Omicron scenarios: 28th December restrictions

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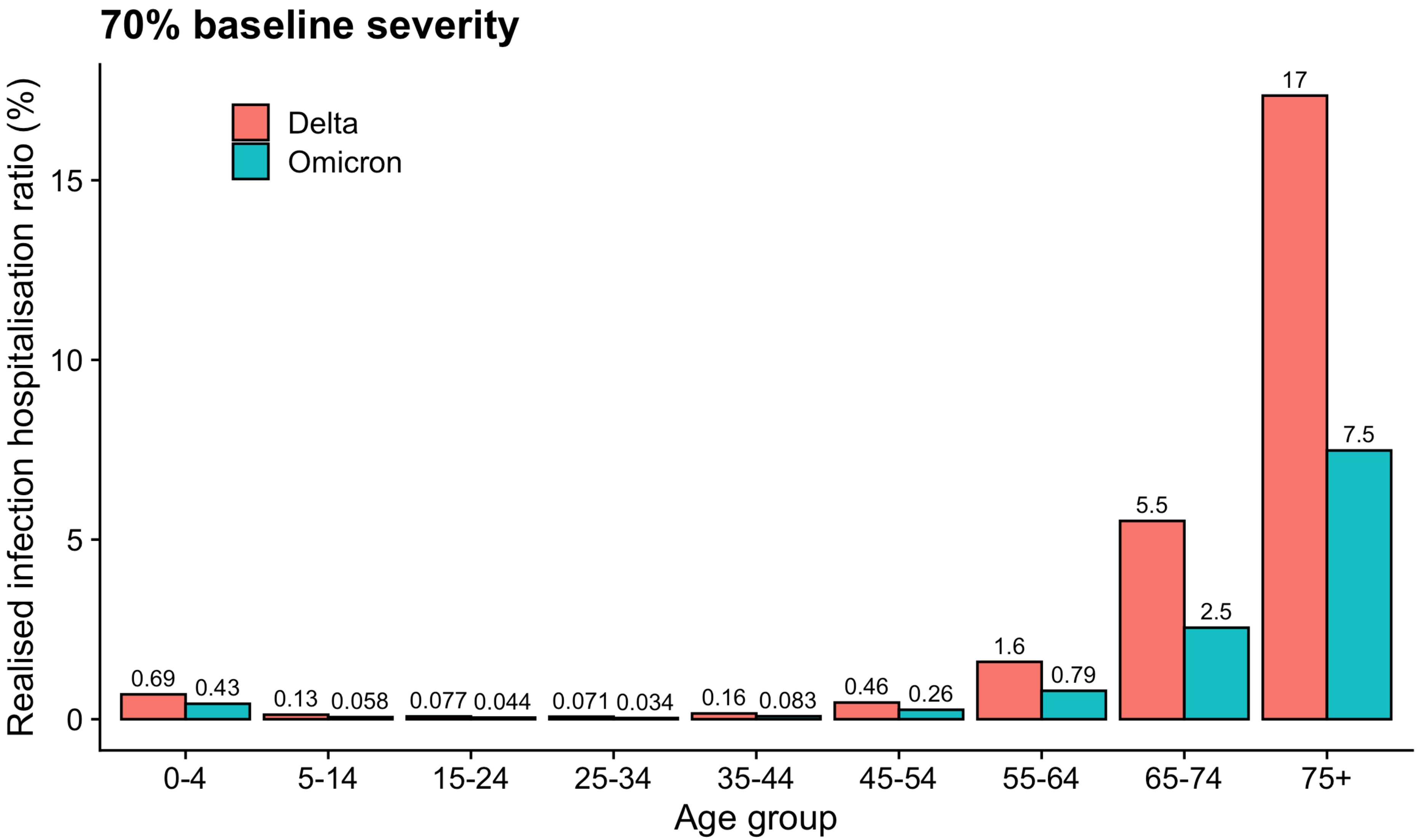
Realised severity of Omicron

There has been substantial confusion over what we mean by modelled Omicron severity being equal to Delta.

The meaning of this is that "baseline" severity is equal — so, severity in a person who has no natural protection and no vaccine protection. The "realised" severity for Omicron is lower than the "baseline" severity because Omicron largely infects people who have some existing protection, due to its immune escape properties.

The next two slides show the "realised" severity for Omicron vs. Delta under our two scenarios with 70% baseline severity and 100% baseline severity for Omicron, relative to Delta. Both show that realised severity for Omicron is well below the realised severity for Delta, even in the "100%" scenario.

Realised severity (70% baseline severity)



Realised severity (100% baseline severity)

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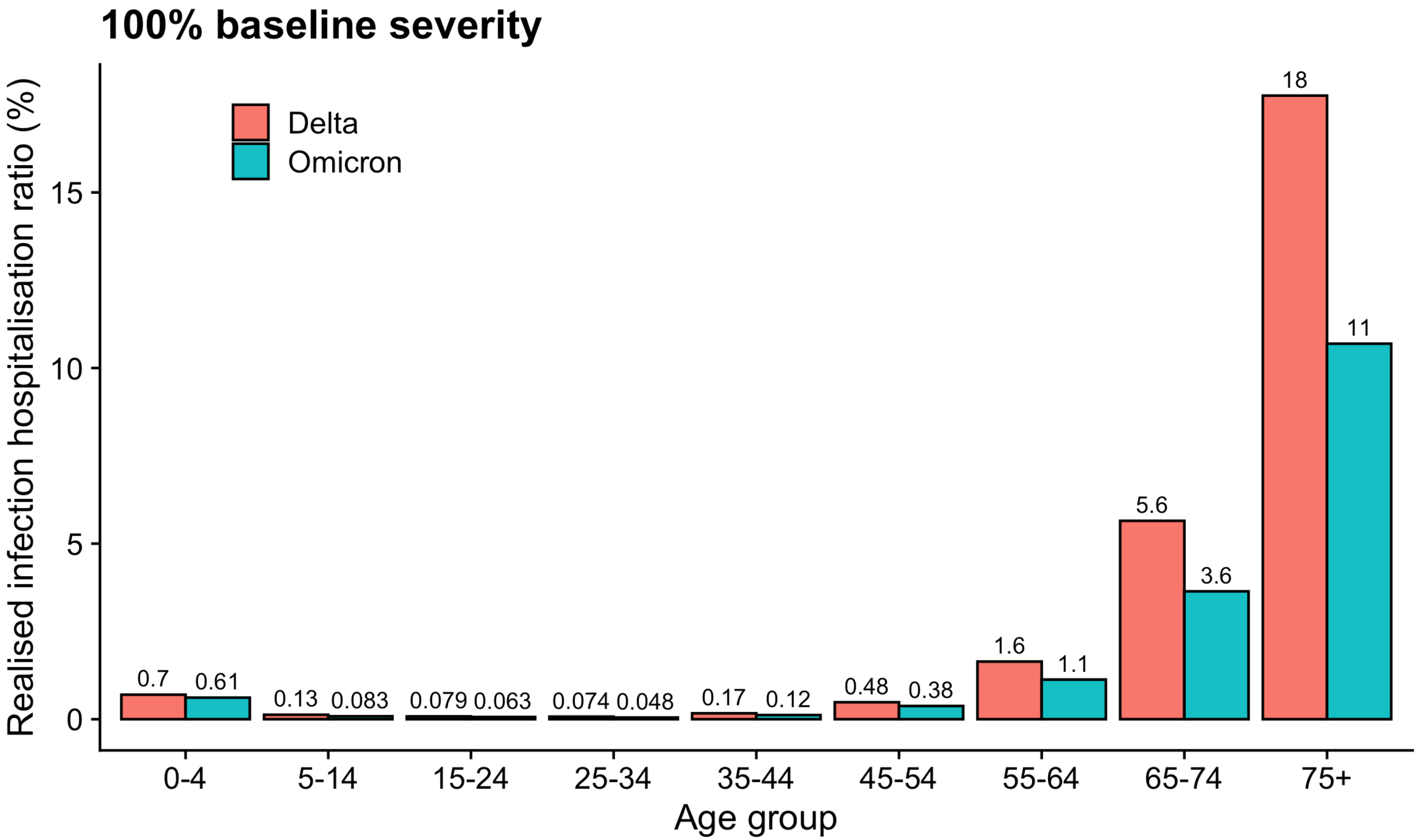


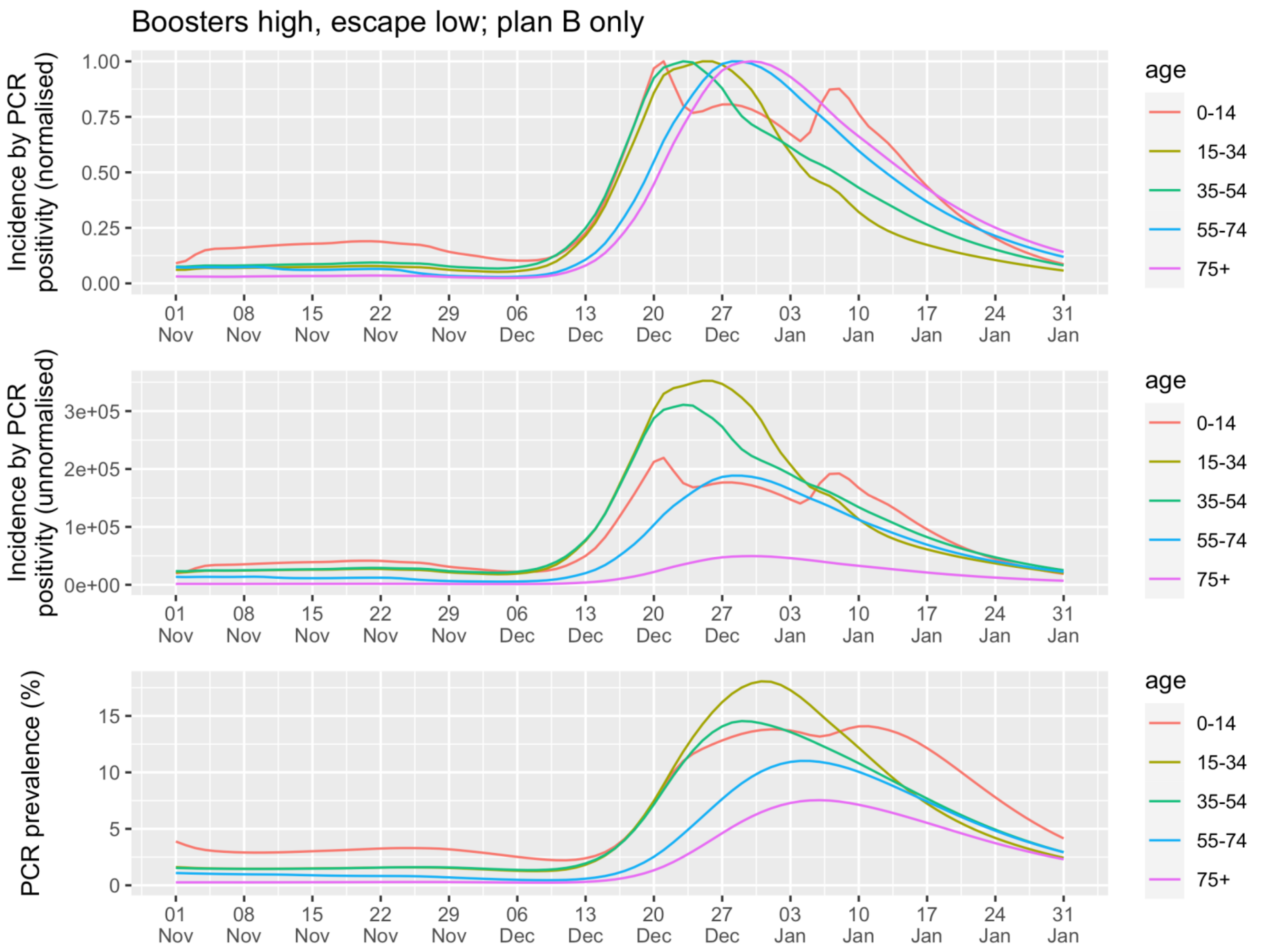
Infections over time

The next two slides show infections over time by age group, for the low and high immune escape scenarios which implement Plan B and no additional measures.

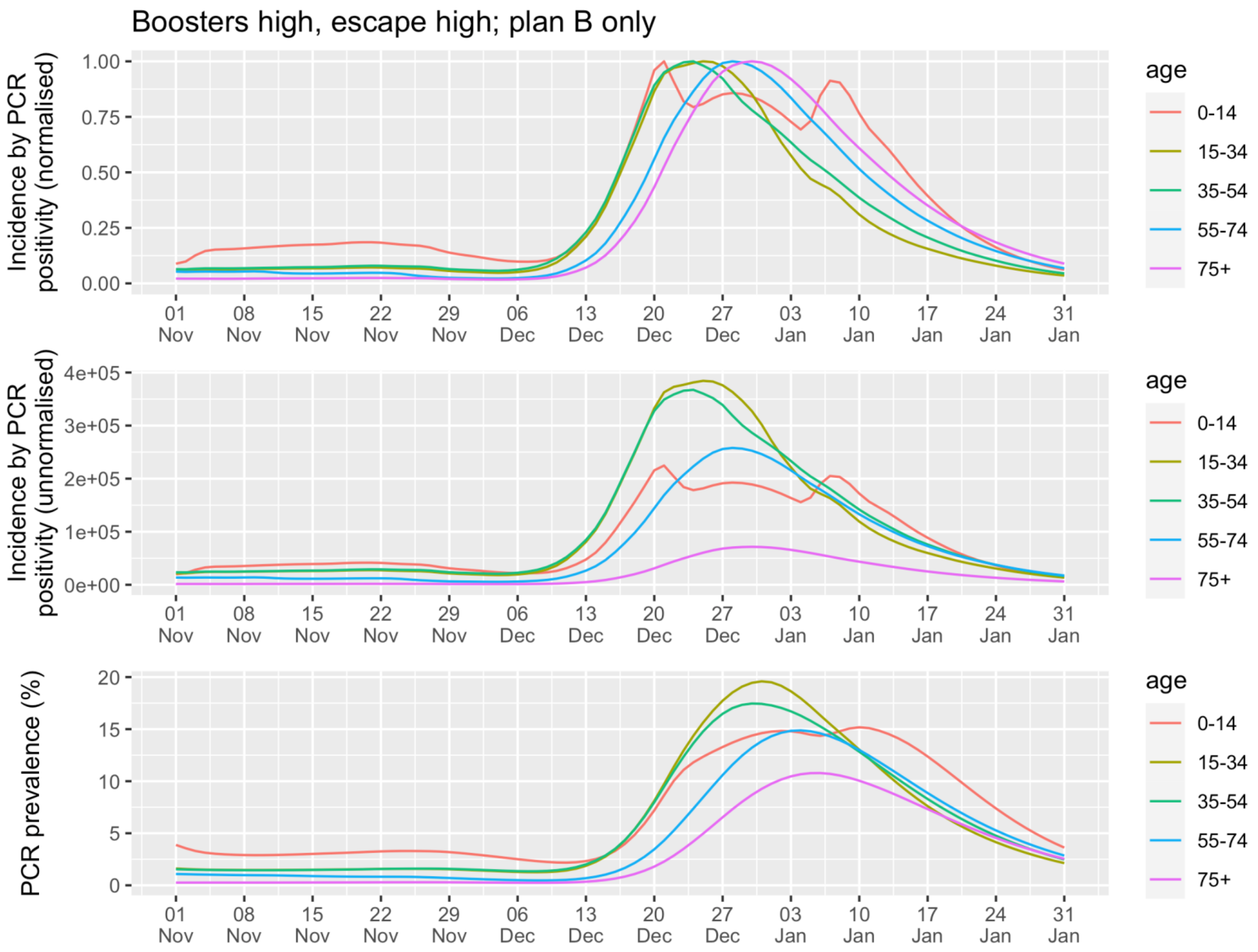
This is to facilitate assessment of when the model projects natural turnover without any further control measures in each age group.

Note that the exact dates on the plots should be taken as approximate. It is extremely difficult to exactly match the time course of the Omicron epidemic even with the data that we do have, since several key parameters such as the incubation period for Omicron are not yet known.

Infections over time – low escape



Infections over time – high escape



Requested control measures

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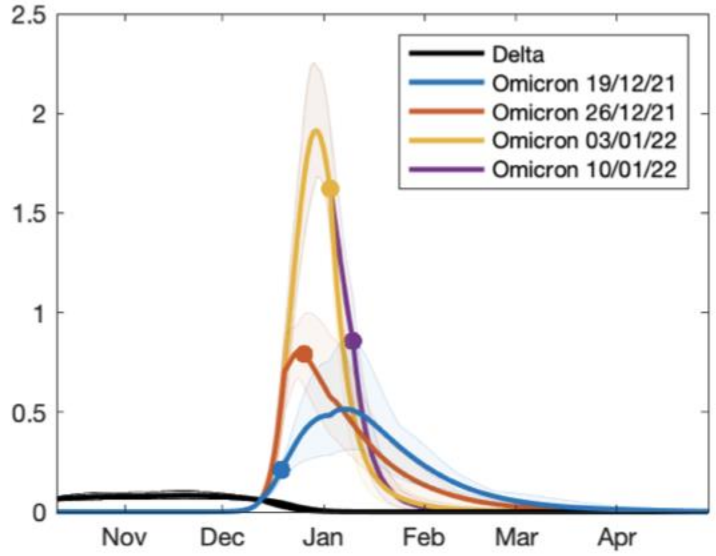
Requested control measures

Note that across most model runs, introducing control measures on December 28th is too late to have a substantial impact upon projected epidemiological dynamics.

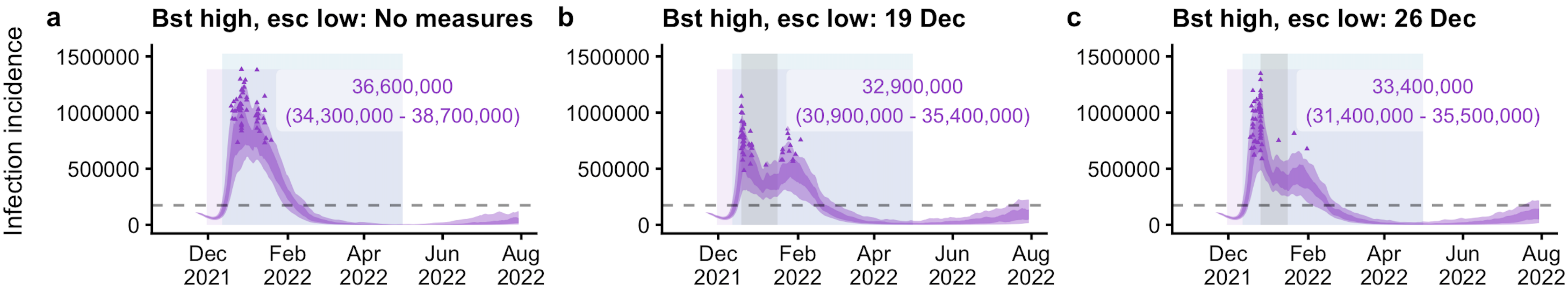
This is consistent with previous modelling by the University of Warwick, which shows the window for effective action rapidly closing after 26th December 2021.

(Source: "Early Omicron Results",
The Warwick Team,
13th December 2021)



Requested control measures

This is also consistent with modelling evidence previously provided by LSHTM which shows the benefit of control measures, in terms of reducing the peak of infections, decreasing when the date of control measures being introduced moves from the 19th to the 26th December.



(Source: Previous modelling by LSHTM, 18th December 2021)

Caveats

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It is not possible for models of Omicron to be perfectly aligned to real world data, since there are several key parameters required to do so which are currently unknown, such as the incubation period.

From Slides 5 and 6, it is also clear that the model assumes that infection rates are already fairly high among the oldest age groups, which may not yet be the case in reality.

KEY MESSAGE: Since burdens are concentrated among the oldest age groups, the benefit of introducing control measures on the 28th December may be greater than we project here, e.g. if infections have not spread into these vulnerable groups as quickly as our model suggests. Similarly, if people are cautious around preventing transmission to vulnerable individuals over the festive period, this may provide substantial benefits in terms of reducing morbidity and mortality.

Low escape, 70% baseline severity

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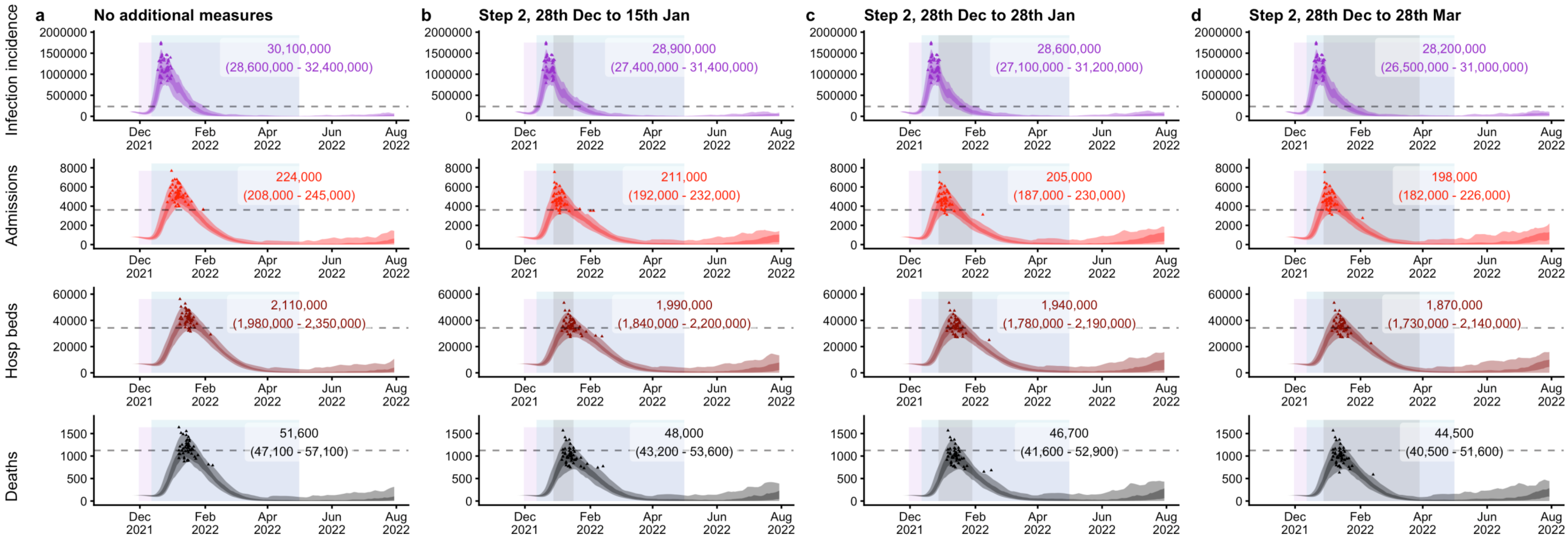
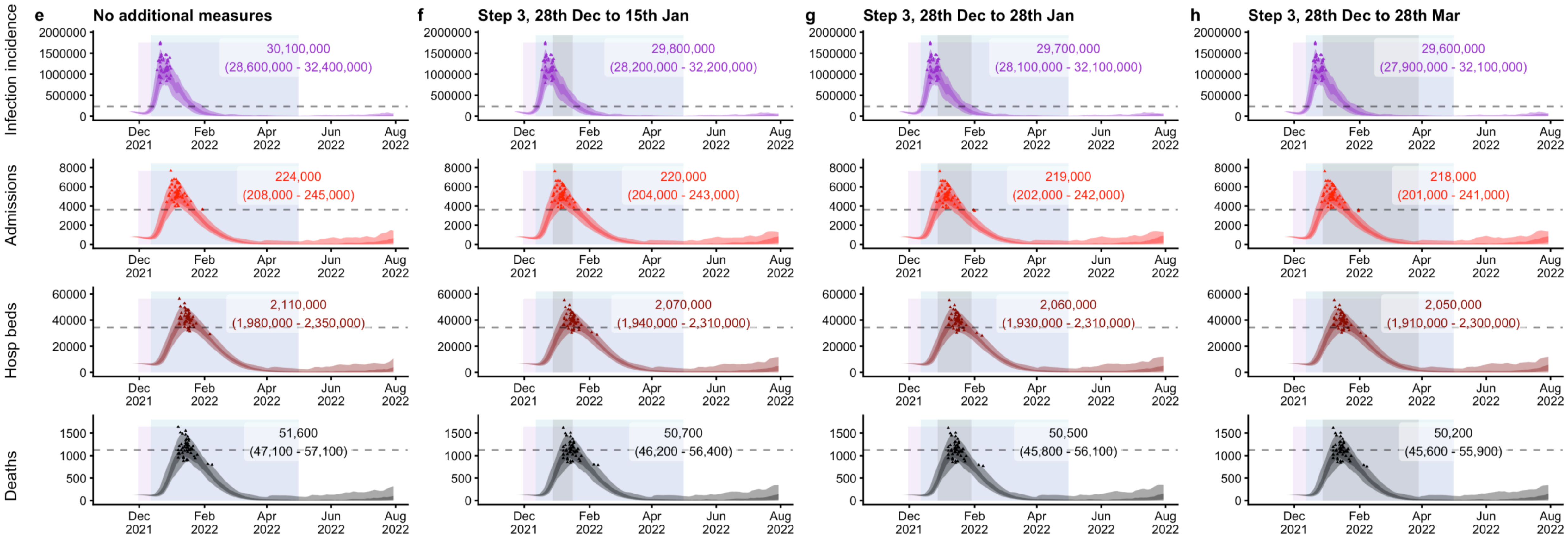
No additional measures vs. Step 2 measures



Low escape, 70% baseline severity

No additional measures vs. Step 3 measures



Low escape, 100% baseline severity

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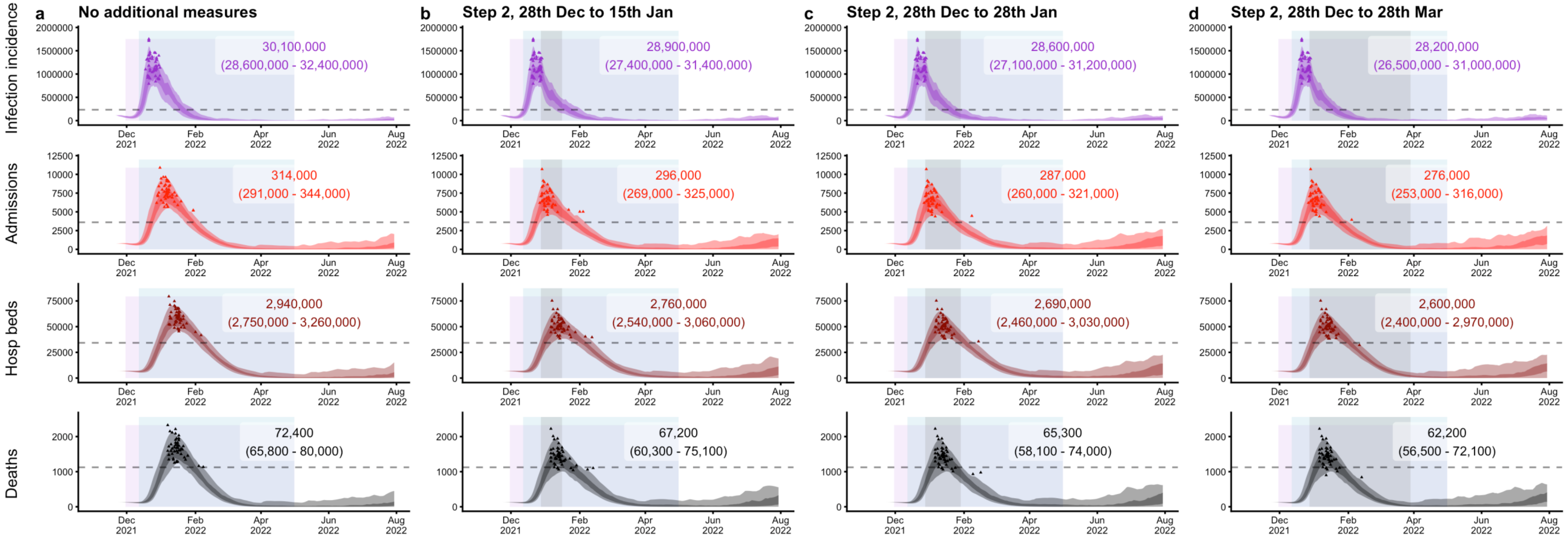
No additional measures vs. Step 2 measures



Low escape, 100% baseline severity

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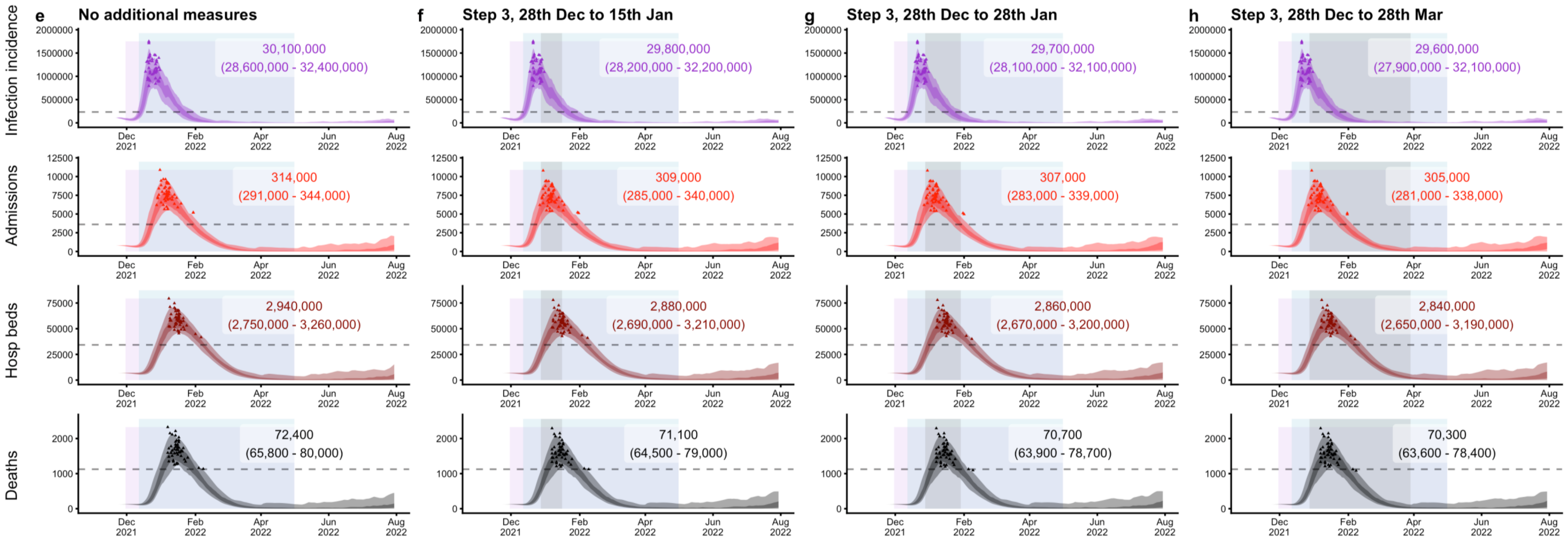
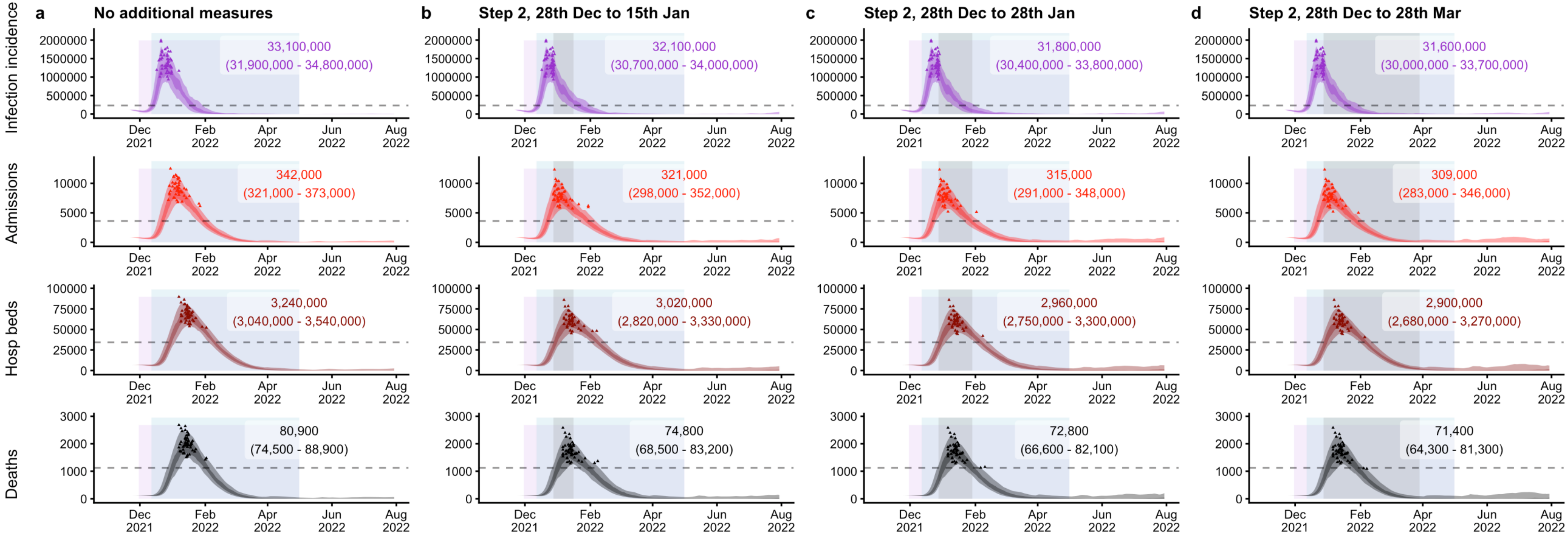
No additional measures vs. Step 3 measures



High escape, 70% baseline severity

No additional measures vs. Step 2 measures



High escape, 70% baseline severity

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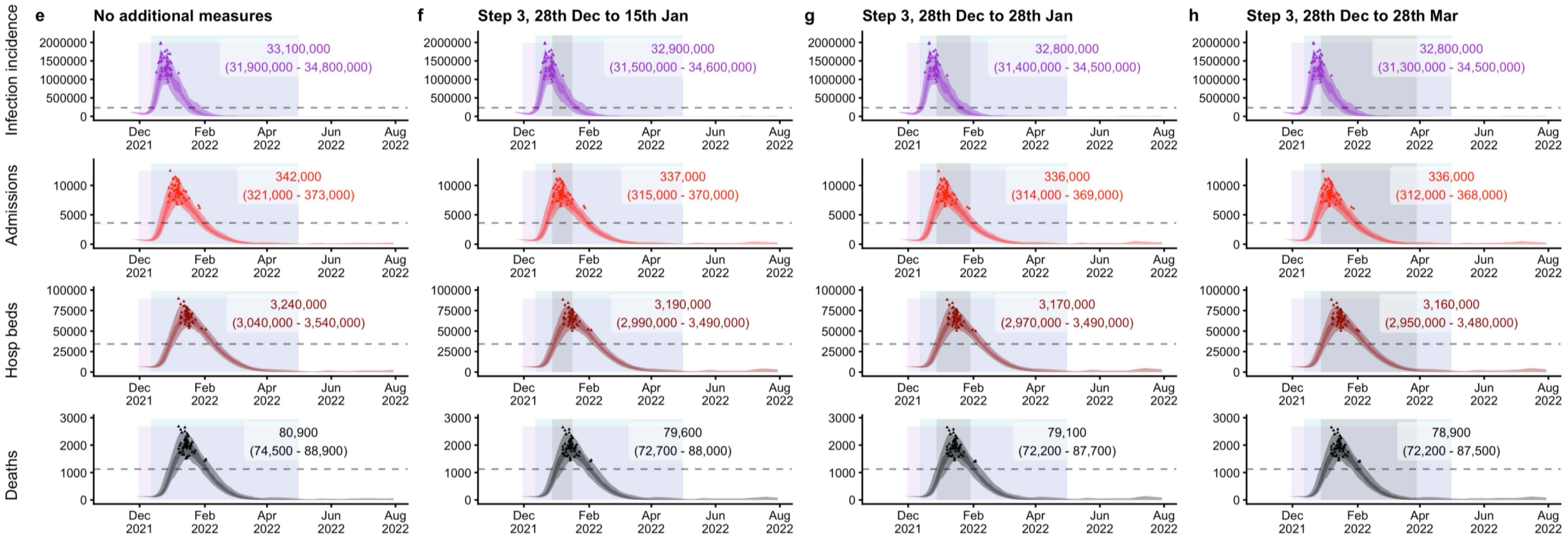
No additional measures vs. Step 3 measures



High escape, 100% baseline severity

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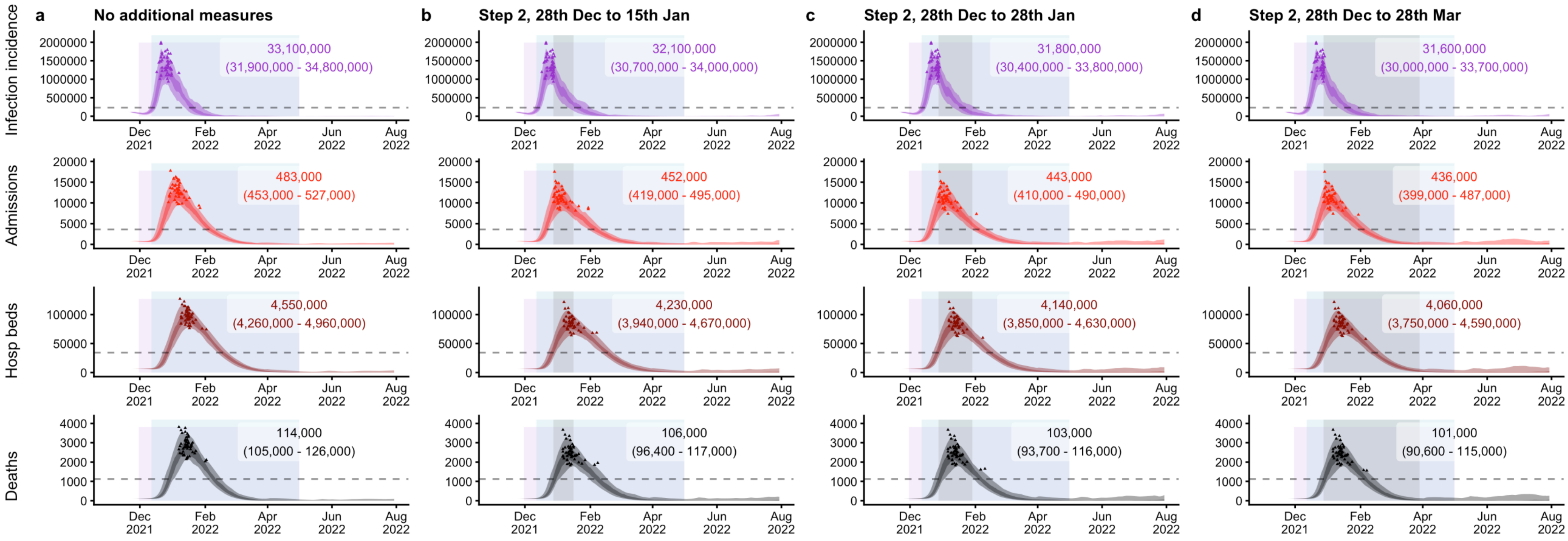
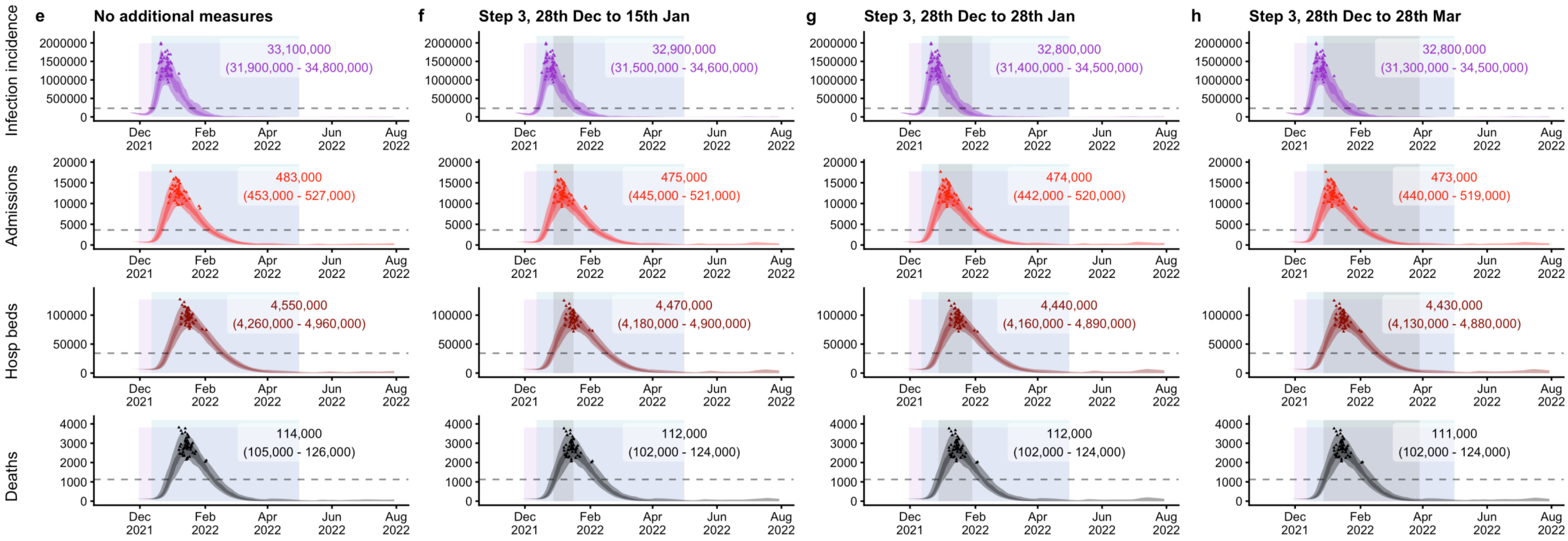
No additional measures vs. Step 2 measures



High escape, 100% baseline severity

No additional measures vs. Step 3 measures



Sensitivity analyses

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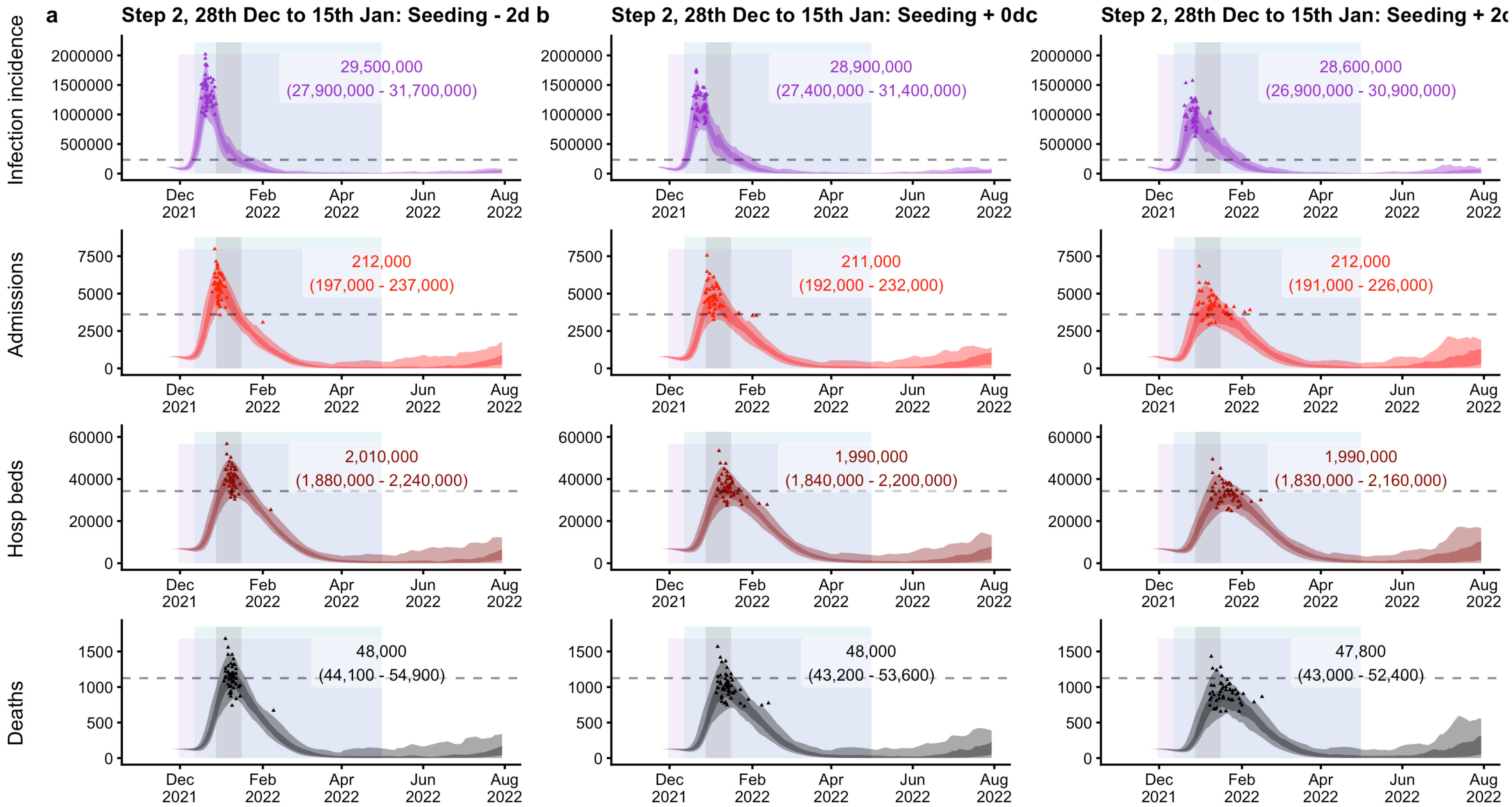
Sensitivity analysis: epidemic start date

Our assumptions about the introduction time of Omicron matter; these assumptions can have a substantial impact on the timing of the projected epidemic peaks, and thus the impact of the various control measures being considered.

The following slide shows a sensitivity analysis with Omicron being introduced 2 days earlier (left-hand column) and 2 days later (right-hand column) than our baseline assumptions.

Step 2 measures are introduced between 28th December 2021 and 15th January 2022 in all three scenarios.

Sensitivity analysis: epidemic start date



Sensitivity analysis: booster waning

For all Omicron analyses thus far, we have assumed that booster vaccinations provide additional protection which wanes after 6 months.

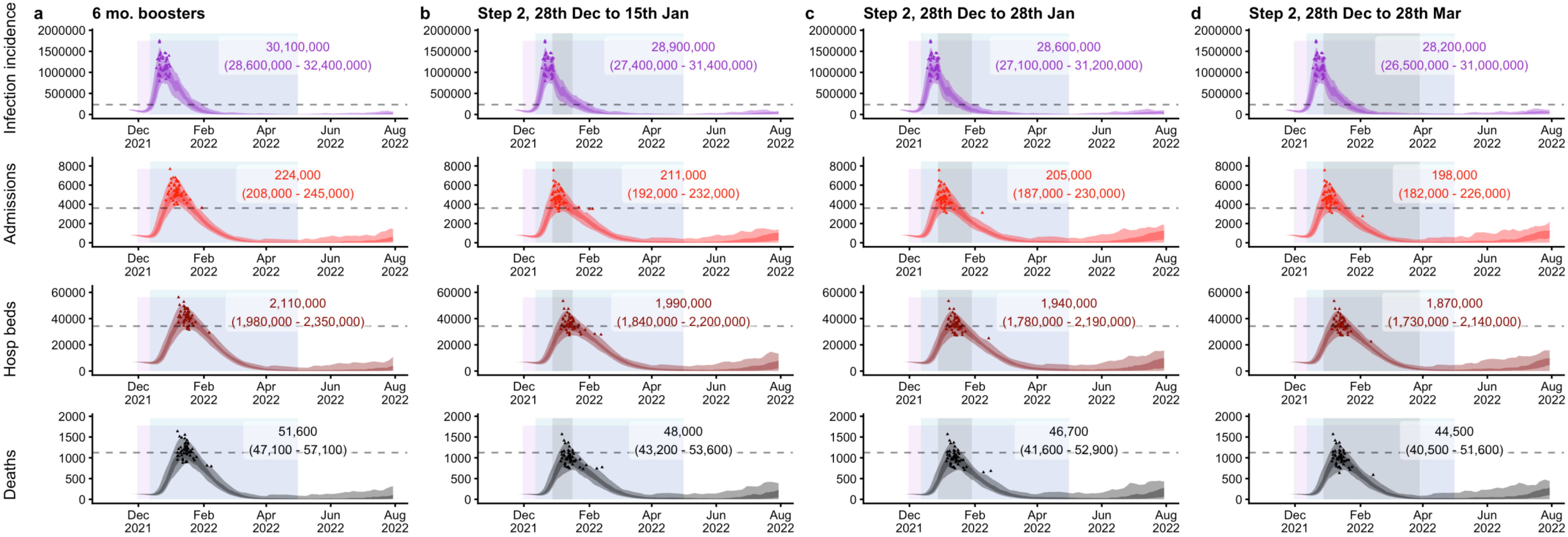
Recent data suggest that protection following booster vaccines may wane after a shorter period than 6 months.

As a sensitivity analysis, we consider an alternative scenario where booster protection lasts for 4 months. This increases deaths by 19% and hospitalisations by 15% when there are no further control measures. The shorter duration of protection also moderately increases the relative benefit of a longer control period (e.g. of 3 months as compared to 1 month) in terms of total hospitalisations and deaths.

Assuming an even shorter duration of protection than 4 months may lead to a greater impact.

Sensitivity analysis: booster waning

6 month duration of booster protection



Sensitivity analysis: booster waning

4 month duration of booster protection