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:

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Key Findings of the November 11th Update

- This update includes data through November 9th, 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 suggests 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

- **Susceptible**
  - Exposed (incubation 2-12 days)

- **Potentially Infectious** (e.g., 5 to 30+ days)
  - May be Symptomatic
  - Symptom May Begin

- **Not Contagious**
  - Symptoms Resolve
  - No longer infectious

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

Effect of Physical Distancing

Where we were

Additional uncertainty if R varies

Uncertainty with no change in R
Hospital New Patient Projections

Effect of Physical Distancing

Where we are today

Additional uncertainty if R varies

Uncertainty with no change in R
Effective Transmission Number “R”

Where we are today

Effect of Physical Distancing

R = 1.0

Effect of Physical Distancing

Additional uncertainty if R varies

Uncertainty with no change in R

Additional uncertainty if R varies

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.
Bed Capacity for COVID-19 Patients

Where we are today

Additional uncertainty if $R$ varies

Uncertainty with no change in $R$
Predictions of Demand in LA County | ICU Beds

ICU Bed Capacity for COVID-19 Patients without activation of alternative ICU locations or staffing

Where we are today

Additional uncertainty if R varies

Uncertainty with no change in R
Predictions of Demand in LA County | Ventilators

Ventilator Availability for COVID-19 Patients

Where we are today

Additional uncertainty if R varies

Uncertainty with no change in R
Where we are today

Predictions of Daily Mortality LA County

- Daily reported deaths
- $\Delta$ 7-day running average
- Additional uncertainty if $R$ varies
- Uncertainty with no change in $R$
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.

• Typical daily hospital admissions for influenza-associated illnesses

• Typical hospital census of patients with influenza-associated illnesses

• Daily hospital admissions for COVID-19

• Hospital bed utilization for COVID-19
Effect of Behaviors to Control Transmission

If transmission....

Maintained at Current Levels

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Increases by ½ above Current Levels

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Increases to Pre-order Levels

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24% (uncertainty 19% to 36%)

69% (uncertainty 60% to 76%)

79% (uncertainty 76% to 82%)

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

*(This includes adults and children)