Africa's response to the COVID-19 pandemic:

A summary of country reports

January 2020 to December 2021

World Health Organization
REGIONAL OFFICE FOR **Africa**

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Foreword

COVID-19 Pandemic presented an unprecedented health emergency, starting in 2019 in Wuhan China, and spreading to the whole world by 2020. It has caused over 5 million deaths within 2 years. WHO is leading efforts to contain the disease through various recommended measures implemented. The WHO AFRO regional office has supported countries by sourcing and distributing PPEs, strengthening lab testing capacity, giving technical support through staff and technical experts supporting coordination activities across various response pillars and in COVID-19 guideline development.

Africa learned lessons on the COVID-19 response from the other regions which reported COVID-19 cases earlier. The countries' response was based on country-specific COVID-19 response plans. However, there were strengths and weaknesses in the implementation of these plans. This report aims to showcase the WHO AFRO Region country responses to COVID-19, WHO AFRO and WHO Country Office support to countries; highlighting best practices and challenges to:

– Document best practices to form a starting point for health emergency response planning to contain any other pandemics or health emergencies

– Provide evidence to promote learning across countries, within the region, and globally to improve COVID-19 and other health emergency response

– Illuminate areas where there were gaps in COVID-19 response to build capacity in these areas, not only for emergency response but also for routine health services

– Highlight key lessons learnt in the COVID-19 response across the WHO AFRO countries

– Give recommendations to improve COVID-19 response

WHO is committed to continued support to the AFRO region countries to ensure a coordinated, efficient response to the COVID-19 pandemic.

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WHO Regional Office for Africa

Acknowledgments

Introduction

SARS-CoV-2, the virus that causes COVID-19, was declared a public health emergency of international concern on 30 January 2020 and a pandemic on 11 March 2020. It was first detected in Wuhan, China in November 2019. Most countries were on high alert and surveillance was heightened at airports and other points of entry.

The principal mode by which people are infected with SARS-CoV-2 is through exposure to respiratory fluids carrying the infectious virus. Exposure occurs in three principal ways: (1) inhalation of very fine respiratory droplets and aerosol particles; (2) deposition of respiratory droplets and particles on exposed mucous membranes in the mouth, nose, or eye by direct splashes and sprays; and (3) touching mucous membranes with hands that have been soiled either directly by virus-containing respiratory fluids or indirectly by touching surfaces with the virus on them[1].

As at 29 November 2021, COVID-19 has caused 259,502,031 infections and 5,183,003 deaths; an average case fatality rate of 2%[2].

Figure 1: COVID-19 Cases by WHO Regions (Nov 29th 2021)
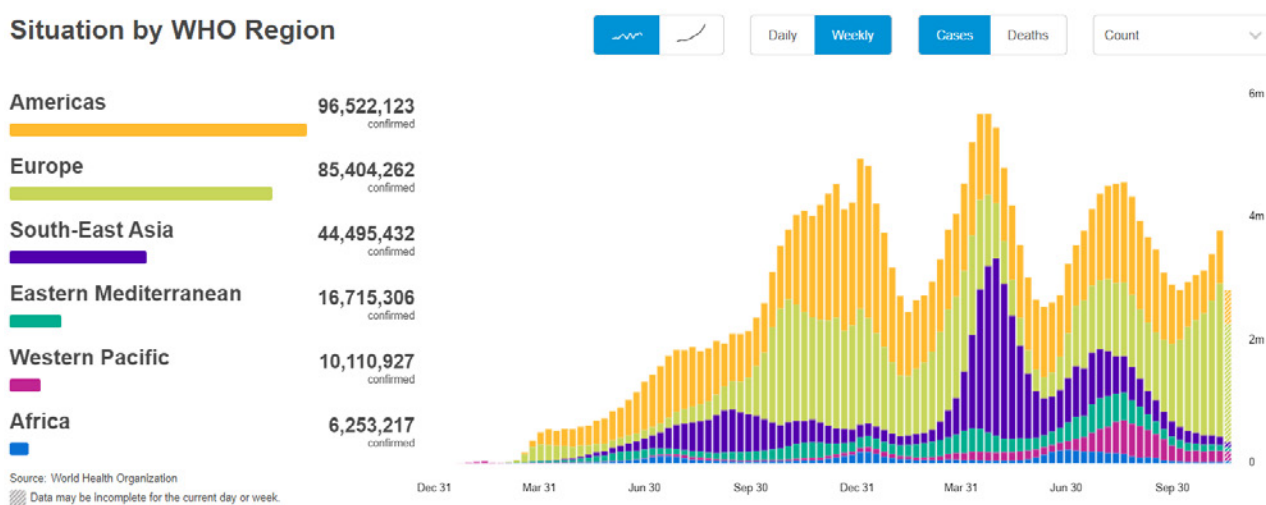
Source: World Health Organization

Introduction

The World Health Organization developed the Strategic Preparedness and Response Plan (SRP) to guide countries on COVID-19 response and prevention. This was focused across 11 pillars, specifically:

1. **Coordination, Planning, Financing and Monitoring**

2. **Risk Communication and Community Engagement (RCCE)**

3. **Surveillance, Outbreak Investigation and Calibration of Public Health Measures**

4. **Points of Entry (POE), International Travel and Transport, and Mass Gatherings**

5. **Laboratories and Diagnostics**

6. **Infection Prevention and Control (IPC) and Protection of the Health Workforce**

7. **Case Management, Clinical Operations and Therapeutics**

8. **Operational Support, Logistics, and Supply Chains**

9. **Strengthening Essential Health Services and Systems**

10. **Vaccination**

11. **Research, Innovation and Evidence**

Objective

This report aims to assess the preparedness and response of the countries in the WHO African region against the SRP guide as reported by the WHO AFRO Countries. The specific objectives are to:

Summarize the overall response of African countries to the COVID-19 pandemic across the different pillars, sequentially from the start of the pandemic *(period of January 2020 to December 2021)*

Highlight specific country responses and highlight best practices and / or innovations

Discuss lessons learnt from the COVID-19 pandemic response

Give recommendations for strengthening health emergency response

The 47 countries in the WHO African region responses were compiled using Situation Reports (sitreps) sent to the WHO Regional Office for Africa (AFRO), based on their COVID-19 response across each pillar. A minimum of two reports were randomly selected per month to assess the major activities against the SRP summarized per pillar and by quarter from January 2020 to December 2021.

The Country Summary was then compiled into Microsoft Excel to enable an analysis of the overall response by pillar across all AFRO countries, examining similarities and differences in the COVID-19 prevention and control measures enacted across countries, progress made in building capacity for containment of the pandemic, innovations and best practices. The information collected was based on the availability and content of country situation reports. Some country sitreps did not contain any qualitative data to assess pillar response.

Results: COVID-19 Response by pillar

1. Coordination, Planning, Financing and Monitoring

Ribbon-cutting ceremony held for the construction of the second phase of the PHEOC in Juba, South Sudan – WHO South Sudan

Country Response

Coordination, planning, financing and monitoring pillars were central to managing all the other pillars. Most countries activated a joint national COVID-19 task force comprising high-level multi-agency/ministerial officials to guide a coordinated response. This was the case in **Botswana**, **Eritrea**, **Ghana**, **Guinea-Bissau**, **Kenya**, **Liberia**, **Malawi**, **Mauritius**, **Namibia**, **Rwanda**, **Seychelles**, **Sierra Leone**, **South Sudan**, **Uganda**, **Tanzania**, **Zambia** and **Zimbabwe**. A Public Health Emergency Operations Centre (PHEOC) was activated to coordinate the day-to-day COVID-19 response activities in each country. The PHEOCs coordinated the development of a costed National COVID-19 Response Plan with technical support from WHO. PHEOCs were initially established at the national level, but later decentralised with increasing cases at the sub-national levels. These decentralised structures were established at different time points within countries. **Lesotho** and **Nigeria** established national and regional PHEOCs at the same time in Q1 2020, whereas sub-national PHEOCs came into play in Q2 2020 in **Guinea-Bissau**. In **Botswana**, public health specialists were deployed to the sub-national units to help guide coordination of response activities in Q4 2020. **Kenya** trained sub-national teams and supported the formation of the sub-national unit PHEOCs in Q4 2020.

Most of the countries in the region reallocated their development budgets to the health sector to fund the COVID-19 prevention and control strategy, which included all pillar activities outlined above. Furthermore, majority of countries received World Bank and other donor support to meet the financial gap in the COVID-19 response plan, for vaccine financing and to support economic mitigation measures to cushion citizens against the effects of lockdown, including loss of income due to orders to remain at home. **Mauritius** launched an online platform for people to order supplies for home delivery. Stringent price controls on essential food (rice, cereals, pulses and pasta) and hygiene commodities like baby and adult diapers, sanitary towels and washing products were enforced to counteract abuses by sellers. Financial

Results: COVID-19 Response by pillar

support was provided by the government to employees of the private sector and the informal sector, through the Wages Assistance Scheme and the Self-Employed Assistance Scheme respectively, during the curfew order. **Gambia** introduced a COVID-19 emergency response nationwide food relief package. In **South Africa**, around 400 million Rands was allocated by the government for the Social Relief of Distress (SRD) grant to vulnerable households. **Ghana** developed a package for vulnerable persons affected by COVID-19 in designated regions (Ashanti and Greater Accra), and exempted funds were drawn from the provident fund or personal pension schemes from income tax. **Sierra Leone** implemented the Quick Action Economic Response Programme (QAERP) to mitigate the shocks associated with COVID-19, aimed at providing safety nets to the most vulnerable through cash transfers and food assistance, supporting labour-based public works and ensuring price stability of essential commodities[3]. **Kenya** implemented a 10% tax relief for individuals and corporate entities, and reduced value-added tax and bank lending rates.

WHO Support

WHO guidance was key in coordinating the COVID-19 response across all countries in the region. The development of the Strategic Response Plan for the WHO African Region guided countries in the development of their country-specific costed response plans. The WHO Country Offices coordinated partners to establish national and regional Incident Management Teams (IMTs) in countries to support governments mount effective COVID-19 response. The WHO country teams provided technical support to form the PHEOCs even before cases were reported in countries. WHO further supported PHEOCs to strengthen coordination of all COVID-19 response activities through staff supporting various pillar teams. WHO continues to support countries to hold Intra Action Review (IAR) meetings to assess COVID-19 response plan progress, successes and challenges in view of adopting more effective and efficient response mechanisms to contain the pandemic. WHO teams also led in resource mobilisation and provided countries with catalytic support to fund the pandemic response.

2. Risk Communication and Community Engagement (RCCE)

Country Response

RCCE activities targeted messaging on measures to prevent the spread of COVID-19, including mask-wearing, staying at home, social distancing and hand-washing. From Q1 2021, the messaging included creating awareness and promoting COVID-19 vaccine uptake. RCCE activities were initiated from the start of the pandemic, with messages disseminated through mass media (e.g., television and radio in different languages, mass SMS messaging and billboards), public address systems in communities, and messaging through community leaders, religious leaders and trained community health workers. Call centres were set up in all countries to respond to questions on COVID-19, address rumours and misinformation, and provide answers to frequently asked questions. IEC materials on COVID-19 prevention measures, symptoms, case management, and later vaccination, were produced and disseminated to the public through community and health facility mechanisms.

Countries used innovative methods to reach specific communities. The **Rwanda** National Police used drones to spread awareness messages to remote and densely populated neighborhoods. **Ghana** used robust RCCE mechanisms focusing on all gatekeepers, such as Queen mothers (women leaders selected from the royal family of each town/village with socio-political influence) and businessmen, to promote prevention and control mechanisms. **Ghana** Health Services entered an agreement with Ghana Premier and Division One Soccer Leagues to utilize their platforms for the propagation of risk communication messaging on COVID-19, including using COVID-19 branded sportswear, screens in stadia to display COVID-19-related messages and show COVID-19-related adverts during matches. Community health workers were used in many countries for COVID-19 prevention messaging. For instance, the **Central African Republic** trained 600 social protection agents for door-to-door sensitisation on COVID-19 in Q2 2020. In **Chad**, community relays were deployed to promote community messaging. **Benin** carried out awareness campaigns in high-traffic areas using health brigades. In

Results: COVID-19 Response by pillar

South Sudan, COVID-19 messages were disseminated by Blue Bicycle Messengers comprising of youths with bicycles – each mounted with a megaphone, amplifier, battery and USB drive. They broadcasted recorded messages while also collecting feedback from communities.

Blue Bicycle Messengers in South Sudan broadcasting recorded messages and collecting feedback from communities – UNDP South Sudan, Kymberly Bays
Source: https://unric.org/en/blue-messenger-bicycles-bring-lifesaving-information-to-south-sudan/

Despite the continuous efforts, many countries highlighted the challenges of non-adherence to COVID-19 prevention guidelines. For example, **Sierra Leone** reported inconsistent adherence to COVID-19 prevention measures (use of face masks and physical distancing) by the majority of the population. In **Kenya**, laxity in observing public health measures on COVID-19, particularly during political events and in public transport (overloading) and markets has been observed across the country. In **Uganda**, complacency in observing COVID-19 protocols was noted after the 2021 Presidential and Parliamentary elections.

In **Ethiopia**, there was low adherence by the public to COVID-19 prevention measures. Lack of adequate resources at sub-national levels in **Zimbabwe** affected community engagement activities in the hardest-to-reach areas in the districts; the country also faced challenges with communities such as Marange sect members who refused to wear masks.

The RCCE messaging was tailored to country contexts and seasons. During holidays in 2020, messages were targeted at observing IPC protocols throughout the festivities. For example, **Senegal** trained and communicated on IPC measures during the Maouloud Islamic holiday in October. **Cameroon** ran the 'Christmas without COVID-19' campaign. **Chad** disseminated messaging on vigilance about COVID-19 in the run-up to end-of-year celebrations. Messages on infection prevention in schools were prepared in advance of school re-opening in 2021. Messages to encourage COVID-19 vaccine uptake were developed and disseminated before the vaccines reached countries. **Benin** developed a communication and social mobilisation strategy for the introduction of the vaccine in Q4 2020. As vaccination began in Q2 2021, a documentary film was aired on the benefits of vaccination against COVID-19, featuring testimonies from influencers and local authorities. A Rumor Management Committee was also set up at the community level to manage the infodemic.

Results: COVID-19 Response by pillar

WHO Support

WHO supported all countries in the region by providing technical support in the development of RCCE messages, IEC materials, and RCCE plans and strategies. Financial support was given for the translation of the messages into local languages, as well as printing, disseminating and distributing IEC materials. Additionally, WHO supported the airing of mass media messages through radio and television.

3. Surveillance, Outbreak Investigation and Calibration of Public Health Measures

Country Response

Most countries reported their first cases of COVID-19 between March and April 2020. The first country in the WHO African region to report a case was **Nigeria** on 28 February 2020, and the last to report was **Lesotho** on 12 May 2020. Most countries have faced three waves of COVID-19, with the first wave peaking between June and August 2020. The second wave peak was observed between December 2020 and February 2021. The third wave was experienced between July and August 2021. A few countries, such as **Angola**, **Congo**, and **Kenya**, experienced a fourth wave in September 2021. These countries had faced an earlier third wave in March/April 2021. The emerging patterns across most African countries, across the 11 aforementioned pillars are summarised below.

Figure 2: Surveillance and Public Health Measures in Africa

2020 Q1 — Jan–Mar	Apr–Jun — 2020 Q2	2020 Q3 — Jul–Sep	Oct–Dec — 2020 Q4	2021 Q1 — Jan–Mar	Apr–Jun — 2021 Q2	2021 Q3 — Jul–Sep	Oct–Dec — 2021 Q4
Regional Rapid response teams established; Widespread environmental disinfection; Easing of lockdown / restriction measures	Surveillance heightened at airports and points of entry; National Rapid Response Teams established; Most countries in lockdown from March 2020	Ongoing IDSR 3 training from Q2 2020	Regional Rapid Response Teams decentralised	Continued emphasis on prevention measures and social distancing during the 3rd wave due to Delta Variant	Most countries implemented full school re-opening between Q4 2020 and Q1 2021; Vaccination begun in most countries in March 2021	Continued emphasis on prevention measures and social distancing	Scale up of vaccination as vaccines become more available

Surveillance was intensified with POE screening of all passengers arriving from high-risk countries in Q1 of 2020 before the first cases were reported in Africa. For most countries, once the first case was reported, call centres were established for reporting suspected cases (alerts) and to give information on where to seek testing and/or treatment services. For most countries, more than 90% of the alerts were investigated, such as **Ethiopia**, **South Sudan**, **Uganda** and **Zimbabwe**.

Rapid response teams (RRTs) were immediately established at the national level to respond to alerts, test, isolate confirmed cases and carry out contact tracing and monitoring. In Q1 and Q2 2020, most RRTs at the national level were also sent to the districts to support surveillance and response. By the end of Q2 2020, most countries had established sub-national RRTs, as more COVID-19 cases were recorded in the districts. This was the case in **Burundi**, **Congo**, and **Nigeria**. **Malawi** trained regional RRTs in Q3 2020. **Kenya** transitioned contact-tracing functions to Nairobi Metropolitan Services and other counties in Q3 2020. Testing for COVID-19 cases remained mostly among suspected cases, internation-

al travelers and those presenting to health facilities for the management of other conditions. Community-based testing approaches were used in hotspot areas from Q2 2020, as with the **Central African Republic** for example, where agents, district medical officers and contact follow-up agents were trained on community-based surveillance. **Ethiopia** launched the enhanced ComBAT strategy with a focus on community-based approaches and mass testing. **Burkina Faso** deployed civil society volunteers to conduct COVID-19 community-based contact tracing. **Gambia** Tourism Security Unit patrol teams began patrols within the tourism development areas to enforce COVID-19 restrictions. Community-based surveillance was also strengthened to increase awareness and testing rates in the **Gambia**. However, community testing was not sustained throughout the review period due to inadequate funding to cater for testing reagents and logistics costs.

The third edition of the Integrated Disease Surveillance and Response (IDSR 3) manual was adopted in 2020 and many countries trained staff on the IDSR 3, including COVID-19, with WHO Country Office (WCO) support. In Q2 2020, **Ghana** and **Malawi** conducted regional Training of Trainers (ToT) on IDSR 3 Technical Guidelines, and **Zambia** trained Districts health teams and health care workers on IDSR. In Q3 2020, **Tanzania** rolled out IDSR 3 guidelines in the Dodoma region, and **Botswana** recruited surveillance officers to support the response in the districts and trained them on IDSR core modules. In Q4 2020, **Namibia** conducted regional IDSR, **Sierra Leone** rolled out IDSR 3 technical guidelines to all 16 districts, and **Uganda** validated and adopted IDSR 3 guidelines and training modules. **Togo** conducted IDSR training in Q2 2021, while **Burundi** did so in Q4 2021.

Public Health Measures

Many countries implemented lockdown policies and procedures, which entailed: restriction of internal movements into or out of endemic zones within the country; restriction of travel in or out of the country; restriction of public transport; working from home except for essential services staff; banning public gatherings; restricting social gathering numbers; and use of curfew hours to restrict social gatherings at night. These were imposed at different levels in all countries within a few days of reporting the first COVID-19 case. Schools were closed and hospitality industry operations were restricted with the closure of restaurants and service industries like salons and gyms.

COVID-19 prevention messages encouraging social distancing measures, wearing of masks, and handwashing and hygiene practices were widely disseminated. Some countries passed laws to penalize failure to wear a mask and non-adherence to social distancing protocols. These measures were compiled as part of the indicators to measure the stringency of COVID-19 prevention measures, i.e., the stringency index[4]. The stringency index was highest in all African countries when the first cases were reported from March to May 2020 but gradually reduced as restrictions were lifted from June/July to September 2020. This coincided with the first wave of COVID-19 in most African countries due to community spread.

Travel limitations within the countries were relaxed in Q2 2020 but re-enacted in some areas with the first wave surge. Restrictions were relaxed in the hospitality industry with the requirement to maintain social distancing and other prevention measures still in place. Phased re-opening of schools for some countries started in Q3 2020 for students sitting national level examinations only, as in **Kenya**, **Malawi**, **Uganda**, **Zambia** and **Zimbabwe**. For most countries, the full re-opening of schools was done between the first and third quarters of 2021 with school IPC guidelines issued. Examples include **Eritrea** in Q2, **Gambia** in Q1, **Ghana** in Q1, **Kenya** in Q3, **Seychelles** in Q1 and **Sierra Leone** in Q3 of 2021. This also coincided with the third wave of COVID-19 seen between June and August 2021.

WHO Support

WHO Country Offices supported countries financially and technically to scale up surveillance capacity, including supporting consultants in surveillance and data management activities, training of RRTs and contact tracers, and the deployment of surge teams in different states as needed to support the case investigation and initial response. WCOs supported surveillance for influenza-like illness (ILI) and severe acute respiratory infection (SARI) and acute respiratory infection (ARI).

Results: COVID-19 Response by pillar

Countries were also supported to conduct IDSR 3 training and mass testing in hotspot areas. **Benin** WHO Country Office supported **Benin** with two data managers focused on surveillance data management, trained central level data managers on the GO surveillance platform and mobilized 34 tablets for the collection and transfer of data from hospital structures.

Nigeria WCO supported the implementation of the hotspot strategy, including the generation of information products. The RRTs in **Congo Brazzaville** and Pointe-Noire were trained by WHO technical officers. In **Sierra Leone**, WHO provided technical support in planning and conducted first-surge mass testing for two months in health facilities and communities. WHO also provided technical support during the training on electronic case-based reporting for ten sentinel sites in Western Area Urban **Sierra Leone**. WHO supported **South Sudan** to conduct the first seroprevalence survey, and supported testing conducted through ILI/SARI/ARI surveillance. **Uganda** WCO supported health facilities to establish surveillance committees to enhance surveillance work at the health facility level. WHO Country Offices also provided technical and financial support for determining appropriate containment measures, developing and printing the guidelines in addition to information, education and communication (IEC) materials, and disseminating messaging on the same.

4. Points of Entry (POE), International Travel and Transport, and Mass Gatherings

Passenger screening at Maya Maya international airport, Brazzaville, Republic of Congo – WHO, D. Elombat

Country Response

Surveillance was intensified at points of entry, with thermal machines installed for temperature screening and passenger screening forms filled by all incoming travelers with details of their travel and destination data. POE staff were trained on screening, testing and contact-tracing measures. Countries closed their airports to commercial flights within days of confirmation of the first COVID-19 case, only allowing for cargo flights. Some African countries closed their borders before the first case was reported, e.g., **Angola**, **Botswana**, **Burkina Faso**, **Burundi**, **Equatorial Guinea**, **Gabon**, **Guinea-Bissau**, **Malawi**, **Mali**, **São Tomé and Príncipe**, **Sierra Leone**. Returnees to most countries were subjected to mandatory quarantine for 14 days. Initially, this was institutional quarantine in Q2 2020, but as the cases increased, this transitioned to home-based self-quarantine in Q3 2020. In **Rwanda**, surveillance teams used bracelet-enabled trackers to enforce travel restrictions for inbound travelers required to be on home-based quarantine. Most of the African countries opened their airports between July and November 2020, as observed in **Cameroon**, **Mauritius** and **Sierra Leone** in July; **Burkina Faso**, **Côte d'Ivoire**, **DRC**, **Kenya**, **Nigeria**, **Rwanda** and **Seychelles** in August; **Cabo Verde** and the **Gambia** in October; **Botswana** and **South Africa** in November 2020. With the re-opening of flights and land borders, guidelines were issued

Results: COVID-19 Response by pillar

requiring all incoming travelers to have a negative Polymerase Chain Reaction (PCR) test done within 48 to 72 hours of travel, and have a repeat PCR test on arrival. Incoming travelers were required to quarantine for 14 days if COVID-19 positive, but this was mostly home-based.

WHO Support

WHO provided technical and financial support in developing standard operating procedures (SOPs) for use at POEs, trained POE staff on COVID-19 preparedness and response and developed travel advisory guidelines for re-opening land borders and airports. WHO country also worked with countries to foster cross border collaboration on land POEs for example WCO **Sierra Leone** provided technical and financial support during the international cross border meeting between **Sierra Leone** and **Liberia** to agree on the implementation of cross border guidelines and also provided technical support during the POE review meeting for all 8 border districts.

5. Laboratories and Diagnostics

Country Response

Figure 3: COVID-19 Laboratory and Diagnostics Response in African Countries

Most countries initially had one or two laboratories with the capacity to test for COVID-19. These were either the national public health laboratory or the national medical research or virology laboratory. Some countries, such as **Namibia** and **Lesotho**, could not initially conduct COVID-19 PCR testing and tested the first samples outside the country. Laboratory testing capacity was scaled up in Q2 2020 through hiring and training of laboratory personnel, procurement of reagents and testing kits for public health facilities, and inclusion of private health facilities in the COVID-19 PCR lab testing network.

Countries like **Comoros**, **Gabon**, **Ghana**, **Kenya**, **Liberia**, **Madagascar** and **Nigeria**, with support from WHO and other partners, further expanded their laboratory capacity for COVID-19 testing by using and scaling up GeneXpert testing[5] in Q2 and Q3 2020. By Q3 2021, **Ghana** had 23 facilities providing testing for COVID-19 using GeneXpert across all 16 regions. Rapid antigen tests were introduced in most countries in Q1 and Q2 of 2021, e.g., **Comoros**, **Equatorial Guinea**, **Namibia**, **Rwanda**, **Seychelles** and **Sierra Leone**. Acquisition of mobile laboratories expanded testing capacity to include community mass testing in **Burundi**, **Kenya**, **Liberia**, **Mali**, **Rwanda**, **South Sudan** and **Togo** in hotspot areas.

Results: COVID-19 Response by pillar

Most countries conducted External Quality Assurance (EQA) for COVID-19 testing labs in Q3 and Q4 of 2020, including **Botswana**, **Eritrea**, **Ghana**, **South Sudan**, **Uganda** and **Zimbabwe**, with support from the WHO Country Office. EQA provided a system for objectively checking the laboratories' performance using an external agency or facility[6] to assess the quality of tests and results and give assurance that the laboratory can produce reliable results while identifying areas that require corrective actions to ensure this. The EQA assessments were followed up with support supervision and mentorship to address gaps noted in the assessment.

Genomic surveillance capacity was available in some African countries in Q1 and Q2 2020, including **Botswana**, **Kenya**, **Malawi**, **Senegal**, **South Africa** and **Uganda**. WHO supported countries to build their genomic sequencing capacity through the development of guidelines for genomic sequencing, training of laboratory technologists and procurement of reagents. Capacity for genomic sequencing was built in other countries like **Gabon**, **Niger** and **Togo** in Q1 and Q2 2021.

Daniel Baah is a data analyst at the Veterinary Services Directorate in Accra, part of which has been repurposed to provide COVID-19 testing services – WHO / Blink Media, Nana Kofi Acquah

WHO Support

WHO played a major role in building laboratory capacity in many African countries by hiring laboratory technicians and training lab personnel on COVID-19 testing, biosafety and IPC measures. WHO also provided equipment and reagents for testing to increase testing capacity, as well as coordinating the EQA in most African countries to ensure reliable COVID-19 results.

Examples of WHO support to countries include **Lesotho** where WHO installed COVID-19 testing machines and orientated the laboratory team in the use of the machines in preparation for cases. WHO in Sierra Leone recruited and trained 30 laboratory personnel who were deployed in the airport and other strategic sites to scale up COVID-19 testing capacity. In **Ghana**, WHO donated 9,000 GeneXpert cartridges for the operationalization of GeneXpert testing sites. Moreover, WHO supported **Eswatini** to expand its capacity for genomic testing.

Results: COVID-19 Response by pillar

6. Infection Prevention and Control (IPC) and Protection of the Health Workforce

Country Response

Infection, prevention and control were targeted toward the general population and health care workers. IPC guidelines and protocols, such as donning and doffing protocols were developed during Q2 2020 to guide IPC measures for health care workers at the health facility level. For example, **Nigeria** developed Guidelines for the Rational Use of Personal Protective Equipment (PPE) in the care of COVID-19 cases. IPC training for health care workers began in Q2 2020 and continued throughout the year to ensure compliance. This was conducted majorly through virtual training in Q1 and Q2 2020 for IPC trainers of trainers, which was then cascaded to health care workers in the health facilities. Follow-up IPC assessments having mostly taken place in Q2 2020 were conducted to assess compliance to IPC protocols at health facilities using the WHO IPC scorecard tool.

Seychelles prioritised health care worker safety through infection prevention and control. In Q1 2020, the country developed a case management and IPC preparedness checklist and carried out IPC assessments in all health care facilities. From Q2 2020, supervisory visits were conducted using the WHO IPC Scorecard and the quarterly IPC practice audit tool to support the practice of IPC protocols. Additionally, the country began an assessment of Health Care Worker (HCW) COVID-19 exposure and infections using the WHO risk assessment tools in Q4 2020. The report was finalised and shared in Q1 2021, and the findings were used to inform the guidance for minimizing and managing COVID-19 risks for health care workers which were finalised in Q3 2021. **Seychelles** also developed the IPC Strategic Framework 2021-2025. In 2021, IPC training materials were updated to include guidance on IPC when giving COVID-19 vaccines, management of biomedical waste from immunisation and disinfection of vaccination sites.

IPC guidelines for the general public were also developed by countries. For instance, **Tanzania** developed guidelines on the rational use of PPE; **Lesotho** developed interim guidelines on the use of non-medical masks in public places; **Ethiopia** developed a community-based strategic activity plan to enhance IPC/water, sanitation and hygiene (WASH); **Nigeria** produced guidelines on IPC safety at National Youth Service Camps, and **Namibia** issued guidelines on COVID-19 exposure in public and work environments to the general public in Q3 2020.

A worker produces face masks at the Kitui Textile Industry, Kenya – AFP / Getty Images, Luis Tato

Results: COVID-19 Response by pillar

At the beginning of the COVID-19 pandemic, there were global shortages in the availability of face masks and other PPE due to lockdown measures limiting exports from China, increased demand globally with the high number of COVID-19 cases outside Africa[7] and long customs clearance processes. Most countries instituted the requirement to wear masks in public, which necessitated countries to begin local manufacture of face masks using locally available materials to supplement the PPE donations from various partners and foundations. The **Central African Republic**, **Eswatini**, **Gambia**, **Ghana**, **Kenya**, **Nigeria**, **Rwanda** and **Uganda** are some examples of countries that began local manufacture of reusable cloth masks in Q2 2020 and later moved to produce disposable masks from Q2 and Q3 2020. **Ghana**, for example, began production of face masks at highly subsidized prices and produced a million quality-assured face masks, with 11th-grade students and teachers across the country benefitting from them. At the same time, countries began local production of alcohol-based hand rubs. By Q1 2021, most African countries had PPEs readily available to the general public at affordable prices.

WHO Support

WHO provided technical and financial support for the development and printing of IPC guidelines and protocols. Furthermore, WHO supported the development of IPC training materials for health workers that were delivered virtually as well as during physical regional training. WHO supported **Eswatini** to develop the IPC action plan and **Zimbabwe** to finalize and print the reviewed PPE policy. In **Eritrea**, WHO provided training and training materials, videos, and interim guidelines to national and sub-national health facilities to build IPC capacity. In **Ghana**, WHO AFRO supported weekly virtual IPC training, and received financial and technical support provided to the Greater Accra Regional Health Directorate for IPC training. WCO **Namibia** supported the introduction of two online interactive courses to provide guidance for the management of ill travelers and the management of COVID-19 cases or outbreaks on boats and ships. WHO AFRO and Country Offices also led support efforts to countries by providing and distributing PPEs, e.g., **Benin**, **Eswatini**, **Gabon**, **Lesotho**, **Liberia**, **Nigeria**, **Senegal** and **South Sudan.**

7. Case Management, Clinical Operations and Therapeutics

Country Response

Figure 4: COVID-19 Case Management and Clinical Operations

2020 Q1 — Jan–Mar	Increase in number of isolation and treatment facilities National COVID-19 case management guidelines finalised and HCWs trained	**2020 Q3** — Jul–Sep	Continued training and support supervision. Increasing ventilators and oxygen capacity
Isolation and treatment facilities identified and prepared COVID-19 Clinical case management protocols developed and HCWs trained	**Apr–Jun 2020 Q2**	Countries established regional treatment centres. Focus on increasing oxygen availability	**Oct–Dec 2020 Q4**
2021 Q1 — Jan–Mar	Continued training and support supervision	**2021 Q3** — Jul–Sep	Continued training and support supervision
Countries revised COVID-19 Case Management Guidelines as needed	**Apr–Jun 2021 Q2**	Continued training and support supervision	**Oct–Dec 2021 Q4**

Results: COVID-19 Response by pillar

Countries adopted the WHO case management guidelines and finalised country-specific case management guidelines and SOPs within Q1 and Q2 2020. There were regular updates to the case management guidelines in line with emerging evidence and guidance from the WHO. National referral hospitals or university teaching hospitals were identified as the first isolation and management units in Q1 and Q2 2020. Countries worked towards establishing regional isolation and treatment centres in Q2 2020. By Q3 2020, most countries had established regional treatment centres, e.g., by Q3 2020, **Eritrea** had established COVID-19 isolation treatment centres in all Zobas, in addition to the two in Asmara; **Burkina Faso** decentralised the management of COVID-19 to other hospitals; **Chad** designated Farcha Provincial Hospital and provincial hospitals as COVID-19 treatment centres. **Senegal** set up treatment centres in each region in Q4 2020 and **Comoros** set up mobile medical teams for home follow-up of positive cases in Q1 2021.

The biggest challenge to COVID-19 management was the availability of COVID-19 intensive care unit (ICU) beds, due to insufficient ventilators and oxygen to manage severe and critical COVID-19 cases. Countries like **Rwanda** started the production of ventilators to meet this gap. Most countries allocated more funds to the health sector to build capacity for ICU beds and increase oxygen capacity. In Q1 2020, **Eswatini** expanded oxygen supply through the installation of a generation plant at The Luke Commission. WHO supported **Uganda** in Q1 2020 to quantify oxygen requirements and related delivery accessories' need for inclusion in the application to the Global Fund to Fight AIDS, Tuberculosis and Malaria for funds dedicated to the COVID-19 response. In **South Sudan**, an oxygen plant including 240 filled oxygen cylinders was constructed and handed over to the MOH in Q3 2020. 30 units of oxygen concentrators were distributed to various health facilities in **Tanzania** in Q3 2020.

Solar powered oxygen concentrator systems are delivered by WHO to Hanaano Hospital in Galmudug state, Somalia – WHO, Ismail Taxta

WHO Support

WHO was key in supporting countries to increase their capacity to manage COVID-19 cases. This included supporting the development and updating of national guidelines on the management of COVID-19, training healthcare workers on IPC and case management across all the countries and providing follow-up supportive supervision to healthcare workers. WHO also supported equipping of the COVID-19 case management centres, for example, WCO **Tanzania** distributed oxygen concentrators, ventilators and other critical supplies for COVID-19 case management. In some countries like **Eswatini**, WHO supported the recruitment of staff to support COVID-19 case management.

Results: COVID-19 Response by pillar

8. Operational Support, Logistics, and Supply Chains

Boosting Sierra Leone's COVID-19 response and disease surveillance with laboratory commodities – WHO Sierra Leone

Country Response

Several countries experienced shortage of PPEs and essential equipment especially in Q1 and Q2 2020 when COVID-19 was first reported in African countries. The shortage was attributed to high global demand for PPEs, travel restrictions, lockdowns and country-specific challenges, which limited importation at the beginning of the pandemic. In many countries, the available PPEs were deployed to all POEs facilities, national lab networks and hospitals. Several independent initiations and interactions were undertaken to tackle this issue, including donations and re-distribution of materials where they are most needed. For instance, donations from Jack Ma and the China Government included COVID-19 test kits, PPEs like masks, face shields, gloves, sanitisers and equipment like ventilators, respirators with accessories, and oxygen generators to **Botswana**, **Guinea-Bissau**, **Guinea**, **Gambia**, **Mauritius**, **Chad**, **Namibia**, and **Tanzania**. WHO and UN agencies' support was also critical with examples of WHO, WFP, WHO, UNDP and UNICEF providing **Guinea-Bissau** and **Zimbabwe** support for telephone and internet connectivity, transport and fleet management including fuel in Q 2 of 2020. Moreover, **Uganda**, **Tanzania**, **Congo**, **Nigeria**, **Gabon**, **Guinea**, **Burkina Faso**, **Lesotho**, **South Sudan**, **Benin**, **Comoros**, **Madagascar** and **Togo**, **Senegal**, **South Sudan** received hand wash, sanitisers and donations of PPEs, masks, gloves from WHO, WFP and UNICEF. In addition to PPEs, **Senegal** received 30 ventilators from the WHO office. Private organizations in-country also contributed to the COVID-19 response through donating PPEs directly or through contribution to existing COVID-19 funds.

By Q2 and Q3 of 2020, most African countries had made strides toward organizing and strengthening procurement mechanisms to acquire COVID-19 PPEs and other required materials. Governments were able to quantify their COVID-19 needs, procure and distribute these commodities to the peripheral facilities. **Seychelles** logistics pillar developed tools to project required PPE in Q2 of 2020 with the support of the World Customs Organization (WCO). This enabled centralized COVID-19 supplies ordering through government procurement in Q3 2020. **Liberia** in Q2 2020 equipped and reinforced the national security stock of drugs, medical equipment and PPE. **Malawi** prepared and submitted their procurement plan for Covid-19 to WB for support in Q3 2020. In Q2 2020, **Benin** activated the Logistics Sub-Committee, which in-return established the COVID-19 stocks status and carried out the needs quantification for 6 months (June-Nov 2020). By Q4 2021, data on COVID-19 stock status in **Benin** was available at all levels, enabling real-time adjustment of orders. **Burundi** instituted a functional emergency purchasing platform in Q2 2020 hence enabling an efficient supply of drugs, personal

Results: COVID-19 Response by pillar

protective equipment, reagents and consumables to the districts. In Q1 2021, **South Sudan** finalized the Procurement plan of over 14 million PPE valued at USD 5 million and submitted it to the South Sudan Humanitarian Fund. In Q1 2021, **Comoros** strengthened customs collections, transport, warehousing and inventory management for COVID-19 supplies. **Equatorial Guinea** carried out training for transfer of skills for logistical management of the storage warehouse of drugs and medical materials in Q2 2021.

WHO Support

WHO gave logistical support **to all 47 countries**. WHO worked with **Eswatini**, **Ethiopia**, **Gambia**, **Kenya**, **Lesotho**, **Nigeria** and **South Sudan** to develop distribution plans and providing vehicles to distribute COVID-19 supplies and charted a special aircraft in **Comoros** to move teams and equipment to Mwali Island to support the COVID-19 response. **Uganda** WCO supported the procurement of laboratory supplies through the Uganda Virus Research Institute (UVRI) procurement channel and gave technical support for the quantification of oxygen and related delivery accessories for inclusion in the Global Fund application for COVID-19 response. WHO provided technical support to enable countries to develop and strengthen their emergency supply needs quantification, procurement and distribution as outlined in the other sections.

9. Strengthening Essential Health Services and Systems

Country Response

With the reporting of COVID-19 cases, health services were disrupted due to fear of SARS-CoV-2 infection while in health facilities. Disruption was also caused by the implementation of lockdown travel restrictions. A decrease in utilisation of health services was observed and WHO guided to ensure continuity of essential health services (CEHS) while still tackling the pandemic. As part of the response, African countries established mechanisms to ensure no or minimal disruption of essential health services. **Eritrea** reinforced messages on the continuity of immunisation services at health facilities in all Zobas. Community outreach activities on immunisation were emphasised and an android application was designed for use by CHWs and schools to promote continuity of services. As a result of the focus on continued child immunisation, routine immunisation coverage in **Eritrea** in 2020 was 14% higher than in 2019 despite COVID-19[8]. **Eswatini** conducted a measles-rubella catch-up campaign with coverage of more than 80%. **Eswatini** guidelines on CEHS were disseminated, and HCWs were sensitised. **Ethiopia** received USD 50,000 funds from WHO (as catalytic support) to regions and districts to support the continuity of essential child health services with immunisation as the entry point. The country disseminated messages to encourage community continuity of immunisation services. Programme coordinators from the Oromia region were trained on CEHS and conducted vaccination drives. Oral Polio vaccination campaigns were integrated with WASH activities and mobile health and nutrition teams were assigned to cover woredas. **Liberia's** MOH also received catalytic funding of USD 50,000 from WHO AFRO to strengthen the continuity of essential health services, including adapting the CEHS guidelines, in addition to monitoring and evaluation (M&E). **Benin** conducted a mass vaccination campaign against meningitis in different communities in Atacora Department. **Madagascar** ensured the continuation of routine vaccination at basic health centres, ensuring the availability of all antigens.

Nigeria's Centre for Disease Control released guidelines for the management of pregnant women and nursing mothers in the context of COVID-19. The Hard-to-Reach team provided life-saving health services to children and women in remote and security-challenged areas. **Ghana** developed guidelines on the continuity of essential Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) services and established specialised COVID-19 management centres to allow for CEHS in other facilities. **Uganda** also received USD 50,000 from WHO to fund the continuity of essential health care services and developed and disseminated guidelines on the continuity of essential health services with an emphasis on performance tracking and response to any disruption of services.

Results: COVID-19 Response by pillar

Continuity of essential services for other health programmes was also prioritised. **Equatorial Guinea** developed the HIV/TB/Hepatitis Strategic Plan 2021-2025. **Gabon** conducted an evaluation of the impact of COVID-19 on the continuity of essential health services, reviewed the performance of the National Tuberculosis Control Programme and developed the Tuberculosis National Strategic Plan 2021-2025. **Zimbabwe** conducted the community action cycle for malaria in the context of COVID-19 and reviewed the implementation of the trachoma programme in the era of COVID-19. **Eswatini** decentralised non-communicable disease services to primary health care facilities to serve the greater population. **South Sudan** launched a National Action Plan for Health Security to strengthen its capacity to prevent, detect and respond to public health emergencies. **Burundi** identified and adopted various activities critical to ensuring service continuity, and validated a service continuity budget of USD 9,142,162.

Case Management Pillar trainers from WHO, CDC and Ministry of Health and Social Services – WHO Namibia

WHO Support

WHO AFRO office supported all AFRO countries in the monitoring of essential health services to quickly detect disruptions and develop appropriate mitigation measures[9]. Additionally, WHO supported frontline health services capacity assessment in the context of COVID-19 to assess the COVID-19 case management capacity in health facilities, and also to assess the continuity of essential health services from primary care facilities to referral facilities. Frontline health services capacity assessments have been conducted in **Burundi**, **Cameroon**, **Chad**, **Congo**, **Ghana**, **Kenya**, **Mali**, **Namibia**, **Nigeria**, **Rwanda**, **Senegal**, **Zambia**, **Zimbabwe** and **Seychelles**. The results have informed the countries on areas for improvement to increase capacity to manage COVID-19 cases, while still ensuring continuity of the essential health services.

WHO AFRO provided catalytic funding to several African countries to ensure continuity of essential health services. These included countries like **Ethiopia**, **Ghana**, **Liberia** and **Uganda**. WHO Country Offices were also instrumental in providing technical support for the development of guidelines on CEHS in several countries, such as **Eswatini**, **Ghana** and **Kenya**. WHO also continued support for routine and catch-up immunisation services in several countries.
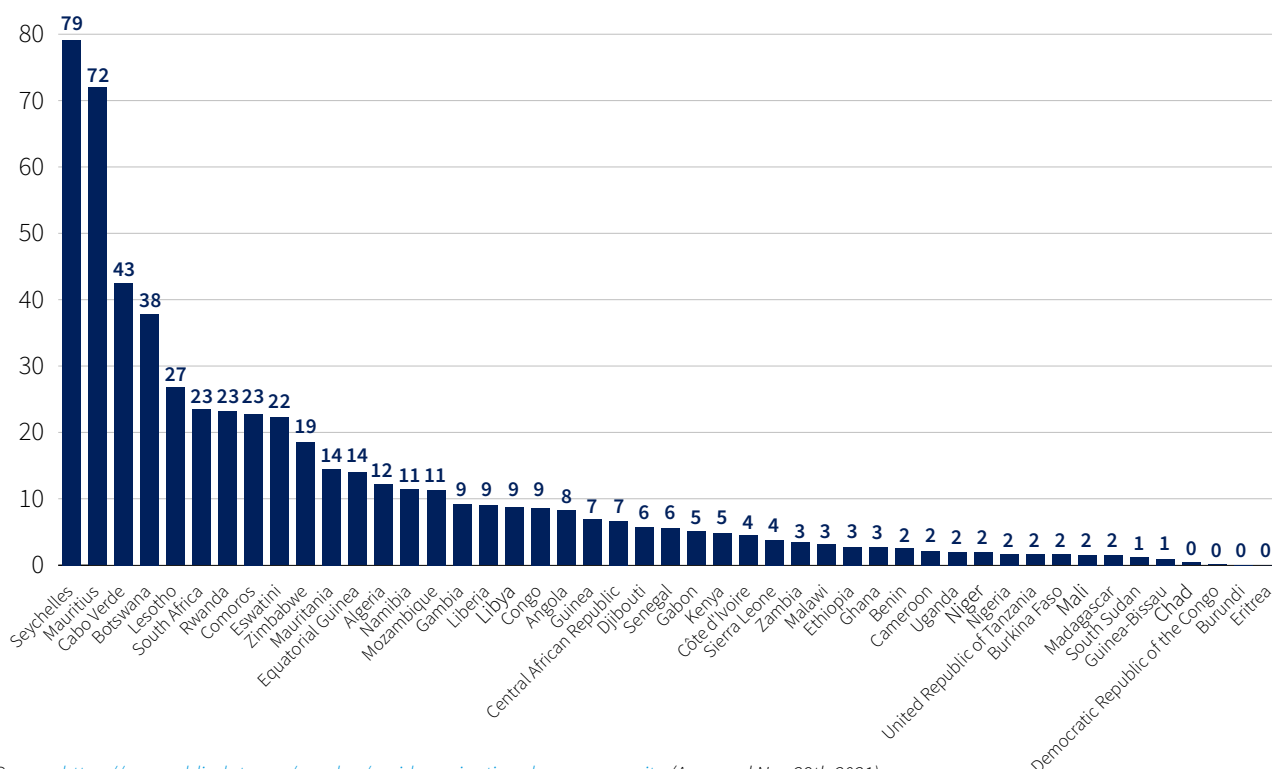
10. Vaccination

Country Response

COVID-19 vaccines were introduced in Q1 2021, one year after the pandemic began in Africa; however, uptake has been low, with 6.8% of the population having received at least one dose of the vaccine, and only 4.45% being fully vaccinated by Q3 2021. As of now, **Seychelles** has the highest proportion of its population vaccinated (79%). It also has the smallest population among the AFRO countries. The **Democratic Republic of Congo (DRC)** has the lowest proportion of the population vaccinated (0%). The low vaccination uptake in DRC has been attributed to safety concerns and a lack of perception of COVID-19 as a threat, especially among those who do not know someone who has been infected or died from COVID-19. Those in conflict-affected areas also consider insecurity to be a greater threat than COVID-19. As a result, despite having received more than 1.7 million doses of AstraZeneca vaccines, more than 1.3 have been redistributed to other countries with higher vaccine uptake[10]. **Eritrea** has not yet started vaccinating its citizens. Figure 2 below shows the percentage of the fully vaccinated target population per country.

Figure 5: Persons fully vaccinated per 100

Source: *https://ourworldindata.org/grapher/covid-vaccination-doses-per-capita* *(Accessed Nov 29th 2021)*

Preparation for vaccination began in Q4 2020 in most countries, with support to develop national deployment and vaccination plans. RCCE messaging was developed to promote vaccine uptake in all countries. Most African countries kicked off their COVID-19 vaccination in March 2021. Some countries began earlier like **Mauritius** in January 2021 and **Zimbabwe** on 22 February with Sinopharm BBIBP-CorV. Vaccine uptake was been slower than expected at first due to low vaccine availability in the countries in Q1 and Q2 2021. Vaccine stocks later increased through donations and country procurement, but uptake remains low for countries in the WHO African region with less than 10% of the population being fully vaccinated[2].

Results: COVID-19 Response by pillar

WHO Support

WHO gave technical support to most AFRO countries in the development of country vaccine and deployment plans. More-over, WHO supported country applications for the COVAX facility, as well as planning and the training of health workers for vaccine roll-out. To review the vaccine and deployment plan, WCO gave technical and financial support to hold vaccine Intra Action Review meetings to assess implementation success, gaps and challenges in COVID-19 vaccine rollout, and develop improved deployment plans. WHO Country offices continue to support countries in the development and dis-semination of messaging to promote vaccine uptake.

11. Research, Innovation and Evidence

Country Response

Most African countries conducted research activities to understand the community knowledge, attitude and practices (KAPs) towards COVID-19. These aimed to generate evidence to inform guidance and strategic direction for COVID-19 prevention and management. In Q1 of 2020 **Ghana**, in collaboration with WHO conducted surveys on face mask use in hotspots districts in the Greater Accra region. In **Tanzania**, WHO supported the MOH Zanzibar Health Research Institute (ZAHRI) in conducting a survey to assess how compliance with public health measures interrupted the transmission of COVID-19 in Q2 2020. In Q3 of 2020, **Nigeria** conducted a perception survey on the threat of COVID-19 and efficacy of recommended protective behaviours. In Q4 2020, **Eritrea** conducted a nationwide mid-line KAP Survey. The results were used to revise the RCCE strategy in Q1 2021. **Botswana** conducted surveys to gauge public perceptions around vacci-nations in Quarter 1 of 2021. **South Sudan** in Q2 2021 conducted a rapid KAPS study targeting concerns like cultural beliefs, behavioural patterns, and identifying knowledge gaps. **Kenya** also conducted several nationwide community KAP surveys from Q3 2020, to understand community response and compliance to COVID-19 containment measures, as well as its effect on the community. **Burkina Faso** in Q4 2021 conducted a socio-anthropological survey, to understand the causes of reducing compliance to the COVID-19 IPC measures which informed the review of the risk communication strat-egy. Seroprevalence surveys were carried out in various countries including **Zimbabwe**, **Zambia**, **Uganda**, **Togo**, **South Sudan**, **South Africa**. **Sierra Leone**, **Senegal**, **Nigeria**. **Mozambique**, **Mauritania**, **Mali**, **Malawi**, **Madagascar**, **Kenya**, **Guinea-Bissau**, **Guinea**, **Ghana**, **Gabon**, **Ethiopia**, **Democratic Republic of the Congo**, **Côte d'Ivoire**, **Congo**, **Central African Republic**, **Cameroon**, **Cabo Verde** and **Angola**. The outcomes of some of the KAP surveys, and seroprevalence surveys highlighted in country SITREP reports can be found in the WHO COVID-19 Knowledge hub (https://aho.afro.who.int/covid-hub/mu) and tracker (https://serotracker.com/en/Explore).

Few clinical trials were reported from the WHO AFRO countries, an example being a clinical trial on the preventive role of "COVID Organics" in Congo in Q2 2020. COVID Organics is herbal remedy made from sweet wormwood (Artemisia annua) and various other plants, developed by Madagascar's state-owned Malagasy Institute of Applied Research, aimed at pre-venting COVID-19.

WHO Support

WHO supported **Guinea**, **Burkina Faso** and **Tanzania**, **Ghana** carry out the aforementioned research on COVID-19 relat-ed topics. Further, WHO Supported **Eswatini** in conducting a study on HCW infection in Q1 2020, and **Benin** to participate in the symposium on resilience mechanisms to health shocks in developing countries which took place in Q4 2020 : In Q1 2021, WHO supported **Nigeria** to develop of action brief on "Quality essential health services and COVID-19- Lessons from Nigeria" in collaboration with the Quality team in headquarters and AFRO for publication in Global Learning Laboratory for quality universal health coverage.

Discussion

COVID-19 testing in Rwanda – WHO Rwanda

COVID-19: A New Global Health Challenge

COVID-19 brought with it an unprecedented health crisis, the response to which required learning from past epidemic and pandemic experiences and quickly generating new evidence to guide containment approaches. The measures applied in emergency responses to COVID-19 were based on lessons learnt from previous epidemics such as that caused by the Ebola virus (EBOV) and pandemics like the one due to the H1N1 Influenza A virus. The Ebola virus - causing Ebola Virus Disease (EVD), a haemorrhagic fever – is transmitted through contact with body fluids, including blood, sweat, saliva, vomit, diarrhea, urine, breast milk and semen infected by the virus. The virus is spread during the final symptomatic stage of the disease[11]. Asymptomatic carriers of EBOV, who do not become ill after physical contact with EVD patients, play a very limited role in the EVD outbreak. Invaded viruses are often quickly wiped out by efficient immune responses, leading to a low viral load and a short-lived inflammatory reaction that disappears in two to three days without subsequent tissue and organ injury. It is commonly believed that an asymptomatic carrier is not infectious[12]. The case fatality rate for Ebola Virus has ranged in various outbreaks from 25 to 90%. The influenza virus is also transmitted through respiratory droplets. It however has a lower-case fatality rate (0.026%) compared to 2% from COVID-19[13]. H1N1 has a short incubation period (one to seven days). Infected patients can transmit the H1N1 virus from one day before symptoms appear up to seven days after symptoms appear.

Although the case fatality rate for COVID-19 is much lower than that of the Ebola Virus, COVID-19 has caused more deaths than all the Ebola Virus outbreaks combined. This is due to the mode of transmission: inhalation of air carrying the smallest very fine droplets and aerosol particles that contain the infectious virus. The risk of transmission is greatest within three to six feet of an infectious source where the concentration of these very fine droplets and particles is greatest. Additionally, COVID-19 asymptomatic and pre-symptomatic patients also transmit the disease and are therefore more likely to expose others unknowingly during the incubation period. COVID-19 has also caused more deaths than Ebola and H1N1 Influenza because of a higher reproduction rate (2.5-3.2) as compared to Ebola Virus (1.5-2.5) and H1N1 Influenza Virus (1.46-1.48). The reproduction number (R0) describes how many additional cases of a disease each infected person will cause during their infectious period. The numbers exist within a range because they depend on a variety of factors that vary from situation to situation and case fatality rate. The characteristics of the three viruses are summarised in Table 1[1, 14, 15, 16, 17, 18, 19].

Discussion

Table 1: Characteristics of COVID-19, Influenza H1N1 and Ebola Virus

	COVID-19	Influenza H1N1	Ebola 2014	Ebola 2018
Categorisation	Pandemic	Pandemic	Endemic	Endemic
Year of outbreak	2019–ongoing	March 2009–June 2010	2014	August 2018 – June 2020
Country of origin	China	Mexico	Guinea	Democratic Republic of Congo
Mode of transmission	Respiratory droplets	Respiratory droplets	Contact with infected body fluids	
Incubation period	5–6 days, with a range of 1–14 days	2 days, with a range of 1–7 days	8–10 days after exposure, with a range of 2–21 days	
Timing of transmission	Symptomatic and asymptomatic transmit virus	1 day before symptoms to 7 days after onset of symptoms	Only symptomatic patients majorly transmit virus	
Reproduction Number (Ro)	2.5–3.2	1.46-1.48	1.51–2.53	1.03
No. of reported cases	261,926,144*	60,800,000 estimated	2.0	3481
No. of reported deaths	5,220,328*	12,469 estimated	11,310	2299
Case fatality rate	2%	0.01–0.03%	39.5%	66%
Susceptible population	Elderly (>58), hypertensive, diabetic, obese	Children, Elderly > 65, pregnant women, chronic disease patients	Any person in close contact with symptomatic patient	Any person in close contact with symptomatic patient

Note: Numbers reported as at November 29th 2021

Africa's Experience: A Different Epidemiological Picture

COVID-19 started in China, but quickly spread to all countries by May 2020. The first COVID-19 wave in Africa peaked between June and August 2020 and was driven by community spread of the imported cases. The second wave peak was experienced between December 2020 and February 2021 and was driven by re-opening of airports in many African countries from July to November 2020. Partial re-opening of schools, travel and low compliance to social distancing regulations during the December holiday season may all have contributed to an upsurge of cases. The third wave was experienced in June/August 2021 and was attributed to entry of the Delta variant into Africa[20]. A few countries experienced a fourth wave in September 2021, e.g. **Angola**, **Congo**, **Kenya**. These countries had experienced an earlier third wave in March/April 2021. Notably, the African experience of COVID-19 was different from that of the rest of the world. Africa showed the lowest number of cumulative cases as compared to all continents.

Table 2: Regional COVID-19 Cases and Mortality

| Global Region	Cumulative cases	Cumulative deaths	Case fatality rate *(for reported cases)*
Asia	81,988,286	1,212,093	1.5
Europe	73,113,205	1,409,485	1.9
Europe	73,113,205	1,409,485	1.9
North America	58,784,038	1,189,970	2.0
South America	38,954,587	1,181,199	3.0
Africa	8,718,947	223,365	2.6
Oceania *(includes Australia)*	366,360	4,201	1.1
Global	**261,926,144**	**5,220,328**	**2.0**

Note: Numbers reported as at 29 November 2021

Discussion

WHO estimates that only 14.2% of the COVID-19 cases are reported in Africa. This is because COVID-19 detection in the region has focused on testing those presenting in health facilities, in addition to arriving and departing travelers, leading to large-scale under-reporting. This is particularly salient in light of the high percentage of asymptomatic cases on the continent.

This would mean that the number of people infected from the onset of the pandemic to November 2021 would be 61.2 million, against the reported 8.7 million cases. This may also mean that deaths are under-reported as well. However, there have been no reports of excess hospitalisation and widespread deaths at the community level in Africa. Several other theories have been advanced to explain the low number of COVID-19 cases and mortality in Africa[21]. One is that the severity of disease in this region has generally been mild with many cases being asymptomatic or with mild to moderate disease. This may be due to higher immunity developed due to exposure to other endemic coronaviruses and therefore development of partial cross-immunity to the SARS-CoV-2. Modelled estimates from recent studies indicated that seroprevalence of COVID-19 antibodies in Africa (51.1%) is high and has been increasing as the cases have increased. The highest seroprevalence estimate in the world is in South East Asia at 68.4%.

**Figure 6: Vaccination vs immunized population as at Dec 31, 2021**
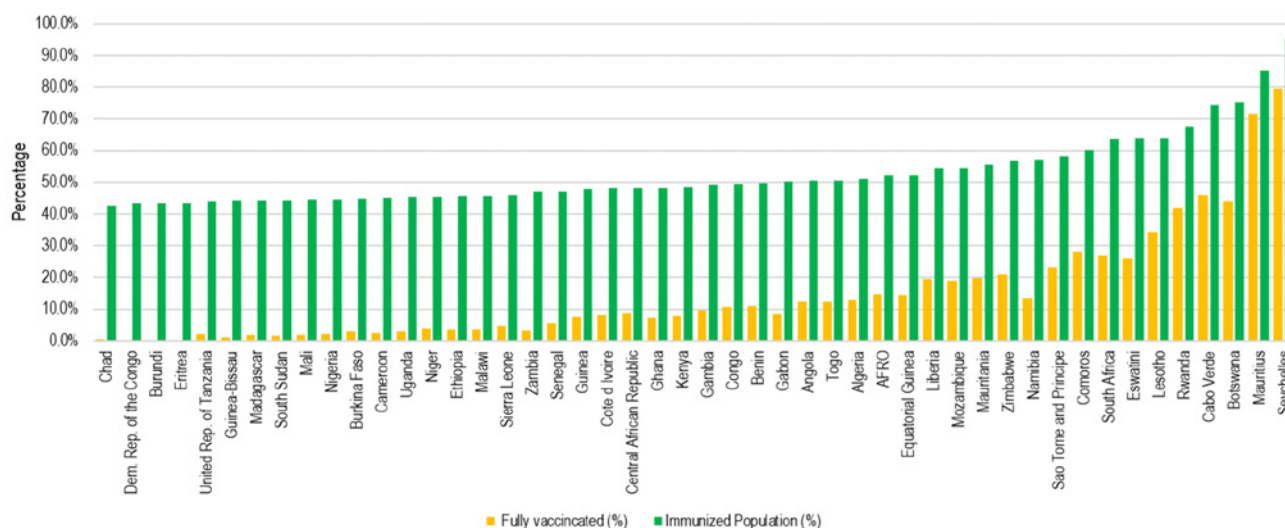
Source: https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(22)00233-9/fulltext

The demographic make-up of Africa also favours mild disease. Age above 58 years is the single largest risk factor for severe COVID-19 illness and mortality. The age distribution in Africa is mostly made up of children and youth (0-35 years) who are less susceptible to COVID-19, explaining why majority of the cases on the continent are asymptomatic or mild. The elderly population in Africa also live in rural areas, whereas most cases in Africa were highest in urban areas/cities where the population is mostly the youth. Chronic diseases like hypertension and diabetes – also risk factors for COVID-19 morbidity – are less prevalent in Africa.

Discussion

Figure 7: Age demographic pyramid in Africa and Europe

Source: https://www.populationpyramid.net/
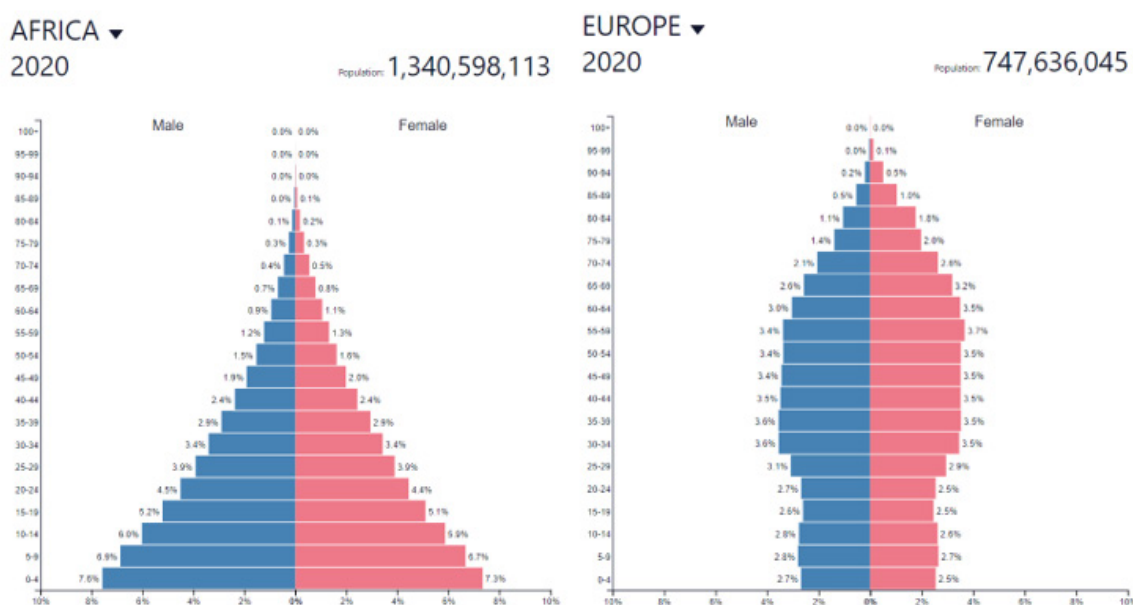
The swift and rapid response to the pandemic prevention and control discussed below cannot go unmentioned and also would explain the lower case and mortality numbers.

Strengths in the Africa Country COVID-19 Response

African countries mounted timely, appropriate containment measures – even with limited resources. The greatest strength lay in activating multi-agency/ministerial National Emergency Response Committees/teams, which were constituted to provide policy directions on response efforts towards the COVID-19 outbreak, often chaired by the Head of State. The multi-agency approach ensured coordination of all relevant stakeholders key to the COVID-19 response. The implementation of strategic decisions was coordinated by the PHEOCs, which were devolved to sub-national units. WHO AFRO countries had developed COVID-19 preparedness and response plans prior to reporting of the first case, having learnt lessons from the rest of the world on the critical nature of early containment measures.

COVID-19 containment measures in African countries were implemented in a timely manner, with airports being shut before or within days of reporting the first COVID-19 case. Lockdowns were instituted in most cases with stay-at-home campaigns running. Countries in the region were able to mobilise their communities to follow these directives, hence accounting for the low number of cases in Q1 and Q2 of 2020. The re-opening of airports and easing of travel restrictions in countries towards the end of Q2 2020 came with the first wave of COVID-19, occurring between June and August 2020.

Risk communication and community messaging was robust with messages created, approved and translated into multiple languages. The RCCE messaging was disseminated using multi-pronged approaches such as through television and radio campaigns, use of social media, use of community and social media influencers, posters and the printing of IEC materials. The consistent messaging was effective in ensuring all citizens and residents were reached, even those in the rural areas. However, there was also a high prevalence of the infodemic phenomenon which contributed to non-compliance to COVID-19 containment measures.

Discussion

Research, Innovation and Production Capacity in Africa

Most of the documented research carried out with regard to the COVID-19 pandemic were KAP surveys to understand community behaviour and response to the pandemic. Seroprevalence surveys were carried out to assess the prevalence of community infection in a set-up of low infectivity rates compared to the global picture. These were useful to inform improvement of COVID-19 control mechanisms. However, more clinical studies should be encouraged to also gauge any differences in management and patient outcomes. This calls for strengthening of health information systems including electronic medical record systems to more readily avail data for research and knowledge management.

There is great untapped capacity to produce health products and technologies, which was utilised in the COVID-19 response as African countries sought innovative local solutions to the challenges presented by the pandemic. To scale up laboratory capacity for COVID-19 testing, most countries made use of GeneXpert machines that were already available, were more affordable than other screening methods, required less personnel and specialisation to operate, and had a faster turnaround time. This enabled speedier diagnosis and management of the disease. To enable adherence to IPC protocols, countries began manufacturing cloth masks, which were cheaper to produce and reusable, thus making them sustainable for the general public. Although cloth masks were proven to be less effective in containing the transmission and spread of COVID-19 as compared to surgical masks, they still slowed disease transmission. Countries also started mass production of surgical masks and hand sanitizers at a much lower cost than the imported options.

Case management capacity was scaled up rapidly with the designation of the first isolation and treatment centres. Temporary isolation and treatment centres in schools or tents in open fields were set up and permanent treatment centres were also constructed. Moreover, existing health facilities were equipped with ventilators. Oxygen plants were built and the use of oxygen concentrators was scaled up to support ICU care for severe and critical COVID-19 cases. Countries like **Rwanda** led in innovation and technology use in Africa by utilising machines for patient examination and record-keeping, as well as manufacturing their own ventilation machines.

Risk Communication and Community Engagement in Pandemic Control

As countries responded to the COVID-19 pandemic with containment and IPC measures, the biggest hurdle has been compliance to these measures over time. This includes social distancing measures, wearing of masks and washing hands. Compliance was highest in the first two quarters of 2020, but reduced over time with the lifting of restriction measures. WHO has described "pandemic fatigue" as the demotivation to follow recommended protective behaviors, emerging gradually over time and affected by a number of emotions, experiences and perceptions. This demotivation is part of a complex interplay of individual and contextual factors that affect protective behaviors[22]. Examples of reasons for this emerging in Africa include: perceived lower risk of COVID-19 with easing of lockdown restrictions; misinformation on COVID-19 causes and effects; the negative social and economic impact of COVID-19 restrictions, among others[23]. A 15-country study in African countries showed that many respondents continued to socialize as before COVID-19, despite public health advice to the contrary. Only a minority reported that they reduced the frequency with which they host guests in their home or gather in large groups to socialize since the outbreak began. Predictably, the countries reporting the lowest observation of protective measures are also those where more people feel that the threat from the virus is being exaggerated – e.g., DRC, Nigeria, Niger and Sudan[24]. This could explain the second COVID-19 wave in Africa, which was largely attributed to airports re-opening to international travel, but also coincided with the December holidays where there is increased travel from urban to rural areas. This likely contributed to faster spread of the Delta variant in the second wave.

The notable vaccine uptake hesitancy among the African population is also due to similar individual and socio-cultural contextual factors that contributed to pandemic fatigue. Vaccine hesitancy has been driven by a lack of trust in COVID-19 vaccines, which is higher in those who trust rumours and conspiracy theories. Likelihood of vaccine uptake was also found to be lower in those who did not perceive themselves to be at risk of getting the disease. These individuals likely did not personally know anyone who had tested positive. Others did not trust the vaccine's safety[24].

Discussion

The Socio-Economic Effect of Health Emergencies

Despite the ban on international travel and local movement restrictions, complete lockdown measures could not be sustained due to significant socio-economic losses associated with the economic slowdowns that ensued. Where full lockdowns were implemented, the public was required to stay home and the knock-on effects resulted in loss of income across many industries, more so to those working in the informal sector and earning daily wages. The hospitality industry was largely impacted due to initial closure of hotels and, even after they were allowed to open, they still operated at sub-optimal capacity due to restrictions on travel and social gatherings. This resulted in the loss of jobs and of income. A study done in **Kenyan** informal settlements showed that 86% of those interviewed experienced partial or full loss of income, and 74% reported eating less or skipping meals due to having too little money for food[25]. This means that though stringent controls may reduce COVID-19 transmission, they are not sustainable in the long term as majority of the AFRO region countries did not have adequate finances to cushion the population against economic losses. The benefits of containment measures must be weighed against socio-economic impact of the same.

Health Systems Strengthening Approaches to Managing COVID-19 and Improving Overall Health Outcomes

COVID-19 is a communicable respiratory disease but those with the highest risk of severe illness and death are the elderly, those with chronic diseases like diabetes, hypertension, chronic respiratory disease, obesity and immunosuppression. COVID-19 therefore blurred the line between communicable and non-communicable diseases programming, and highlighted the need for health systems strengthening in order to cater for all disease conditions and emergencies. The COVID-19 pandemic also exposed weaknesses in the health system in terms of emergency response. The need for ICU care increased with rising cases of severe and critical COVID-19. The availability of ICU beds, ventilators and oxygen at the bedside was limited in many African countries. Governments therefore put financing into the health sector to strengthen critical care by investing in ventilators, piped oxygen, along with improving referral, M&E and surveillance systems. This has not only benefitted COVID-19 patients but also all other patients needing critical care.

A strong commodity supply chain system is key to ensuring a responsive health system. At the beginning of the pandemic, most African countries were not able to quantify their COVID-19 supplies needs. Mechanisms for the procurement, storage and distribution of commodities were not well established with reliance on donations. However with time, counties were capacity built to be able to quantify their needs for the COVID-19 response and put in place mechanisms to ease procurement and supply given the urgency of the situation.

There was a notable decline in the community utilisation of outpatient health care services as countries reported their first COVID-19 cases[26]. This was mainly attributed to fear of nosocomial COVID-19 infection. Lockdown measures also limited travel and access to health facilities. The decline in access to, and utilisation of, health services was noted early in the response and measures put in place to monitor and implement timely response to ensure continuity of essential health services. Therefore, the pandemic threatened to negate gains made across all health programmes and reverse or slow the progress towards attaining the Sustainable Development Goals (SDG) 2030 targets. Development and dissemination of guidelines to ensure CEHS was key in ensuring that, despite dealing with a pandemic, the health system remained resilient to cater for other disease conditions.

Lessons Learnt

1. **Global connectivity through air travel has increased the chances of disease spread across countries and continents at a rapid pace.**

2. **Each disease presents different characteristics that may require new strategies for control, containment and prevention, while still leveraging lessons learnt from previous outbreaks. It is therefore critical to document and use lessons to mount a rapid emergency response. At the same time, agility to rapidly learn about the virus and therefore understand approaches to containing it is required.**

3. **African countries have sufficient capacity and have responded swiftly and appropriately to the COVID-19 pandemic, even with limited resources. The activation of a multi-sectoral/-agency response enabled coordination of all available resources towards the COVID-19 response, with the health sector coordinating alongside other ministries/agencies. Owing to this, African countries were able to gather public support and compliance to the international and local travel restrictions and lockdown measures. The countries were able to reach most of their population with multi-pronged RCCE messaging.**

4. **Gaps and challenges in the COVID-19 response were evident with limitations in robust sustained surveillance mechanisms, low COVID-19 testing capacity, weak emergency response supply chain systems, and untapped research opportunities on COVID-19 response and case management. To build resilient health systems, these gaps need to be addressed.**

5. **Countries have local capacity for innovation and manufacturing. Countries developed country-appropriate solutions, for example the production of cloth masks, expansion of laboratory testing using available GeneXpert machines and working with community influencers to disseminate RCCE messages and promote behaviour change.**

6. **Countries had inadequate emergency response funding to fund the COVID-19 response plan and also implement economic mitigation measures to cushion citizens against loss of income due to the restriction measures.**

7. **The community's perception of the risk of COVID-19 infection and death, and willingness to take self-responsibility to contain the spread of the disease is key in containing pandemics and uptake of vaccines. Widespread infodemic also resulted in lowered compliance to restriction measures and low vaccine uptake. Continuous, multi-pronged RCCE messaging is necessary to reinforce containment measures throughout the pandemic and ensure that pandemic fatigue does not affect protective behaviours too severely.**

Recommendations

1. Disease outbreak in one country should be of international concern as the risk of spread to all other countries is high, especially for diseases spread by respiratory route. Therefore, irrespective of the country of origin, there a coordinated global response is recommended to contain the disease, develop treatment modalities and produce vaccines for all.

2. Country responses to COVID-19 showcased the potential for home-grown solutions to global challenges that meet the local population's needs. African countries are advised to maximise their potential to manufacture in the health sector for scalable and sustainable COVID-19 emergency response and for health system strengthening. This is through countries developing policies and funding to encourage innovation and manufacturing.

3. Governments must have emergency preparedness plans and resources, not only to fund emergencies, but also to address any resultant economic shocks. Financial reserves need to be built to enable self-sustaining economic relief mechanisms as necessary.

4. Study and understanding of the socio-cultural dynamics of each community is recommended in order to create effective RCCE mechanisms. This includes the most effective communication mechanisms with widest reach and knowledge of community influencers to increase community acceptance and trust of RCCE messaging. Measures that allow people to live their lives as they know it while minimising risk should be employed, with the community as part of the decision-making to avoid pandemic fatigue.

5. Measures to ensure continuity of health services should be prioritised at the beginning of any pandemic to avoid excess mortality in other disease areas due to lack of essential health services.

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