

Projections of Hospital-based Healthcare Demand due to COVID-19 in Los Angeles County

November 11, 2020 Update

County DHS COVID-19 Predictive Modeling Team:

Roger J. Lewis, MD, PhD;¹ Juliana Tolles, MD, MHS;¹ M. Claire Jarashow, PhD, MPH;² Fei Wu, PhD;³ Joe Marion, PhD;⁴ Kert Viele, PhD;⁴ Todd Graves, PhD;⁴ Henry Shin;¹ Frederic Schoenberg, PhD;⁵ Andrea Bertozzi, PhD;⁵ Tom Belin, PhD⁵

1. Los Angeles County, Department of Health Services
2. Los Angeles County, Department of Public Health
3. Los Angeles County, Office of the Chief Information Officer
4. Berry Consultants, LLC, Austin, TX
5. University of California, Los Angeles



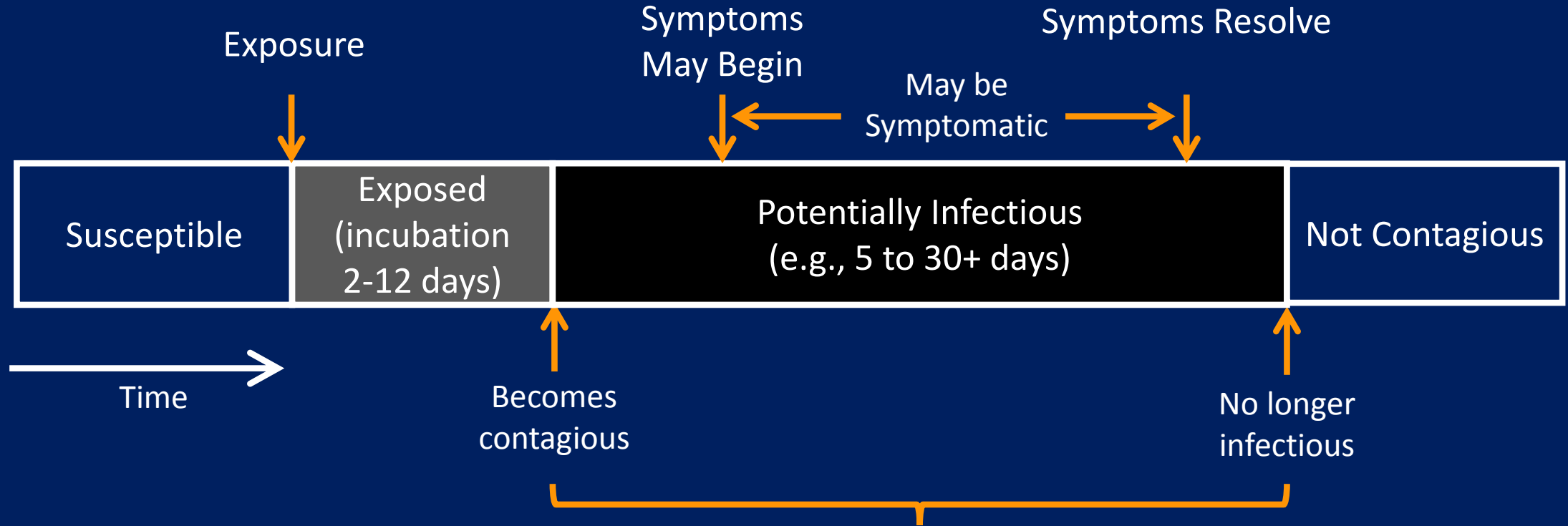
Key Findings of the November 11th Update

- This update includes data through November 9nd, 2020.
- Although we have yet to see significant influenza activity in Los Angeles County, we consider the usual increase in influenza-associated utilization of hospital beds that is expected. These estimates will be updated when influenza activity is detected.
- Key findings:
 - The number of new patients with COVID-19 requiring hospitalization each day across Los Angeles County appears to be gradually increasing.
 - The estimated transmission number (“R”) is 1.03 with an uncertainty of 0.97 to 1.09. Last week the estimate was 1.02 with an uncertainty of 0.95 to 1.07. If R is above 1 the number of cases will increase over time.
 - Based on the current estimate for R, it is likely that the number of cases will go up slowly. The current number of hospital beds, ICU beds, and ventilators in Los Angeles County are likely adequate over the next 4 weeks.
 - The model suggests about 1 in 580 Los Angeles County residents are currently infectious to others and that about 1 in 6 have had COVID-19.

How Many in Los Angeles are Infectious to Others?

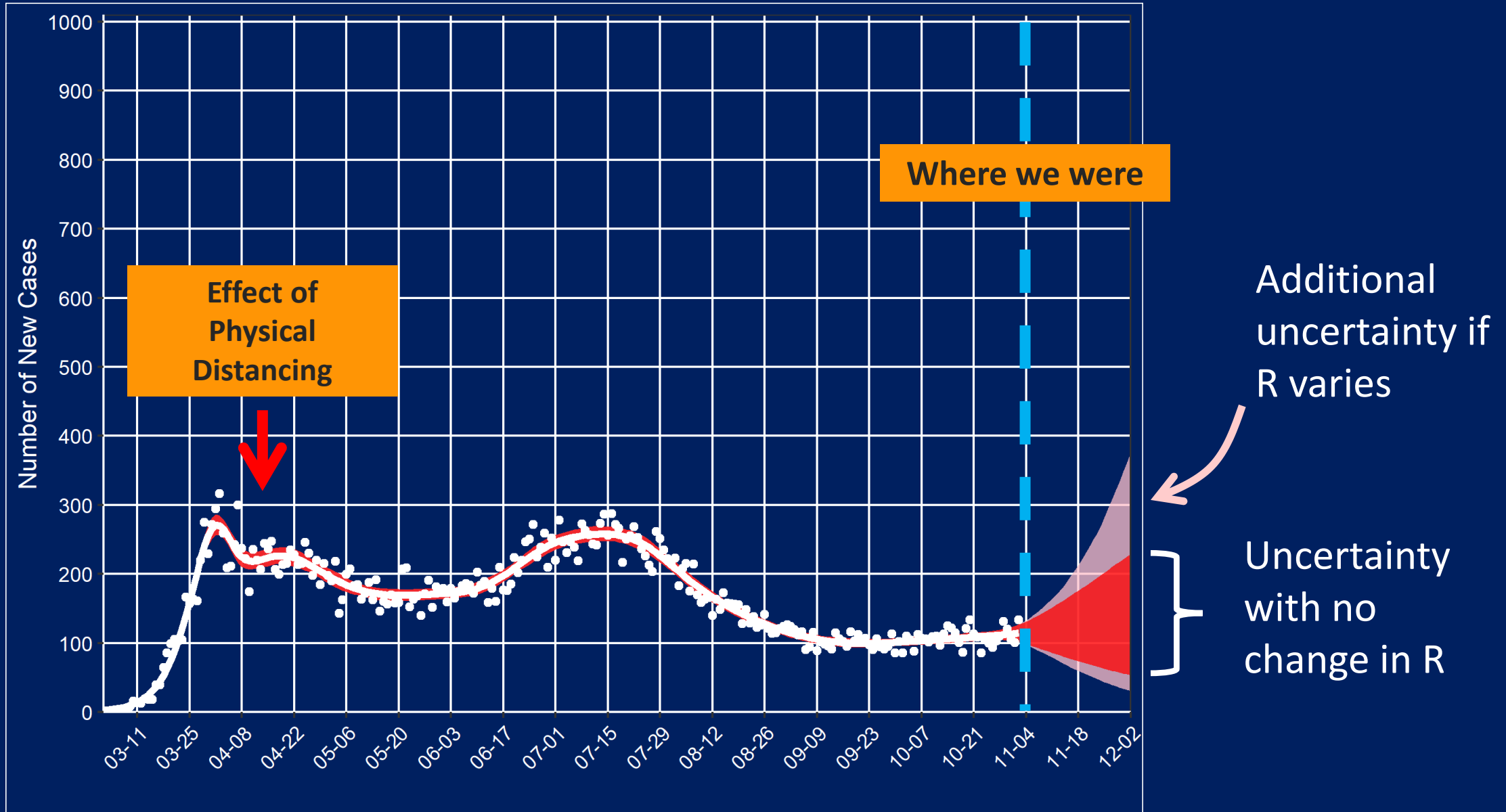
- The DHS team's epidemic model estimates the number of people in Los Angeles County who:
 - Are still **susceptible** to infection if exposed;
 - Have been **exposed** and are incubating, but not infectious;
 - Have COVID-19 and are **infectious** to others, though they may have no symptoms; and
 - Have had COVID-19 and either **recovered** or died, so they are no longer infectious
- The model suggest that about 0.17% (uncertainty of 0.11% to 0.26%) of everyone in Los Angeles County is currently infected and infectious to others.
- This suggests about 1 in 580 (between 1 in 950 and 1 in 390) Los Angeles County residents are currently infectious to others. Last week this estimate was 1 in 670.

A Patient's Journey | COVID-19

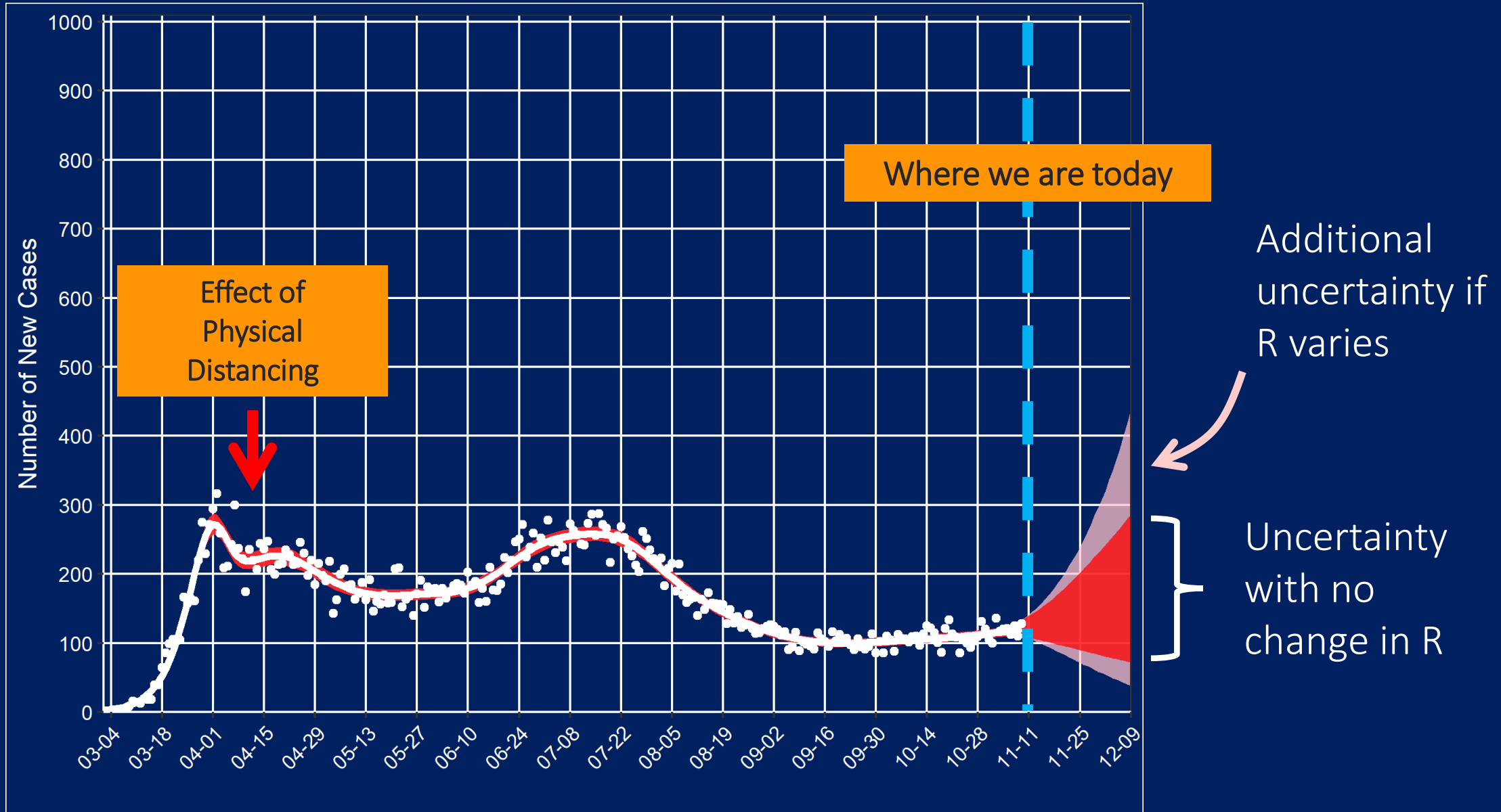


Goal of physical distancing, public use of cloth face coverings, quarantine, isolation and similar actions is to reduce the number of new susceptible people exposed during this time

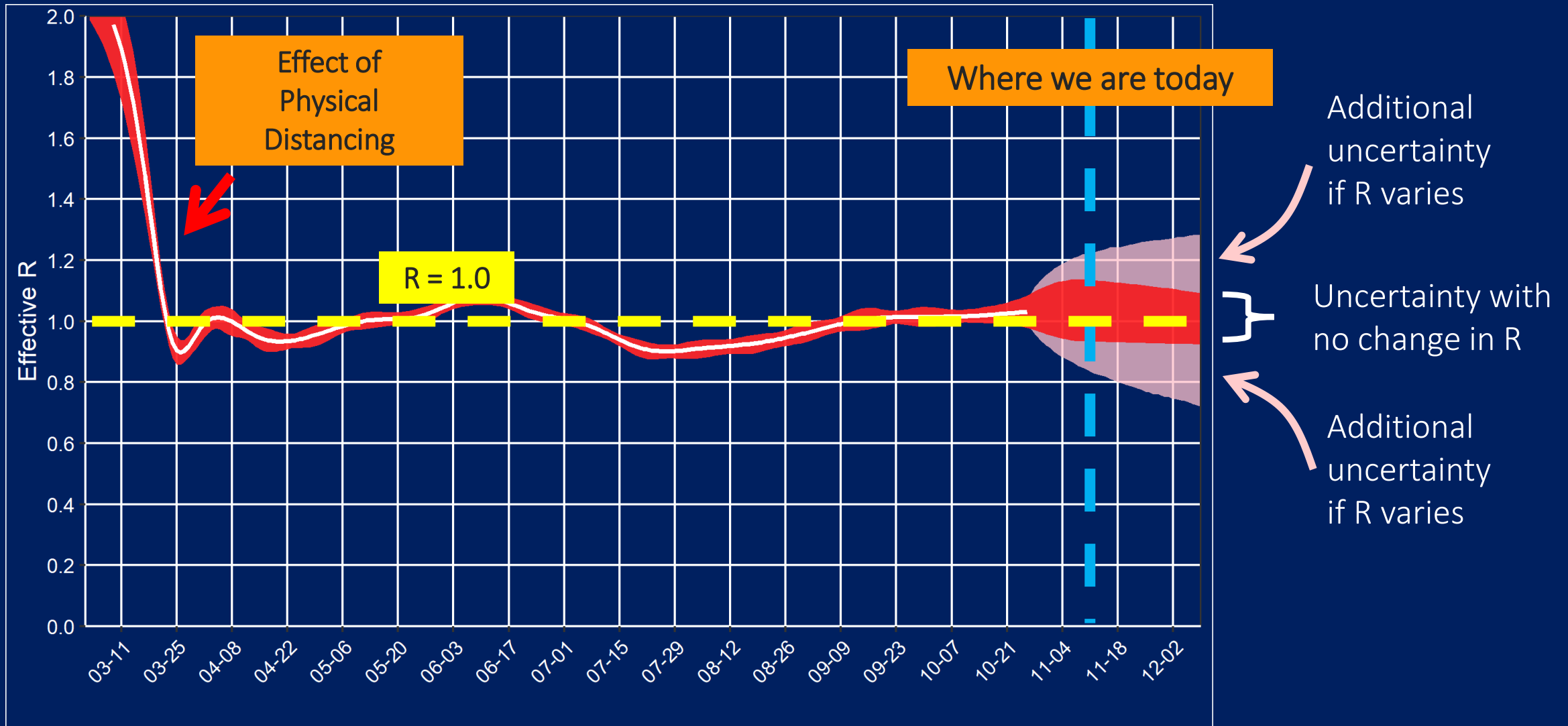
Hospital New Patient Projections: From Last Week



Hospital New Patient Projections

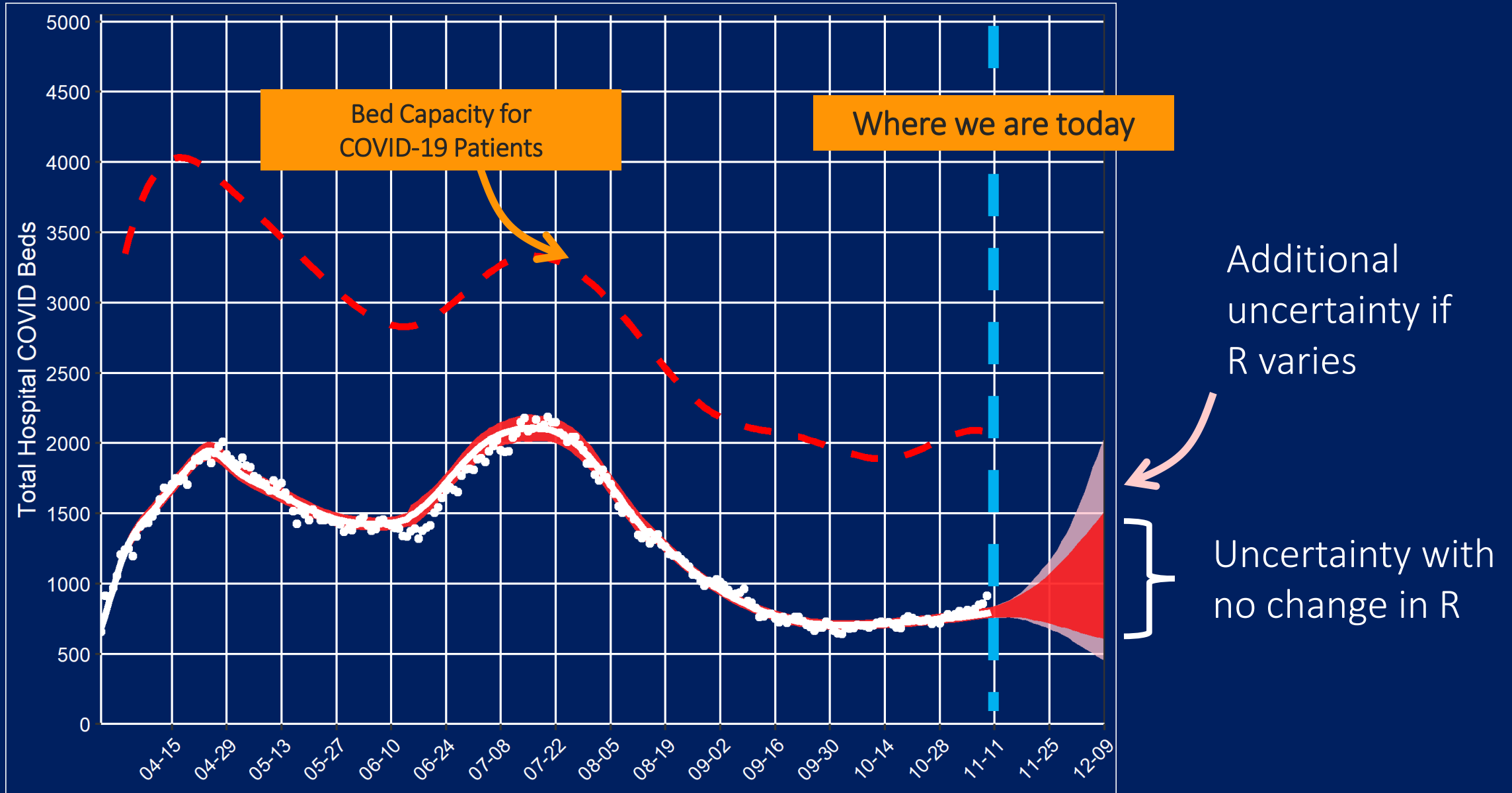


Effective Transmission Number “R”

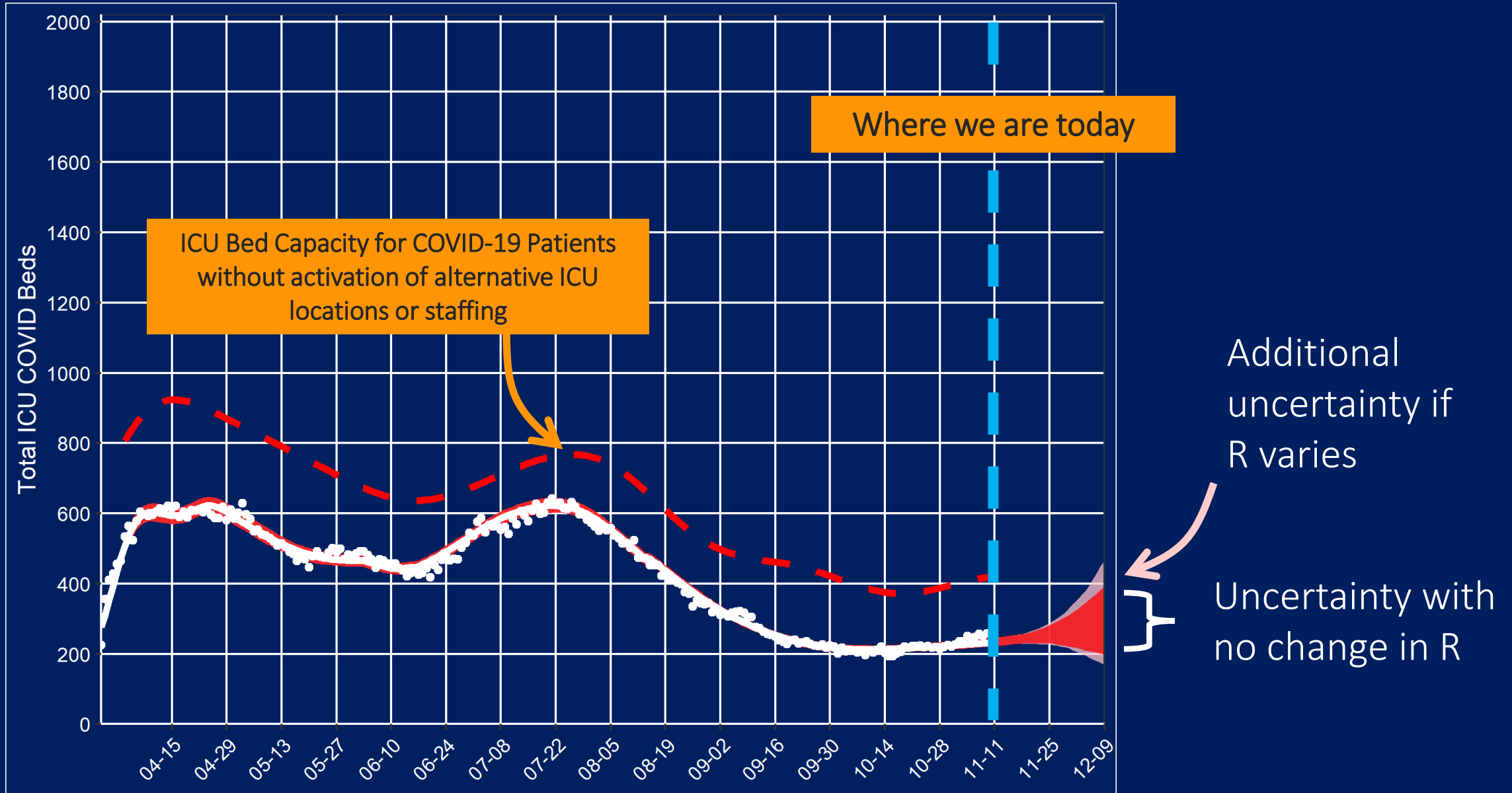


Note: We have adjusted the R that we present to account for the fraction of the population that is presumed to be immune to reinfection. At the beginning of the pandemic, this fraction was essentially zero so this would not have made any difference. But as more people have been infected, and are presumed to have immunity, we are presenting an R that includes this factor.

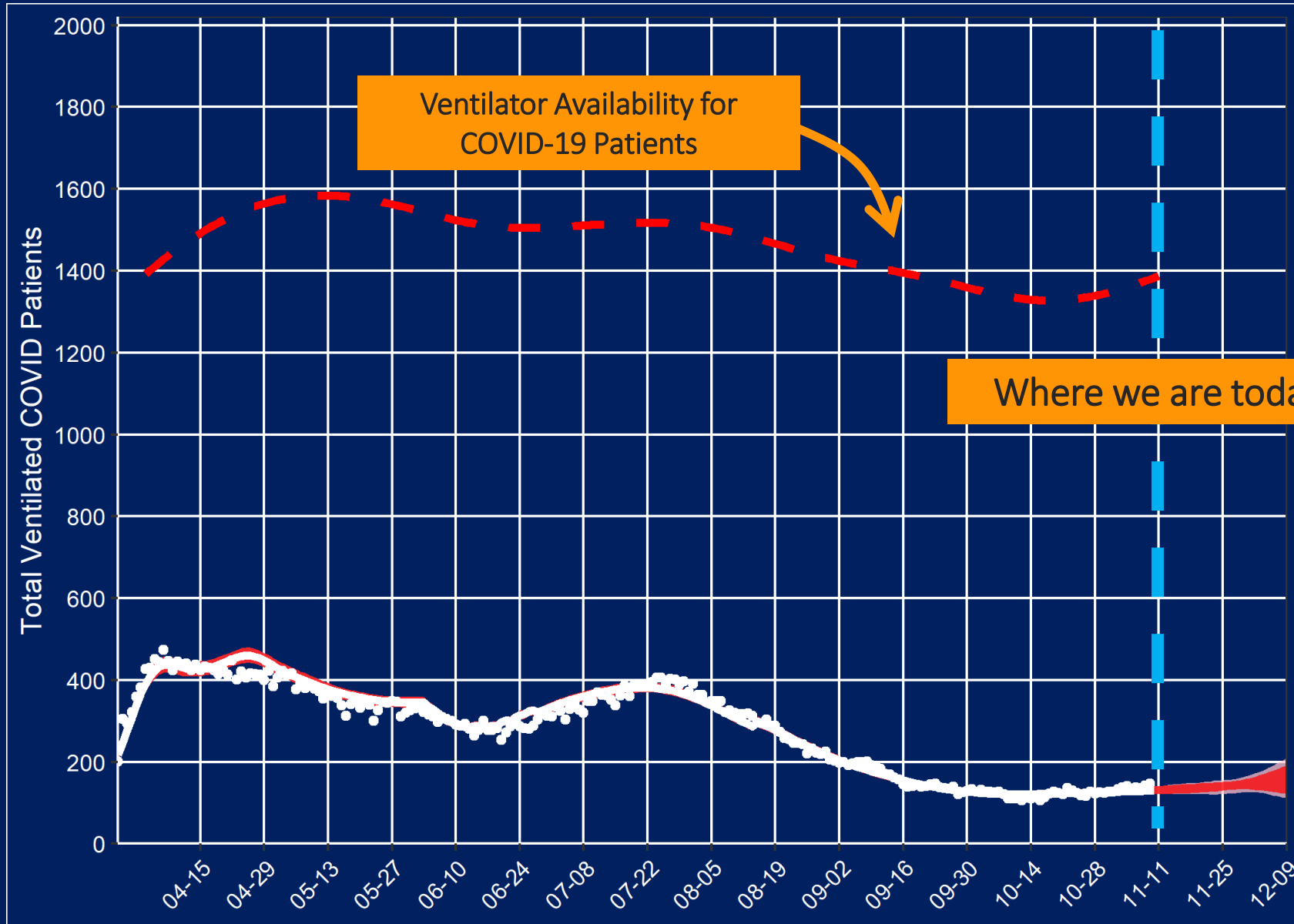
Predictions of Demand in LA County | Hospital Beds



Predictions of Demand in LA County | ICU Beds



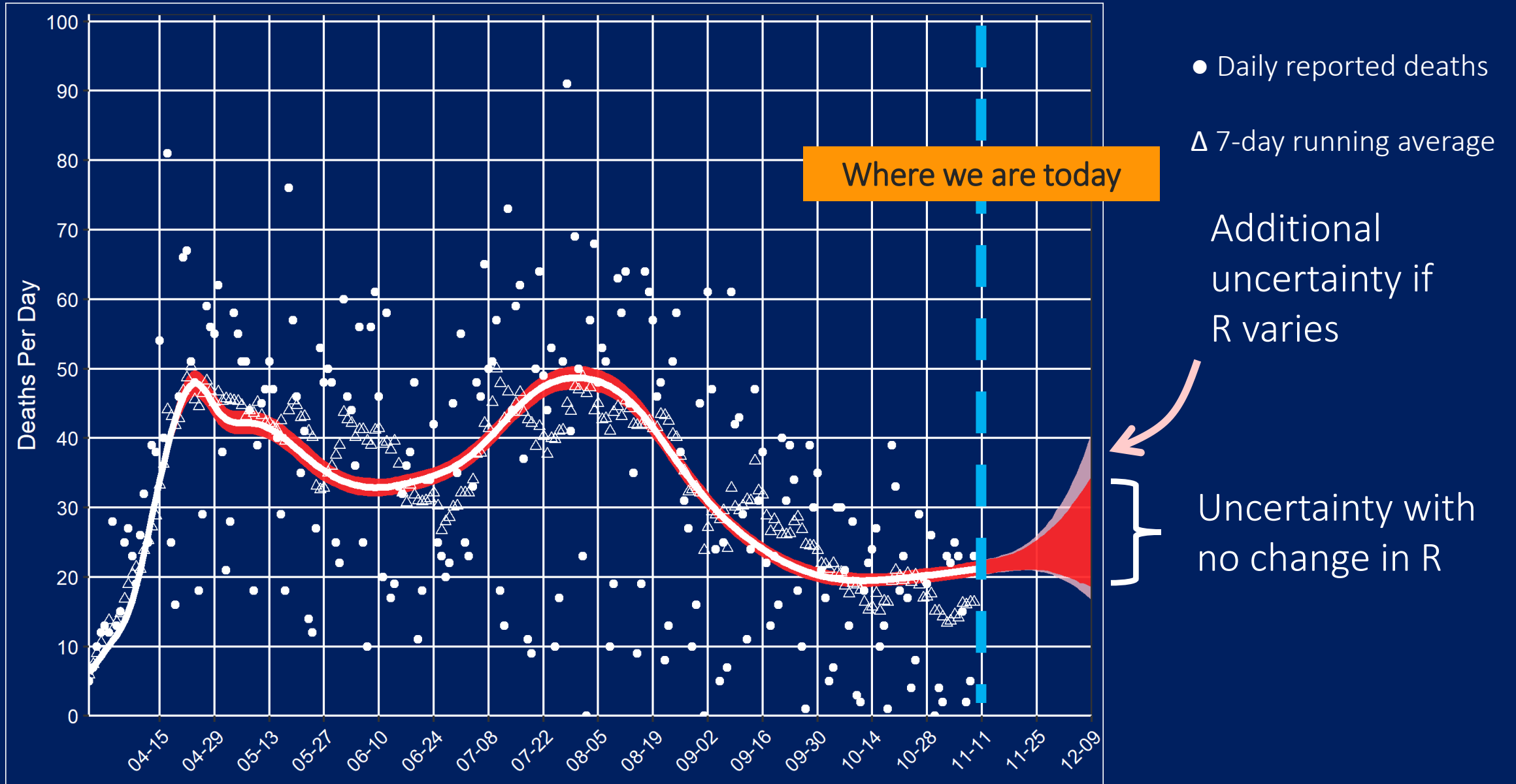
Predictions of Demand in LA County | Ventilators



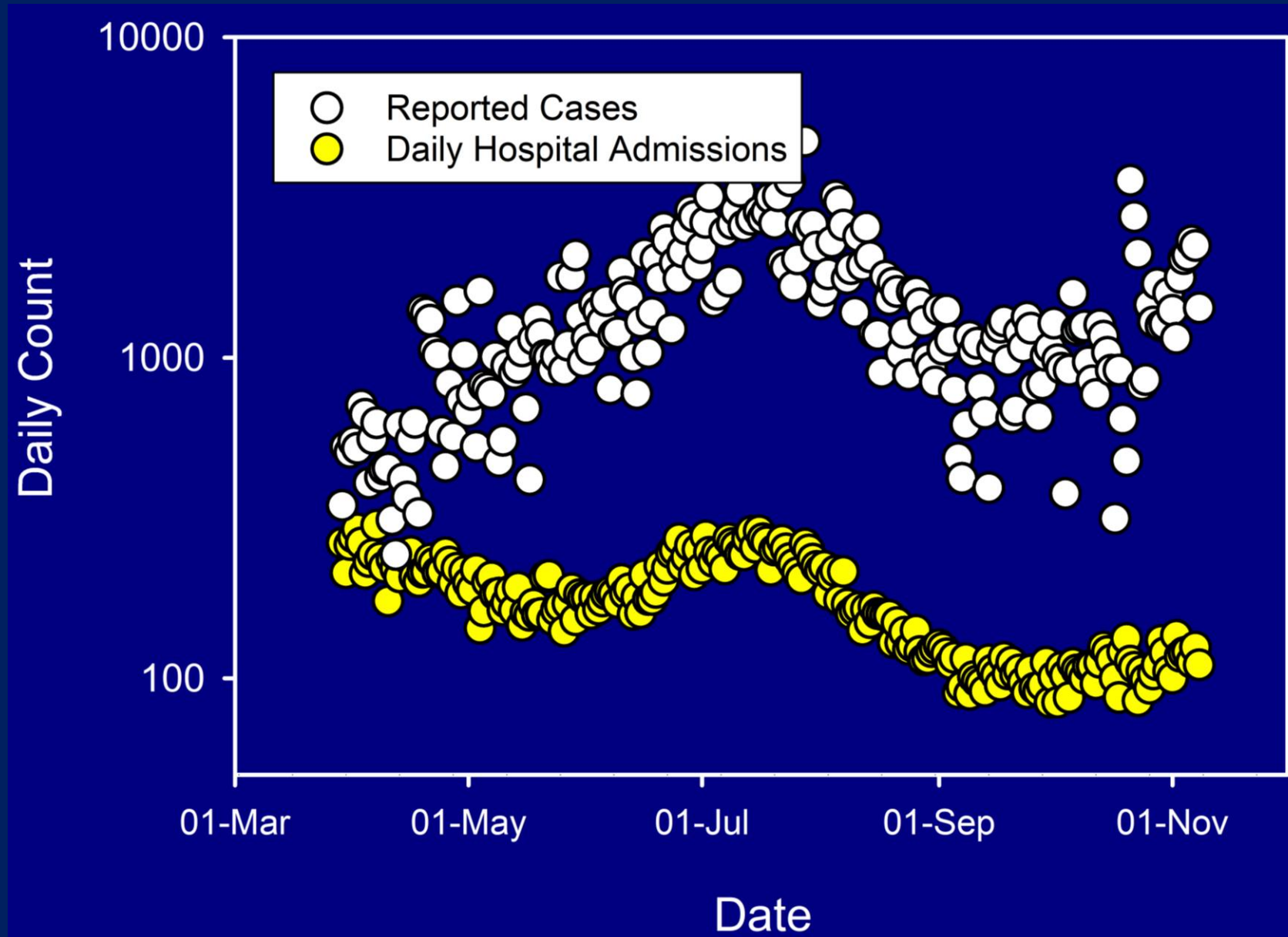
Additional
uncertainty if
R varies

Uncertainty with
no change in R

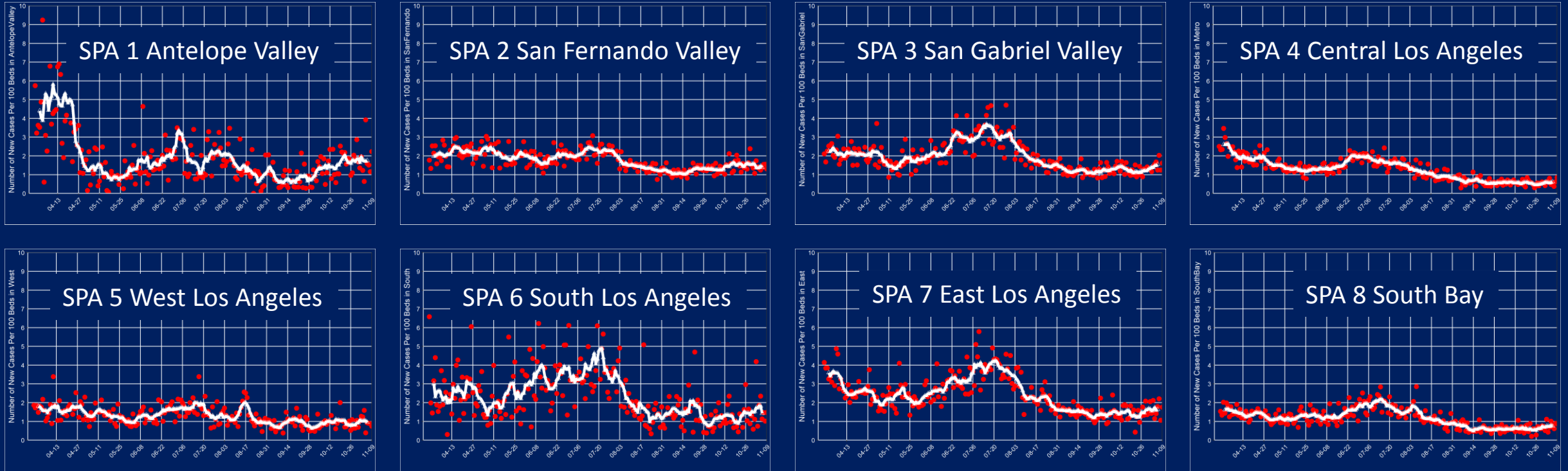
Predictions of Daily Mortality LA County



Hospital Admissions are a Varying Fraction of New Cases



Daily New COVID-19 Hospitalizations by Service Planning Areas (SPAs), per 100 Hospital Beds

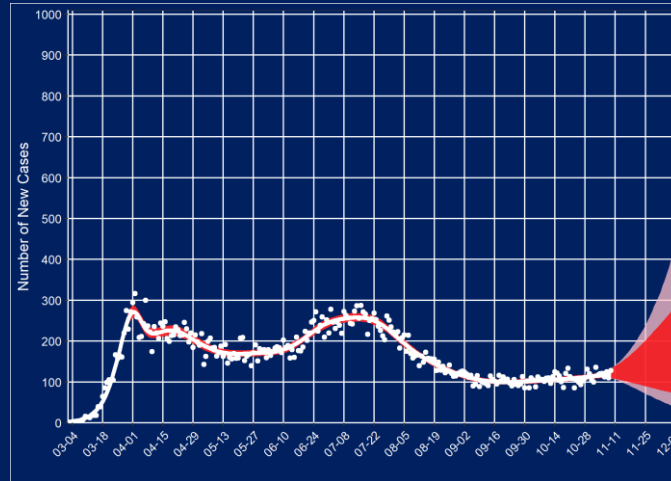


- The transmission of COVID-19 in Los Angeles County is changing over time, with different patterns in different geographic areas
- More detailed geographical analysis is required to identify specific communities needing additional support in identifying cases and limiting spread

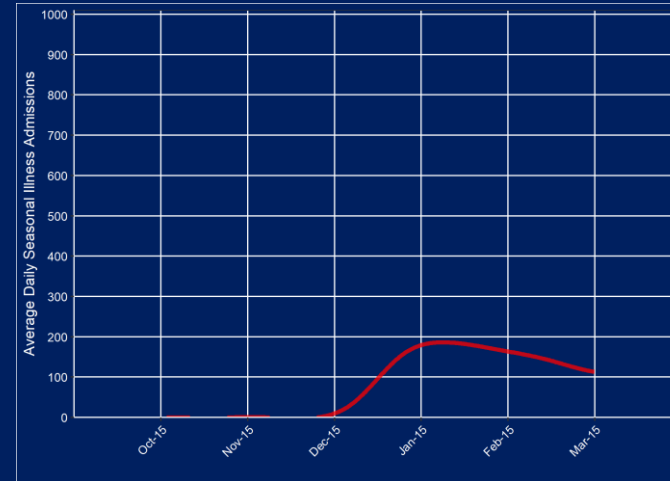
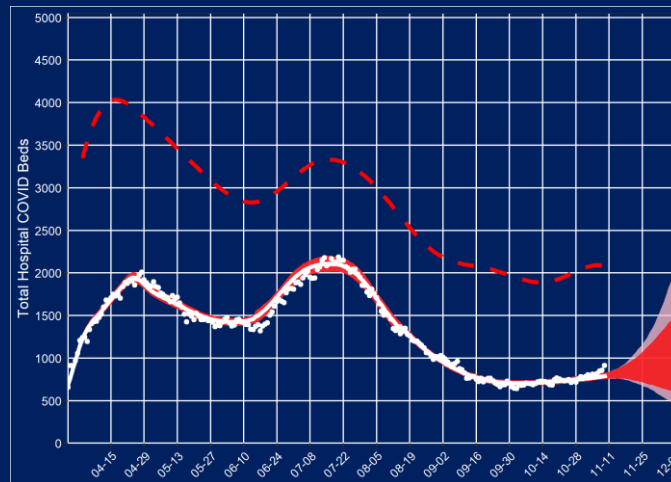
What about Influenza?

- We have not yet seen significant influenza activity in Los Angeles County. The usual seasonal increase in utilization of hospital beds from influenza-associated illnesses is shown below. Influenza-associated illnesses typically lead to a demand for hospital beds similar to the current demand for patients with COVID-19. These estimates will be updated when influenza activity is detected.

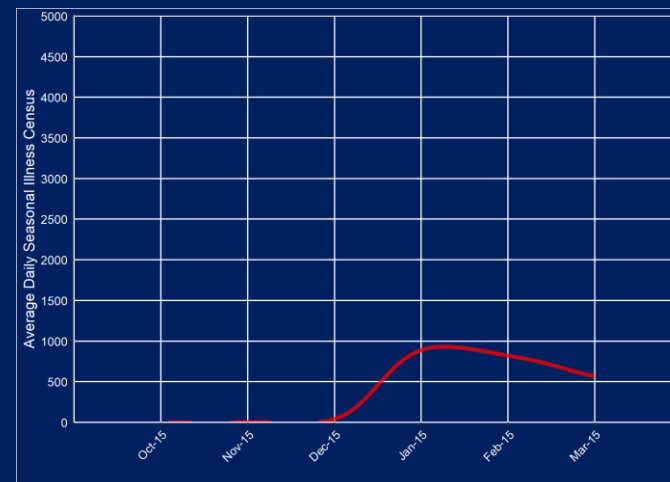
- Daily hospital admissions for COVID-19



- Hospital bed utilization for COVID-19



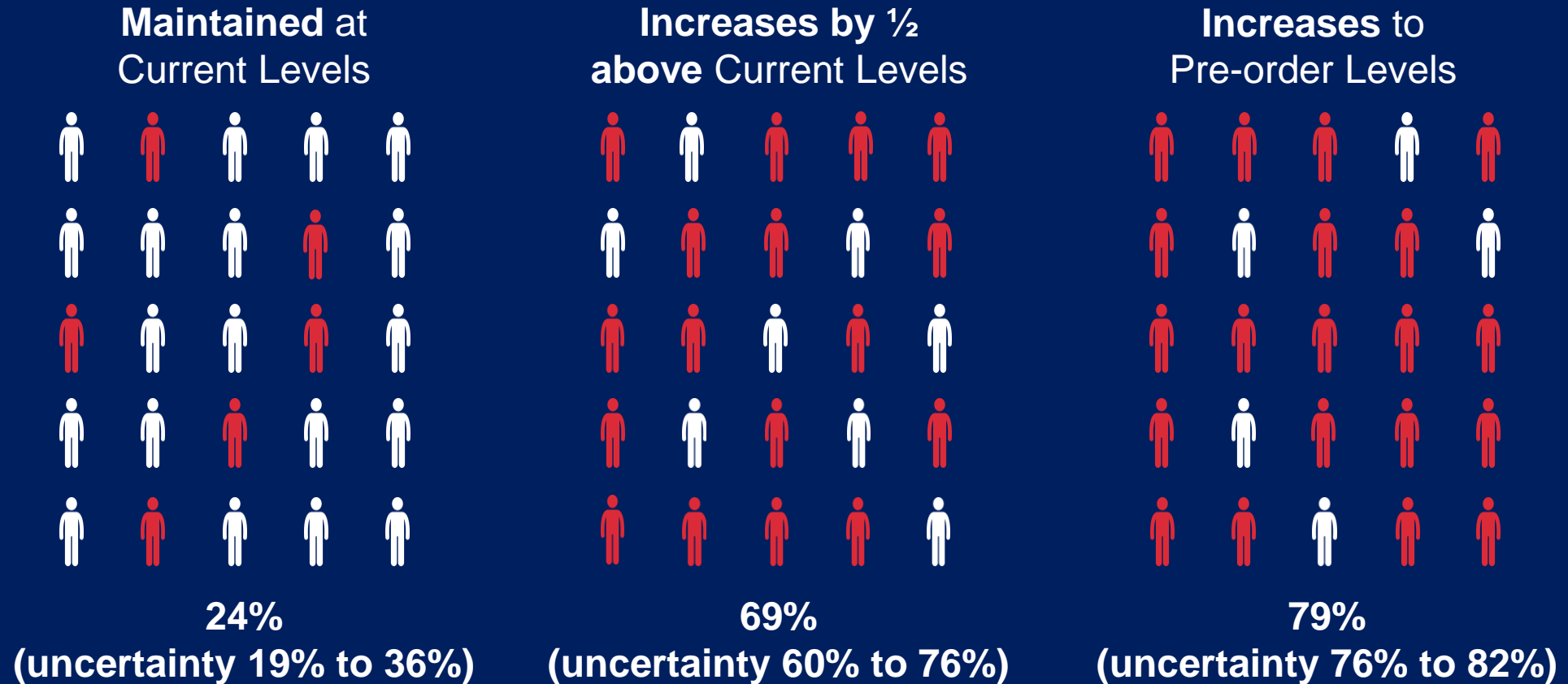
- Typical daily hospital admissions for influenza-associated illnesses



- Typical hospital census of patients with influenza-associated illnesses

Effect of Behaviors to Control Transmission

If transmission....



... of LA County residents will have been infected by March 31, 2021 *

**(This includes adults and children)*