

Initiatives and research projects being undertaken at UKZN

regarding COVID-19; A brief description

1. UKZN established a COVID-19 War Room at the onset of the pandemic. The War Room is housed in the College of Health Sciences and is led by the DVC of the College, Professor Busi Ncama and Professor Mosa Moshabela, Dean and Head of the School of Nursing and Public Health. The War Room provides advice to UKZN and the KZN Department of Health on all aspects of COVID-19.
2. In the School of Health Sciences, the following research projects are being undertaken:

Principal Investigator/s	Discipline	Project Description
Dr Frasia Oosthuizen/ Dr Varsha Bangalee	Pharmaceutical Sciences	Focus on drug safety and policy have prepared an article on the spread of coronavirus and the implications for pharmacovigilance. Are also currently working on a systematic review around the use (misconceptions) of chloroquine for COVID-19.
Prof Panjasram Naidoo	Pharmaceutical Sciences	The knowledge and perceptions of 3 rd and 4 th year Health Science students towards COVID -19.
Professor Pragashnie Naidoo	Occupational Therapy	This entails a phenomenological analysis of the Lived Experiences of Individuals diagnosed with COVID-19.
Professor Percy Mashige	Optometry	Working with a team of eye care professionals made up of ophthalmologists, optometrists, ophthalmic nurses and opticians from Ghana and South Africa to investigate the infection control

		and management measures across eye care facilities in response to the COVID-19 pandemic.
Dr Peter Owira	Pharmaceutical Sciences	<p>Repurposing the old and almost discarded chloroquine for the COVID-19 pandemic: is there hope? (an interrogative opinion piece)</p> <p>Evaluating the of repurposing chloroquine, hydroxychloroquine, lopinavir boosted with ritonavir (Alluvia®) and ivermectin which are currently approved for other therapeutic purposes as potential agents against this virus. These drugs have been used in clinical trials in other countries but the results are inconclusive.</p>
Prof Mahmoud Soliman	Pharmaceutical Sciences	Understanding The Binding of Remdesivir With SARS-CoV-2 RNA-Dependent Polymerase May Pave The Road Towards Potential Drugs for COVID-19 Treatment – A perspective From Molecular Design
Prof Mahmoud Soliman	Pharmaceutical Sciences	Exploring the Atomistic and Structural Activity of Ritonavir and TMC-310911 on COVID-19 and SARS-CoV Proteases
Prof Mahmoud Soliman	Pharmaceutical Sciences	Integrative immunoinformatics paradigm for predicting potential B-cell and T-cell epitopes as viable candidates for subunit vaccine design against COVID-19 virulence

3. In the School of Clinical and Professional Practice, the following is being undertaken:

Professor Nyamande is involved in 4 projects:

- Public Health emergency Solidarity Trial funded by the WHO
- Consequences of HIV and TB Co-infection on Covid-19 Disease dynamics, Severity and Immune responses under AHRI (Africa Health Research Institute)
- Sentinel, hospital based surveillance for investigation of SARS -Coronavirus-2 and other respiratory pathogens. This is being run by the MRC and the Co-chairs are Prof Shabir Madhi and Prof Marta Nunes.
- Hydroxychloroquine for mild to moderate Covid-19 disease: a randomised control trial. Prof Keertan Dheda from UCT is the PI and the research is funded by the MRC.

4. One of our Centres in Health Sciences (KRISP) under the leadership of its Director, Professor Tulio de Oliveira is working on the following:

- There is a joint proposal (between KRISP and CAPRISA) which has been submitted to DSI. The proposal is titled “How is the SARS-COV-2 coronavirus spreading in urban and rural KwaZulu-Natal, South Africa?”. It is an epidemiological and phylogenetic investigation of COVID-19 transmission to guide locally-appropriate prevention.
- A number of other projects of a similar nature are being planned with AHRI (African Health Research Institute) to leverage of their current studies in Somkhele.
- Clinical training (Dr Richard Lessells has been working at the Coronavirus War room and with Prof. Yunus Moosa).
- Outbreak analysis (Dr Richard Lessells, Prof. de Oliveira and Prof. Yunus Moosa).
- Diagnostics qPCR
- Genotyping and Bioinformatics
- Data analysis (Prof. Petruccione and Prof. de Oliveira are co-leading the UKZN COVID-19 Big Data group)

5. The College of Law and Management Studies have the following projects that they are working on:

Researcher	Keyword(s)	Description
Chiweshe, Nigel (Mr) & Dr Ntabeni Jere	e-learning	Working on online learning responses to COVID-19 by the 26 public universities in South Africa.
De Haas, Mary (Ms)	Socio-economic rights	Monitoring COVID-related problems experienced by health workers as well as community members (e.g. lack of access to water).
Gerwel, Cecile (Prof)	Organisational behaviour	Interested in leadership and organisational behaviour.
Govender, Kaymarlin (Prof)	Health governance	Expertise in health systems, health governance, human behaviour. Currently

Researcher	Keyword(s)	Description
	Health systems Human behaviour	assisting multilateral agencies and networks in Africa to understand the implications of COVID-19 on human behaviour and health systems, including establishing priorities for research and interventions in the short and medium term. At a health governance level, interested in understanding how the global agenda for global health security can be resuscitated, especially in terms of our commitments to international norms of capabilities of health systems.
McQuoid-Mason, David (Prof)	Confidentiality	Researching the medical ethical and legal aspects of confidentiality during the Covid19 epidemic.
Mututa, Stephen (Prof)	Informal sector	Researching the impact of COVID 19 on the business informal sector in eThekweni and Msunduzi municipalities, and the social and economic contexts in combating COVID19 in KZN.
Naude, Micheline (Prof)	Supply chain	Researching supply chain management during the COVID-19 Pandemic.
Singh, Upasana (Ms)	e-learning	Researching e-learning during the COVID-19 pandemic
Van der Westhuizen, Thea (Ms)	Youth entrepreneurship	Youth entrepreneurship in a post-Covid-19 era
Whitear-Nel, Nicci (Ms)	Remote court hearings	Researching remote court hearings, using videoconferencing or similar electronic technology that obviates physical presence in the court room, in civil cases.
<i>Prof Thaldar's Research Group:</i>		
Botes, Marietjie (Dr)	Pandemic Preparedness Data sharing Biological weapons	Researching South Africa's pandemic preparedness. Data sharing under the present COVID-19 circumstances to help researchers follow best practices to maximize the efficiency of their work. Lesson learnt from the TB epidemic and consequences of not taking meds. Are health care workers obliged to show up for work during a pandemic? Viruses as hired guns: Can the current regulatory framework contain biological weapons?

Researcher	Keyword(s)	Description
Botes, Marietjie (Dr), with Prof Donrich Thaldar	Quarantine orders	Practical guidelines for obtaining quarantine orders for COVID-19-diagnosed persons in a post-lockdown context.
Kinderlerer, Julian (Prof)	Human rights	Contributed to the “Statement on European Solidarity and the Protection of Fundamental Rights in the COVID-19 Pandemic” by the European Group on Ethics in Science and new technologies.
Thaldar, Donrich (Prof), with his PhD students	Genome editing	The COVID-19 pandemic’s impact on the global discourse of heritable genome editing.
Townsend, Beverley (Dr), with Prof Maurice Mars of Health Sciences	e-health	Researching e-health and the HPCSA’s response to the COVID-19 Pandemic.

- There is a multidisciplinary project between the College of Humanities and the College of Agriculture, Engineering and Science entitled “A Sentiment Analysis of Community Perception and Potential Resistance to ‘Lockdown’ During the COVID Pandemic”. Brief overview of the project as follows:

Unlike previous epidemics such as COVID-SARS (2002), HIN1 (2009), we currently have at our disposal a greater arsenal of data driven tools and methodologies to probe the human and sociological impact of a pandemic, beyond the epidemiological. Thus, data driven sociological studies such as this one, that help to understand how mitigating measures by government are perceived and what levels of adherence or resistance by individuals and collectives will subscribe to, are critical for future planning for possible future disaster/pandemic scenarios.

Given above, the project aims to trawl through the large volumes of tweets over the period of five days leading up to and the actual lockdown period of 21 days to undertake a sentiment and trend analysis of the recurrent themes and issues that are densely/frequently present in the twitter feeds. The project will aim to analyse what proportion of the tweets ‘speak out’ against what is perceived/experienced as varying degrees of infringements on civil liberties on movement and other ‘taken for granted activities’, such as congregational observances of communal worship, large familial celebrations and rituals etc., that have been banned during this period.

The study will use deep learning techniques, such as Recurrent Neural Networks (RNN), to analyse and classify the sentiment of a dataset of mined tweets. These tweets will be curated based on a predefined set of characteristics, including, but not limited to: the geolocation of the tweet origin, the date posted, specific keywords and hashtags related to COVID-2 (corona virus, life under lockdown/pandemic (boredom, resistance, anger etc.) that

comprise the tweet. Since tweets can essentially be reduced a one-dimensional timeseries of data, with a single tweet linked to a point in time, we intend to utilize the conducted analysis to model and visualize the change in trends as the pandemic and conditions in South Africa develop(ed) over a particular time period/segment. These visualizations can in turn critically aid in finding correlations between public sentiment and the levels of freedom infringement that are imposed on individuals. Such a study has potentially valuable insights to contribute to future policy formulation in pandemic contexts.

7. The College of Humanities is working on the publication of a number of special issues of the journal *Alternation* which would address difference social and human aspects of the impact of COVID-19. These would include:

- The Impacts of the Coronavirus (COVID-19) Pandemic on Tourism and Sport
- Humanities Curriculum in the Time of COVID-19
- Issues of Decolonization and Africanization in Southern African Contexts
- The Church and the Coronavirus (COVID-19)
- Rurality, Education and the Coronavirus (COVID-19) Pandemic
- Public Policy Responses in the Time of Pandemic
- (Re)learning to Teach in the Context of the Covid-19 Lockdown and Shutdown
- Business, Management, IS&T and Governance

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