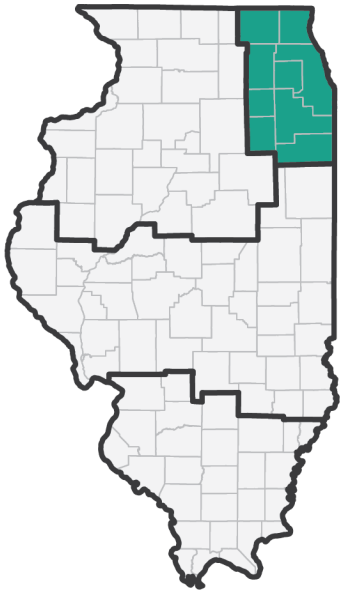
Early warning signs for exceeding hospital capacity in the Northeast Restore Region

Reese Richardson, Manuela Runge, and Jaline Gerardin

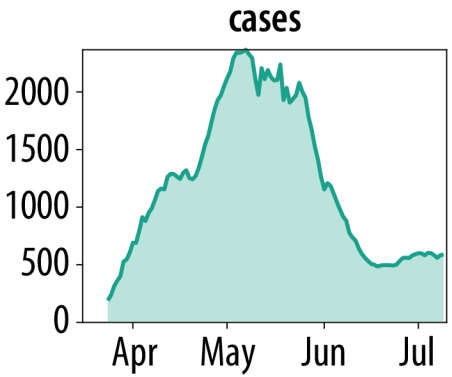
July 9, 2020 (updated: July 14, July 21)

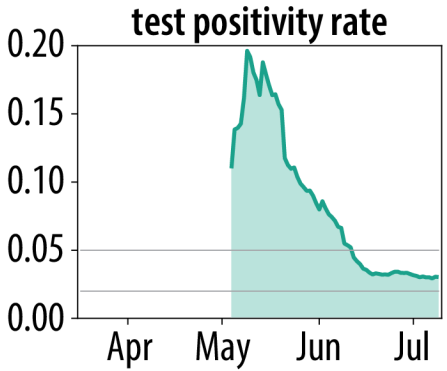
Institute for Global Health
Northwestern

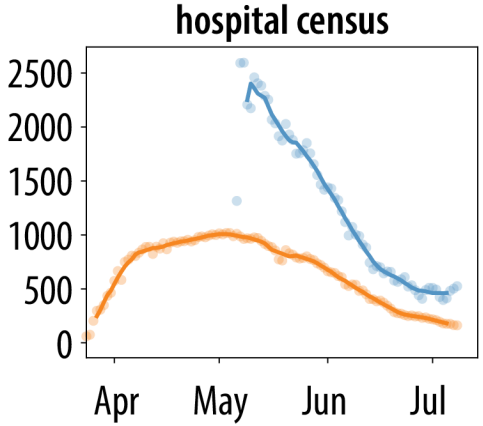
The Northeast Region is slowly ticking up



Northeast Region







covid occupied non-ICU

covid occupied ICU

Data from July 9 2020
IDPH public and EMResource

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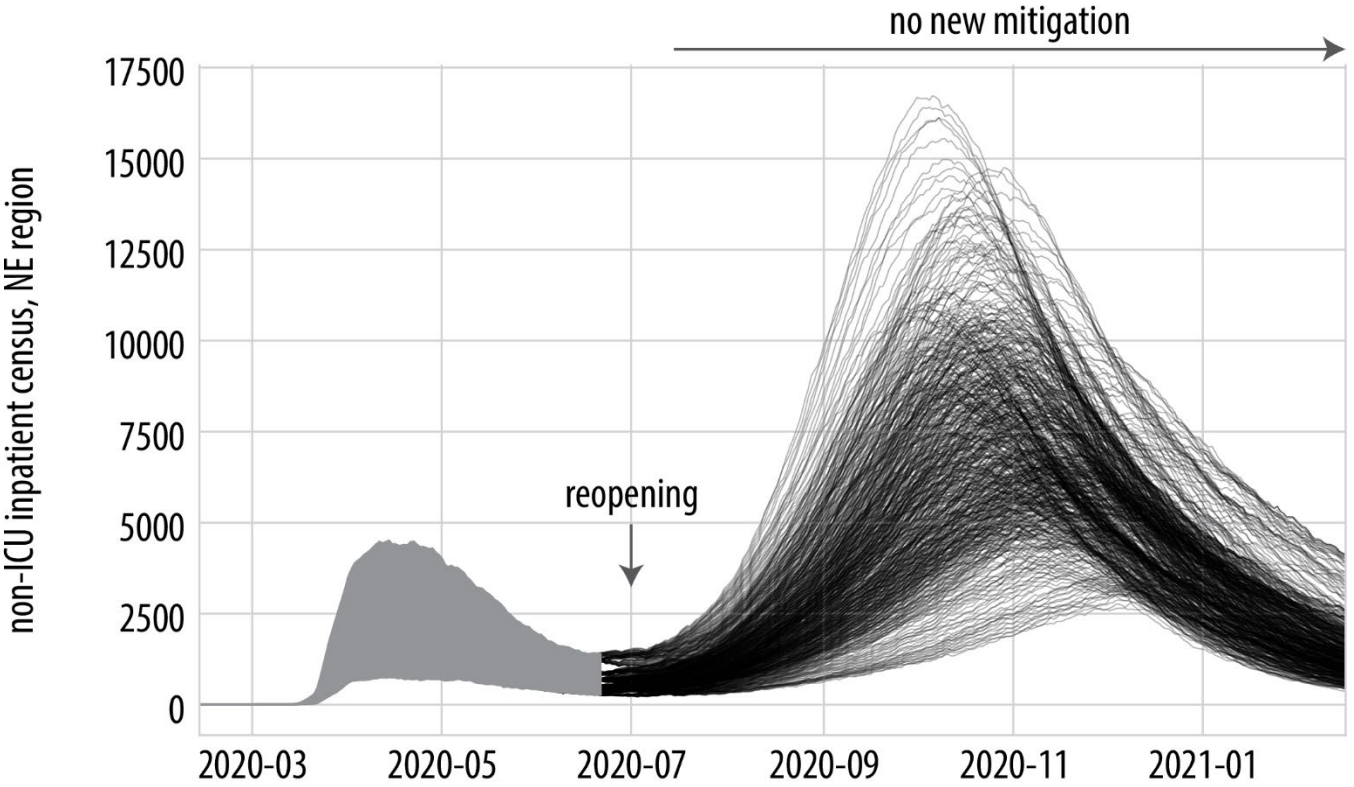
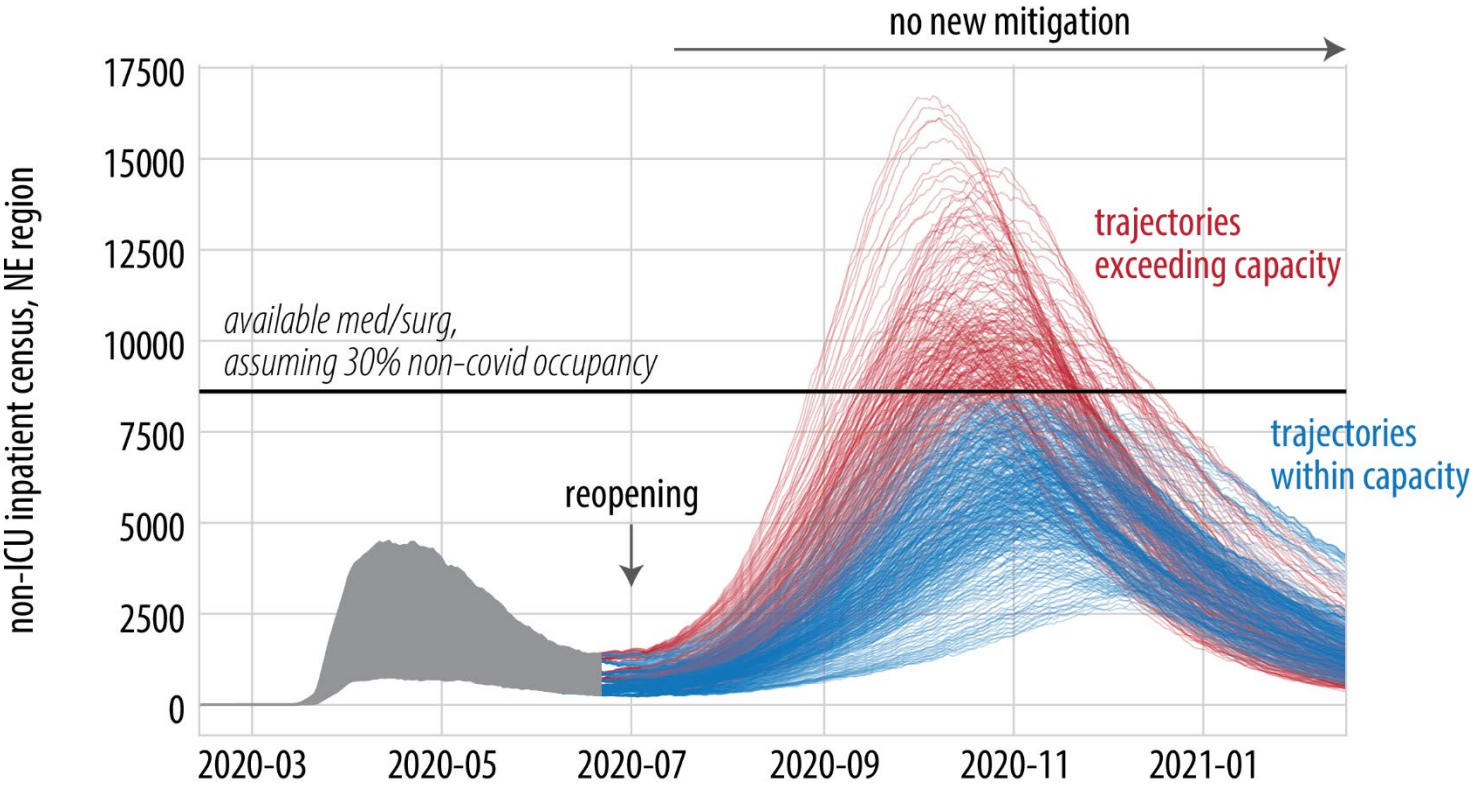
How do we know when to start prepping Metro ACF for overflow inpatient needs?

Model focus: Northeast Restore Region ONLY

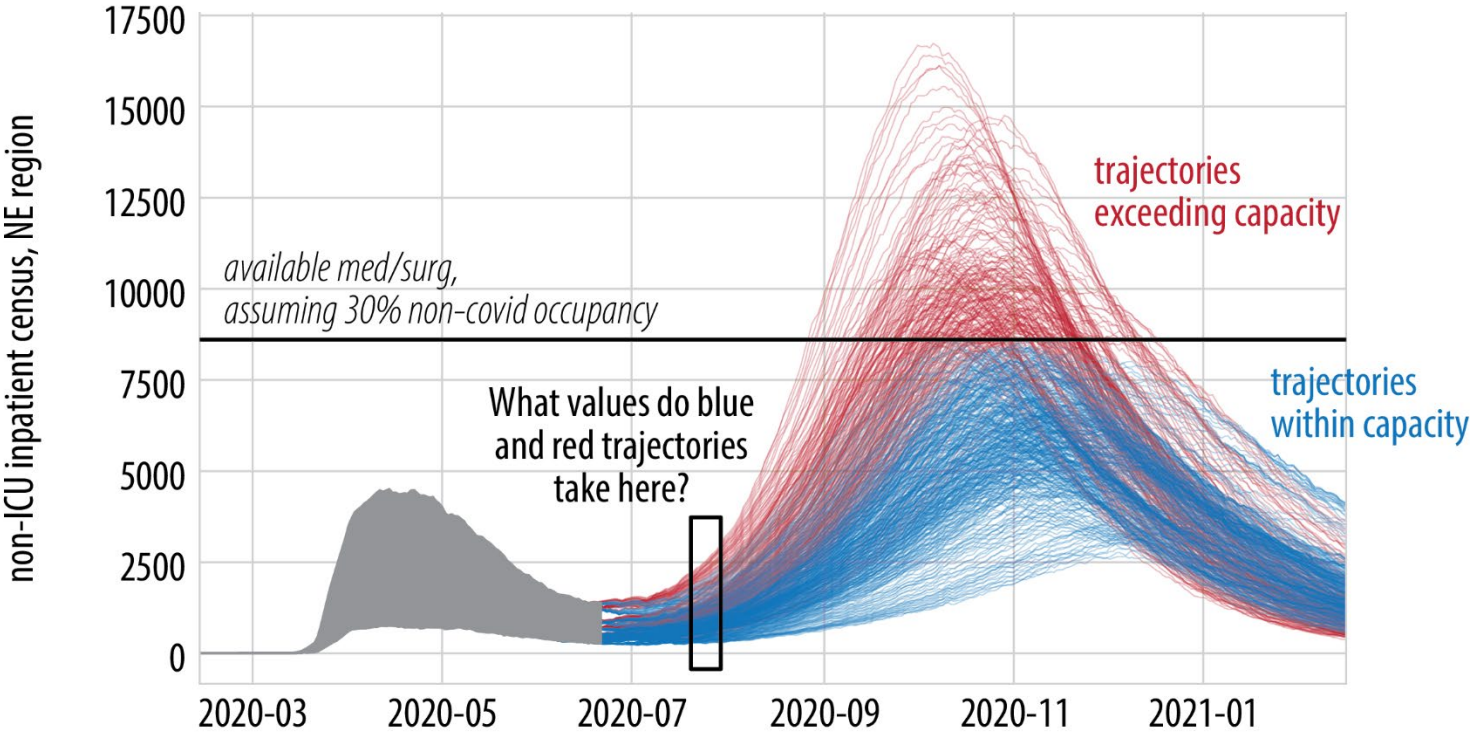
Our model can generate an ensemble of possible second waves, some of which exceed med/surg capacity



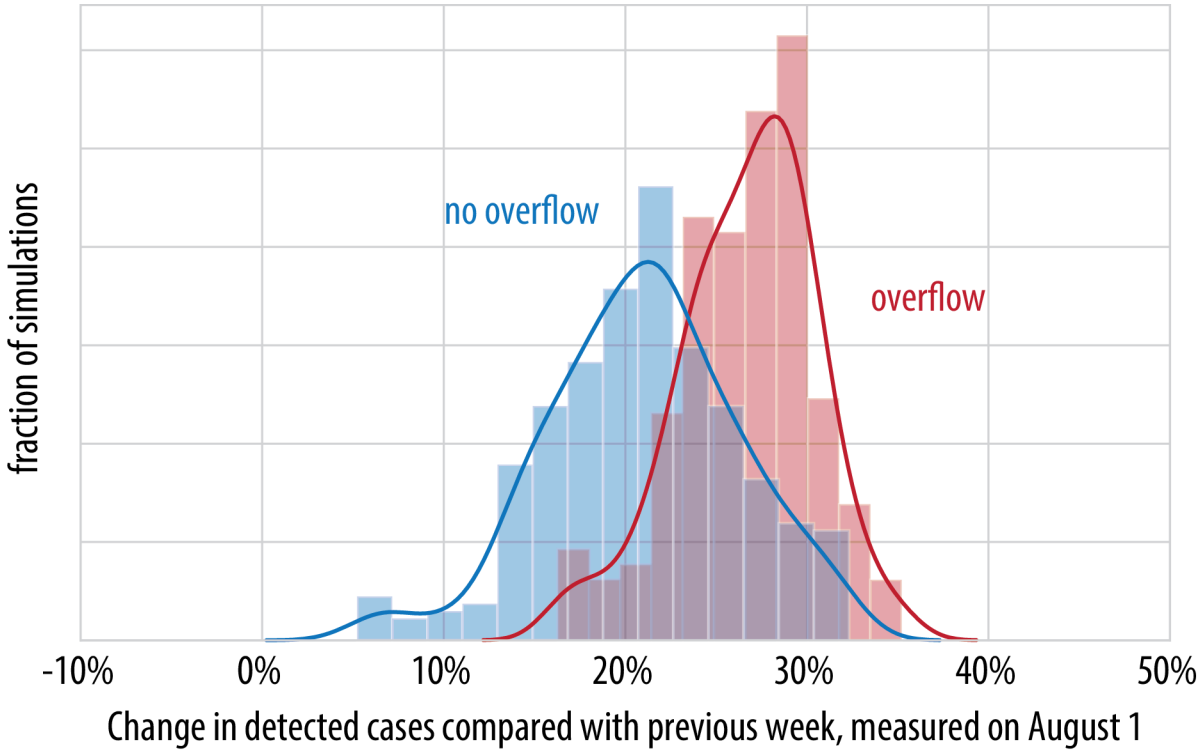
Some second waves will exceed capacity, some won't



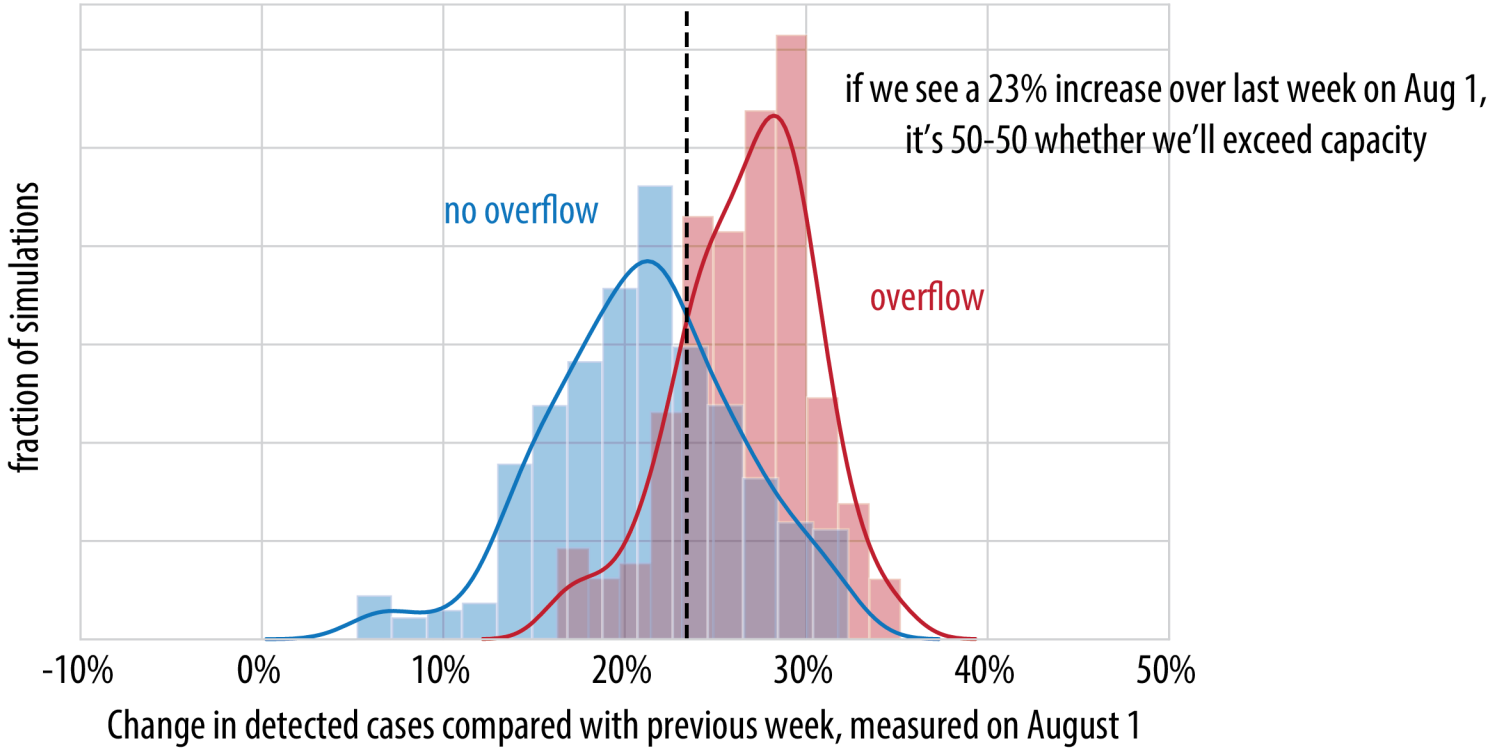
At an earlier date, can we differentiate trajectories that ultimately will or won't exceed capacity?



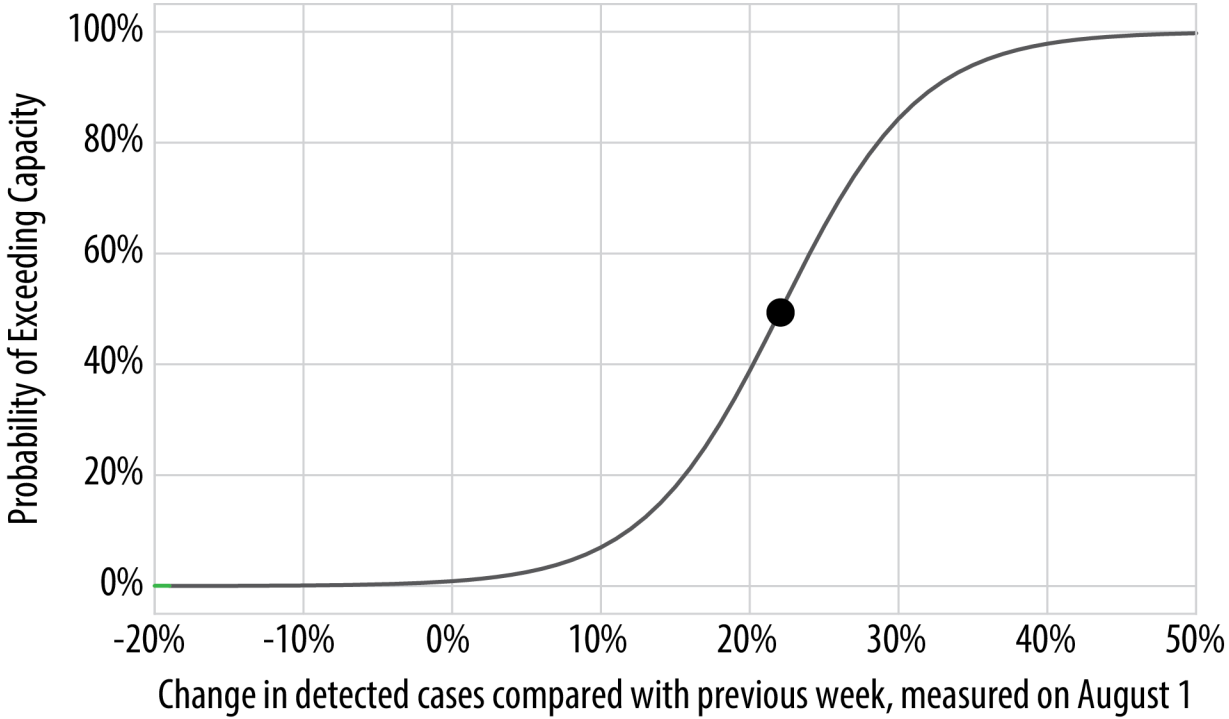
Trajectories that overflow tend to have higher week-over-week increase



For each amount of week over week change, we can measure what fraction of trajectories exceeded capacity



For each date, we can calculate the probability of overflowing capacity, based on increase in cases



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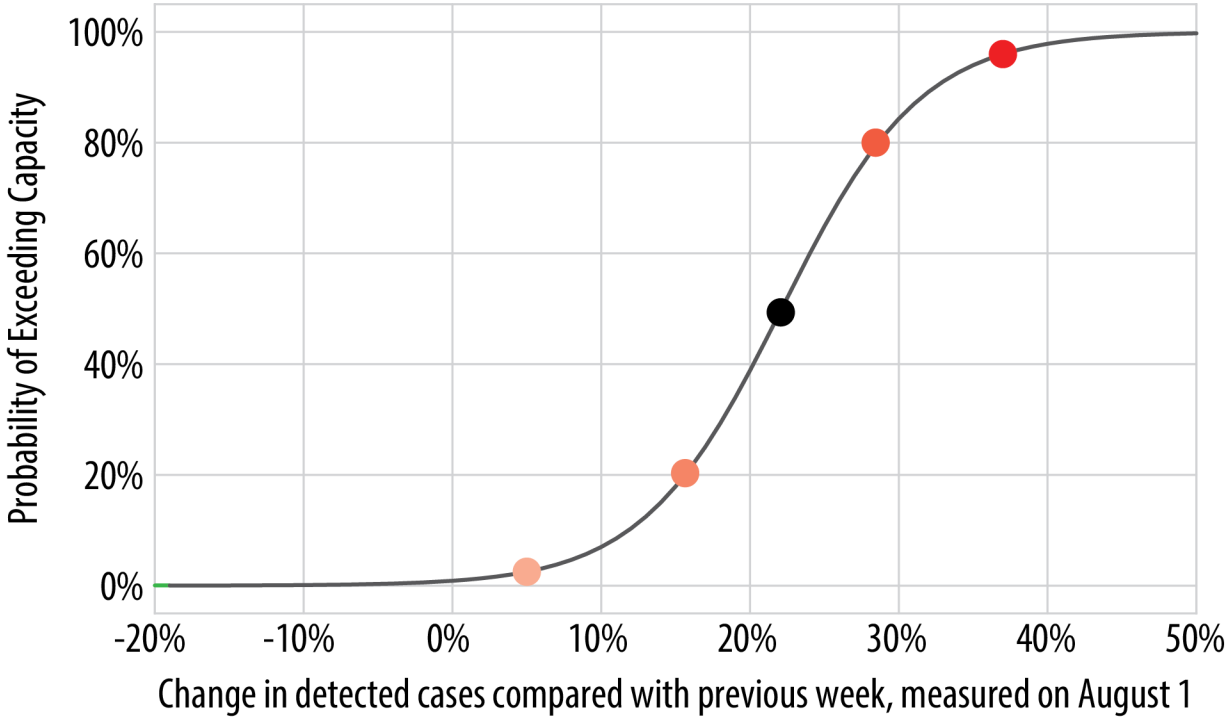
Let’s identify a few levels of risk tolerance we’re interested in



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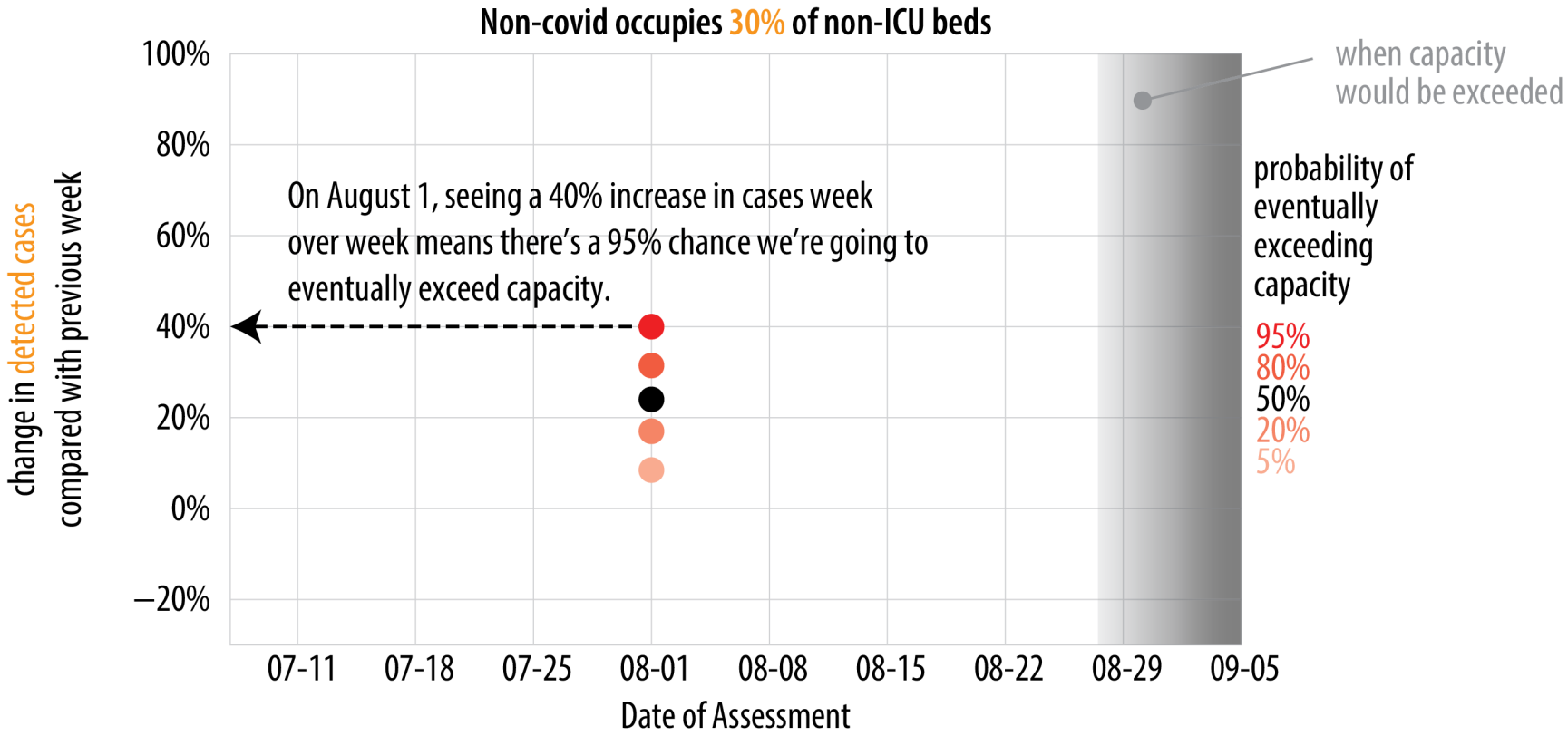
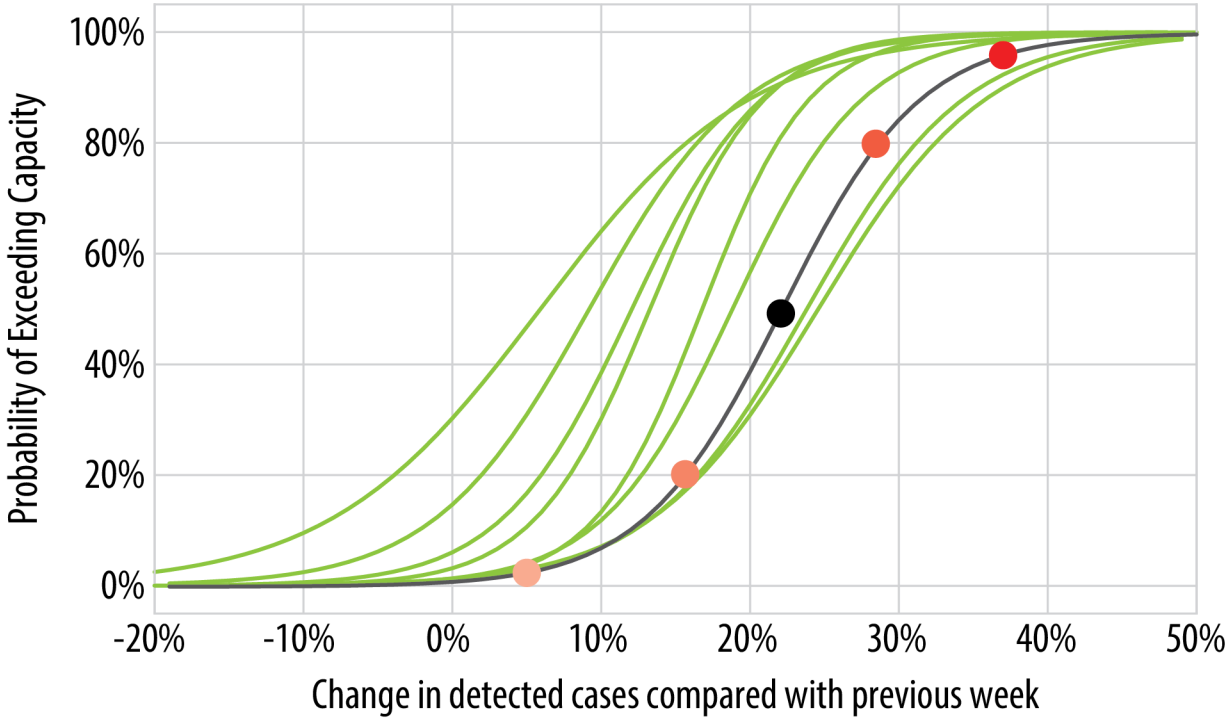
With a given risk tolerance, we can then find what level of increase in cases should sound the alarm



We repeat the analysis, looking at different dates of when we're evaluating our indicator



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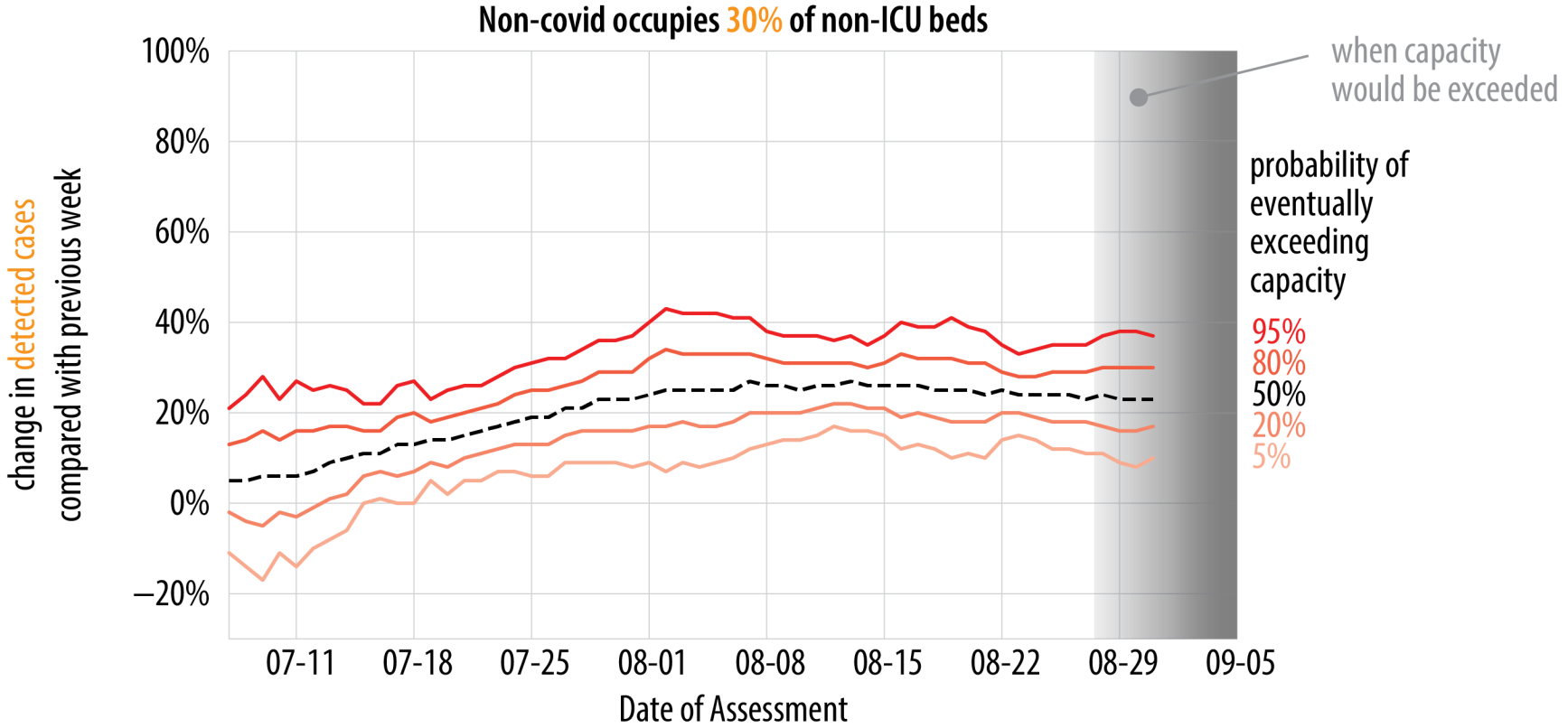
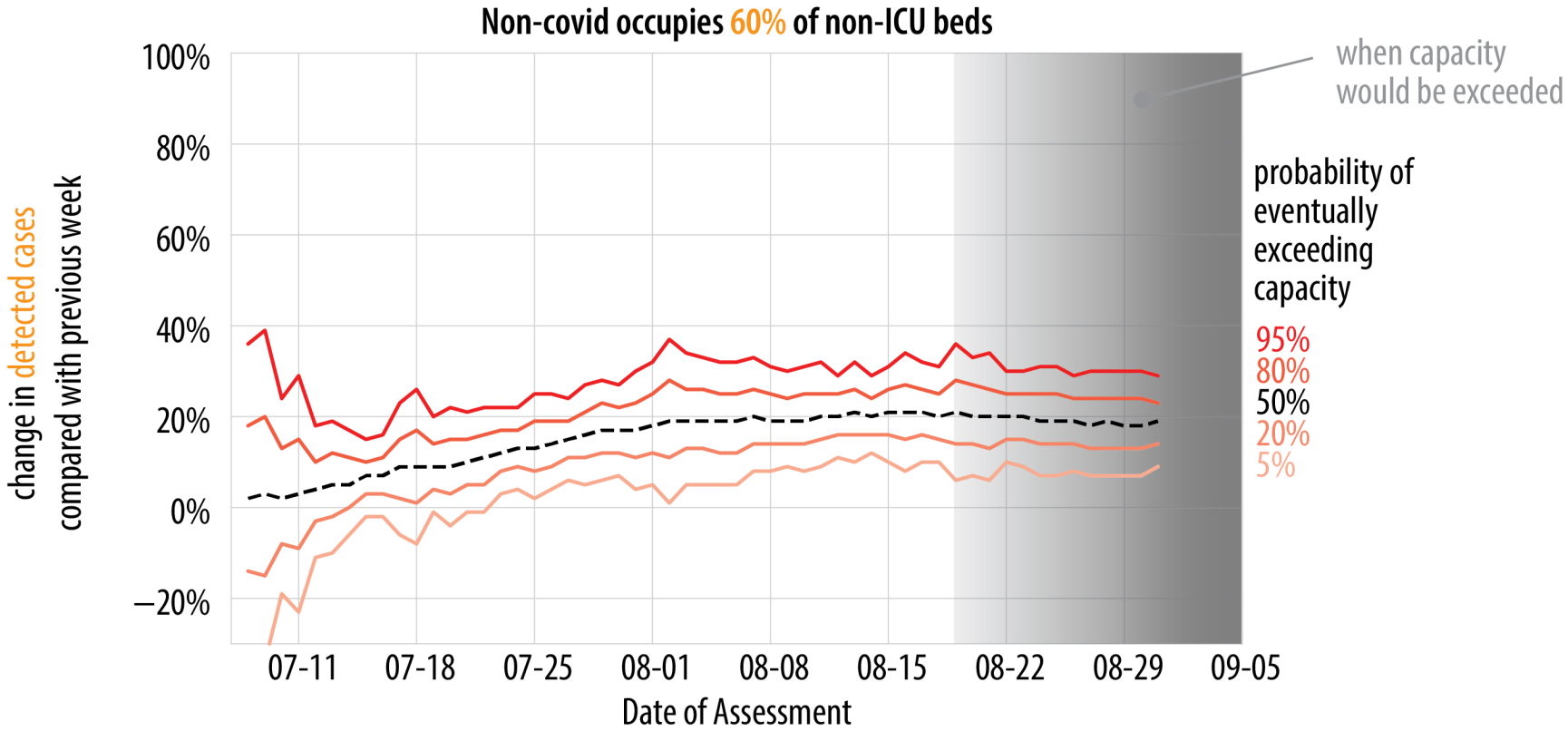
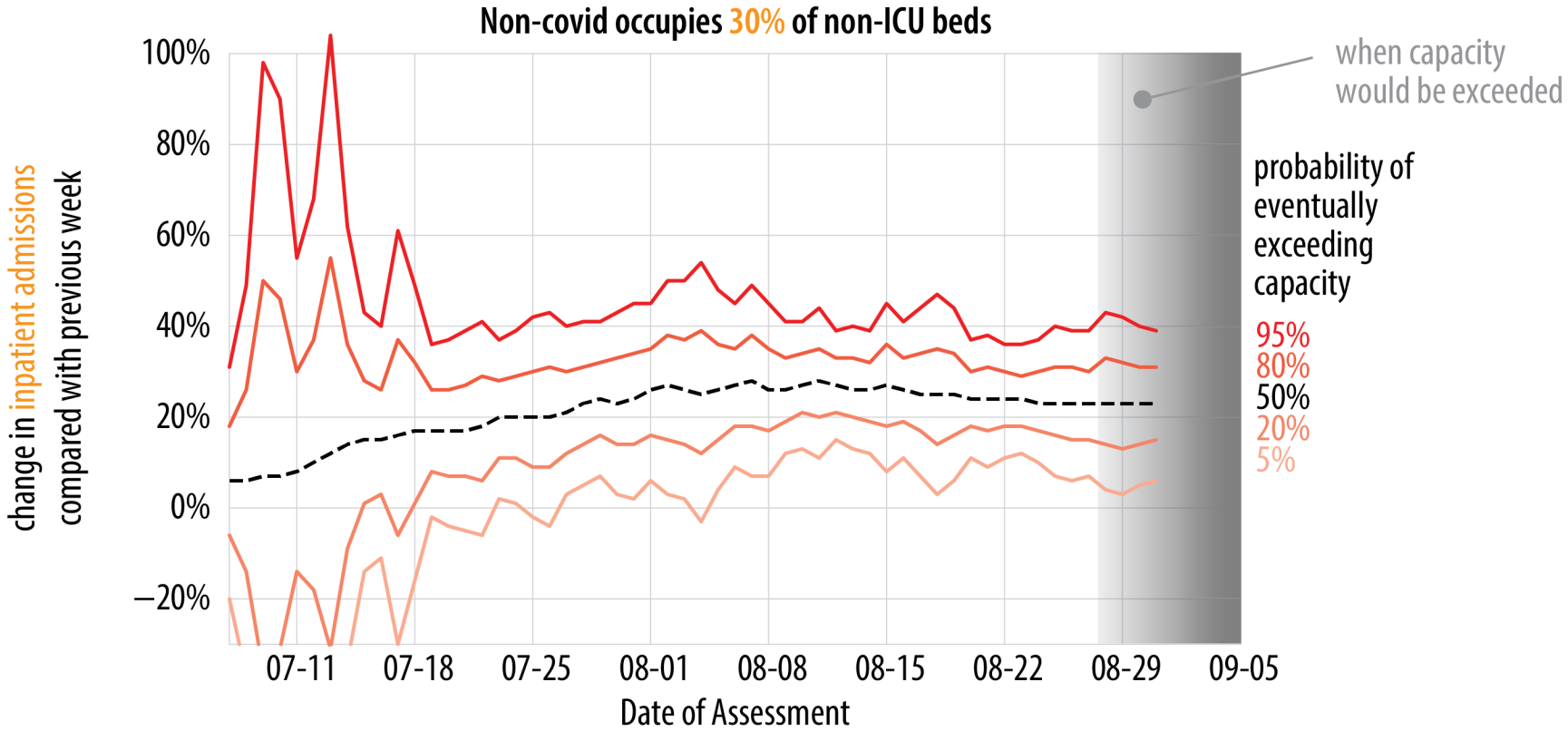
Under low non-covid occupancy, seeing a 20%+ increase in cases week over week indicates likely overflow



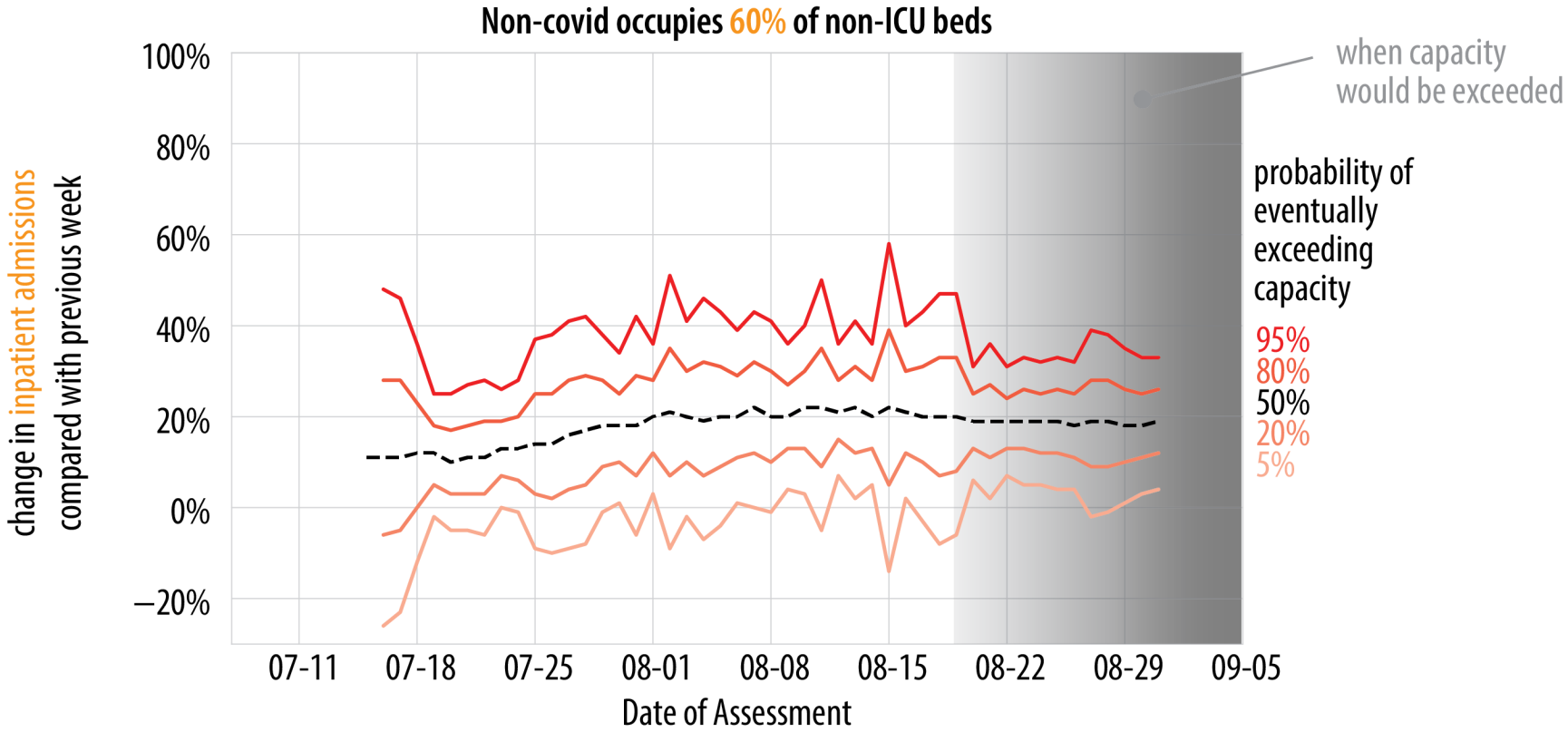
Under higher non-covid occupancy, 10-15% increase in cases in mid July is cause for alarm



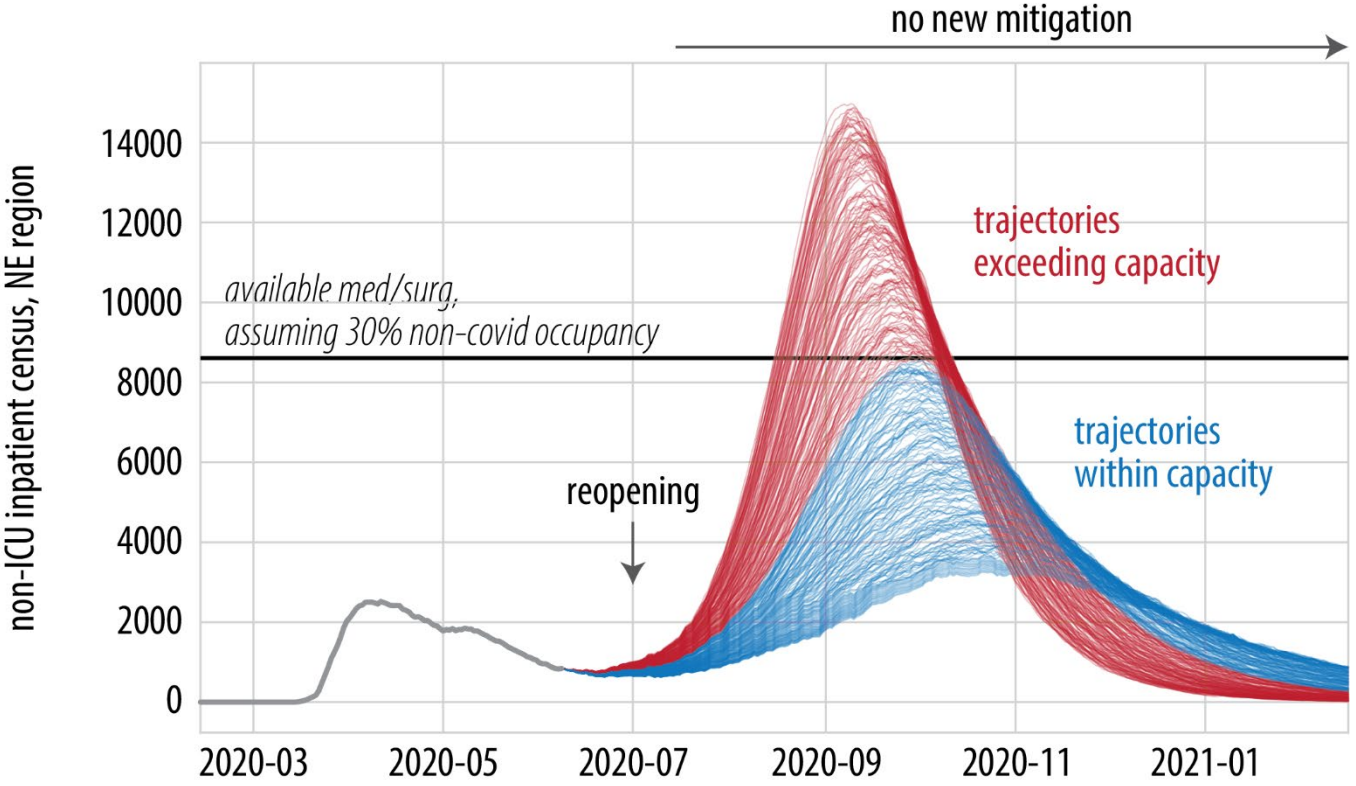
We could also use hospital admissions as an indicator: 20-30% increase is a red flag if lots of beds are available…



…and 10-20% increase is a red flag if fewer beds are available for covid patients

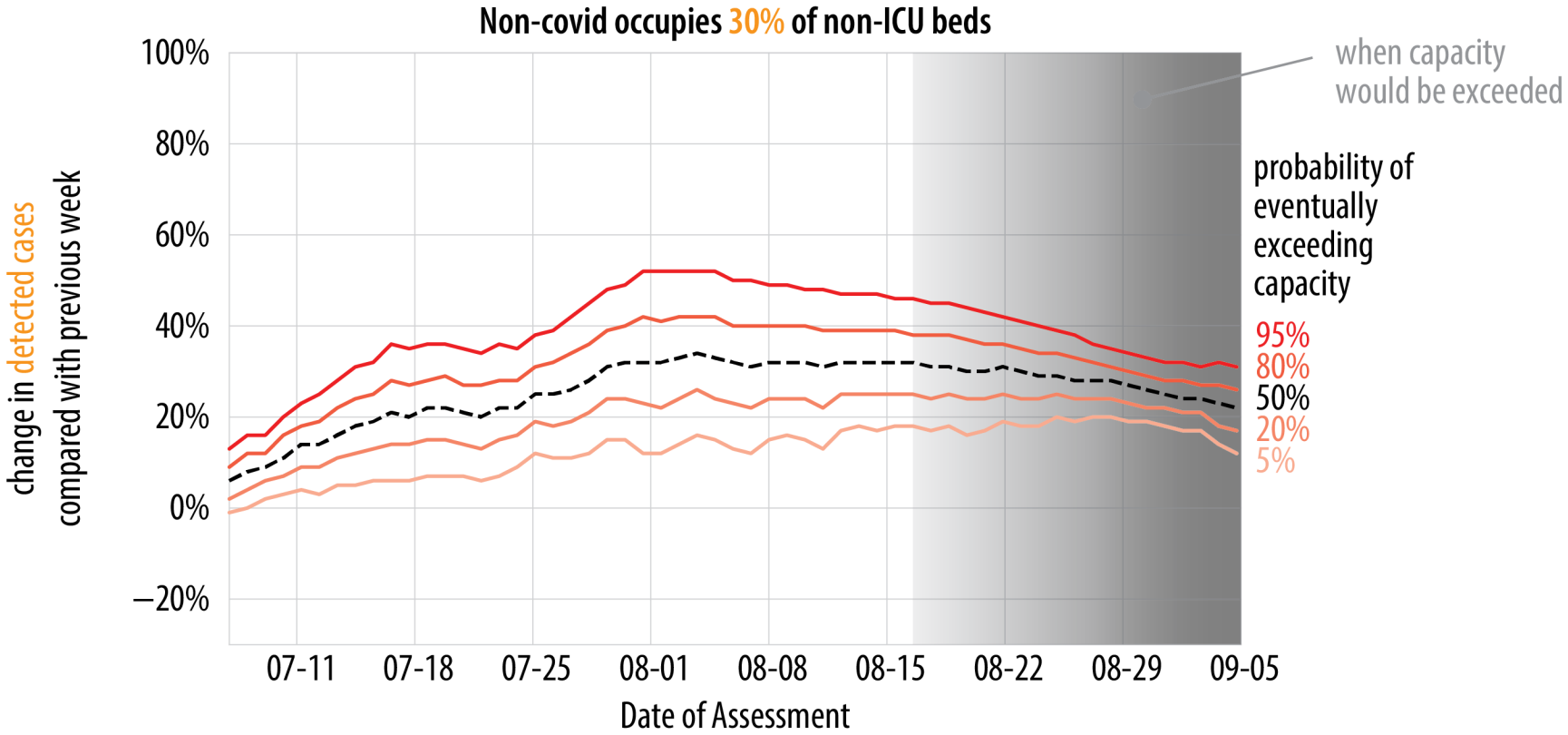


What if we repeat the analysis using only those simulated trajectories that best match historical data?



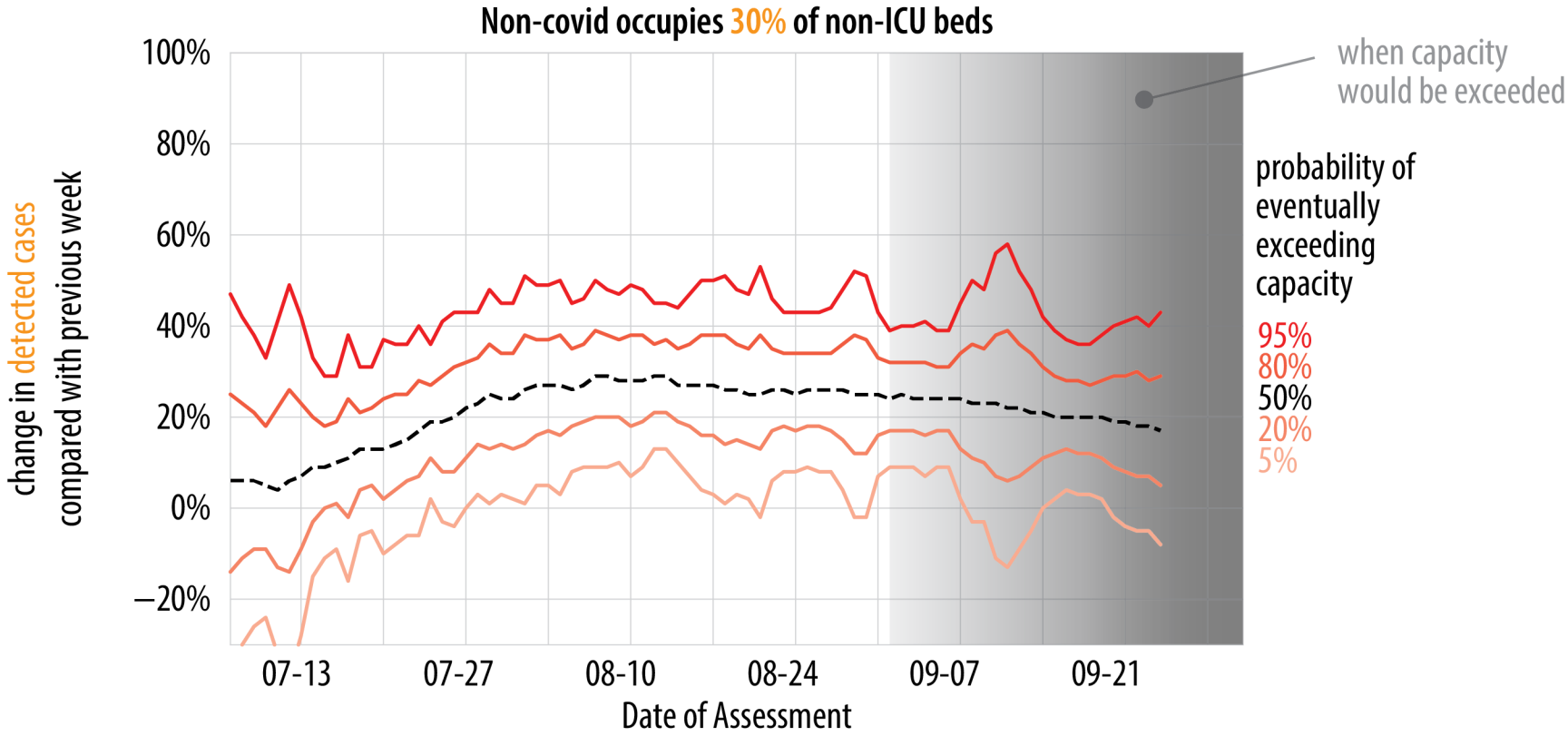
*model version with no uncertainty in disease progression and severity

20% weekly increase in cases is still cause for alarm

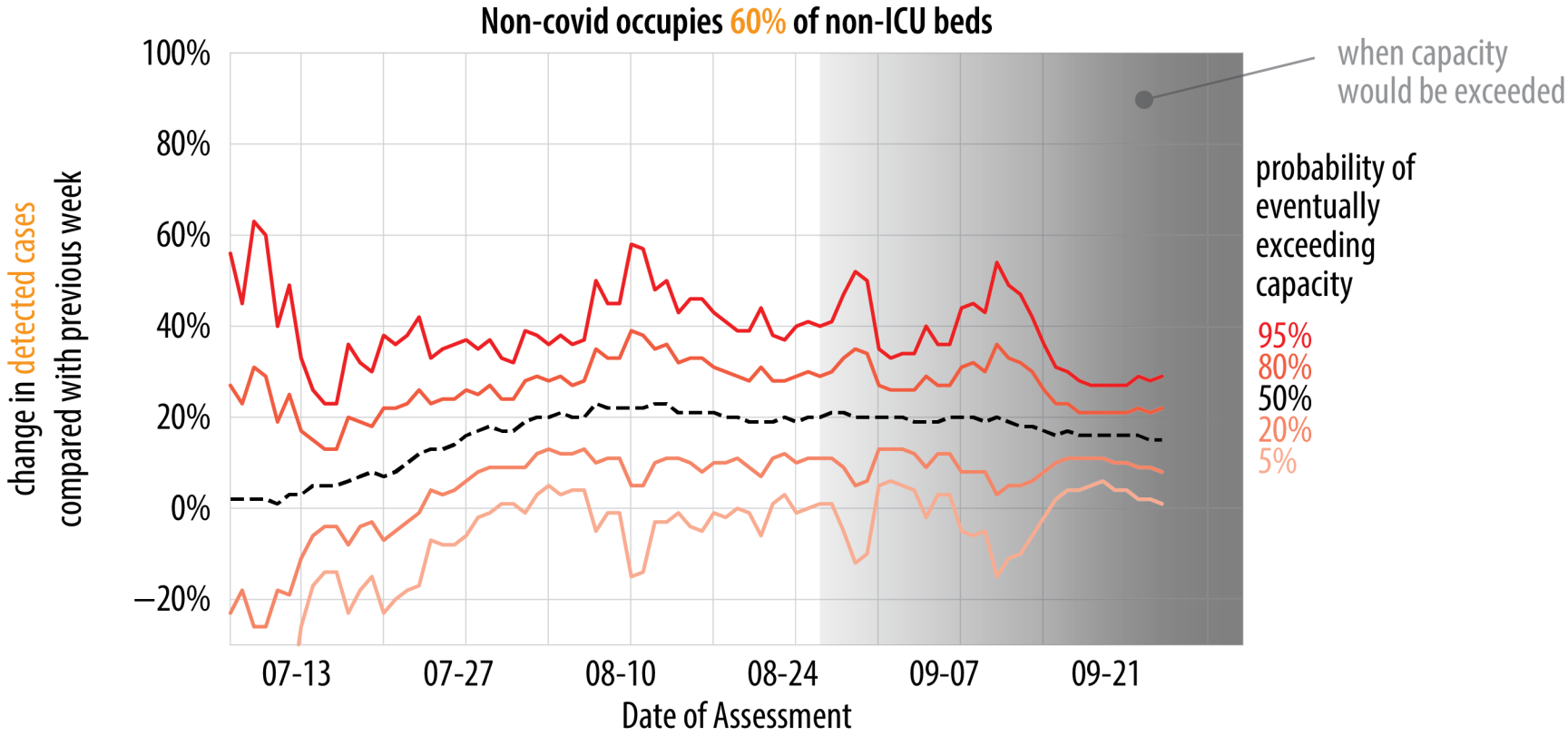


**model version with no uncertainty in disease progression and severity*

Covid Region 11 at 30% non-covid occupancy



Covid Region 11 at 60% non-covid occupancy

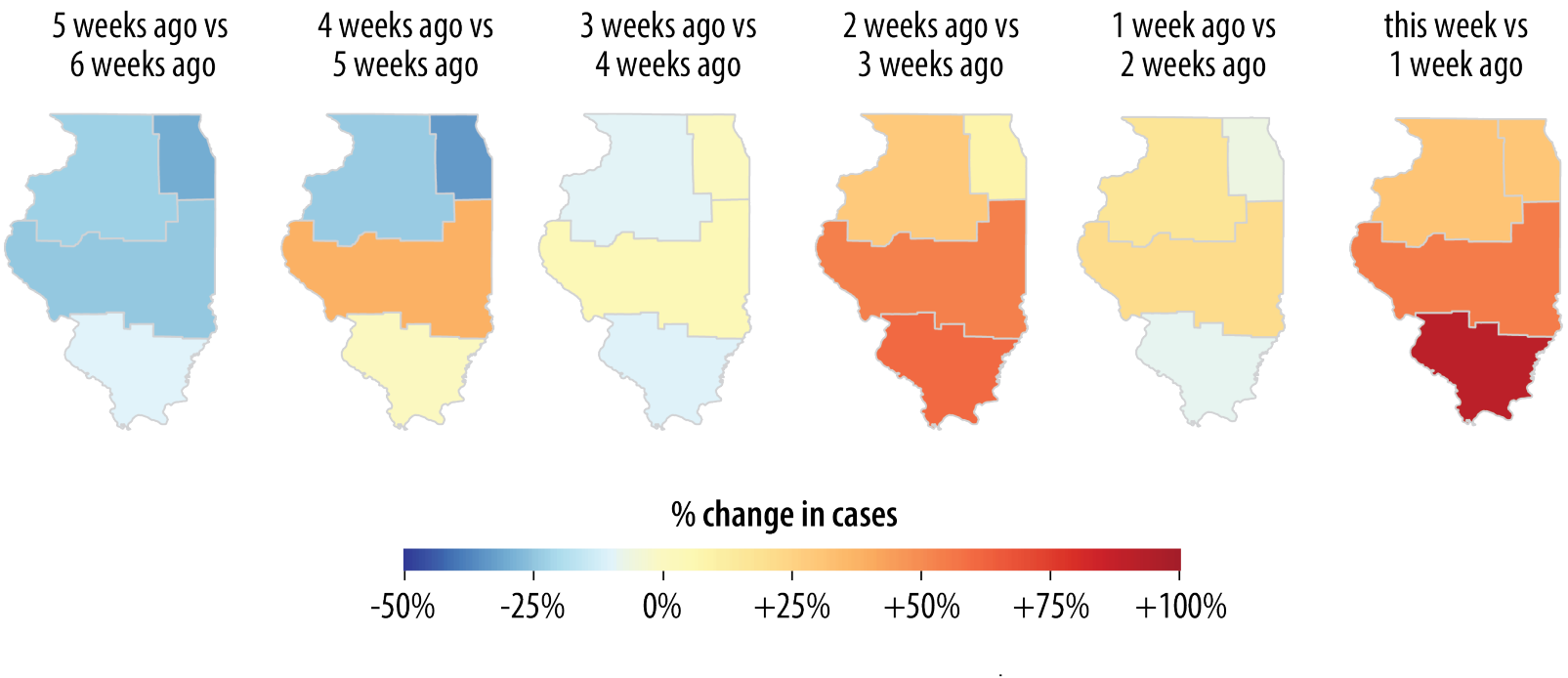


Notes and assumptions

- Results are for the Northeast Region only and do not apply to other regions
- We assume no change in transmission after July 15: no further increase in transmission due to additional reopening or decrease in transmission due to new interventions such as major ramp-up of contact tracing
- We assume no change in the detection rate of asymptomatic, mild symptomatic, or severe cases beyond current levels

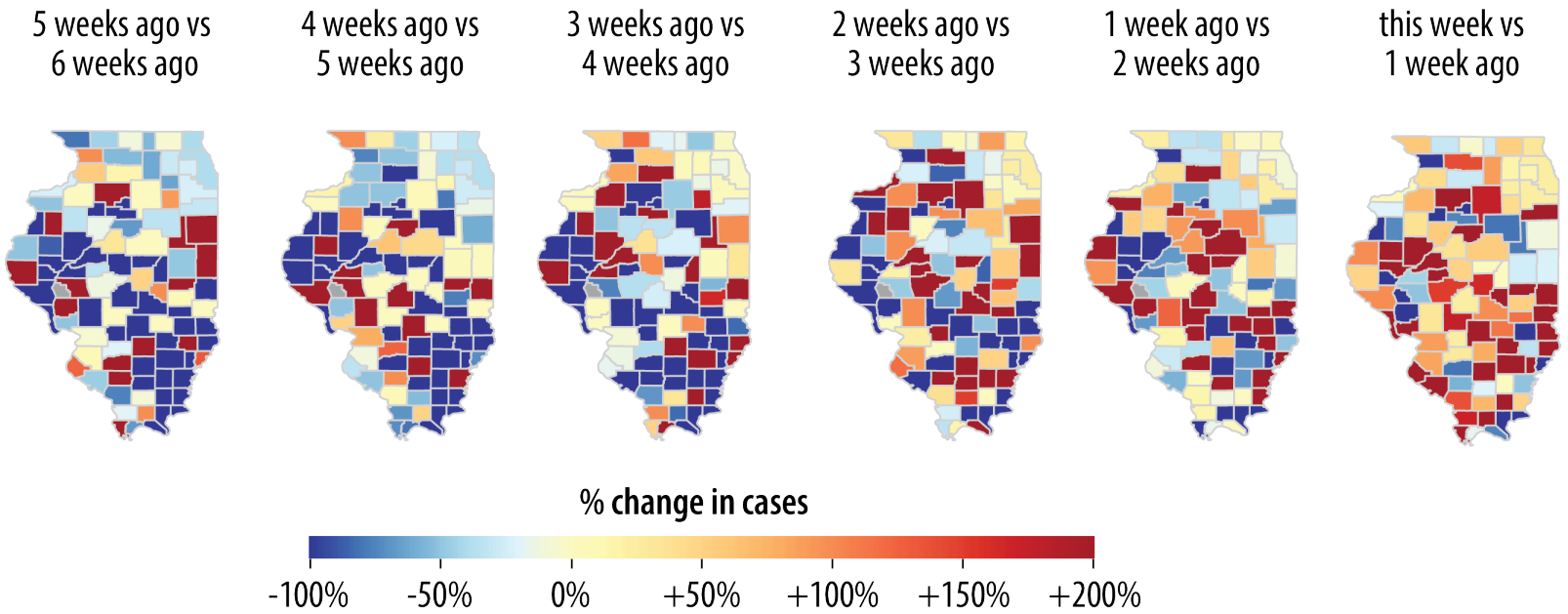
What’s the current situation with respect to week over week increase in cases and admissions?

Public data shows cases increasing in all regions



Data from July 14 2020
IDPH public

Public data shows cases increasing in many counties



Data from July 14 2020
IDPH public

In the Northeast Region, current trends are cause for concern but we have some time before needing to trigger Metro ACS.