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

April 29, 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^

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 April 29th Update

• This update includes data on hospital visits and volume through April 27, 2020. The model now accounts for increased hospital length of stay observed in patients with COVID-19.

• Key findings:
  • The overall volume of hospital-based care for patients with COVID-19 appears generally stable, within the model uncertainty, consistent with prior predictions;
  • It remains unclear if current measures are adequate to lead to a reduction in illness, or if more effective measures will be required;
  • The number of hospital beds in Los Angeles County appears adequate to meet the projected need for the care of additional COVID-19 patients over the next 4 weeks;
  • The number of ICU beds in Los Angeles County, especially with the addition of new ICU beds through multiple efforts across the County, is likely adequate to meet the projected need for the care of additional COVID-19 patients over the next 4 weeks; and
  • The number of mechanical ventilators in Los Angeles County appears adequate to meet the projected need for the care of additional COVID-19 patients over the next 4 weeks.

• If transmission increases, for example due to a reduction in physical distancing without the implementation of other effective control measures, modeling predicts that an increase in patient volume at healthcare facilities would occur after delay of approximately 2-4 weeks.
Susceptible | Exposed (incubation 2-12 days) | Infectious (e.g., 10 to 30+ days) | Clinically Well (no symptoms)

Exposure → Symptoms Begin → Symptomatic → No longer infectious

Becomes contagious → Not Contagious

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.
Goal of Public Health Response

Effects of physical distancing & public health interventions:

1. Delay peak in demand, increased time to prepare
2. Decrease peak demand, increased ability to surge
3. Decrease total population infected

Source: CDC 2007
Hospital Patient Projections

Where we are today

Effect of Physical Distancing

Uncertainty
Predictions of Demand in LA County | Hospital Beds

Current Bed Capacity for COVID-19 Patients

Where we are today

Uncertainty
Predictions of Demand in LA County | ICU Beds

Current ICU Bed Capacity for COVID-19 Patients

Where we are today

Uncertainty
Predictions of Demand in LA County | Ventilators

Current Ventilator Availability for COVID-19 Patients

Where we are today

Uncertainty
Effect of Physical Distancing Behavior

As summer approaches, if physical distancing is....

<table>
<thead>
<tr>
<th>Reduced to Pre-order Levels</th>
<th>Maintained at Current Levels</th>
<th>Increased Above Current Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Distancing Icons] (99%</td>
<td>![Distancing Icons] (12%)</td>
<td>![Distancing Icons] (7%)</td>
</tr>
<tr>
<td>(uncertainty 94% to 100%)</td>
<td>(uncertainty 9% to 17%)</td>
<td>(uncertainty 6% to 9%)</td>
</tr>
</tbody>
</table>

...of LA County residents will have been infected by August 1<sup>st</sup>, 2020 *

*(This includes adults and children)*