Eight-Week COVID19 Projections for New York City

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Please see Methods in README.pdf

Results – see tables (Projected Epidemic Outcomes and Healthcare Demands etc.) in WeeklyProjections<date>.xlsx; see figures below.

Some observations based on confirmed COVID19 case data up to 4/3/2020:

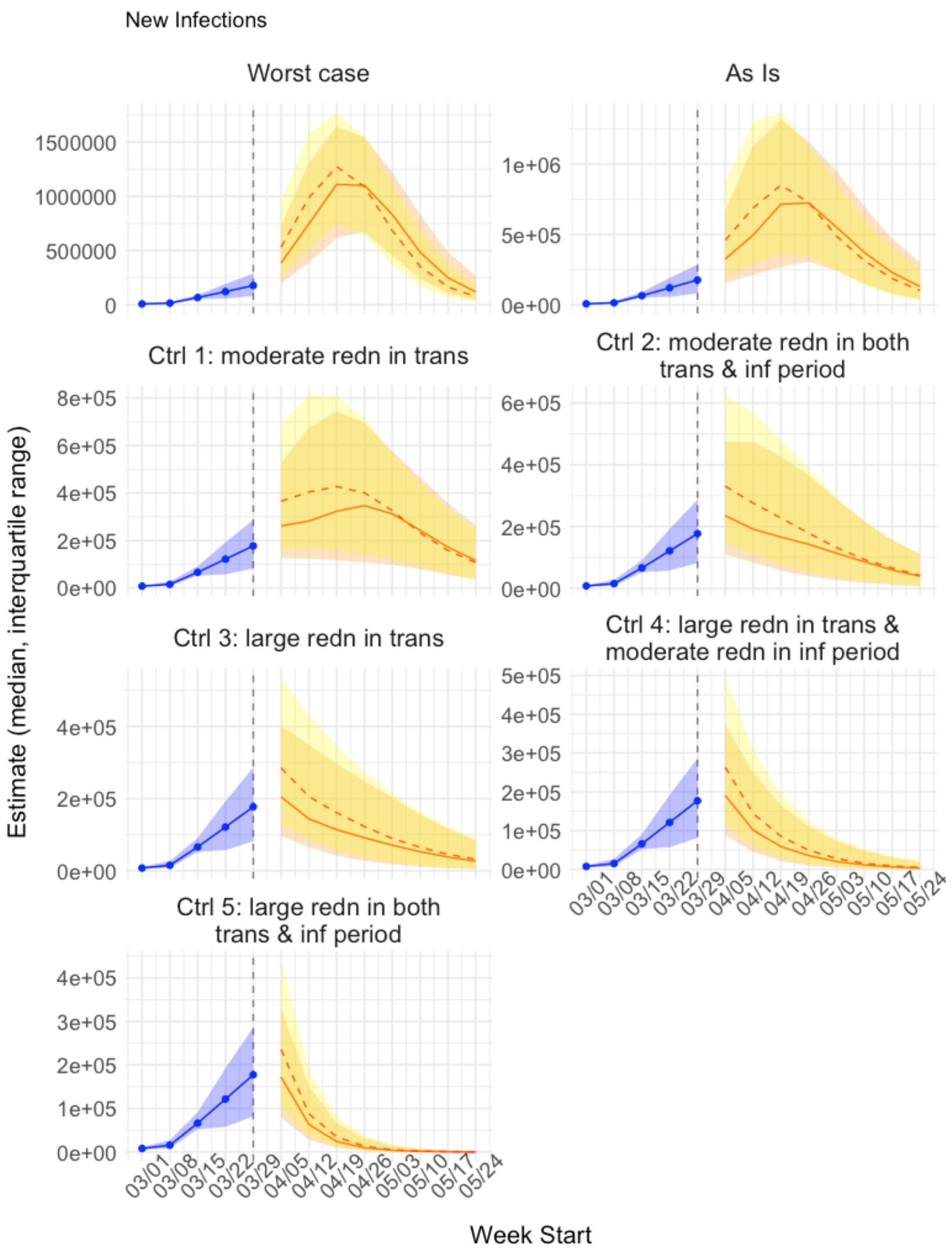
1) Preliminary assessment indicated social distancing implemented since early-mid March has substantially reduced transmission. Comparing to the no-control scenario (i.e. lifting social distancing and other control measures), maintaining current level of social distancing would avert approximately 1.2 M (IQR: 682,000 – 2.4 M) infections, 31,000 ICU (IQR: 28,000 – 37,000) admissions, and 13,000 (IQR: 12,000 – 17,000) deaths in the next 8 weeks.

2) The transmission rate and infectious period – two parameters indicative of speed of disease spread – have been estimated to reduce gradually since the week of 3/8/20, thanks to New Yorkers practicing social distancing and other infection and transmission control measures. However, the rates of reduction in these two parameters appeared to slow down during last week and remained at a similar level as the week before. As such, current spread of COVID19 remained at a relatively high level and per current status quo (see results for the As Is scenario below), number of infections are projected to continue to increase. So as other epidemic outcomes (e.g. hospitalization and ICU admission) as well as healthcare demands (e.g. needs for ventilators).

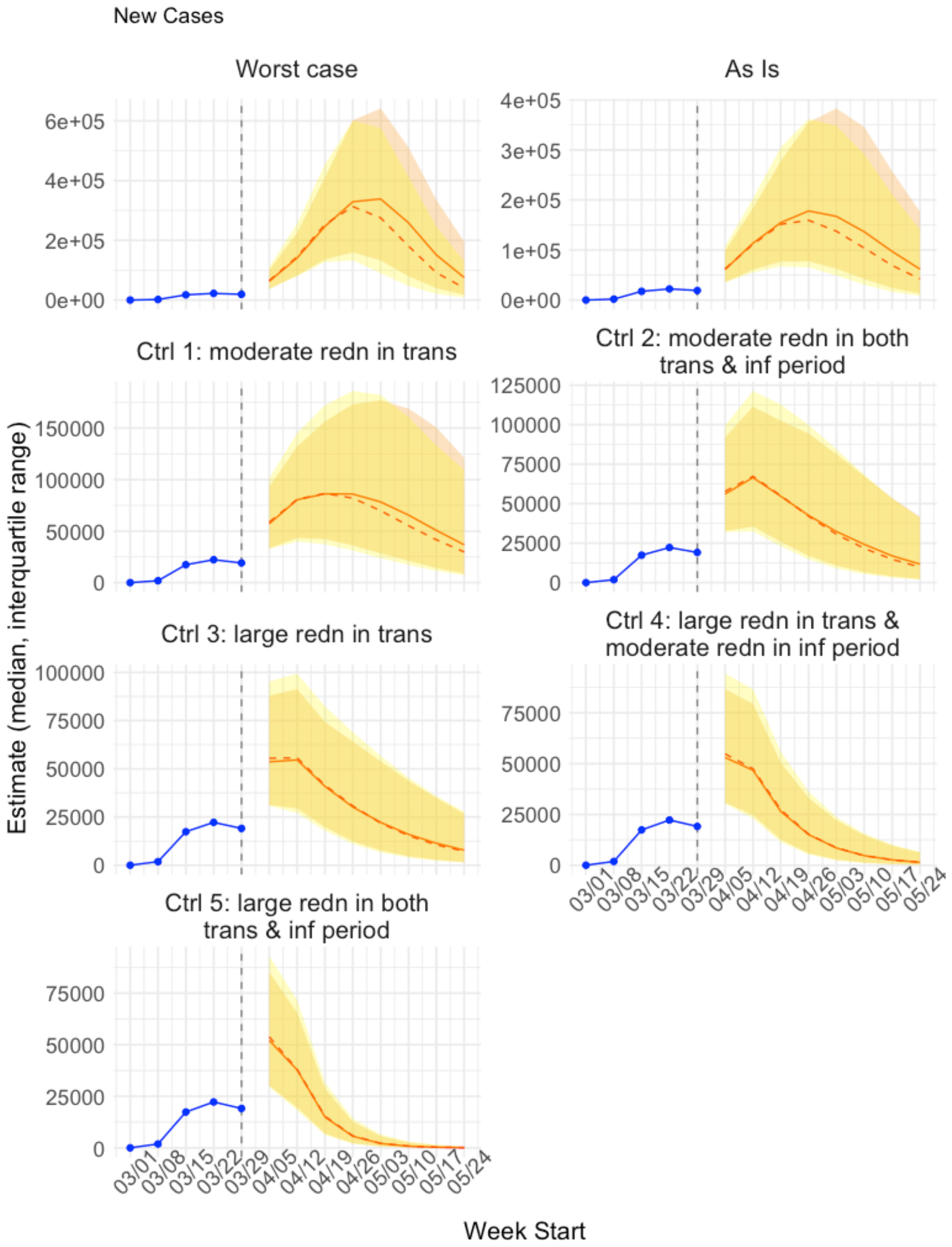
3) To further reduce transmission and flatten the curve, continued and more stringent transmission controls such as those shown in the Ctrl 2-5 scenarios below may be needed in the coming weeks to avoid overwhelming the healthcare systems.

Acknowledgement: We thank the NYC Department of Health and Mental Hygiene (DOHMH) for sharing of data and allowing this public posting.

Caution: Please note that there are large uncertainties in our model projections due to unknown disease transmission dynamics (model misspecification), changing behavior and policies, delay in reporting, and under-reporting. In particular, the data our projections are based on reflect situations ~2 weeks ago due to time lags from interventions implemented to transmission events (a couple days to weeks), from infection to symptom onset (~2-6 days), from symptom onset to seeking treatment (~2-7 days), from seeking treatment to getting tested and then reported in the surveillance system (~2-7 days). In addition, how the epidemic would unfold also depend largely in behavior changes over time.



Projected number for the next 8 weeks under different control scenarios. Blue lines and points show median estimates for the model training period; red lines show projected median numbers with seasonality (solid lines) or without seasonality (dashed lines); shaded regions shown the interquartile ranges (IQR) for model estimates with seasonality (in orange) or without seasonality (in yellow). Dates are the first day (i.e. Sunday) of the week.



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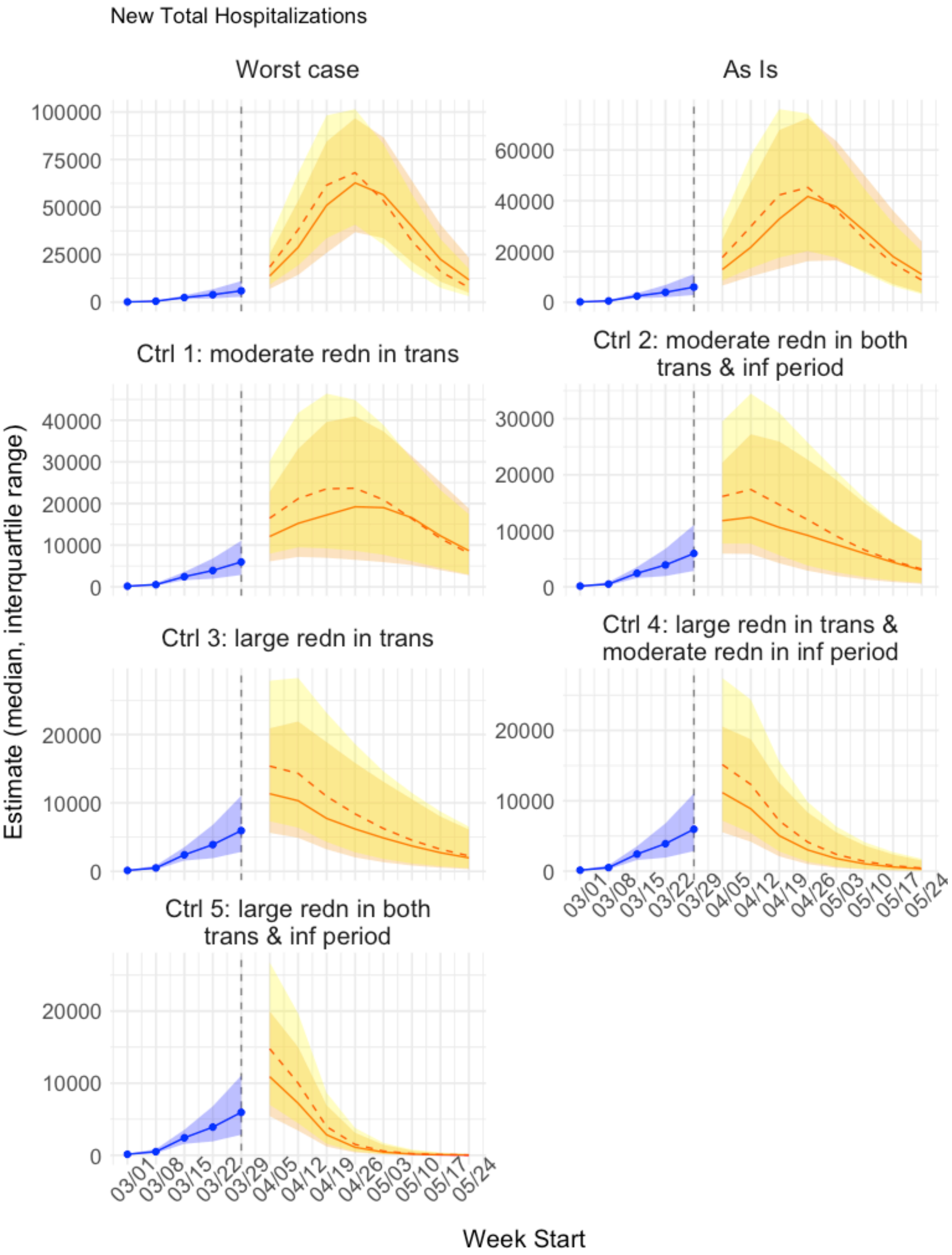

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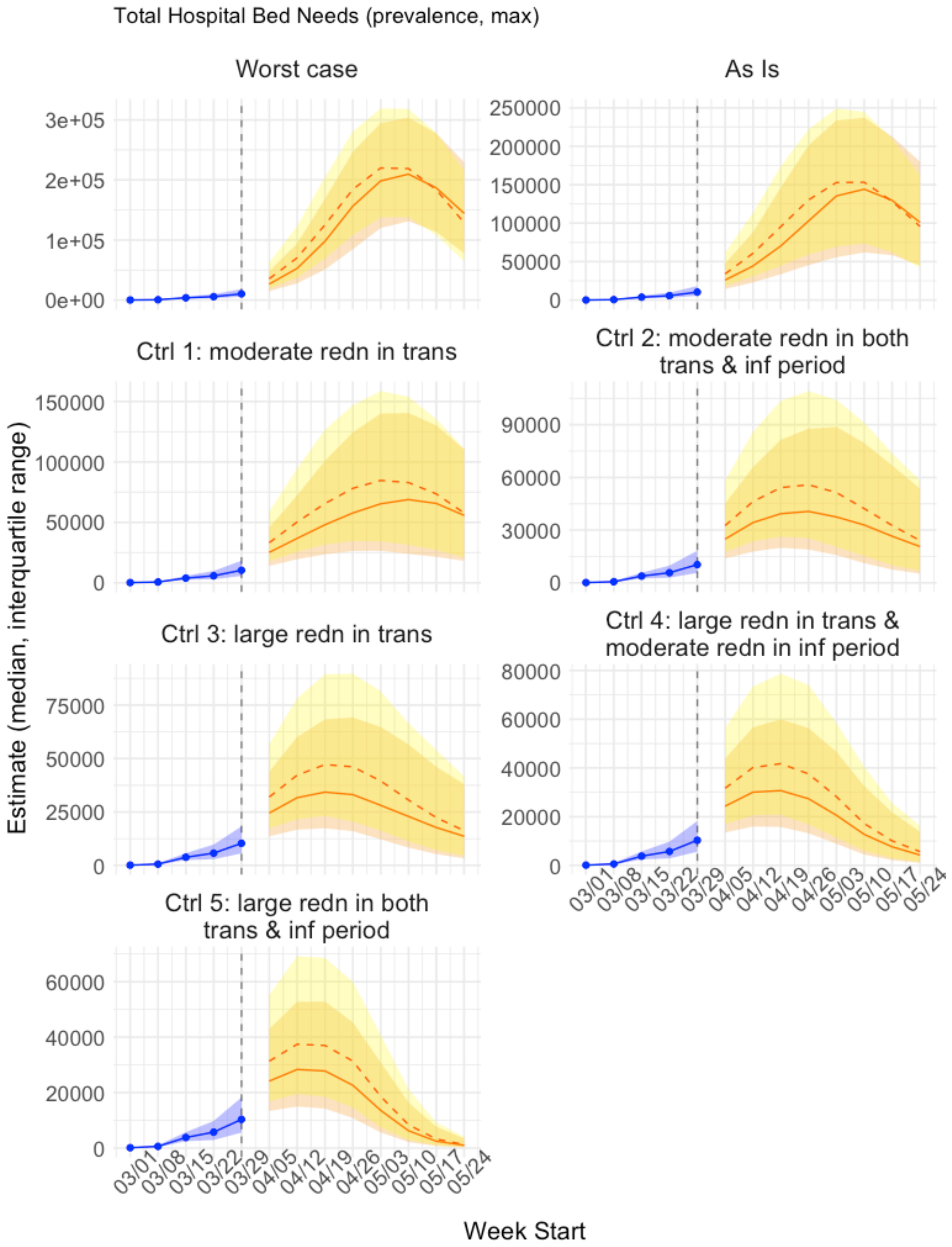

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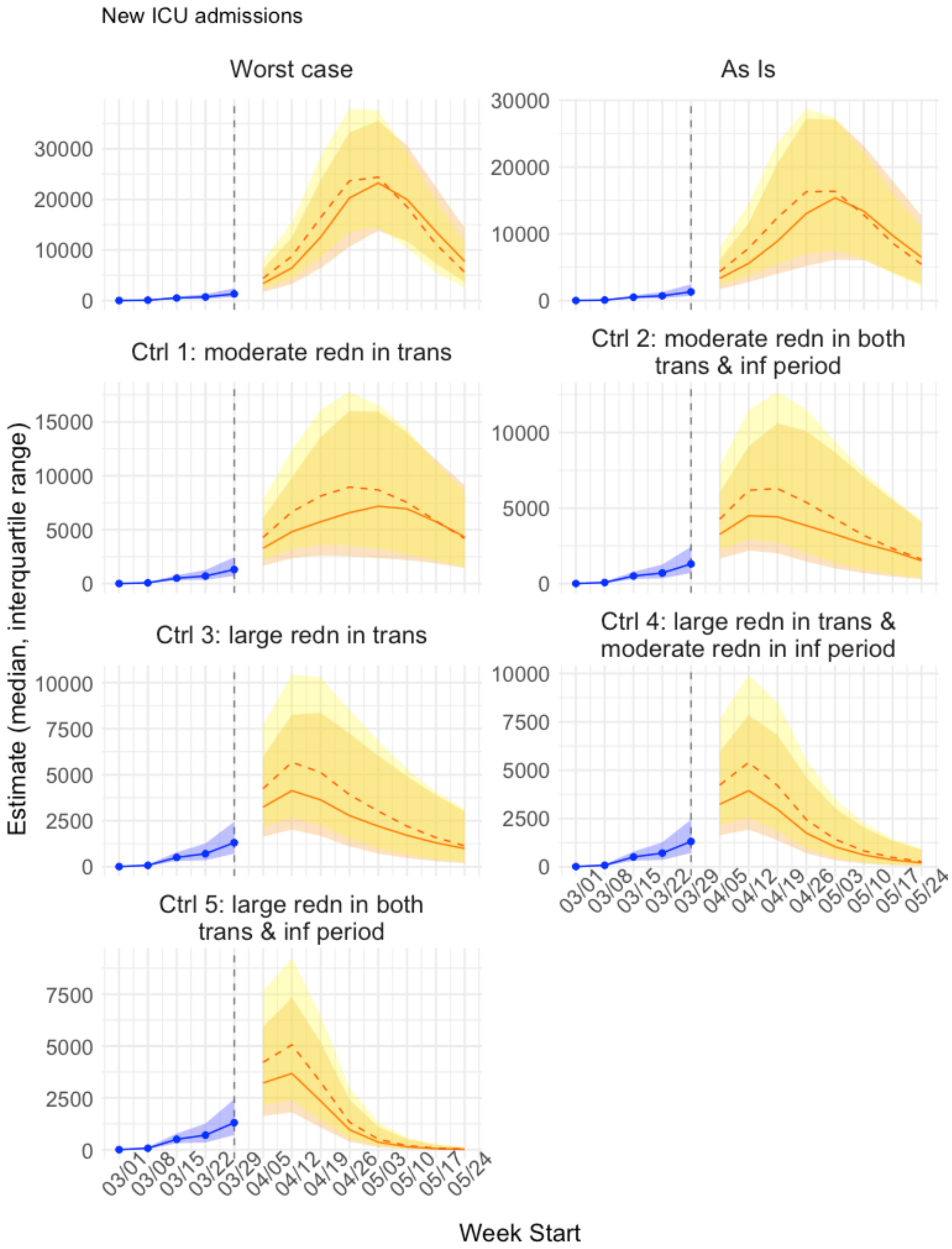

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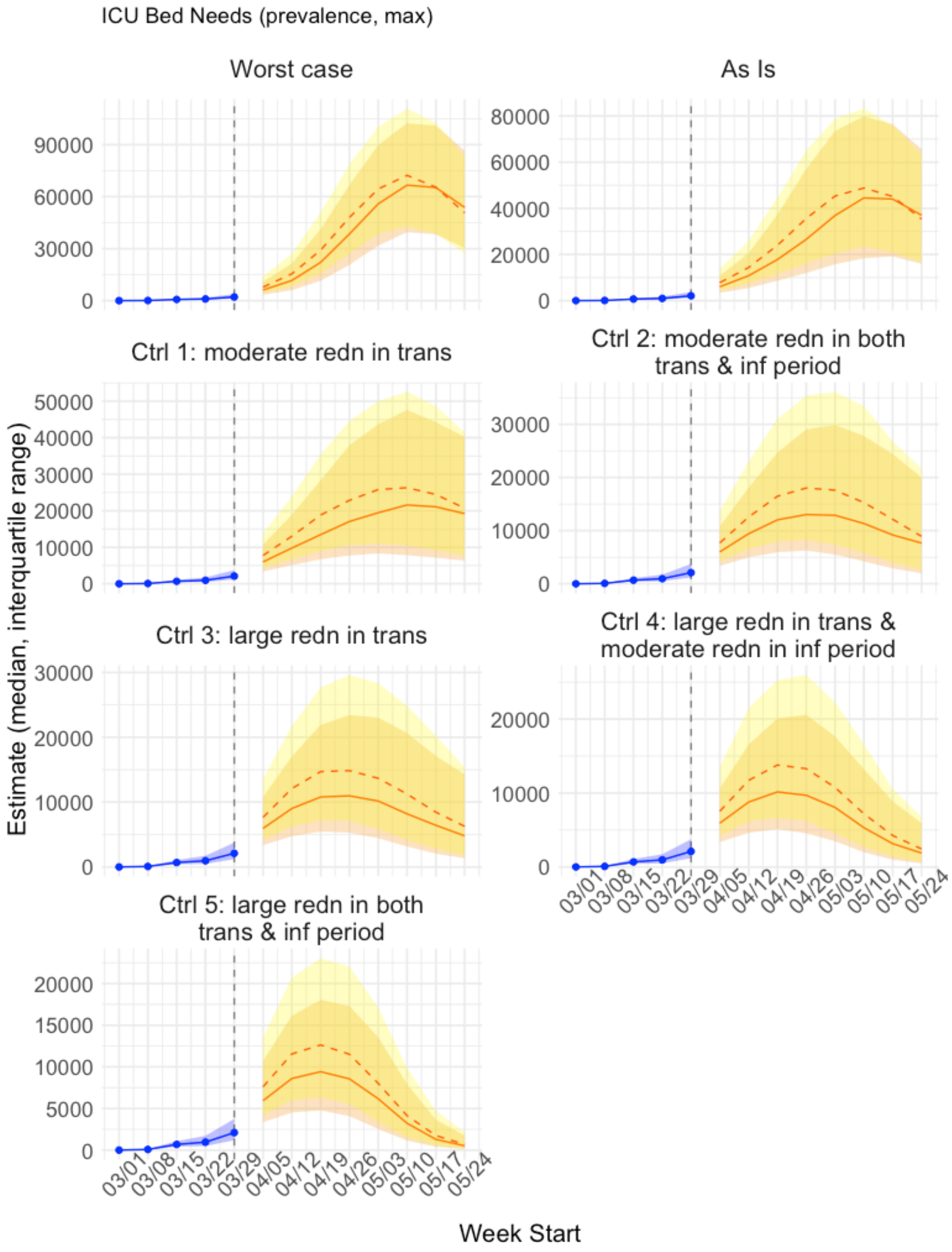

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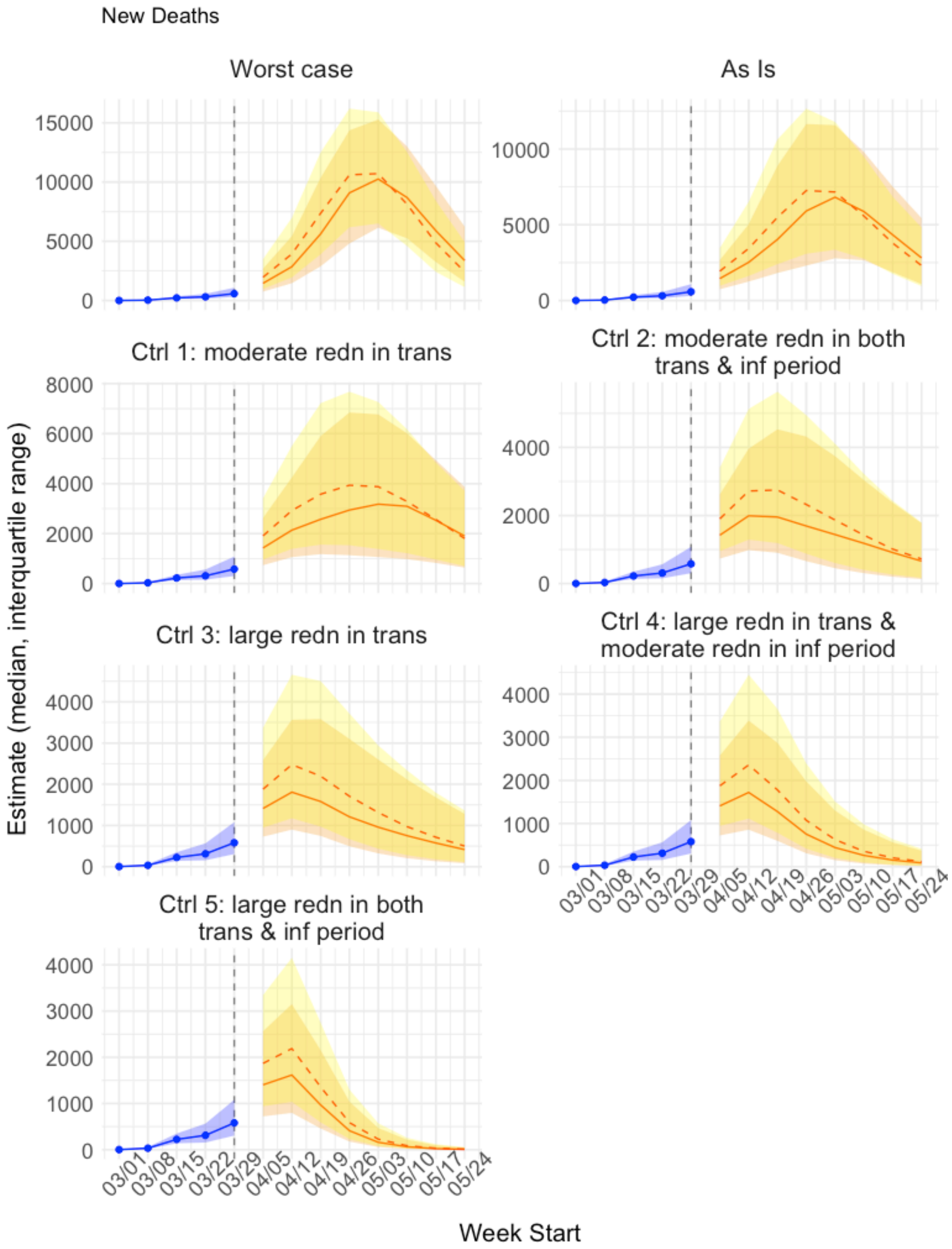

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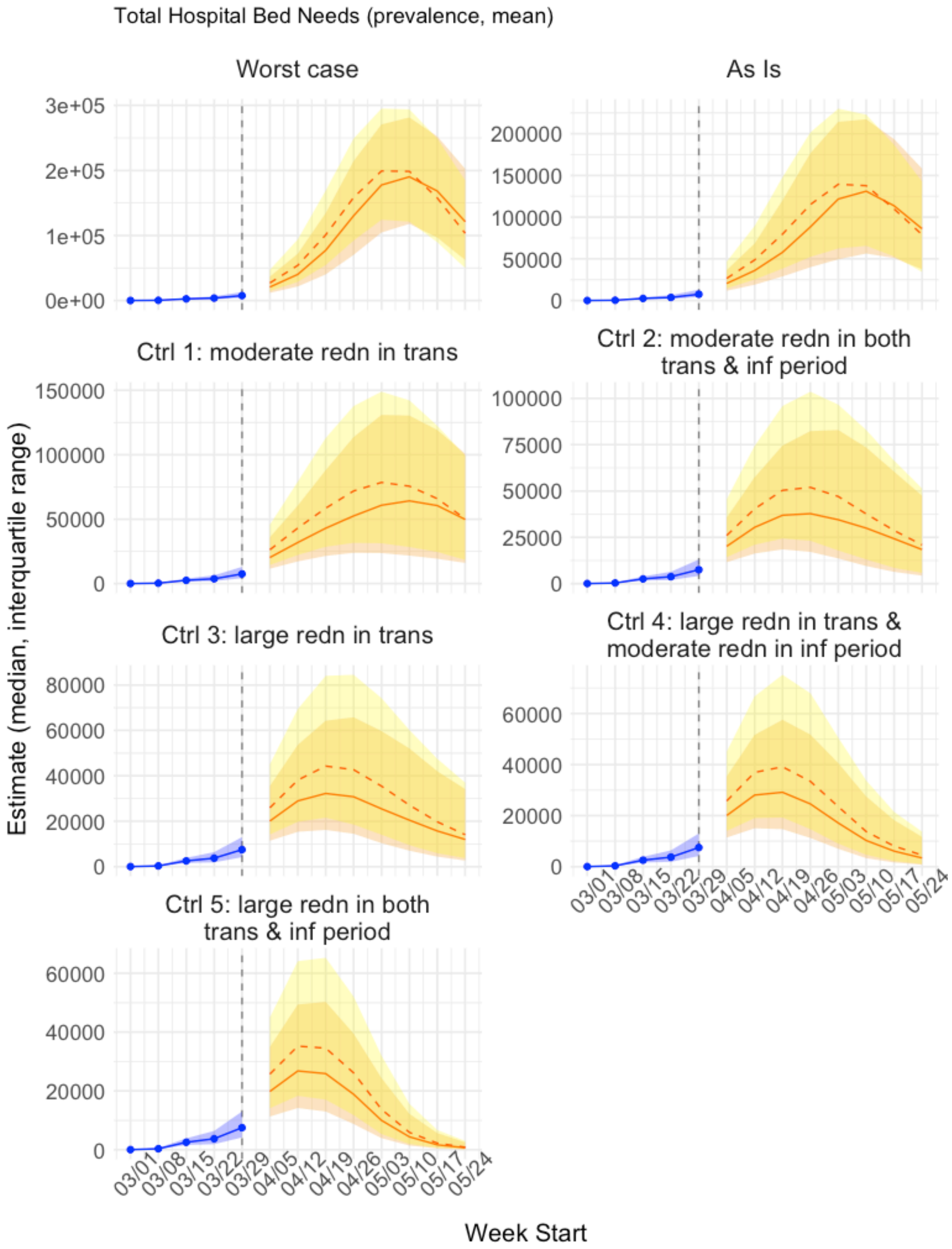

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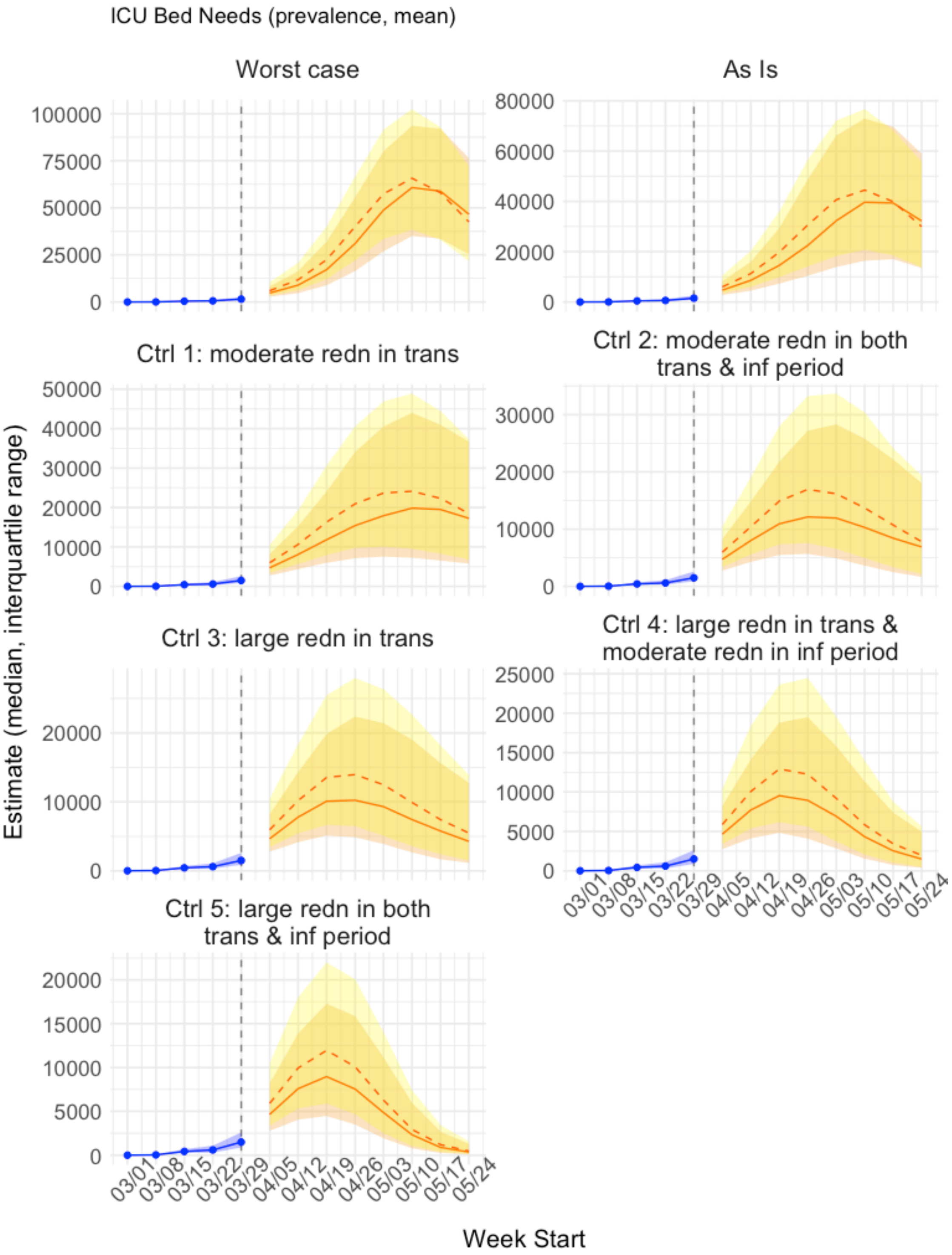

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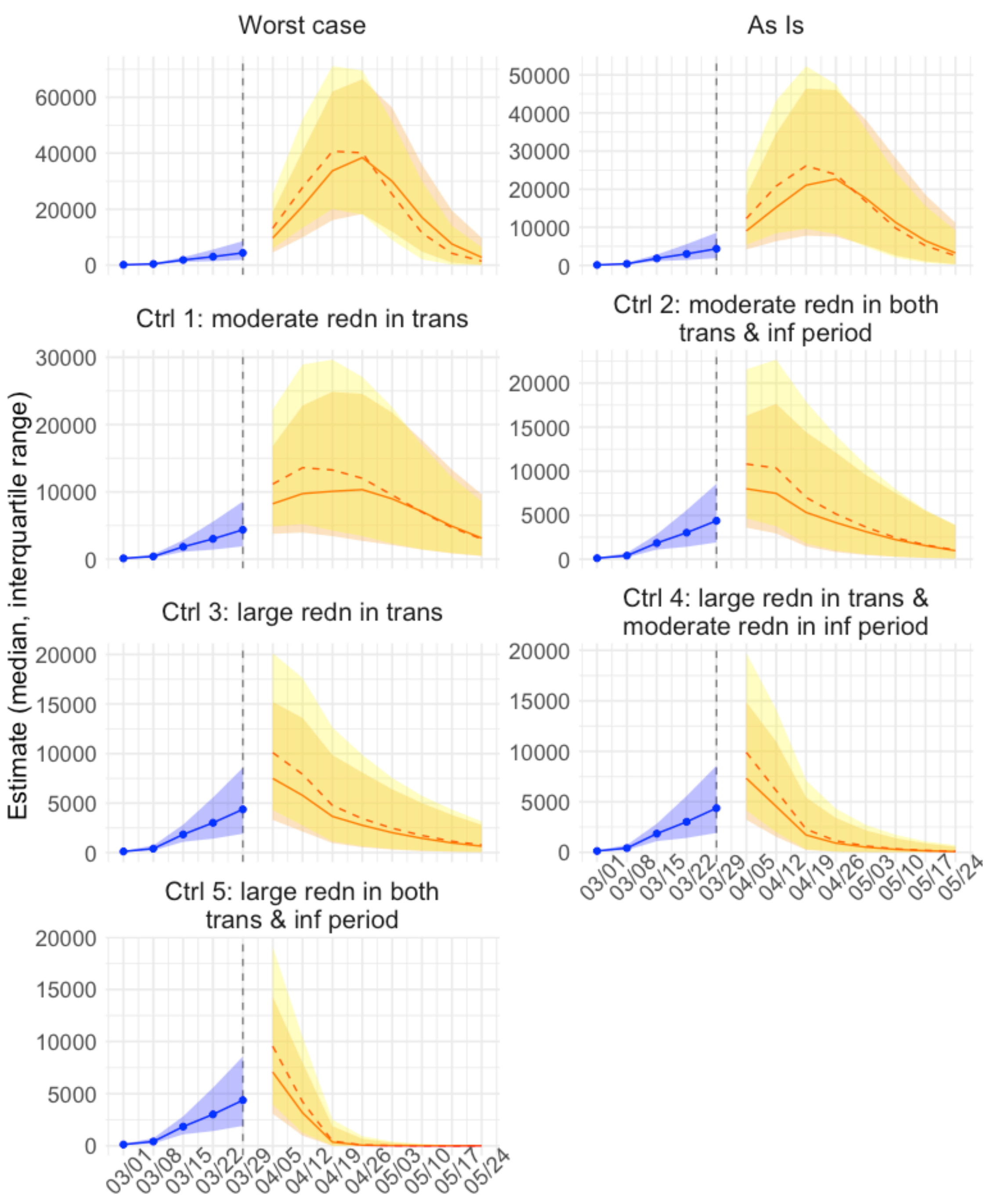
New Non-ICU Hospitalizations



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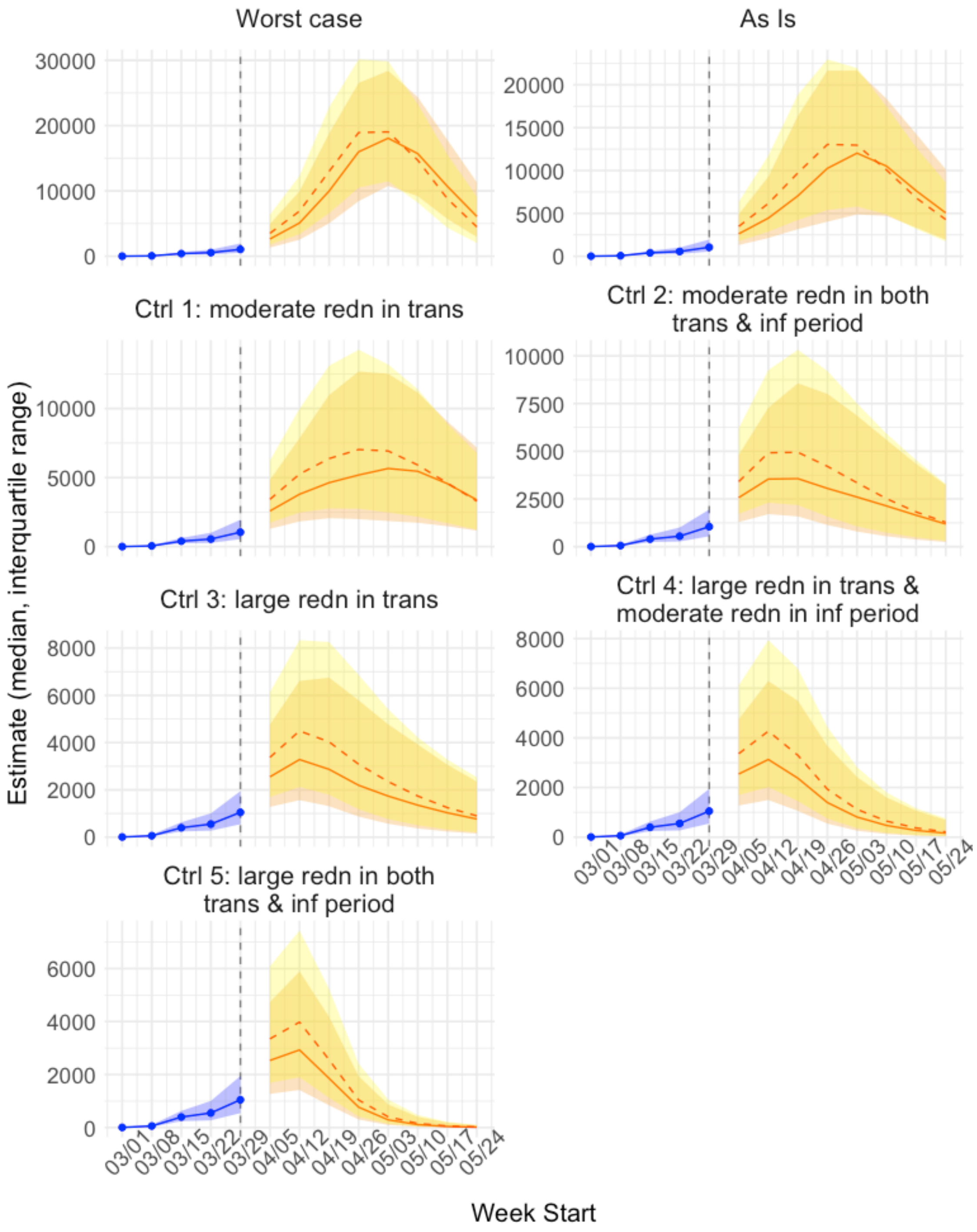
New Intubations



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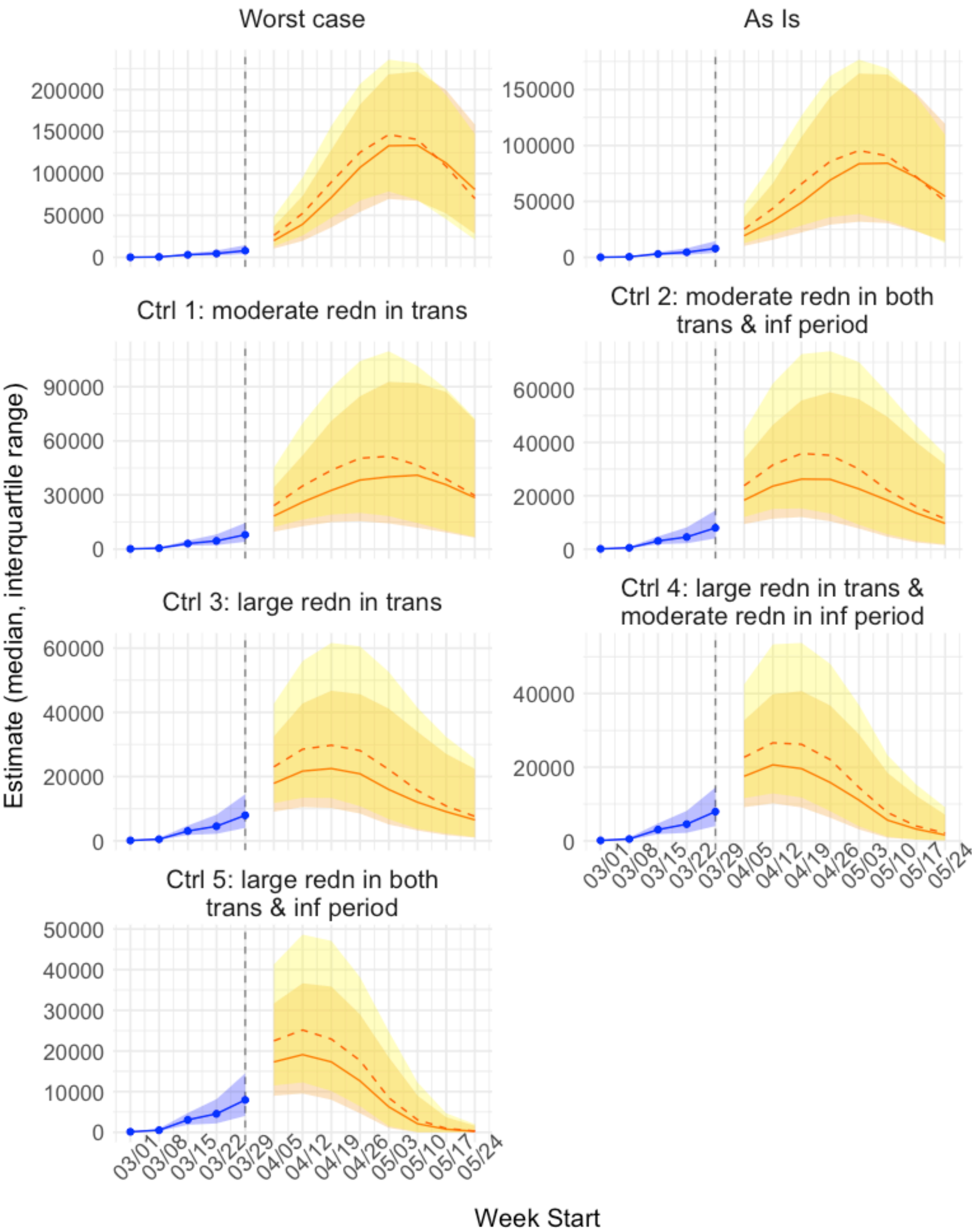
Non-ICU Hospital Bed Needs (prevalence, max)



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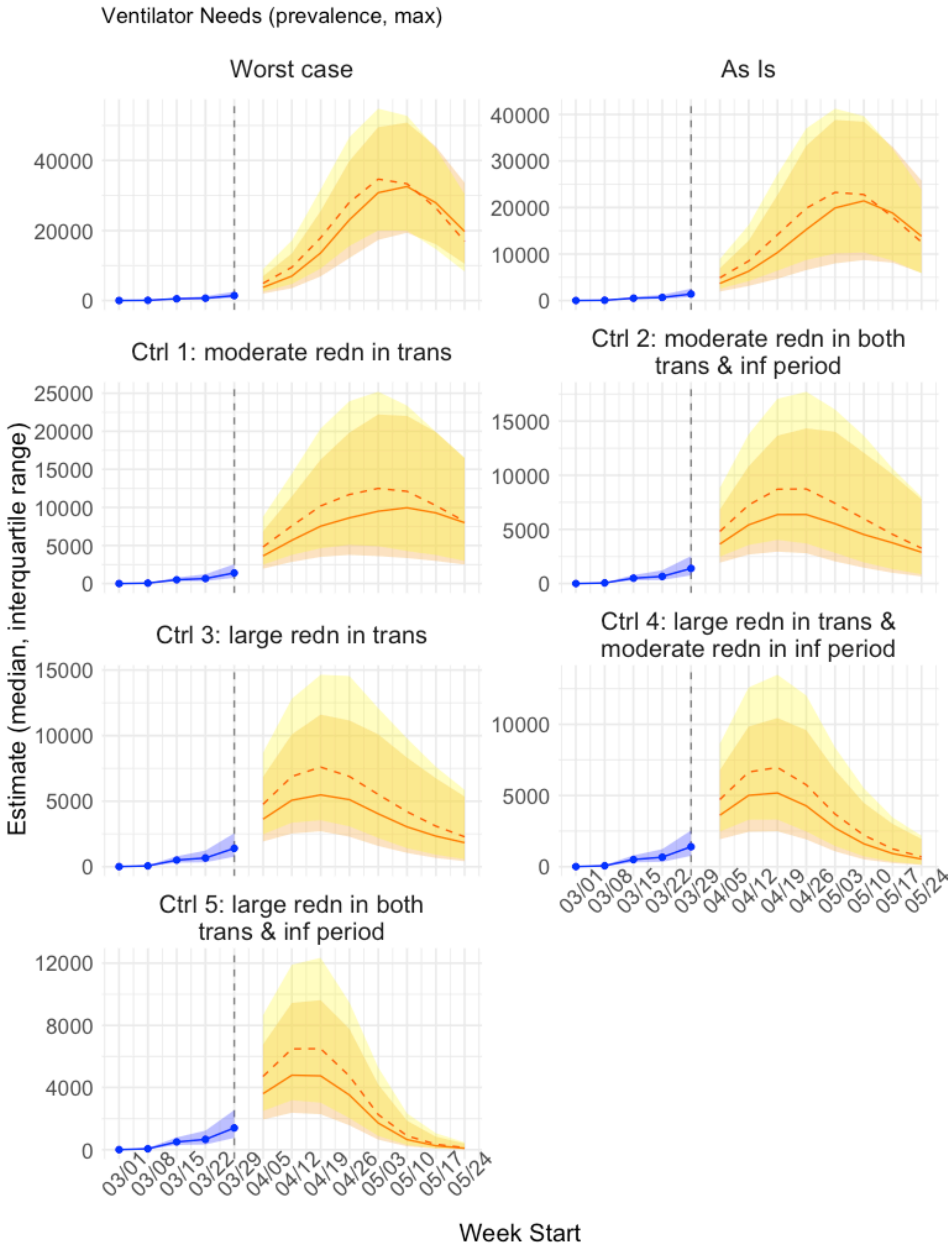

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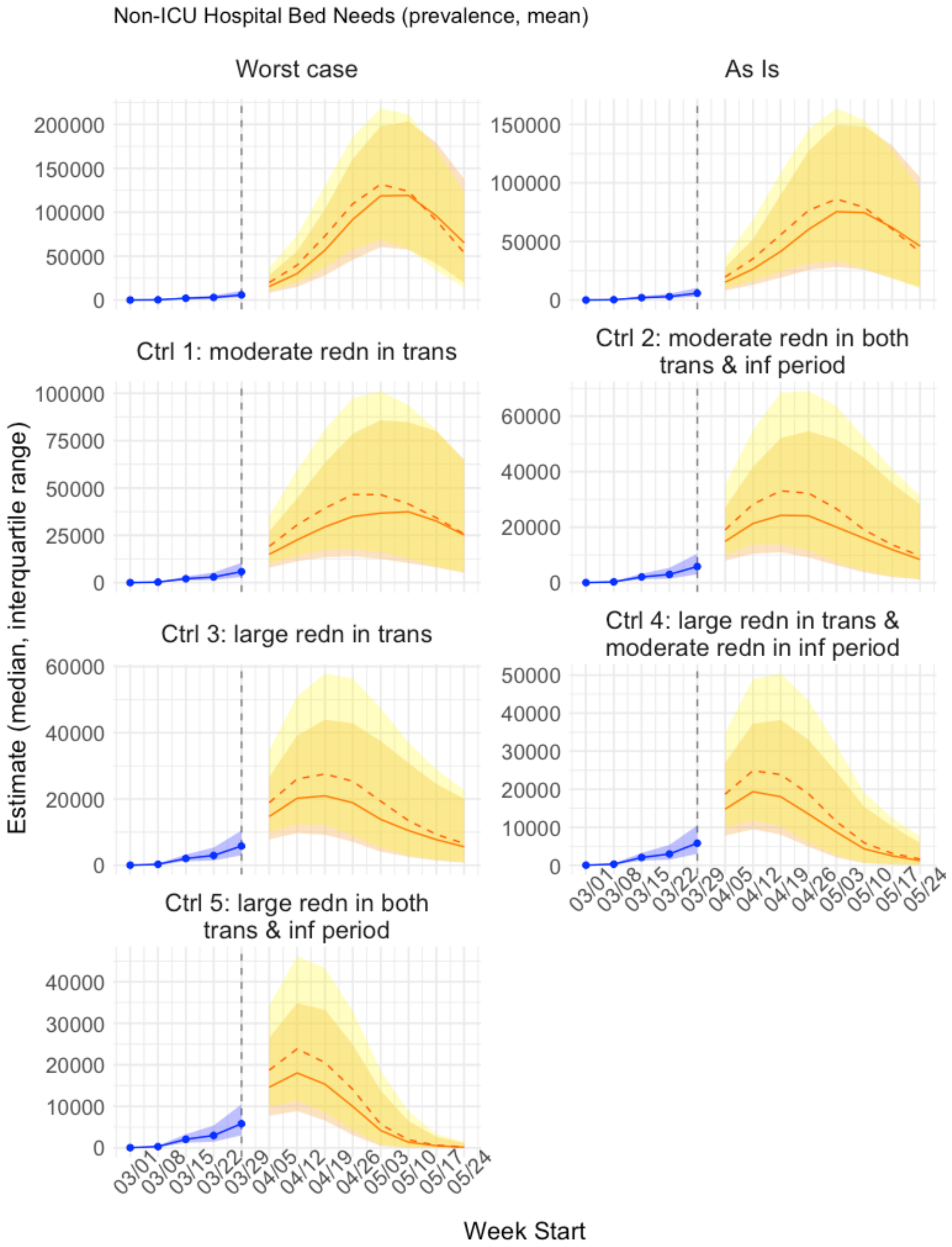

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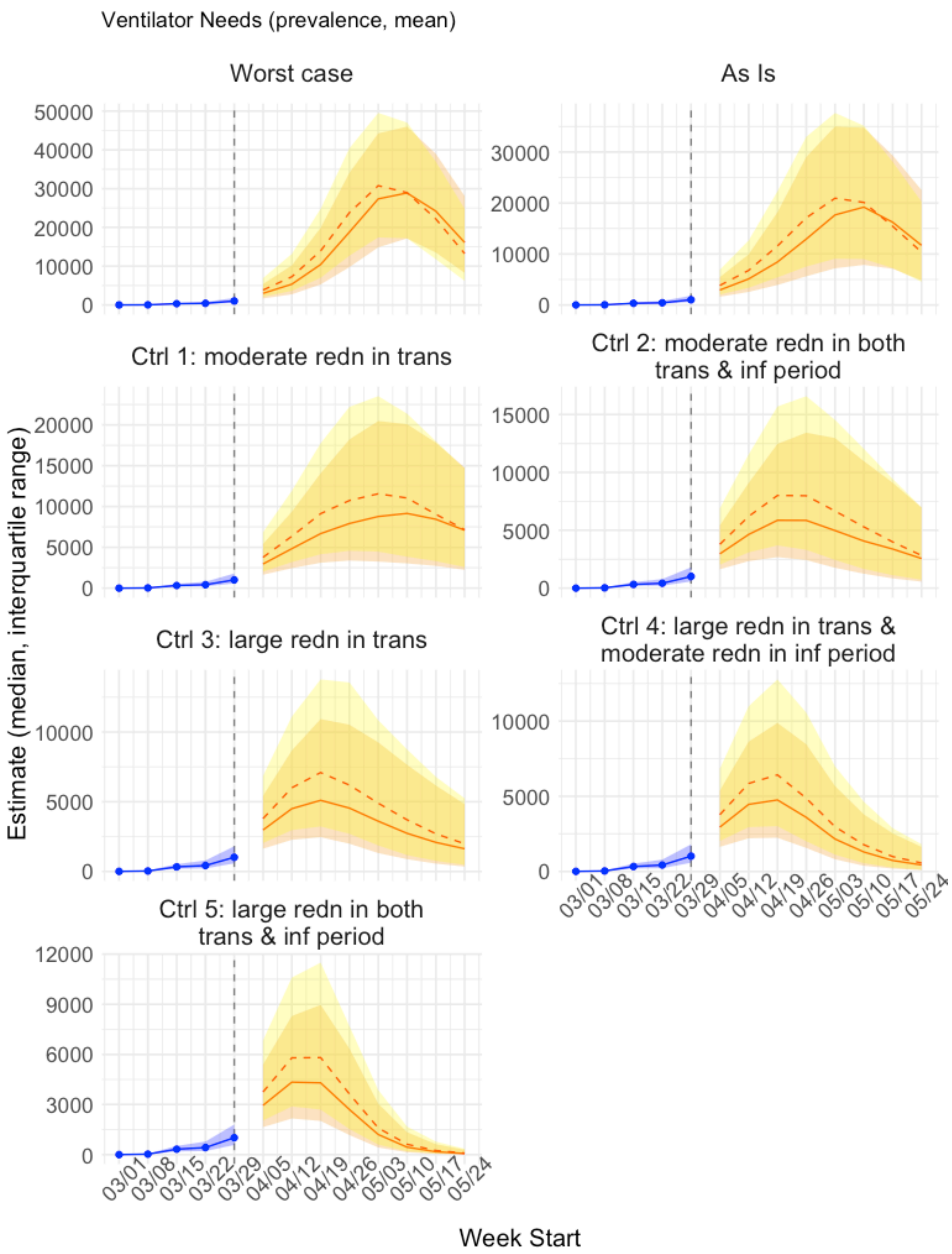

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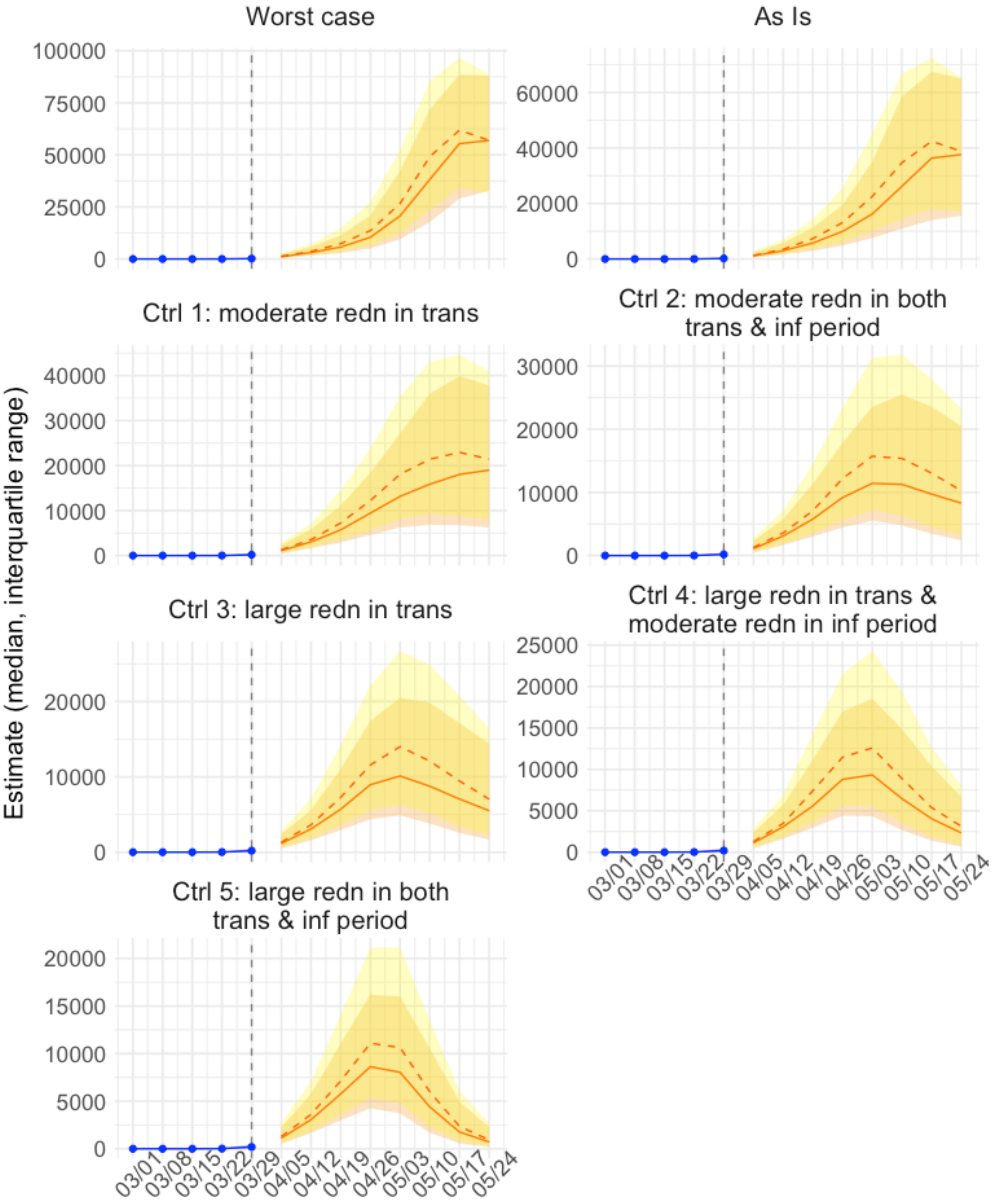
Total Hospitalization Dischange



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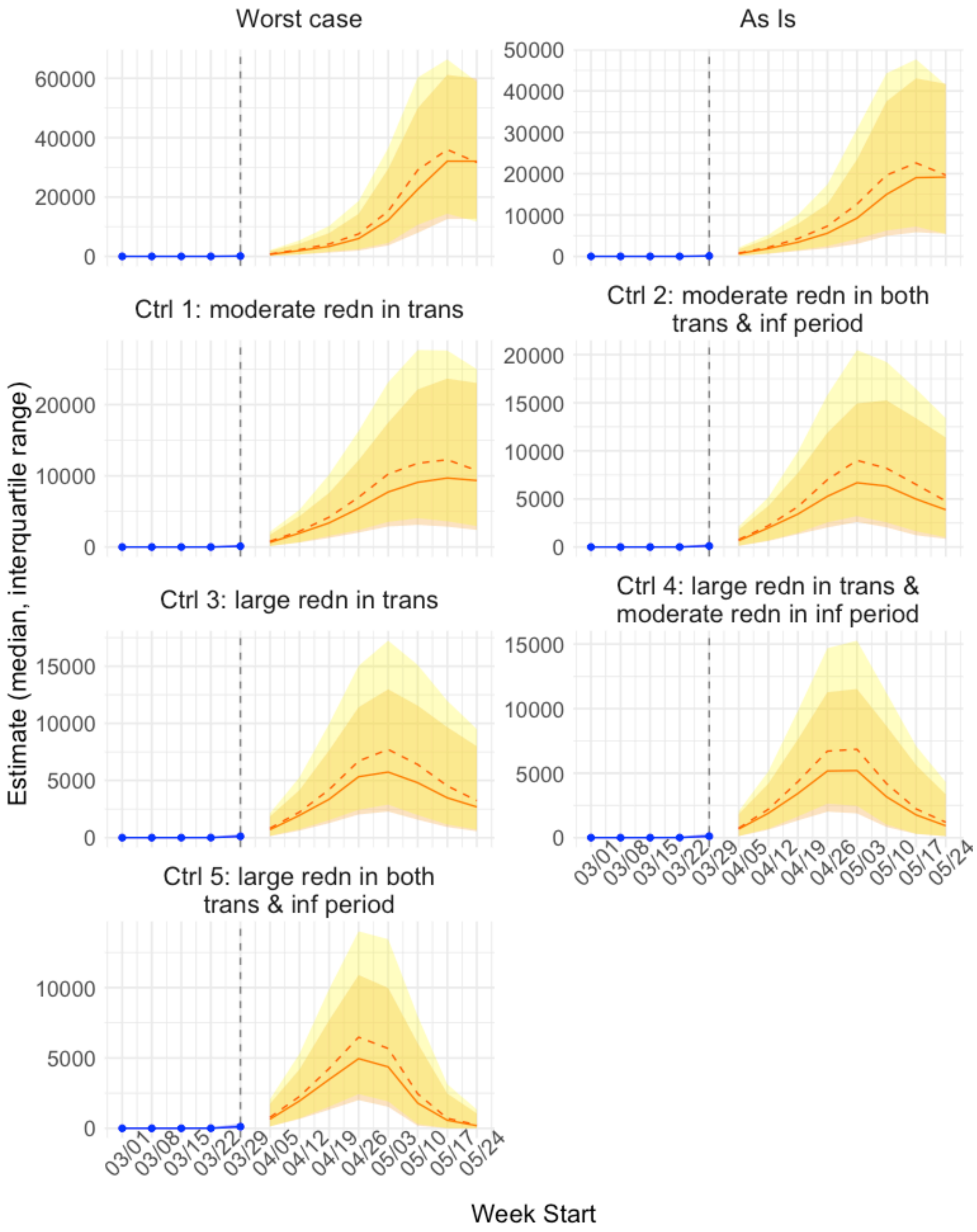
Non-ICU Hospitalization Dischange



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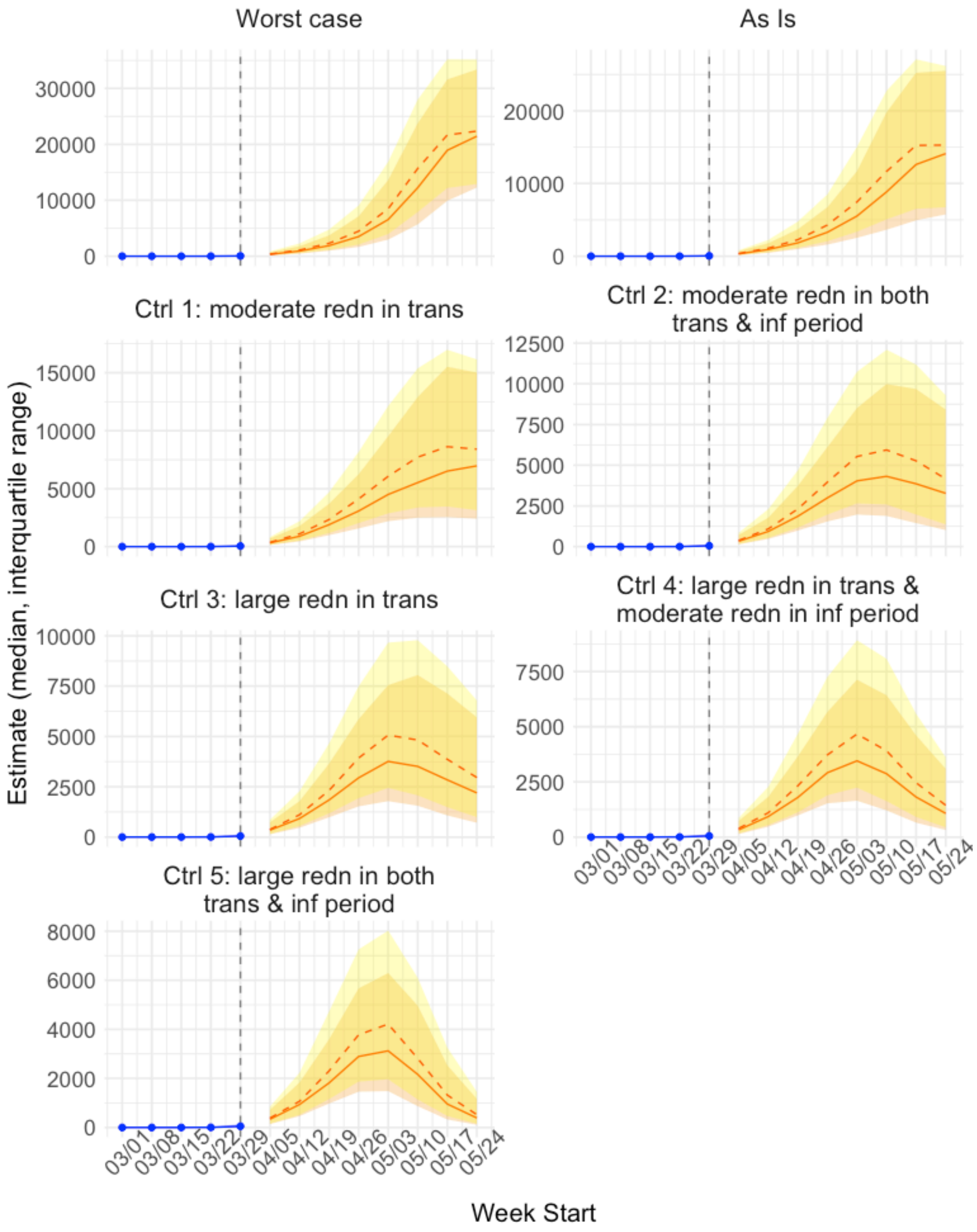
New ICU Dischange



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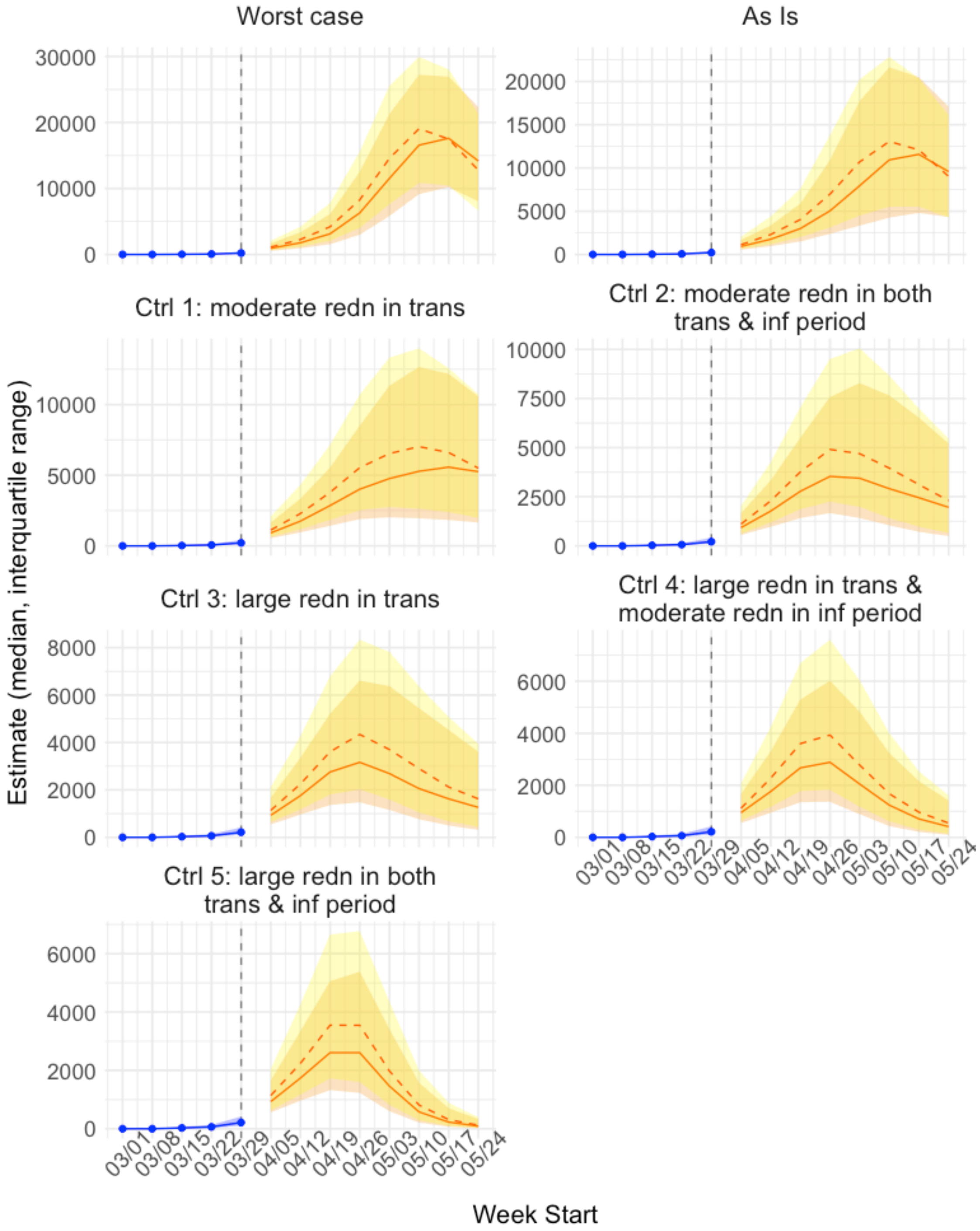
New Extubation



Worst case

As Is

Ctrl 1: moderate redn in trans

Ctrl 2: moderate redn in both trans & inf period

Ctrl 3: large redn in trans

Ctrl 4: large redn in trans & moderate redn in inf period

Ctrl 5: large redn in both trans & inf period

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