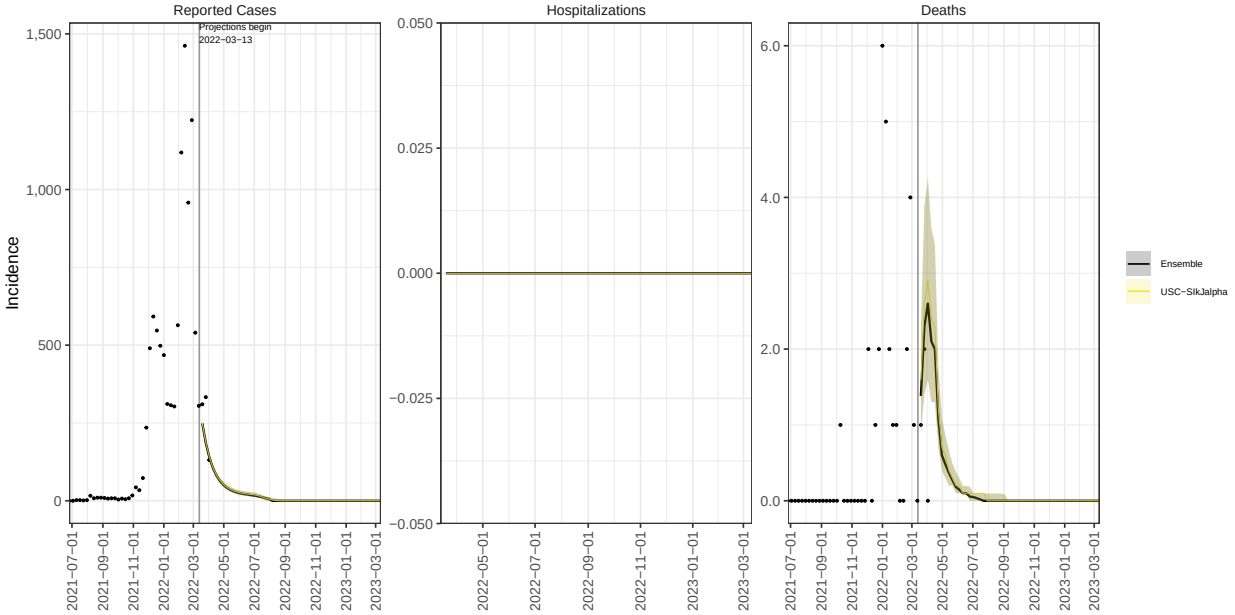

WY model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
CU−AGE−ST
JHU_IDD−CovidSP
MOBS_NEU−GLEAM_COVID
MOBS_NEU−GLEAM_COVID_OT
UNCC−hierbin
USC−SIkJalpha
UVA−adaptive
UVA−EpiHiper

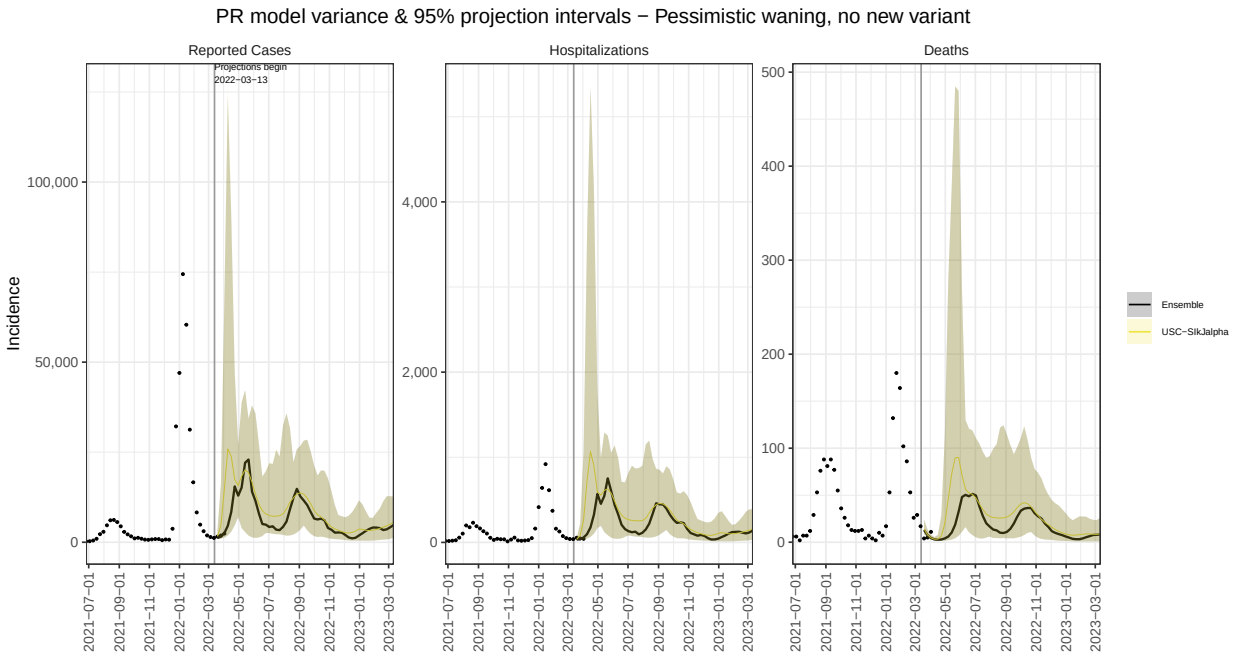

AS model variance & 95% projection intervals − Pessimistic waning, no new variant
Reported Cases
Hospitalizations
Deaths
Projections begin
2022−03−13
Incidence
Ensemble
USC−SIkJalpha

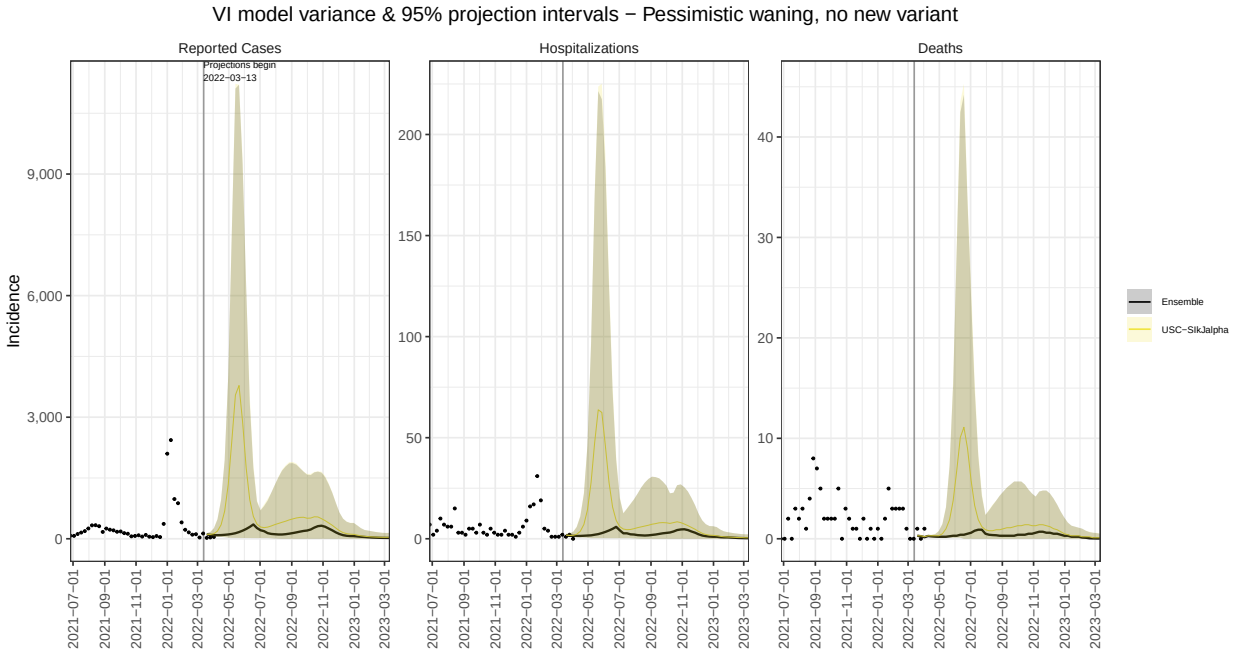
GU model variance & 95% projection intervals − Pessimistic waning, no new variant



MP model variance & 95% projection intervals − Pessimistic waning, no new variant







Teams and models

- Columbia University - Age-Stratified Model
  - Marta Galanti (CU), Teresa Yamana (CU), Sen Pei (CU), Jeffrey Shaman (CU)
- Johns Hopkins ID Dynamics COVID-19 Working Group — COVID Scenario Pipeline
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(Johns Hopkins Infectious Disease Dynamics, University of North Carolina at Chapel Hill), Claire P. Smith (Johns Hopkins Infectious Disease Dynamics), Shaun Truelove (Johns Hopkins Infectious Disease Dynamics)

- North Carolina State University - COVSIM
  - Erik Rosenstrom (North Carolina State University), Jessica Mele (North Carolina State University), Julie Swann (North Carolina State University), Julie Ivy (North Carolina State University), Maria Mayorga (North Carolina State University)
- Northeastern University MOBS Lab — GLEAM COVID
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- University of North Carolina at Charlotte - UNCC-hierbin
  - Shi Chen (UNCC Dept. of Public Health Sciences & School of Data Science), Rajib Paul (UNCC Dept. of Public Health Sciences and School of Data Science), Daniel Janies (UNCC Dept. of Bioinformatics and Genomics), Jean-Claude Thill (UNCC Dept. of Geography and Earth Sciences and School of Data Science)
- University of Southern California — SI kJalpha
  - Ajitesh Srivastava, University of Southern California
- University of Texas at Austin - ImmunoSEIRS
  - Anass Bouchnita (Lead modeler, University of Texas at Austin), Spencer Fox (University of Texas at Austin), Michael Lachmann (University of Texas at Austin), Lauren Ancel Meyers (Senior author, University of Texas at Austin), and the UT COVID-19 Modeling Consortium
- University of Virginia — adaptive
  - Przemyslaw Porebski (UVA), Srini Venkatramanan (UVA), Anniruddha Adiga (UVA), Bryan Lewis (UVA), Brian Klahn (UVA), Joseph Outten (UVA), James Schlitt (UVA), Patric Corbett (UVA), Pyrros Alexander Telionis (UVA), Lijing Wang (UVA), Akhil Sai Peddireddy (UVA), Benjamin Hurt (UVA), Jiangzhou Chen (UVA), Anil Vullikanti (UVA), Madhav Marathe (UVA)
- University of Virginia - EpiHiper
  - Jiangzhuo Chen (UVA), Stefan Hoops (UVA), Parantapa Bhattacharya (UVA), Dustin Machi (UVA), Bryan Lewis (UVA), Madhav Marathe (UVA)

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- Justin Lessler, University of North Carolina, Chapel Hill
- Katriona Shea, Penn State University
- Cécile Viboud, NIH Fogarty
- Shaun Truelove, Johns Hopkins University
- Rebecca Borchering, Penn State University
- Claire Smith, Johns Hopkins University
- Emily Howerton, Penn State University

- Nick Reich, University of Massachusetts at Amherst
- Harry Hochheiser, University of Pittsburgh
- Michael Runge, USGS
- Lucie Contamin, University of Pittsburgh
- John Levander, University of Pittsburgh
- Jessica Kerr, University of Pittsburgh