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MEDIA RELEASE

“SA’s COVID-19 infections could exceed 570 000” – UP researchers

PRETORIA – University of Pretoria researchers, Dr Laurentz Olivier and Professor Ian Craig of the Department of Electrical, Electronic and Computer Engineering have estimated that the cumulative number of confirmed COVID-19 cases in South Africa will be around 570 000. However, it could go as high as 2.5 million if disease control measures are not effective.

“This is the long-term prediction of the total number of cases throughout the pandemic,” they explain. Their predictions are based on an epidemiological model that they developed for South Africa. Currently, the country has reported more than 90 000 confirmed COVID-19 cases with over 50 000 recoveries and in excess of 1 800 deaths, making the number of actively infected cases around 32 000. Their model predicts a peak of 70 000 active cases by late October 2020, with an upper limit of 300 000.

From their model, the total number of deaths is predicted to range from about 10 000 to 90 000 when the rate of transmission is varied by plus/minus 10%. “The move to lockdown level 4 and 3 since the model predictions were done will likely impact on the disease spread, such that the peak in the confirmed infectious individuals might occur earlier than the model predicts,” they explain.

All of these predictions are heavily dependent on the disease control measures in place, the adherence of the population to these measures, and the rate at which positive cases can be identified and isolated, according to Dr Olivier and Prof Craig.

“This implies that the number of cases may in future increase or decrease dramatically depending on the regulations in place, and the adherence of the population to those regulations,” they say.

As South Africa is still in the early phases of the global COVID-19 pandemic with the confirmed infectious cases not having peaked, the model was first frame-worked on data for Germany, Italy, and South Korea – countries for which the number of infectious cases are well past their peaks.

The progression of the number of cases as well as the fraction of the population that is projected to be infected in total is quite different across these countries. The model is, however, able to fit all the data quite well, even though it only uses the number of confirmed infectious cases, recovered cases, and deceased cases for the respective country as a whole, Prof Craig said.

“When using only initial data for Germany (11 March to 28 March), the projection was that by mid-May the number of confirmed cases would be in excess of one million, with the peak in confirmed cases only occurring by the end of June 2020. In reality, the confirmed cases in Germany appear to flatten out below 20 000 with the peak having occurred in April 2020. This illustrates that it is very difficult to accurately predict the transmission rate during the initial phase of the pandemic,” Prof Craig said.

A similar scenario is observed in South African where initial data for the period from 23 March to 8 May 2020 was used to obtain the model parameters. It is found that the model fits the initial disease progression well, but that the long-term predictive capability of the model is rather poor.

The model for South Africa was subsequently recalculated with a realistically constrained transmission rate parameter. The resulting model still fits the data well, and long-term predictions appeared much more reasonable, according to Prof Craig and Dr Olivier.

Data collection, collation and curation for COVID-19 in South Africa

The University of Pretoria's Dr Vukosi Marivate, ABSA Chair of Data Science, from the [Data Science for Social Impact](#) group, is leading collaborators and volunteers who have developed the largest open-source repository for COVID-19 data in South Africa.

The project has more than 50 members who are sharing the latest and historical data on cases, testing, recoveries, health system capability and more.

The data shows district and subdistrict level for most provinces in the country and is used by local and international researchers to model the pandemic. This is indicated by the increasing citations of the repository. Other innovators have built dashboards, maps and testing tools using this open-source data.

The working group has developed a dashboard using the data to inform the public and to show innovators and scientists the possibilities of using it. An example is a Xitsonga language version of the dashboard.

The research group is working on research using the data in the repository/data bank as well as on understanding the engagement of the government and the public about the COVID-19 response. This is done through modelling traditional media and social media reporting, using natural language processing and machine learning methodologies, which is a strength of the research group.

Information on the Coronavirus COVID-19 (2019-nCoV) Data Repository and Dashboard for South Africa

The data repository is available at <https://github.com/dsfsi/covid19za>

The dashboard is available at <https://dsfsi.github.io/covid19za-dash/>

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on the Hatfield Campus, Pretoria. This 112-year-old institution is also the largest producer of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country that has a Faculty of Veterinary Science which is ranked top in Africa, and overall has 120 academic departments, as well as 92 centres and institutes, accommodating more than 55 000 students and offering about 1 100 study programmes.

UP is one of the top five universities in South Africa, according to the 2019-2020 rankings by the Center for World University Rankings. It is also ranked among the top 100 universities worldwide in three fields of study

(veterinary science, theology and law), and among the top 1% in eight fields of study (agricultural sciences, clinical medicine, engineering, environment/ecology, immunology, microbiology, plant and animal sciences and social sciences).

In May 2020, the annual UK Financial Times Executive Education Rankings once again ranked GIBS as the top South African and African business school. The University also has an extensive community engagement programme with approximately 33 000 students involved in community upliftment. Furthermore, UP is building considerable capacities and strengths for the Fourth Industrial Revolution by preparing students for the world beyond university and offering work-readiness and entrepreneurship training to its students.

As one of South Africa's research-intensive universities, UP launched the *Future Africa Campus* in March 2019 as a hub for inter- and transdisciplinary research networks within UP and the global research community to maximise 4IR innovation and address the challenges and stresses our continent and world is facing. In addition, UP also launched the Javett Art Centre in September 2019 as a driver of transdisciplinary research development between the Humanities and other faculties. In 2020 UP will launch Engineering 4.0. as a hub not only for Smart Cities and Transport, but also to link the vast resources in technology and data sciences to other faculties via Future Africa. These initiatives are stimulating new thinking at the frontier of 'science for transformation'.

For more information, go to www.up.ac.za