

**IEM's AI Modeling: Short-term COVID-19 Projections****Date: 8/27/21**

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 8/27/21 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.**

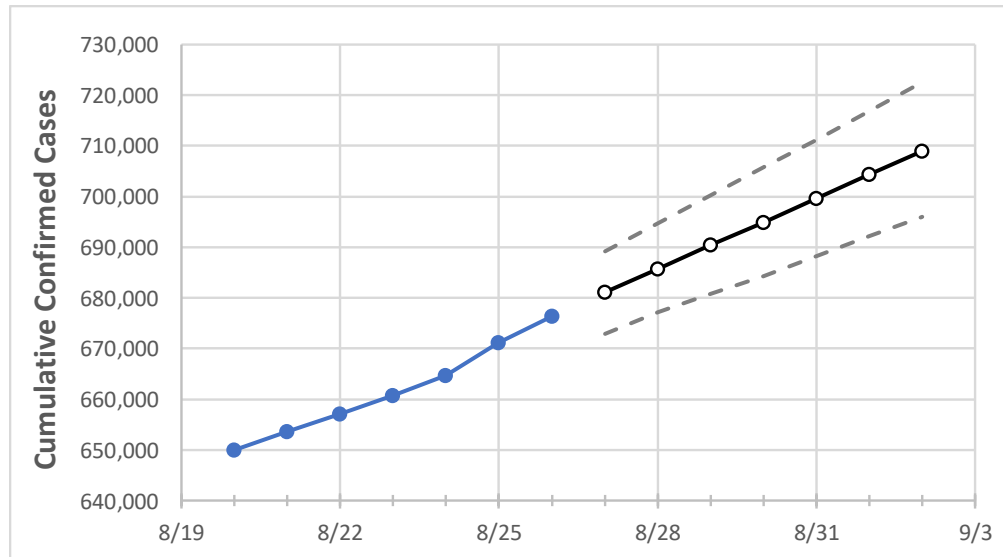
**IEM's Modeling Lead**

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:					
	8/23	8/24	8/25	8/26	8/27	8/28	8/29	8/30	8/31	9/1	9/2
Louisiana	660,804	664,618	671,237	676,368	681,074	685,779	690,412	694,910	699,674	704,329	708,877

**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:					
	8/23	8/24	8/25	8/26	8/27	8/28	8/29	8/30	8/31	9/1	9/2
Ascension Parish	19,432	19,507	19,762	19,856	19,989	20,108	20,232	20,356	20,476	20,611	20,717
Bossier Parish	18,411	18,522	18,759	18,865	19,007	19,147	19,290	19,434	19,584	19,732	19,883
Caddo Parish	34,295	34,535	34,739	34,939	35,138	35,335	35,533	35,730	35,925	36,120	36,313
Calcasieu Parish	29,288	29,369	29,738	29,890	30,091	30,301	30,510	30,712	30,917	31,136	31,333
East Baton Rouge Parish	56,872	57,240	57,766	58,123	58,489	58,850	59,204	59,557	59,922	60,281	60,622
Jefferson Parish	63,783	64,111	64,561	64,996	65,365	65,744	66,107	66,472	66,831	67,196	67,540
Lafayette Parish	34,100	34,255	34,529	34,745	34,942	35,138	35,329	35,520	35,704	35,887	36,067
Lafourche Parish	15,869	15,923	16,137	16,330	16,456	16,572	16,684	16,798	16,917	17,035	17,138
Orleans Parish	42,383	42,579	42,857	43,140	43,379	43,610	43,840	44,069	44,298	44,522	44,741
Ouachita Parish	25,752	25,978	26,265	26,510	26,707	26,909	27,099	27,292	27,494	27,690	27,878
Rapides Parish	17,871	17,963	18,313	18,482	18,680	18,877	19,072	19,278	19,483	19,691	19,907
St. Bernard Parish	6,139	6,165	6,260	6,316	6,378	6,443	6,507	6,572	6,638	6,705	6,774
St. Charles Parish	8,094	8,154	8,207	8,245	8,288	8,332	8,374	8,416	8,457	8,497	8,536
St. James Parish	2,935	2,965	2,993	3,027	3,052	3,076	3,100	3,124	3,150	3,175	3,201
St. John the Baptist Parish	5,619	5,669	5,723	5,780	5,828	5,877	5,926	5,975	6,024	6,074	6,124
St. Tammany Parish	38,626	38,863	39,229	39,541	39,832	40,125	40,416	40,698	40,982	41,270	41,552

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:											
	8/23	8/24	8/25	8/26	8/28				8/30				9/1			
Ascension Parish	19,432	19,507	19,762	19,856	20,108	(4,022)	[965]	{483}	20,356	(4,071)	[977]	{489}	20,611	(4,122)	[989]	{495}
Bossier Parish	18,411	18,522	18,759	18,865	19,147	(3,829)	[919]	{460}	19,434	(3,887)	[933]	{466}	19,732	(3,946)	[947]	{474}
Caddo Parish	34,295	34,535	34,739	34,939	35,335	(7,067)	[1,696]	{848}	35,730	(7,146)	[1,715]	{858}	36,120	(7,224)	[1,734]	{867}
Calcasieu Parish	29,288	29,369	29,738	29,890	30,301	(6,060)	[1,454]	{727}	30,712	(6,142)	[1,474]	{737}	31,136	(6,227)	[1,495]	{747}
East Baton Rouge Parish	56,872	57,240	57,766	58,123	58,850	(11,770)	[2,825]	{1,412}	59,557	(11,911)	[2,859]	{1,429}	60,281	(12,056)	[2,893]	{1,447}
Jefferson Parish	63,783	64,111	64,561	64,996	65,744	(13,149)	[3,156]	{1,578}	66,472	(13,294)	[3,191]	{1,595}	67,196	(13,439)	[3,225]	{1,613}
Lafayette Parish	34,100	34,255	34,529	34,745	35,138	(7,028)	[1,687]	{843}	35,520	(7,104)	[1,705]	{852}	35,887	(7,177)	[1,723]	{861}
Lafourche Parish	15,869	15,923	16,137	16,330	16,572	(3,314)	[795]	{398}	16,798	(3,360)	[806]	{403}	17,035	(3,407)	[818]	{409}
Orleans Parish	42,383	42,579	42,857	43,140	43,610	(8,722)	[2,093]	{1,047}	44,069	(8,814)	[2,115]	{1,058}	44,522	(8,904)	[2,137]	{1,069}
Ouachita Parish	25,752	25,978	26,265	26,510	26,909	(5,382)	[1,292]	{646}	27,292	(5,458)	[1,310]	{655}	27,690	(5,538)	[1,329]	{665}
Rapides Parish	17,871	17,963	18,313	18,482	18,877	(3,775)	[906]	{453}	19,278	(3,856)	[925]	{463}	19,691	(3,938)	[945]	{473}
St. Bernard Parish	6,139	6,165	6,260	6,316	6,443	(1,289)	[309]	{155}	6,572	(1,314)	[315]	{158}	6,705	(1,341)	[322]	{161}
St. Charles Parish	8,094	8,154	8,207	8,245	8,332	(1,666)	[400]	{200}	8,416	(1,683)	[404]	{202}	8,497	(1,699)	[408]	{204}
St. James Parish	2,935	2,965	2,993	3,027	3,076	(615)	[148]	{74}	3,124	(625)	[150]	{75}	3,175	(635)	[152]	{76}
St. John the Baptist Parish	5,619	5,669	5,723	5,780	5,877	(1,175)	[282]	{141}	5,975	(1,195)	[287]	{143}	6,074	(1,215)	[292]	{146}
St. Tammany Parish	38,626	38,863	39,229	39,541	40,125	(8,025)	[1,926]	{963}	40,698	(8,140)	[1,953]	{977}	41,270	(8,254)	[1,981]	{990}

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.