

**IEM's AI Modeling: Short-term COVID-19 Projections****Date: 10/27/21**

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 10/27/21 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.**

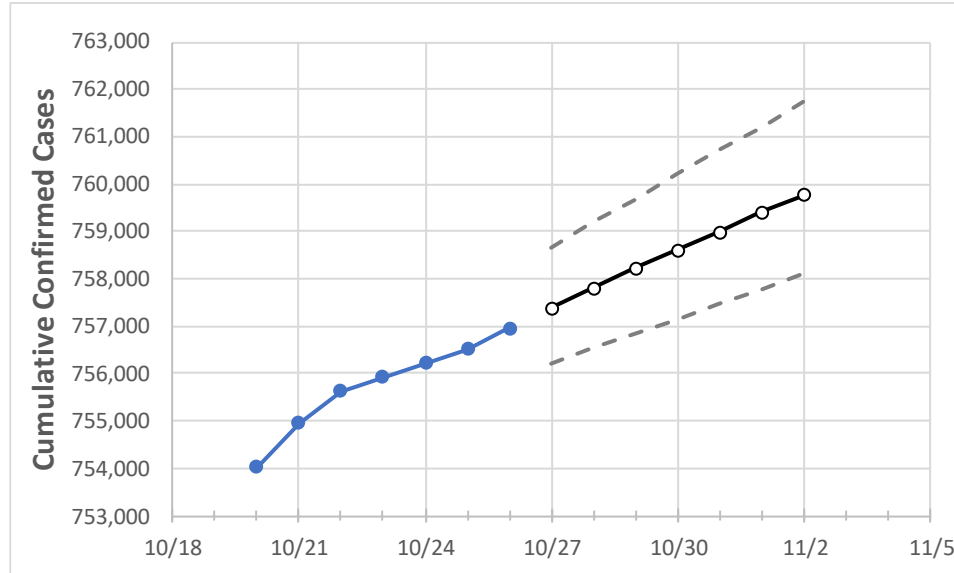
**IEM's Modeling Lead**

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:						
	10/23	10/24	10/25	10/26	10/27	10/28	10/29	10/30	10/31	11/1	11/2
Louisiana	755,924	756,216	756,509	756,969	757,379	757,799	758,217	758,607	758,995	759,405	759,764

**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:						
	10/23	10/24	10/25	10/26	10/27	10/28	10/29	10/30	10/31	11/1	11/2
Ascension Parish	21,723	21,728	21,734	21,739	21,747	21,754	21,761	21,767	21,774	21,781	21,787
Bossier Parish	21,643	21,653	21,663	21,675	21,687	21,697	21,708	21,718	21,729	21,739	21,748
Caddo Parish	39,277	39,294	39,311	39,353	39,375	39,397	39,419	39,439	39,459	39,479	39,497
Calcasieu Parish	34,347	34,362	34,378	34,395	34,422	34,448	34,473	34,498	34,523	34,547	34,572
East Baton Rouge Parish	63,669	63,683	63,696	63,737	63,770	63,800	63,831	63,861	63,890	63,920	63,948
Jefferson Parish	69,355	69,381	69,406	69,429	69,456	69,484	69,510	69,537	69,562	69,588	69,612
Lafayette Parish	38,695	38,709	38,723	38,746	38,777	38,808	38,840	38,873	38,905	38,937	38,966
Lafourche Parish	17,827	17,832	17,838	17,843	17,851	17,858	17,865	17,873	17,880	17,886	17,893
Orleans Parish	46,636	46,657	46,679	46,707	46,732	46,758	46,781	46,806	46,830	46,854	46,877
Ouachita Parish	31,411	31,420	31,430	31,446	31,464	31,481	31,497	31,513	31,527	31,542	31,556
Rapides Parish	21,152	21,163	21,175	21,190	21,204	21,219	21,233	21,248	21,262	21,276	21,291
St. Bernard Parish	6,877	6,881	6,885	6,888	6,891	6,895	6,898	6,900	6,903	6,907	6,909
St. Charles Parish	8,852	8,856	8,860	8,865	8,869	8,873	8,878	8,882	8,886	8,890	8,894
St. James Parish	3,489	3,492	3,494	3,499	3,505	3,510	3,516	3,522	3,527	3,534	3,540
St. John the Baptist Parish	6,290	6,291	6,293	6,296	6,298	6,301	6,303	6,305	6,308	6,310	6,312
St. Tammany Parish	43,428	43,445	43,462	43,485	43,506	43,527	43,547	43,566	43,587	43,606	43,623

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:											
	10/23	10/24	10/25	10/26	10/28			10/30			11/1					
Ascension Parish	21,723	21,728	21,734	21,739	21,754	(4,351)	[1,044]	{522}	21,767	(4,353)	[1,045]	{522}	21,781	(4,356)	[1,045]	{523}
Bossier Parish	21,643	21,653	21,663	21,675	21,697	(4,339)	[1,041]	{521}	21,718	(4,344)	[1,042]	{521}	21,739	(4,348)	[1,043]	{522}
Caddo Parish	39,277	39,294	39,311	39,353	39,397	(7,879)	[1,891]	{946}	39,439	(7,888)	[1,893]	{947}	39,479	(7,896)	[1,895]	{947}
Calcasieu Parish	34,347	34,362	34,378	34,395	34,448	(6,890)	[1,654]	{827}	34,498	(6,900)	[1,656]	{828}	34,547	(6,909)	[1,658]	{829}
East Baton Rouge Parish	63,669	63,683	63,696	63,737	63,800	(12,760)	[3,062]	{1,531}	63,861	(12,772)	[3,065]	{1,533}	63,920	(12,784)	[3,068]	{1,534}
Jefferson Parish	69,355	69,381	69,406	69,429	69,484	(13,897)	[3,335]	{1,668}	69,537	(13,907)	[3,338]	{1,669}	69,588	(13,918)	[3,340]	{1,670}
Lafayette Parish	38,695	38,709	38,723	38,746	38,808	(7,762)	[1,863]	{931}	38,873	(7,775)	[1,866]	{933}	38,937	(7,787)	[1,869]	{934}
Lafourche Parish	17,827	17,832	17,838	17,843	17,858	(3,572)	[857]	{429}	17,873	(3,575)	[858]	{429}	17,886	(3,577)	[859]	{429}
Orleans Parish	46,636	46,657	46,679	46,707	46,758	(9,352)	[2,244]	{1,122}	46,806	(9,361)	[2,247]	{1,123}	46,854	(9,371)	[2,249]	{1,124}
Ouachita Parish	31,411	31,420	31,430	31,446	31,481	(6,296)	[1,511]	{756}	31,513	(6,303)	[1,513]	{756}	31,542	(6,308)	[1,514]	{757}
Rapides Parish	21,152	21,163	21,175	21,190	21,219	(4,244)	[1,018]	{509}	21,248	(4,250)	[1,020]	{510}	21,276	(4,255)	[1,021]	{511}
St. Bernard Parish	6,877	6,881	6,885	6,888	6,895	(1,379)	[331]	{165}	6,900	(1,380)	[331]	{166}	6,907	(1,381)	[332]	{166}
St. Charles Parish	8,852	8,856	8,860	8,865	8,873	(1,775)	[426]	{213}	8,882	(1,776)	[426]	{213}	8,890	(1,778)	[427]	{213}
St. James Parish	3,489	3,492	3,494	3,499	3,510	(702)	[168]	{84}	3,522	(704)	[169]	{85}	3,534	(707)	[170]	{85}
St. John the Baptist Parish	6,290	6,291	6,293	6,296	6,301	(1,260)	[302]	{151}	6,305	(1,261)	[303]	{151}	6,310	(1,262)	[303]	{151}
St. Tammany Parish	43,428	43,445	43,462	43,485	43,527	(8,705)	[2,089]	{1,045}	43,566	(8,713)	[2,091]	{1,046}	43,606	(8,721)	[2,093]	{1,047}

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.