FEMA/ASPR - Arizona Briefing

COVID-19 Planning Considerations

May 7, 2020

Outbreak Scenarios Notes

- There are multiple planning tools and models that states, tribes, and territories can use to make important COVID-19 decisions
- FEMA and HHS are working with the Johns Hopkins University (JHU) Applied Physics Laboratory to develop planning tools that states and territories can use in concert with other available resources to assist with decision making
- The models provided by JHU alongside other commonly used models can be considered in an attempt to capture a more holistic view of the public health picture
- The planning tools federal agencies have shared with states, tribes, and territories have changed several times over the course of the incident as more data was gathered and adjustments to parameters were made based on observed, real-world conditions in the state, tribe, or territory and across the country
- This public health analysis includes overlaying real public health data within the model and better describing any potential variations using traditional public health methods
- Any models presented in this briefing are preliminary results and are not forecasts or predictions

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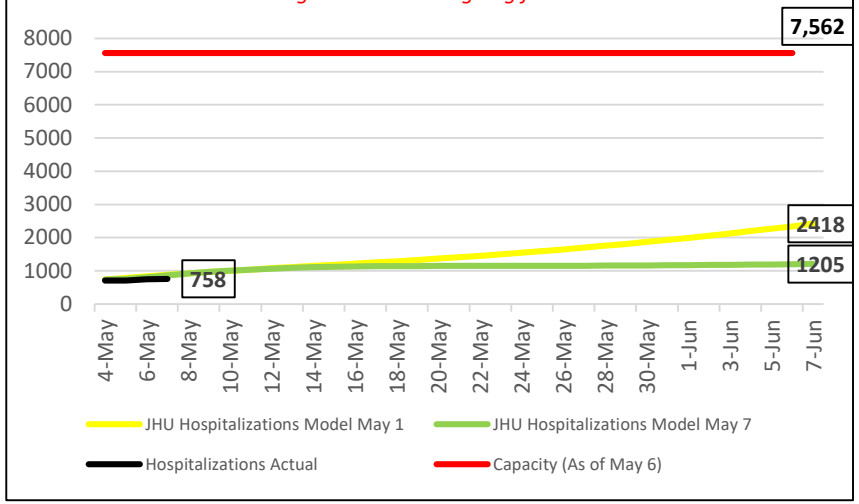
Outbreak Scenarios & Timelines (30 Day Outlook)

Current outbreak scenarios show hospitalizations, critical care, and ventilator usage will remain below capacity in period of assessment

JHU Hospitalizations Model: May 1 v. May 7

This model shows the current "best guess" scenario for COVID-19 impacts per the CDC. It does not account for potential easing of mitigative measures going forward



JHU Critical Care Model: May 1 v. May 7

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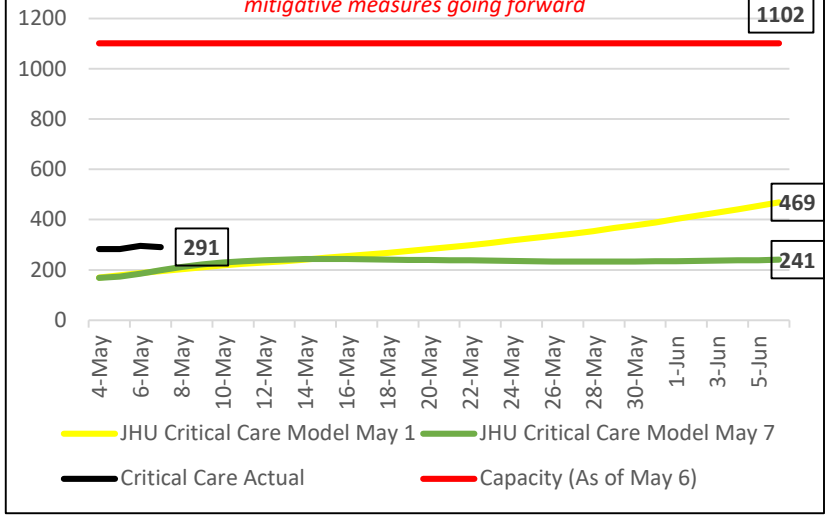
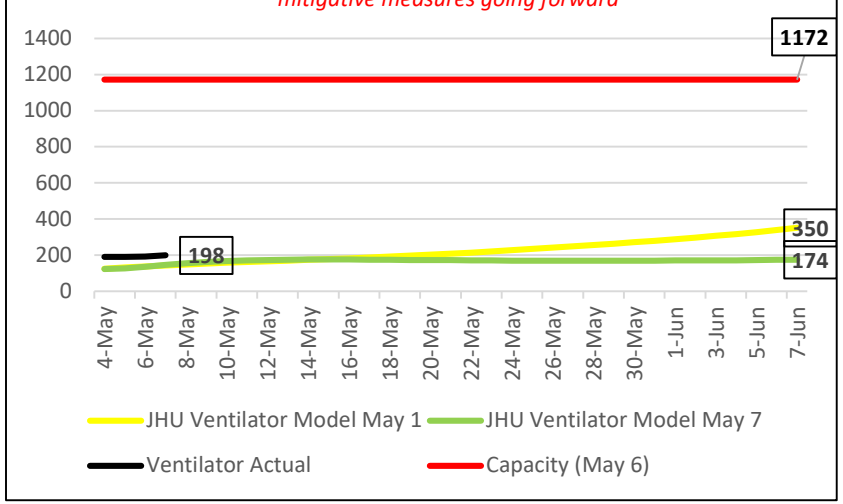


JHU Ventilator Model: May 1 v. May 7

This model shows the current "best guess" scenario for COVID-19 impacts per the CDC. It does not account for potential easing of mitigative measures going forward



May 7 Model Predicted Values

Date	4-May	5-May	6-May	7-May	8-May	9-May	10-May	11-May	12-May	13-May	14-May	15-May	16-May	17-May	18-May	19-May	20-May	21-May	22-May	23-May	24-May	25-May	26-May	27-May	28-May	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun
Hospitalizations	734	752	804	863	918	962	1004	1037	1068	1091	1109	1122	1129	1137	1141	1144	1146	1147	1147	1148	1149	1150	1152	1154	1156	1158	1161	1165	1168	1174	1179	1185	1192	1199	1205
Critcal Care	169	173	185	199	211	221	229	234	238	241	243	243	243	242	241	240	240	238	238	236	235	234	233	233	233	233	234	234	234	235	237	238	239	241	243
Ventilator Usage	123	126	135	145	154	161	166	170	173	174	175	175	175	175	174	173	172	171	171	170	169	168	168	168	168	168	169	169	170	170	170	171	172	173	174

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Hospital Utilization Actuals April 12-May 7

Current Cases (JHU, 05/06/2020)	Cases	Casualties
	9,305	395

Current Hospital Utilization
(AZ Department of Health Services, 05/06/2020)

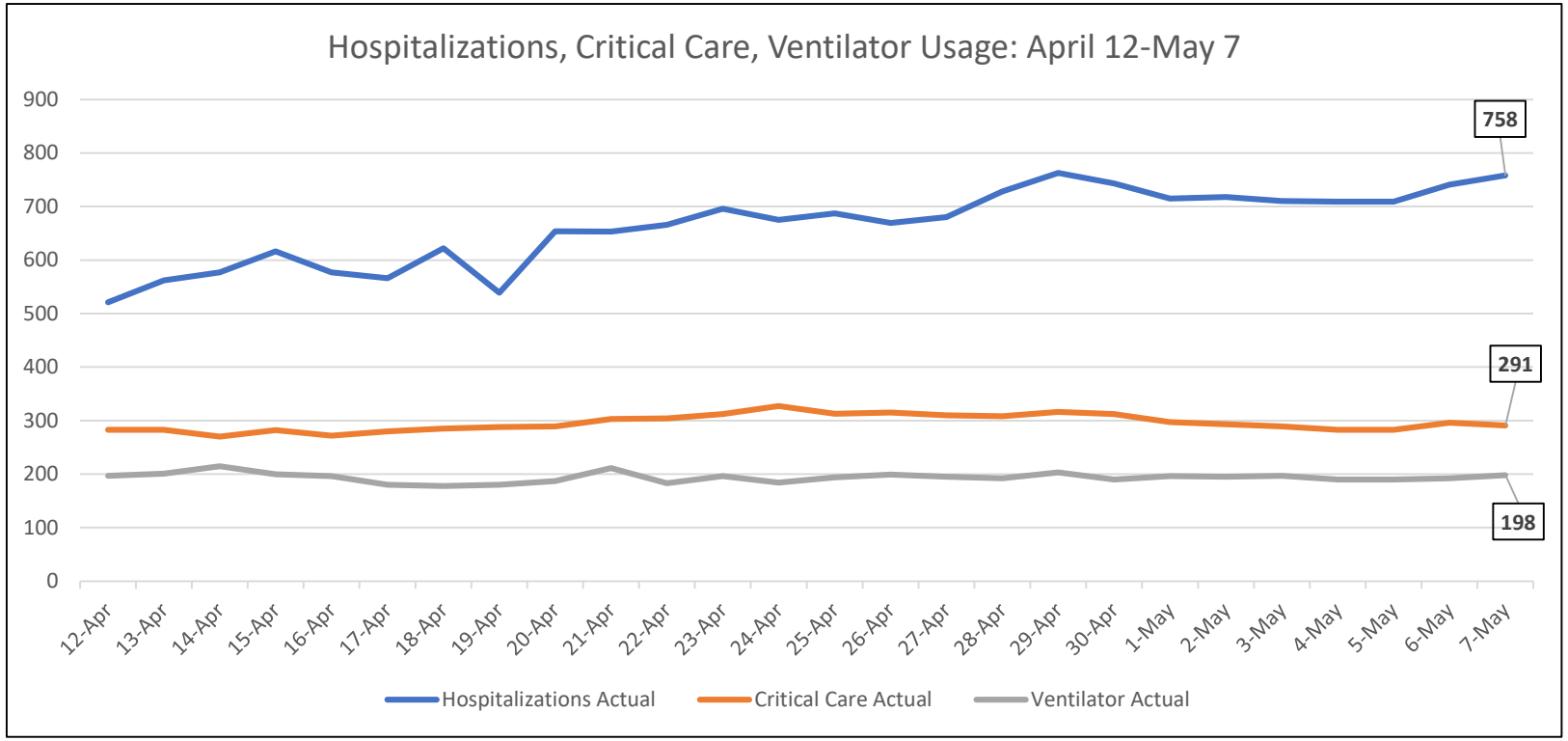
RESOURCE	TOTAL	IN USE	% AVILABLE
LICENSED BEDS	14,719	7,157	51%
ICU BEDS	2,241	1,719	23%
VENTILATORS	1,733	561	68%

Overall Analysis

- Hospitalizations, Critical Care, and Ventilator use has seen an uptick over the last three days.
- Hospitalizations, Critical Care, and Ventilator use has slowed its increase substantially the last 14 days compared to the 14 days before that

Critical Care and Ventilator Usage

- Critical Care and Ventilator usage as percentage of total hospitalizations was 54% (ICU) and 38% (Ventilator) respectively on April 12—this is much higher than the 20% (ICU) and 14% (Ventilator) observed globally
- These numbers are starting to normalize towards national statistics at 38% (ICU) and 26% (Ventilator on) May 7, but remains well above the expected rates.



Actual Hospital Utilization Over Time

The metrics for reopening America include a 14 day downward trajectory of COVID-like syndromic cases and treatment of all patients without crisis care. While Arizona is see a slowing in hospital utilization, it has yet to see a prolonged period of decrease.

Date	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	1-May	2-May	3-May	4-May	5-May	6-May	7-May	26 Day Average % Change	14 Day Average % Change
Hospitalizations Actual	521	562	577	616	577	566	622	539	654	653	666	696	675	687	669	680	728	763	743	715	718	710	709	709	741	758		
Percent Change (Day to Day)		7.30%	2.60%	6.33%	-6.76%	-1.94%	9.00%	-15.40%	17.58%	-0.15%	1.95%	4.31%	-3.11%	1.75%	-2.69%	1.62%	6.59%	4.59%	-2.69%	-3.92%	0.42%	-1.13%	-0.14%	0.00%	4.32%	2.24%	1.31%	0.56%
Critical Care Actual	283	283	270	282	272	280	285	288	289	303	304	312	327	313	315	310	308	316	312	297	293	289	283	283	296	291		
Percent Change (Day to Day)		0%	-5%	4%	-4%	3%	2%	1%	0%	5%	0%	3%	5%	-4%	1%	-2%	-1%	3%	-1%	-5%	-1%	-1%	-2%	0%	4%	-2%	0.07%	-0.54%
Ventilator Actual	197	201	215	200	196	180	178	180	187	211	183	196	184	194	199	195	192	203	190	196	195	197	190	190	192	198		
Percent Change (Day to Day)		1.99%	6.51%	-7.50%	-2.04%	-8.89%	-1.12%	1.11%	3.74%	11.37%	-15.30%	6.63%	-6.52%	5.15%	2.51%	-2.05%	-1.56%	5.42%	-6.84%	3.06%	-0.51%	1.02%	-3.68%	0.00%	1.04%	3.03%	-0.14%	0.00%

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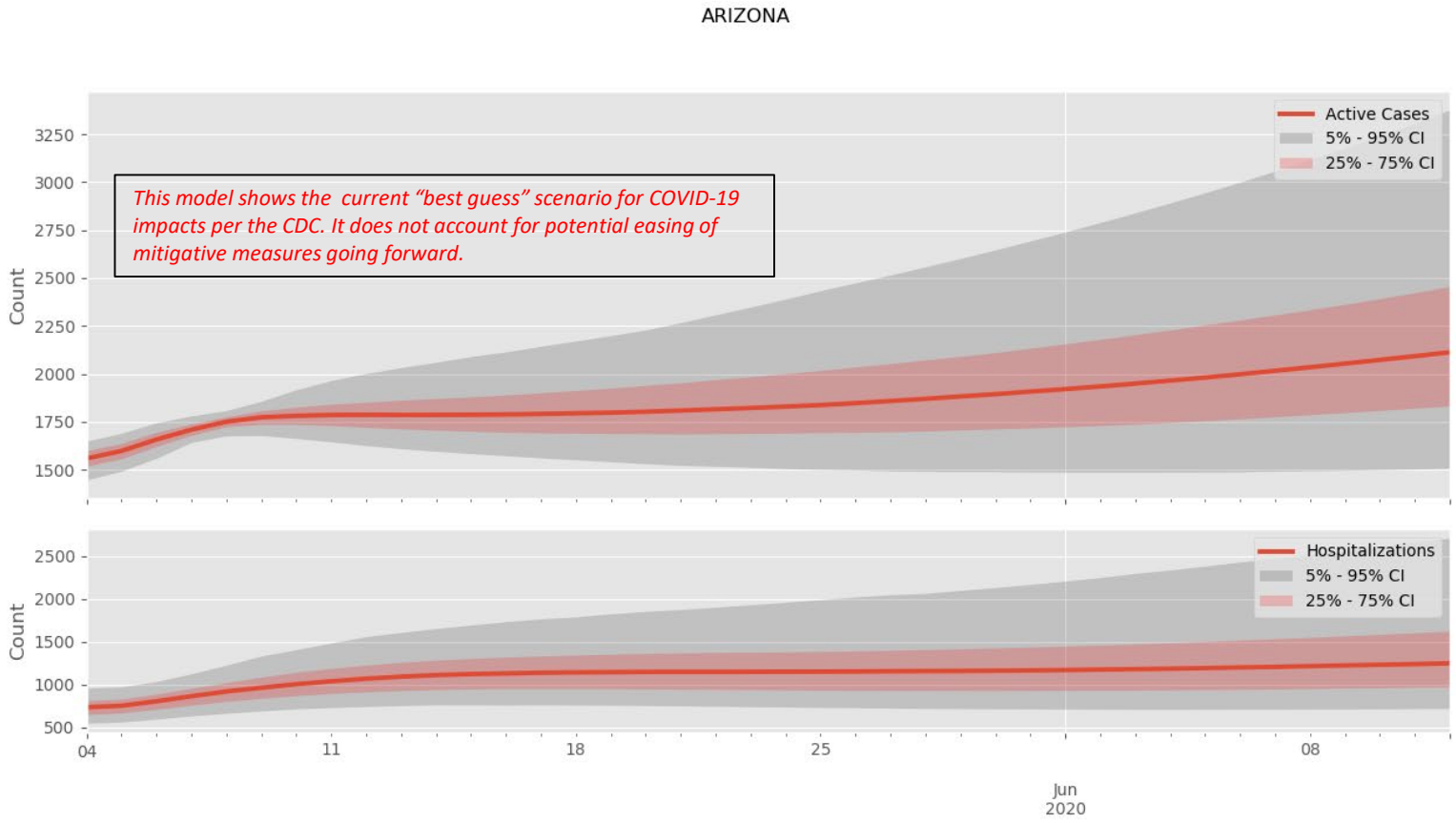
Johns Hopkins Applied Physics Lab Model: Active Cases and Hospitalizations

SEIR Model Assumptions

CDC "Best Guess" Assumptions

- Mitigation is interpreted using mobility data
- Assumes only a testing factor of 10
- Doubling Time=5.5 days
- Initial R0=2.5
- Overall Unmitigated Serologic Attack Rate: 60%
- Symptomatic Case Fatality Ratio: 0-49: 0.06; 50-64:0.3; 65+: 1.7; Overall: 0.5
- Symptomatic Case Hospitalization Ratio (%): 0-4: 4.0; 5-17: 1.0; 18-49: 4.0; 50-64: 8.5; 65+: 19.5; Overall: 8.0
- Proportion of infections that are asymptomatic: 35%
- Relative infectiousness of asymptomatic individuals: 100%
- Proportion of transmission occurring prior to symptom onset: 35%
- Pre-existing immunity: none
- Time to Symptom Onset: 5 days
- Average time between primary and secondary infection: 7 days
- Time to seek care: </=2 days: 35%; 3-7 days: 50%; >/=8 days: 25%
- Mean time from onset to hospitalization: 0-49: 6.0; 50-64: 6.3; >/=5.2
- Mean duration of hospitalization: 0-49: 3.1; 50-64: 7.8; >/=65: 6.5
- ICU% among those hospitalized: 0-49: 10; 50-64: 20; 65+: 30
- %ventilated among those in ICU: 0-49: 60; 50-64: 75; 65+: 75
- Mean time from symptom onset to death: 10 days



All magnitudes are highly unreliable based on the range uncertainty in the data with the time horizon

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Johns Hopkins Applied Physics Lab Model: Cumulative Cases and Cumulative Fatalities

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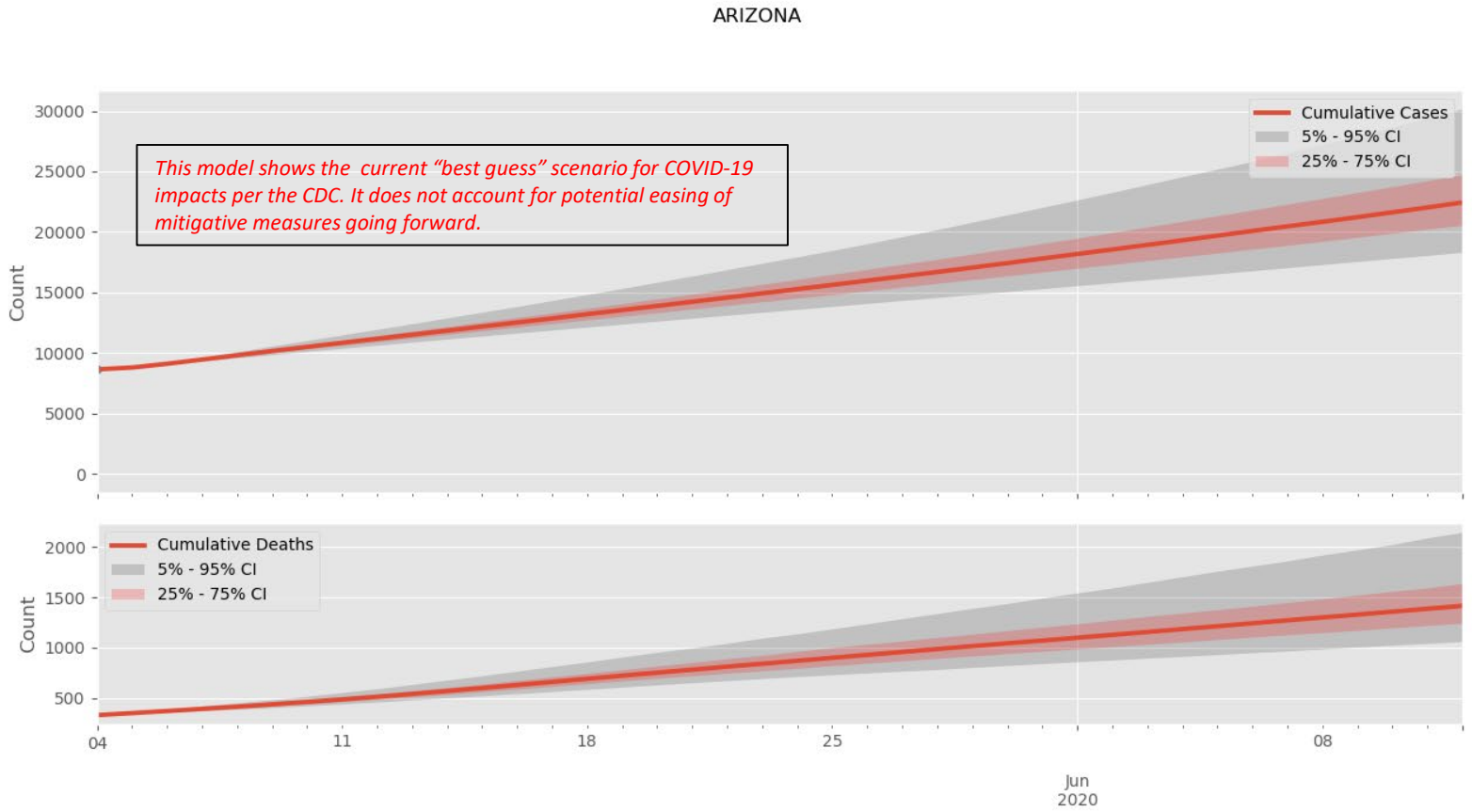

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FEMA

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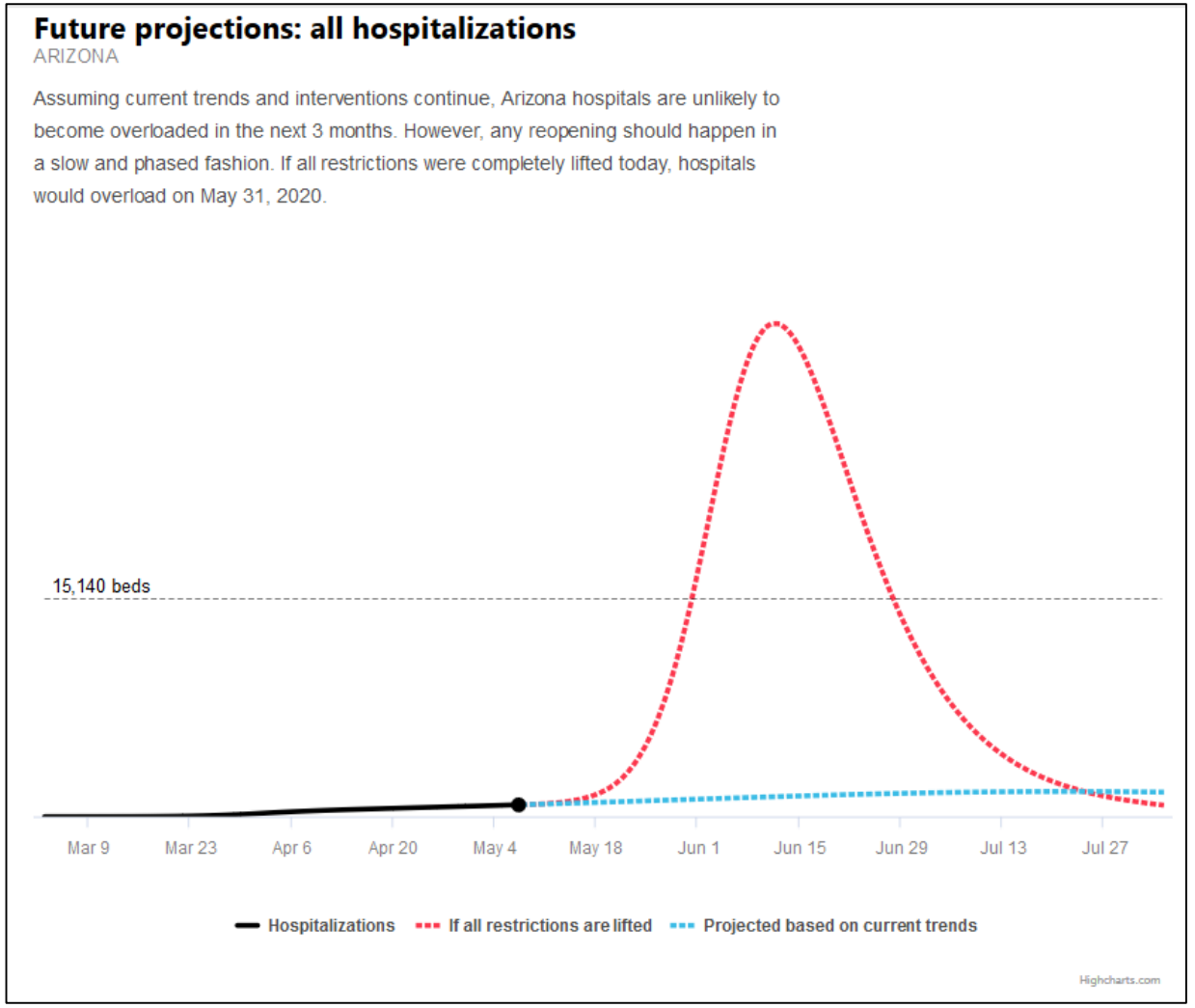
COVID ACT NOW: All Hospitalizations

ASPR ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE



COVID Act Now Assumptions available here: https://data.covidactnow.org/Covid_Act_Now_Model_References_and_Assumptions.pdf

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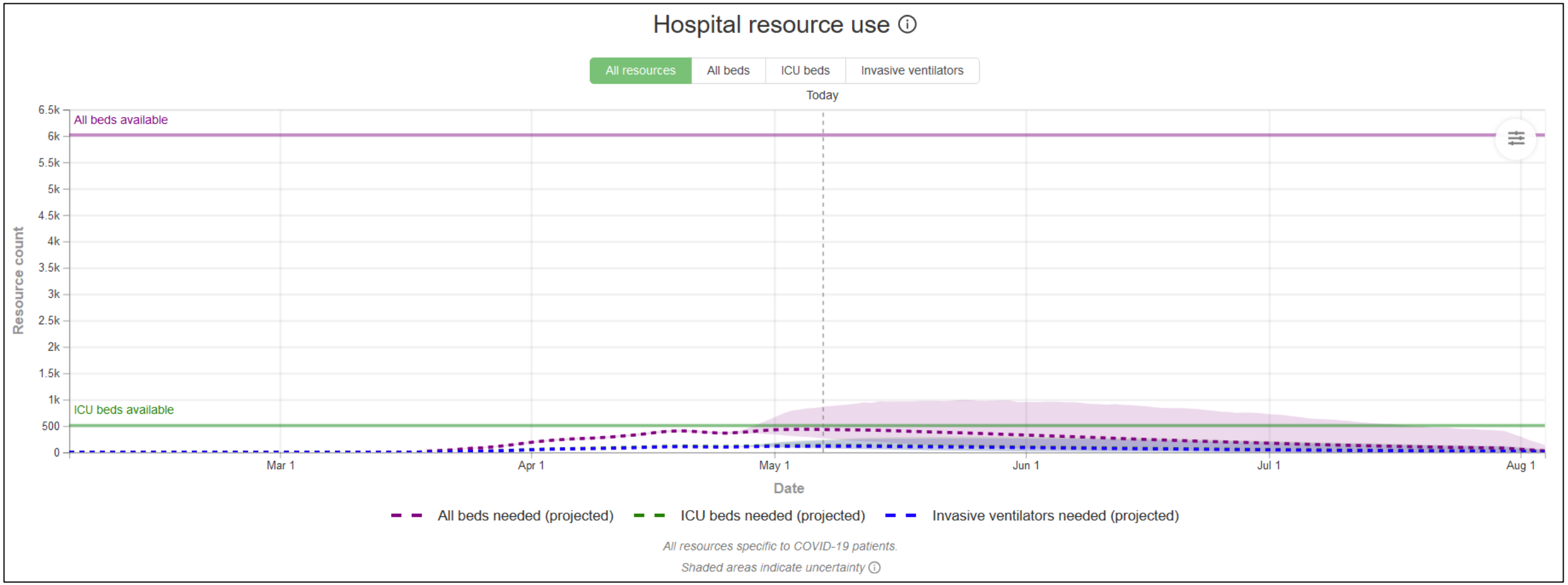
IHME: Hospital Resource Use



IHME Information available here: https://www.medrxiv.org/content/10.1101/2020.04.21.20074732v1