RSV Scenario Modeling Hub Report

17 December, 2024
Scenario Modeling Hub Team[1]

Key Takeaways

Full scenario specifications can be found here.

The RSV Scenario Modeling Hub has generated early season hospitalization estimates for the 2024-25 season over a 45-week period running from July 28, 2024 to June 7, 2025. Four intervention scenarios were considered, representing the impact of maternal vaccines, long-acting monoclonal antibodies for infants (nirsevimab), and senior vaccines, in conjunction with a counterfactual scenario where these new interventions were not implemented. Intervention scenarios assumed different timings of infant interventions (classic timing following current recommendations, with a campaign starting in September for maternal vaccines and in October for nirsevimab, compared to early timing where immunizations start 1.5 months earlier), combined with optimistic and pessimistic assumptions about waning of vaccine-induced immunity in seniors aged 60 years and older. Intervention coverage and effectiveness were the same for all scenarios and were based on recent real-world data and projections of uptake. Ensemble projections are based on contributions from 12 teams using the trimmed linear opinion pool aggregation approach. All-age and age-specific estimates of RSV hospitalizations are provided nationally and for the 12 states that contribute to multi-year RSV-NET surveillance.

Our main findings include:

- On a national scale, and compared to the counterfactual, we project that 17% (95% Confidence Interval [CI]: 15-18%) of seasonal RSV hospitalizations, or 29,300 (95% CI: 23,200–35,500) hospitalizations, will be averted in the scenario with slow vaccine waning in seniors and early timing of infant interventions (scenario A), compared to non-intervention scenario (scenario E). Intervention benefits are projected to be highest in the targeted age groups, with hospitalization reduction of 31% (95% CI: 24-38%) among infants and 22% (95% CI: 19-25%) among seniors for scenario A vs E.
- These results correspond to 0.56 (95% CI: 0.42-0.71) infant hospitalizations averted per 100 infants receiving immunization during the 2024-25 season (i.e., via maternal vaccines and nirsevimab) in the most optimistic scenario (scenario A). For seniors, it corresponds to 0.07 (95% CI: 0.05-0.09) senior hospitalization averted per 100 senior vaccine doses administered across the 2023-2024 and 2024-2025 seasons.
- Assumptions about vaccine waning among seniors affect projected intervention benefits. In scenarios assuming a 50% decay in vaccine protection in the second year after vaccine receipt (i.e., VE declines from 75% in the first year to 38% in the second year, scenario B), we project that 9,500 (95% CI: 5,000-14,700) senior hospitalizations will be averted. This compares to 13,000 (95% CI: 9,100-16,800) hospitalizations averted if the vaccine maintains robust protection for two years (i.e., VE decays by only 10%, from 75% to 68%, scenario A). Further, there is a statistically significantly greater reduction in senior hospitalizations if the vaccine maintains robust protection over two years, with 7% (95% CI: 4-10%) more hospitalizations averted by scenario A (slow vaccine waning) than scenario B (fast waning).
- The timing of infant interventions has little impact on intervention benefits. For instance, we project 14,300 (95% PI: 10,600-18,100) infant hospitalizations averted if the immunization campaign starts early, compared to 13,700 (95% PI: 9,900-17,600) if the timing is as currently recommended. The number of hospitalizations averted does not significantly differ based on the timing of infant interventions, with the percent reduction in infant hospitalizations between scenarios A and C being 0% (95% CI: -6-5%).
- The peak and cumulative hospitalization burden of the 2024-25 RSV season is likely to remain lower than that of last season and this is consistent across all scenarios. On a national scale, RSV activity is most likely to peak from mid-December to mid-February, with the earliest peak expected in Southeastern States (Georgia, Tennessee) and the latest peak in Western states (Utah, Colorado, New Mexico).
- The combined hospitalization impact of RSV, influenza, and COVID-19 is likely to remain below that of last season based on the 50% projection interval (SMH COVID-19 Round 18, scenario of high immune escape and boosters for all; combined with SMH Influenza Round 1 for 2024-25, scenario of usual vaccine coverage and dominance of A/H1 or

[1] Compiled by Shaun Truelove, Sung-mok Jung, Lucie Contamin, Kaiyuan Sun, Sara Loo, and Cécile Viboud.

A/H3; and combined with SMH RSV Round 1 for 2024-25, scenario of optimistic senior waning and classic timing of infant interventions). RSV is expected to represent around 13-15% of respiratory admissions throughout the winter.

A few caveats are worth noting:

- We did not find a clear benefit of an early immunization campaign among infants, likely because there is a trade-off between immunization early enough in the season to precede the peak of RSV activity and waning of immunization protection within the season. We note that this trade-off may eventuate differently in Florida, which has particularly early RSV timing but is not included in this analysis since it is not part of RSV-NET. Further, both infant scenarios assume a rapid uptake of catch-up doses of nirsevimab, within one month of the assumed start of the RSV campaign. If in practice catch-up immunizations are delayed due to supply shortages or other issues, the trade-off between the two immunization options may also ensue differently.
- Most models project that RSV timing will broadly return to normal in 2024-25 after several disrupted seasons due to COVID-19 interventions. Yet some aspects of the rebound remain poorly understood. Further, testing practices continue to evolve in the wake of the COVID-19 pandemic (e.g., increased use of multi-pathogen testing), which may affect reported hospitalizations in the RSV-NET system. Testing changes are not fully understood and not accounted for in the models.
- There is limited availability of calibration data from the RSV-NET hospitalization dataset, which covers only a fraction of 12 states (9% of the US population overall). Future work could focus on expanding these projections to all states as more data become available via the NHSN reporting system.
- Most models assume that RSV interventions do not affect susceptibility to infection or transmission, so that ensemble estimates of indirect benefits are minimal (i.e., hospitalization reduction in non-intervened individuals 1-59 years are within 0-3% depending on age group and scenario considered).

Round 1 - 2024-2025 Scenario Specifications

RSV Round 1 considered 4 intervention scenarios representing the impact of new vaccines and long-acting monoclonal interventions, in conjunction with a counterfactual scenario, where these new interventions were not implemented. Intervention scenarios assumed different timings of infant interventions (classic timing following current recommendations, with a campaign starting in September for maternal vaccines and in October for nirsevimab, compared to early timing where immunizations start 1.5 month earlier), combined with optimistic and pessimistic estimates of waning of vaccine-induced immunity in seniors 60+ years. Scenario assumptions are indexed on past coverage of influenza vaccines by state and age group and efficacy estimates from randomized control trials for RSV interventions.

	Optimistic senior waning • Vaccine is administered from Aug to June to seniors **60+ yrs** • Total coverage, which includes last year and this year's vaccinations, saturates at **45%** of the eligible population and is indexed on the 2021-22 state- and age-specific flu vaccine coverage • VE against hospitalization is **75% at the time of vaccine receipt** and is reduced by 10% in the second season after receipt**, i.e., VE_year2=68%.**	**Pessimistic senior waning** • Same timing and coverage assumptions as for the optimistic senior waning level • VE against hospitalization is **75% in the first year** after vaccination and is reduced by 50% in the second year, **VE_year2=38%.**	**No senior vaccination in 2023-2024 and 2024-25**

Early timing of infant interventions (1.5 month earlier than usual)
• Long-acting monoclonals (nirsevimab) target infants ≤ 7 months during RSV season, starting **Aug 15 ending Mar 30**
  ○ coverage saturates at **55%** nationally (+10% higher than last year)
  ○ Timing of administration differs between catch-up babies born Apr 1-Aug 14, and those born during the RSV campaign Aug 15-Mar 30
  ○ VE against hospitalization is **80%**
• Maternal vaccine given to pregnant mothers 32-36 weeks, starting **July 15 ending Jan 31**
  ○ Coverage saturates at **25%** of eligible women
  ○ VE against hospitalization is **60%**
	Scenario A	**Scenario B**	

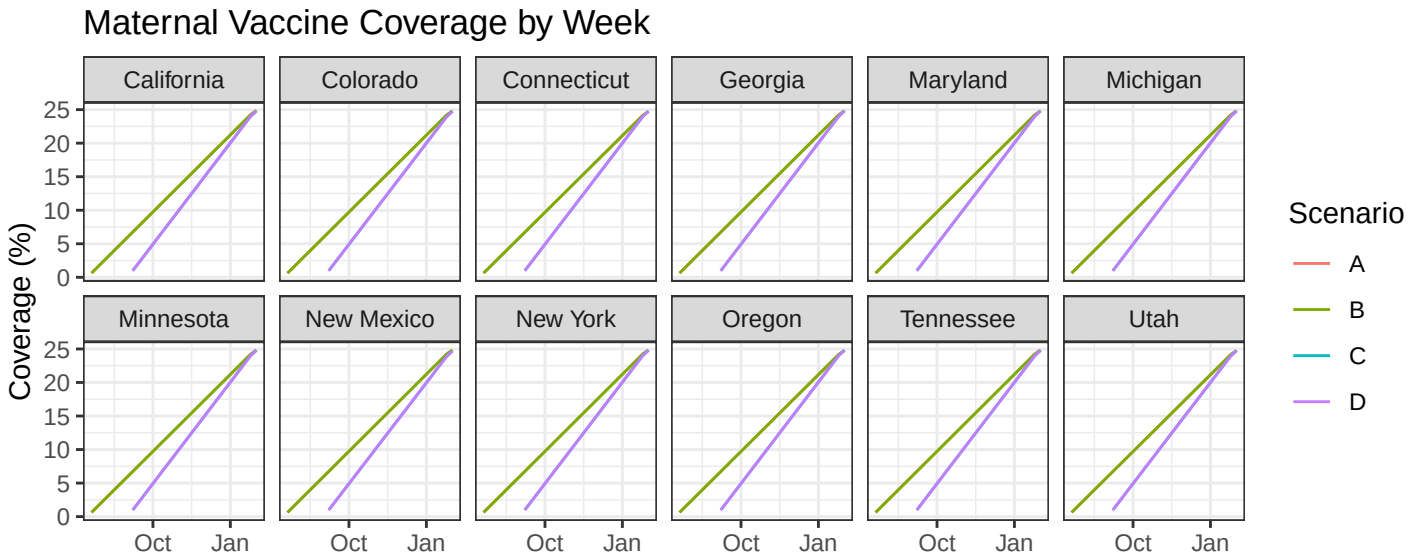
Classic timing of infant interventions
• Long-acting monoclonals (nirsevimab) as above, except that campaign **starts Oct 1 and ends Mar 30**
  ○ Timing of administration differs between babies born before the campaign Apr 1-Sep 30, and those born during the RSV campaign Oct 1-Mar 30
  ○ Other parameters (VE and vaccine coverage) unchanged
• Maternal vaccine as above, except that campaign **starts Sep 1 and ends Jan 31**
	Scenario C	**Scenario D**	

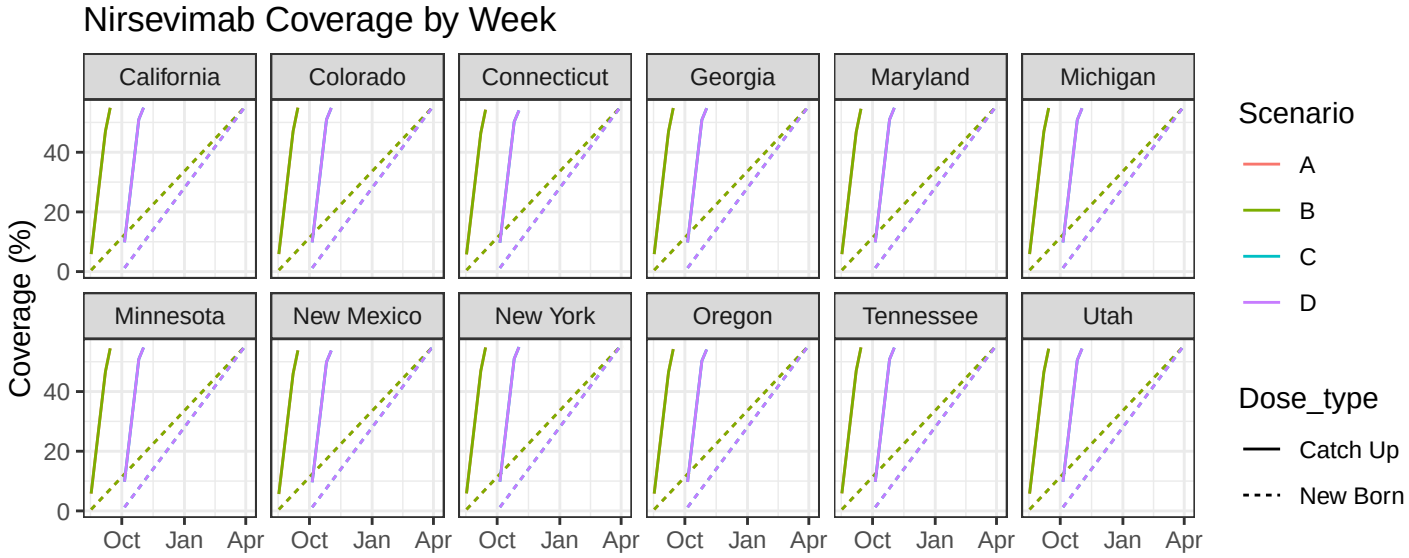
Nirsevimab and maternal vaccines are not available. No infant intervention beyond what was used historically, ie, limited supply of palivizumab, targeting ~2% of birth cohort at high risk			**Scenario E (counterfactual)**

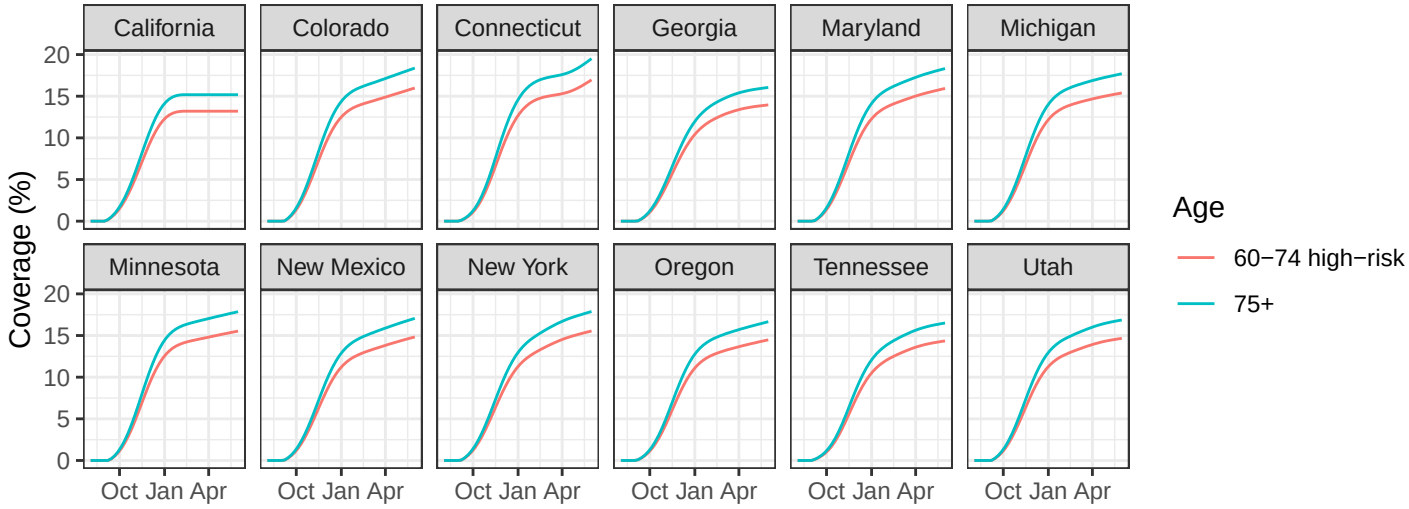
Full scenario specifications can be found here.

Vaccination Coverage Scenarios

Vaccination coverage was specified by the Scenario Modeling Hub Coordiantion Team based on real-world data and expert opinion. The following figures show the weekly cumulative coverage of maternal vaccines, nirsevimab in infants, and senior vaccines by scenario and geography. Scenarios A and C are identical to B and D for maternal and infant interventions and thus are not visible.



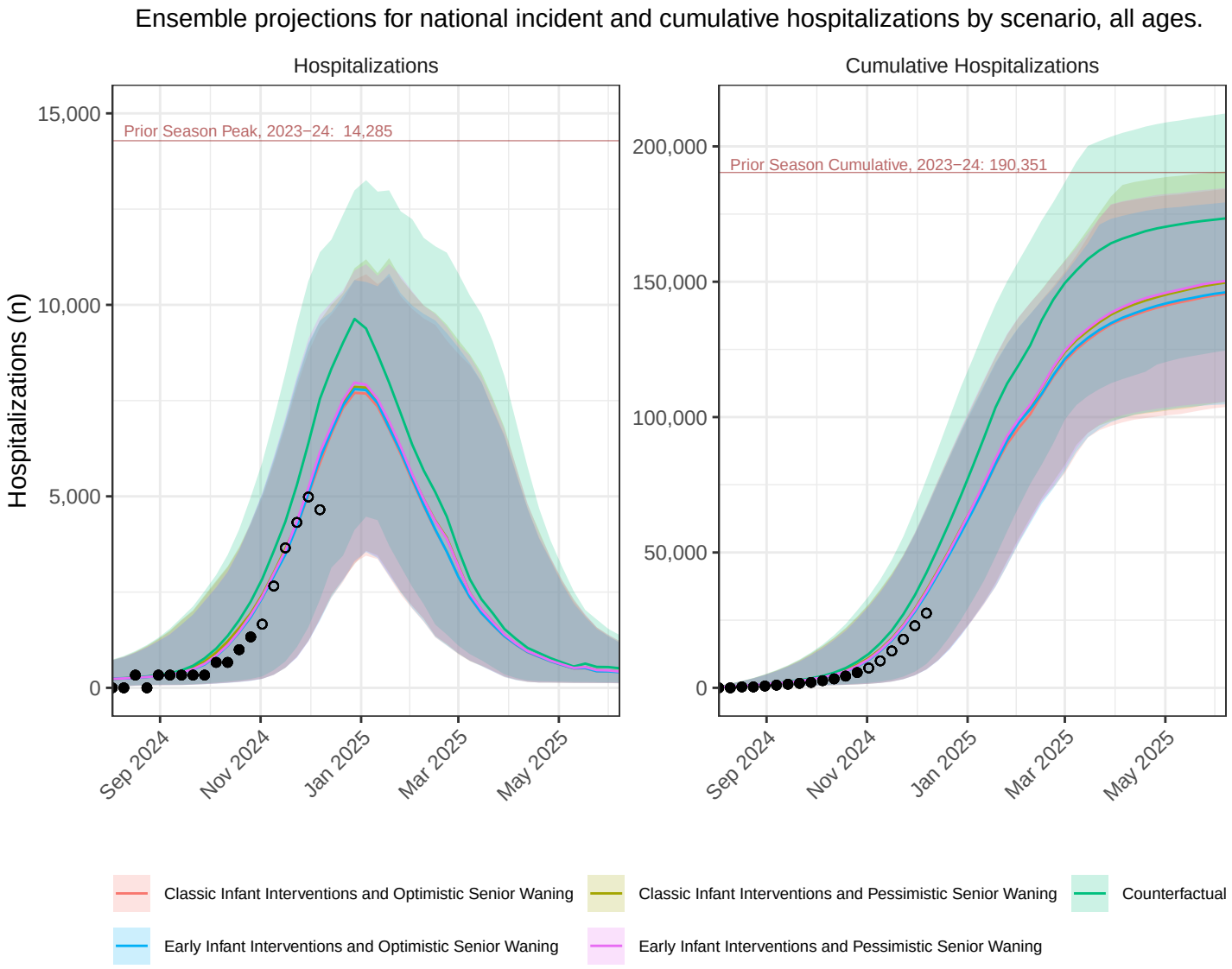




National Ensemble Projection Results

Scenario Comparison

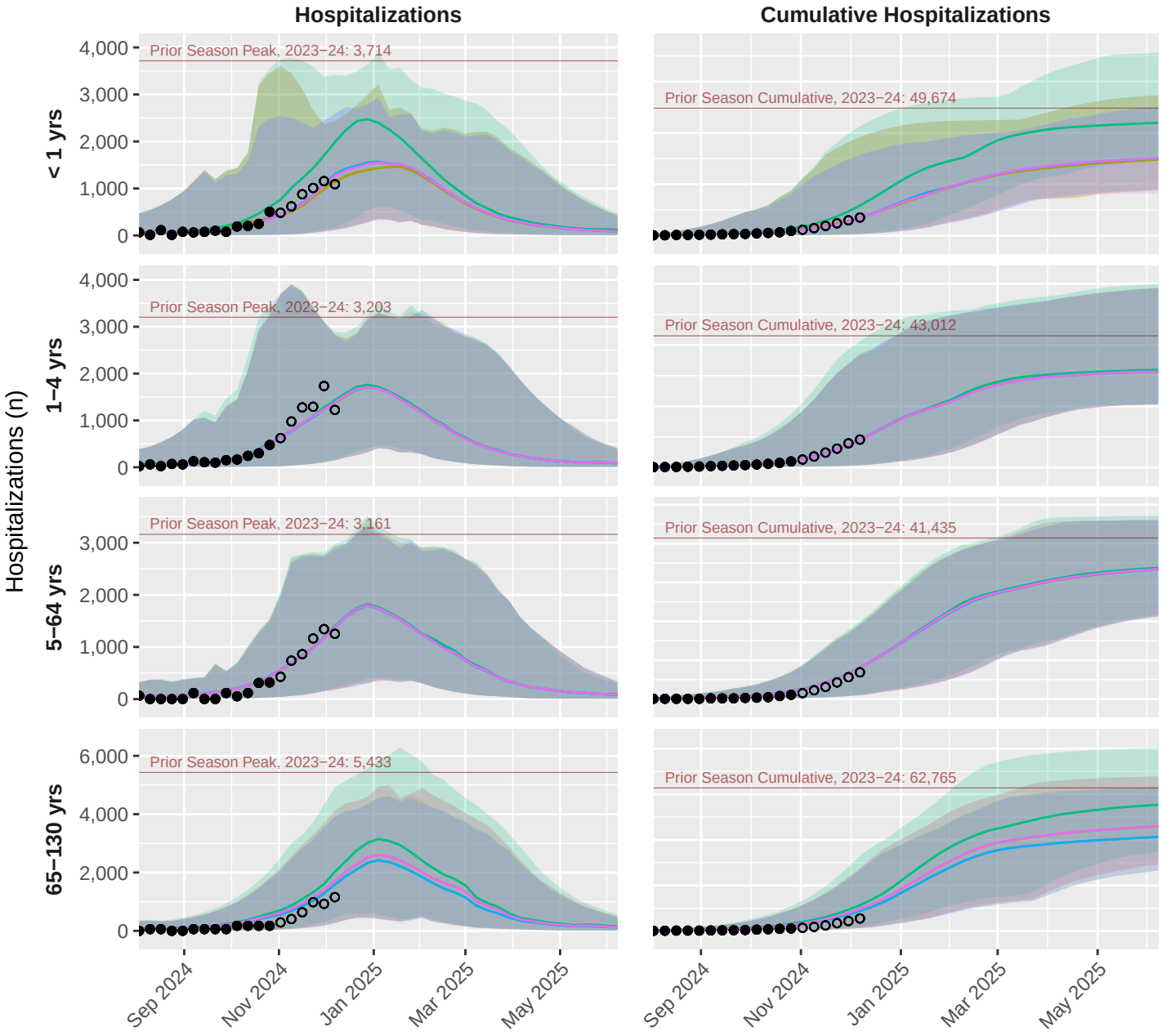
The scenario projections were overall similar between scenarios, with increased peak and cumulative size as scenarios became more pessimistic. The national projections follow the empirical hospitalizations well for both incident and cumulative projections, demonstrating robustness and good calibration of the overall ensemble. Horizontal lines are given for prior peak incident and cumulative hospitalizations from the 2023-24 season, taken from RSV-NET (which is used as a proxy for hospitalizations).

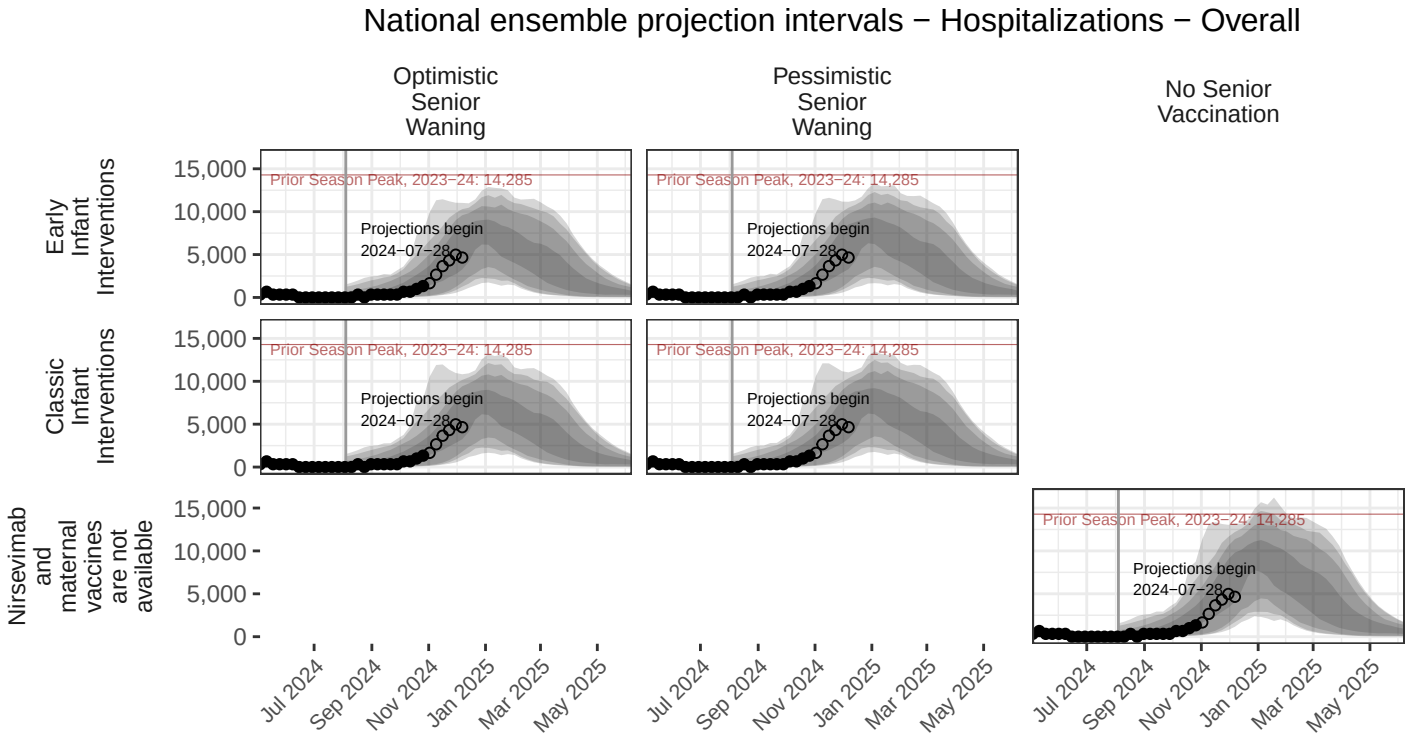


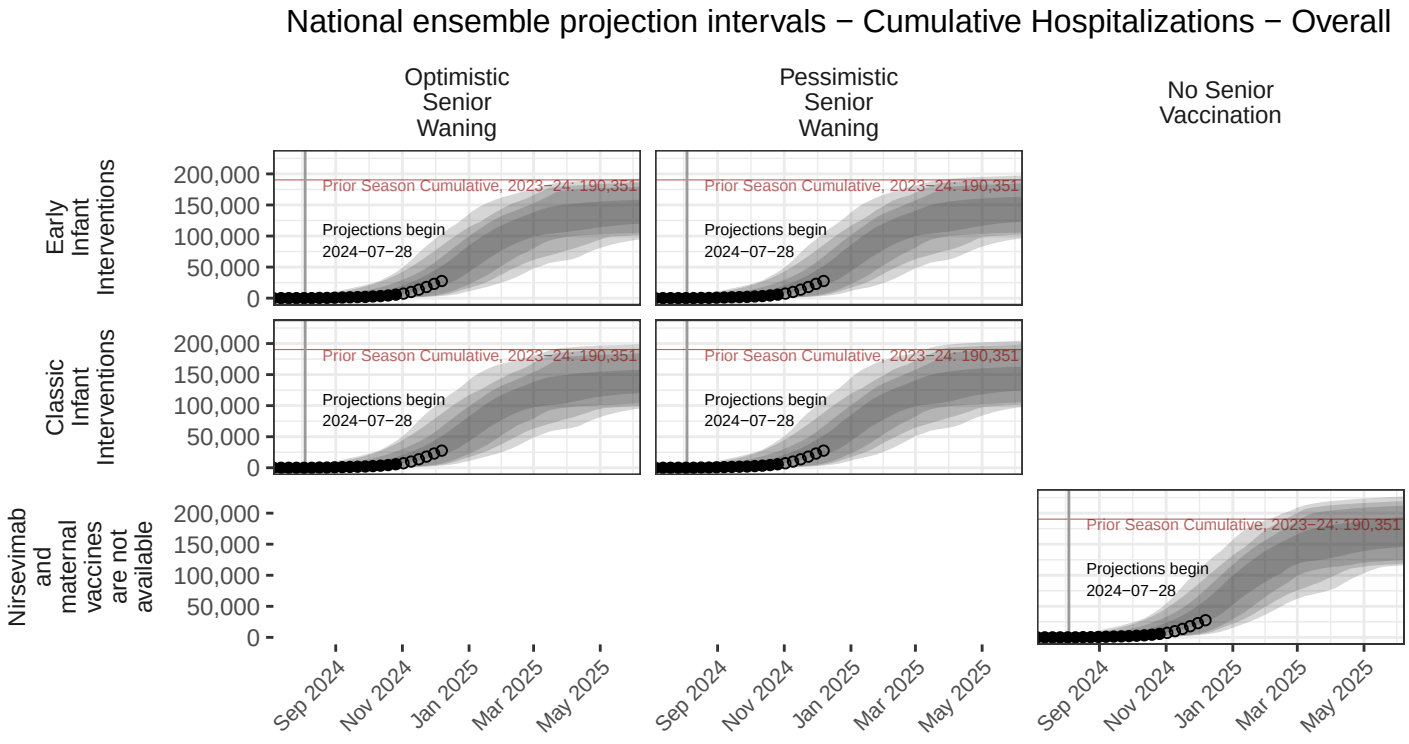
Comparisons by Age

The scenario projections by age group were also similar between scenarios nationally, with increased peak and cumulative size as scenarios became more pessimistic. The national projections also follow the empirical age-specific hospitalizations well up to the time of this report. Age group projections remain less than those experienced for the 2023-24 season for both peak and cumulative hospitalizations (horizontal red lines for prior peak represent incident and cumulative hospitalizations from the 2023-24 season, taken from RSV-NET). Lines represent the median ensemble projections, and shaded regions represent the 95% prediction intervals.

National ensemble projections of incident and cumulative RSV hospitalizations, by Age



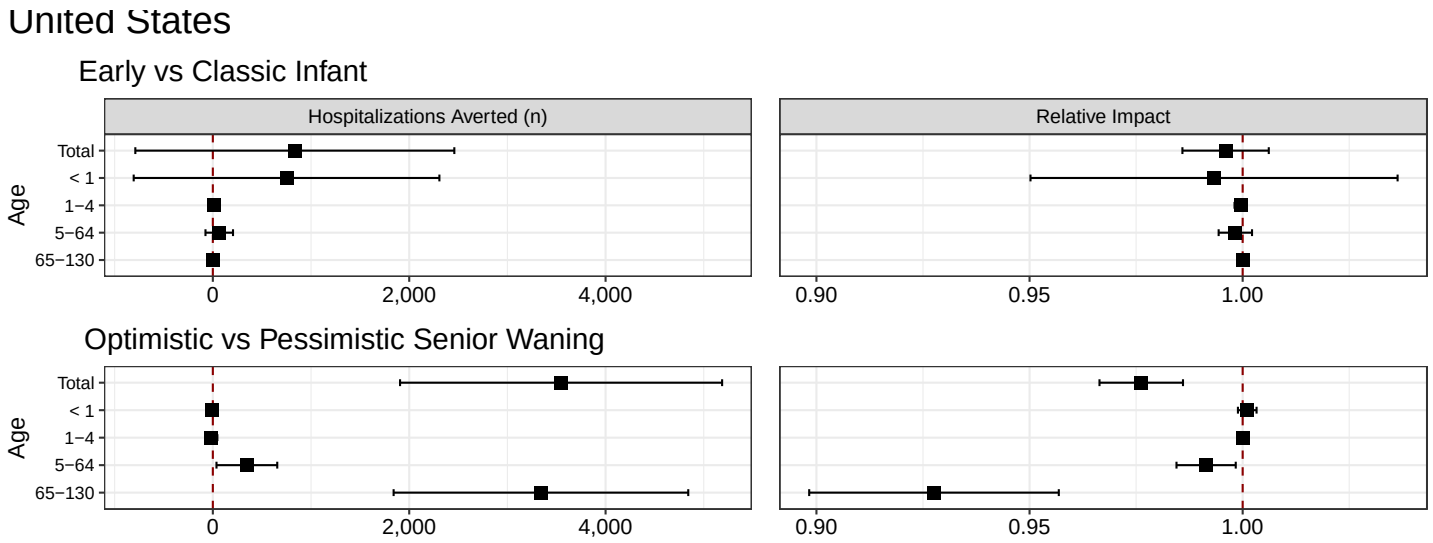

National ensemble projection intervals − Hospitalizations − Overall
Optimistic Senior Waning
Pessimistic Senior Waning
No Senior Vaccination
Early Infant Interventions
Classic Infant Interventions
Nirsevimab and maternal vaccines are not available
Prior Season Peak, 2023−24: 14,285
Projections begin 2024−07−28
15,000
10,000
5,000
0
Jul 2024
Sep 2024
Nov 2024
Jan 2025
Mar 2025
May 2025
From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals


National ensemble projection intervals − Cumulative Hospitalizations − Overall
Optimistic Senior Waning
Pessimistic Senior Waning
No Senior Vaccination
Early Infant Interventions
Classic Infant Interventions
Nirsevimab and maternal vaccines are not available
Prior Season Cumulative, 2023−24: 190,351
Projections begin 2024−07−28
200,000
150,000
100,000
50,000
0
Sep 2024
Nov 2024
Jan 2025
Mar 2025
May 2025
From lightest to darkest shading represents 95%, 90%, 80% and 50% projection intervals

Meta-Analysis of Scenario Comparative Impacts - National

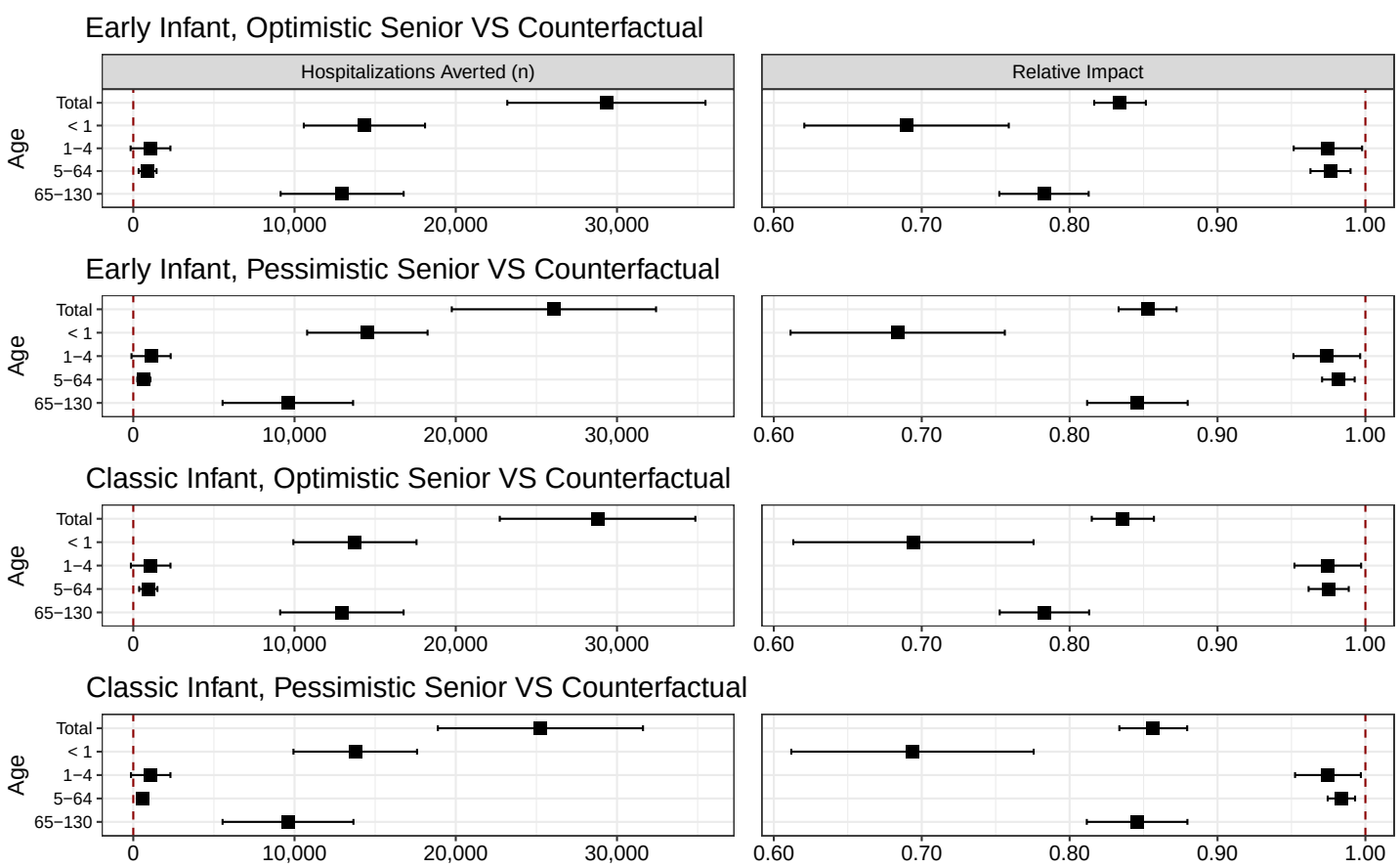
Optimistic vs. Pessimistic Impacts of RSV Immunization Scenarios, National

Estimates of cumulative hospitalizations averted and relative impact in hospitalization for July 28, 2024 to June 7, 2025 comparing optimistic versus pessimistic scenarios, for the US, by age group.



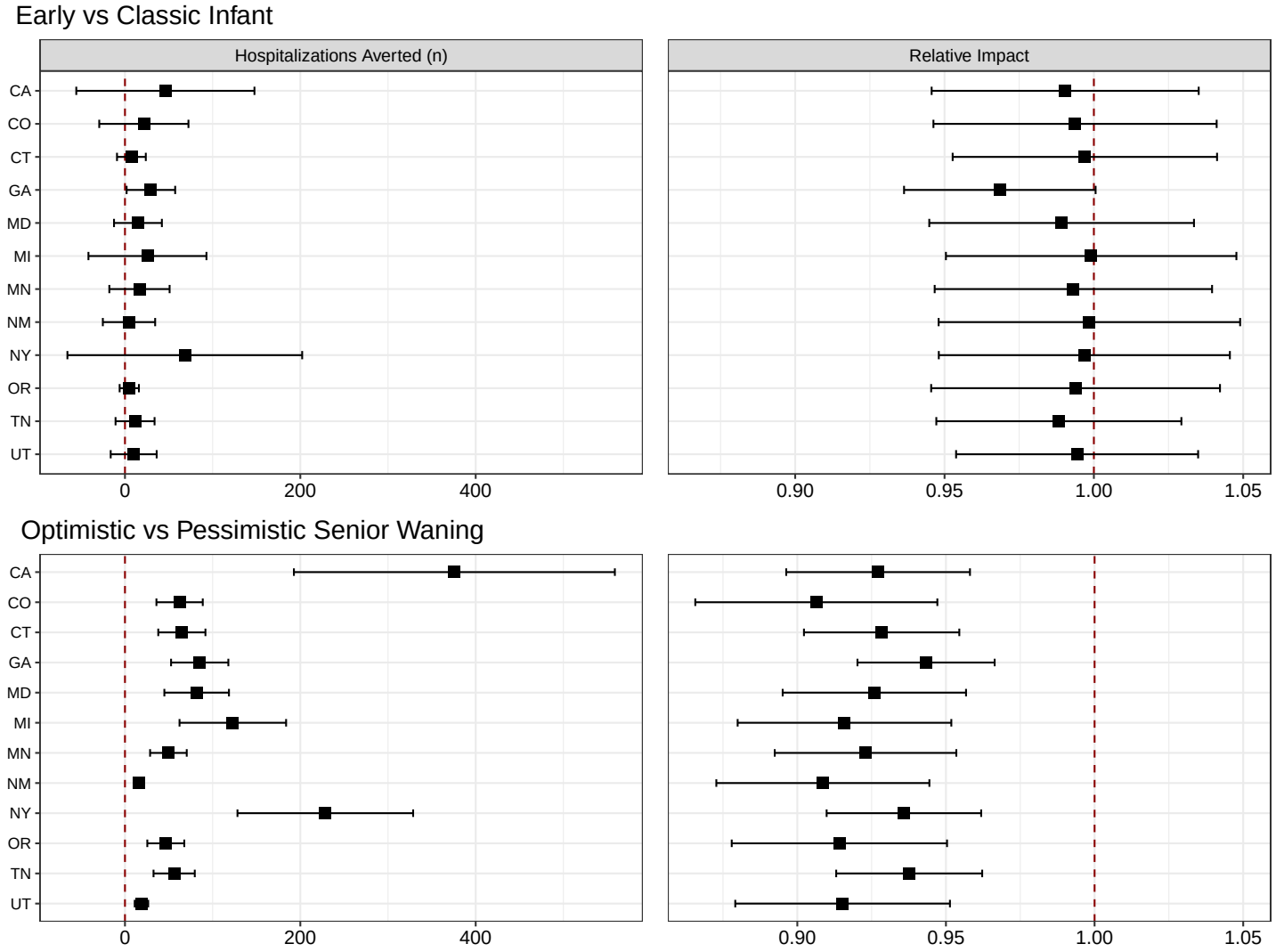
RSV Immunization Scenarios vs Counterfactual, National

Estimates of cumulative hospitalizations averted and relative impact in hospitalization for July 28, 2024 to June 7, 2025 comparing optimistic and pessimistic scenarios to the counterfactual scenario, for the US, by age group.



Optimistic vs. Pessimistic Impacts of RSV Immunization Scenarios, by State

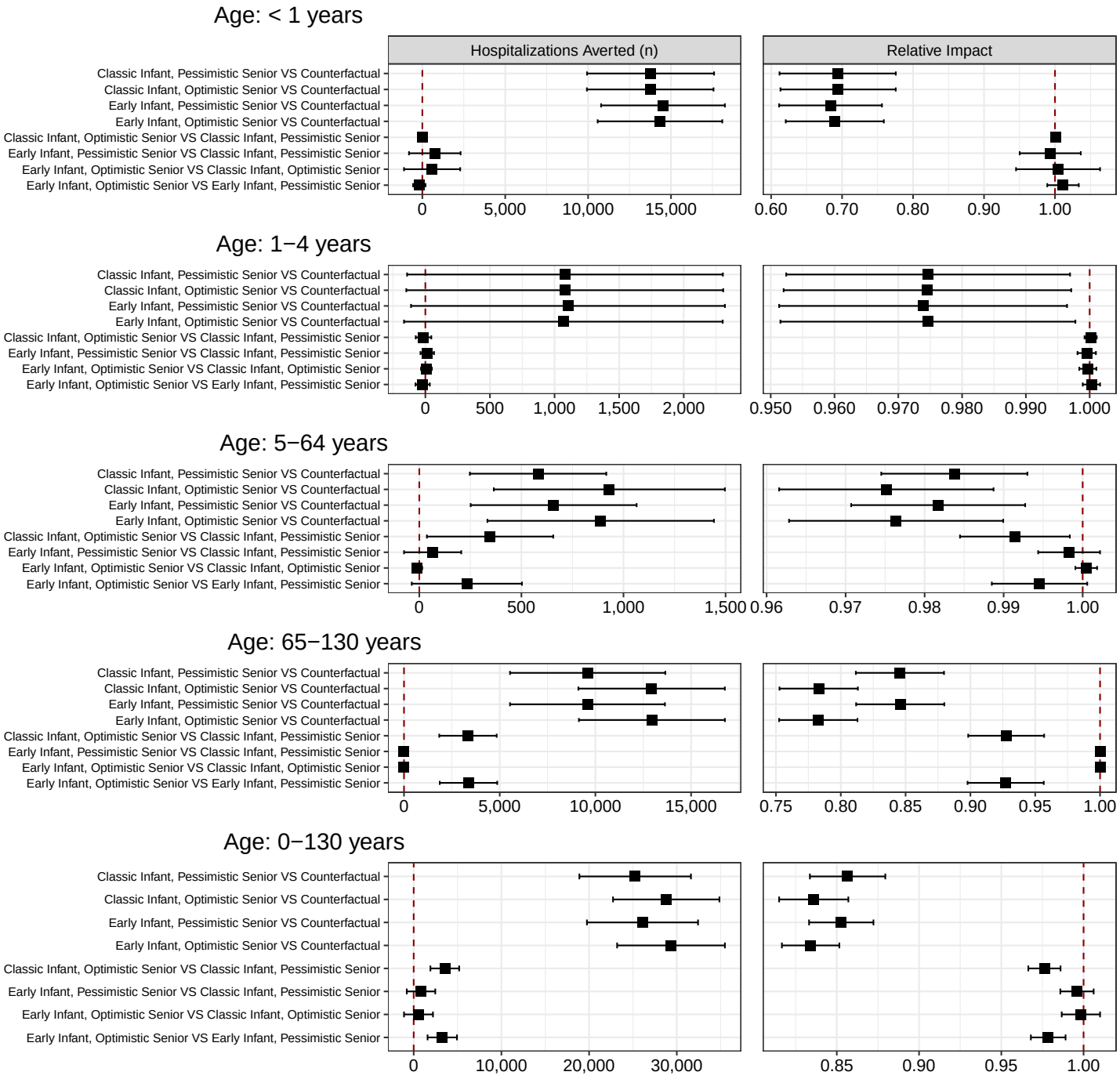
Estimates of cumulative hospitalizations averted and relative impact in hospitalization for July 28, 2024 to June 7, 2025 comparing optimistic versus pessimistic scenarios among infants aged <1 year (Early vs Classic Infant comparison) and among adults aged 65+ (Optimistic vs Pessimistic Senior Waning).



RSV Immunization Scenarios Comparisons - All, National

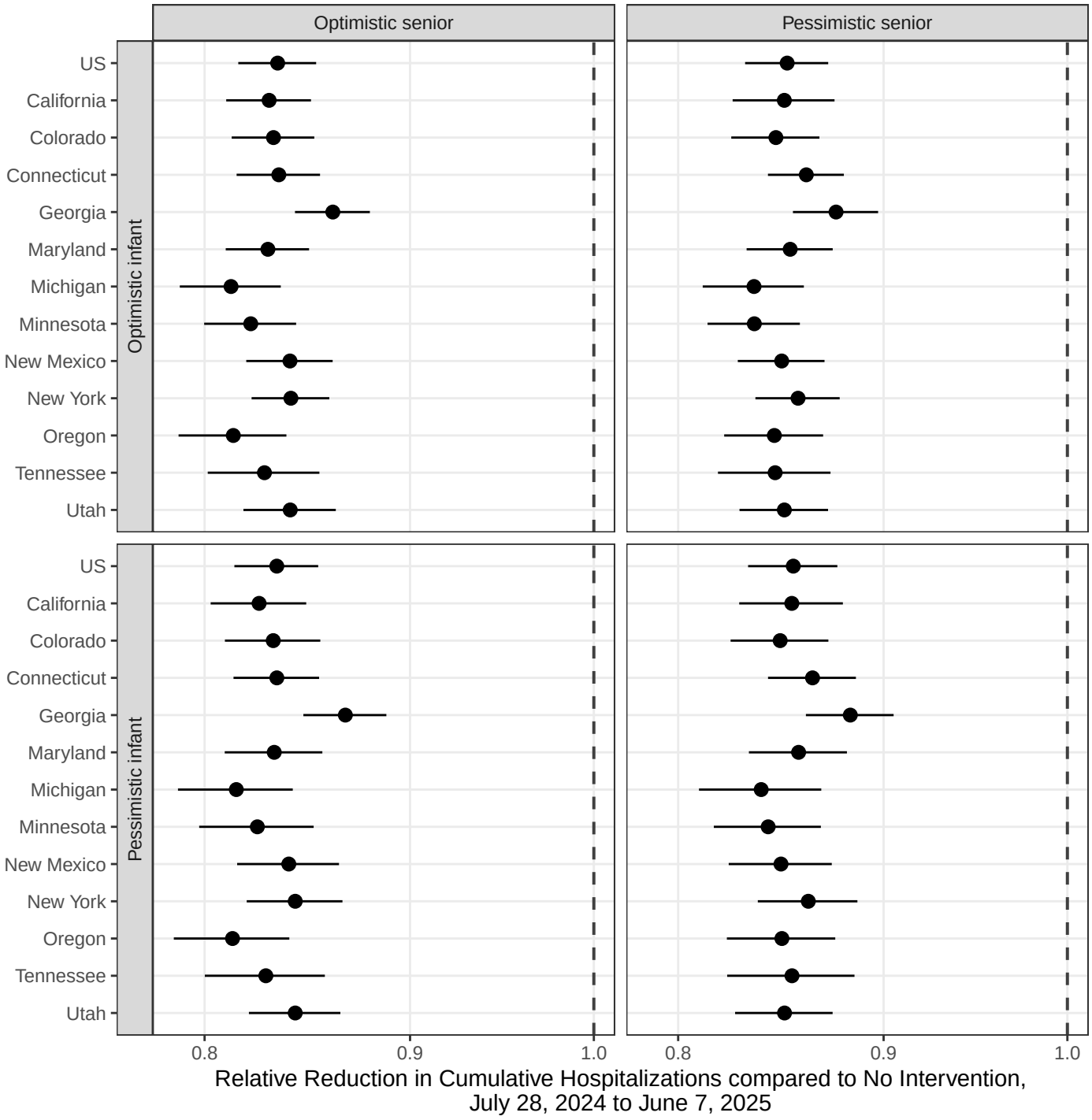
Estimates of cumulative hospitalizations averted and relative impact in hospitalization for July 28, 2024 to June 7, 2025 comparing all scenarios, for the US, by age group.

United States



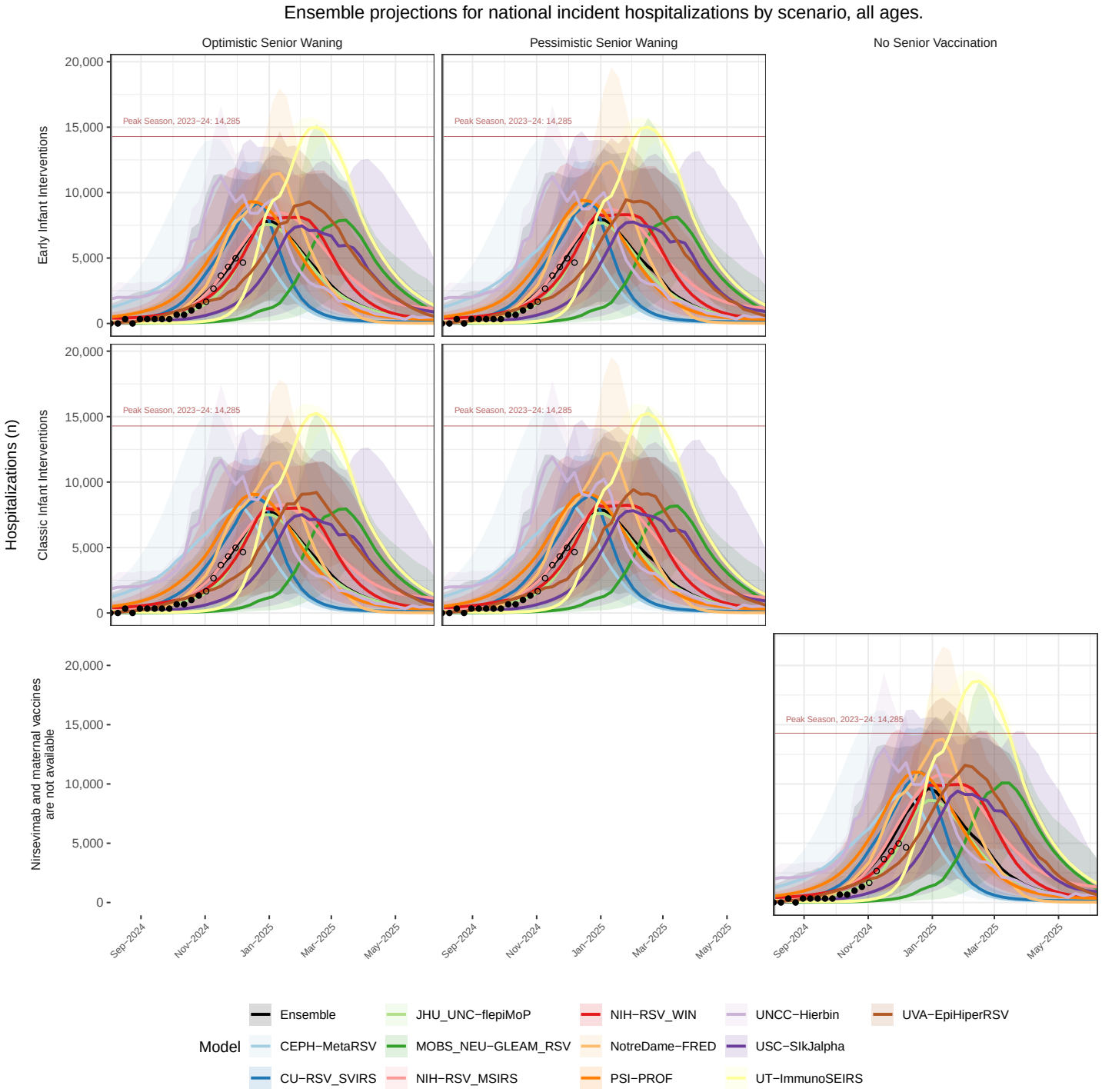
Relative Impact in Hospitalization compared to No Intervention (the Counterfactual)

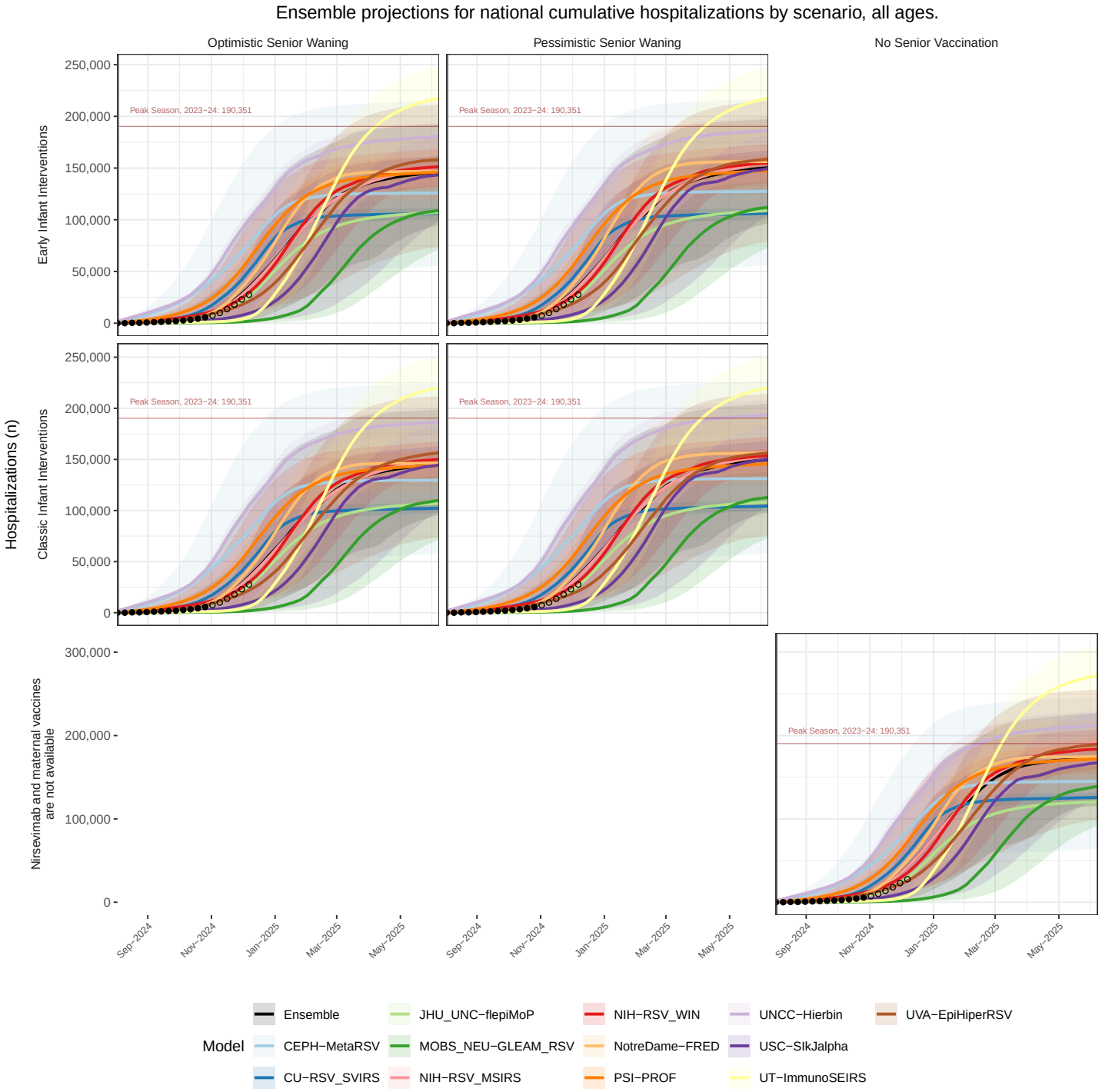
Estimates of relative hospitalizations averted contrasting cumulative projections at the end of the season for each vaccine scenario versus the counterfactual scenario, for the US and each state, all age groups.



National individual model projections

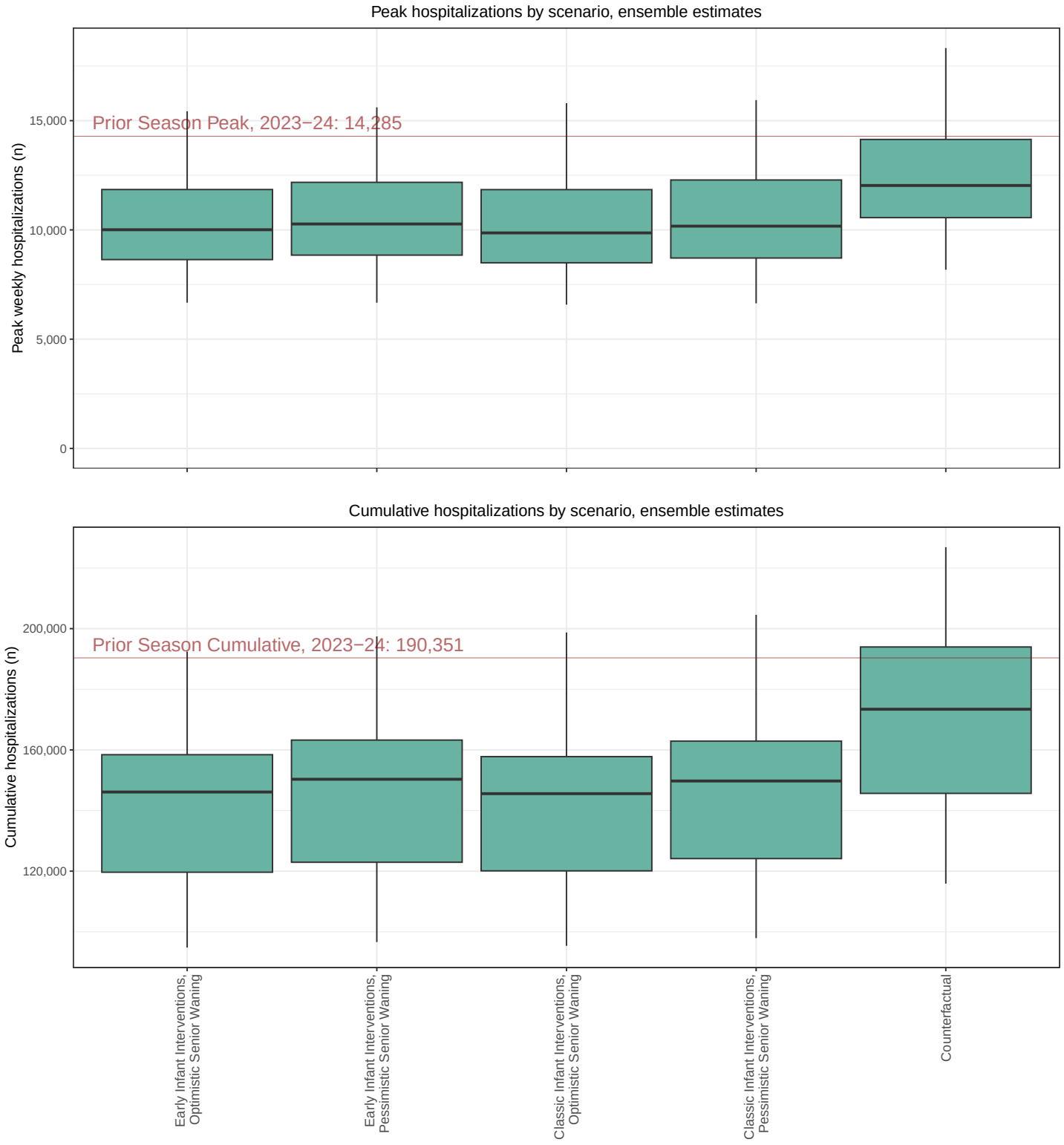
Individual model projections and ensemble by scenario for national hospitalizations, deaths and cumulative hospitalizations.




Ensemble projections for national cumulative hospitalizations by scenario, all ages.
Optimistic Senior Waning
Pessimistic Senior Waning
No Senior Vaccination
Hospitalizations (n)
Early Infant Interventions
Classic Infant Interventions
Nirsevimab and maternal vaccines are not available
Peak Season, 2023–24: 190,351
250,000
200,000
150,000
100,000
50,000
0
300,000
Sep–2024
Nov–2024
Jan–2025
Mar–2025
May–2025
Model
Ensemble
CEPH–MetaRSV
CU–RSV_SVIRS
JHU_UNC–flepiMoP
MOBS_NEU–GLEAM_RSV
NIH–RSV_MSIRS
NIH–RSV_WIN
NotreDame–FRED
PSI–PROF
UNCC–Hierbin
USC–SIkJalpha
UT–ImmunoSEIRS
UVA–EpiHiperRSV

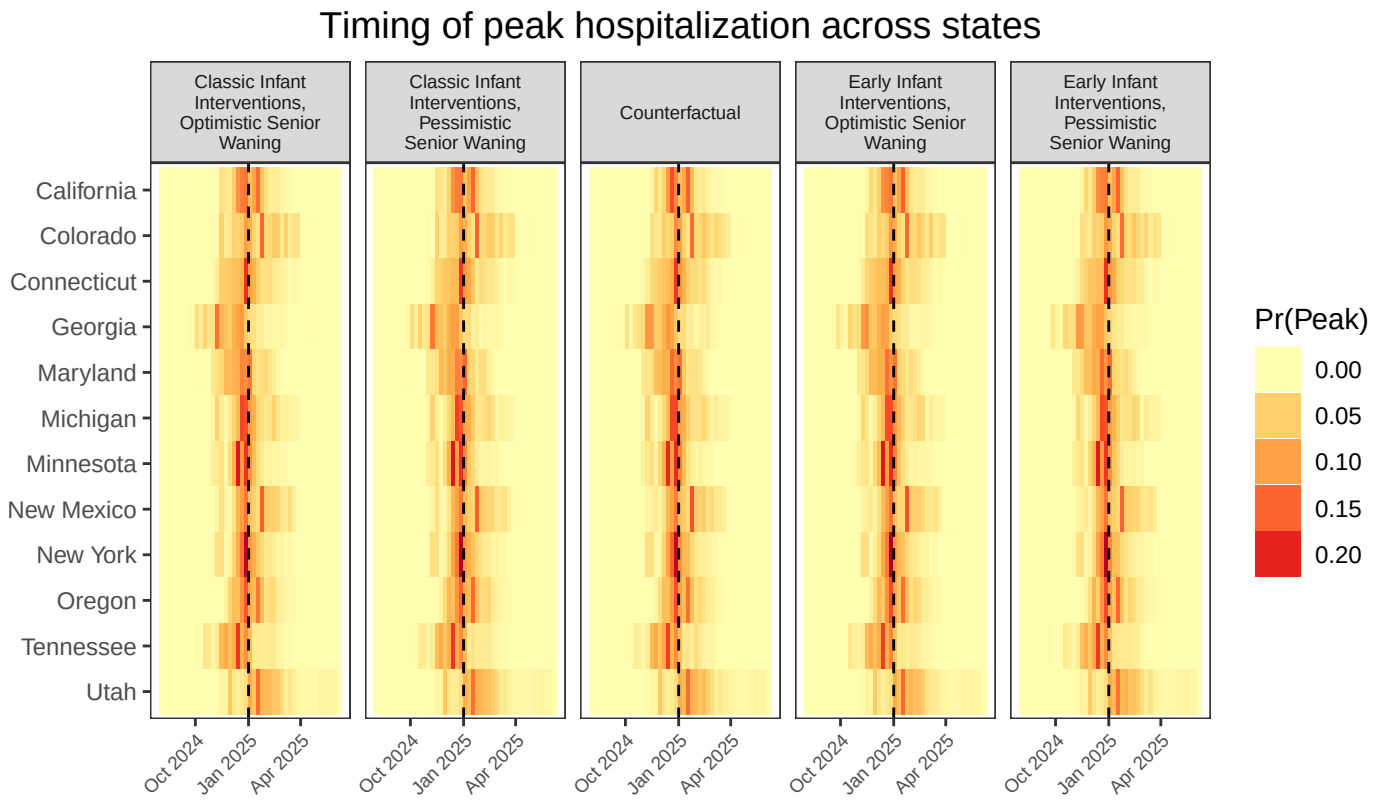
Peak and Cumulative Hospitalizations

Scenario variation in national peak size and cumulative hospitalization burden

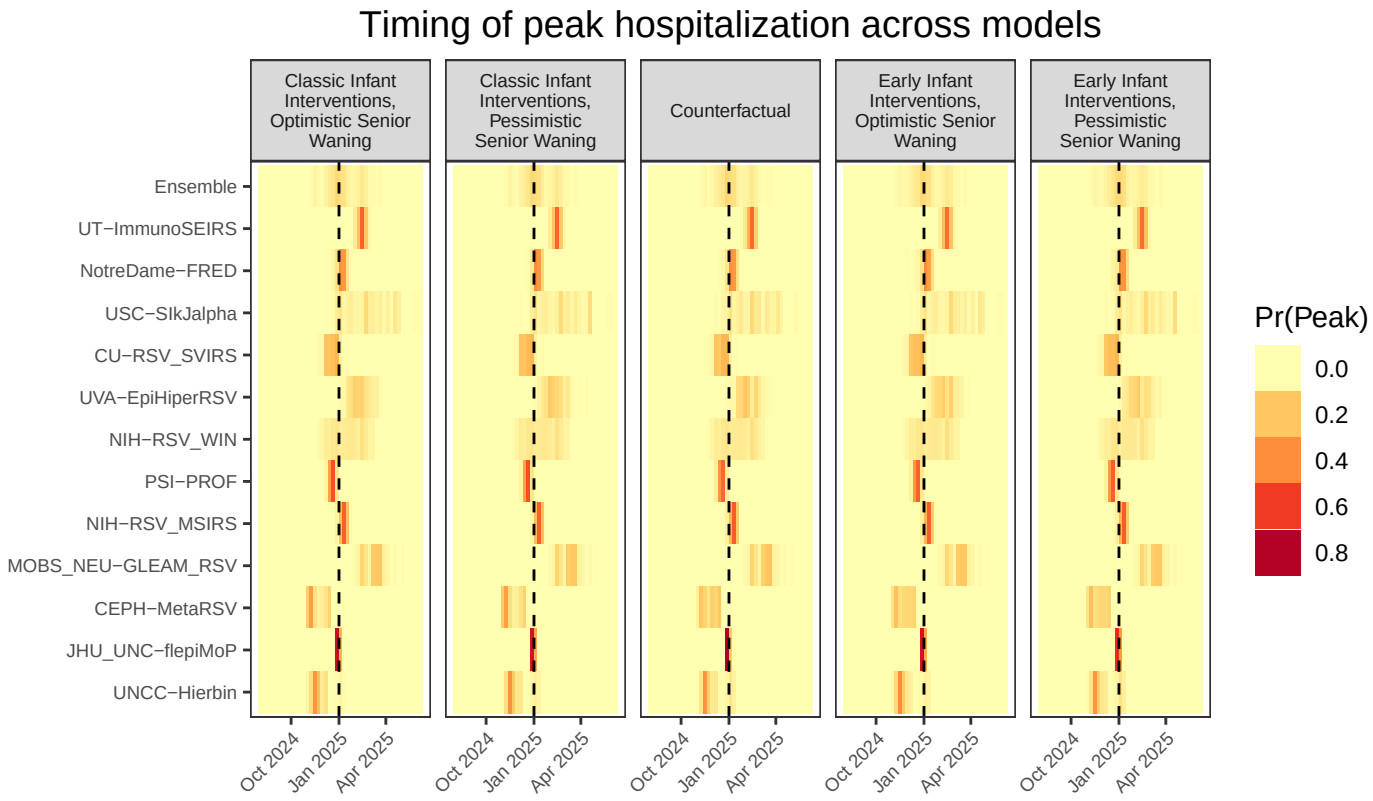


Peak Hospitalization Timing

State variability in peak hospitalization timing. Ensemble projections of state-level timing of peak hospitalization incidence.



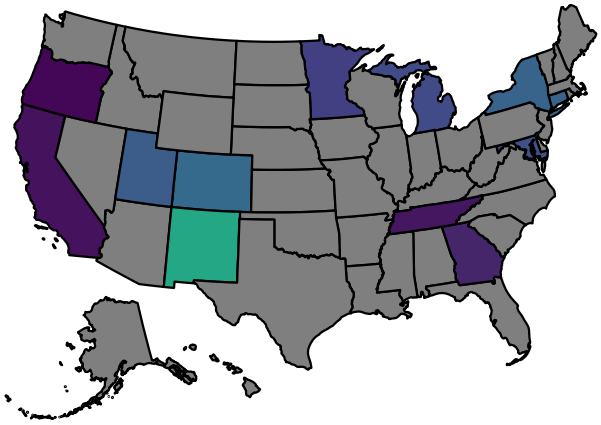
Model variability in national peak hospitalization timing. Individual model probabilities for national timing of peak hospitalizations.



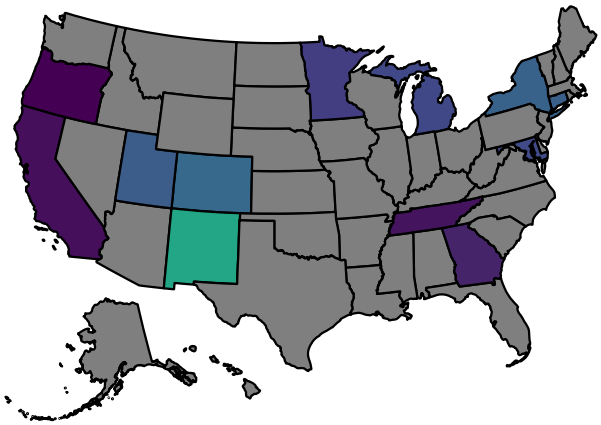
Risk Maps, Peak and Cumulative Hospitalization Rates

Peak Hospitalizations per 10,000 population

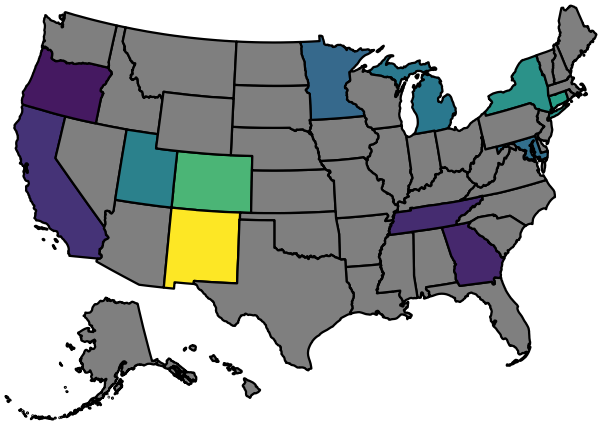
Projected peak size for 2024−25 season,
Classic Infant Interventions and Pessimistic Senic



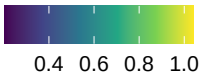
Projected peak size for 2024−25 season,
Early Infant Interventions and Optimistic Senior W



Reported peak size, 2023−24 season

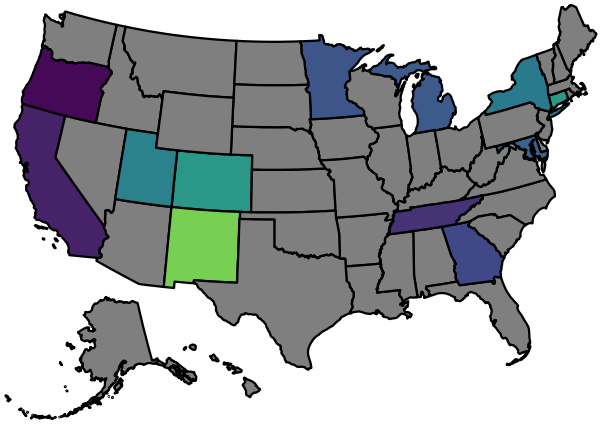


Peak incident hosps
per 10,000 pop

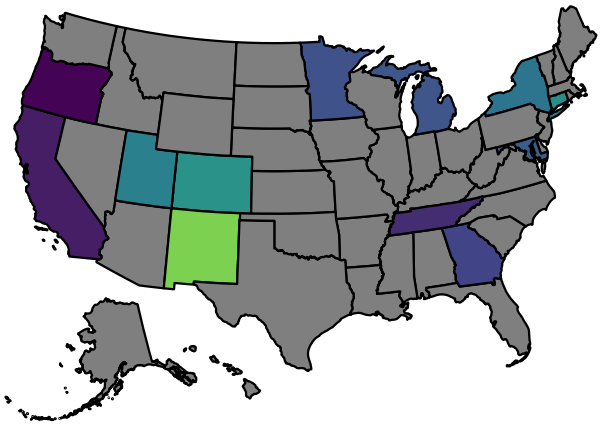


Cumulative Hospitalizations per 10,000 population

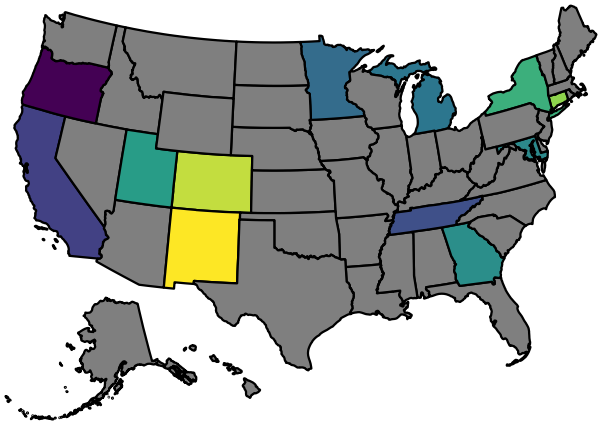
Projected cumulative hosp. rate, 2024−25 season
Classic Infant Interventions and Pessimistic Senic



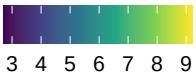
Projected cumulative hosp. rate, 2024−25 season
Early Infant Interventions and Optimistic Senior W



Reported cumulative hosp. rate, 2023−24 season



Cumulative hosps
per 10,000 pop

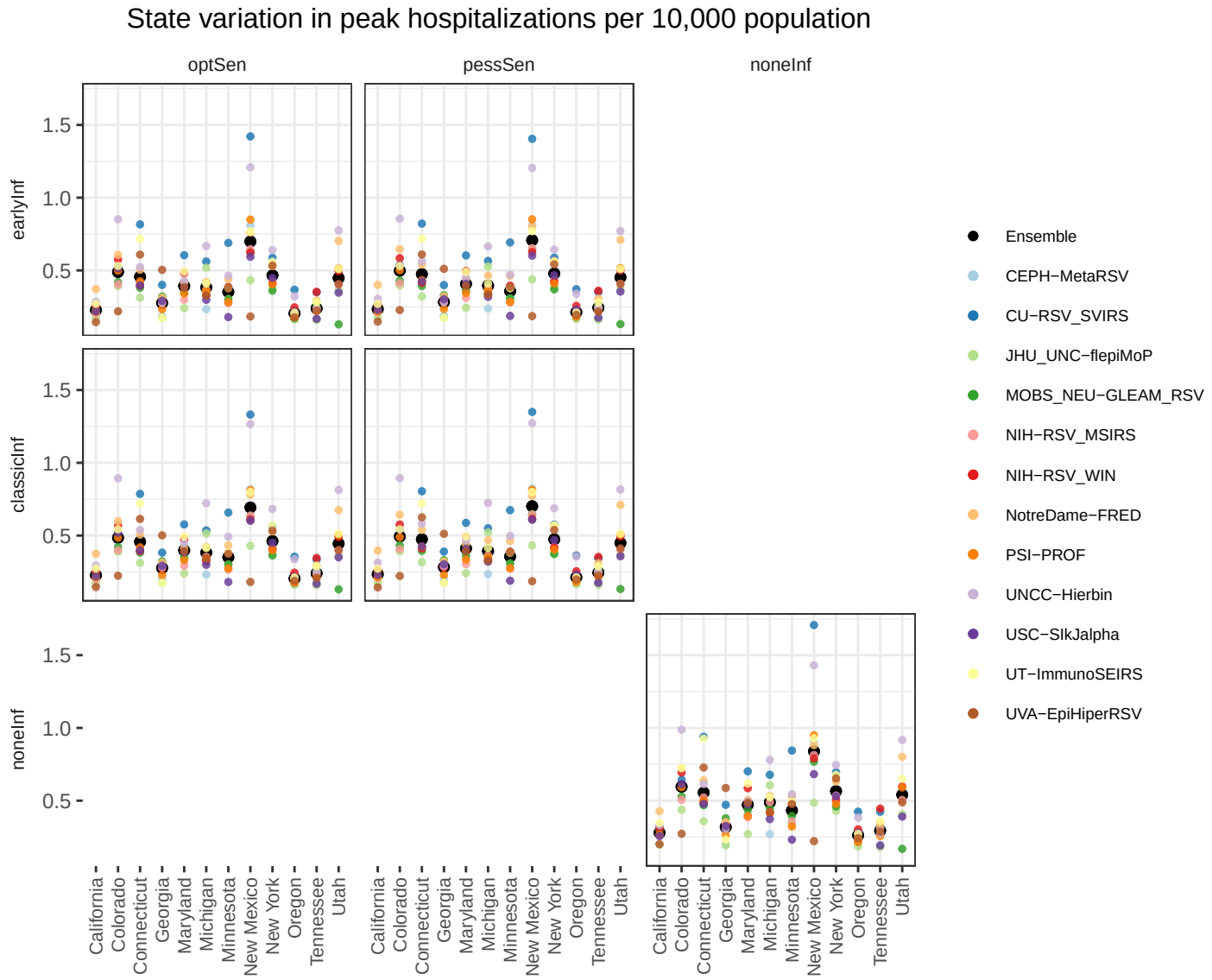


Model-Specific Projections

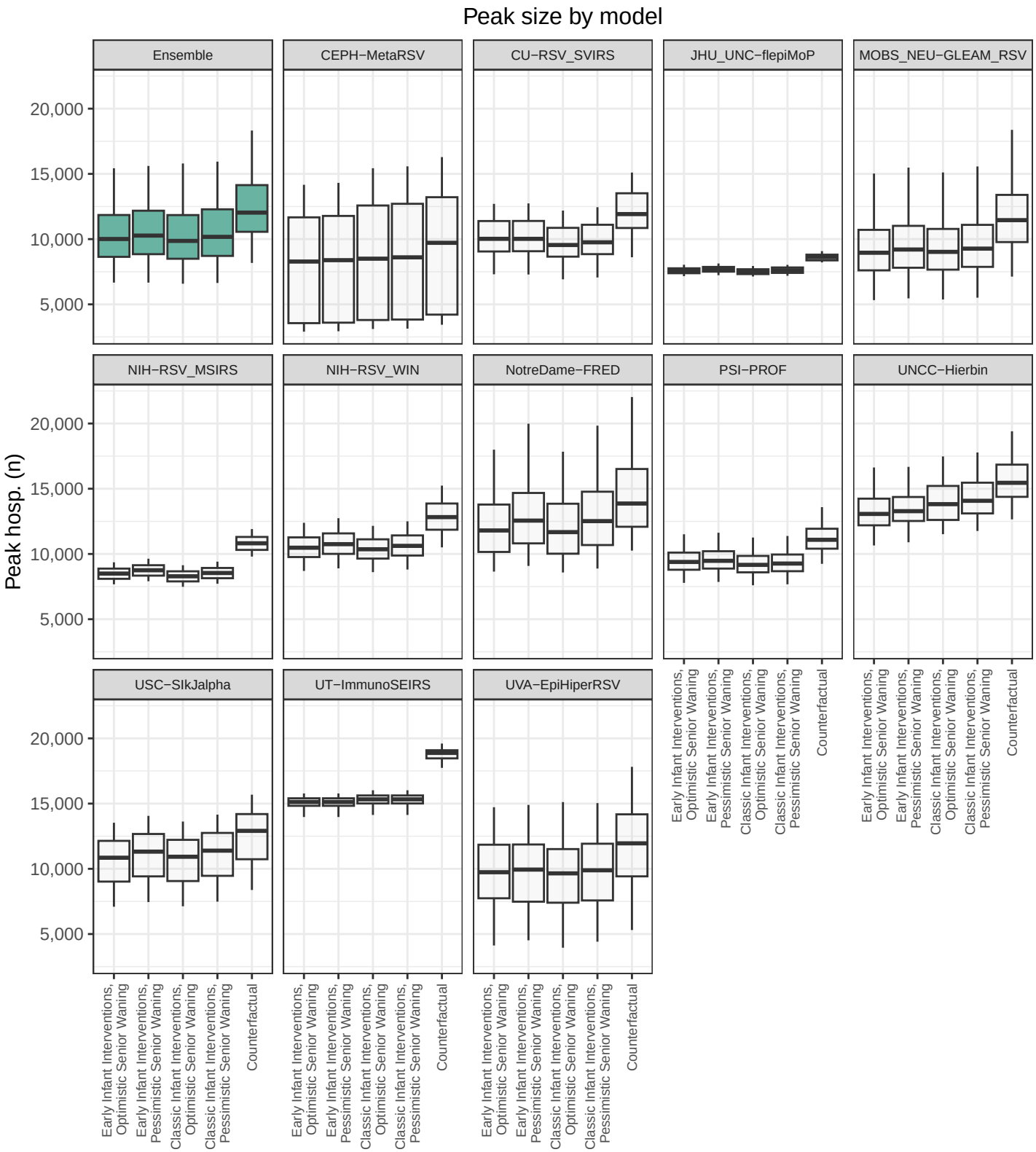
Peak hospitalization size

Variability in peak hospitalization incidence, by state and model.

Individual model and ensemble projections for state-level weekly peak hospitalization incidence per 10,000 population.

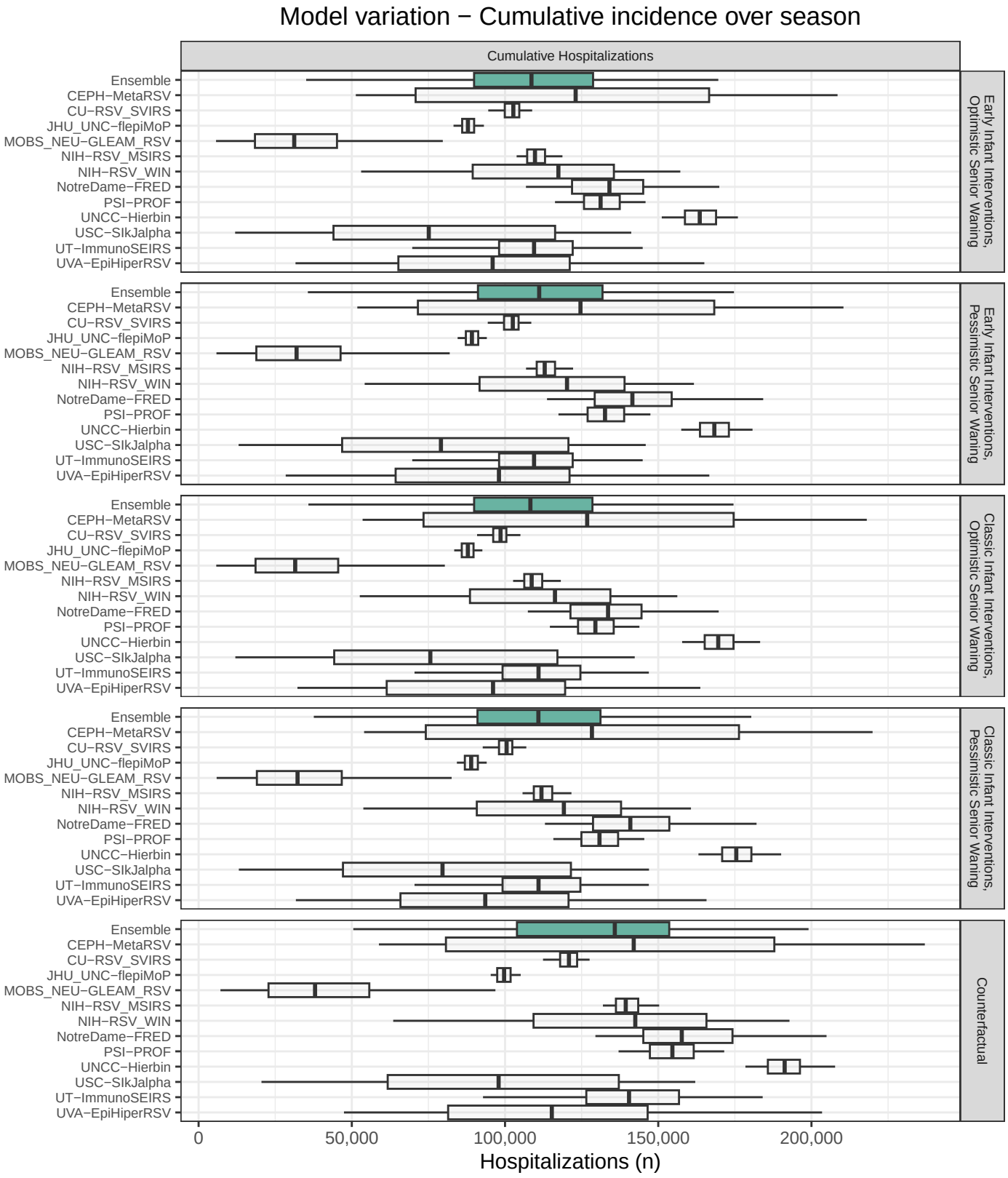


Model variability in national peak size



Cumulative Hospitalizations

Cumulative incidence over season by model

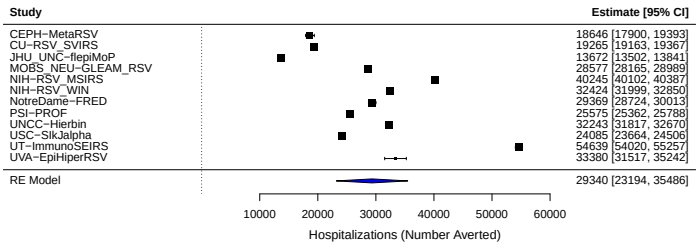


Meta-Analysis

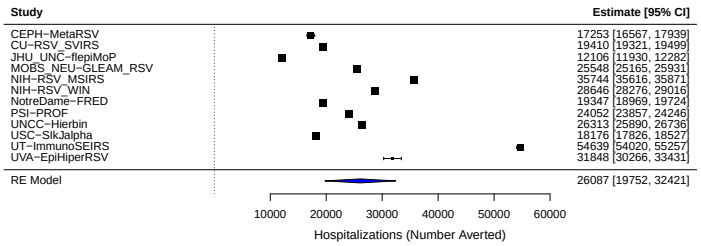
National Estimates of Hospitalizations averted by Infant and Senior Immunization as compared to the Counterfactual

Number of Hospitalizations Averted Estimates of hospitalizations averted contrasting cumulative projections at the end of the season for each vaccine scenario vs the counterfactual scenario.

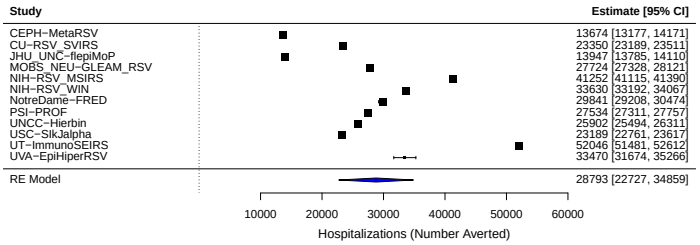
Early Infant, Optimistic Senior VS Counterfactual
US − 0−130 years



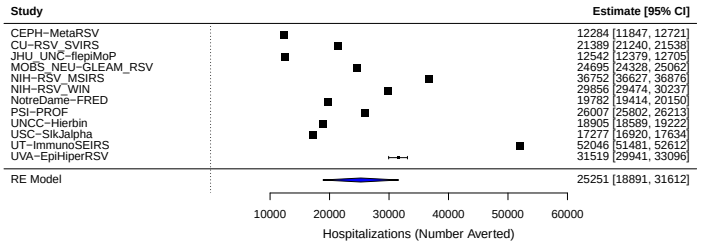
Early Infant, Pessimistic Senior VS Counterfactual
US − 0−130 years



Classic Infant, Optimistic Senior VS Counterfactual
US − 0−130 years

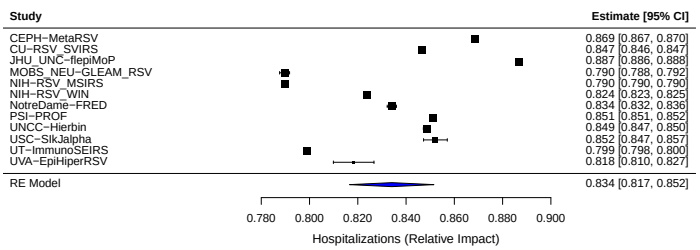


Classic Infant, Pessimistic Senior VS Counterfactual
US − 0−130 years

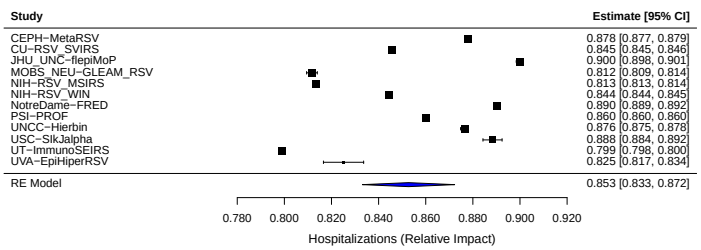


Relative Impact in Hospitalizations Estimates of the relative impact in hospitalization contrasting cumulative projections at the end of the season for each vaccine scenario vs the counterfactual scenario.

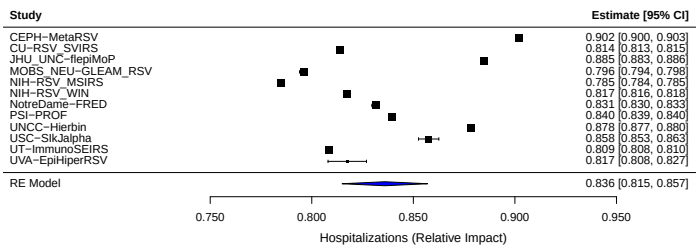
Early Infant, Optimistic Senior VS Counterfactual
US − 0−130 years



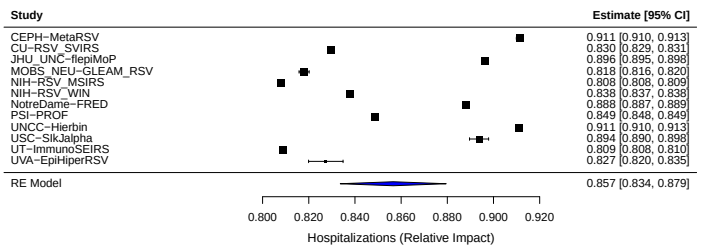
Early Infant, Pessimistic Senior VS Counterfactual
US − 0−130 years



Classic Infant, Optimistic Senior VS Counterfactual
US − 0−130 years



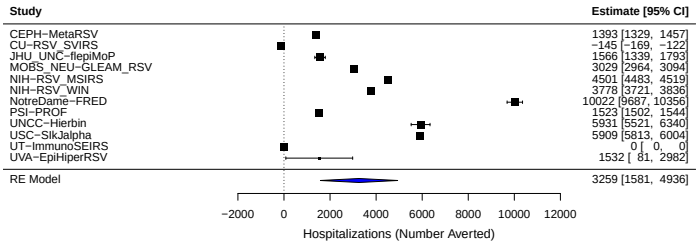
Classic Infant, Pessimistic Senior VS Counterfactual
US − 0−130 years



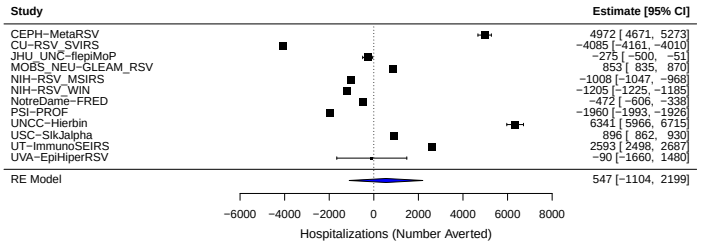
National Estimates of Hospitalizations averted by Optimistic vs Pessimistic Immunization

Number of Hospitalizations Averted

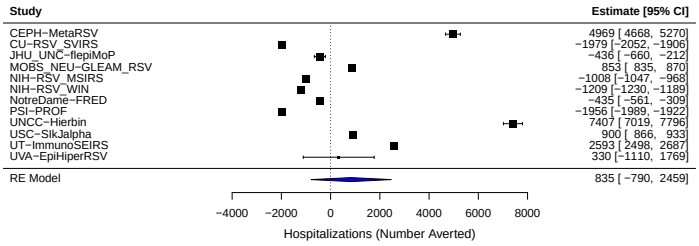
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − 0−130 years



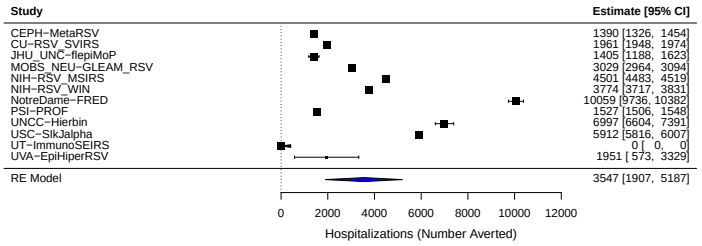
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − 0−130 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − 0−130 years

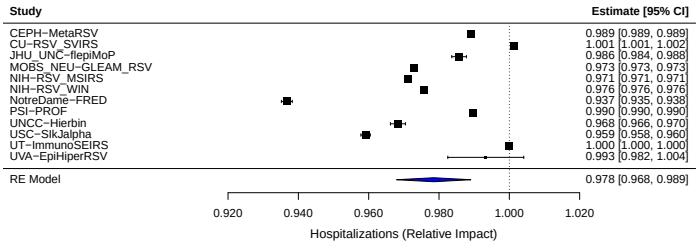


Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − 0−130 years

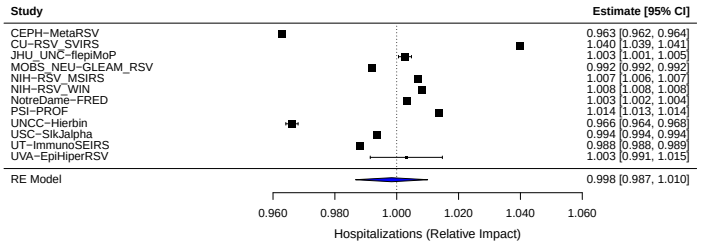


Relative Impact in Hospitalizations

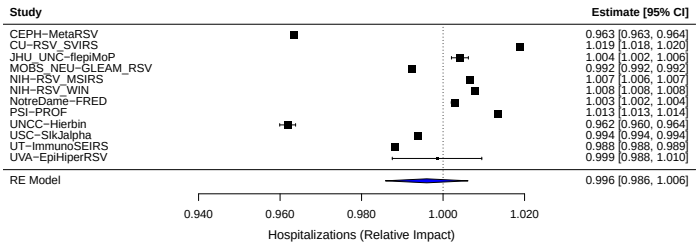
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − 0−130 years



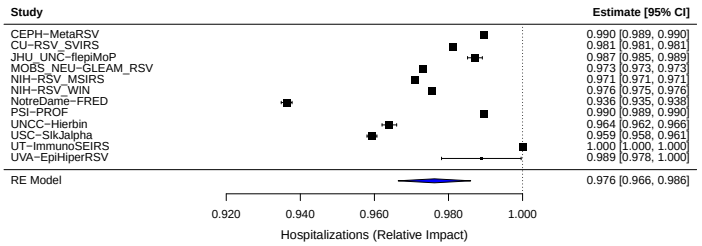
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − 0−130 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − 0−130 years



Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − 0−130 years

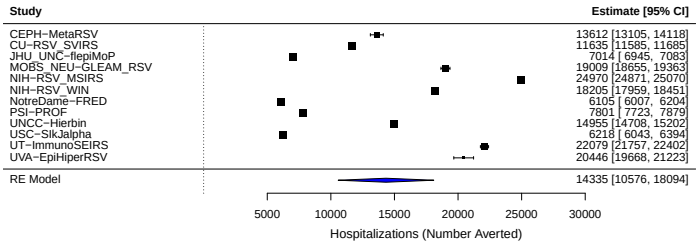


Infants: National Estimates of Hospitalizations averted by Infant and Senior Immunization as compared to the Counterfactual

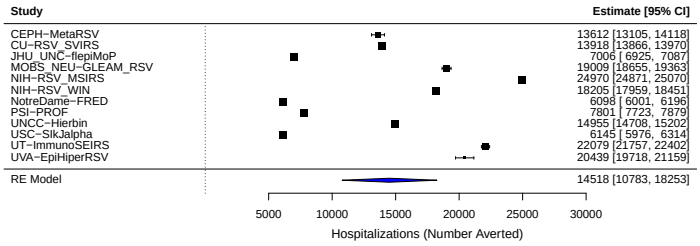
Number of Hospitalizations Averted Among Infants (0 - 0.99 yrs)

Estimates of hospitalizations averted contrasting cumulative projections at the end of the season for each vaccine scenario vs the counterfactual scenario.

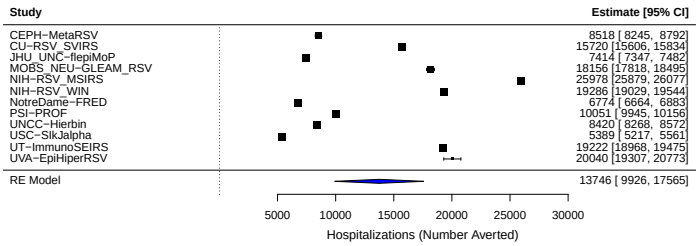
Early Infant, Optimistic Senior VS Counterfactual
US − < 1 years



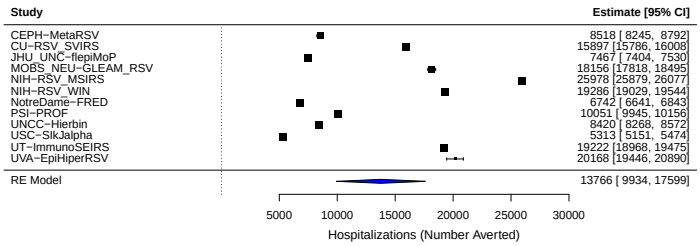
Early Infant, Pessimistic Senior VS Counterfactual
US − < 1 years



Classic Infant, Optimistic Senior VS Counterfactual
US − < 1 years



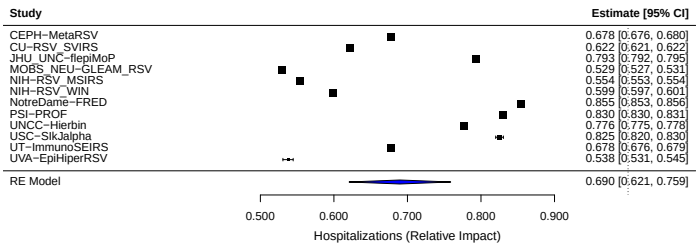
Classic Infant, Pessimistic Senior VS Counterfactual
US − < 1 years



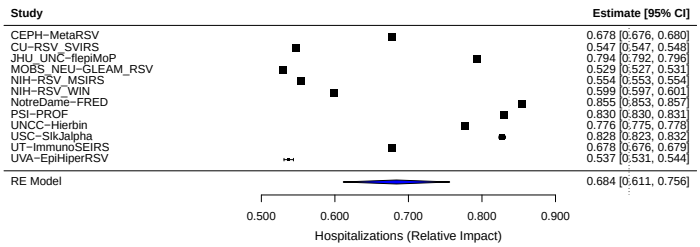
Relative Impact in Hospitalizations Among Infants (0 - 0.99 yrs)

Estimates of the relative impact in hospitalization contrasting cumulative projections at the end of the season for each vaccine scenario vs the counterfactual scenario.

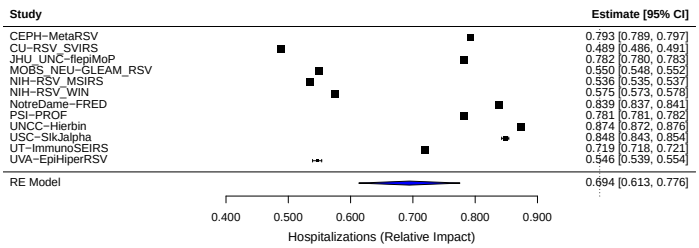
Early Infant, Optimistic Senior VS Counterfactual
US − < 1 years



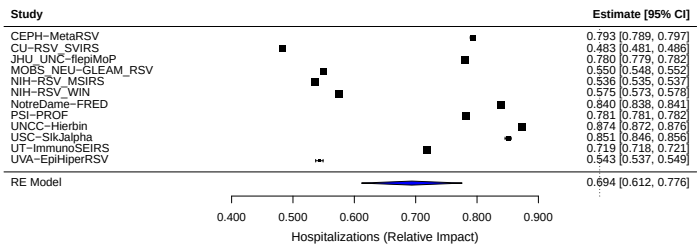
Early Infant, Pessimistic Senior VS Counterfactual
US − < 1 years



Classic Infant, Optimistic Senior VS Counterfactual
US − < 1 years



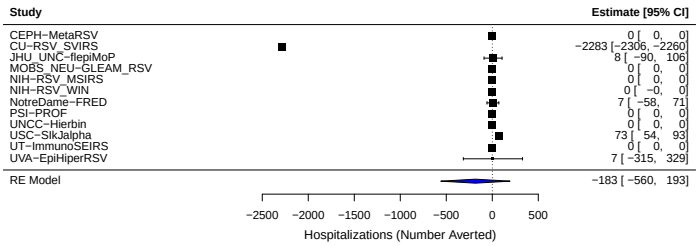
Classic Infant, Pessimistic Senior VS Counterfactual
US − < 1 years



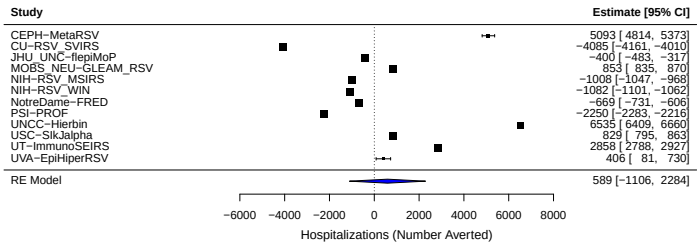
Infants: National Estimates of Hospitalizations averted by Optimistic vs Pessimistic Immunization

Number of Hospitalizations Averted Among Infants (0 - 0.99 yrs)

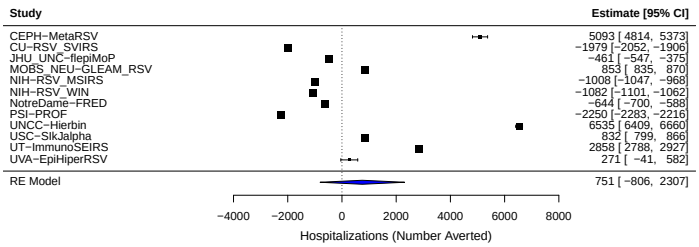
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − < 1 years



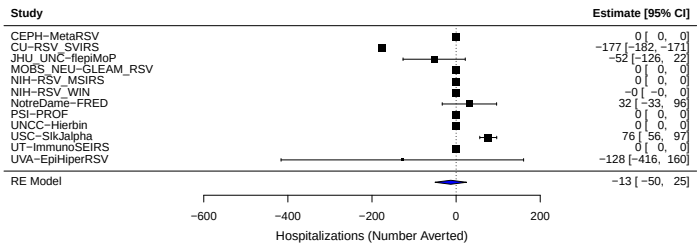
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − < 1 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − < 1 years

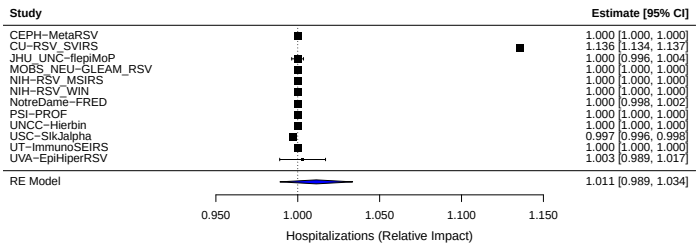


Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − < 1 years

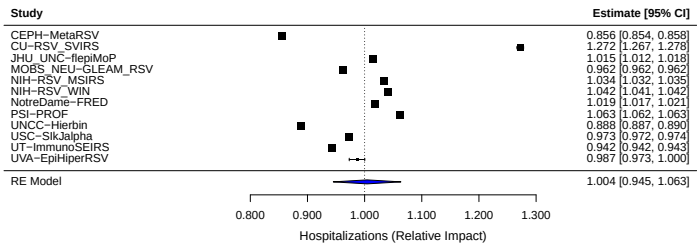


Relative Impact in Hospitalizations Among Infants (0 - 0.99 yrs)

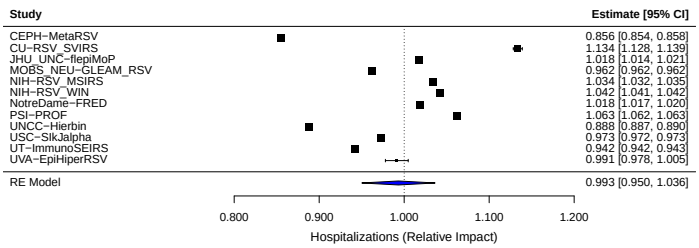
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − < 1 years



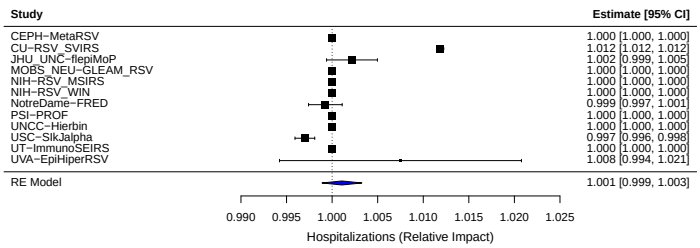
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − < 1 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − < 1 years



Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − < 1 years

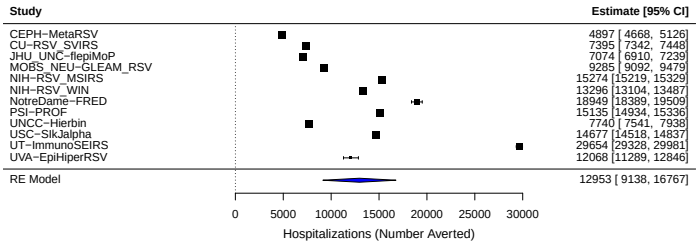


Seniors: National Estimates of Hospitalizations averted by Infant and Senior Immunization as compared to the Counterfactual

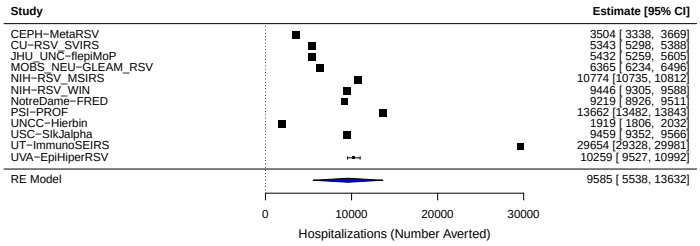
Number of Hospitalizations Averted Among Seniors (65 - 130 yrs)

Estimates of hospitalizations averted contrasting cumulative projections at the end of the season for each vaccine scenario vs the counterfactual scenario.

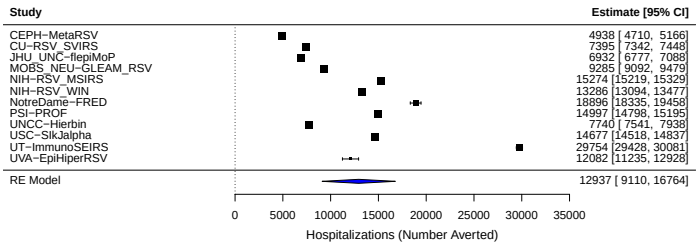
Early Infant, Optimistic Senior VS Counterfactual
US − 65−130 years



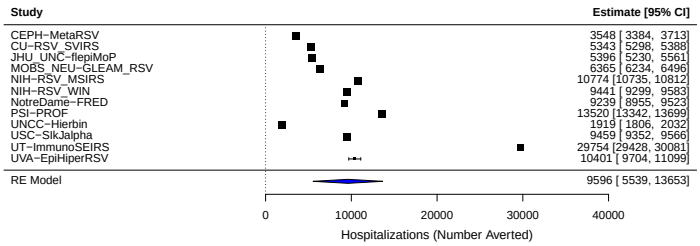
Early Infant, Pessimistic Senior VS Counterfactual
US − 65−130 years



Classic Infant, Optimistic Senior VS Counterfactual
US − 65−130 years



Classic Infant, Pessimistic Senior VS Counterfactual
US − 65−130 years



Relative Impact in Hospitalizations Among Seniors (65 - 130 yrs)

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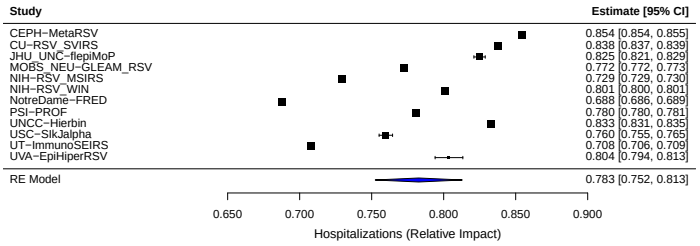
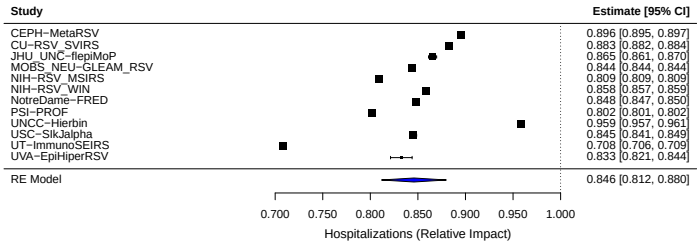
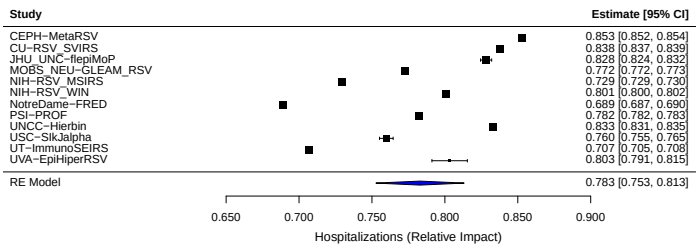
Early Infant, Optimistic Senior VS Counterfactual
US − 65−130 years



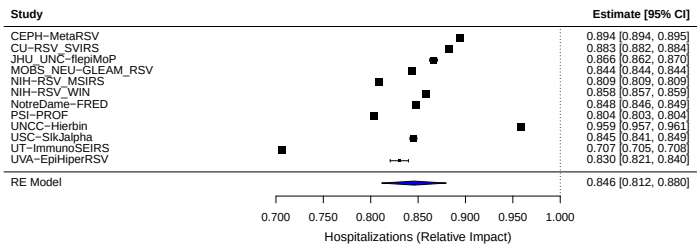
Early Infant, Pessimistic Senior VS Counterfactual
US − 65−130 years



Classic Infant, Optimistic Senior VS Counterfactual
US − 65−130 years



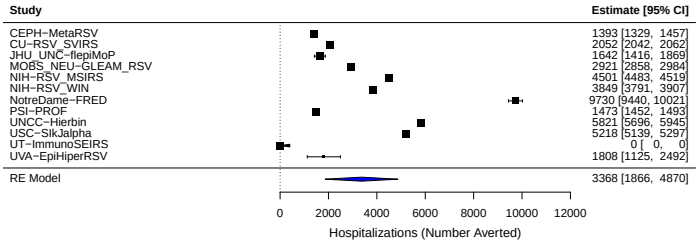
Classic Infant, Pessimistic Senior VS Counterfactual
US − 65−130 years



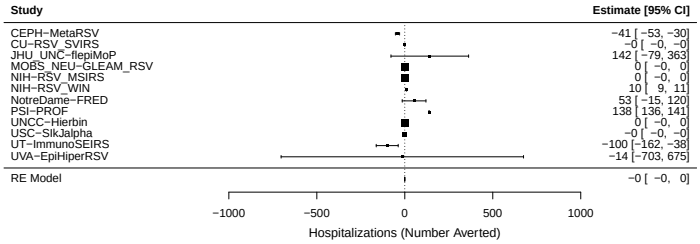
Seniors: National Estimates of Hospitalizations averted by Optimistic vs Pessimistic Immunization

Number of Hospitalizations Averted Among Seniors (65 - 130 yrs)

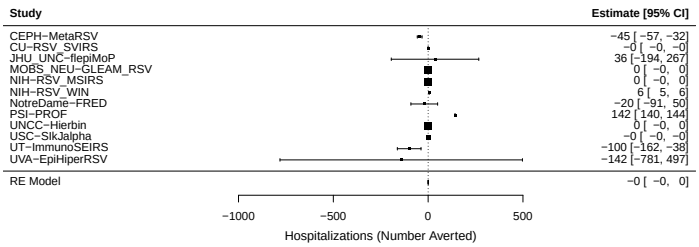
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − 65−130 years



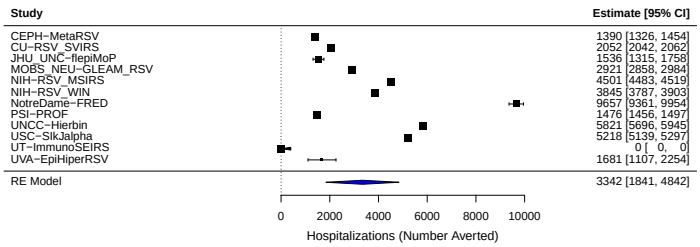
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − 65−130 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − 65−130 years

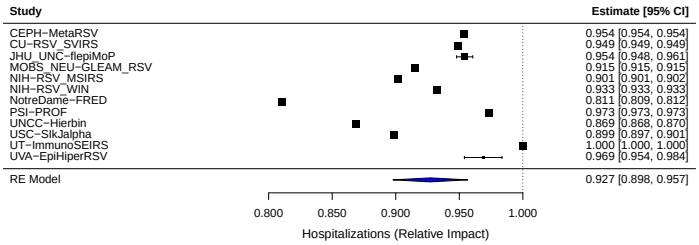


Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − 65−130 years

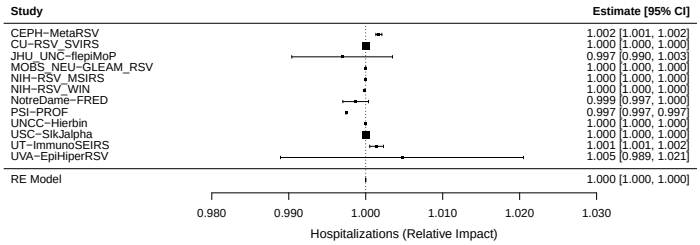


Relative Impact in Hospitalizations Among Seniors (65 - 130 yrs)

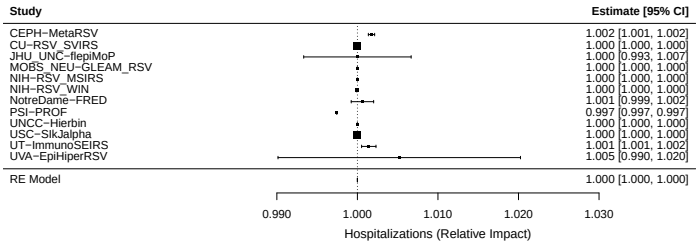
Early Infant, Optimistic Senior VS Early Infant, Pessimistic Senior
US − 65−130 years



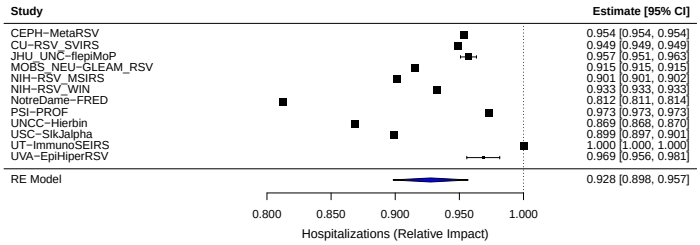
Early Infant, Optimistic Senior VS Classic Infant, Optimistic Senior
US − 65−130 years



Early Infant, Pessimistic Senior VS Classic Infant, Pessimistic Senior
US − 65−130 years



Classic Infant, Optimistic Senior VS Classic Infant, Pessimistic Senior
US − 65−130 years



Teams and models

- CEPH Lab at Indiana University - MetaRSV
- Marco Ajelli (Indiana University Bloomington), Shreeya Mhade (Indiana University Bloomington), Paulo C. Ventura (Indiana University Bloomington), Maria Litvinova (Indiana University Bloomington), Snigdha Agrawal (Indiana University Bloomington), Allisandra G. Kummer (Indiana University Bloomington), Kedir Turi (Indiana University Bloomington)
- Columbia University — RSV_SVIRS
- Teresa Yamana (CU), Sen Pei (CU)
- Johns Hopkins University and University of North Carolina at Chapel Hill - flepiMoP
- Sara Loo (JHU), Alison Hill (JHU), Joseph Lemaitre (UNC), Anjalika Nande (JHU), Madeleine Gastonguay (JHU), Sung-mok Jung (UNC), Timothy Willard (UNC), Carl Pearson (UNC), Vivek Murali (JHU), Justin Lessler (UNC), Shaun Truelove (JHU)
- MOBS Lab at Northeastern University - GLEAM RSV Model
- Alessandro Vespignani (Network Science Institute, NEU), Matteo Chinazzi (The Roux Institute, NEU, Portland (ME); Network Science Institute, NEU), Jessica T. Davis (Network Science Institute, NEU), Clara Bay (Network Science Institute, NEU), Guillaume St-Onge (The Roux Institute, NEU, Portland (ME); Network Science Institute, NEU),
- National Institutes of Health - RSV_MSIRS
- Kaiyuan Sun (Fogarty International Center, NIH), Cécile Viboud (Fogarty International Center, NIH)
- National Institutes of Health - RSV_WIN
- Chelsea Hansen (Fogarty International Center, NIH), Samantha Bents (Fogarty International Center, NIH), Cécile Viboud (Fogarty International Center, NIH)
- Predictive Sciences - Package for Respiratory Disease Open-source Forecasting
- James Turtle (Predictive Science Inc), Michal Ben-Nun (Predictive Science Inc), Pete Riley (Predictive Science Inc)
- University of North Carolina Charlotte - Hierbin
- Chen S (UNCC), Janies D (UNCC), Paul R (UNCC)
- University of Notre Dame - FRED
- Sean Moore (UND), Alex Perkins (UND, Guido Espana (CDC Center for Forecasting and Analysis)
- University of Southern California - SIkJalpha
- Ajitesh Srivastava (USC), Majd Al Aawar (USC)
- University of Texas at Austin - UT-ImmunoSEIRS
- Kaiming Bi (UTA), Shraddha Ramdas Bandekar (UTA), Anass Bouchnita (The University of Texas at El Paso), Spencer J. Fox (The University of Georgia), Lauren Ancel Meyers (UTA)
- University of Virginia - EpiHiper Scenario Modeling for RSV
- Jiangzhuo Chen (UVA), Stefan Hoops (UVA), Bryan Lewis (UVA), Srini Venkatramanan (UVA), Parantapa Bhattacharya (UVA), Dustin Machi (UVA), Madhav Marathe (UVA)

Past Teams and Models

- National Institutes of Health - RSV_Phenomenological
- Kaiyuan Sun (Fogarty International Center, NIH), Cécile Viboud (Fogarty International Center, NIH)

The RSV Scenario Modeling Hub Coordination Team

- Shaun Truelove, Johns Hopkins University
- Cécile Viboud, NIH Fogarty
- Justin Lessler, University of North Carolina
- Sara Loo, Johns Hopkins University
- Lucie Contamin, University of Pittsburgh

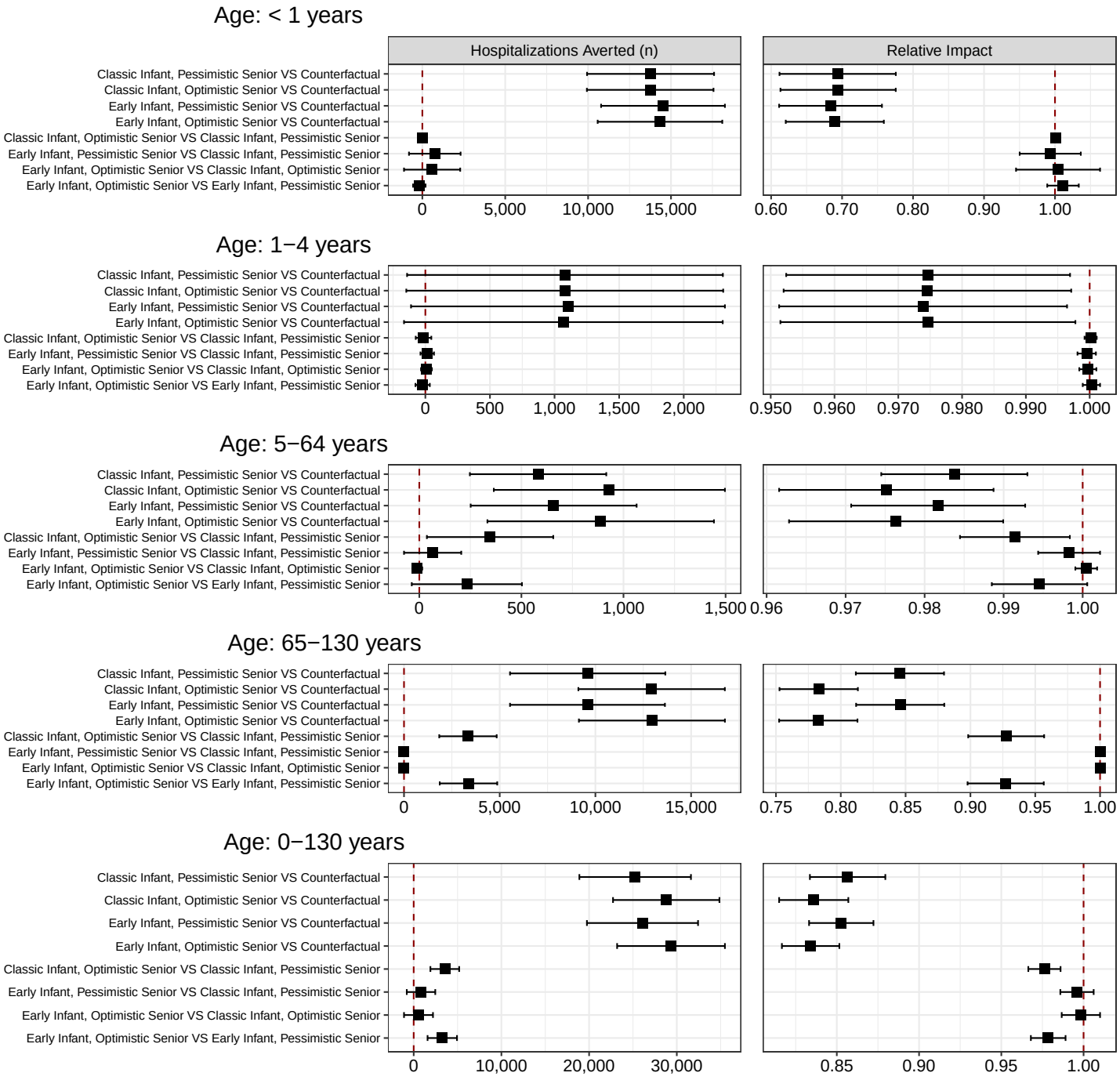
- Emily Howerton, Penn State University
- Claire Smith, Johns Hopkins University
- Harry Hochheiser, University of Pittsburgh
- Katriona Shea, Penn State University
- Michael Runge, USGS
- Erica Carcelen, John Hopkins University
- Sung-mok Jung, University of North Carolina
- Jessi Espino, University of Pittsburgh
- John Levander, University of Pittsburgh
- Samantha Bents, NIH Fogarty
- Katie Yan, Penn State University

Supplementary Information

State Impact of RSV Immunization Scenarios, by Age

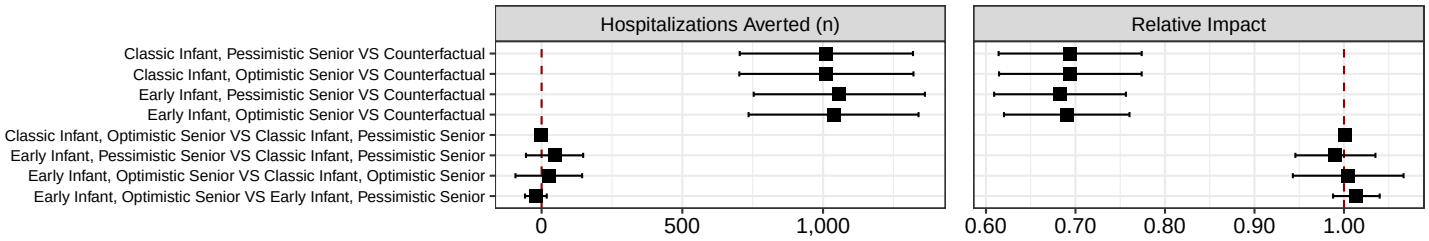
Estimates of cumulative hospitalizations averted and relative impact in hospitalization for July 28, 2024 to June 7, 2025 comparing scenarios, for the each state, by age group.

United States

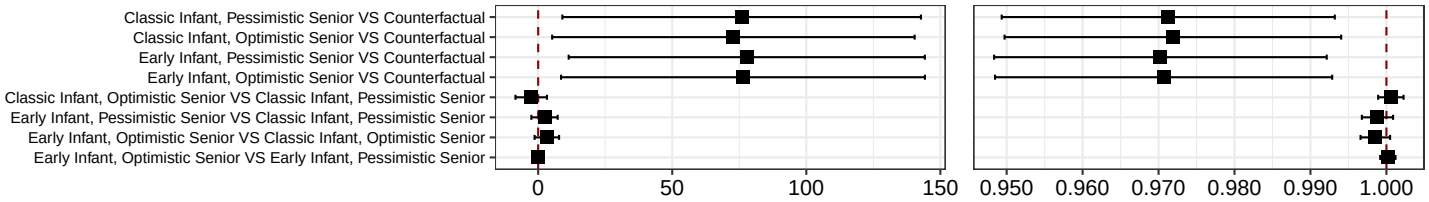


California

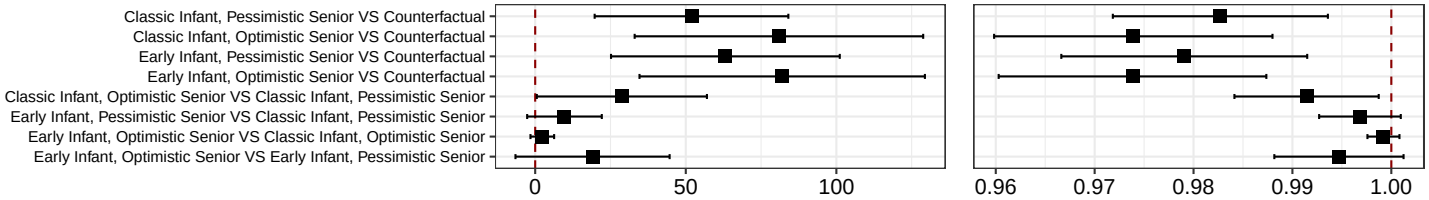
Age: < 1 years



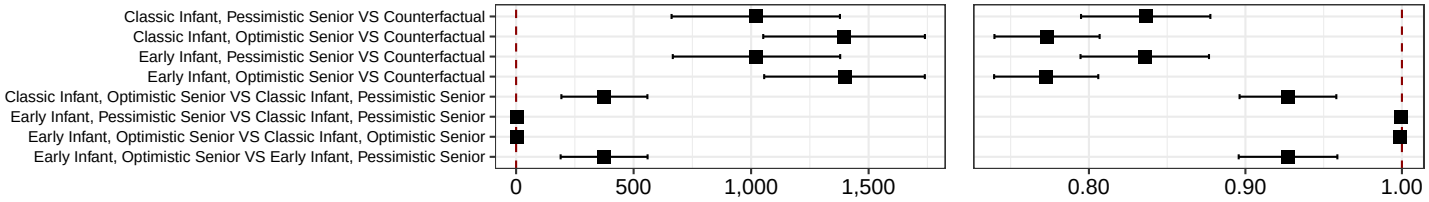
Age: 1−4 years



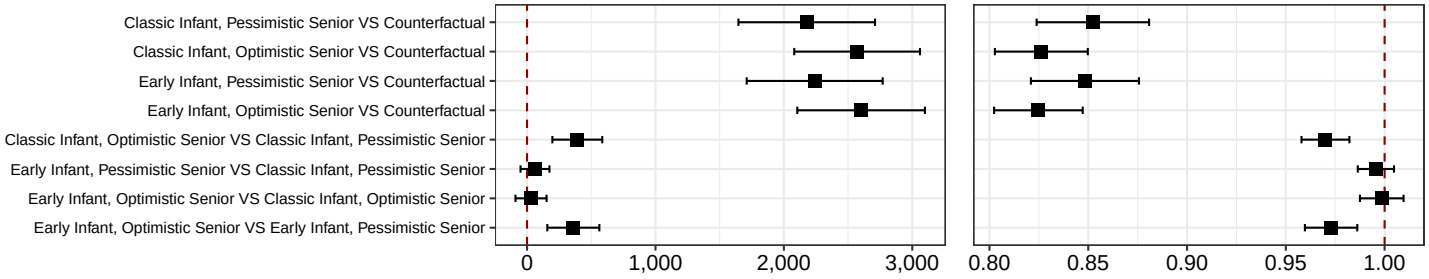
Age: 5−64 years



Age: 65−130 years

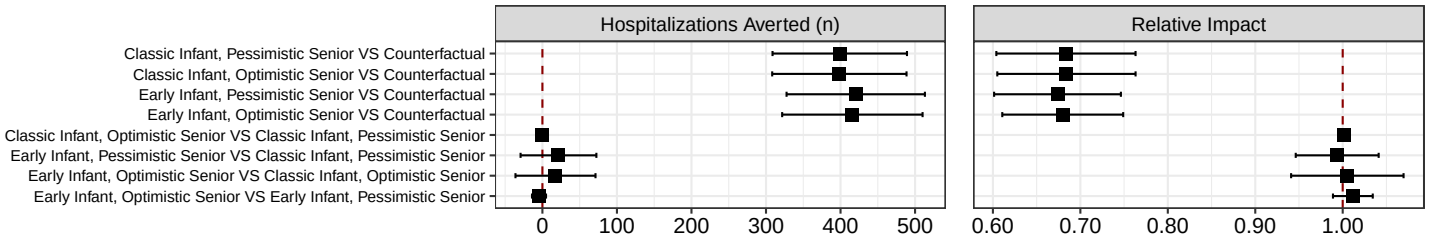


Age: 0−130 years

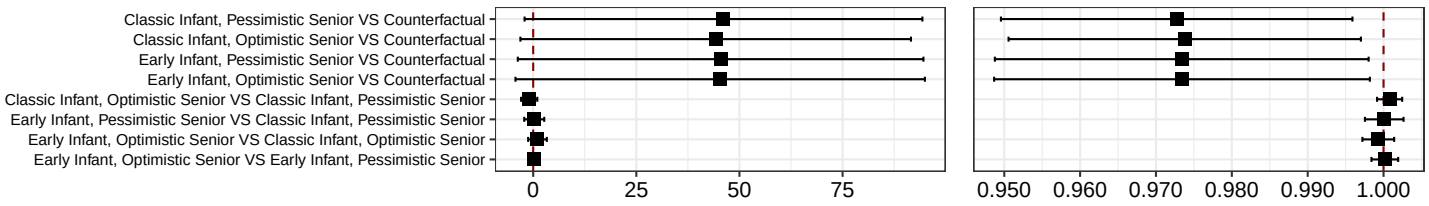


Colorado

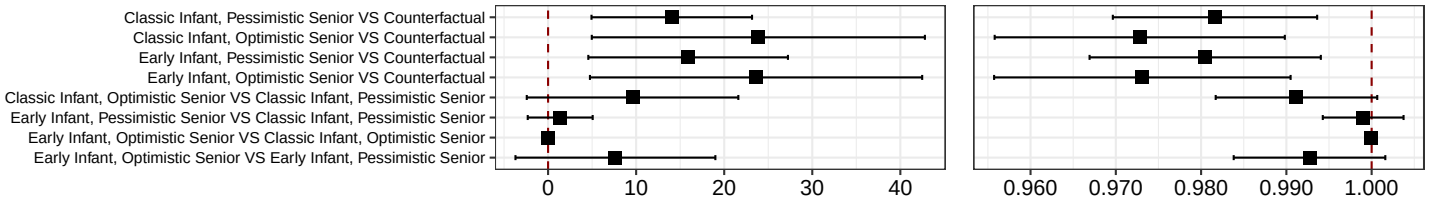
Age: < 1 years



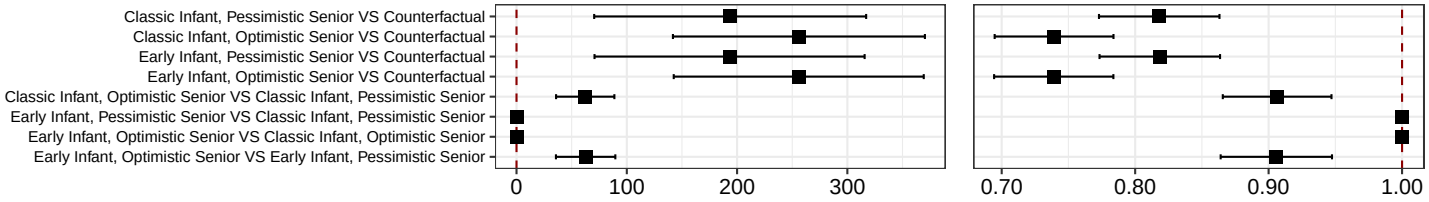
Age: 1−4 years



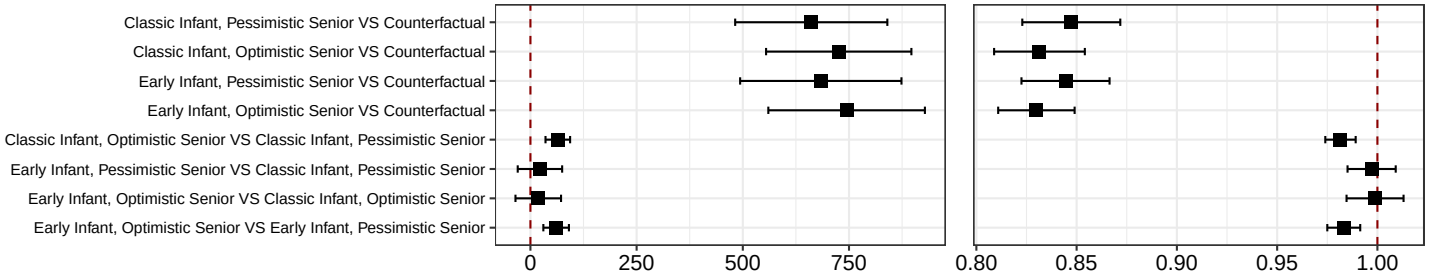
Age: 5−64 years



Age: 65−130 years

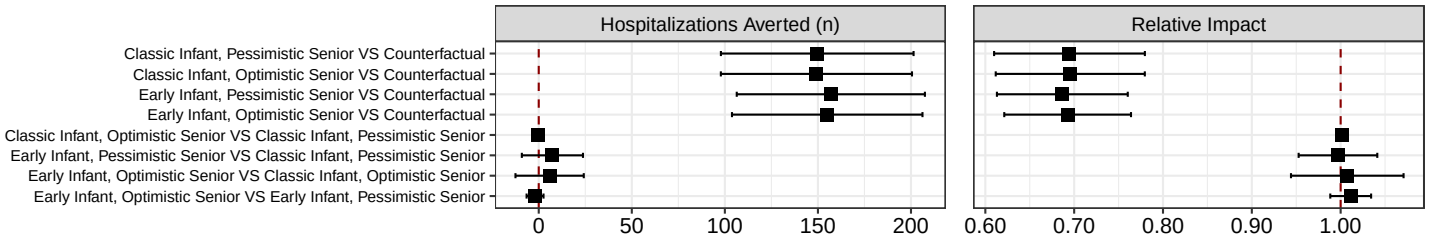


Age: 0−130 years

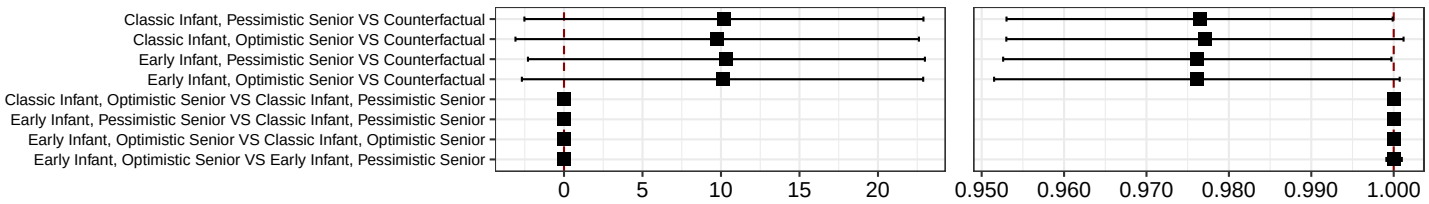


Connecticut

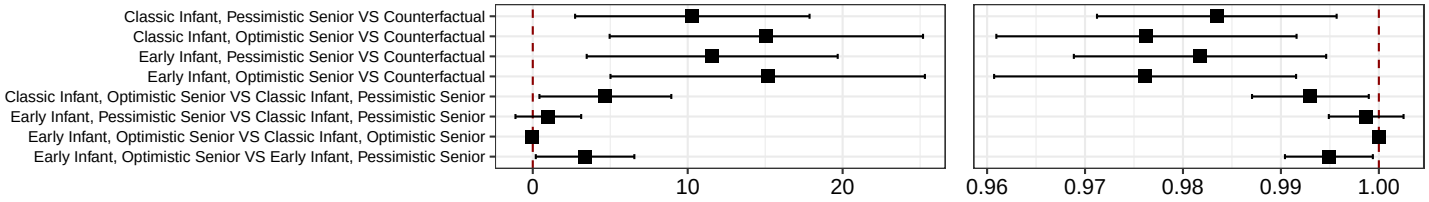
Age: < 1 years



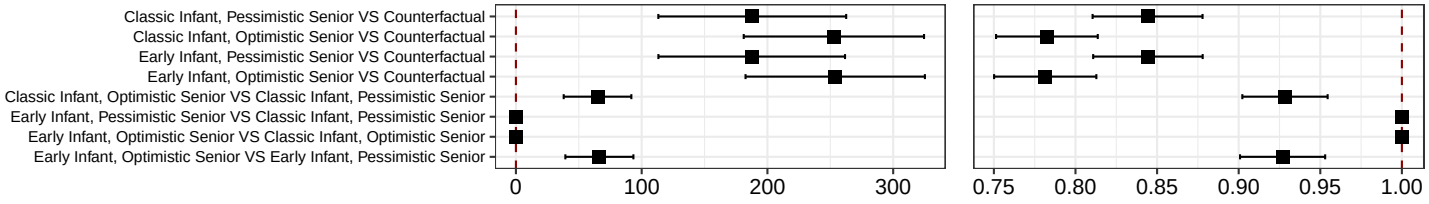
Age: 1−4 years



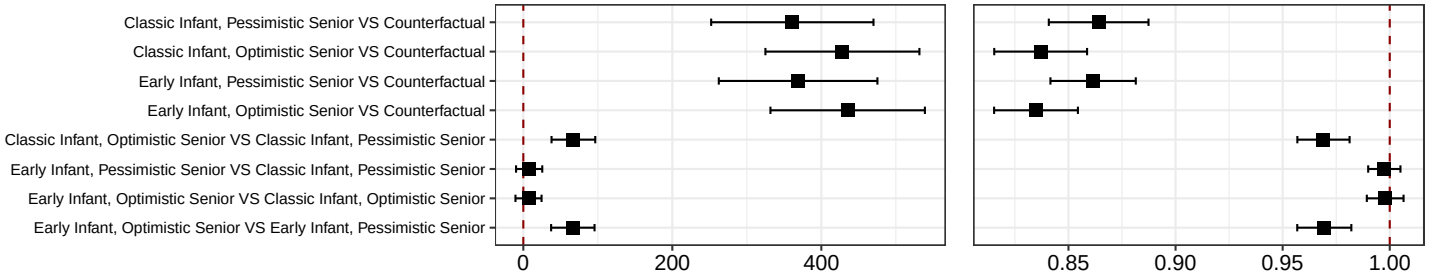
Age: 5−64 years



Age: 65−130 years

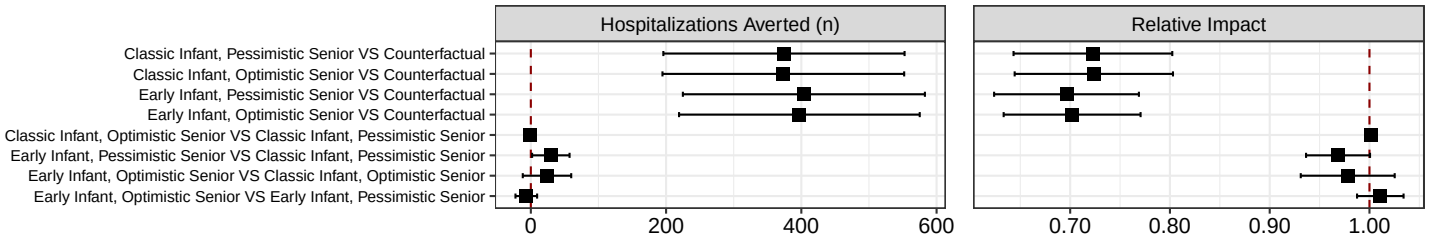


Age: 0−130 years

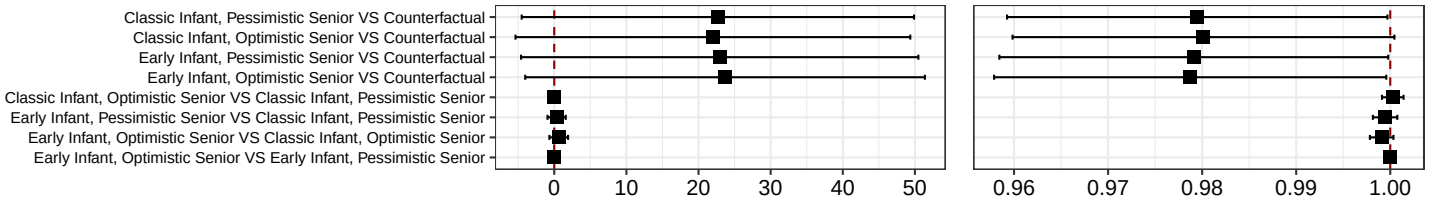


Georgia

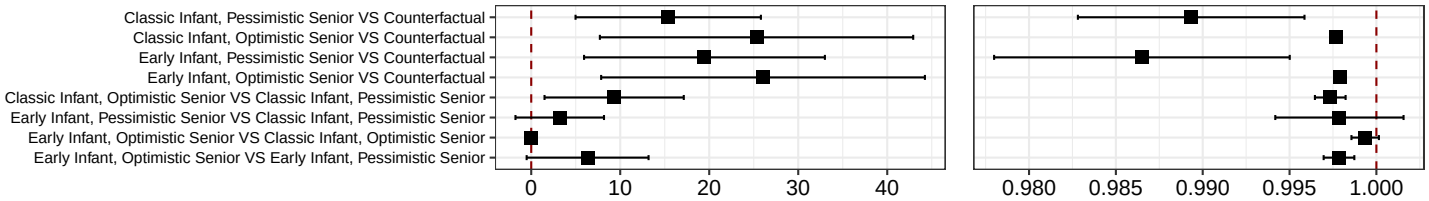
Age: < 1 years



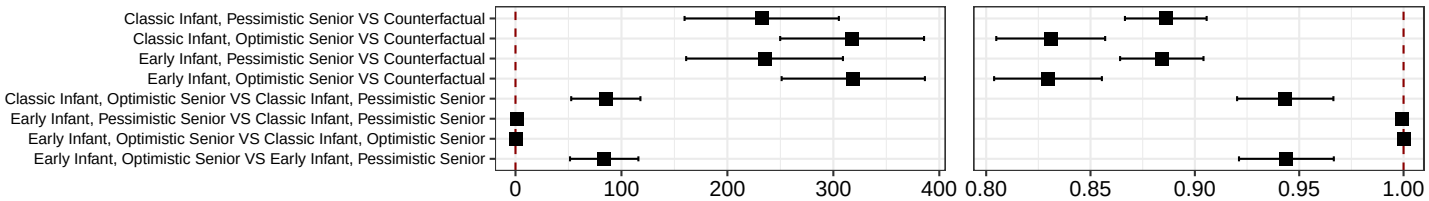
Age: 1−4 years



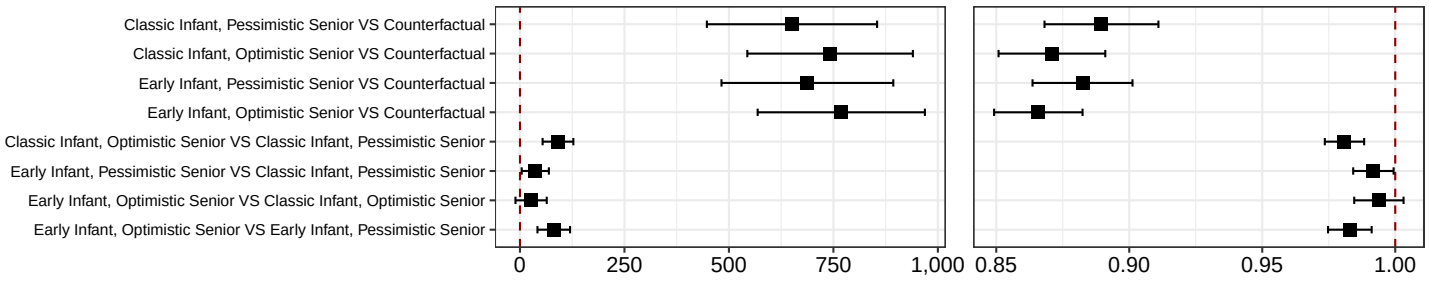
Age: 5−64 years



Age: 65−130 years

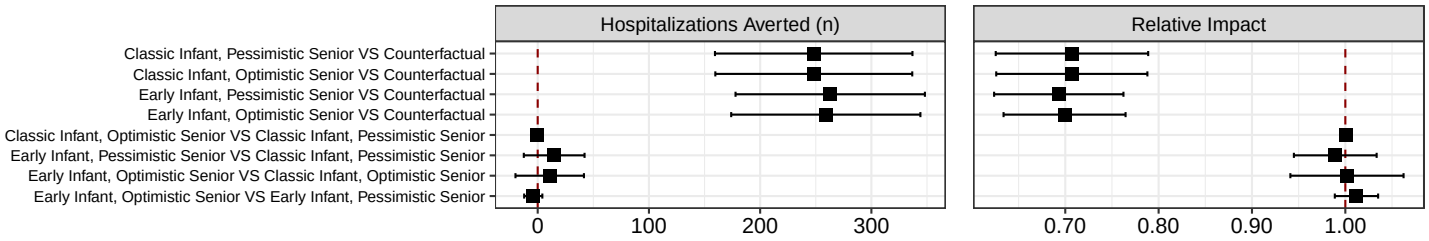


Age: 0−130 years

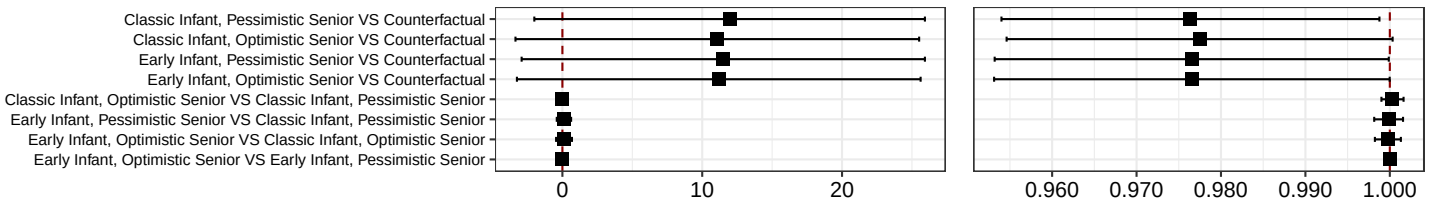


Maryland

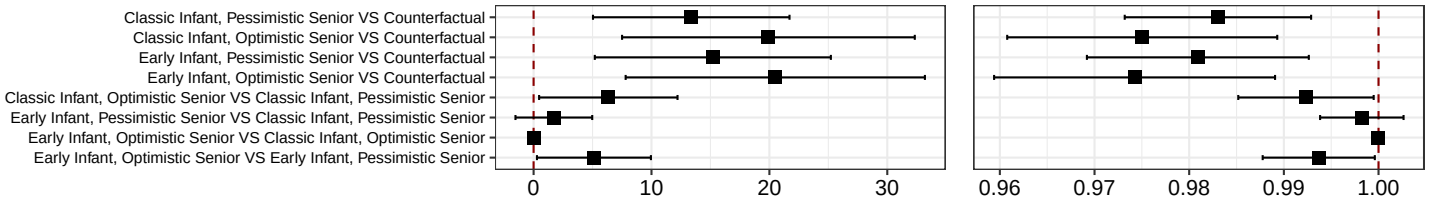
Age: < 1 years



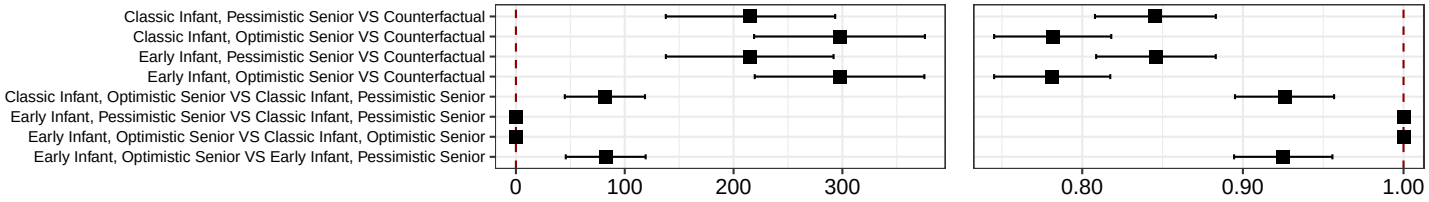
Age: 1−4 years



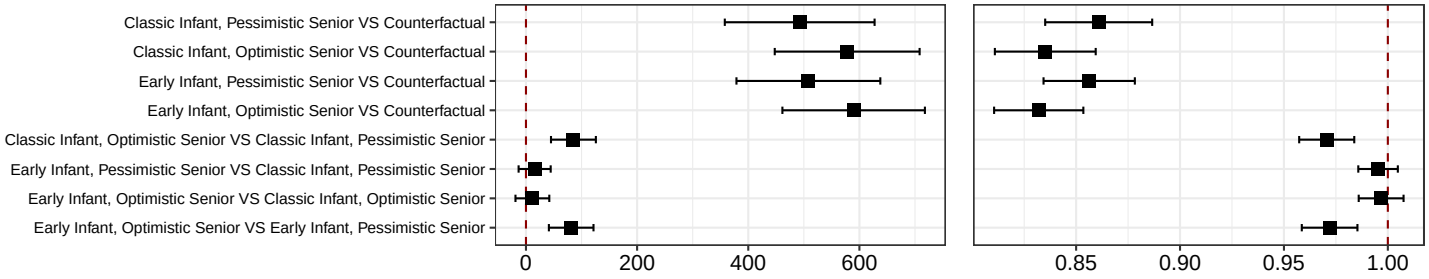
Age: 5−64 years



Age: 65−130 years

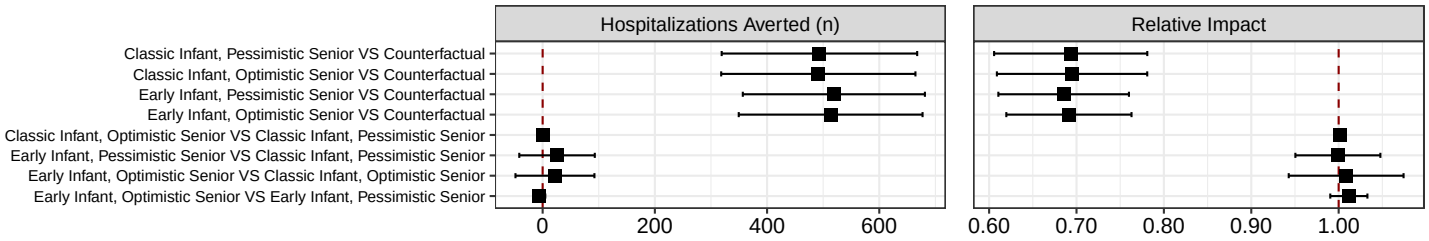


Age: 0−130 years

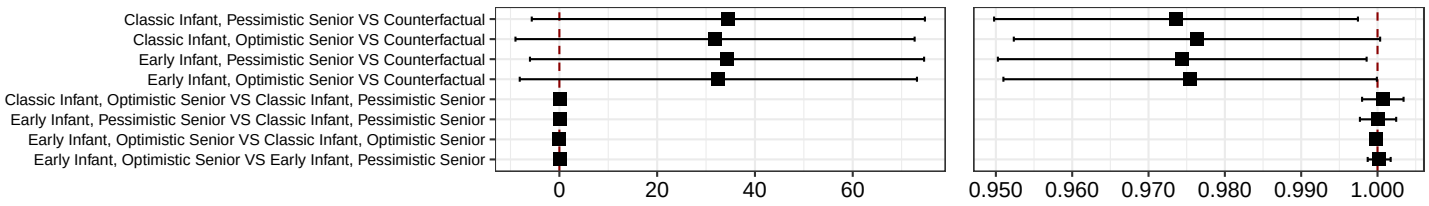


Michigan

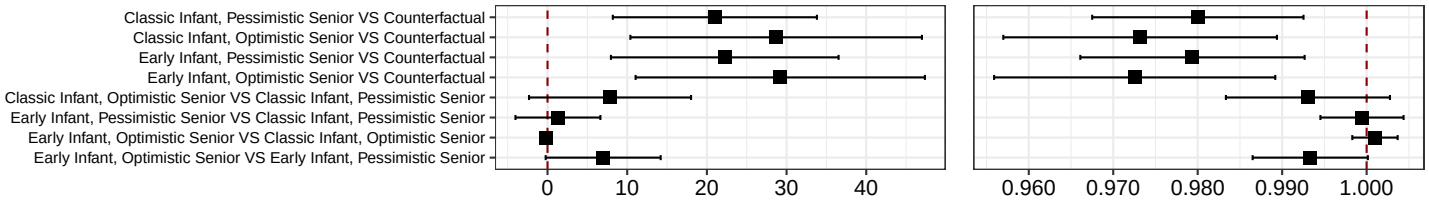
Age: < 1 years



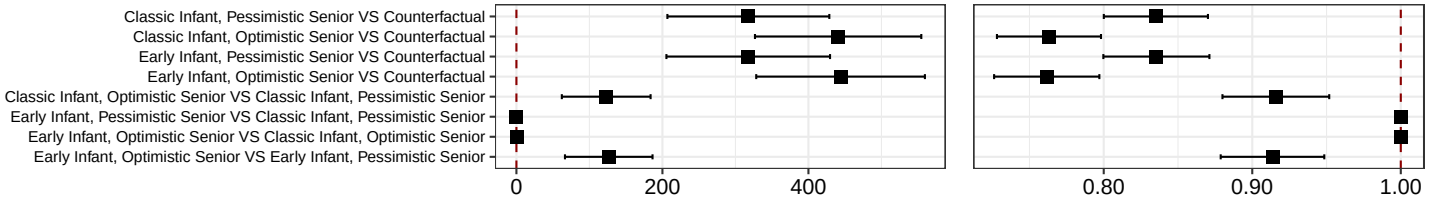
Age: 1−4 years



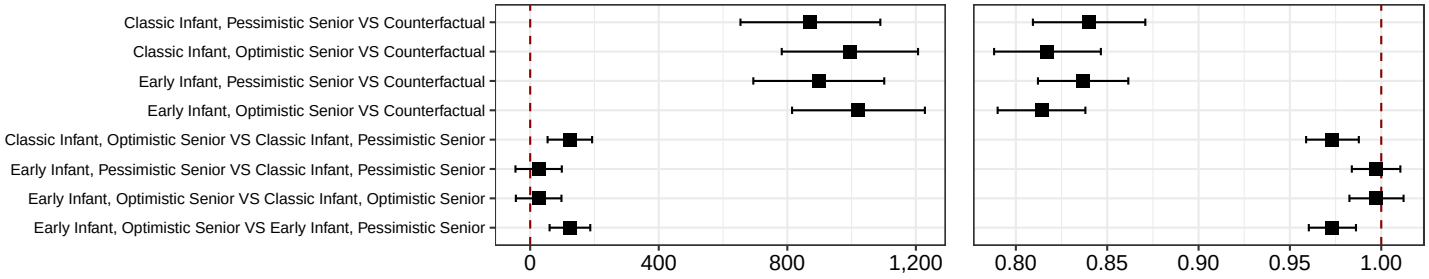
Age: 5−64 years



Age: 65−130 years

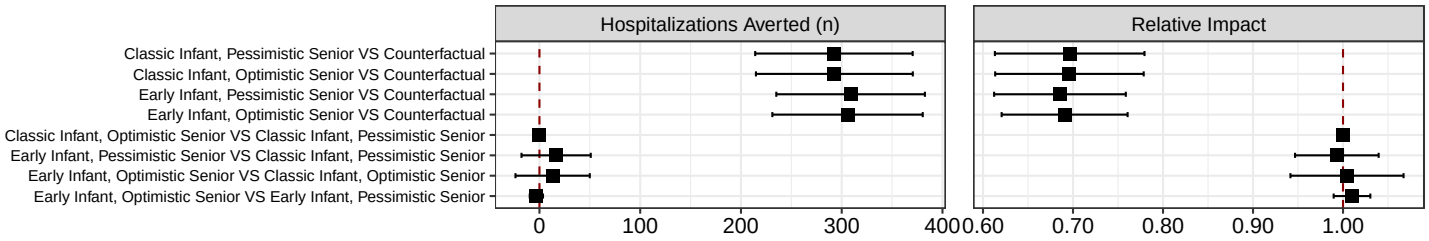


Age: 0−130 years

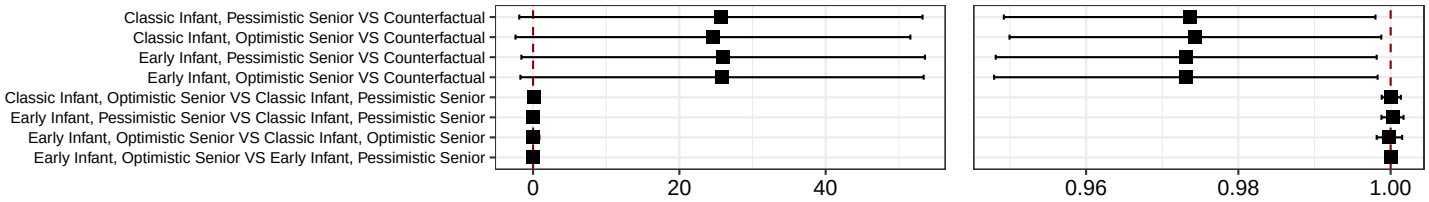


Minnesota

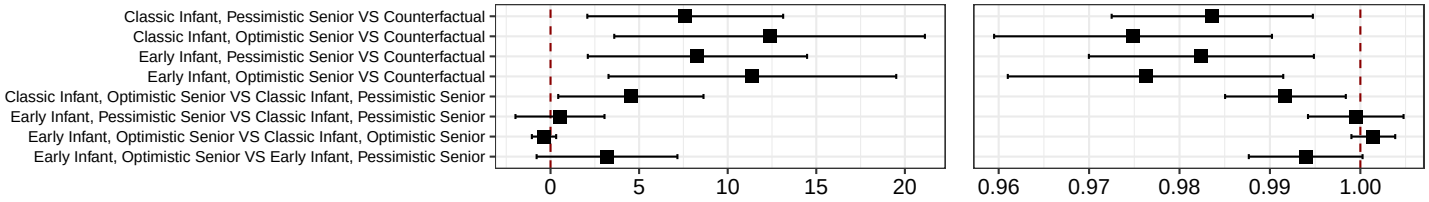
Age: < 1 years



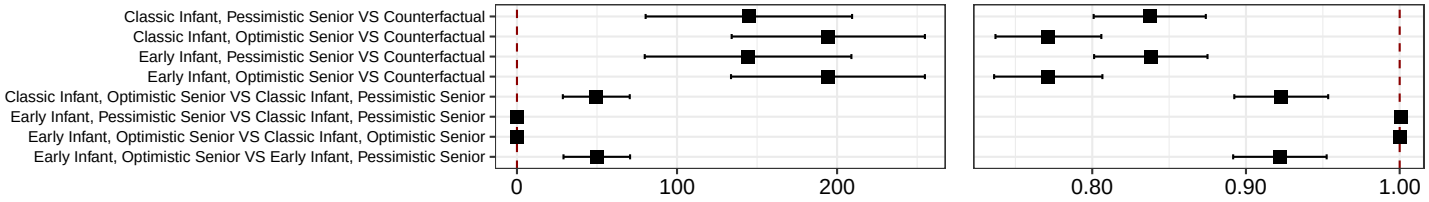
Age: 1−4 years



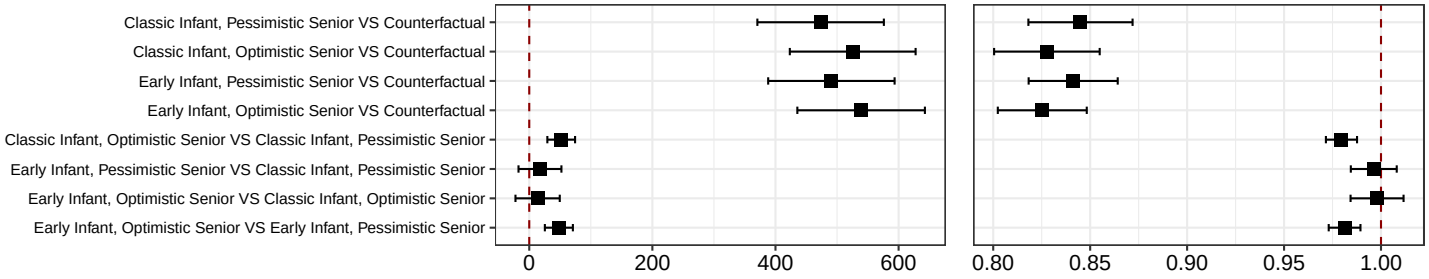
Age: 5−64 years



Age: 65−130 years

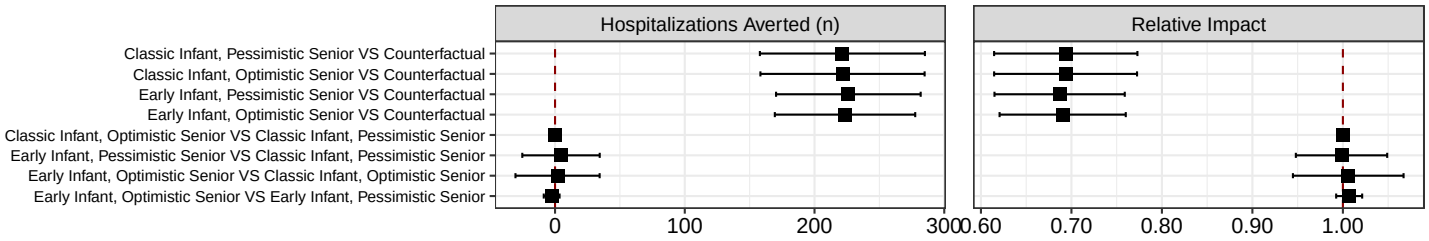


Age: 0−130 years

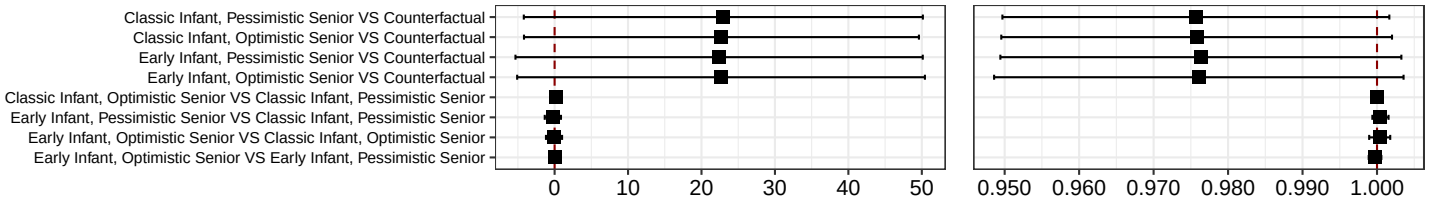


New Mexico

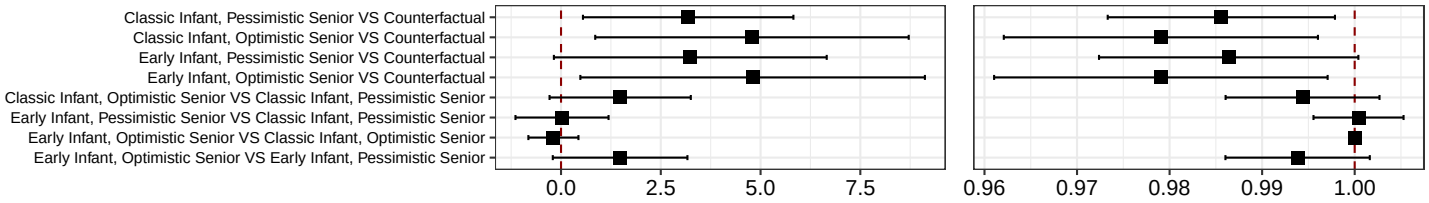
Age: < 1 years



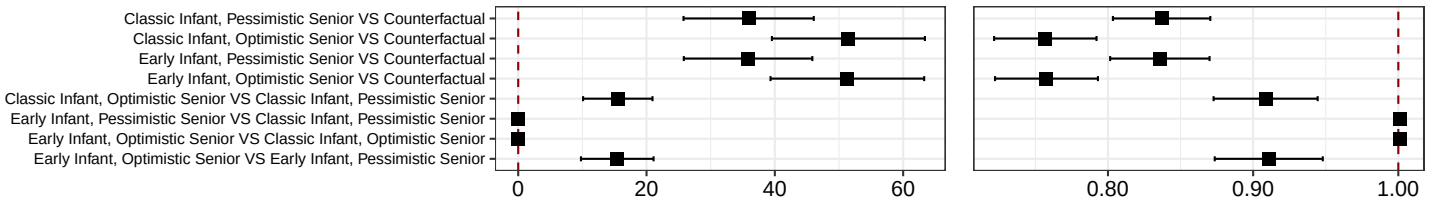
Age: 1−4 years



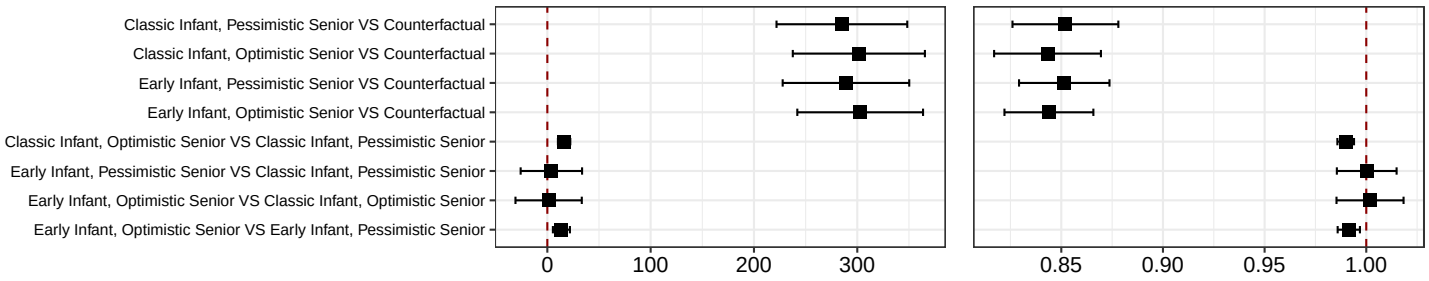
Age: 5−64 years



Age: 65−130 years

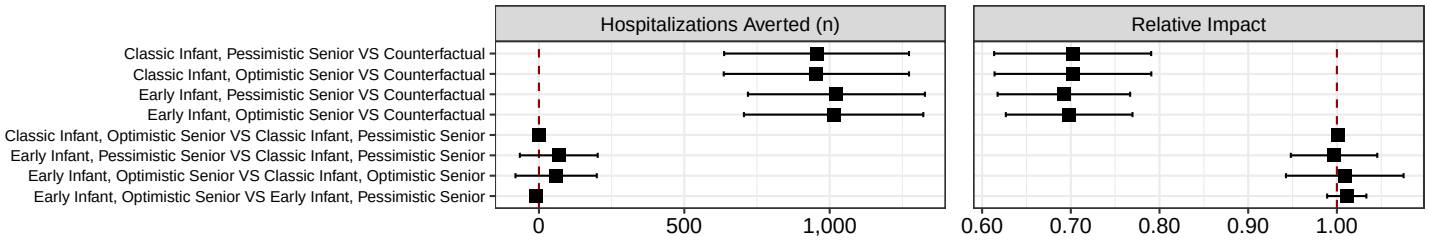


Age: 0−130 years

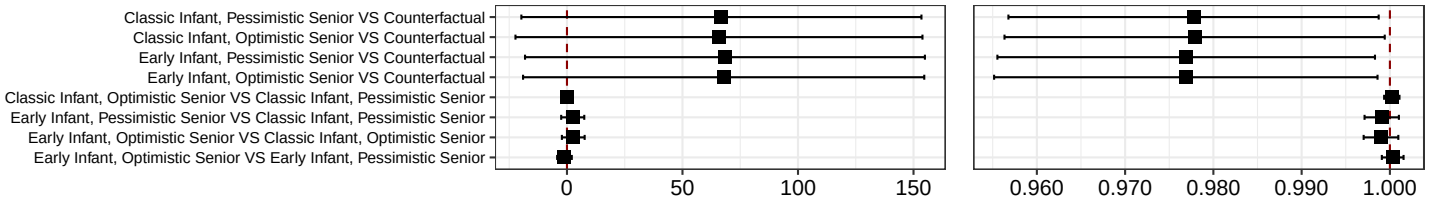


New York

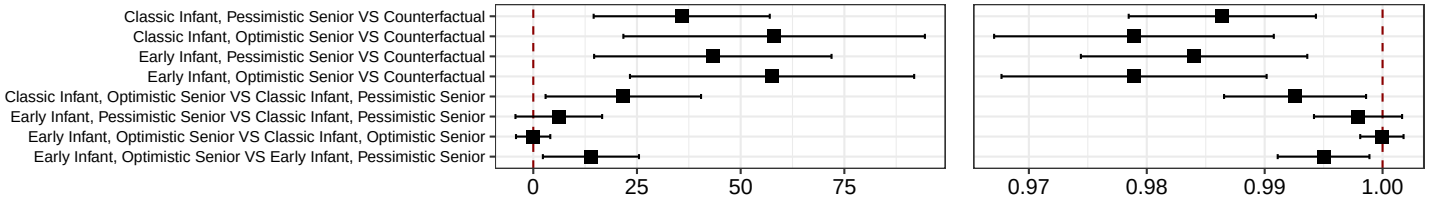
Age: < 1 years



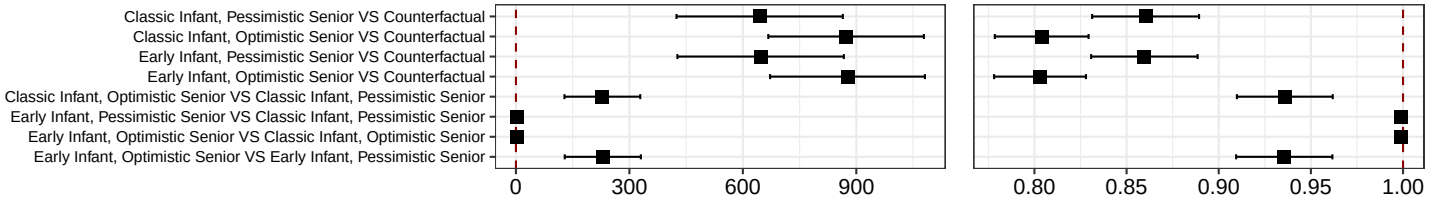
Age: 1−4 years



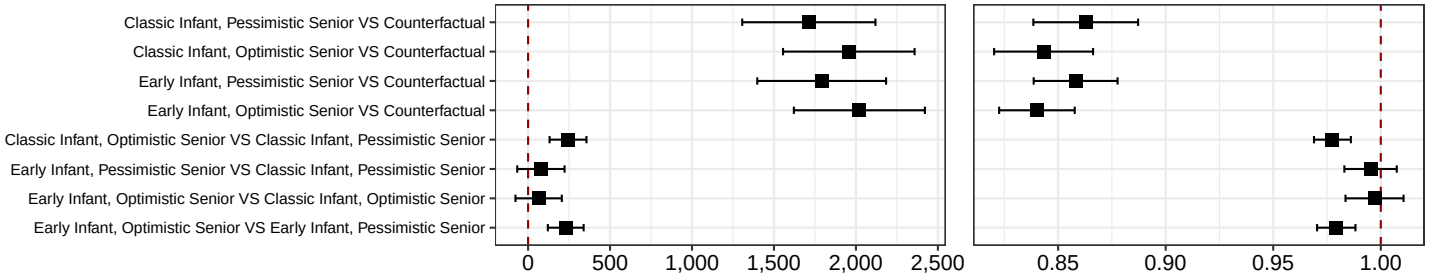
Age: 5−64 years



Age: 65−130 years

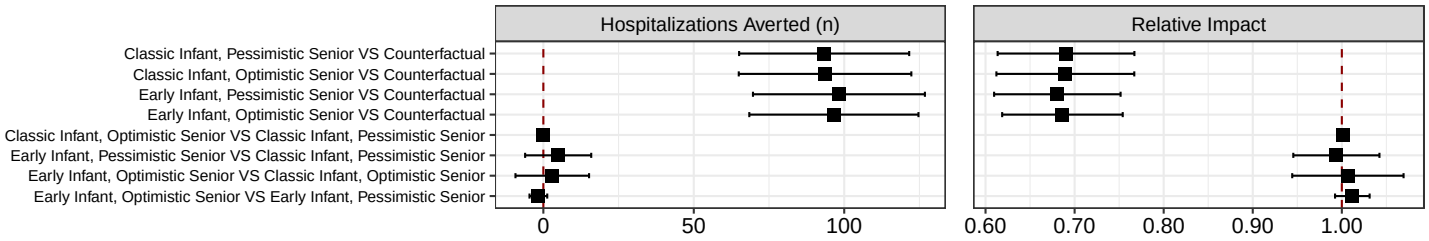


Age: 0−130 years

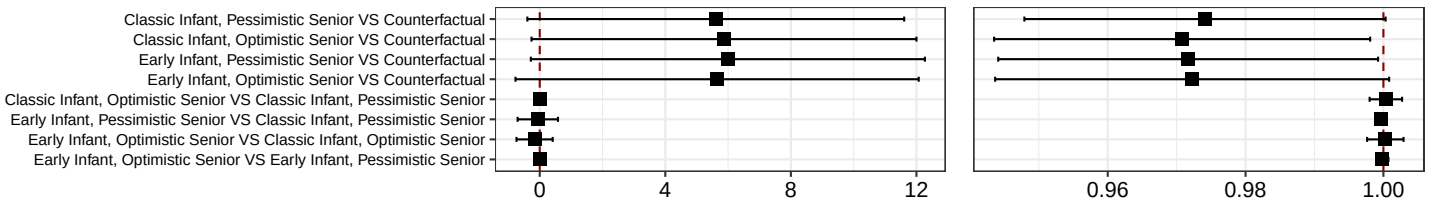


Oregon

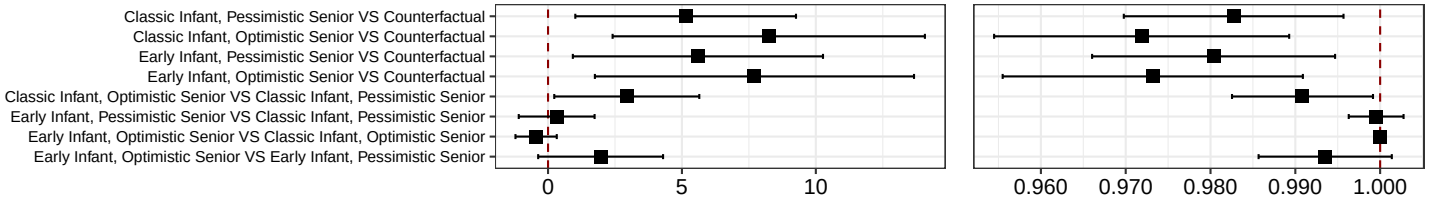
Age: < 1 years



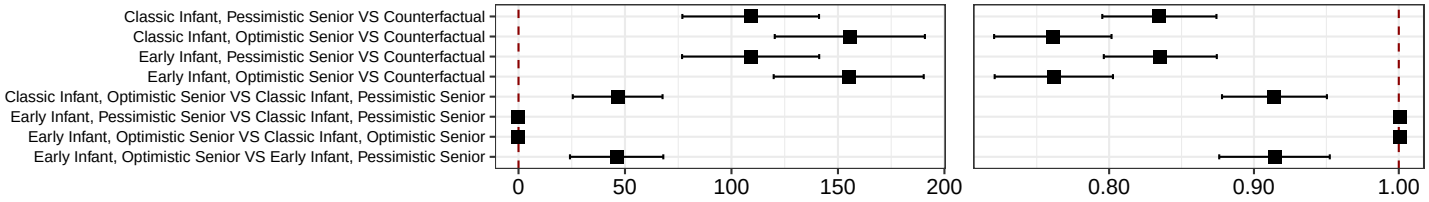
Age: 1−4 years



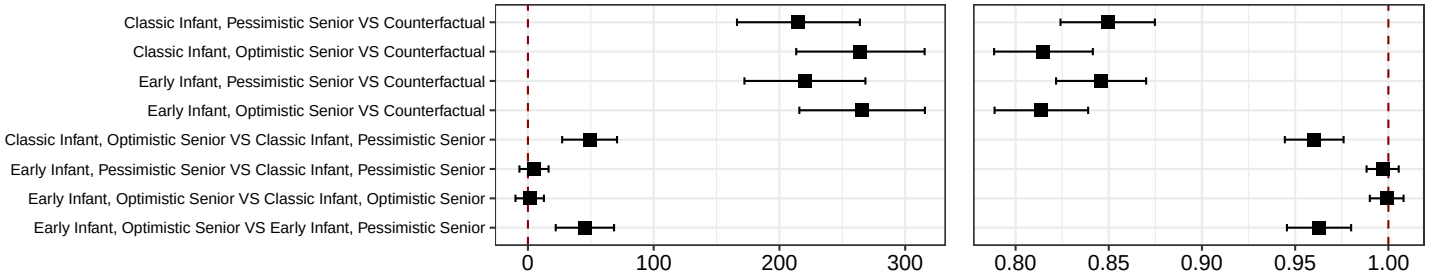
Age: 5−64 years



Age: 65−130 years

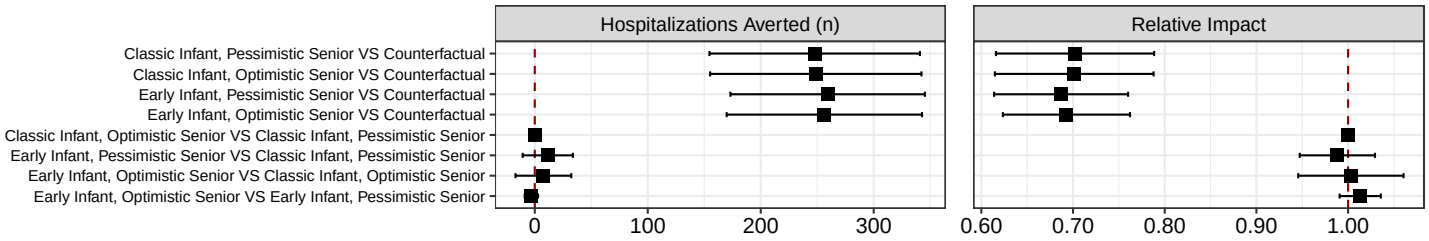


Age: 0−130 years

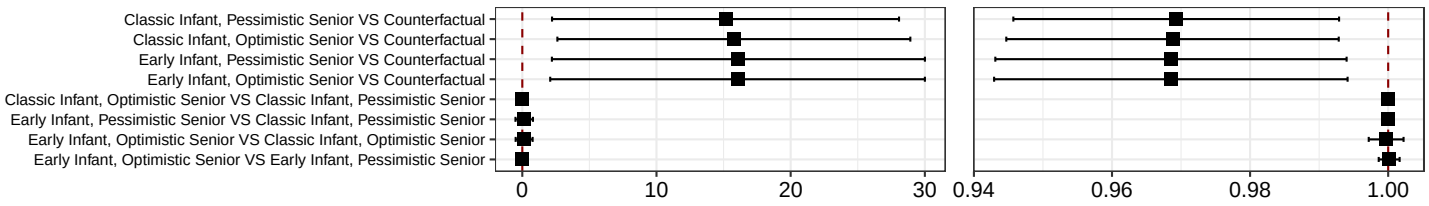


Tennessee

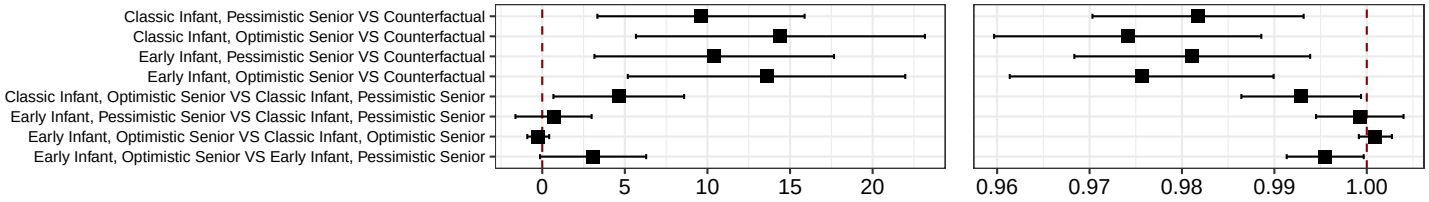
Age: < 1 years



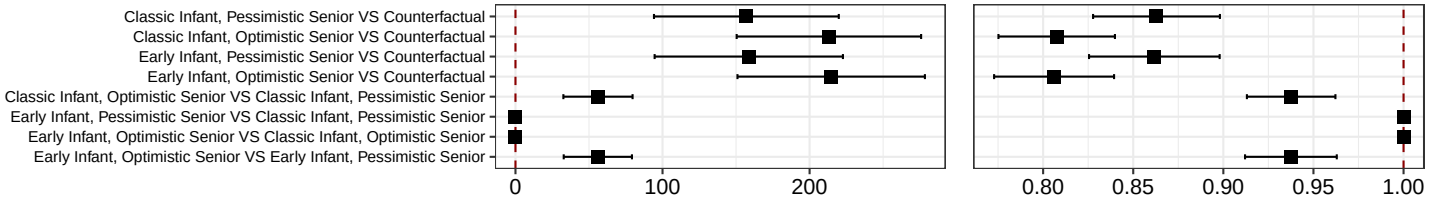
Age: 1−4 years



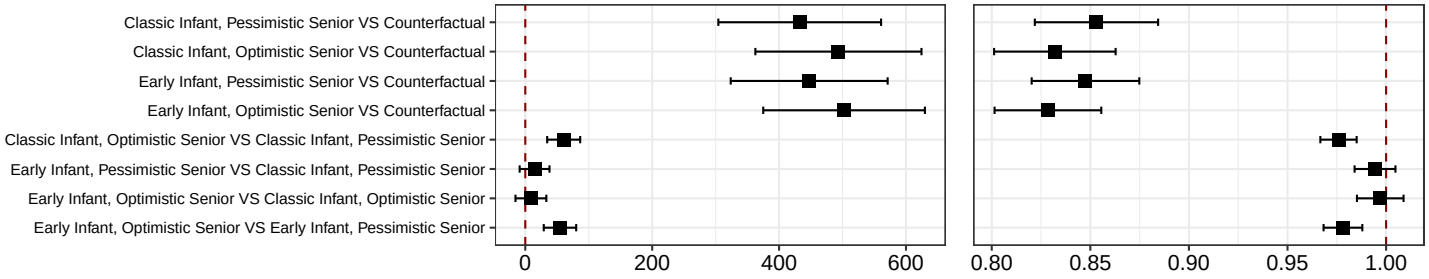
Age: 5−64 years



Age: 65−130 years

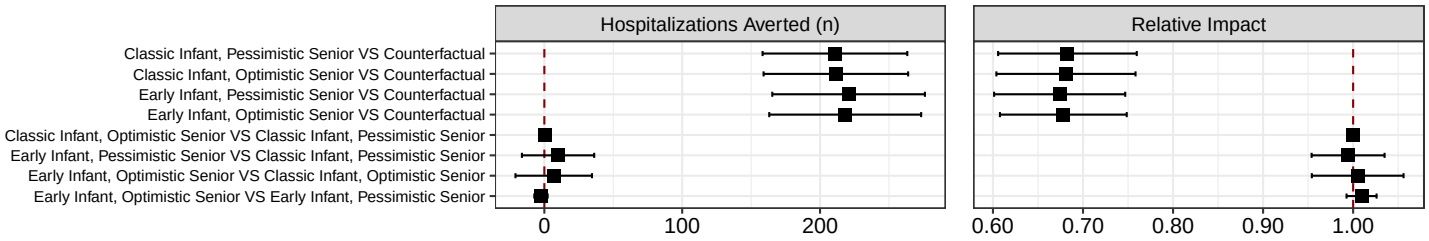


Age: 0−130 years

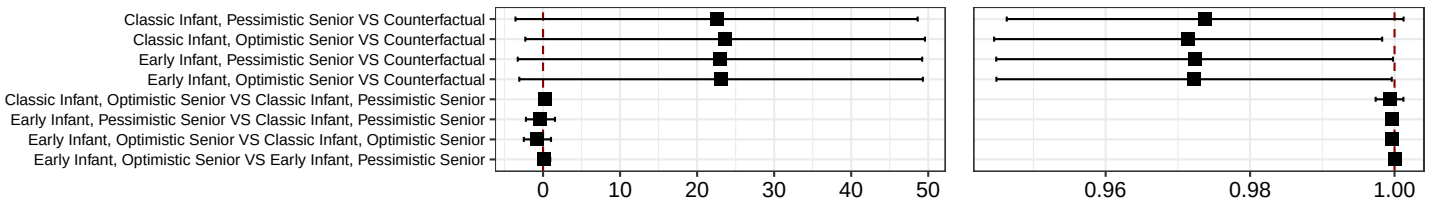


Utah

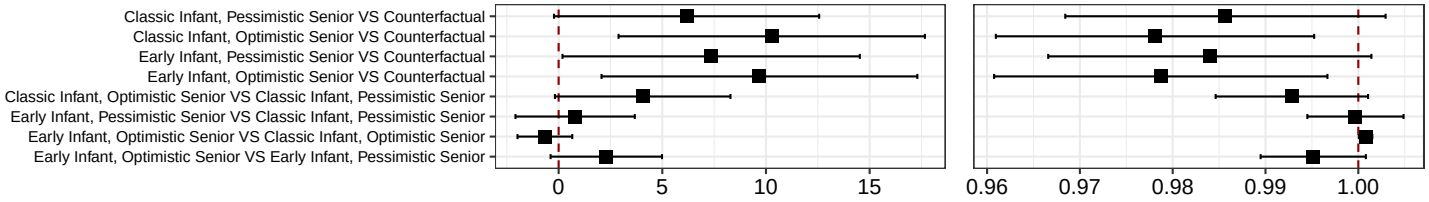
Age: < 1 years



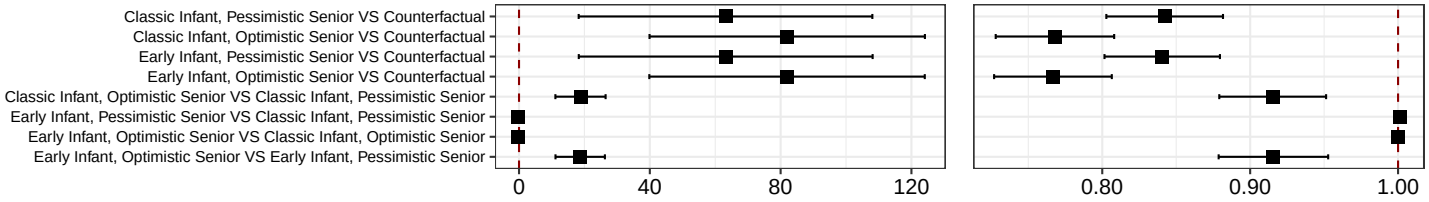
Age: 1−4 years



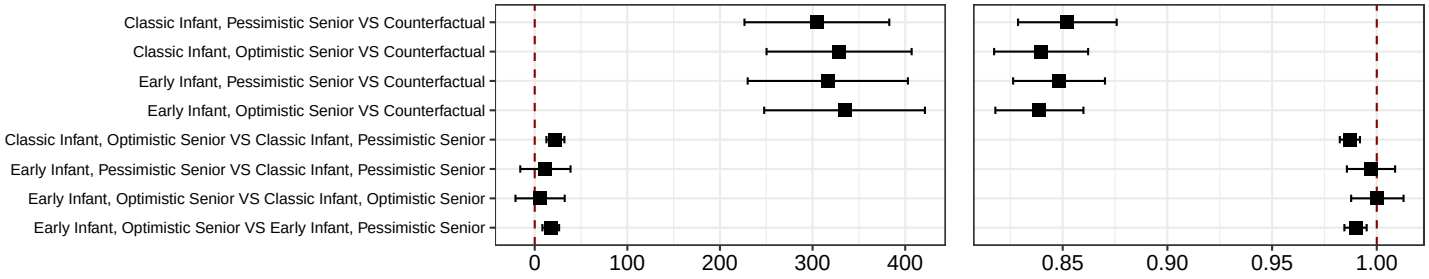
Age: 5−64 years



Age: 65−130 years

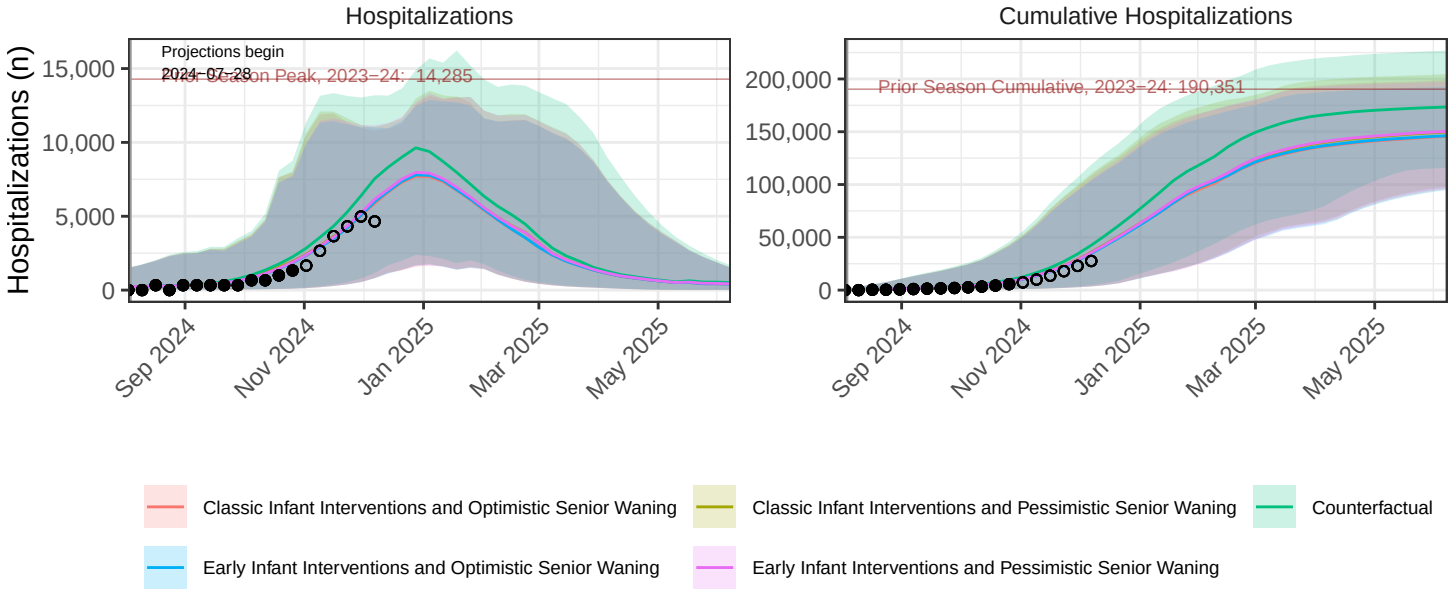


Age: 0−130 years

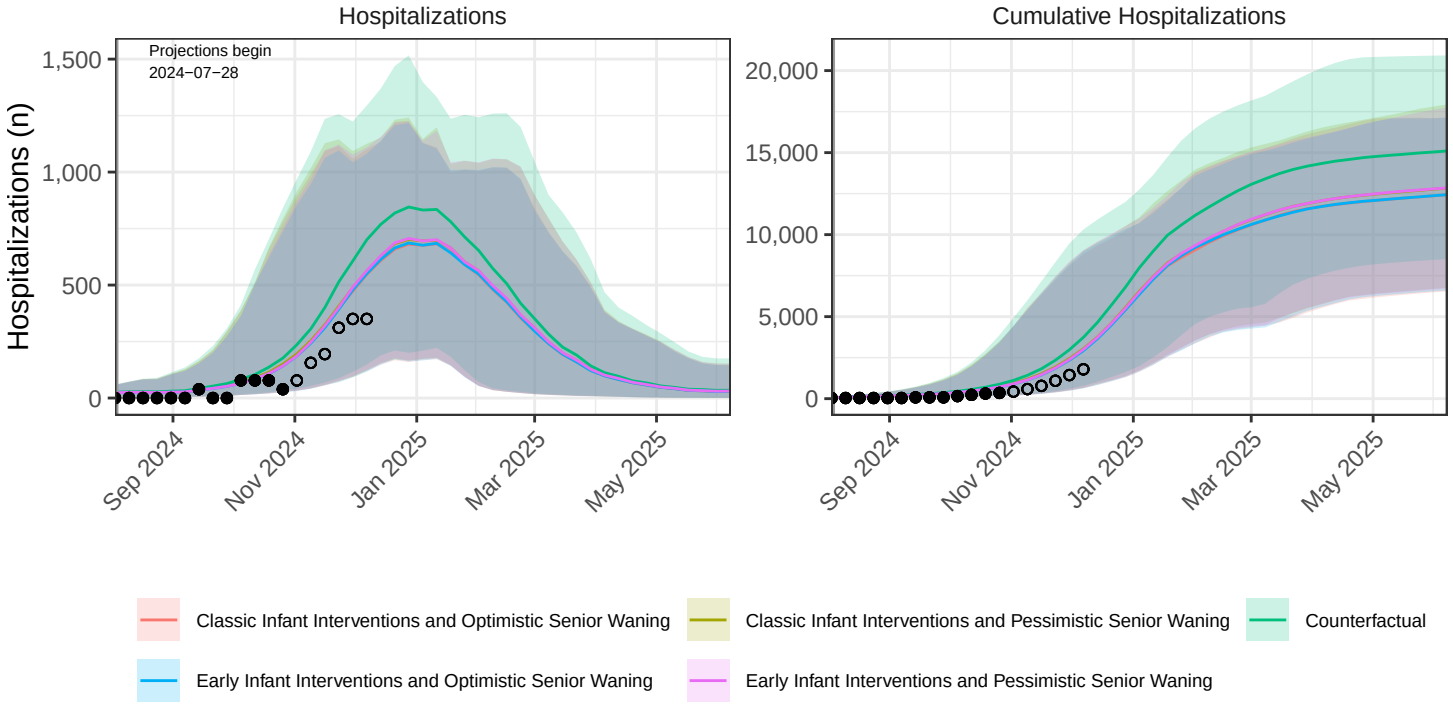


State Scenario Comparison

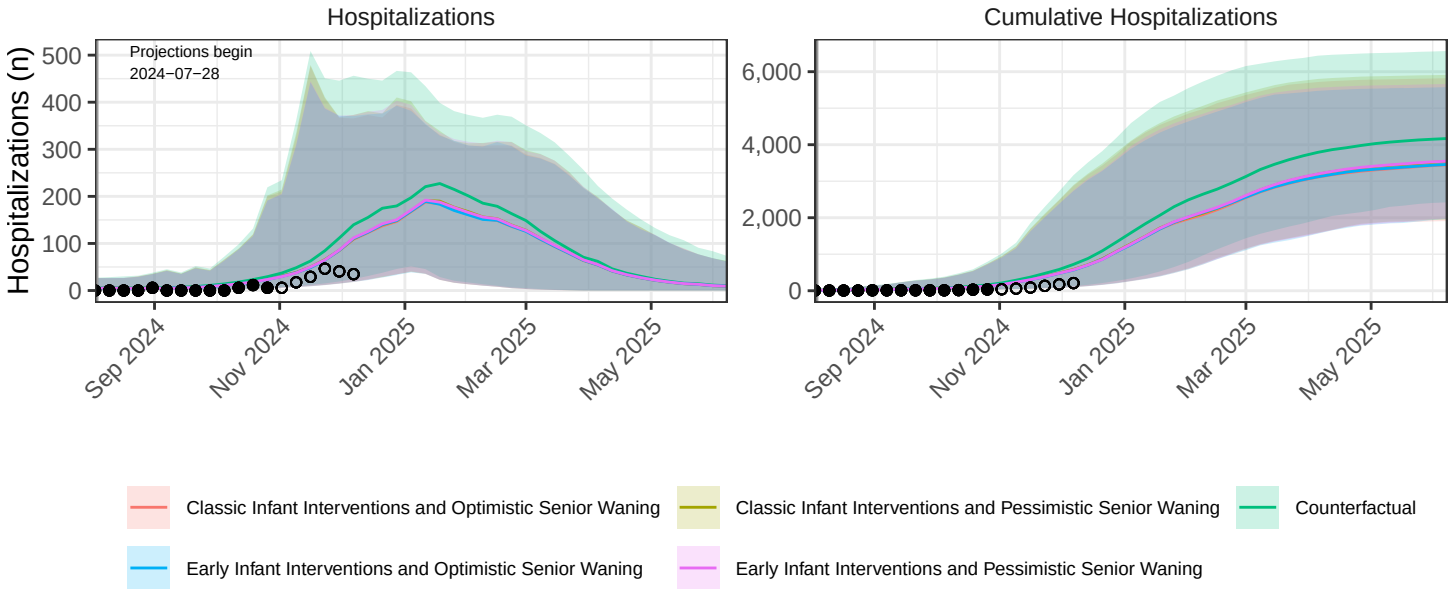
United States, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



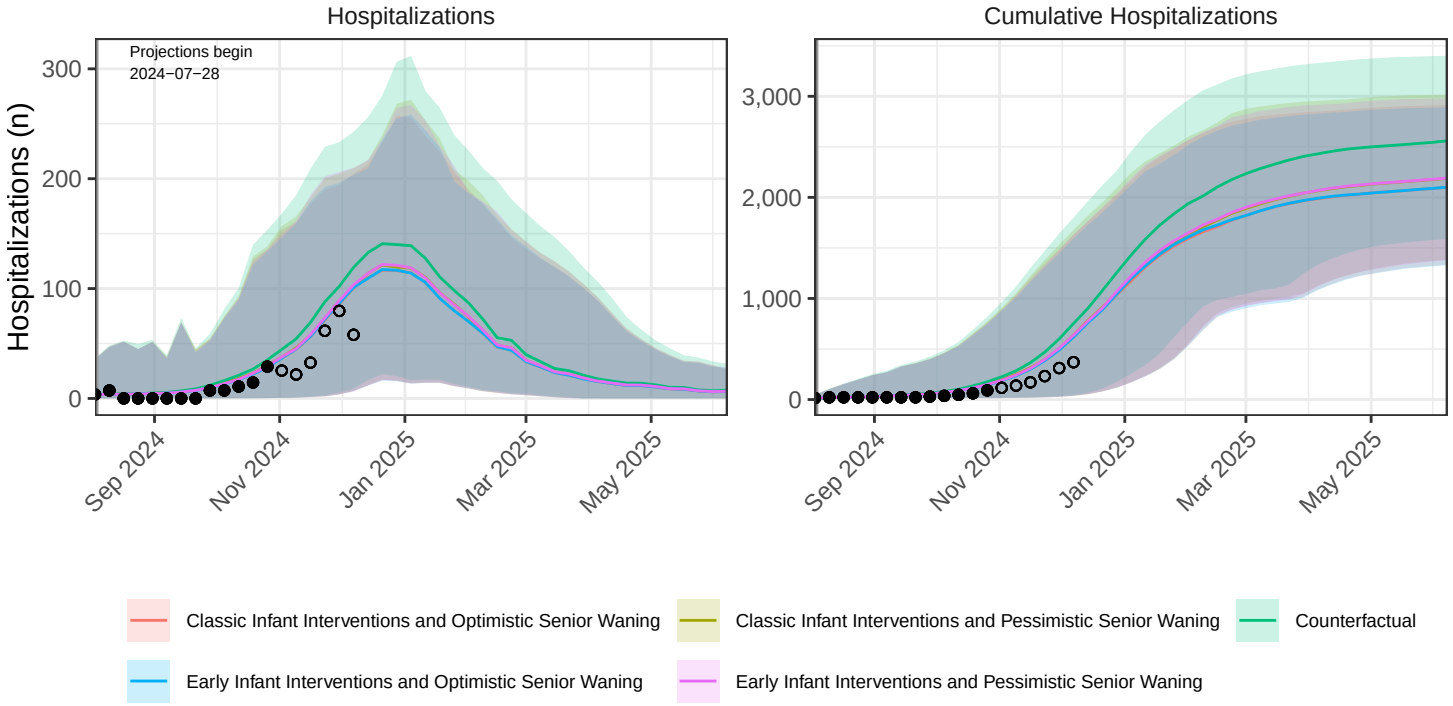
California, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



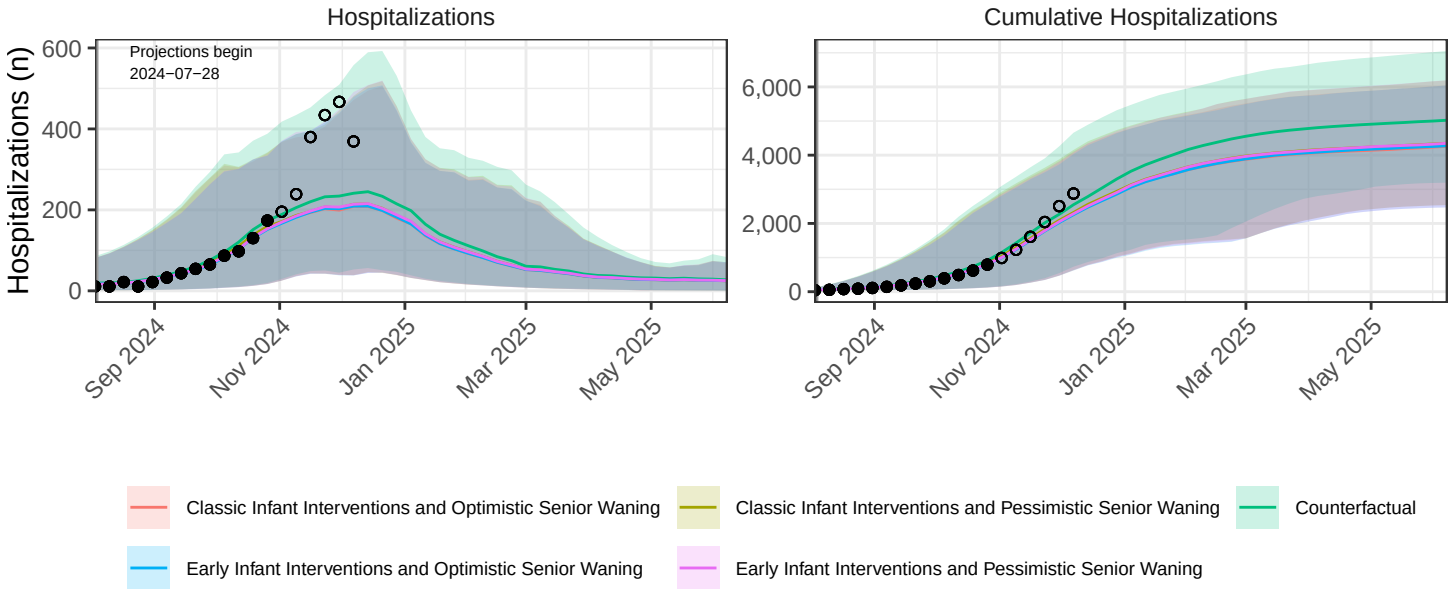
Colorado, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



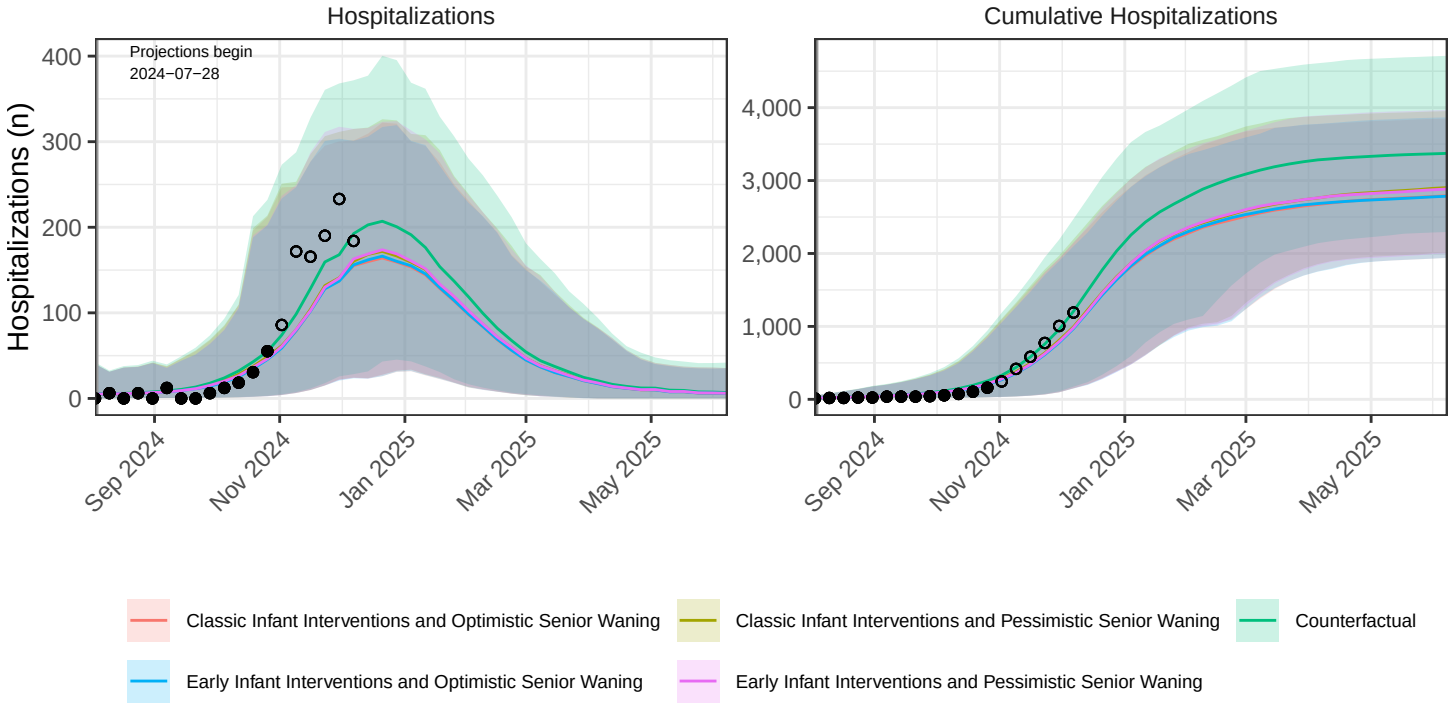
Connecticut, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



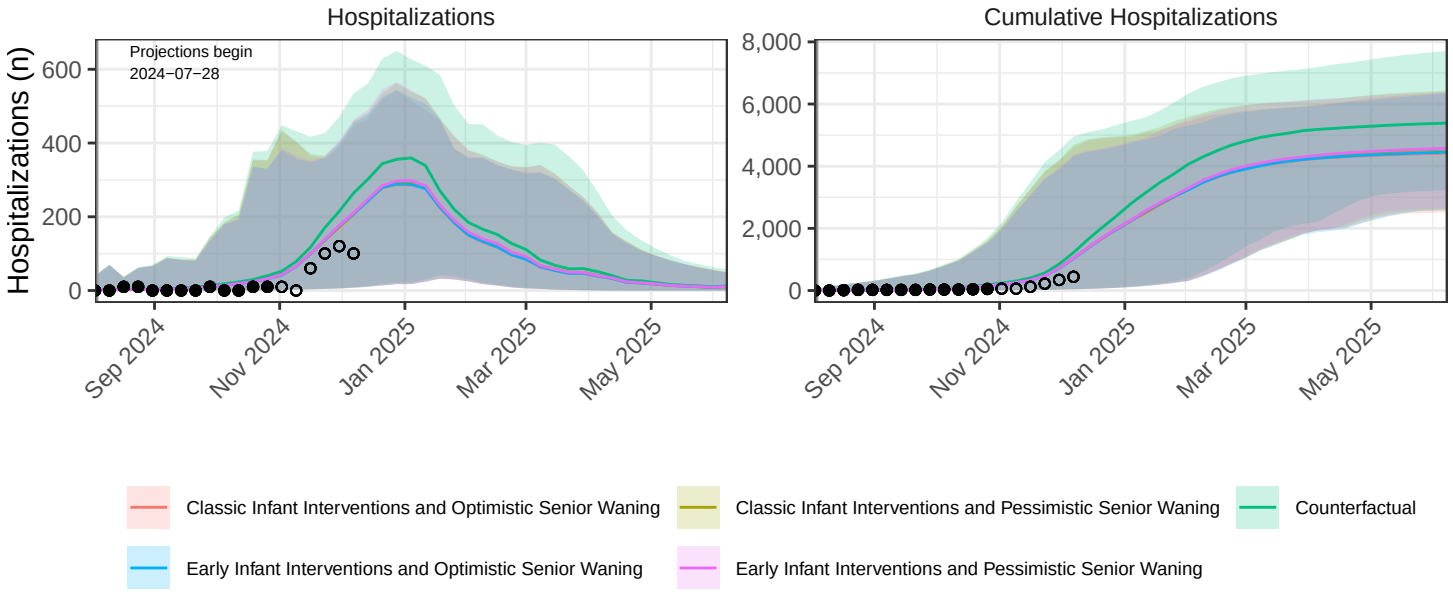
Georgia, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



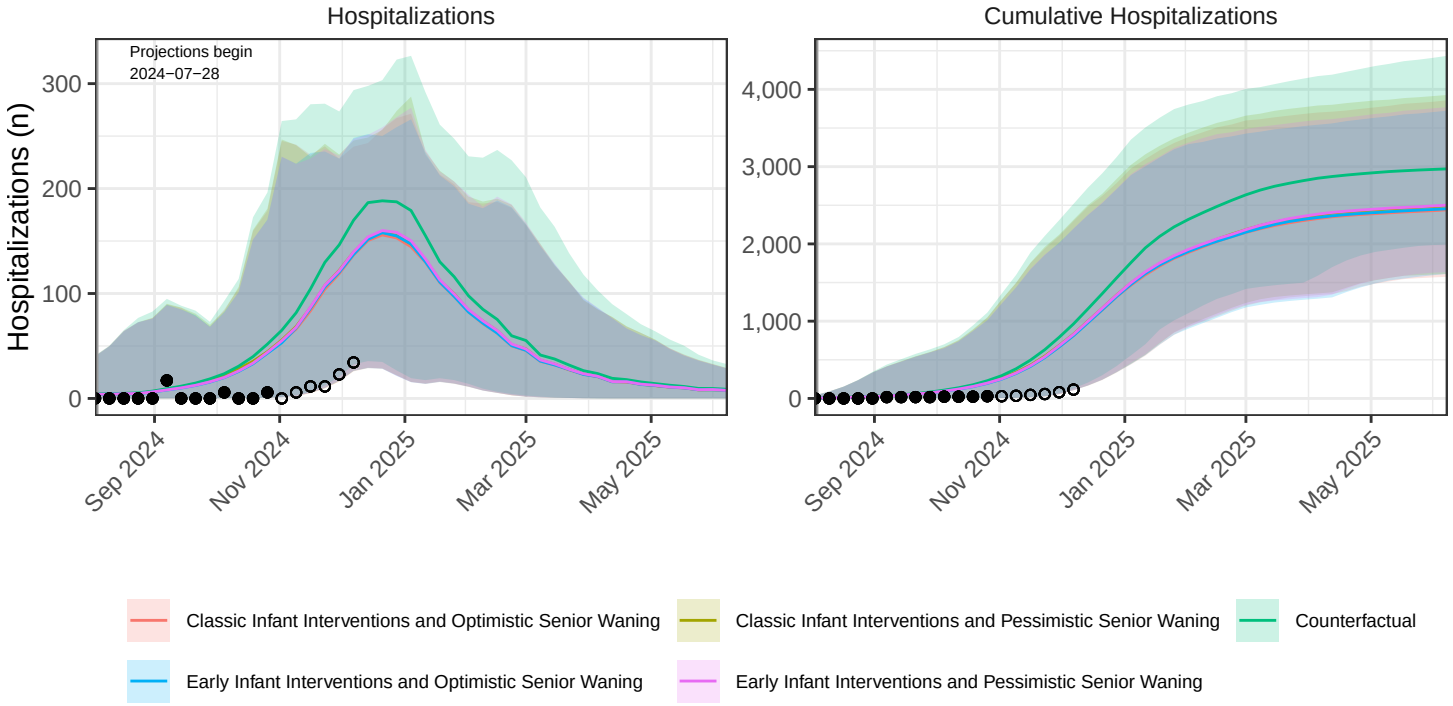
Maryland, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



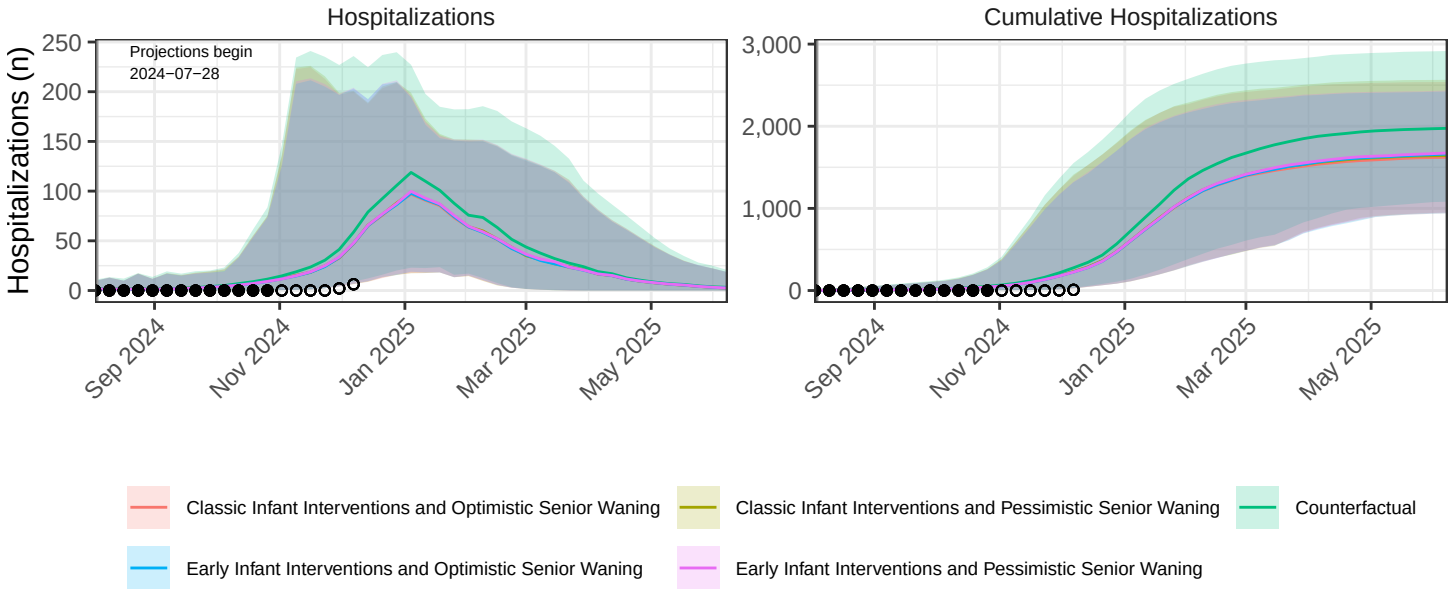
Michigan, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



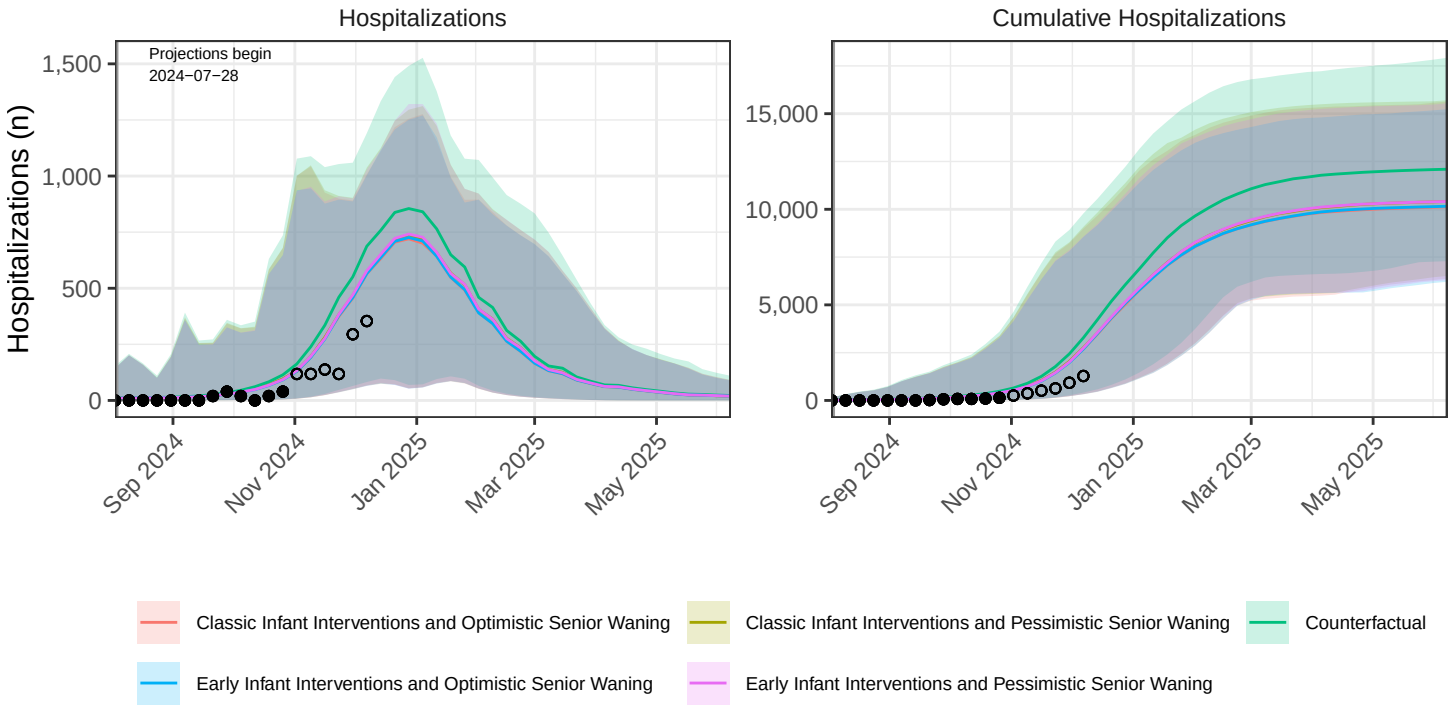
Minnesota, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



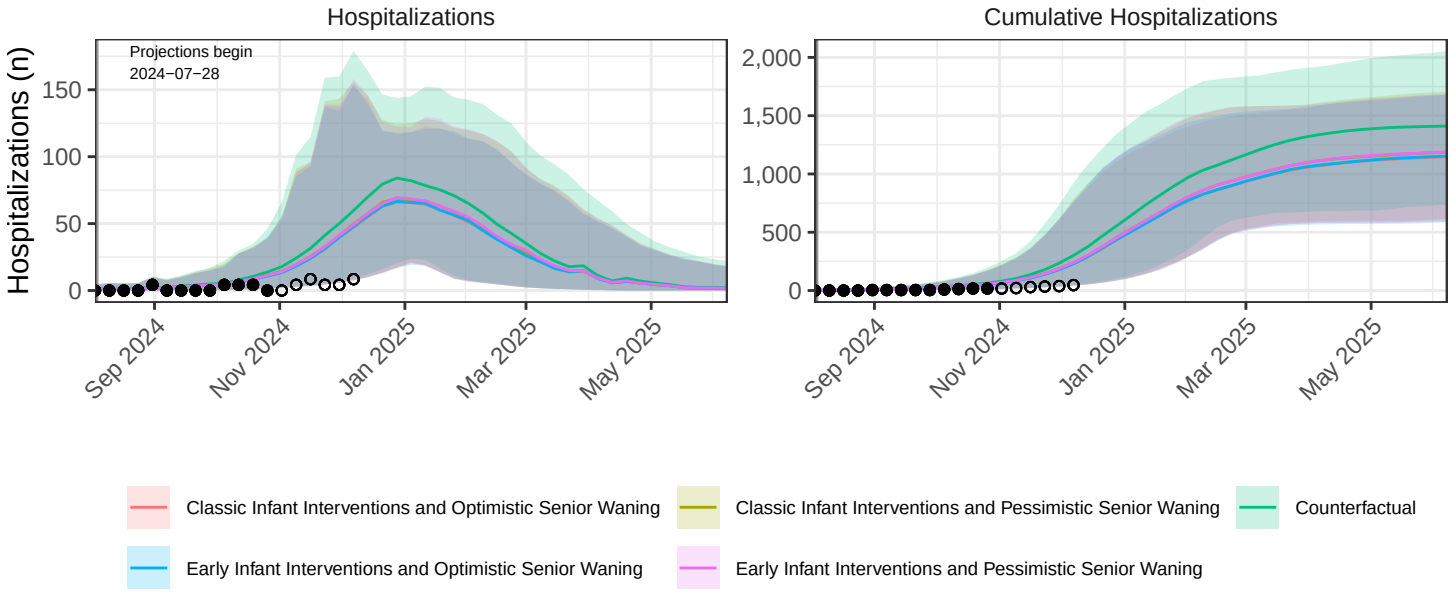
New Mexico, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



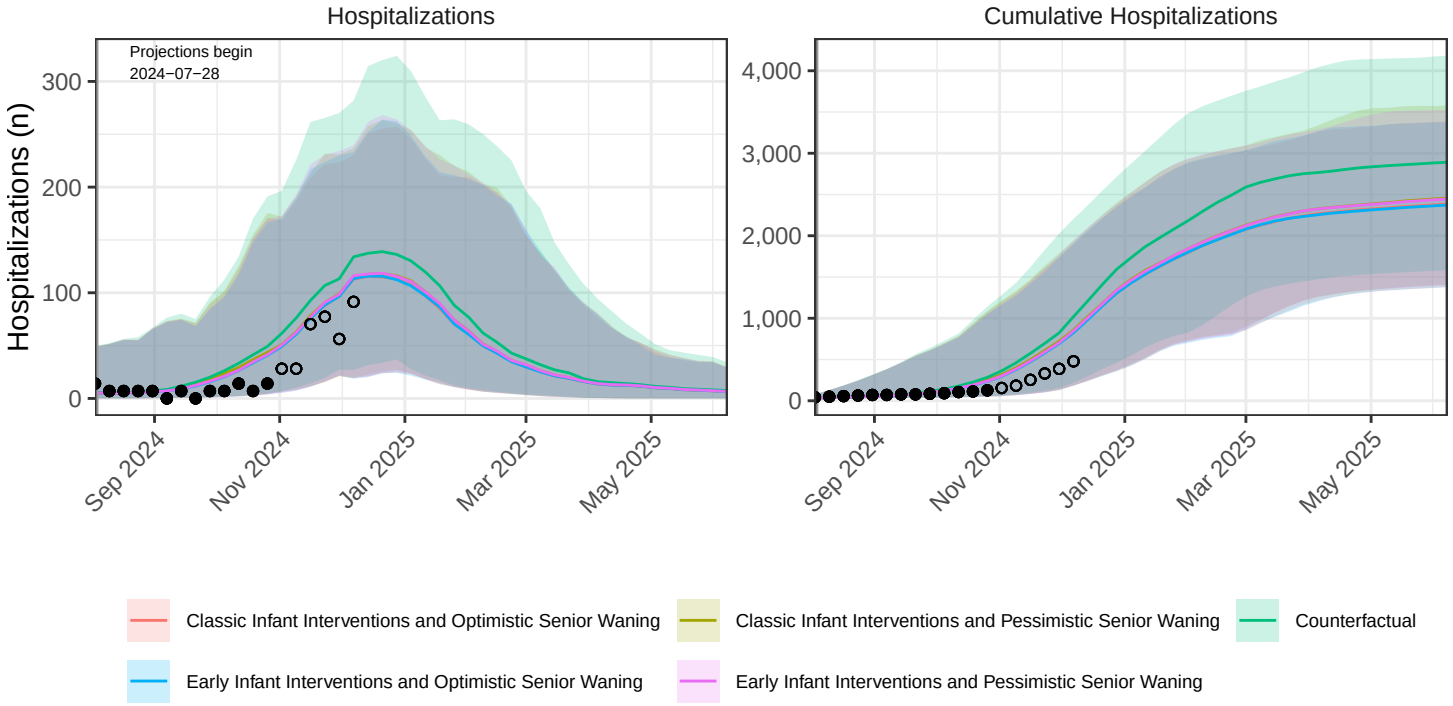
New York, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



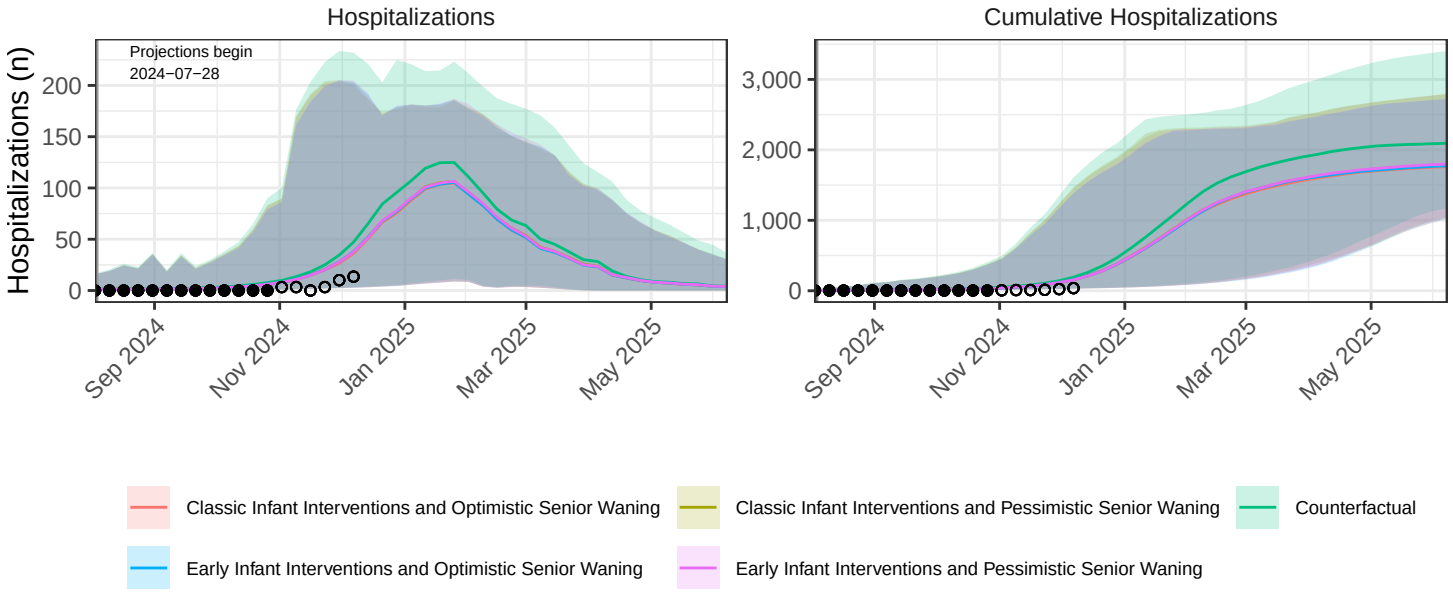
Oregon, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



Tennessee, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



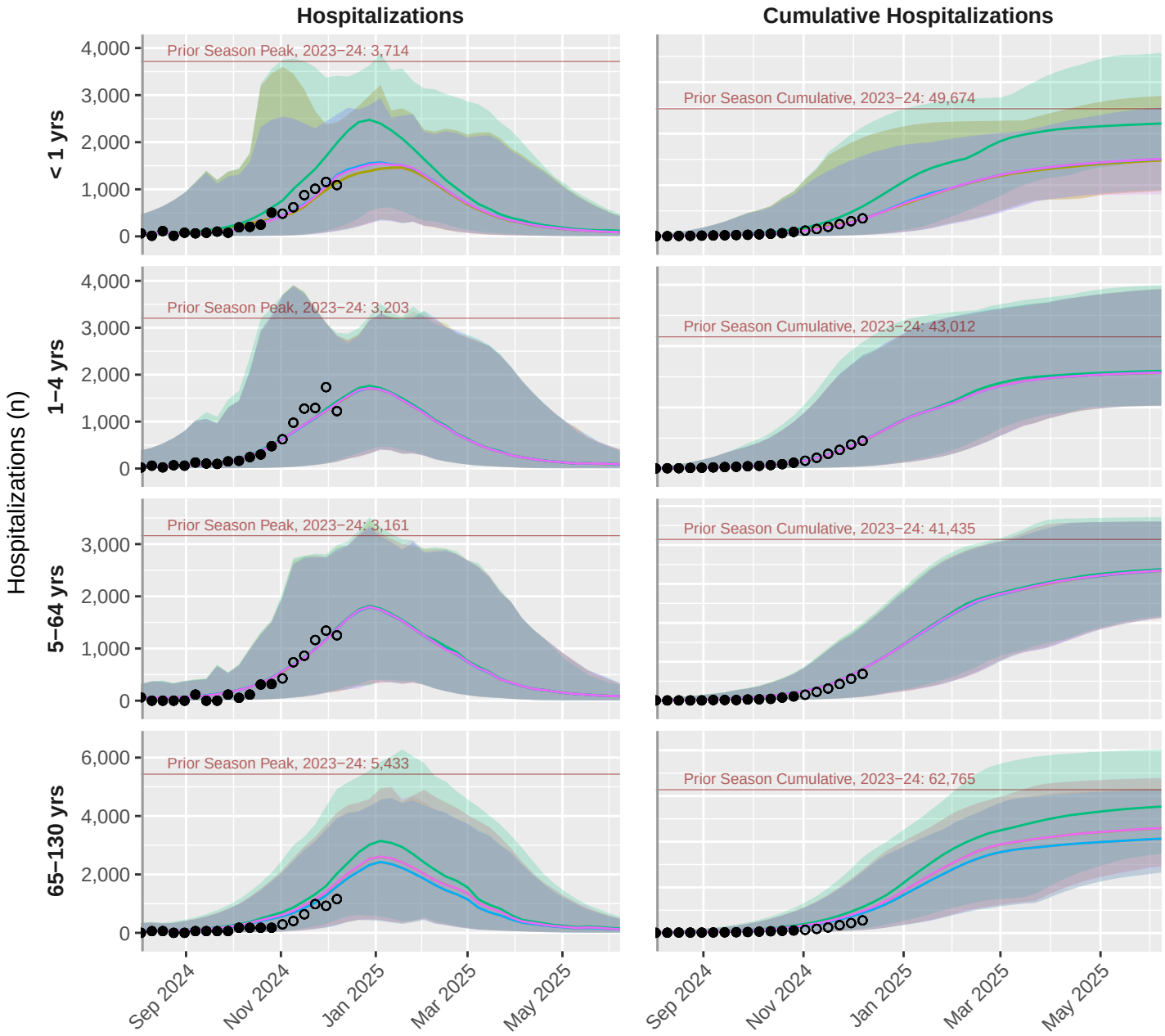
Utah, Ensemble projections for incident and cumulative hospitalizations by scenario, all ages.



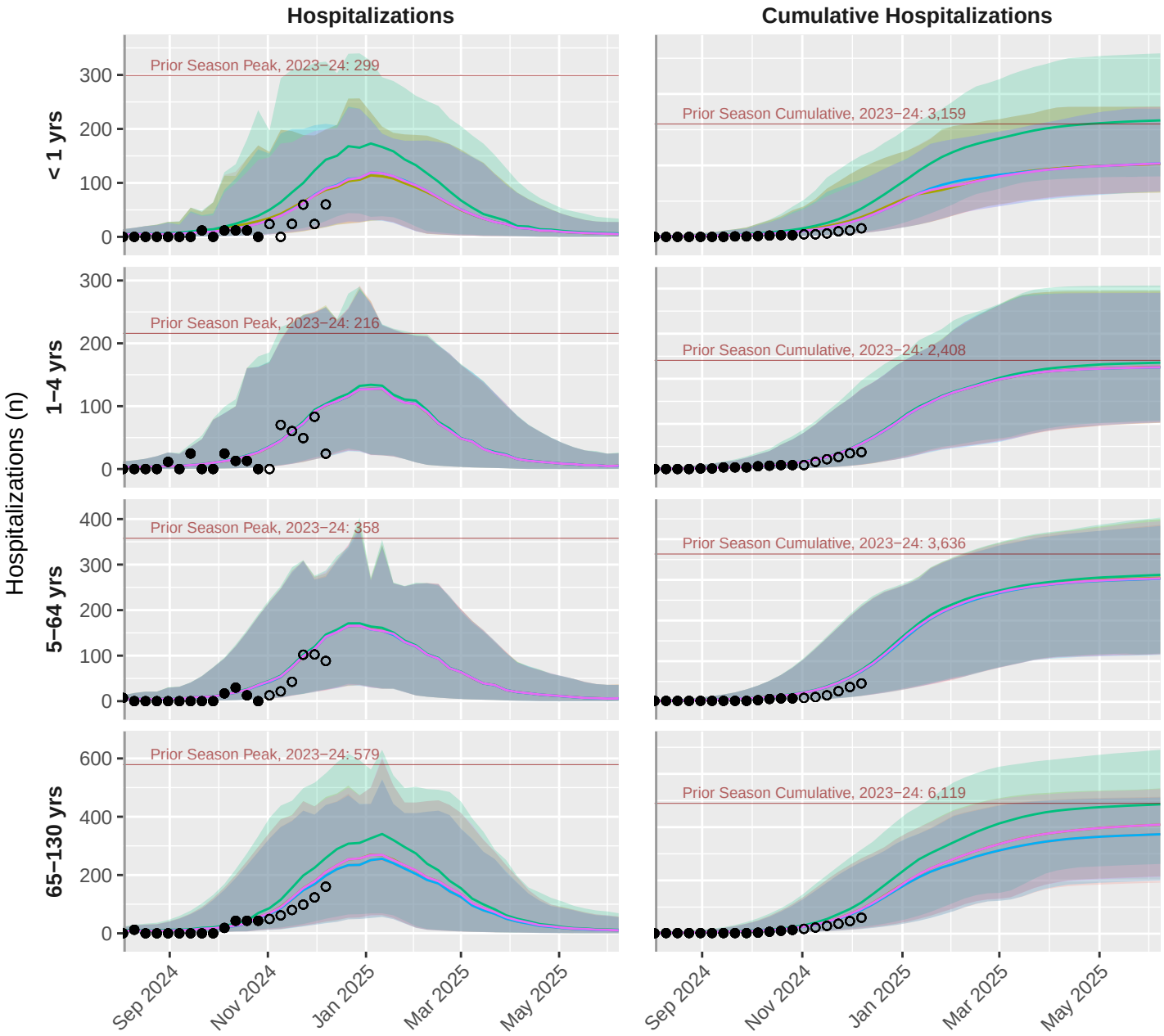
State Scenario Comparisons by Age

The scenario projections by age group were also very similar between scenarios within each state, with increased peak and cumulative size as scenarios became more pessimistic. The state projections also follow the empirical age-specific hospitalizations well for the younger age groups, however, as with the national projections, there is significant under-projection of hospitalizations in the 65-130 year age group, though the 95% projection intervals of the cumulative do contain the empirical data. This age group also substantially exceeded both peak and cumulative hospitalizations from the 2023-24 season, which was considered substantially larger; this may indicate a change in testing or reporting among this age group, and not a difference in infection or disease. Horizontal lines are given for prior peak incident and cumulative hospitalizations from the 2023-24 season, taken from RSV-NET (which is used as a proxy for hospitalizations). Lines represent the median ensemble projections, and shaded regions represent the 95% prediction intervals.

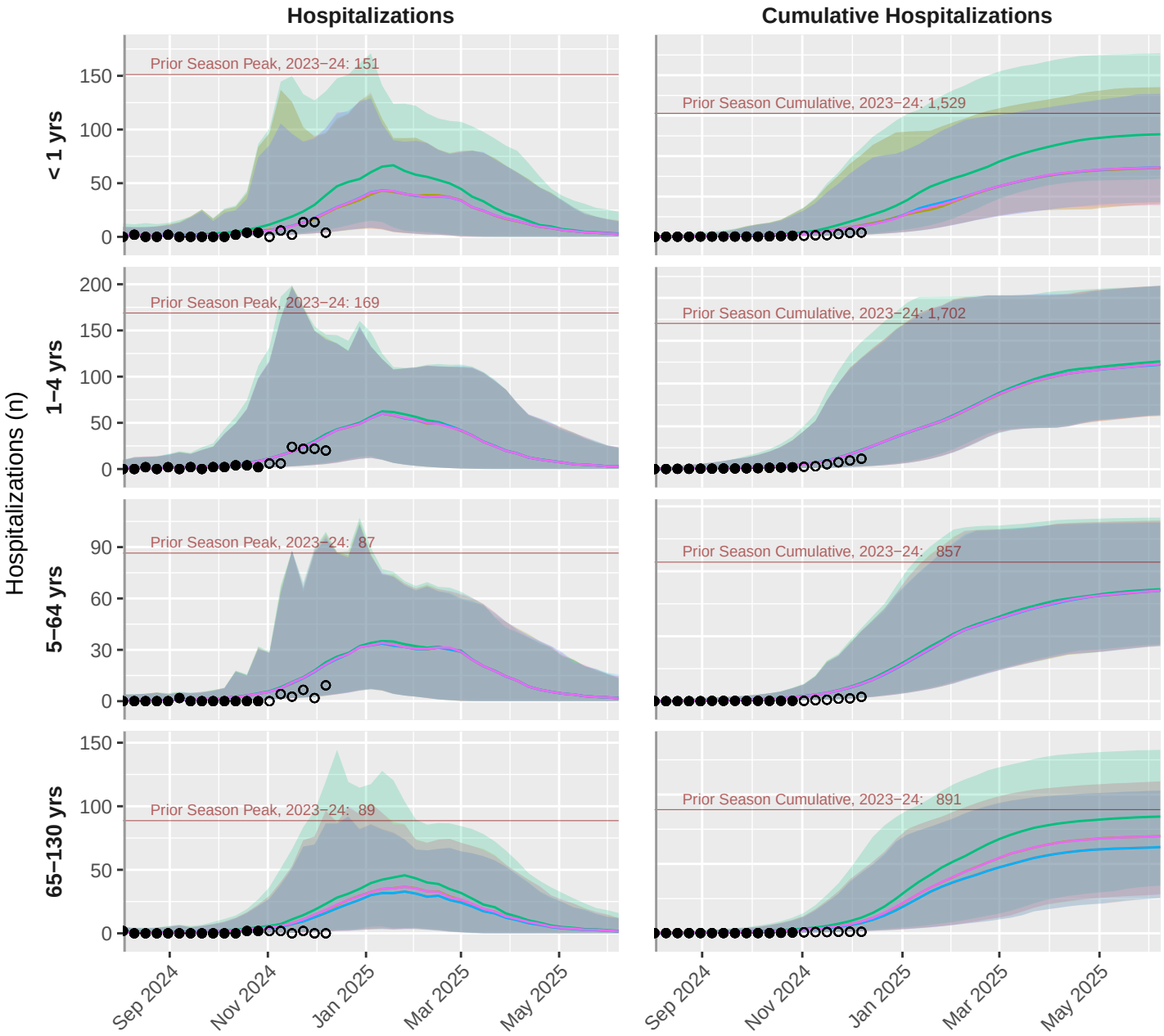
United States, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



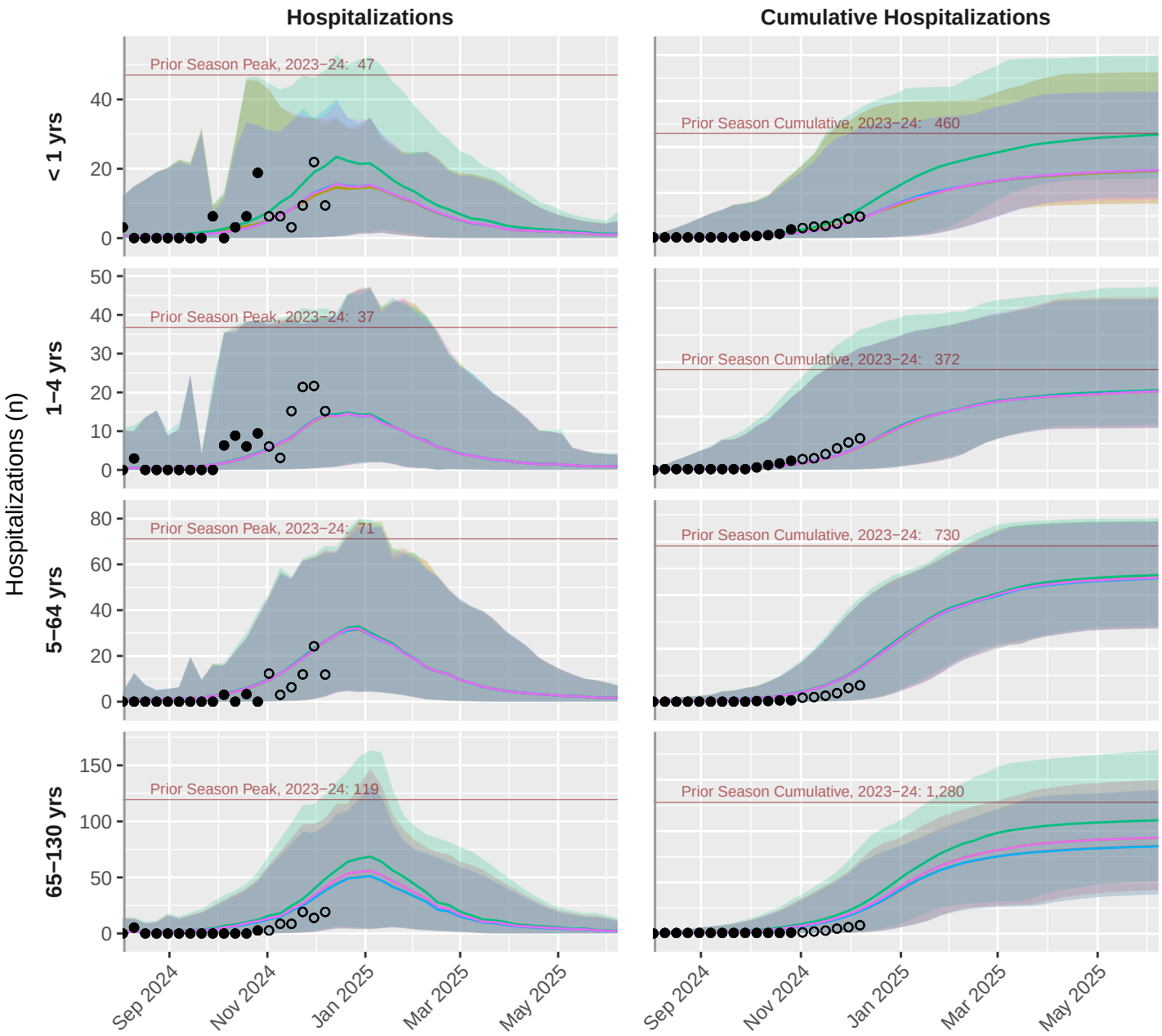
California, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



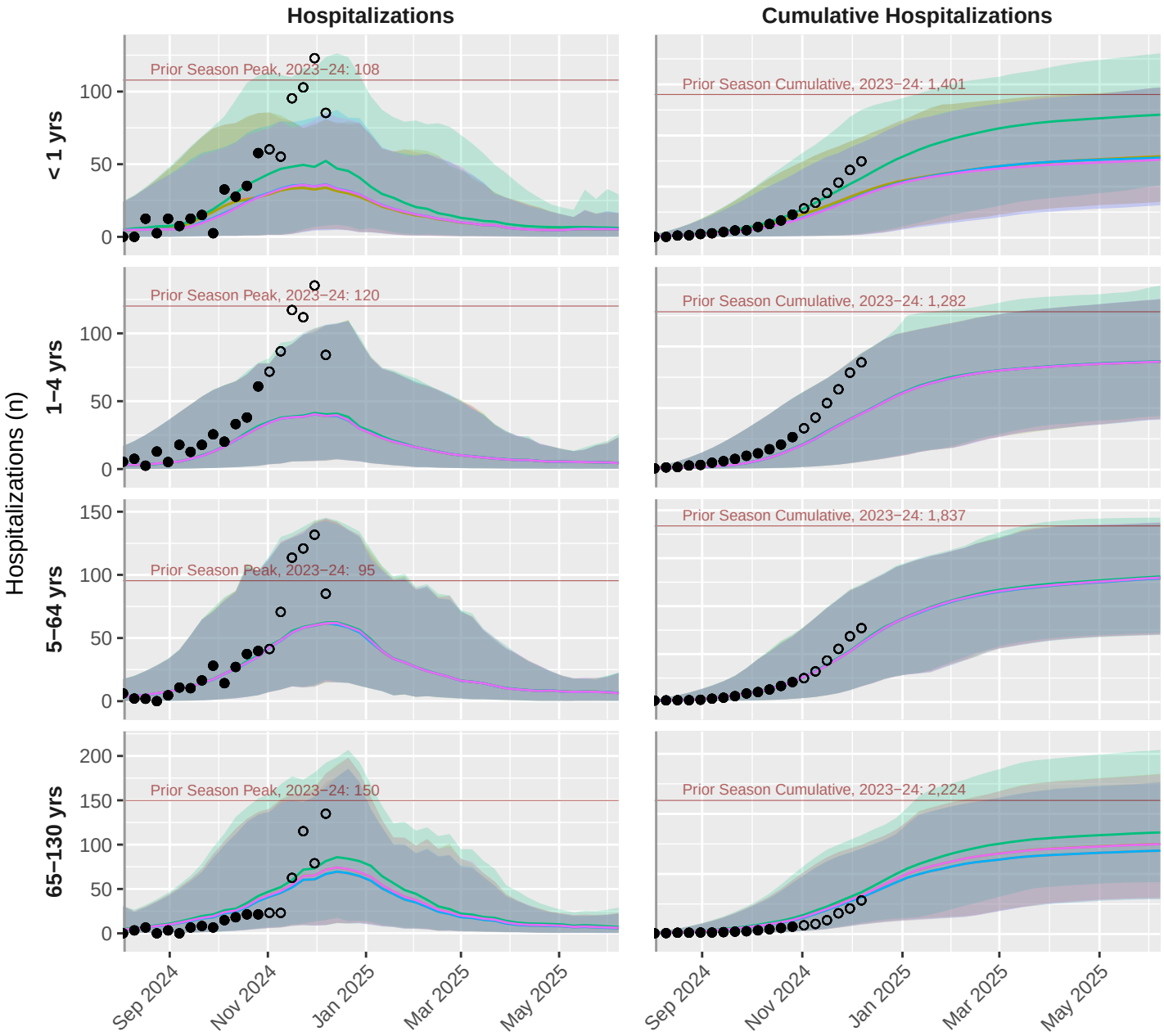
Colorado, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



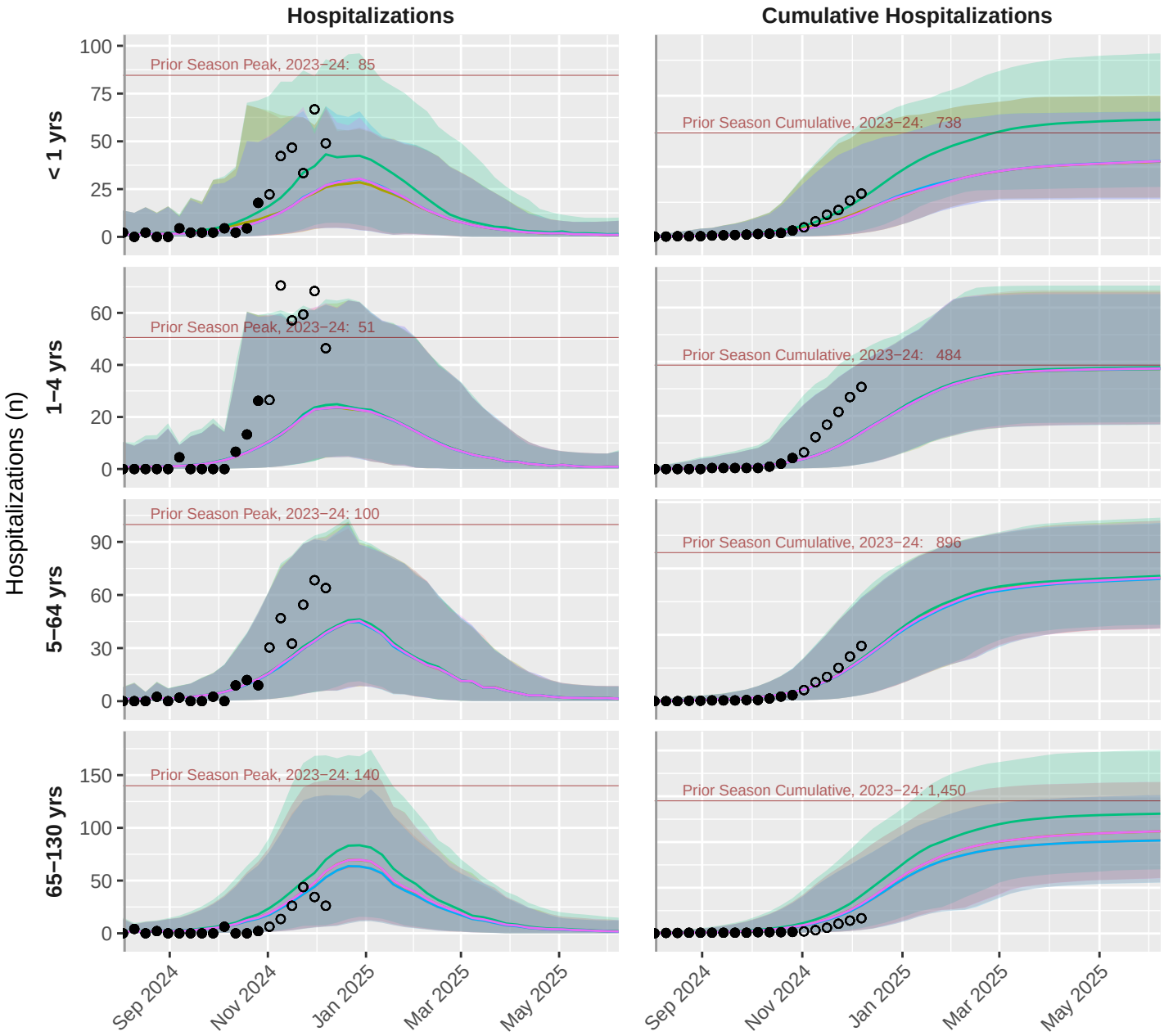
Connecticut, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



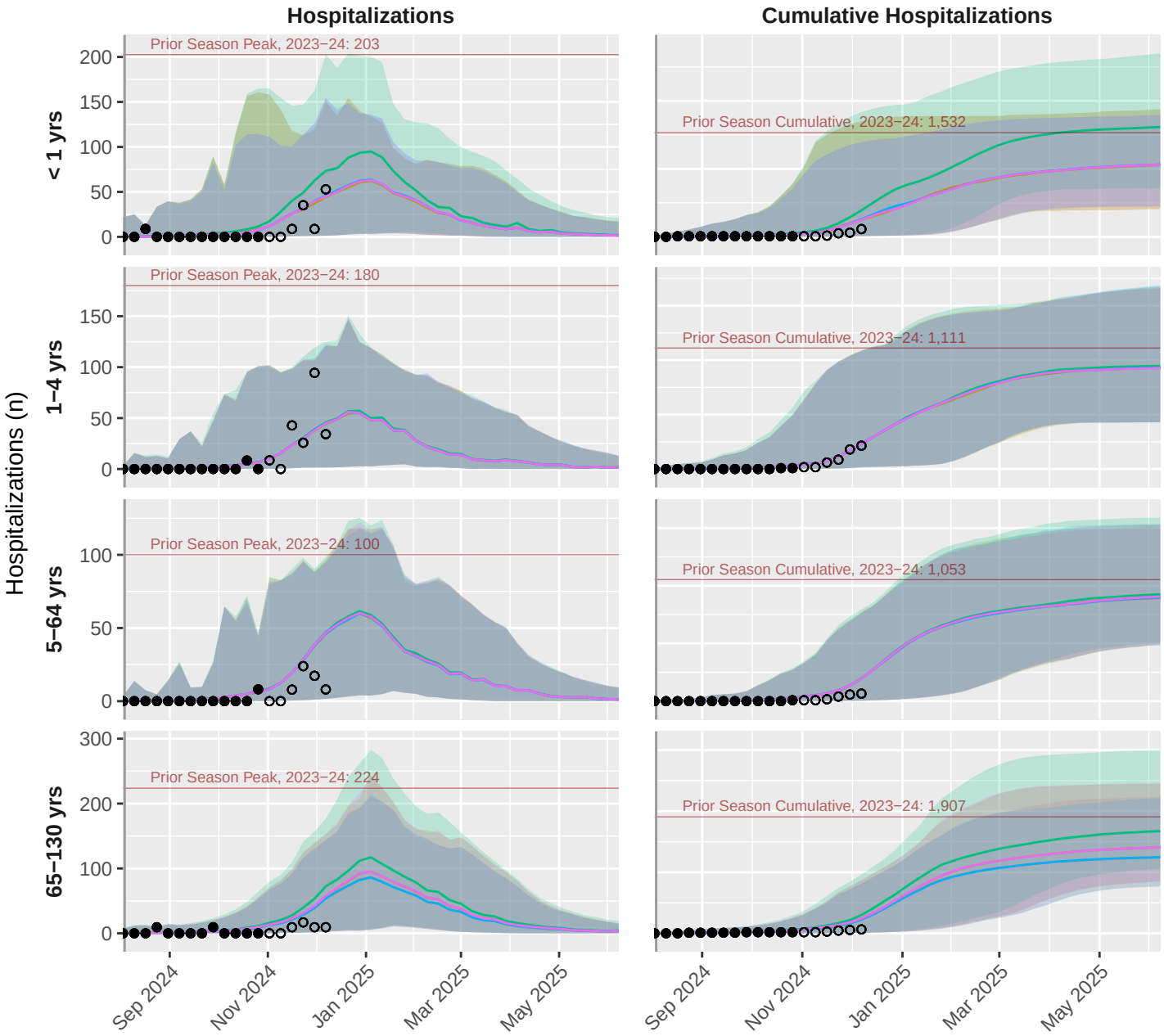
Georgia, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



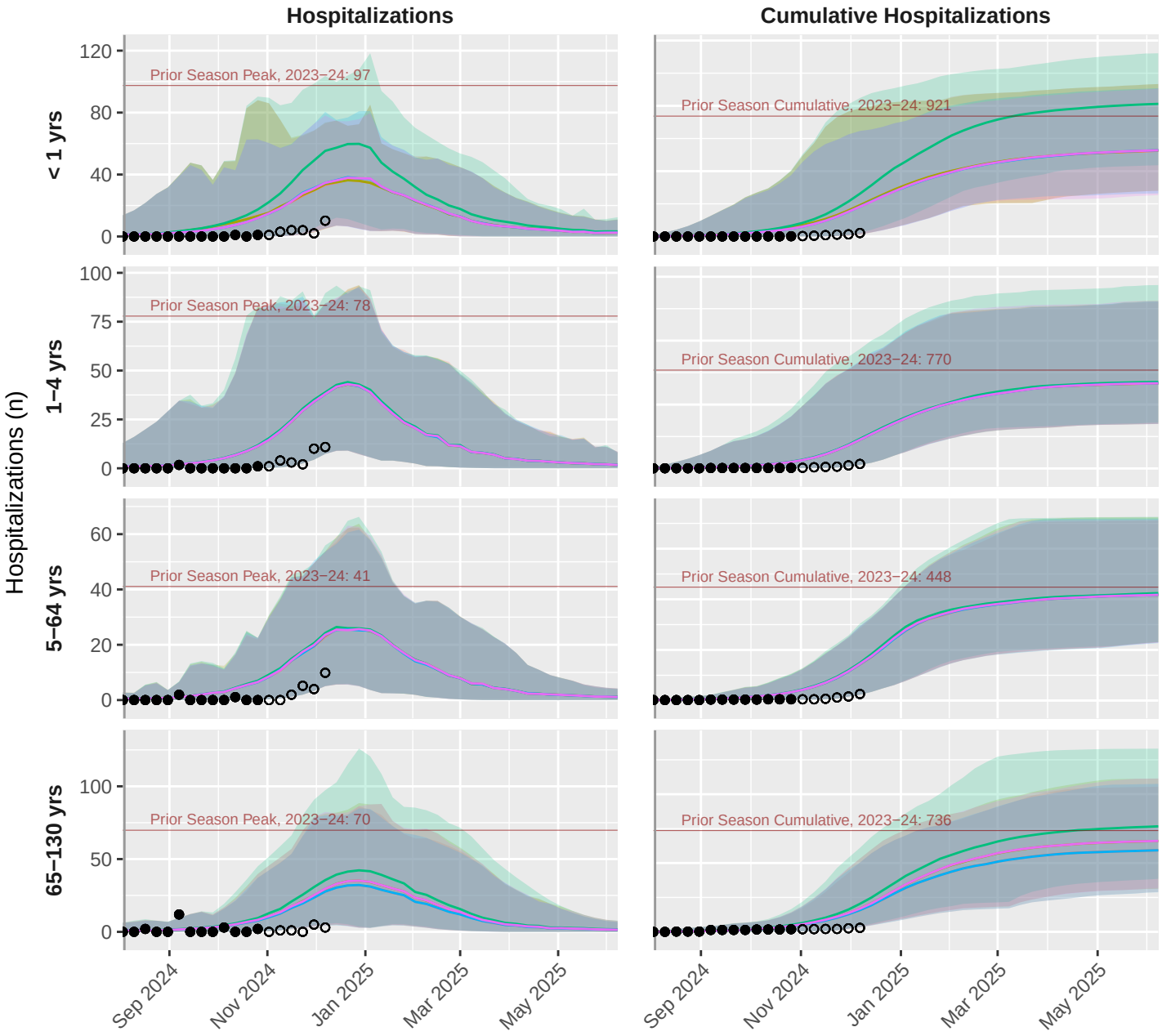
Maryland, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



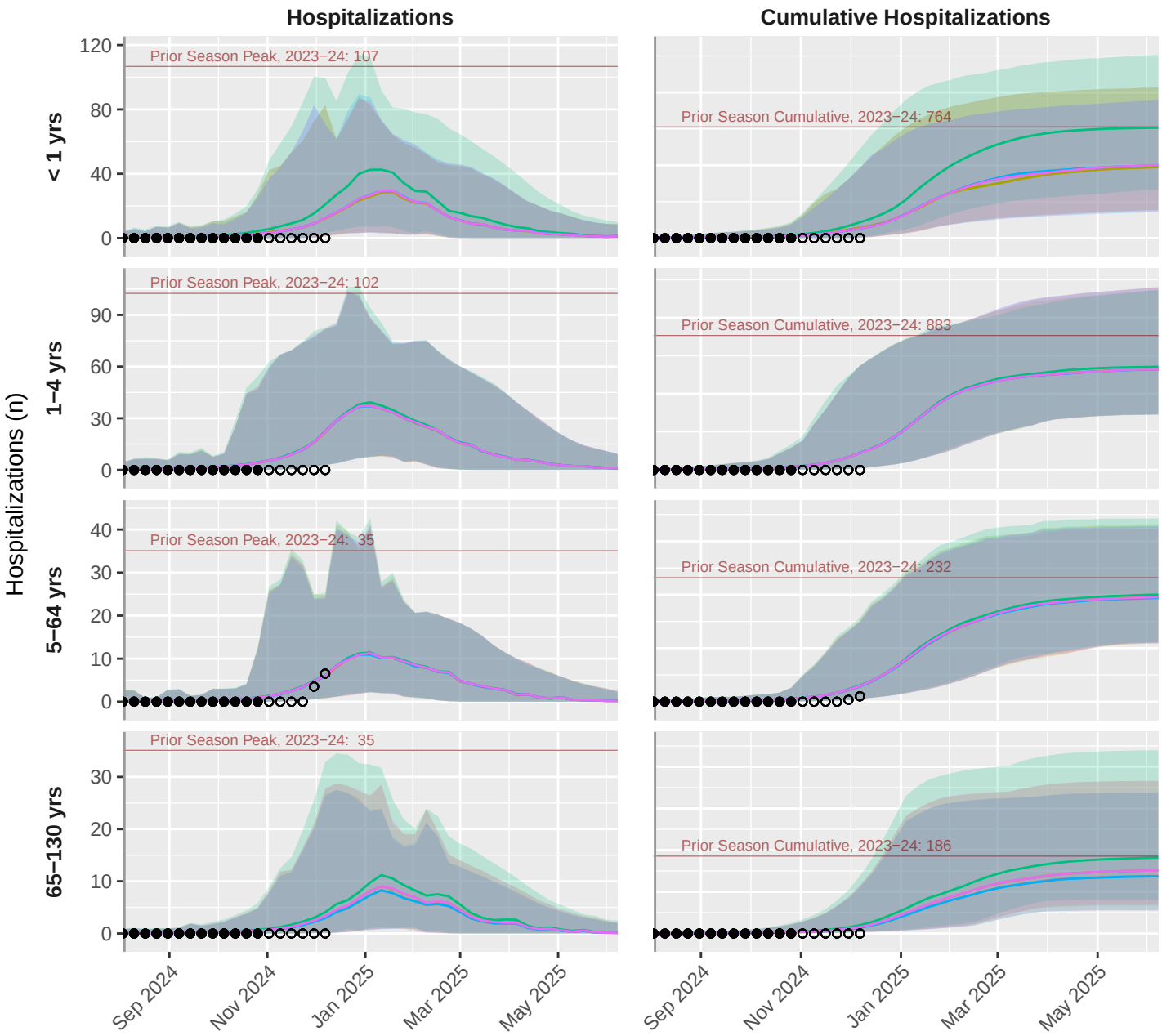
Michigan, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



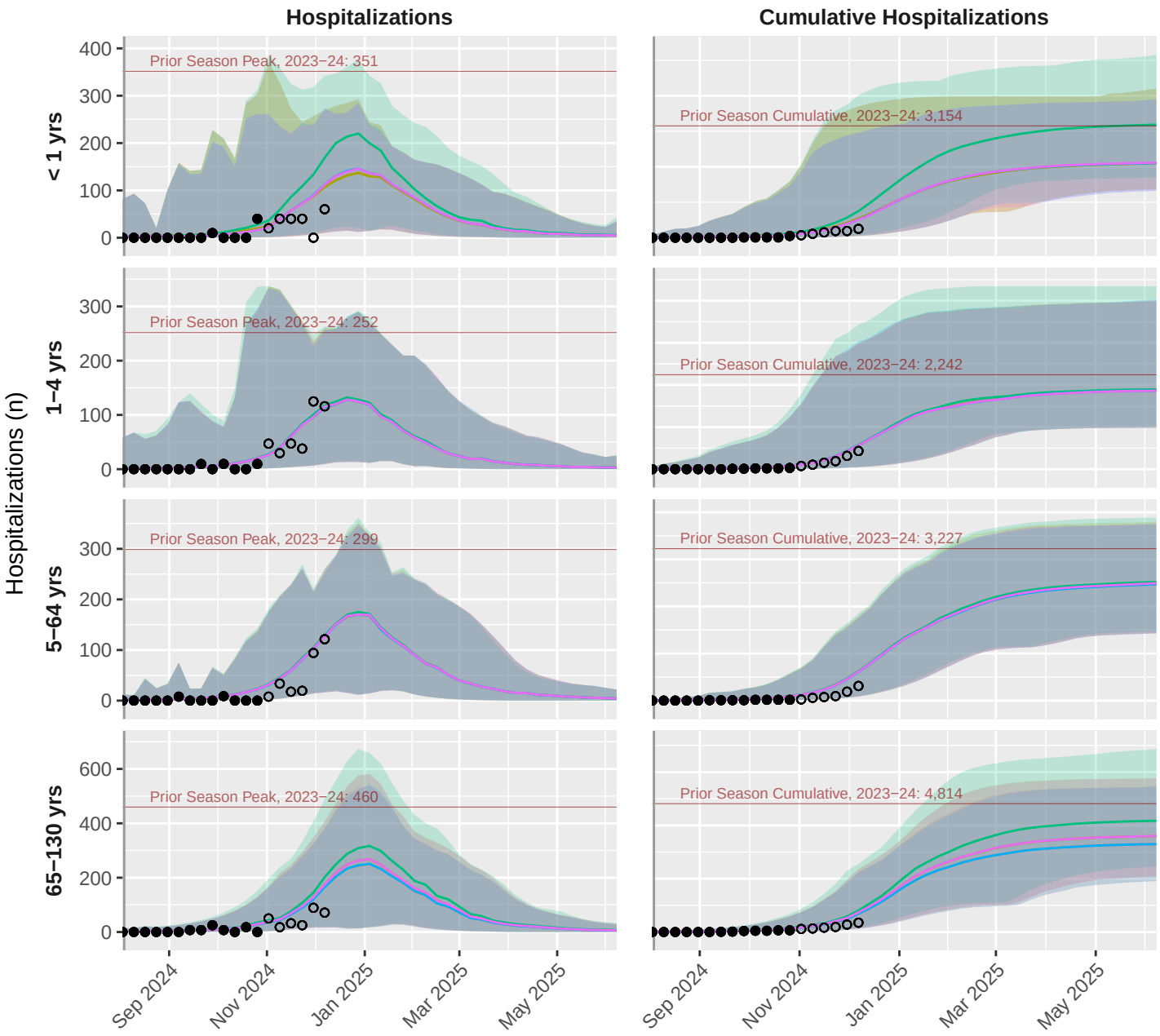
Minnesota, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



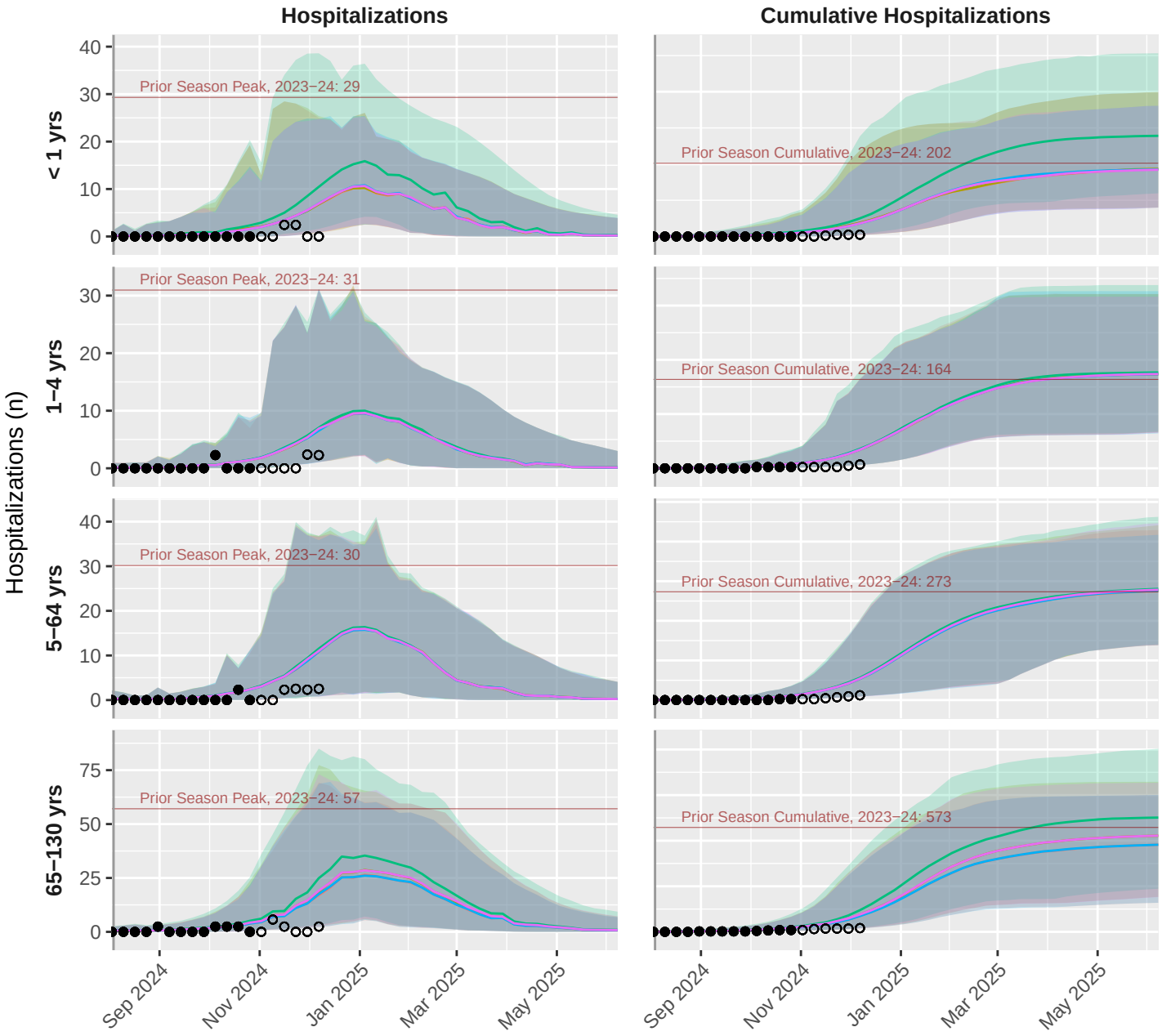
New Mexico, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



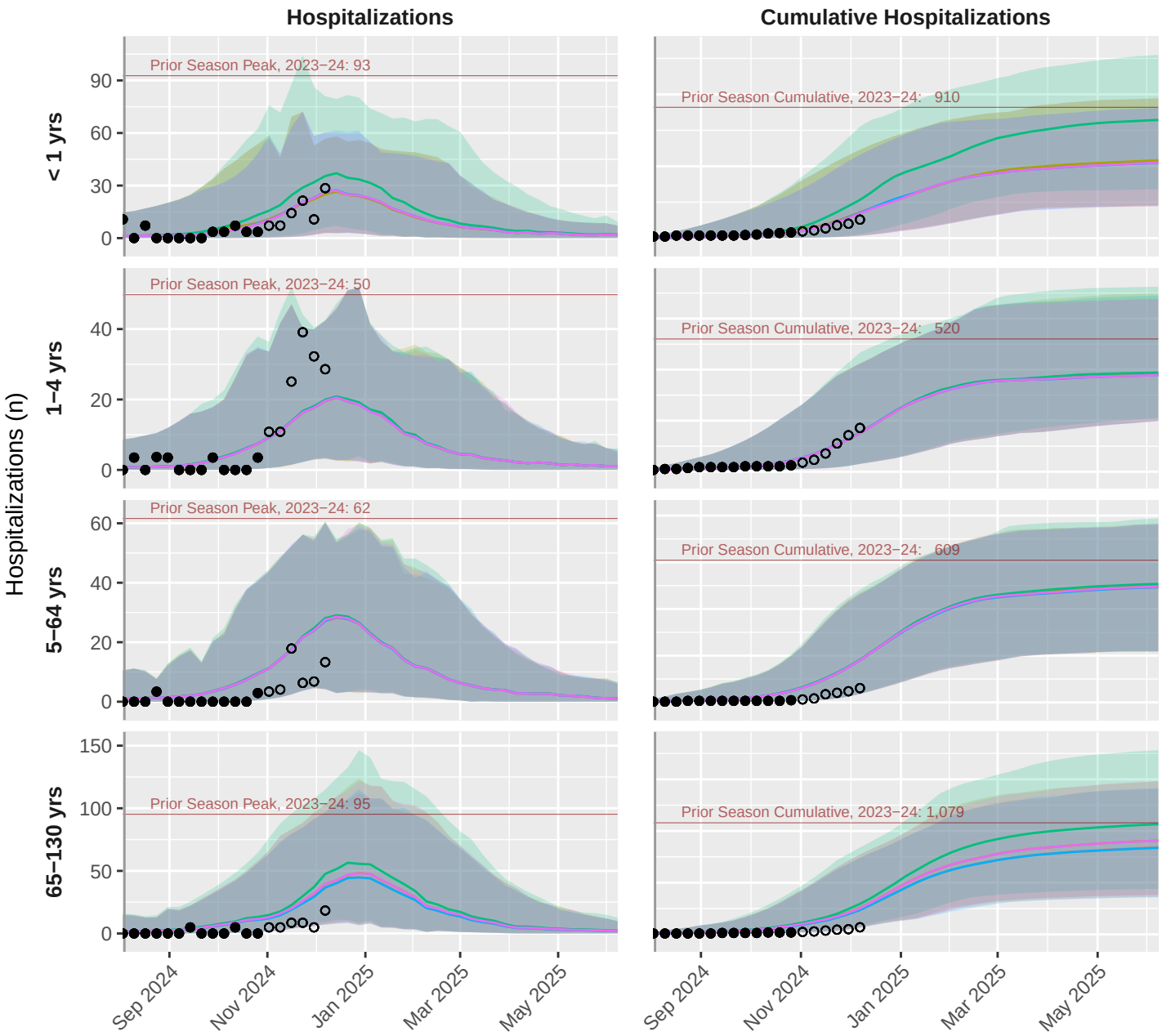
New York, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



Oregon, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



Tennessee, Ensemble projections of incident and cumulative RSV hospitalizations, by Age



Utah, Ensemble projections of incident and cumulative RSV hospitalizations, by Age