

<p>Durban University of Technology</p> <p>REFER TO APPENDIX 2</p>	<p>Analysis of Epidemiological Data to Inform Strategic Planning and Targeted Interventions – Artificial Intelligence based system and Info-epidemiological big data analytics capacity</p> <hr/> <p>Lessening the Social and Economic Impact of COVID-19 Project of Homelessness</p> <hr/> <p>3D Printing Technology. Set up for face masks, oxygen connectors, oxygen splitters and other parts that may be needed to safeguard human life. In addition to the 12 3D printers, the university has two industrial Resin printers that could be used to print moulds to support large scale manufacturing processes. DUT currently has a stock of raw materials to immediately commence printing to contribute to its quota to mitigating the effects of Covid-19 on society.</p> <hr/> <p>Use of Drones and Internet of Things to Support Data Collection, Monitoring and Evaluation. Already being used for environmental studies</p>	<p>Information Systems Together with the SAMRC and the District Health Information System</p> <hr/> <p>Urban Futures Centre with eThekweni Municipality</p> <hr/> <p>DUT 3D printing laboratory and Reinforced and Moulded Plastics Technology Station</p> <hr/> <p>Department of Information Technology</p>
<p>Nelson Mandela University</p> <p>REFER TO APPENDICES 3 and 3.1</p>	<p>MEGA-THEME 1: ENGINEERING AND DESIGN and MEGA-THEME 2: PUBLIC HEALTH AND SAFETY</p> <hr/> <p>Sanitiser Production; also researching Capric triglyceride as an antiviral barrier cream</p> <hr/> <p>Face Shields</p> <p>3-D printed masks with interchangeable filter. Produce a unit every 30 seconds</p> <p>The current work includes research on filtration materials, evacuation hoods, field bed design, reverse engineering of components for the Nuffield ventilator in</p>	<p>InnoVenton and Department of Pharmacy; Department of Chemistry</p> <hr/> <p>COVID-19 Engineering Team With Industry Together with CPUT, CUT, WSU</p>

	<p>conjunction with WSU, and other respiratory devices. Additionally, eNtsa assists in the coordination of rapid response to needs highlighted by role players and the Metro.</p> <hr/> <p>Other Personal Protective Equipment: masks, boots, aprons, gowns;</p> <p>Community project on production of cloth masks for community use.</p> <hr/> <p>Working with the field hospitals to increase the number of beds by 300 with 20% being for critical care</p> <p><i>Zanempilo</i> Mobile Clinic with staff and student volunteers. While there were no issues around the principle of the concept, there were concerns around personal insurance, indemnity, and PPE availability for volunteers. The ECDoh was informed that need/availability of PPE.</p> <hr/> <p><u>ICT solutions</u></p> <p>Customising and, where required, developing smart digital solutions to assist with the tracing, tracking and capturing of data of COVID-19 positive patients. Cloud-based digitized case identification and referral form are deployed at entry facilities. A unique patient identifier is created that can trace the patient through the system at all levels.</p> <p>Other solutions include mobile Apps that offer Artificial Intelligence-powered virtual health assistants and chatbots that are used to enhance the processes, offer self-service, and respond to frequently asked questions. Social (also known as physical) distancing is supported through the deployment of mobile Apps that allow healthcare workers to connect to patients via Video Observational Therapy (VOT) to enable initial screening. The data repository, created through the use of all the ICT solutions, allows for the construction of heat maps to show the highest concentration of infected or tested persons. This, in turn, will assist with patient management and screening planning.</p>	<hr/> <p>Faculties of Humanities, Engineering, Health Sciences and Science</p> <hr/> <p>Faculty of Health Sciences</p> <hr/> <p>The Centre for Community Technologies</p> <p>In partnership with the ICT industry, the ECDoh and the Nelson Mandela Bay Emergency Response team</p>
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	<p>In collaboration with North-West University, Optentia and a few other partners, the CCT-team also rolled out the Yabelana App, which provides a user-friendly experience to connect users with information about essential services.</p> <p>A mortuary information management system has been developed to track mortality rates</p> <hr/> <p>MEGA-THEME 2: PUBLIC UNDERSTANDING AND AWARENESS <i>(details in a separate Engagement and Research Report)</i></p> <hr/> <p>MEGA-THEME 4: CLINICAL AND MEDICAL ASSISTANCE</p> <ul style="list-style-type: none"> • Drug manufacturing: preparation of hydroxychloroquine if it is proven to be active against the coronavirus <hr/> <p>MEGA-THEME 5: DATA ANALYTICS AND RESEARCH INFORMATION</p> <ul style="list-style-type: none"> • Create an mHealth information platform (mobile or smart phones) or modify an existing one to enable early detection of contagious disease • Forecasting COVID-19 propagation for the next six months in South Africa • Mathematical modelling of COVID-19 transmission dynamics (model formulations for various intervention measures) • Forecasting for COVID-19: spread of the infection, impact on economic growth and human development • Contact tracing (extract aggregated data); Generate heat maps <hr/> <p>MEGA-THEME 6: MENTAL HEALTH INTERVENTIONS</p> <ul style="list-style-type: none"> • Patient wellness: update current App with COVID-19 data to manage personal wellness and provide access to services through mobile technology 	<hr/> <p>Centre for Community Technology (CCT) Faculty of Education</p> <hr/> <p>SARChI Chair in Microfluidic Bio/Chemical Processing</p> <hr/> <p>NMU mHealth research Groups</p> <p>NMU Department of Mathematics and Applied Mathematics; Centre for Expertise in Forecasting CCT</p> <hr/> <p>CCT</p>
<p>Rhodes University</p> <p>REFER TO APPENDIX 4</p>	<p>Technical advice to the National Task Team to produce ventilators for the country;</p> <p>Technical advice to the Presidential Task Team looking into social policy measures to assist informal workers affected by the COVID-19 crisis.</p> <hr/> <p>Sanitiser Manufacturing – thousands of litres have been distributed</p>	<p>Department of Physics</p> <p>Department of Economics</p> <hr/>

	<p>_____</p> <p>Protective Masks – for distribution to communities around the university</p> <p>_____</p> <p>Community Engagement (<i>details in a separate Engagement and Research Report</i>)</p> <p>_____</p> <p>Mathematical modeling of the pandemic</p>	<p>Department of Pharmacy + South African Institute of Aquatic Biodiversity</p> <p>_____</p> <p>Housekeeping Services Unit.</p> <p>_____</p> <p>Department of Mathematics</p>
<p>Tshwane University of Technology</p> <p>REFER TO APPENDIX 5</p>	<p><u>Sanitiser Manufacturing</u></p> <p>Staff and students Ga-Rankuwa campus have been hard at work mixing up large volumes of hand sanitisers to help keep the TUT community safe.</p> <p>A group of researchers are conducting a research on the quality of sanitizers across the country.</p> <p>_____</p> <p><u>Face Masks</u></p> <p>Staff at the Arts campus are making face masks.</p> <p>_____</p> <p>Staff from Engineering and the Built Environment are making face masks and shields using a variety of techniques</p>	<p>TS in Chemicals</p> <p>Department of Chemical, Metallurgical and Materials Engineering</p> <p>_____</p> <p>Arts staff</p> <p>_____</p> <p>Faculty of Engineering and the Built Environment</p>
<p>University of Cape Town</p> <p>REFER TO APPENDIX 6</p>	<p>UCT's Research on COVID-19</p> <p>A selection of projects focusing on the COVID-19 pandemic are underway at the University of Cape Town</p> <p>_____</p> <p>Mapping genetic diversity of South African SARS-CoV-2 strains to monitor geographical spread</p> <p>_____</p> <p>Vaccine development</p> <p>_____</p> <p>Antibodies for a variety of SARS-CoV and SARS-CoV-2 proteins and associated Diagnostics</p>	<p>_____</p> <p>UCT/GSG Virology</p> <p>_____</p> <p>Biopharming Research Unit (BRU)</p> <p>_____</p> <p>Biotechnology Immunotherapy Unit with the NICD</p>

	<p>Establishment of immunoassays and enzyme immunoassays for antibody detection for sero-surveillance.</p> <p>Support for vaccine development and screening – hope to set up SARS CoV-2 ELISAs to support vaccine development and screen recovered patient sera, followed by investigating cellular immune responses to infection in HIV-infected and uninfected individuals.</p> <p>Pseudo-neutralisation assay will lead the testing of the SARS-CoV-2 S protein products for binding to the receptor ACE2 protein / transfected cells using bio-layer interferometry (BLI), and comparison of binding of different products to ACE2 and inhibition of binding by mAbs.</p> <p>Developing rapid testing diagnostic approaches</p> <p>Interaction and overlap between SARS-CoV2, HIV-1 and M. tuberculosis infections</p> <p>Therapeutic trial for COVID-19. This international study explores treatments for COVID-19 in hospitalized patients. https://www.dailymaverick.co.za/article/2020-</p> <p>Chloroquine treatment for COVID-19</p> <p>COVID-19 epidemiology</p> <p>Epidemiological Modelling of COVID-19 in the city.</p> <p>Rapid production of COVID-19 -related reagents and vaccines</p>	<p>Biotechnology Immunotherapy Unit with the NICD</p> <p>Biotechnology Immunotherapy Unit with the NICD</p> <p>Biotechnology Immunotherapy Unit with the NICD</p> <p>UCT's Department of Pulmonology, UCT</p> <p>UCT Principal Investigator/Centre for Infectious Diseases Research in Africa.</p> <p>UCT Division of Infectious Diseases With WHO-led Solidarity clinical trials</p> <p>Department of Public Health</p> <p>Department of Mathematics and Applied Mathematics</p> <p>BRU and Cape Bio Pharms Ltd.</p>
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	<ul style="list-style-type: none"> • The immune response of COVID19 patients and identification of prognosis marker of COVID19 • Influence of age and parental health status on susceptibility/immunity to SARS-CoV-2 • The Faculty of Health Sciences at UCT have set up a protocol to assist in expediting approvals for the COVID-19 studies, both in terms of the ethics approval and in obtaining approval to work in community settings or on a district platform. • Further, the faculty is setting up a faculty-wide biorepository to provide an umbrella structure to link all projects and to address in a unified manner issue of safety, risk, equity and access to data and specimens. 	
<p>University of Johannesburg</p> <p>REFER TO APPENDIX 20</p>	<p>Products manufacturing</p> <p><u>Ventilators:</u></p> <ul style="list-style-type: none"> • UJ is using open-source ventilator designs to develop and build a suitable prototype to test at the UJ EMS Simulation Lab (E-Vent and OxyGEN). In addition, initiate a repair and maintenance programme to support public and private Gauteng based hospitals to bring out of service equipment back online and support industry partner(s) to upskill and mobilise SMMEs to respond to the global shortage. <p><u>Face shields:</u></p> <ul style="list-style-type: none"> • Using 3D printers to produce face shields <p><u>Sanitisers:</u></p> <ul style="list-style-type: none"> • Formulates and distributes hand sanitisers (based on WHO formula) <p><u>Rudderless, new generation of drones:</u></p> <ul style="list-style-type: none"> • Inventing a drone with thermal and infrared cameras that generates real-time images, that will monitor adherence to social distancing restrictions. <p>Self-screening tool</p> <ul style="list-style-type: none"> • COVID-19 self-screening tool to assist with decision-making on the need to get tested for SARS-CoV-2 infection. It is not a diagnostic or treatment tool. • The screening tool is also being considered by the UJ division (Occupational Health Practice) for usage in COVID-19 lockdown phases 1-3 <p>Beyond epidemiological modelling</p>	<hr/> <p>Engineering and the Built Environment (FEBE)</p> <hr/> <p>Library and Information Centre</p> <hr/> <p>Faculty of Health Sciences and FEBE</p> <hr/> <p>Institute for Intelligent Systems/FEBE</p> <hr/> <p>Institute for Intelligent Systems (IIS)</p> <hr/> <p>IIS /FEBE</p>

	<ul style="list-style-type: none"> Developing advanced modelling for the epidemic data of COVID-19 in South Africa, for more accurate forecasting of future trends <p><u>Multiscale modelling:</u></p> <ul style="list-style-type: none"> Seeking biomathematical approaches to transform public health action on a local, regional or global scale by identifying and filling gaps in mathematical modelling knowledge on the burden of Emerging Respiratory Infections (ERIs), in particular, the COVID-19 <p>Research</p> <p><u>COVID-19 Impact Survey:</u></p> <ul style="list-style-type: none"> A social science survey to understand the socio-economic and other impacts of COVID-19 <p><u>Impact of COVID-19 on Happiness Index:</u></p> <ul style="list-style-type: none"> How has COVID-19 impacted the “happiness index?” <p><u>Phytochemical analysis of Madagascar COVID- Organics:</u></p> <ul style="list-style-type: none"> Perform phytochemical profiling on the herbs/mixture with intent to comment on whether the content has medicinal value <p><u>Information hubs for COVID-19 decision-making:</u></p> <ul style="list-style-type: none"> Creation of a ‘Living COVID-19 Knowledge Hubs Database’, which will act as a one-stop research evidence portal for policy-makers and researchers to navigate the large number of available research databases and repositories related to COVID-1 <p>Socio-political decision-making on COVID-19</p> <p><u>Evidence map to track the policy response to COVID-19:</u></p> <ul style="list-style-type: none"> Supporting the South African Department for Planning, Monitoring and Evaluation in rapidly collating the evidence base on two topics: (a) support to small and medium enterprises in the context of COVID-19 and (b) supporting the tracking of local and international government policy responses to COVID-19. This project includes tracking the international and South African policy response to COVID-19. <p><u>Examples of African evidence-informed decision-making in action:</u></p>	<hr/> <p>Faculty of Science</p> <hr/> <p>Centre for Social Change [in collaboration with the Human Sciences Research Council (HSRC)]</p> <hr/> <p>College of Business and Economics</p> <hr/> <p>Research Centre for Plant Metabolomics, Faculty of Science</p> <hr/> <p>Africa Centre for Evidence, Faculty of Humanities in collaboration with McMaster University</p> <hr/> <p>Africa Centre for Evidence, Faculty of Humanities</p> <hr/>
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	<ul style="list-style-type: none"> Housing a collection via the Africa Evidence Network of examples of how evidence is being used to address a wide range of decisions across Africa, and making them freely available (in English and French). This includes the hosting of a free webinar series about using research evidence in decision-making. <p><u>Hosting a virtual international conference on evidence-informed decision-making re: COVID-19</u></p> <ul style="list-style-type: none"> EVIDENCE 2020, the biennial event of the Africa Evidence Network, is going fully virtual with the newly designed EVIDENCE 2020 ONLINE being launched in May. <p><u>COVID-END: A network to support decision-makers and researchers towards the best available research to combat COVID-19</u></p> <ul style="list-style-type: none"> Partnering with global leaders, the Africa Centre for Evidence is contributing to global evidence synthesis efforts through our active participation in COVID-END, a network that aims to make evidence on all aspects of COVID-19 accessible to decision-makers all over the world. 	<p>Africa Evidence Network, Africa Centre for Evidence, Faculty of Humanities</p> <hr/> <p>Africa Evidence Network, Africa Centre for Evidence, Faculty of Humanities</p> <hr/> <p>Africa Centre for Evidence, Faculty of Humanities</p>
<p>University of Pretoria</p> <p>REFER TO APPENDIX 7</p>	<p><u>Clinical Trials and Testing</u></p> <ol style="list-style-type: none"> A WHO multi-centre clinical trial study for Africa is looking at various antiviral compounds. UP is leading a SA MRC study on different rapid test methods. The Department of Medical Virology established an accredited testing facility with NHLS and is fully functional. Systems and protocols have been put in place in collaboration with the Gauteng Department of Health to screen, manage and treat COVID-19 patients. <hr/> <p><u>Community Health and Counselling</u></p> <ol style="list-style-type: none"> The UP Department of Family Medicine has developed the UP (Community Orientated Primary Care) Research Unit as part of the Community Oriented Primary Care initiative. The UP Tshwane, COVID-19 Care Helpline, has been established and is manned by doctors/registrars from UP. The Faculty of Health Sciences is involved in projects supporting homeless people in the Tshwane area, including substance use support, screening and testing. 	<p>UP in collaboration with the MRC Department of Medical Virology</p> <hr/> <p>Department of Family Medicine</p> <hr/> <p>Faculty of Health Sciences</p>

	<p>4. The Faculty has developed guidelines to support staff and students with mental health-related issues.</p> <hr/> <p>Modelling</p> <ol style="list-style-type: none"> 1. A trans-disciplinary study is doing a modelling study of COVID in South Africa. 2. Created a repository to collate data on the ongoing coronavirus pandemic in Africa. The goal is to record detailed information on each reported case in every African country. 3. A team has developed what is believed to be the first interactive app in the country that provides real-time data on COVID-19 using R-Shiny (a statistical software package). <hr/> <p>Research:</p> <ol style="list-style-type: none"> 1. The Centre for Viral Zoonosis is researching bats as a potential carrier of the virus and are working with NICD on COVID-19 related initiative. 2. With Gavan Institute in Sydney Australia, profiling risk of South Africans, using whole-genome profiles. 3. Other COVID-19 related projects are: <ul style="list-style-type: none"> o HIV and TB related o Diabetes-related o Air Quality o Health Risk Assessment in Mpumalanga 4. Many studies are in the planning stage and still need to get ethical approval. 	<hr/> <p>A partnership between Health Sciences and Mathematics and Applied Mathematics</p> <p>ABSA Chair of Data Science and Senior Lecturer at the Department of Data Science</p> <p>Department of Statistics in collaboration with other international universities</p> <hr/> <p>Centre for Viral Zoonosis</p> <p>UP in collaboration with Gavan Institute, Australia</p> <hr/>
University of Western Cape	<p>First South African SARS-CoV-2 genome sequencing.</p> <p>A ventilator prototype being developed</p> <p>Locally manufactured Transmission Ventilator Mask</p>	<p>UWC/SANBI/NICD</p> <p>SAIAMC</p> <p>SAIAMC</p>
University of Witwatersrand	<hr/> <p>Big Data research</p>	<hr/>

<p>REFER TO THE 11 FILES TITLED APPENDIX 8</p>	<ul style="list-style-type: none"> • <u>Dashboard development</u>: Using mathematical modelling and analysis, a multidisciplinary team led by a WITS Physics professor has developed what they termed a COVID-19 South Africa Dashboard – essentially a tool for monitoring the development of the Corona virus in South Africa and other African countries, intending to predict the spread and impact of the Corona virus in Africa • <u>Epidemiological modelling</u>: As a partner within the Gauteng City-Region Observatory (GCRO), WITS scientists contributed to the development of an interactive map showing the province’s vulnerability to COVID-19. • Professors David Rubin and Adam Pantanowitz are developing a model to demonstrate the effect of intermittent quarantines, which may help maintain essential services and sustain economic activity <hr/> <p>Public Health</p> <ul style="list-style-type: none"> • <u>Drug trials</u>: WITS professors are leading the South African research team in the 10-nation World Health Organisation-led Solidarity clinical trials aimed at identifying the most effective treatment against COVID-19. • <u>Other research and contact tracing</u>: Wits RHI, which has previously led the WHO initiative in support of the national Department of Health’s delivery of HIV and TB services, is being entrusted with COVID-19 research work as well as training community workers to trace community contacts of those infected with corona virus. Leading in this regard is Professor Helen Rees, Executive director: Wits RHI • <u>Vaccine development</u>: WITS just secured a grant from the national Department of Health and the National Health Laboratory Services (NHLS), primarily to strengthen the COVID-19 virus surveillance and to undertake research related to new therapies and vaccines, as part of bolstering South Africa’s response to the pandemic. Both initiatives are led by Prof Shabir Madhi, Director of the Medical Research Council Respiratory and Meningeal Pathogens Research Unit (RMPRU) at Wits. • <u>Rapid Testing development</u>: In support of national public health and to render COVID-19 testing more accessible, WITS, in partnership with the Gift of the Givers Foundation, opened a testing centre at the Braamfontein Campus on Enoch Sontonga Road. <hr/> <p>Economic analysis of the impact of Covid-19</p>	<ul style="list-style-type: none"> • WITS School of Physics with NRF’s iThemba Labs and data analytics from DataConvergence. • The GCRO is a partnership between WITS, UJ and the Gauteng Provincial Government. • The Wits Biomedical Engineering Research Unit <hr/> <p>Wits Reproductive Health and HIV Institute (Wits RHI); WHO</p> <p>WITS Medical Research Council Respiratory and Meningeal Pathogens Research Unit (RMPRU) with DoH; NHLS</p> <p>WITS University with the Gift of the Givers Foundation, Mullar Laboratories and NICD</p> <hr/>
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	<ul style="list-style-type: none"> • <u>Open letter to President from WITS economists and social advocates</u>: On 31 March, a group of 78 academics from Wits wrote an open letter urging President Cyril Ramaphosa for a more significant action balancing health and economic safeguards to protect citizens against the effects of the national lockdown. • <u>Strategy to replace the initial national lockdown</u>: On 9 April, a group of six WITS experts submitted to the Presidency, a blueprint for a staggered re-opening of the economy as a measure to safeguard livelihoods during the national lockdown. This strategy provided some of the key scientific counsel that influenced the President’s plan for the extended lockdown. <p>Empirically-based public information</p> <p>In the COVID-19 Special Issue of the Wits Journal of Clinical Medicine, published in April 2020, medical researchers present the first clinical data on COVID-19 published in South Africa. The journal, published by Wits University Press under open access conditions, presents, among others, ethical difficulties that health professionals will face regarding COVID-19 patients. Topics covered in this edition range from the clinical, through ethical, to the social dynamics of its impact. Highlights include:</p> <ul style="list-style-type: none"> • Diagnosis of COVID-19: Considerations, controversies and challenges in South Africa • Social dimensions of COVID-19 in South Africa: A neglected element of the treatment plan • Clinical ethical challenges in the COVID-19 crisis in South Africa • Potential impact of SARS-CoV-2 infection in HIV-positive patients in South Africa • COVID-19: The concept of herd immunity – is it a strategy for South Africa? <p>The edition features much more. Academics and students may freely access Covid-19 Resources published in the Wits University Press eBook collection for free, via their university libraries through JSTOR and Proquest until 1 July 2020.</p>	<p>MRC Respiratory and Meningeal Pathogens Research Unit; School of Governance; Department of Social Security Systems Administration and Management Studies; Faculty of Commerce, Law and Management; Department of Economics and the Southern Centre for Inequality Studies</p> <hr/> <ul style="list-style-type: none"> • Wits University Press; • Wits School of Internal Medicine, in collaboration in the COVID-19 considerations research, with UCT; the Medical Research Council; the London School of Hygiene and Tropical Medicine; Lancet Laboratories; Stellenbosch University and the National Health Laboratory Services; • Wits School of Clinical Medicine through its various divisions, namely: <ul style="list-style-type: none"> ○ The Department of Family Medicine and Primary Care; ○ the Steve Biko Centre for Bioethics; ○ the Pulmonology Division in the Department of Medicine and ○ the Department of Emergency Medicine.
<p>University of Zululand</p>	<p><u>Disinfectant/Sanitiser Manufacturing</u>, mainly for use by the University community</p>	<p>Department of Biochemistry and Microbiology in collaboration with the Department of Chemistry</p>

REFER TO APPENDIX 9		
Walter Sisulu University REFER TO APPENDIX 10	<u>Engineering of components for the South African Emergency Ventilator Project</u> A WSU Engineering Professor, Carlo van Zyl, with design engineers and resources from Nelson Mandela University's eNTSA, is involved in the reverse engineering, design and development of a non-invasive mechanical ventilator. The WSU work includes the design of a mechanical pressure sensing device to replace a gauge indicating respiratory pressure. <hr/> 'Netiquette' amidst crisis: Critical Discourse Analysis of posts on a trade union WhatsApp group following the presidential announcement of a 21-day COVID-19 national lockdown	Faculty of Engineering with NMU and eNTSA <hr/> Department of Arts.
University of Venda REFER TO APPENDIX 11	Symptomatic Screening and Awareness Campaign targeted at the University Community. .	Transversal Committee on Business Continuity
University of Limpopo REFER TO APPENDIX 12	<u>Testing services:</u> The VLIR and DIMAMO (Dikgale, Mamabolo, and Mothiba) HDSS staff are mobilised to use their research infrastructure for testing. The Project has a potential reach of 100 000 community members in 18 000 households where the clinic is involved. One of their current activities is diseases risk monitoring. Some Professional Nurses availed themselves and are on standby to assist with extended virus testing services <u>Sanitiser production:</u> The Department of Pharmacy in collaboration with the Department of Chemistry are ready to commence with the production of sanitizers.	
Cape Peninsula University of Technology REFER TO APPENDIX 13	Design and specification of face mask <hr/> Development of N95 Type Face Mask Development of Face Shield	DTI, Clothing Industry <hr/> Health Manufacturing. Together with UWC Dental, Wits, PGWC, UCT, Groote Schuur

	<p>Development of Ventilator (MedTronics)</p> <hr/> <p>Development and Testing of Ventilator (UWC)</p>	<hr/> <p>In partnership with UWC</p>
<p>North-West University</p> <p>REFER TO APPENDIX 14</p>	<p>Contact tracing and monitoring (surveillance), data capture and epidemiology modelling and trend analysis on the spread of the disease.</p> <p>A multidisciplinary think tank on the COVID-19 pandemic.</p> <p>Validation of a locally developed diagnostic test for the Coronavirus (SARS CoV-2) for more accurate, cost-effective diagnosis and quicker turnaround time</p> <p>Ready to make hand and room sanitisers and sanitisers prior to the lockdown.</p> <p>Ability to print 3D face masks, especially in Vaal campus.</p> <p>Capacity to identify new diagnostic markers using metabolomics technologies.</p> <hr/> <p>A team of Medical Device Developers are currently actively working on solutions to the pandemic, in the form of an emergency ventilator (collaboration with CUT - CRPM), some PPE innovations as well as screening and diagnostic tools.</p> <p>PPE manufacturing for health workers: face shields</p> <p>Intubation shields</p> <p>Students working on bed design and manufacture</p> <p>Non-invasive ventilator project</p>	<p>Faculty of Natural and Agricultural Science</p> <p>The African Centre for Disaster Studies within the Unit for Environmental Sciences and Management</p> <p>Faculty of Health Sciences</p> <p>Chemistry Department</p> <p>The School of Computing Sciences and Systems</p> <p>NWU's Centre for Human Metabolomics</p> <hr/> <p>Faculty of Engineering (Medical Device Manufacturing Team) In collaboration with partners at CUT, SU, UCT, VUT and the Council for Scientific and Industrial Research (CSIR)</p>

	Invasive ventilator project	
University of South Africa	Ormonde Facilities in Johannesburg have been offered to the Gauteng Government as they seek avenues to establish quarantine centres.	
Sefako Makgatho Health Sciences University REFER TO APPENDIX 15	<p>Development of a Mobile App SMU Covid-19 screening tool for student and staff</p> <p>Development of an Audit Tool for Covid-19 Readiness Gauteng Department of Health (GDOH) invited a 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 are representing GDOH, UNICEF, and WHO developed such a 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.</p> <p>WHO International Clinical Trial – the South African Solidarity Research SMU is involved in the Solidarity Research project of the WHO. The clinical trial called Solidary Research will compare the safety and effectiveness of four different drugs or drug combinations against Covid-19.</p> <p>Validation Tests for SARS COV-2 virus DoH has asked SMU to conduct tests for SARS Cov-2 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.</p> <p>Development of Guidelines for Health Care Practitioners – Covid-19</p> <p>Guidelines for Oral Health Care Practitioners in South Africa in Response to Covid-19 Researchers at SMU 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 <i>South African Dental Journal (SADJ)</i>.</p> <p>Guidelines for Pharmacists in South Africa in Response to Covid-19</p>	<p>SMU in partnership with TUT and WITS with the Gauteng Department of Health, UNICEF and the WHO</p> <p>SMU in partnership with eight other medical schools in SA and the WHO</p> <p>SMU with the NHLS</p> <p>The School of Oral Health Sciences</p> <p>School of Pharmacy in collaboration with peers from the Dr George Mukhari Academic Hospital, WITS,</p>

	<p>Researchers at SMU 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 the pharmaceutical community have developed guidelines for Pharmacists in South Africa in response to Covid-19.</p> <hr/> <p>Hand Sanitisers Project There is a concern currently in South Africa about the shortages of hand sanitisers. The researchers at SMU through a collaborative project between the School of Pharmacy and the School of Science and Technology are currently in the process of developing hand sanitisers to stop the spread of the COVID-19 using alcohol-based hand sanitiser within the university community.</p> <hr/> <p>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. Examples of on-going research projects include:</p> <ul style="list-style-type: none"> • Screening of Selected Medicinal Plants Against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Bacterial Respiratory Pathogens • Genomic characterisation of the COVID-19 novel human-pathogenic coronavirus isolated from patients in different sites of Limpopo, Gauteng and Eastern Cape Provinces, South Africa • Epidemiological model to counter the spread of COVID-19 in Gauteng and Limpopo Provinces • The impact of Covid-19 pandemic on core university mandates in three under-resourced universities in South Africa 	<p>UKZN, Nelson Mandela Hospital, Netcare, Mediclinic, Life HealthCare</p> <hr/> <p>The School of Pharmacy and the School of Science and Technology</p> <hr/> <p>SMU's School of Science and Technology and School of Medicine with collaborators from WSU and UNIVEN</p>
<p>Stellenbosch University REFER TO APPENDIX 16</p>	<p>SynSurf® A synthetic pharmaceutical to be tested as a supportive agent for the treatment of Acute/Adult Respiratory Distress Syndrome (ARDS).</p> <hr/> <p>Modelling Covid-19 spread in African countries – SACEMA</p>	<p>SU in collaboration with AzarGen Biotechnologies (Pty) Ltd</p> <hr/>

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	<ul style="list-style-type: none"> 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. <hr/> <p>One of UKZN's Centres in Health Sciences (KRISP) under the leadership of its Director, Professor Tulio de Oliveira is working on the following:</p> <ul style="list-style-type: none"> A joint proposal (between KRISP and CAPRISA) has been sent to the DSI for funding. The proposal is titled: "How is the SARS-COV-2 coronavirus spreading in urban and rural KwaZulu-Natal, South Africa?" A number of other projects e are being planned with AHRI (African Health Research Institute) to leverage 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) <hr/> <p>The College of Law and Management Studies is researching the effects of COVID-19 from various perspectives:</p> <ul style="list-style-type: none"> Online learning responses to COVID-19 by the 26 public universities in South Africa COVID-related problems experienced by health workers as well as community members (e.g. lack of access to water). Expertise in health systems, health governance, human behaviour the implications of COVID-19 on human behaviour and health systems, including establishing priorities for research and interventions in the short and medium-term) The medical ethical and legal aspects of confidentiality during the Covid19 epidemic The impact of COVID 19 on the informal business sector in eThekwini and Msunduzi municipalities, and the social and economic contexts in combating COVID19 in KZN 	<hr/> <p>KRISP</p> <hr/> <p>College of Law and Management Studies</p>
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	<ul style="list-style-type: none"> • Supply chain management during the COVID-19 Pandemic. • E-learning during the COVID-19 pandemic • Researching remote court hearings, using videoconferencing or similar electronic technology that obviates physical presence in the courtroom, in civil cases • 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. 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? • Practical guidelines for obtaining quarantine orders for COVID-19-diagnosed persons in a post-lockdown context. • 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. • The COVID-19 pandemic’s impact on the global discourse of heritable genome editing. • Researching e-health and the HPCSA’s response to the COVID-19 Pandemic. <hr/> <p>A multidisciplinary project entitled “A Sentiment Analysis of Community Perception and Potential Resistance to ‘Lockdown’ During the COVID Pandemic”.</p> <hr/> <p>UKZN is working on the publication of several special issues of the journal <i>Alternation</i>, which would address different social and human aspects of the impact of COVID-19. These would include:</p> <ul style="list-style-type: none"> • 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 	<hr/> <p>College of Humanities and the College of Agriculture, Engineering and Science</p> <hr/> <p>College of Humanities</p>
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<p>University of the Free State</p> <p>REFER TO APPENDIX 18</p>	<ul style="list-style-type: none"> • Business, Management, IS&T and Governance <p>Public Health</p> <ul style="list-style-type: none"> • <u>Public Health Emergency Solidarity clinical trials</u>: UFS is one of South Africa’s universities participating in this 45-nation initiative of the WHO, that is evaluating four treatment options (remdesivir, lopinavir/ritonavir, lopinavir/ritonavir plus interferon, chloroquine or hydroxychloroquine) for the treatment of COVID-19. The trials will be carried out at Bloemfontein-based medical facilities, including Pelonomi Provincial Hospital, Universitas Teaching Hospital, 3 Military Hospital, Mediclinic, and Rosepark Clinic. • <u>Diagnostics testing</u>: Through the Division of Virology and the Department of Internal Medicine, the UFS is also conducting diagnostic testing for the NHLS in the Free State and Northern Cape. <hr/> <p>Research and Innovation</p> <ul style="list-style-type: none"> • <u>Determination of kinetics of antibody responses to coronavirus</u>: the Division of Virology, in collaboration with UFS clinicians, will run tests for a period of up to three months in confirmed patients, to establish the exact kinetics of antibody responses. This will help to determine the exact role of rapid antibody assays in the COVID-19 outbreak. • <u>Establishment of panels of positive and negative samples for assay development and validation</u>: In order to assess patient immunity levels and to validate the diagnostic sensitivity and specificity of point-of-care assays available on the market, the Division of Virology will test both confirmed positive and negative samples at UFS’s biosafety level-3 facility. • <u>Development of diagnostic reagents</u>: UFS departments have protein production systems that will be adapted to the expression of viral proteins with application in the development of assays. Each participating partner will use multiple expression systems to produce various viral proteins, which will then be systematically tested to identify the most suitable protein for the development of assays (immunofluorescent assays, ELISA and lateral flow or point-of-care assays) with application as both diagnostic and epidemiological tools. The end goal is to identify proteins that could have application in research projects or potential commercial development. 	<p>Department of Internal Medicine; Department of Critical Care, the Division of Virology and FARMOVS, a UFS wholly-owned clinical trial company</p> <hr/> <p>Division of Virology</p> <hr/> <p>Division of Virology</p> <hr/> <p>Division of Virology and the Department of Biochemistry, Microbiology and Biotechnology with scientists from the University of Cape Town.</p>
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<p>Mangosuthu University of Technology</p> <p>REFER TO APPENDIX 19 for more</p>	<ul style="list-style-type: none"> • MUT is conducting virtual screening, physicochemical properties and molecular docking study of the Food and Drug Association approved compounds similar to the non-nucleoside reverse transcriptase inhibitor (NNRTI), efavirenz, targeting COVID-19 • Identificaton of SAR-COV preclinical (in vivo) compounds targeting COVID-19 main protease: A scoping review, meta-analysis and molecular docking studies 	<p>the Food and Drug Association The Research directorate: NRF Administrator in collaboration with the Department of Chemistry</p>
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