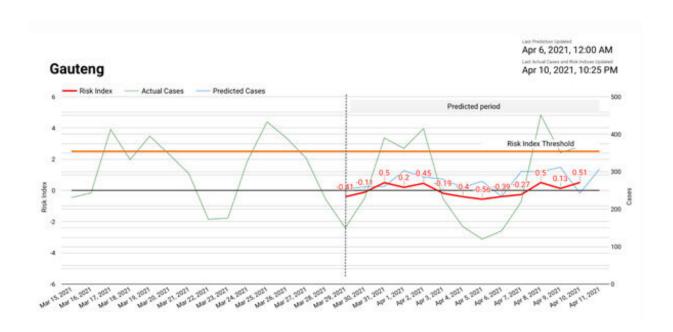# AI-powered algorithm released to detect the third wave in South Africa

April 12 2021

Credit: Wits University

An artificial intelligence (AI)-based algorithm that has been designed by the University of the Witwatersrand (Wits University) in partnership with iThemba LABS, the Provincial Government of Gauteng and York University in Canada, shows that there is a low risk of a third infection wave of the COVID pandemic in all provinces of South Africa.

The AI-powered early detection system functions by predicting future

daily confirmed cases, based on historical data from South Africa's past infection history, that includes features such as mobility indices, stringency indices and epidemiological parameters.

"These parameters are consistent with clinical public health measures that can contain, control and mitigate against the COVID-19 pandemic," says Dr. James Orbinski, Director of the York University Dahdaleh Institute for Global Health Research.

The AI-based algorithm works in parallel, and supports the data of an already existing algorithm that is based on more classical analytics. Both of these algorithms work independently and are updated on a daily basis. The existence of two independent algorithms adds robustness to the predictive capacity of the algorithms. The data of the AI-based analysis is published on a website that is updated on a daily basis.

"The current data shows us the risk for a third infection wave of COVID-19 is small across most of provinces in South Africa, but we still remain highly vulnerable," says Professor Bruce Mellado, Director of the Institute for Collider Particle Physics at Wits University.

It is crucial that South Africans continue to adhere to the South African government's COVID regulations and take all necessary precautions to prevent the spread of the pandemic.

The advent of infection waves is driven by circumstances that are difficult to predict and therefore to control. In this complex environment, early detection algorithms can provide an early warning to policy makers and the population. Early detection algorithms are able to issue an alert when the data displays a significant change that is consistent with the advent of a new wave.

While algorithm-based predictions can never be 100% accurate, Mellado

is confident that the model presents a very good prediction over at least a two-week period. While predictions can be made over longer-term periods, these predictions become less accurate.

The model is trained on the interim period in between waves one and two in all of the South African provinces. The algorithm was tested with data taken during the period of past peaks to evaluate its performance.

"AI technology provides us with invaluable potential to develop early detection and alert systems that are highly needed for rapid and dynamic decision making under risk and uncertainty under the current pandemic," says Ali Asgary, Professor of Disaster & Emergency Management and Associate director of York University's Advanced Disaster, Emergency, and Rapid-response Simulation (www.adersim.info.yorku.ca)

AI is very effective in navigating through complex problems with a large number of parameters and dimensions, while at the same time learning from the data. Data hides within itself a wealth of information that AI can extract efficiently.

"Our team's development of an early detection algorithm for the third wave speaks to the power of AI to generate data-based solutions to highly complex problems," says Professor Mellado, Director of the Institute for Collider Particle Physics.

Provided by Wits University

Citation: AI-powered algorithm released to detect the third wave in South Africa (2021, April 12) retrieved 25 April 2024 from https://medicalxpress.com/news/2021-04-ai-powered-algorithm-south-africa.html