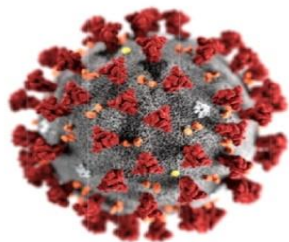


# COVID-19



## ASRIC Response and Intervention



**Inventory on R&D Interventions  
to COVID-19 in Africa**

# Inventory on R&D Interventions to COVID-19 in Africa

Abuja, Nigeria

Report of August 2020

This document was commissioned by the African Scientific Research and Innovation Council (ASRIC) and it reflects information from the various AU Member States, which are not necessarily those of the African Union and its Commission.

This document was developed to improve and strengthen science, technology, and innovation interventions to COVID-19 pandemic at national, regional and continental levels through the building and upgrading Research & Development (R&D) interventions with the aim to assist the Member States and Regional Economic Communities (RECs) and other stakeholders to adopt and domesticate such interventions.

## **PREFACE**

This document has been prepared by the African Scientific Research and Innovation Council (ASRIC) in response to the COVID-19 pandemic that has spread globally. Africa is no exception, with the ongoing increase in the number of new cases and deaths due to the pandemic. This is partly due to many challenges, including low testing capability, human and health infrastructure constraints and funding, that preexisted before and during the pandemic.

To date, COVID-19 does not have a vaccine or cure, and African governments use non-pharmaceutical interventions while taking advantage of science and research to find a permanent solution. The effectiveness of these interventions should from time to time be measured, to decide whether they enhance the general well-being of the African people. It is now time for African governments to respond to the COVID-19 pandemic with advancements in research and development (R&D) that can balance economic opportunities and public health issues.

The main purpose of this document is to present an overview of various R&D interventions ongoing across AU Member States in response to COVID-19, thus inviting the various working groups and taskforces to participate in the implementation of the Science Technology and Innovation (STI) Strategy "Actions and Interventions" for COVID-19.

## **ACKNOWLEDGEMENTS**

The ASRIC Secretariat is thankful to the eminent scientists from across Africa and Diaspora who have voluntarily accepted to contribute and to support the fight against the COVID-19 pandemic in Africa through the Advisory Board, working groups and taskforces under the auspices of the ASRIC. Special thanks is directed to the members taskforce on Mapping out and inventory of R&D interventions for COVID-19. The ASRIC hereby recognizes the invaluable contribution of Katrina Niiteta, Martin Mih Tasah, Muhammed Tekanyi, Agbla Jijoho Mischael Michel Ebenezer, Miria Noowe, Ki-Zerbo Charles Lamou and Dieudonne Hakizimana in making this first edition of Mapping out and inventory of R&D interventions for COVID-19.

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## **CHAPTER 1: INTRODUCTION**

The African Scientific Research and Innovation Council (ASRIC) was established by the Executive Council of the African Union as a specialized Technical Advisory Body to the African Union with African Union, Scientific, Technical and Research Commission (AU-STRC) as its Secretariat through the African Union's Executive Council Decision (EX.CL/Dec. 747 (XXII)). The ASRIC was commissioned to encourage scientific research and innovation to address socio-economic development challenges in Africa. It also mobilizes African research excellence, provides a forum for dialogue among African scientists and serves to create and maintain a nexus between continental research and innovation as a voice of the African scientific community.

The launch of ASRIC in November 2018 and its 1<sup>st</sup> Congress was a milestone for increasing the impact on Africa's future and prosperity in science, technology, and innovation. The ASRIC Congress consists of African scientists from all the African National Academies of Science, National Research Councils, African Institutes of Science, Technology and innovation (STIs), Scientists and Collaborators in the Diaspora. The Congress agreed on the implementation of key scientific and technological programs and projects in line with its Science, Technology and Innovation Strategy for Africa (STISA) and the overall continental framework "AU Agenda 2063".

The COVID-19 pandemic has affected the world and has sent a worldwide shockwave with a greater impact on governments and the population. Clearly, the overall spread of COVID-19 has been tough, especially for America, Italy, Spain and some other European countries. At the continental level, the infection rate has been generally quite low in Africa compared to others, nevertheless the rise in new infections in Africa may be due to the low testing capacity and other factors yet to be determined in most African countries. The comparatively lower rates of infection in Africa, therefore, does not ease the readiness of nations for fighting the pandemic.

In order to be proactive in its response, ASRIC has urgently assembled a group of eminent scientists and professionals to guide Africa's fact-based intervention to COVID-19 pandemic. In its movement to respond to the global pandemic, ASRIC has set up an Advisory Board to guide ASRIC's strategic intervention through formulating policies/guidelines, R&D plans, and other activities that emphasize on getting a right afro-centric response to the pandemic, such as Non-Pharmaceutical Interventions (NPIs), diagnosis, therapy, and vaccines among others. Hence, ASRIC's intervention in tackling COVID-19 is established through the formation of the following groups:

#### **a- ASRIC Advisory Board on STI Intervention for COVID-19**

The Board is to advise and guide ASRIC's intervention in the pandemic through formulating policies/guidelines, research and development plans and activities towards getting a diagnosis, therapy, vaccines. They are also looking to strengthen research capacity building that addresses hospital requirements, including equipment, laboratory facilities, test kits, ventilators, safety gears, drugs, and other equipment by formulating supportive policies/guidelines for implementation.

#### **b- Working Group to Study the Impact of COVID-19 on Africa's Food and Nutritional Security**

The objective of this working group is to develop a guided response that will minimize the impact of Covid-19 on Africa's Food and Nutrition Security in order to ensure the wellbeing of Africa's citizens.

#### **c- Working Group to Study the Socioeconomic Impact of COVID-19 on Africa**

This working group has the aim of developing, providing guidance and advice on how the pandemic's socio-economic impact can be improved (e.g. the results of some of the containment measures like social distancing, lockdowns, etc., on the lives of people already burdened with other diseases and living on a less than a dollar per day). The group will also work out/help on the development of non-pharmaceutical intervention (NPIs) measures that is driven by African culture and the realities on the ground.

#### **d- Working Group on Africa's Indigenous Knowledge to Preventing and Controlling Emerging Infectious Diseases on the Continent like COVID-19: Utilizing an Afro-centric Response**

This working group has the objective to develop and implement an Afro-centric response to COVID-19 and other infectious diseases building on Africa's abundant indigenous knowledge rooted in Africa's ethno-geographical and cultural characteristics through an R&D comprehensive programme. This programme is aimed at the development of traditional medicine intervention to the pandemic, and posting community prevention measures.

On April 14, 2020, the ASRIC STI Intervention Advisory Board for COVID-19 held its first meeting, and therefore several meetings were held to advise ASRIC on what best means to respond to the pandemic of COVID-19 using STI while building upon existing African resources. As of that, the board developed the ASRIC STI Strategic intervention for Covid-19 "Actions and Interventions". These actions and interventions are mainly composed of three pillars: Enabling Environment; Research and Development; and Publicity and Outreach. However, each pillar encompasses various sub-pillars in response to the pandemic. Among these



sub-pillars is the Mapping out and inventory of R&D interventions for COVID-19, where this publication is focusing on.

STI Intervention to Covid-19					
Enabling environment	Development of policy briefs/guidelines on investment in health care & health research systems.	Research & Development	Afro-centric non pharmaceutical interventions for outbreak.	Publicity and outreach	Identification of stakeholders
	Development of guideline on IP protection in joint research and collaboration during outbreaks.		Covid-19 pandemic modeling.		
	Development of guidelines on research translation.		Development and/or validation of rapid testing kit.		
	Development of AU Guidelines on outbreak hazard and STI intervention.		Mapping out and inventory of the pandemic.		Publicity campaigns that are tailored to stakeholders
	Health professional training/capacity building.		Inter-Africa STI cooperation.		
			Clinical trials.		
			Impact on the covid-19 on Africa's health system.		

As part of its mission to advance the creation, communication and application of Research and Development (R&D) knowledge to benefit society and improve people's lives, the ASRIC developed taskforces to assess the evolution of R&D interventions to fight against COVID-19 among the AU Members States. This fiche document presents the findings of these taskforces relating to Mapping out R&D interventions: ventilators; non-pharmaceutical interventions; rapid testing kits/diagnostic kits as well as vaccines and drug interventions for COVID-19 being carried out among the AU Member States. Further information on the products, however, can be provided through consultation with the focal persons in charge directly.



The key purpose of this document is first to support knowledge sharing and exchange between the Members States and improve the visibility of Africa's R&D output addressing the pandemic. In addition, this document aims to guide how best ASRIC and African Union Member States can respond to the COVID-19 pandemic utilizing STI while building on existing African resources.



## **CHAPTER 2: NON-PHARMACEUTICAL INTERVENTIONS FOR COVID-19**



Non-pharmaceutical interventions (NPIs) are a group of public health initiatives to minimize human contact rates, thus reducing transmission of the virus within the African community. The actual Covid-19 pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spreads rapidly through different modes of transmission: close/direct contact with an infected person, infected surface, or infected object. In the absence of confirmed vaccines and drugs, non-pharmaceutical interventions are the pioneer measures to effectively contain the disease over the world.



Non-pharmaceutical interventions (NPIs) in this document include measures to delay the progression of the disease, as opposed to vaccines, treatment, and/or use of organic substances. For COVID-19 these include social distancing, hand washing, respiratory hygiene, wearing of face masks, travel restrictions (border closures), closure of schools, closure of businesses, banning of mass gatherings, isolation, and lockdown. As schools reopen, international flights start operating and additional regional and national activities recommence, the AU Member States must ensure that the social-cultural background of the diverse African communities is adapted to the non-pharmaceutical interventions (self-isolation, hand washing, hygienic improvement, the safety of working place or school)


This chapter maps out different non-pharmaceutical interventions that have been developed and are being used among the AU Members States to reduce the incidence of the pandemic.



Product Name	NamSan Antiseptic Solution for all		
Country	Namibia		
Product description		Product photo	
This product is a hand sanitizer prepared according to the recommendation of WHO. It is made with 80% ethanol, 1.45% glycerin and 0.125% of Hydrogen Peroxidase.			
Product information: Disinfectant chemical			
Approval authority		Namibian Standard Institution (NSI)	
Name of the producer		University of Namibia	
Tel	+264612065047	Mobile	+26481242342
Email	snowaseb@unam.na inceptus@unam.na	Website	http://www.unam.edu.na/
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Muganga disinfectant pour les mains		
Country	Burundi		
Product description		Product photo	
It is a hand sanitizer made with Ethanol; glycerin; DM AQUA; permitted color and perfume by SAVONOR Industry.			
Product information: Disinfectant chemical			
Approval authority		ISO9001	
Name of the producer		SAVONOR Industry	
Tel	+25722223860	Mobile	+25722223860
Email	info@savonor.com	Website	http://www.savonor.com/
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	Ponagiene Hand Sanitizer		
Country	Burundi		
Product description		Product photo	
It is a hand sanitizer made with alcohol, glycerin and lavande.			
Product information: Disinfectant chemical			
Approval authority		ISO9001	
Name of the producer		SAVONOR Industry	
Tel	+25769543167	Mobile	+25769543167
Email	dedithmbo@gmail.com	Website	<a href="https://www.ponapharma.com/">https://www.ponapharma.com/</a>
IP information			
For more information on IP and product, kindly contact the producer.			


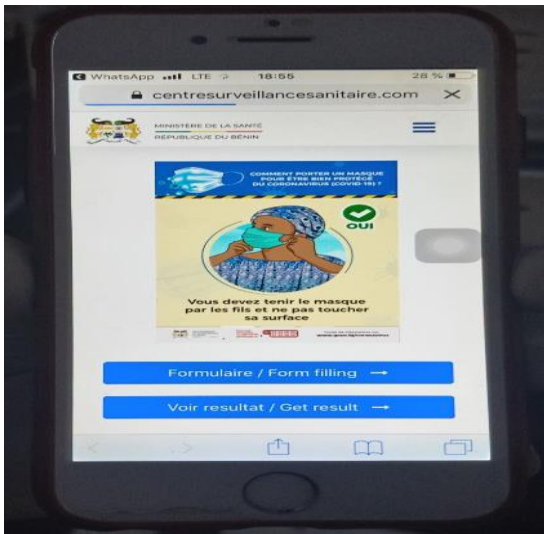
Product Name	Nam Steri Hand Alcohol Hand Sanitizer		
Country	Namibia		
Product description		Product photo	
It is a hand sanitizer made with 70% alcohol.			
Product information: Disinfectant chemical			
Approval authority		Namibian Standard Institution (NSI)	
Name of the producer		Extracorporeal Life Support Organization (ELSO)	
Tel	+264612065047	Mobile	Unknown
Email	n.ithana@elso.net	Website	<a href="https://www.elso.org">https://www.elso.org</a>
IP information			
For more information on IP and product, kindly contact the producer.			


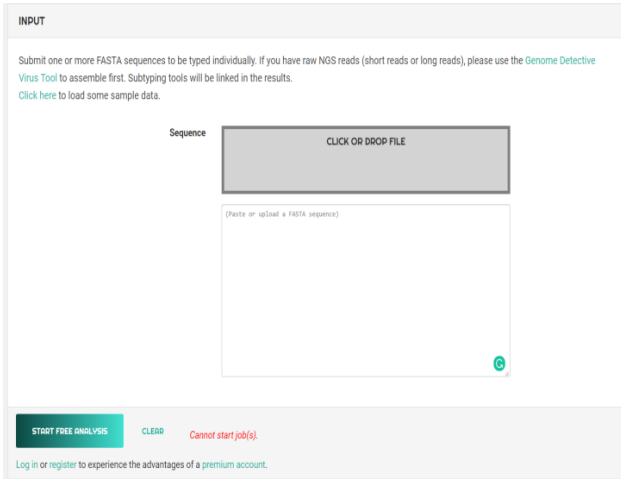
Product Name		A hand sanitation station	
Country		Namibia	
Product description		Product photo	
A hand sanitation station is a hand-operated hygienic application tool/machine built and approved by application for hand sanitation purposes. The sanitation station has a built-in mist system that provides an antiseptic hand sanitizer solution that kills users' hands with both bacteria and germs. It is also built with an automatic checking temperature with biometric contact tracing digital registry system. It is calibrated using the WHO standard sanitizer obtained from the University of Namibia.			
Product information: Disinfectant tool			
Approval authority		Information not available	
Name of the producer		New Technology Company	
Tel	Unknown	Mobile	+264813780253
Email	newtechnologies@tech-center.com	Website	http://web.manjaroda.com/newtech/
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Pedal operator dispenser stands		
Country	Namibia		
Product description		Product photo	
A 5L pedal-operated hand sanitizer dispenser stand. This stand allows the user to use the hand sanitizer without touching the bottle with the help of a foot-pedal operated mechanism. This ensures that touching the bottle itself is not spreading the virus.			
Product information: Disinfectant tool			
Approval authority		Information not available	
Name of the producer		New Technology Company	
Tel	+264812077256	Mobile	+264813475482
Email	rudolf@rushoinvestments.com	Website	https://www.facebook.com/rushoengineering/
IP information			
For more information on IP and product, kindly contact the producer.			







Product Name	Pedal operator dispenser stands		
Country	Namibia		
Product description		Product photo	
Closed 25L pedal operated water dispenser on wheels. It is a hands-free foot water supply system that improves hygiene in the hands, reduces infection and reduces wastes.			
Product information: Disinfectant tool			
Approval authority		Information not available	
Name of the producer		New Technology Company	
Tel	+264812077256	Mobile	+264813475482
Email	rudolf@rushoinvestments.com	Website	https://www.facebook.com/rushoengineering/
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Centre de surveillance sanitaire		
Country	Benin		
Product description	Product photo		
<p>This application is used to manage and track passengers at the care site at Cardinal Bernadin Gantin Airport in Cotonou.</p> <p>After having checked in on the platform, each passenger is assigned a number which, once scanned, is automatically transmitted to the site. Thus, at the site level on available screens, each passenger can see his number and box dedicated to his care.</p> <p>With this application, the passenger will be able to follow his results in real-time and the availability of his passport which had been withdrawn on his arrival.</p>			
Product information: Mobile/Tracking App			
Approval authority		Autorité de Protection des données personnelles - Commission Nationale de l'Informatique et des Libertés du Bénin (Personal Data Protection Authority-National Commission for Information Technology and Liberties of Benin)	
Name of the producer		GFA (Gestion de file d'attente)	
Tel	+22996761836	Mobile	+22996761836
Email	zolamonsegnonwulfrid@yahoo.fr	Website	https://www.centresurveillancesanitaire.com
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name		Coronavirus Typing Tool	
Country		South Africa	
Product description		Product photo	
<p>Genome detective is a web-based, user-friendly software application to quickly and accurately assemble all known virus genomes from next-generation sequencing datasets. This application allows the identification of phylogenetic clusters and genotypes from assembled genomes in FASTA format. The software accepts up to 2000 sequences at a time.</p>			
Product information: Software for genome sequence detection			
Approval authority		Information not available	
Name of the producer		Vagner Fonseca and Prof. Tulio de Oliveira	
Tel	Unknown	Mobile	+27 (0) 31 260 4898
Email	deoliveira@ukzn.ac.za	Website	https://pubmed.ncbi.nlm.nih.gov/32108862/
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Inesfly Sanitiser Hands/Air/Surface		
Country	Namibia		
Product description		Product photo	
Inesfly Sanitiser Spray is a wide-spectrum biocide ready-to-use for domestic and professional use in the field of bacteria, fungi and viruses. The substance is made from ammonium quaternary and biguanidine (0.058%).			
Product information: Disinfectant chemicals			
Approval authority		SANS 1853 South African National Standard	
Name of the producer		InesflyI Insecticide Coatings Namibia	
Tel	+26461238059	Mobile	+264812752257
Email	richard@inesfly.com.na	Website	http://www.inesfly.com.na
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Misting Sanitizing tunnel		
Country	Namibia		
Product description	Product photo		
<p>Misting Sanitizing tunnel that is a walk through sanitizing machine manufactured in Namibia.</p> <p>Sprays a fine mist through a misting tunnel, fogger, spray pack, or handheld device.</p> <p>Hands, Air and surfaces are disinfected within 10 minutes and have no residual effect. It can be used on humans safely.</p> <p>Must close or cover eyes.</p>			
Product information: Disinfectant tool			
Approval authority	SANS 1853 South African National Standard		
Name of the producer	InesflyI Insecticide Coatings Namibia		
Tel	+26461238059	Mobile	+264812752257
Email	richard@inesfly.com.na	Website	http://www.inesfly.com.na
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	URMAPHA-MICRO		
Country	Benin		
Product description		Product photo	
<p>This is a hydro-alcoholic product, which means that the product is in the form of a gel, in the form of a liquid solution and also of soaps. It is used to disinfect hands but also work surfaces. They can be used in homes, supermarkets, offices but also medical laboratories. It essentially contains alcohol, glycerol, hydrogen peroxide and thickener.</p>			
Product information: Disinfectant chemicals			
Approval authority		Research Unit in Applied Microbiology and Pharmacology of natural substances / University of Abomey-Calavi	
Name of the producer		Research Unit in Applied Microbiology and Pharmacology of natural substances / University of Abomey-Calavi	
Tel	+22967103441	Mobile	+22967103441
Email	ayenacesaire@yahoo.fr	Website	https://www.e-urmapha.uac.bj
IP information			
For more information on IP and product, kindly contact the producer.			

<b>Product Name</b>		<b>Face mask</b>	
<b>Country</b>		The Gambia	
			
<b>Product description</b>		<b>Product photo</b>	
This is a cloth face mask made with double layer 100% cotton poplin fabric with a pocket for filter insertion.			
<b>Product information:</b> Protective tool			
<b>Approval authority</b>		Gambia Standards Bureau	
<b>Name of the producer</b>		Facil clothing limited	
<b>Tel</b>	+46736790077	<b>Mobile:</b>	+46736790077
<b>Email</b>	Unknown	<b>Website</b>	<a href="https://facilclothing.com/info/news">https://facilclothing.com/info/news</a>
<b>IP information</b>			
For more information on IP and product, kindly contact the producer.			

Product Name	PharmSan Sanitiser		
Country	Uganda		
Product description		Product photo	
It is a hand sanitizer of liquid and gel formulation containing 70% Ethyl Alcohol and 0.5% Chlorhexidine.			
Product information: Disinfectant chemical			
Approval authority		Center of Excellence at Mbarara University of Science and Technology (MUST)	
Name of the producer		Pharm-Biotechnology and Traditional Medicine Centre (PHARMBIOTRAC)	
Tel	+256 772 837055	Mobile:	+256 772 837055
Email	Unknown	Website	<a href="https://www.ace2.iucea.org/index.php/press/covid-updates">https://www.ace2.iucea.org/index.php/press/covid-updates</a>
IP information			
For more information on IP and product, kindly contact the producer.			


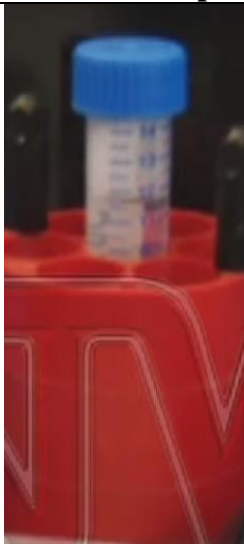




<b>Product Name</b>		<b>SOS-COVID application</b>	
<b>Country</b>		Cameroon	
<b>Product description</b>		<b>Product photo</b>	
The mobile app "SOS-COVID" not only informs the population but it lets them conduct self-diagnostics. This helps to rapidly and efficiently detect new cases that “can then be taken care of as quickly”. This is possible thanks to the geolocalization system integrated into the application. Other functionalities of the mobile app include statistics (all cases of Covid-19 reported worldwide, the number of victims per State as well as the number of people cured), a toll-free number (a button below the test result) to automatically call health emergencies in charge of the crisis, and awareness-raising.			
<b>Product information: Mobile App</b>			
<b>Approval authority</b>		Information not available	
<b>Name of the producer</b>		Ekani Louis CEO of House Innovation	
<b>Tel</b>	+237 697 09 88 59	<b>Mobile</b>	+256 772 837055
<b>Email</b>	Unknown	<b>Website</b>	<a href="https://www.businessincameroon.com/health/0904-10188-cameroon-local-startup-house-innovation-creates-a-mobile-app-for-covid-19-auto-diagnostics">https://www.businessincameroon.com/health/0904-10188-cameroon-local-startup-house-innovation-creates-a-mobile-app-for-covid-19-auto-diagnostics</a>
<b>IP information</b>			
For more information on IP and product contact the producer			


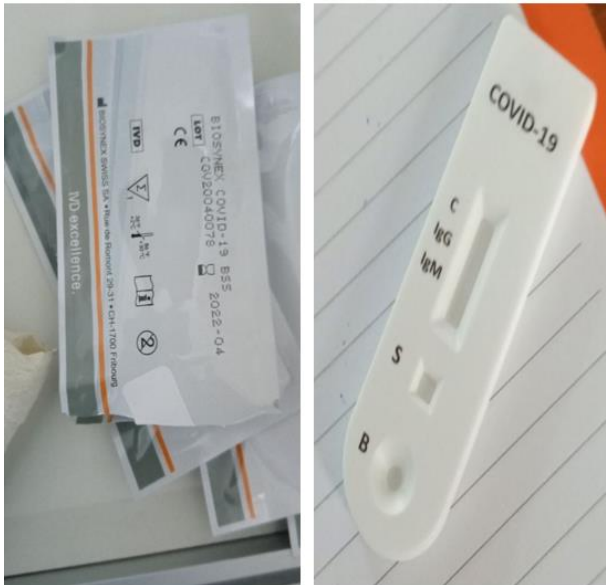
### **CHAPTER 3: RAPID TESTING KITS/ DIAGNOSTIC KITS INTERVENTION FOR COVID-19**



A Rapid Testing/Diagnostic Kit is a simple and easy-to-do medical diagnostic test. It is suitable for preliminary or emergency medical screening and uses in restricted-resource medical facilities. It can produce results usually in around 20 minutes or less than an hour.



This section, therefore, aims to map out different Rapid Testing Kits/Diagnostic Kits interventions developed and used among the African Members States in response to the fight against the COVID-19 pandemic.



<b>Product Name</b>		<b>STDS-Agx (swab tube dipstick agglutination) COVID-19 test kit</b>	
<b>Country</b>		Uganda	
<b>Product description</b>		<b>Product photo</b>	
Estimated at US\$1.07, the test kit can produce results in a minute or two compared to the four-to-six hours it takes when using other diagnostic kits. Ideally, the swab tube dipstick is simply chosen for ease of use when choosing a sample. Tests will work by generating solid particles (agglutination) from a reaction between the virus and the target antibody in the tube.			
<b>Product information:</b> Rapid Testing Kit			
<b>Approval authority</b>		Information not available	
<b>Name of the producer</b>		Makerere University, the Health Ministry, the Technology and Innovation Ministry, Astel Diagnostics Uganda and the Uganda Virus Research Institute.	
<b>Tel</b>	Unknown	<b>Mobile</b>	+256782450610
<b>Email</b>	wmisaki@yahoo.com	<b>Website</b>	<a href="https://allianceforscience.cornell.edu/blog/2020/04/ugandan-scientists-develop-quick-low-cost-covid-19-test-kits/">https://allianceforscience.cornell.edu/blog/2020/04/ugandan-scientists-develop-quick-low-cost-covid-19-test-kits/</a>
<b>Phase of clinical evaluation</b>		Unknown	
<b>IP information</b>		The product will be patented	
For more information on IP and product, kindly contact the producer.			

Product Name	Abbott m2000 SARS-CoV-2 assay		
Country	Namibia		
Product description		Product photo	
The Abbott RealTime SARS-C0V-2 assay is a real-time (rt) reverse transcriptase (RT) polymerase chain reaction (PCR) test intended for the qualitative detection of nucleic acids from the SARS-CoV-2 in nasopharyngeal (NP) and oropharyngeal (OP) swabs from patients who are suspected of COVID-19 by their healthcare provider.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		PathCare Namibia	
Tel	+264614313047, +264612954032	Mobile	Unknown
Email	karen.Engelbrecht@pathcare.org Ndumbu.pentikainen@nip.com.na	Website	<a href="http://www.pathcarenamibia.com/">http://www.pathcarenamibia.com/</a> <a href="https://nip.com.na/">https://nip.com.na/</a>
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name		BIOSYNEX COVID-19 BSS (IgG/IgM)	
Country		Benin	
Product description		Product photo	
<p>BIOSYNEX COVID-19 BSS (IgG/IgM) is a rapid immunochromatographic test for the qualitative detection of IgG and IgM antibodies against SARS-Cov-2 in whole blood serum or human plasma, to facilitate the diagnosis of primary and secondary infections with SARS-Cov-2. It has a sensitivity of 91.8% for IgM and 100% for IgG. Its specificity is 99.2% for IgM and 99.5% for IgG.</p>			
Product information: Rapid Testing Kit			
Approval authority		Ministry of Health	
Name of the producer		Airport Screening and Care center and Ministry of Health	
Tel	+22967211469	Mobile	+22967211469
Email	gcotomale@gmail.com	Website	Unknown
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	Standard Q Rapid test for COVID-19		
Country	South Africa		
Product description		Product photo	
STANDARD Q Test for COVID-19 antigen is a rapid chromatographic immunoassay for the qualitative detection of specific antigens to SARS-CoV-2 present in human nasopharynx.			
Product information: Rapid Testing Kit			
Approval authority		South African Health Products Regulatory Authority (SAHPRA)	
Name of the producer		Capebio Technologies	
Tel	+27 (0) 12 844 0441	Mobile	Unknown
Email	info@capebiossa.com	Website	https://capebiossa.com/
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	CFX96 Real-Time System, C1000 Touch Thermal cycler, Bio-Rad		
Country	Namibia		
Product description		Product photo	
It is a flexible and precise RT-PCR instrument. The precision of the temperature steps is critical for the rate and efficiency of the PCR. To obtain reliable, consistent results, all samples wells must maintain proper temperature throughout each incubation step.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		Developed by Bio-Rad Laboratories Inc and in use at the University of Namibia (UNAM)	
Tel	+264612064045	Mobile	Unknown
Email	lmhuulu@unam.na	Website	http://www.unam.edu.na
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	Tianlong Real-Time PCR System, Gentier 48E		
Country	Namibia		
Product description		Product photo	
Gentier 48E real-time PCR detection system is specifically designed for small and medium-sized laboratories, mobile laboratories, on-site detection and other workers by Tianlong Technology. Depending on its excellent performance and portability, accurate and effective test results can be made in a shorter time.			
Product information: PCR development			
Approval authority		Council of Fashion Designer of America (CFDA)	
Name of the producer		Developed by Tianlong Technology and in use at the University of Namibia (UNAM)	
Tel	+264612064045	Mobile	Unknown
Email	lmhuulu@unam.na	Website	http://www.unam.edu.na
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	GeneXpert System 16 (PCR)		
Country	Namibia		
Product description		Product photo	
GeneXpert Instrument Systems automate and incorporate the preparation of samples, nuclear acid extraction and amplification, and target sequence detection with simple or complex samples by using real-time PCR tests. The systems consist of an instrument, computer, and preloaded software for running tests and viewing the results.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		Developed by Cepheid Company and used at the Namibia Institute of Pathology	
Tel	+264612954032	Mobile	+264811256340
Email	Ndumbu.pentikainen@nip.com.na	Website	https://nip.com.na/
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	Cobas 4800 System - Roche molecular diagnostics (PCR)		
Country	Namibia		
Product description		Product photo	
The Cobas 4800 System fully automates sample preparation with real-time polymerase chain reaction (PCR) technology for amplification and detection.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		Developed by Roche company and used at the Namibia Institute of Pathology	
Tel	+264612954032	Mobile	+264811256340
Email	Ndumbu.pentikainen@nip.com.na	Website	<a href="https://nip.com.na/">https://nip.com.na/</a>
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			


Product Name	LightCycler 480 system (Roche Molecular Systems) PCR		
Country	Namibia		
Product description		Product photo	
The LightCycler 480 system is an efficient, intermediate to high-throughput PCR-platform for gene detections, gene expression testing, genetic variation analysis and array validation. The system is designed to provide various gene detection methods.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		Developed by Roche company and used at the Namibia Institute of Pathology	
Tel	+264612954032	Mobile	+264811256340
Email	Ndumbu.pentikainen@nip.com.na	Website	<a href="https://nip.com.na/">https://nip.com.na/</a>
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



Product Name	BioER Line-gene 9600 plus Real Time PCR System		
Country	Namibia		
Product description		Product photo	
The device is capable of providing up to 96 samples and fast double color scanning, and the 5-channel detection is also designed to expand the total wavelength of the fluorescent detection.			
Product information: PCR development			
Approval authority		FDA	
Name of the producer		Developed by BIOER company and used at the Namibia Institute of Pathology	
Tel	+264612954032	Mobile	+264811256340
Email	Ndumbu.pentikainen@nip.com.na	Website	<a href="https://nip.com.na/">https://nip.com.na/</a>
Phase of evaluation		The product passed the clinical evaluation stage	
IP information			
For more information on IP and product, kindly contact the producer.			



## **CHAPTER 4: INVESTIGATION ON VACCINE AND DRUG INTERVENTIONS FOR COVID-19**

Several months after the rise of the novel coronavirus from a regional epidemic to a global threat, medical institutions, research academies and drug manufacturers have rushed to advance their best ideas to avert the pandemic. Many of them take a lead from older antivirals, some are tapping tried and tested techniques, while others are moving forward with future approaches to human medicine.


This section aims to state some of the most talked-about efforts to treat or prevent coronavirus infection among the Africa Members States.

Product Name	ChAdOx1 nCoV-19		
Country	South Africa		
Product description		Product photo	
<p>The South African Ox1Cov-19 Vaccine VIDA-Trial is testing the ChAdOx1 nCoV-19 vaccine that was developed at Oxford University’s Jenner Institute, which is already undergoing trials in the UK and Brazil. ChAdOx1 nCoV-19 is made from a virus (ChAdOx1), which is a weakened version of a common cold virus (adenovirus) that causes infections in chimpanzees and has been genetically changed so that it can't grow in humans.</p> <p>Genetic material has been added to the ChAdOx1 construct, which is used to make proteins from the COVID-19 virus (SARS-CoV-2) called Spike glycoprotein (S). This protein is usually found on the surface of SARS-CoV-2 and plays an essential role in the infection pathway of the SARS-CoV-2 virus. The SARS-CoV-2 coronavirus uses its spike protein to bind to ACE2 receptors on human cells to gain entry to the cells and cause an infection. By vaccinating with ChAdOx1 nCoV-19, there is a hoping to make the body recognize and develop an immune response to the Spike protein that will help stop the SARS-CoV-2 virus from entering human cells and therefore prevent infection.</p>			
Product information: Vaccine Trial			
Approval authority		Information not available	
Name of the producer		Prof. Shabir Madhi from University of the Witwatersrand and Oxford University’s Jenner Institute	
Tel	+27(0)117171000	Mobile	+27 (0) 119899885
Email	Shabir.Madhi@wits.ac.za	Website	<a href="https://www.gavi.org/vaccineswork/first-african-trial-covid-19-vaccine">https://www.gavi.org/vaccineswork/first-african-trial-covid-19-vaccine</a>
Phase of evaluation		The product has passed Phase 2 of trial	
IP information			
For more information on IP and product contact the producer			

Product Name	Corocure (Traditional medicine)		
Country	Cameroon		
Product description		Product photo	
Corocure is a combination of antiretroviral drugs and traditional medicine made by Dr. Euloge Yiagnigni Mfopou to treat patients infected with COVID-19. Corocure has combined extracts of plants and an exigent that patients take for at least 9 days.			
Product information: Drug/Treatment			
Approval authority		Information not available	
Name of the producer		Good Health Promotion Clinic, Yaounde and Ministry of Public Health	
Tel	Unknown	Mobile:	Unknown
Email	eyiagni@yahoo.com	Website	<a href="https://www.cameroon-tribune.cm/article.html/33011/en.html/covid-19-treatment-cameroonian-wins-international-prize-for">https://www.cameroon-tribune.cm/article.html/33011/en.html/covid-19-treatment-cameroonian-wins-international-prize-for</a>
Phase of evaluation		The product has passed Phase 1 of the trial (Safety of the drug)	
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	ELIXIR COVID-19 and ADASAK COVID-19		
Country	Cameroon		
Product description		Product photo	
These are traditional cures created by Archbishop of the Metropolitan Archdiocese of Douala Samuel Kleda. ELIXIR COVID-19 was made for the treatment of severe cases and ADSAK COVID-19 was made for the treatment of mild symptoms.			
Product information: Drug/Treatment			
Approval authority		Information not available	
Name of the producer		Metropolitan Archdiocese of Douala and Ministry of Public Health	
Tel	Unknown	Mobile	Unknown
Email	Unknown	Website	<a href="http://www.crtv.cm/2020/04/covid-19-archbishop-samuel-kleda-proposes-a-herbal-remedy/">http://www.crtv.cm/2020/04/covid-19-archbishop-samuel-kleda-proposes-a-herbal-remedy/</a>
Phase of evaluation		The product has passed Phase 1 of the trial (Safety of the drug)	
IP information			
For more information on IP and product, kindly contact the producer.			







<b>Product Name:</b>	<b>Pneumo-coccal conjugate vaccine (PCV)-10 /PCV-13</b>		
<b>Country:</b>	South Africa		
<b>Product description</b>		<b>Product photo</b>	
Marc Mendelson in an editorial publication explained a vaccination strategy with the pneumo-coccal conjugate vaccine (PCV), either PCV-10 or PCV-13 which aims to reduce pneumonia hospitalization of children. PCV-13 has been shown to reduce bacteraemic and non-bacteraemic community-acquired pneumonia (CAP) and vaccine-type invasive pneumococcal disease (IPD) in adults more than 65 years of age. In his theory, optimizing childhood vaccination coverage with PCV and increasing use in adults to mitigate the effects of CAP and IPD in the face of a SARS-CoV-2 epidemic, maybe a second vaccination strategy available to LMICs to reduce its impact on their health systems.		<b>Photo not available</b>	
<b>Product information: Drug/Treatment Trial</b>			
<b>Approval authority</b>		Information not available	
<b>Name of the producer</b>		Division of Infectious Diseases and HIV Medicine, Department of Medicine	
<b>Tel</b>	Unknown	<b>Mobile</b>	Unknown
<b>Email</b>	marc.mendelson@uct.ac.za	<b>Website</b>	<a href="https://www.ijidonline.com/article/S1201-9712(20)30149-1/abstract">https://www.ijidonline.com/article/S1201-9712(20)30149-1/abstract</a>
<b>Phase of evaluation</b>		The product has passed Phase 1 of the trial (Safety of the drug)	
<b>IP information</b>			
For more information on IP and product, kindly contact the producer.			


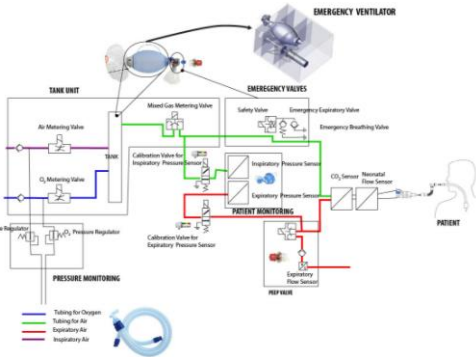
## **CHAPTER 5: INVESTIGATION ON VENTILATORS FOR COVID-19 INTERVENTION**




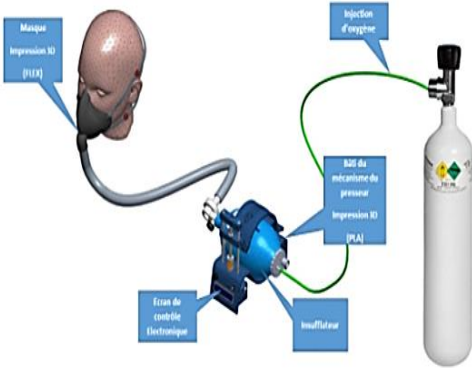
The global COVID-19 pandemic is threatening to overwhelm our national health system, triggering an increase in mortality rate due to shortages of essential equipment, such as ventilators. However, with the recent development and widespread implementation of small-scale innovations production such as 3-D printers and open-source ventilators, numerous health and academic institutions as well as manufacturers in African Member States are actualizing the potential to address shortages in medical supply.

This section provides a background on the research and development of ventilators to alleviate the crisis of the COVID-19 pandemic across the Africa Members States.

<b>Product Name</b>		<b>3D printing mask ventilator</b>	
<b>Country</b>		Kenya	
<b>Product description</b>		<b>Product photo</b>	
The prototype 3D printing ventilator was designed according to the International Standards Organization (ISO), the Kenya Bureau of Standards and Pharmacy and Poisons Boards standards. The ventilator detects oxygen and normal air then passes through a humidifier to give it enough pressure and volume required to ventilate a patient.			
<b>Product information: Ventilator development</b>			
<b>Approval authority</b>		Information not available	
<b>Name of the producer</b>		Fidel Makatia from Kenyatta University	
<b>Tel</b>	+254208703000 +254208704000	<b>Mobile</b>	254703575888
<b>Email</b>	info@ku.ac.ke	<b>Website</b>	<a href="https://www.rfi.fr/en/africa/20200425-kenyan-students-innovate-to-fill-covid-19-ventilator-shortage-coronavirus-innovation-ghana-uganda">https://www.rfi.fr/en/africa/20200425-kenyan-students-innovate-to-fill-covid-19-ventilator-shortage-coronavirus-innovation-ghana-uganda</a>
<b>Phase of evaluation</b>		Prototype	
<b>IP information</b>			
For more information on IP and product, kindly contact the producer.			

<b>Product Name</b>	<b>Ventilator prototype</b>		
<b>Country</b>	Cameroon		
<b>Product description</b>		<b>Product photo</b>	
The ventilator produced is a prototype of the much-needed ventilation and a vaporized sanitizing door. Here the ventilator has its mask which goes onto the face of the patient and then the tube which transports the air. The prototype still has other things needed to be put in place, such that it works simply, but it is difficult to use now because breathing is affected by the artificial support system.			
<b>Product information:</b> Ventilator development			
<b>Approval authority</b>		Information not available	
<b>Name of the producer</b>		Agence Universitaire pour l'innovation (AUI)	
<b>Tel:</b>	Unknown	<b>Mobile:</b>	Unknown
<b>Email</b>	contact@au-techno.com  au-entreprises@gmail.com	<b>Website</b>	<a href="https://www.africanews.com/2020/04/17/covid-19-cameroon-engineers-develop-ventilator-prototype/">https://www.africanews.com/2020/04/17/covid-19-cameroon-engineers-develop-ventilator-prototype/</a>
<b>Phase of evaluation</b>		Prototype	
<b>IP information</b>			
For more information on IP and product, kindly contact the producer.			

Product Name	Open Design Low-Cost Ventilator		
Country	Uganda		
Product description		Product photo	
<p>The proposed Ventilator is based on an electromechanical Architecture utilizing Motors, Potentiometers, Air Pressure Transducers, Air Flow Transducers, a Valve Mask Compression Unit, Inhalation &amp; Exhalation Control Valves, and a Monitoring System. These assist in the control of inhalation and exhalation by increasing and decreasing the patient's airway pressure or tidal volume.</p>			
Product information: Ventilator development			
Approval authority		Information not available	
Name of the producer		Makerere University, Resilient Africa Network (RAN), Kiira Motors Corporation, Ministry of Science, Technology and Innovation (MOSTI)	
Tel		Mobile	
Email	press@coronavirus.mak.ac.ug	Website	<a href="https://news.mak.ac.ug/2020/04/maks-ran-kmc-and-mosti-collaborate-develop-low-cost-ventilator">https://news.mak.ac.ug/2020/04/maks-ran-kmc-and-mosti-collaborate-develop-low-cost-ventilator</a>
Phase of evaluation		Prototype	
IP information			
For more information on IP and product, kindly contact the producer.			

Product Name	3D non-invasive respirator	
Country	Tunisia	
Product description	Product photo	
<p>This device consists of four intrinsic modules, including the mask, the venture, the electronic card-based ventilator control mechanism, and the insufflator. The device is then easily connected to an oxygen tank. The production-ready design of the respirator is available in OPEN SOURCE software and can be downloaded free via the site shared by the project partners. This comes with a free instruction manual with special guidance on the operation of the respirator for ease of use. The device has also been designed to be used in both a hospital and a home setting.</p> <ul style="list-style-type: none"><li>The proposed device can be used in one of three ways. The mask, with its built-in filter, can be used as a protective mask against COVID-19 (Option 1).</li><li>The device also allows oxygenation of the patient through a venturi oxygen mask (Option 2).</li><li>The venturi mask (the device comes with several different venturis) or the High Oxygen Enrichment Rate (HAFOE) mask incorporates a venturi body to provide a predetermined, fixed concentration of oxygen. The non-invasive ventilation is presented in Option 3 (figure c).</li></ul>	  <p>a. Option 1: Protective Mask b. Option 2: Venturi based ventilators</p>  <p>c. Option 3 : Non-invasive ventilator System</p>	
	<b>Product information:</b> Ventilator development	
Approval authority	Information not available	
Name of the producer	Polytechnic Engineering School of Université Centrale in Tunisia, a member institution of Honoris United Universities, in partnership with Digital Industry Tools Expert (DITEX).	

<b>Tel</b>	Unknown	<b>Mobile</b>	Unknown
<b>Email</b>	nidhal.rezg@univ-lorraine.fr	<b>Website</b>	<a href="https://honoris.net/honoris-united-universities-develops-3d-printed-respirator/">https://honoris.net/honoris-united-universities-develops-3d-printed-respirator/</a>
<b>Phase of evaluation</b>		Prototype	
<b>IP information</b>			
For more information on IP and product, kindly contact the producer.			

## **CONCLUSION**

The COVID-19 pandemic with its attendant effects is a serious global cause for concern. However, Africa can defeat the virus by harnessing various efficient interventions such as have been highlighted in this booklet. The ASRIC calls upon AU Member States to avail themselves of these opportunities to strengthening R&D for knowledge-sharing and research collaboration which would no doubt improve citizens' health and quality of life.