

**IEM's AI Modeling: Short-term COVID-19 Projections****Date: 3/11/22**

Leveraging over 15 years of support to HHS for medical consequence modeling and our proprietary artificial intelligence (AI) models, IEM believes that our Coronavirus model outputs can be used to assist localities and their medical facilities to better prepare for an increase in hospitalizations, to better plan for and locate drive-through testing facilities, and to determine where increased levels of transmission may be occurring.

**We have been refining our AI model over the past month and are confident in its ability to provide accurate 7-day projections that can be used for operational and logistical planning.**

**AI-based Model Background**

IEM is currently using an AI model to fit data from various sources and project new cases of COVID-19. We do not assume the average number of secondary infections (R-value) stays the same over time. IEM's AI model finds the best R-value over time to evaluate how it changes over the course of the outbreak. The IEM modeling team is running ~11 million simulations to fit each state's data and using the best fit for the R-value to project new cases over the next 7 days. The AI models are executed on a daily basis to evaluate the changing dynamics of the COVID-19 pandemic. Our projections have typically been within 10%, and are often within 5%, of actual confirmed cases.

The projections shown in this document are based on data pulled in as of 3/11/22 9 a.m.

**Please provide any feedback or send any questions that you might have to us. We are continually updating and improving the model, so your feedback is critical.**

**Also, if you have more current or refined data for your State, Commonwealth or Territory that you would like IEM to factor in, please let us know.**

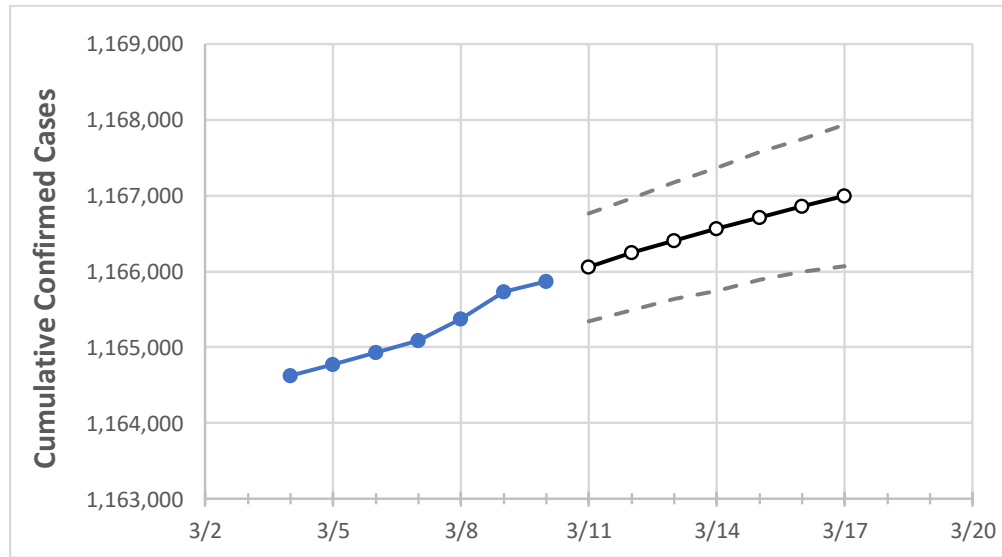
**IEM's Modeling Lead**

Dr. Prasith "Sid" Baccam is a **Computational Epidemiologist expert** at IEM with more than **20 years of experience in medical consequence modeling and simulation of disease outbreaks** and medical consequences following hypothetical attacks with biological agents or emerging infectious diseases. He develops key simulation models and decision support tools at IEM, specializing in public health, disaster response, and medical countermeasures (MCM) to enhance data-driven decision making and improve modeling assumptions.

Upon receiving his **Ph.D. in Applied Mathematics and Immunobiology** at Iowa State University, Dr. Baccam worked as a Postdoctoral Research Associate at Los Alamos National Laboratory where he focused on researching viral and immunological modeling. After his stint at Los Alamos, Dr. Baccam has served as Task Lead in multiple public health projects have allowed him to develop expertise as a mathematical biologist and a leader on high-performance modeling and simulation teams.

He has worked with state and local public health officials as well as Federal agencies, including **HHS**, the Centers for Disease Control and Prevention (**CDC**), and the Department of Homeland Security (**DHS**). Dr. Baccam has published numerous papers on public health response models and implications on policy and has been invited to participate in workshops and symposiums held by the Institute of Medicine (now the National Academy of Health). His modeling results have been briefed to the **Executive Office of the President** and informed two presidential policy actions.

## Louisiana State Projections



	Actual Confirmed Cases On:				Projected Cases For:						
	3/7	3/8	3/9	3/10	3/11	3/12	3/13	3/14	3/15	3/16	3/17
Louisiana	1,165,084	1,165,373	1,165,736	1,165,872	1,166,055	1,166,243	1,166,406	1,166,565	1,166,714	1,166,862	1,167,001

**Note:** The State's projection shows a "best estimate" curve (the solid line with circles) and the dotted lines are the upper and lower estimates around that best estimate. Our projections have typically been within 10%, and are often within 5%, of actual confirmed cases.

## Louisiana Parishes

	Actual Confirmed Cases On:				Projected Cases For:						
	3/7	3/8	3/9	3/10	3/11	3/12	3/13	3/14	3/15	3/16	3/17
Ascension Parish	33,052	33,054	33,065	33,066	33,070	33,075	33,078	33,083	33,087	33,090	33,094
Bossier Parish	35,238	35,244	35,255	35,260	35,267	35,273	35,279	35,285	35,290	35,295	35,300
Caddo Parish	63,218	63,229	63,237	63,245	63,254	63,263	63,271	63,279	63,286	63,294	63,301
Calcasieu Parish	51,623	51,633	51,652	51,655	51,661	51,667	51,673	51,678	51,684	51,688	51,693
East Baton Rouge Parish	105,107	105,127	105,162	105,173	105,188	105,202	105,216	105,229	105,243	105,256	105,266
Jefferson Parish	107,998	108,036	108,062	108,075	108,095	108,118	108,139	108,157	108,178	108,194	108,213
Lafayette Parish	59,172	59,182	59,205	59,209	59,219	59,227	59,235	59,243	59,250	59,257	59,263
Lafourche Parish	26,148	26,154	26,160	26,161	26,164	26,167	26,170	26,173	26,176	26,178	26,181
Orleans Parish	83,008	83,065	83,137	83,173	83,199	83,226	83,251	83,275	83,300	83,324	83,345
Ouachita Parish	47,197	47,204	47,218	47,222	47,231	47,238	47,246	47,253	47,260	47,268	47,274
Rapides Parish	30,830	30,833	30,843	30,848	30,852	30,856	30,859	30,862	30,865	30,868	30,870
St. Bernard Parish	10,675	10,677	10,678	10,680	10,681	10,682	10,683	10,684	10,685	10,686	10,687
St. Charles Parish	13,137	13,141	13,142	13,142	13,144	13,145	13,147	13,148	13,149	13,151	13,152
St. James Parish	5,454	5,454	5,454	5,454	5,455	5,456	5,457	5,458	5,459	5,459	5,460
St. John the Baptist Parish	9,999	10,000	10,004	10,005	10,006	10,007	10,008	10,009	10,010	10,011	10,012
St. Tammany Parish	68,016	68,035	68,049	68,059	68,068	68,076	68,084	68,093	68,099	68,107	68,113

Some recipients of our daily COVID-19 short-term (7 day) projections have requested projections of demand for: hospital bed, intensive care unit (ICU) beds, and mechanical ventilation. We realize that different states and localities will have different characteristics for hospital demand of COVID-19 cases, and we are presenting the best assumptions we could find for those medical demands based on scientific literature and health data reporting. Specifically:

- **Beds:** For hospitalization, we use a range of 10% and 20% of cases require hospitalization based on CDC's report ([MMWR, March 18, 2020](#)) and state reports of COVID-19 cases.
- **ICU:** The CDC report found that 24% of hospitalized cases require ICU care.
- **Ventilators:** Based on clinical data from China and state reports, we assume that 50% of ICU cases require a ventilator.

If you have other estimates for these assumptions, please share them with us as we work to refine our modeling, assumptions, and data on a daily basis.

The medical demands shown in the table assume 20% of **cumulative** confirmed cases require hospitalization. To get the medical demand for the assumption that 10% of confirmed cases require hospitalization, simply divide the demand by 2.

### Louisiana Medical Demands by County

	Actual Confirmed Cases On:				Projected Cases (Hospitalized) [ICU] {Ventilator} For:											
	3/7	3/8	3/9	3/10	3/12				3/14				3/16			
Ascension Parish	33,052	33,054	33,065	33,066	33,075	(6,615)	[1,588]	{794}	33,083	(6,617)	[1,588]	{794}	33,090	(6,618)	[1,588]	{794}
Bossier Parish	35,238	35,244	35,255	35,260	35,273	(7,055)	[1,693]	{847}	35,285	(7,057)	[1,694]	{847}	35,295	(7,059)	[1,694]	{847}
Caddo Parish	63,218	63,229	63,237	63,245	63,263	(12,653)	[3,037]	{1,518}	63,279	(12,656)	[3,037]	{1,519}	63,294	(12,659)	[3,038]	{1,519}
Calcasieu Parish	51,623	51,633	51,652	51,655	51,667	(10,333)	[2,480]	{1,240}	51,678	(10,336)	[2,481]	{1,240}	51,688	(10,338)	[2,481]	{1,241}
East Baton Rouge Parish	105,107	105,127	105,162	105,173	105,202	(21,040)	[5,050]	{2,525}	105,229	(21,046)	[5,051]	{2,525}	105,256	(21,051)	[5,052]	{2,526}
Jefferson Parish	107,998	108,036	108,062	108,075	108,118	(21,624)	[5,190]	{2,595}	108,157	(21,631)	[5,192]	{2,596}	108,194	(21,639)	[5,193]	{2,597}
Lafayette Parish	59,172	59,182	59,205	59,209	59,227	(11,845)	[2,843]	{1,421}	59,243	(11,849)	[2,844]	{1,422}	59,257	(11,851)	[2,844]	{1,422}
Lafourche Parish	26,148	26,154	26,160	26,161	26,167	(5,233)	[1,256]	{628}	26,173	(5,235)	[1,256]	{628}	26,178	(5,236)	[1,257]	{628}
Orleans Parish	83,008	83,065	83,137	83,173	83,226	(16,645)	[3,995]	{1,997}	83,275	(16,655)	[3,997]	{1,999}	83,324	(16,665)	[4,000]	{2,000}
Ouachita Parish	47,197	47,204	47,218	47,222	47,238	(9,448)	[2,267]	{1,134}	47,253	(9,451)	[2,268]	{1,134}	47,268	(9,454)	[2,269]	{1,134}
Rapides Parish	30,830	30,833	30,843	30,848	30,856	(6,171)	[1,481]	{741}	30,862	(6,172)	[1,481]	{741}	30,868	(6,174)	[1,482]	{741}
St. Bernard Parish	10,675	10,677	10,678	10,680	10,682	(2,136)	[513]	{256}	10,684	(2,137)	[513]	{256}	10,686	(2,137)	[513]	{256}
St. Charles Parish	13,137	13,141	13,142	13,142	13,145	(2,629)	[631]	{315}	13,148	(2,630)	[631]	{316}	13,151	(2,630)	[631]	{316}
St. James Parish	5,454	5,454	5,454	5,454	5,456	(1,091)	[262]	{131}	5,458	(1,092)	[262]	{131}	5,459	(1,092)	[262]	{131}
St. John the Baptist Parish	9,999	10,000	10,004	10,005	10,007	(2,001)	[480]	{240}	10,009	(2,002)	[480]	{240}	10,011	(2,002)	[481]	{240}
St. Tammany Parish	68,016	68,035	68,049	68,059	68,076	(13,615)	[3,268]	{1,634}	68,093	(13,619)	[3,268]	{1,634}	68,107	(13,621)	[3,269]	{1,635}

For additional information from IEM, please contact Bryan Koon, Vice President of Emergency Management and Homeland Security at [bryan.koon@iem.com](mailto:bryan.koon@iem.com) or 850-519-7966 or Stephanie Tennyson at [stephanie.tennyson@iem.com](mailto:stephanie.tennyson@iem.com) or 202-309-4257.