COVID-19 Disease Outbreak Outlook
Arizona State and Pima County
Updated April 8, 2020

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As of April 7th, 2726 COVID-19 cases and 151 deaths have been reported in Arizona. The doubling time (7-day moving average) for the total number of reported cases has increased from 2.7 days to 7.1 days since March 29th indicating that the pace of newly reported infections is slowing (Table 1). The largest single-day report of new cases occurred on April 3rd and 4th with 250 cases on each (Figure 1).

Because trends in hospitalizations, ICU admissions, and deaths lag reported cases, the pace of these outcomes will not slow for several weeks. The Institute for Health Metrics and Evaluation (IHME) recently revised their estimates of hospitalizations and deaths downward. The IHME now predicts hospitalizations will peak on April 22nd, but uncertainty remains about the peak's size (Figure 2, following page). The mid-range estimate calls for 1203 beds at the peak, twice the 560 beds currently occupied, but below the 6017 available. For ICU admissions, the mid-range estimate calls for 248 beds on the April 24th peak, more than twice the 109 currently occupied beds, but below the 508 available (Figure 3, following page). However, ICU needs could exceed capacity if trends deviate.

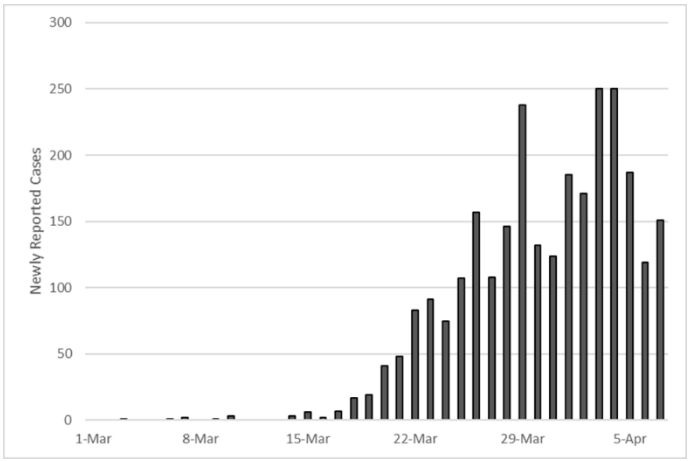

Figure 1. Newly Reported COVID-19 Cases in Arizona

Table 1. Reported COVID-19 Cases and Deaths in Arizona from March 20 – March 27.

	Mar 29	Mar 30	Mar 31	Apr 1	Apr 2	Apr 3	Apr 4	Apr 5	Apr 6	Apr 7
Total Reported Cases	1157	1289	1413	1598	1769	2019	2269	2456	2575	2726
Newly Reported Cases	238	132	124	185	171	250	250	187	119	151
Doubling Time (days)*****	2.72	3.20	3.51	3.89	4.63	4.72	5.04	6.16	6.71	7.07
Total Reported Deaths	20	24	29	32	41	52	64	65	73	80

*7-day moving average of doubling time based on day-to-day increass in total reported case count.

Pima County

As of April 7th, 464 COVID-19 cases have been reported in Pima County (Table 2). Growth in Pima County has generally followed that of Arizona as a whole. Here too, the pace of newly reported cases is slowing. Unfortunately, I have not reliably captured Pima County deaths, so those are not reported. I may have made a single-day data error on April 6th, with 0 new cases being reported.

Table 2. Reported COVID-19 Cases in Pima County from March 24 – Apr 2.

	Mar 29	Mar 30	Mar 31	Apr 1	Apr 2	Apr 3	Apr 4	Apr 5	Apr 6†	Apr 7
Total Reported Cases	187	202	217	237	280	326	372	415	415	464
Newly Reported Cases	34	15	15	20	43	46	46	43	0	49
Doubling Time (days)*	1.98	2.71	2.85	3.83	4.45	4.50	5.13	5.77	6.37	6.03

*7-day moving average of doubling time based on day-to-day increass in total reported case count. †Likely single-day error in data capture.

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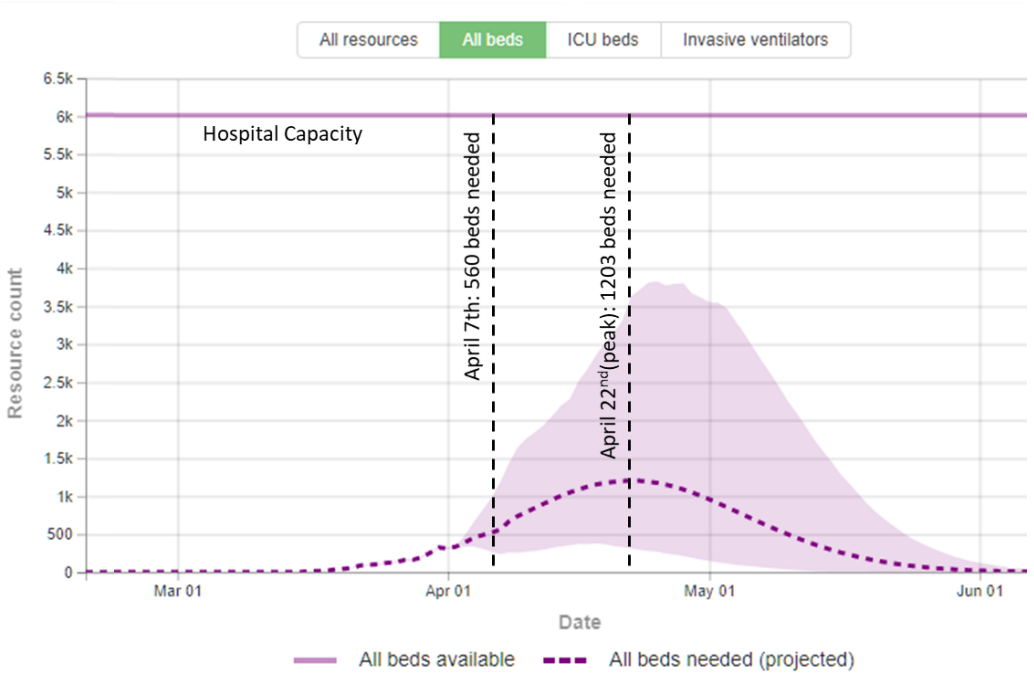
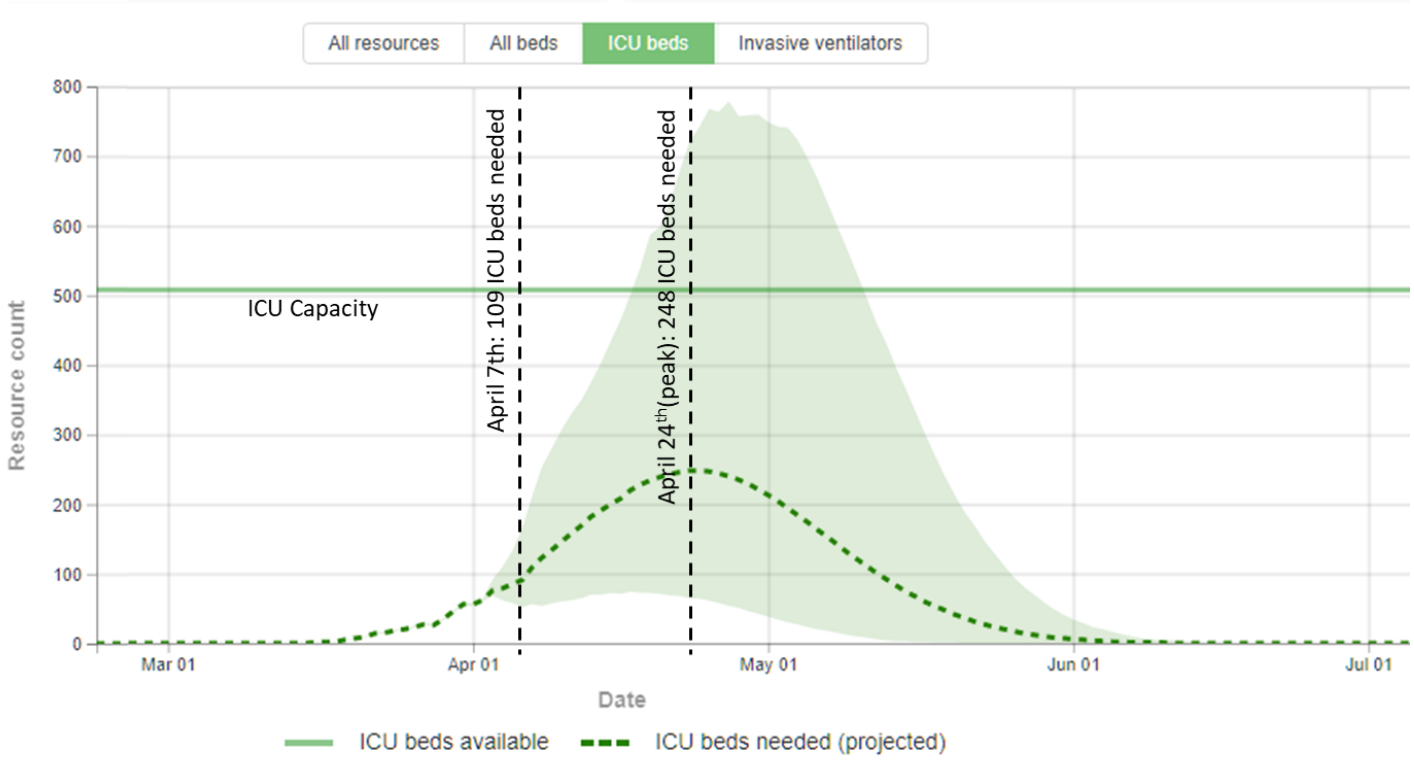


Screenshot April 8, 2020 at 11:35AM.

Figure 2. IHME Estimated COVID-19 Hospitalizations and Capacity.



Screenshot April 8, 2020 at 11:35AM.

Figure 3. IHME Estimated COVID-19 ICU Utilization and Capacity.

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Additional Thoughts Regarding the Publicly Available Forecast Models

As mentioned in the last update, 2 models predict Arizona COVID-19 hospitalizations: one from COVID ACT NOW (Act Now model) and another from IHME. After the recent IHME update, the total number of projected hospitalizations has declined from 176,000 to 29,000 which is similar to the number projected by the strict shelter-by the Act Now model of strict social distancing (10,000 hospitalizations, Figure 4). The most substantial remaining difference between the two is that the projected peak will occur sooner in the IHME model (April 22nd) than the Act Now model (26th). The earlier peak seems more plausible given current local trends.

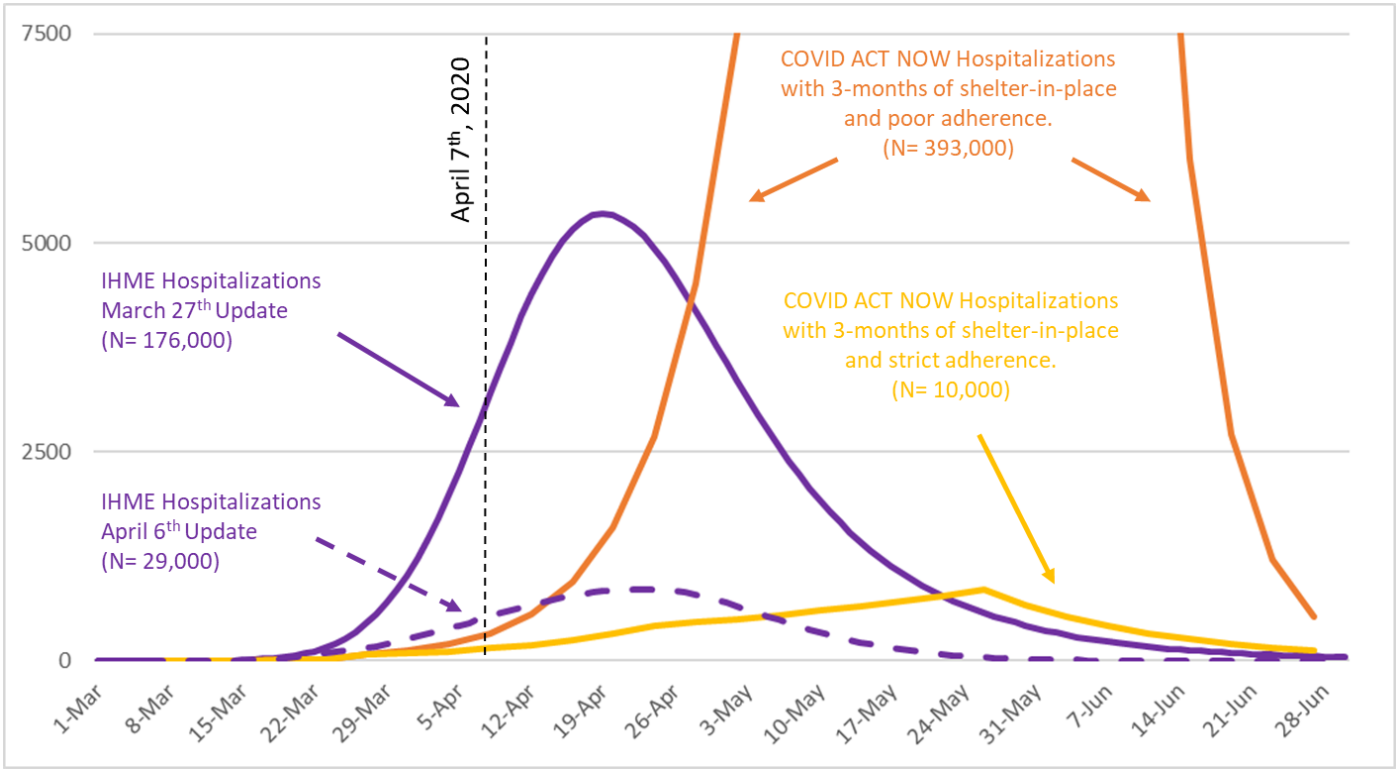

Figure 4. Predicted COVID-19-Related Hospitalizations in Arizona by the Act Now Model and the Original and Updated IHME Model.

In summary,

- Mounting evidence indicates that social distancing, including the current stay-at-home order, is slowing the spread of new infections. Given this success, maintaining or increasing our social distancing efforts over the coming weeks should remain our highest priority.
    - Even though the pace of new infections has slowed, the risk of being infected remains high as we are simply coming down the other side of the peak.
- The lag between new infections and hospitalizations and ICU admissions means that the pace of these outcomes will increase for the next 1 - 3 weeks before slowing.
    - Over the next 2 weeks, hospitalists and intensivists should prepare for a continued increase in admissions until a peak around April 22nd - 24th. Admissions are predicted to be twice that of today but could be somewhat higher.
    - Given limited ICU capacity, the strain is likely to be greater in critical care settings than general floor beds.

Next update scheduled for April 13.

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