



**OFFICE OF THE DEPUTY-VICE CHANCELLOR
RESEARCH, POSTGRADUATE STUDIES AND INNOVATION**

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SMU RESEARCH & INNOVATION RESPONSE TO COVID-19

INTRODUCTION

Sefako Makgatho Health Sciences University (SMU) is a university which focus in providing high quality health sciences education in form of not only teaching and learning but including research and innovation. As an academic institution, SMU has various specialists who are involved in various areas of their research expertise both within and outside the university to mitigate amongst others the spread of corona virus and impact of CVoid-19. SMU is therefore committed to support government to overcome the COVID-19 pandemic. Despite this major challenge facing us as a nation, it is pleasing to report the activities of SMU in the area of research and innovation for combating Covid-19.

Advisory Role to Ministerial Task Team Committees

Post-Secondary Educational and Training Sector (PSET) Task Team on Covid-19

SMU is involved in helping the government to curb the spread of coronavirus through its involvement in the Ministerial PSET Task Team on Covid-19. The research activities of SMU in this role are done through the Vice-Chancellor's office. SMU Acting Vice Chancellor, Prof O Ayo-Yusuf serves on the Ministerial PSET Covid-19 Task Team. The PSET Task Team on Covid-19 guides the response of the PSET sector to the development of the pandemic and its implications for the sector and its role in society.

Development of a Mobile App SMU Covid-19 screening tool for student and staff

Public Health Ministerial Advisory Committee on Covid-19

SMU plays a very important role on the research related activities affecting public health and as a result is contributing to Covid-19 by advising the government through Public Health Ministerial Committee. Prof Mathilda Mokgatle from School of Health Care Sciences serves on the Public Health Ministerial Committee team was appointed by the Minister of Health to advise and provide guidance, for decision-making on the response to Covid-19 epidemic. The main purpose of this Committee is to provide high-level strategic advice to the Minister of Health and support the NDoH in the public health-related response to the COVID-19 outbreak in South Africa. The Public Health Ministerial Advisory Committee works together with the three other Ministerial Advisory Committees on COVID-19: Pathologists and Laboratory; Public Health; and Research. In this role, SMU responsibility in the team is to integrate research as evidence to respond to Public Health and Community responses for the epidemic, synthesis of rapid reviews conducted the research team and contributing towards development of prevention and control guidelines, health messages and guidelines.

Development of an Audit Tool for Covid-19 Readiness

Gauteng Department of Health (GDOH) invited team of experts from universities and civic organisations to develop the audit readiness tool in combating Covid-19. SMU researchers together with those from TUT and Wits, and experts representing GDOH, UNICEF, and WHO developed such tool which assessed the availability of the infrastructure and resources needed to respond to the health care needs with the growing epidemic in Gauteng Province. Based on the tool, a report was presented on the available hospital beds including ICU, ventilators, emergency management services (EMS), community health workers (CHWs), personal protective equipment (PPEs), and the financial report on budget needs to expand services in response to Covid-19.

WHO International Clinical Trial – the South African Solidarity Research

South Africa is one of the 10 countries involved in an international clinical trial launched by the World Health Organisation with the aim of finding the right medication against coronavirus which causes Covid-19 disease. The clinical trial called Solidarity Research will compare the safety and effectiveness of four different drugs or drug combinations against Covid-19. The South African Solidarity research team is led by senior academics and clinicians from eight medical schools of which SMU is one of them. The SMU researchers involved in the clinical trial are led by Prof Maphoshane Nchabeleng with fellow investigators Dr Temitayo Famoroti, and Dr Chowdhury.

Validation Tests for Corona virus (SARS COV-2 virus)

SMU is privileged to be one of the institutions in the country that has been requested by the Department of Health to conduct tests for corona virus (SARS Cov-2 virus). SARS Cov-2 virus is a virus that causes Covid-19 disease. The Head of Department of Virology at SMU, Prof Gloria Selabe together with her colleague Dr Temitayo Famoroti have led the validation tests for the virus. The virology department has already completed its validation tests for the SARS COV 2 virus. They will be starting with testing and samples can now be sent to the Virology NHLS lab housed within SMU. These two researchers from SMU are also participating in the task team of Dr George Mukhari Hospital on the COVID-19 response.

Development of Guidelines for Health Care Practitioners – Covid-19

Guidelines for Oral Health Care Practitioners in South Africa in Response to Covid-19

Researchers at SMU led by Prof Pagollang Motloba and his colleagues Prof Neil Wood, Dr Sandra Koutras, and Dr Shogan Govender from the School of Oral Health Sciences have developed guidelines for South African dental practitioners in response to Covid-19. The guidelines have been published recently in the *South African Dental Journal (SADJ)*. The published paper provides consolidated evidence and best practice on how to prevent and minimize the spread of corona virus infection within the dental setting through the use of a flowchart. The development of such guidelines is important taking into account the role of the dental profession in the management of COVID-19 as oral healthcare practitioners carry the greatest risk of COVID-19 acquisition due to face-to-face communication with patients, as well as frequent exposure to body fluids such as saliva and blood together with fomites (such as dental instruments).

Guidelines for Pharmacists in South Africa in Response to Covid-19

Researchers at SMU led by Prof Natalie Schellack and her colleagues, Dr Marnus Milne, and Dr Elmien Bronkhorst from School of Pharmacy together with research collaborators from Dr George Mukhari Academic Hospital, University of Witwatersrand, University of KwaZulu-Natal, Nelson Mandela Children Hospital, Netcare, MediClinic, Life HealthCare, and pharmaceutical country have developed guidelines for Pharmacists in South Africa in response to Covid-19. These guidelines have been accepted for publication in the *South African Journal of Infectious Diseases*. Since the outbreak of COVID-19, and its declaration as a pandemic by the World Health Organization (WHO), the reliance on pharmacists as one of the first points of contact within the healthcare system has been highlighted. This evidence-based review paper is aimed at providing guidance for pharmacists, in community, hospital and other settings in South Africa, on the management of patients with suspected or confirmed coronavirus disease 2019, or COVID-19. The situation is rapidly evolving, and new evidence continues to emerge on a daily basis. The guidelines document takes into account and includes newly available evidence and recommendations, particularly around the specs relating to COVID-19 such as epidemiology; the virus, its modes of transmission and incubation period; symptom

identification; social media myths and misinformation; treatment guidelines and medicines that may need to be kept in stock; treatment and prevention options, including an update on vaccine development; the case for and against the use of NSAIDs, ACE-inhibitors and angiotensin receptor blockers (ARBs) in patients with COVID-19; and interventions and patient counselling by the pharmacist.

Hand Sanitizers Project

There is a concern currently in South Africa about the shortages of hand sanitizers. The researchers at SMU through a collaborative project between the School of Pharmacy (Prof Natalie Schellack, Prof Hannelie Meyer and Mr Madan Poka) and the School of Science and Technology (Prof Lawrence Obi, Dr Bethumile Maseko, and Dr Benson Iweriebor) are currently in the process of developing hand sanitizers in order to stop the spread of the covid-19 using alcohol based hand sanitiser within the university community. The aims are to develop an alcohol based hand sanitiser for the University community (staff and students), and then to distribute the alcohol based hand sanitiser to different schools of SMU and educate the community on how to use the sanitiser.

Other Research and Innovation Projects

Researchers at SMU based in the School of Science and Technology in collaborations with colleagues from the School of Medicine, and also those from Walter Sisulu University (WSU), and University of Venda (Univen) are currently busy developing protocols for the following projects in response to Covid-19 response.

Anti-infective Activity of Selected Medicinal Plants Against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Bacterial Respiratory Pathogens

Currently, there is no cure for coronavirus, and management is predicated on "supportive care," or symptomatic management Centres for Disease Control and Prevention (CDC, 2020). Screening of these plants for anti SARS CoV-19 activities, including their mode of action, isolation and structural elucidation of active compounds or their phytochemicals could hold promise as candidates for eventual drug designs and development. Pathogens

associated with respiratory infections will also be included in the study for possible cases of superinfection or co-infection.

Genomic characterization of the COVID-19 novel human-pathogenic coronavirus isolated from patients in different sites of Limpopo, Gauteng and Eastern Cape Provinces, South Africa

The aim of this study is to genetically characterize novel Coronavirus strains obtained from COVID-19 patients from different sites in Limpopo, Gauteng and Eastern Cape Provinces, South Africa and compare them with those obtained from different regions of the globe for epidemiological purposes. In the present study, we will analyse 2019-nCoV complete genomes from patients in familial clusters and compare them with the genomes of related β CoVs to provide insights into the potential source and control strategies.

Epidemiological model to counter the spread of COVID-19 in Gauteng and Limpopo Provinces

The SIR model is a widely used tool to model the spread of infectious diseases such as influenza, HIV, smallpox, SARS, measles and the likes. Its mere importance is to propose an intervention to minimize damages, control spread and design a meaningful policy in the future. Like influenza and smallpox, COVID-19 is a highly infectious viral disease which has no cure or vaccine. In this work we will study the pattern of infection (spread) of the disease in Gauteng and Limpopo provinces through mathematical models to identify an effective intervention technique to control the spread. Numerical simulations and statistical analysis will be done to determine the optimal intervention using available data, if any, or simulated data otherwise.

The impact of Covid-19 pandemic on core university mandates in three under-resourced universities in South Africa

In South Africa, virtual and blended learning are being considered for practical or pragmatic solutions to the completion of the academic year in the midst of the COVID-19 pandemic and other unforeseen disruptions. However not all universities are adequately endowed with online teaching and learning, research and community engagement platforms. Under-resourced universities such as SMU, WSU and Univen may experience

challenges. The challenges stem from the fact that majority of the students in the designated universities are from previously disadvantaged areas, with poor access to online platforms and limited financial resources. Therefore, the need to embark on a comprehensive study to determine the impact of Covid 19 on the core mandates of a University (teaching and learning, community engagement and research) in under-resourced universities is of utmost urgency and importance.

Educational and awareness campaigns on coronavirus and COVID 19 in selected rural communities in Gauteng, North West and Limpopo Provinces

It is important too to educate the communities about the virus itself and how it manifests in the human body. People need to understand the symptoms of coronavirus and what they should do if one exhibits signs and symptoms related to COVID 19. During the educational campaign, it will be of importance to inform them of where to seek medical attention should they suspect that they might have contracted the virus. This project aims to disseminate information about COVID 19 in selected areas around Gauteng, Limpopo and the North West provinces, raise awareness and educate rural communities from the selected areas about good hygiene, social distancing and eventualities of COVID 19 related deaths, and educate communities about the impact of the spread of COVID 19 if it is not controlled.

SMU Position Statement on Research Involving Human Participants (Clinical Research) during Covid-19

SMU has a responsibility to ensure that a responsible approach to all research involving human subjects is required in the country, especially in the context where clinical care is being provided to South African study participants, in the context of COVID-19. Therefore, SMU reiterates its strong support for the responsible conduct of research during the COVID-19 pandemic in South Africa.

We are anticipating community spread of SARS-CoV2 (the virus responsible for COVID-19 disease) in South Africa. Therefore, all research activities where people are brought together for research purposes, where research participants and research staff are placed at risk by virtue of the nature of data collection, or where specimen collection poses

transmission risk, should be urgently reviewed to determine the risk for SARS-CoV2 transmission. Our duty as SMU is to ensure the protection of all research participants and staff, as well as reduce the risk of transmission. In line with current government recommendations to practice social distancing, we must minimise the risk of transmission at research sites and in all Research Ethics Committee approved studies involving human participants. Therefore, specifically in the context of Covid-19 pandemic, SMUREC has developed guidelines with recommendations for all studies that will include human subjects. Such guidelines have been shared with research community and other relevant stakeholders associated with SMU

Yours faithfully



Prof PH Demana

Acting Deputy Vice-Chancellor

Research, Postgraduate Studies & Innovation