

**IEM's AI Modeling: Short-term COVID-19 Projections****Date: 11/3/21**

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 11/3/21 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.**

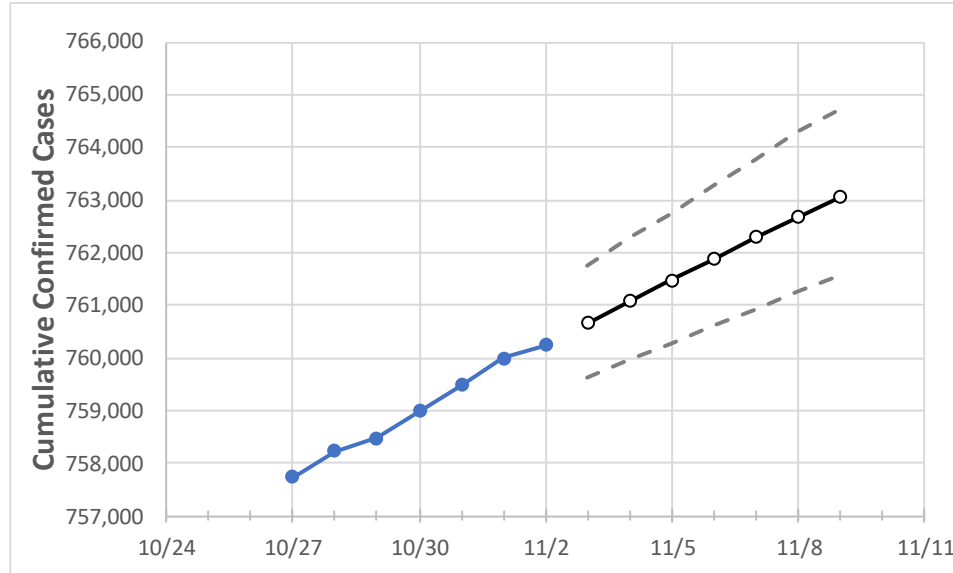
**IEM's Modeling Lead**

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:						
	10/30	10/31	11/1	11/2	11/3	11/4	11/5	11/6	11/7	11/8	11/9
Louisiana	758,981	759,490	760,000	760,246	760,655	761,067	761,483	761,883	762,283	762,674	763,054

**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:						
	10/30	10/31	11/1	11/2	11/3	11/4	11/5	11/6	11/7	11/8	11/9
Ascension Parish	21,784	21,790	21,795	21,798	21,805	21,812	21,819	21,825	21,831	21,838	21,844
Bossier Parish	21,723	21,732	21,741	21,754	21,764	21,774	21,784	21,793	21,803	21,812	21,822
Caddo Parish	39,447	39,465	39,484	39,497	39,516	39,534	39,552	39,570	39,587	39,605	39,621
Calcasieu Parish	34,476	34,485	34,494	34,507	34,525	34,541	34,558	34,574	34,589	34,606	34,622
East Baton Rouge Parish	63,857	63,873	63,888	63,905	63,928	63,951	63,974	63,995	64,018	64,039	64,059
Jefferson Parish	69,537	69,557	69,576	69,593	69,614	69,636	69,657	69,678	69,698	69,718	69,737
Lafayette Parish	38,949	39,014	39,080	39,089	39,132	39,173	39,213	39,255	39,297	39,342	39,379
Lafourche Parish	17,900	17,914	17,927	17,935	17,945	17,954	17,963	17,974	17,983	17,993	18,002
Orleans Parish	46,817	46,839	46,860	46,867	46,889	46,911	46,932	46,953	46,973	46,993	47,014
Ouachita Parish	31,516	31,525	31,533	31,552	31,565	31,577	31,589	31,600	31,612	31,623	31,633
Rapides Parish	21,231	21,241	21,250	21,258	21,270	21,282	21,293	21,303	21,314	21,326	21,336
St. Bernard Parish	6,897	6,900	6,902	6,903	6,905	6,908	6,910	6,912	6,914	6,916	6,918
St. Charles Parish	8,877	8,883	8,888	8,890	8,894	8,897	8,901	8,904	8,907	8,910	8,914
St. James Parish	3,516	3,520	3,524	3,527	3,532	3,538	3,543	3,548	3,554	3,559	3,565
St. John the Baptist Parish	6,308	6,311	6,313	6,314	6,316	6,318	6,320	6,322	6,324	6,326	6,328
St. Tammany Parish	43,593	43,617	43,642	43,661	43,683	43,703	43,724	43,745	43,765	43,786	43,805

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:											
	10/30	10/31	11/1	11/2	11/4				11/6				11/8			
Ascension Parish	21,784	21,790	21,795	21,798	21,812	(4,362)	[1,047]	{523}	21,825	(4,365)	[1,048]	{524}	21,838	(4,368)	[1,048]	{524}
Bossier Parish	21,723	21,732	21,741	21,754	21,774	(4,355)	[1,045]	{523}	21,793	(4,359)	[1,046]	{523}	21,812	(4,362)	[1,047]	{523}
Caddo Parish	39,447	39,465	39,484	39,497	39,534	(7,907)	[1,898]	{949}	39,570	(7,914)	[1,899]	{950}	39,605	(7,921)	[1,901]	{951}
Calcasieu Parish	34,476	34,485	34,494	34,507	34,541	(6,908)	[1,658]	{829}	34,574	(6,915)	[1,660]	{830}	34,606	(6,921)	[1,661]	{831}
East Baton Rouge Parish	63,857	63,873	63,888	63,905	63,951	(12,790)	[3,070]	{1,535}	63,995	(12,799)	[3,072]	{1,536}	64,039	(12,808)	[3,074]	{1,537}
Jefferson Parish	69,537	69,557	69,576	69,593	69,636	(13,927)	[3,343]	{1,671}	69,678	(13,936)	[3,345]	{1,672}	69,718	(13,944)	[3,346]	{1,673}
Lafayette Parish	38,949	39,014	39,080	39,089	39,173	(7,835)	[1,880]	{940}	39,255	(7,851)	[1,884]	{942}	39,342	(7,868)	[1,888]	{944}
Lafourche Parish	17,900	17,914	17,927	17,935	17,954	(3,591)	[862]	{431}	17,974	(3,595)	[863]	{431}	17,993	(3,599)	[864]	{432}
Orleans Parish	46,817	46,839	46,860	46,867	46,911	(9,382)	[2,252]	{1,126}	46,953	(9,391)	[2,254]	{1,127}	46,993	(9,399)	[2,256]	{1,128}
Ouachita Parish	31,516	31,525	31,533	31,552	31,577	(6,315)	[1,516]	{758}	31,600	(6,320)	[1,517]	{758}	31,623	(6,325)	[1,518]	{759}
Rapides Parish	21,231	21,241	21,250	21,258	21,282	(4,256)	[1,022]	{511}	21,303	(4,261)	[1,023]	{511}	21,326	(4,265)	[1,024]	{512}
St. Bernard Parish	6,897	6,900	6,902	6,903	6,908	(1,382)	[332]	{166}	6,912	(1,382)	[332]	{166}	6,916	(1,383)	[332]	{166}
St. Charles Parish	8,877	8,883	8,888	8,890	8,897	(1,779)	[427]	{214}	8,904	(1,781)	[427]	{214}	8,910	(1,782)	[428]	{214}
St. James Parish	3,516	3,520	3,524	3,527	3,538	(708)	[170]	{85}	3,548	(710)	[170]	{85}	3,559	(712)	[171]	{85}
St. John the Baptist Parish	6,308	6,311	6,313	6,314	6,318	(1,264)	[303]	{152}	6,322	(1,264)	[303]	{152}	6,326	(1,265)	[304]	{152}
St. Tammany Parish	43,593	43,617	43,642	43,661	43,703	(8,741)	[2,098]	{1,049}	43,745	(8,749)	[2,100]	{1,050}	43,786	(8,757)	[2,102]	{1,051}

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.