IEM's AI Modeling: Short-term COVID-19 Projections
Date: 11/15/21

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 11/15/21 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.

Washington State Projections
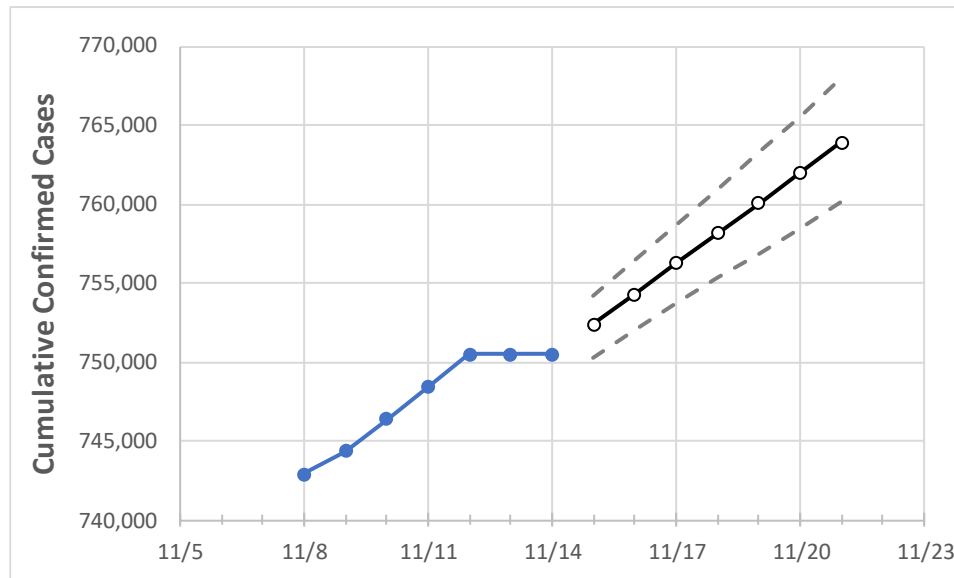
	Actual Confirmed Cases On:				Projected Cases For:						
	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21
Washington	748,416	750,477	750,477	750,477	752,381	754,281	756,224	758,119	760,048	762,006	763,924

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.

Washington Counties

	Actual Confirmed Cases On:				Projected Cases For:						
	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21
Benton	31,761	31,792	31,792	31,792	31,824	31,857	31,889	31,920	31,952	31,983	32,012
Clark	43,341	43,455	43,455	43,455	43,564	43,674	43,780	43,889	43,997	44,106	44,208
Grant	16,588	16,629	16,629	16,629	16,664	16,698	16,732	16,767	16,800	16,835	16,869
Island	4,181	4,196	4,196	4,196	4,211	4,226	4,241	4,256	4,272	4,288	4,303
King	168,387	168,735	168,735	168,735	169,055	169,368	169,686	170,000	170,309	170,627	170,943
Kitsap	17,465	17,522	17,522	17,522	17,566	17,608	17,652	17,694	17,739	17,780	17,823
Pierce	95,641	95,924	95,924	95,924	96,197	96,481	96,766	97,052	97,343	97,633	97,932
Skagit	12,103	12,170	12,170	12,170	12,239	12,309	12,379	12,448	12,521	12,591	12,663
Snohomish	68,248	68,503	68,503	68,503	68,725	68,940	69,157	69,383	69,609	69,838	70,057
Spokane	74,880	75,125	75,125	75,125	75,338	75,550	75,765	75,983	76,199	76,423	76,646
Thurston	21,668	21,761	21,761	21,761	21,833	21,907	21,977	22,052	22,124	22,197	22,270
Whatcom	17,313	17,384	17,384	17,384	17,451	17,519	17,585	17,653	17,721	17,788	17,857
Yakima	44,382	44,457	44,457	44,457	44,525	44,591	44,657	44,725	44,788	44,856	44,919