

Equity in the public and private health sector responses to COVID-19 in east and southern Africa

Pascalina Chanda-Kapata, Zambia

**With Training and Research Support Centre,
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Executive summary

This desk review was commissioned by the Regional Network for Equity in Health in East and Southern Africa (EQUINET) through Training and Research Support Centre (TARSC), with review support from the University of Zambia and Ifakara Health Institute. It aims to identify learning from features affecting equity in the public and private sector health system responses to COVID-19 in the countries of East and Southern Africa (ESA), and to raise policy implications for future (re)investment in strengthened public health system preparedness/functioning and private sector co-ordination.

The desk review included secondary grey and published documents in English from online databases, country and international organisation websites. As much of the information sought is not documented in the public domain and some countries have more information available than others, the review also integrated structured input from EQUINET steering committee (EQUINET SC) members covering Malawi, South Africa, Tanzania, Uganda and Zimbabwe.

The pandemic has strained the already stretched health systems in ESA countries, and was affected by previous levels of public leadership and engagement with the private sector. The response, based on international health regulations (IHR) recommendations, was multi sectoral and involved a range of collaborations between the public and private sectors. Country plans were public sector-led, in co-operation with international development partners, which helped trigger partnerships between the public and private sectors in the response both in and beyond the health sector.

The public sector role was critical and responsible in ensuring a co-ordinated, equitable and comprehensive response across all sectors, and for regulating and accrediting private sector activities. To varying degrees, national mechanisms were set up for this, which involved other technical actors and stakeholders, though systematic information on the comprehensiveness of information flow, level of trust among actors, and the effectiveness of alignment of resources and actions was not available in the documents located. Measures that support public sector leadership and co-ordination include: one national monitoring and evaluation (M&E) system to co-ordinate information flow; effective use of tax waivers and purchasing incentives; public regulation; and transparent information and public accountability on resources and their use. The public sector directly implemented many of the key responses, providing a framework for private responses and public institutions, like universities, played a role in innovation, research and analysis to support the response.

The private for-profit sector mobilised technical and financial resources, although the documents found provided limited information on how far these resources were pooled and on what procedures were in place for listing beneficiaries and funds received and disbursed in the public domain. It also played a key role in the production and distribution of commodities for the response, including by switching production lines in both the formal and informal sectors, albeit with deficits as well as potential social inequalities in access. The sector provided complementary laboratory and case management and, in some countries, vaccine procurement services. As these services were generally fee-charging, they tended to serve higher-income households and those covered by medical insurance.

The private not-for-profit sector, including health providers, civil society and community organisations and other non-state actors, played a role in risk communication and community engagement, supporting efforts to reach underserved communities and high risk groups. The sector also provided food and psychosocial support to patients in hospitals and personal protective equipment (PPE) for health workers; information outreach and support for uptake of prevention measures and of various community-led responses. In some countries, civil society and media have also played a role in the oversight of public funds and services. There was some reporting of separate monitoring set up to validate public information, but less oversight of private sector operations. Documentation on privacy concerns or legal frameworks relating to the use of private health data in private sector applications (apps) was limited, a concern that has also been raised in other countries.

These roles took place in a context of existing challenges and social inequalities in health faced by the public sector in ESA countries. There is some evidence that the pandemic has widened these inequalities. Limited testing capacity, service and personnel deficits, disruptions in supply chains of essential commodities and food, limited resources for prevention measures, social protection and care are noted to have had deeper negative consequences for low-income communities. This added to the increased risk of infection due to overcrowded housing and transport, job and income loss and psychosocial pressures in these communities.

Innovative public and private sector approaches for dealing with challenges were developed, such as hiring more health workers, allocating specific days for non-COVID services, providing multi-month supplies for chronic diseases and local development of health technologies. Prior investment, such as Integrated Disease Surveillance and Response (IDSR) implementation capacities, also affected response capabilities pointing to the positive role of sustained system investment to manage even short term shocks. In the private-for-profit sector, escalating costs of essential commodities and disruption of other essential services were also identified as more likely to affect social groups with fewer resources to seek alternative services or meet escalating costs, thus exacerbating inequities.

The mix of and co-operation between the public and the different private sectors varied across ESA countries. Where this was effective, collaboration was observed to support a continuum of care, accurate information on outbreaks and cases and a more co-ordinated system for resource mobilisation, risk communication and community engagement, and to connect the different elements of the response. It was noted that this co-operation called for trust and transparency between partners. It was not clear how far these mechanisms included representation from the social/community organisations most affected by the pandemic.

While the gaps in the response disproportionately affect low-income households and those with greater health need and risk, it was not always clear how equity was being achieved in the public-private mix. While effective interaction, organisation of duties and collaboration between the public and private sectors was recognised as important for the comprehensiveness, timeliness, coverage and overall equity in the response to COVID-19, it was also implied that past challenges and inequalities in the relationship between the two sectors persisted, particularly in the pressurised context of a pandemic. Border closures, reduced international trade and economic closures also affected the availability of public resources to lead responses, with the risk of generating new debt to meet the needs of public sector roles raising further constraints.

COVID-19 has highlighted both the opportunities and the demand for more effective and strategic engagement and management of the private sector in health, and for equity to be given more central consideration in this interaction. The findings suggest some key areas to be addressed in policy dialogue on private sector participation including: mechanisms to centrally pool and allocate resource contributions; avoiding fee barriers to use of services and resources offered by private providers; ensuring private sector commodity support is made available in both the public and private sectors; and transparency and public information outreach, including on resource contributions. It is important that examples of positive, innovative practices in the public-private mix are shared to build on existing investments, such as in relation to surveillance programmes and technology innovations, and to learn from cross country and sector collaborations.

It is also suggested that a more systematic assessment of the equity impacts of the disruptions to households, health services and public and private sector activities is carried out in the region. This is important in designing measures for the public-private mix that can support equity. Closing inequalities needs to be part of the design of country or regional recovery planning and for global engagement, given that equity and solidarity between countries are essential for an effective public health response in a pandemic.

1. Introduction

The COVID-19 pandemic is causing social, health and economic challenges worldwide. East and southern African countries have mounted multi-sectoral responses including, but not limited to: border closures; travel restrictions; lock downs; preparedness; prevention and outbreak management; social protection; and mitigation measures. There are wide variations in countries' capabilities for implementation of responses, in their extent and nature, and in equity regarding who is covered by them. An important factor is the relative nature of public and private roles and public leadership in the various countries.

Given prior work raising concern in the Regional Network for Equity in Health in East and Southern Africa (EQUINET) on the privatisation of health services and the inequities in and poor regulation of public subsidies to the private for-profit sector in health, EQUINET commissioned this desk review through Training and Research Support Centre (TARSC), with review support from the University of Zambia and Ifakara Health Institute, to explore the private and public sector roles and contributions in the 2020–2021 pandemic.

It aims to identify the relevant features of the public and private sector health system roles in the response to COVID-19, draw out the equity implications of these responses, and raise policy implications for (re)investing in strengthened public health system preparedness/functioning and private sector co-ordination in the countries of East and Southern Africa (ESA). The work differentiates the private for-profit (PFP) sector from the private not-for-profit (PNFP) sector.

1.1 Country characteristics and COVID-19 related information

The ESA region covers diverse countries in terms of country size, population, economic and social development, global connectedness, health systems functioning and other attributes (see *Table 1*).

Table 1: Selected characteristics of the ESA member states

Country	Population	Class-ification 2021	Global health security index rank 2020	Global connectedness index ranking* 2020	Average SPAR 2020 capacities Scores on 13 (JEE on 19)	First reported COVID Case (noting this was affected by test capacity)
Angola	33,933,610	LMIC	25.2 (170)	153	64% (44%)	22 March 2020
Botswana	2,397,241	UMIC	31.1 (139)	154	43% (41%)	31 March 2020
DRC	92,377,993	Low income	26.5 (161)	165	51% (36%)	3 November 2020
Eswatini	1,172,362	LMIC	31.3 (139)	151	45% (36%)	23 March 2020
Kenya	54,985,698	LMIC	47.1 (55)	133	44% (53%)	14 March 2020
Lesotho	2,159,079	LMIC	30.2 (144)	n/a	40% (37%)	14 May 2020
Madagascar	28,427,328	Low-income	40.1 (86)	115	36% (38%)	21 March 2020
Malawi	19,647,684	Low-income	28.0 (154)	155	39% (32%)	2 April 2020
Mauritius	1,273,433	High-income	34.9 (na)	48	64% (63%)	20 March 2020
Mozambique	32,163,047	Low income	28.1 (153)	110	69% (49%)	23 March 2020
Namibia	2,587,344	UMIC	35.6 (104)	108	61% (46%)	15 March 2020
South Africa	60,041,994	UMIC	54.8 (34)	57	79% (61%)	5 March 2020
Tanzania	61,498,437	LMIC	36.4 (101)	150	51% (49%)	17 March 2020
Uganda	47,23,531	Low income	44.3 (63)	162	69% (49%)	22 March 2020
Zambia	18,92,651	LMIC	28.7 (152)	128	58% (45%)	19 March 2020
Zimbabwe	15,092,171	LMIC	38.2 (92)	166	51% (42%)	21 March 2020

Notes: (LMIC=lower middle income; UMIC= Upper middle income).

*The DHL Global Connectedness Index measures globalisation based on international flows of trade, capital, information, and people. Sources: Altman and Bastianl, 2020; Global Health Security Index. 2019; Karamagi et al., 2021; Li et al., 2021; Onafeso et al., 2021, WHO SPH, n.d; World Bank, 2021; World Population Review, 2021.

This review covers the 16 countries from the ESA region shown in *Table 1*, as well as from the following regional organisations: Southern Africa Development Community (SADC); the East African Community (EAC); and the East, Central and Southern Africa Health Community (ECSA-HC).

COVID-19 was first reported from Wuhan, China, on 31 December 2019, followed by a rapid spread globally, leading the World Health Organization (WHO) to declare it a public health emergency of international concern (PHEIC) on 20 January 2020, and by 11 March 2020, as a pandemic (WHO 2020a; Li et al., 2021). COVID-19 disease is caused by a viral infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (Shereen et al., 2020). A WHO-China Study on the origins of SARS-CoV-2 attributes the likelihood of different origins as:

direct zoonotic spillover is considered to be a possible-to-likely pathway; introduction through an intermediate host is considered to be a likely to very likely pathway; introduction through cold/ food chain products is considered a possible pathway; introduction through a laboratory incident was considered to be an extremely unlikely pathway (WHO 2021a:9).

The rapid global spread of SARS-CoV-2 is attributed to globalisation; viral characteristics such as asymptomatic transmission; high infectiousness and a high reproductive rate (between 1.9–6.5 infected by each case); and the wide range of symptoms (Alimohamadi et al., 2020; He et al., 20; Li et al., 2021; WHO, 2021a). It was introduced to Africa through international travel, with the first reported case in Africa in Egypt, on 14 February 2020, and the first in the ESA region on 14 March 2020 in Kenya, after which the community spread of SARS-CoV-2 became established among ESA member states, as happened around the world (Kapata et al., 2020; Bugembe et al., 2020; Li et al., 2021).

As of 23 June 2021, there were 180,137,081 confirmed cases, 3,902,164 deaths and 164,885,466 recoveries worldwide, with Africa contributing 5,321,682 cases, 139,280 deaths and 4,693,376 recoveries (Worldometers, 2021). Apart from the direct health consequences, COVID-19 has led to disruptions in the social and economic sectors as countries grapple with containment measures (Gondwe, 2020; Kavanagh et al., 2020; Haider et al., 2020; IMF, 2020). The pandemic has intensified existing health system challenges such as staff shortages, industrial actions, stock outs of medicines and personal protective equipment (PPE) and interruptions to service delivery (Haider et al., 2020; Murewanhema and Mukumidze, 2020).

The pandemic and the responses to it have diverted resources from essential health services, strained human resources, further drained the national treasuries, led to business closures, derailed education calendars and reduced local and international trade (Gondwe, 2020; Leight et al., 2021; Lone and Ahmad 2020). Lost trade revenues exposed low-income countries to debt, perpetuating the diversion of country resources from service delivery to debt servicing (Gondwe, 2020). COVID-19-related disruptions in education services and informal employment have disproportionately affected young people in the region (Govender et al., 2020). The mobility restrictions implemented as a means of curbing viral transmission have led to delays or cancellation of childhood immunisation, which is expected to negatively affect child health and survival due to a projected rise in preventable diseases (Govender et al., 2020).

WHO has provided technical guidance on strategic actions required to control the COVID-pandemic using a public health approach, while ensuring that *speed, scale, and equity must be our guiding principles* (WHO, 2020b:4). ESA states implemented measures based on the 2005 International Health Regulations (IHR), which mandates member states to develop the core capacities to prevent, control and provide a public health response to international disease spread (WHO, 2005; Umvilighozo et al., 2020). In line with the IHR implementation framework, countries activated their epidemic preparedness and response system to address the COVID-19 pandemic through various sectors. The actions taken included border closures, restricting public gatherings, infection prevention and control (IPC), surveillance (passive and active), treatment and care, coupled with risk communication and community engagement (RCCE) (Umvilighozo et al., 2020).

WHO has developed a system for assessing IHR core capacities in member states using the Joint External Evaluation (JEE) and the State Party Annual Reporting (SPAR) frameworks (WHO, 2017; WHO, 2018). The SPAR is undertaken annually while the JEE is carried out every five years, based on 13 and 19 IHR core capacities respectively. It is noted that there is debate on how well these scores assess pandemic preparedness, given the poorer performance of high-income countries with high scores.

The SPAR scores for ESA countries for 2020 and the latest JEE scores for the period 2016–2019 are shown in *Table 1*, with further information available on the WHO Strategic Partnership for Health Security and Emergency Preparedness (SPH) Portal (WHO SPH, n.d). The Global Health Security Index, a further measure, predicted that the world was not ready for the pandemic, but also failed to assess the difference between measured and actual capacity and willingness to respond, including failure to measure the role of civil society organisations (CSOs) and community systems (Baum et al., 2021). ESA states that have been affected by conflict also faced challenges in their capacity to respond (ASSET, 2020). Health system functionality in the WHO African Region (WHO AFRO) ranges from 34 to 76 based on four capacities (access, quality, demand for essential services and resilience to external shocks). The IHR resilience index averages 47.6 with a range from 8–100 in the 16 countries (Karamagi et al., 2021). Access to essential services represents the lowest capacity in most countries in the region, specifically due to poor physical access to services (Karamagi et al., 2021).

Other factors also affect risk and vulnerability to the pandemic in the region, including demographic and socio-economic disparities at household and community level (Shadmi et al., 2020); and equity in access to response measures and services (Gribble and Rottach, 2020). The financial and liquidity crisis, changes in service provision and costs have impacted on health system efforts to achieve universal health coverage (Williams et al., 2020). The private health sector is reported to have made limited contribution to improved access and affordability among low-income communities, with the growth of private for-profit (PFP) providers before the pandemic leading to cost escalation and impeding the risk and income cross subsidies needed for equity (McIntyre, 2010; Foster, 2012).

Regulation and monitoring of private sector activities has been noted to be important for universality and equity in health systems and to curtail escalating out-of-pocket (OOP) expenditure and reduce households' financial burden and impoverishment from seeking healthcare (Foster, 2012; Doherty, 2011). In the COVID pandemic, both public and private sectors took on new or intensified roles across a range of public health, economic and social protection functions (AfDB, 2020). The African Union and Africa CDC set up an Africa COVID-19 Response Fund to mobilise private sector resources (Africa News, 2020) to prioritise 'people-centred' public-private partnerships that would focus on support to areas of vulnerability and public services and foster regional integration (Vallee, 2020).

2. Methods

This desk review included evidence searched between April and June 2021 from published journal articles, reports and journal commentaries in English, covering the pandemic in 2020 and 2021 in Pub Med Central or Google scholar, using search terms from the framework provided. Grey literature was accessed from various online media reports, country specific websites, blogs, international organisation briefs and websites and from the EQUINET newsletter database. A total of 146 documents were included. A structured template was used to obtain reports on private and public sector roles in the pandemic from EQUINET Steering Committee members in their countries, covering Malawi, South Africa, Tanzania, Uganda and Zimbabwe (EQUINET SC). The review and the EQUINET SC reports covered: stewardship; prevention; port health; treatment and care; laboratory services and health technology innovation; findings on speed, comprehensiveness, coverage and equity of the responses; and on the mobilisation, equity, affordability and pooling of finances for the response. Efforts were made to identify any areas of diversion of, or contributions to resources for other key services, and any issues related to co-ordination across providers,

programmes and sectors both within and across countries, and in relation to the integration of public rights, participation and accountability.

There were limitations in the methods used. These include lack of inclusion of articles in languages other than English (i.e. in French and Portuguese, which are relevant in the ESA region); variations in the quality and quantity of documented information for all countries, including on the equity dimensions and impact of responses, given the ongoing changing situation in the pandemic and the high representation of some countries in the documented literature (e.g. South Africa, Kenya). The authors did not access and include grey literature not available online, although the inclusion of the EQUINET SC information noted earlier helped offset this gap. While a more detailed in-country assessment is needed to properly explore the full scale of responses and their equity implications, the review does raise initial findings and, for those that appear to be consistent across a number of countries and sources, points to potential issues for follow up and policy dialogue.

3. Roles and response

As of March 2020, within three months of the emergence of COVID-19, thirteen ESA member states had reported their initial cases, followed by another in May 2020, and lastly, the Democratic Republic of Congo (DRC) in November 2020 (see *Table 1*). Prior to the cases being reported, all countries had activated their national preparedness and response systems based on the IHR core capacities and the prevailing WHO guidance for the COVID-19 response (WHO, 2020b). Some of the key measures implemented included, but were not limited to: border and airport closures; national or partial lockdowns; testing; isolation and hospitalisation with establishment of facilities for management of this; and risk communication and community engagement (RCCE) using various modes (see *Table 2*).

While all countries restricted international travel, there was a mixed approach to the implementation of lockdowns in the region. For example, full national lockdowns were applied early in the pandemic in Rwanda and Uganda, while other countries had more strict restrictions on movements in urban areas (Resnick et al., 2020). Lockdowns in the first wave in Kenya and South Africa lasted longer than those in other ESA countries and less extreme measures were implemented in Tanzania and Zambia, with the latter focusing more on risk communication; Tanzania applied limited preventive measures (Resnick et al., 2020; Kell, 2020). As community transmission of SARS-COV-2 became established within countries, additional measures were implemented such as: expanding surveillance; active surveillance in high risk areas such as Ports of Entry (POE); hospitals, workplaces and communities; expanding rapid and polymerase chain reaction (PCR) testing facilities; reassigning frontline personnel; closing schools; restricting public gatherings; deploying rapid response teams for contact tracing; mask mandates; training of health workers in new case management approaches; and implementing remote work or working from home (Umviligihozo et al., 2020; Onafeso et al., 2021; Hale et al., 2021). Mobile testing was implemented in only two countries (South Africa and Uganda), while mobile hospitals were used for case management in three (Uganda, Zimbabwe and South Africa).

While there were some investments in developing new technological approaches, ESA countries largely relied on products from elsewhere, the availability of which was hampered by global supply chain challenges (Kavanagh et al., 2020). Some of the innovative approaches included: adopting new technologies such as drone transportation of testing kits; local production of face masks, water, sanitation and hygiene (WASH) products, including locally engineered and produced sanitisers and ventilators; the EAC cargo driver tracking system and digital certificate; online training of frontline staff; and e-mentorship/clinical support teams outreach to underserved areas (Ihekweazu and Agogo. 2020; Ochu et al., 2021). Africa member states in collaboration with the private sector created the [Africa Medical Supply Platform](#), a network of vetted private sector industry manufacturers of commodities required for diagnostics, therapeutics, PPE and vaccines for the response to COVID-19 across Africa (Nsofo, 2021). Shortfalls in the supply of essential health products were exacerbated by the hoarding of supplies by high-income countries. Many ESA countries relied on the

COVAX facility for access to COVID-19-related vaccines (GAVI, 2021) but this facility covers only a planned 20% of the target population for vaccinations and the delivery remains challenging due to restrictions on exports from India (WHO, 2021b).

COVID-19 vaccines for the African Union (AU) member states are being co-ordinated through the African Vaccination Acquisition Task Team (AVATT), an AU initiative set up to ensure that 60% of African citizens are vaccinated to attain herd immunity (Masseguin, 2021). AVATT sources vaccines from the COVAX facility, private company donations, manufacturers and high-income country donations (Global Citizen, 2021a,b).

Details on the response measures and COVAX vaccine allocations and types for each ESA country for February to May 2021, are shown in *Table 2*. The roles of the private and public sectors in COVID-19 vaccination are discussed later in the paper.

Table 2: Response measures to COVID-19 in the ESA region

Country	Border closure	Airport closure	Partial lockdown	Mobile test centres	Field hospital	Vaccine COVAX facility allocation	Lockdown stringency index*
Angola	Yes	Yes	Yes	No	No	2,172,000 SII/AZ 100,600 Pfizer(AMC)	50–75
Botswana	Yes	No	Yes	No	No	100,800 AZ 19,890 Pfizer(SFP)	50–75
DRC	Yes	Yes	Yes	No	No	5,928,00	25–50
Eswatini	Yes	Yes	Yes	No	No	108,000 (AMC)	50–75
Kenya	Yes	Yes	Yes	No	No	3,564,00	1–25
Lesotho	Yes	Yes	Yes	No	No	132,000 SII/AZ(AMC)	50–75
Madagascar	Yes	Yes	Yes	No	No	250,000 SII/A*	-
Malawi	No	No	Yes	No	No	1,260,000 (AMC)	25–50
Mauritius	Yes	Yes	Yes			100,800 (SFP)	50–75
Mozambique	Yes	Yes	Yes	No	No	2,064,000 (AMC)	50–75
Namibia	Yes	No	Yes	No	No	108,000 (SFP)	25–50
South Africa	Yes	Yes	Yes	Yes	Yes	2,426,400*AZ 117,000 Pfizer (R1)+1,275,000Pfizer (R3)	25–50
Tanzania	Yes	Yes	No	No	No	-	1–25
Uganda	Yes	Yes	Yes	Yes	Yes	3,024,000 (AMC)	1–25
Zambia	No	Yes	Yes	No	No	1,212,000 (AMC)	25–50
Zimbabwe	Yes	Yes	Yes	No	Yes	984,000 (AMC)	50–75

Notes: (AMC=Advance Market Commitment, SFP= Self-Financing Participants, SII= Serum Institute of India, AZ=AstraZeneca).

*Lockdown stringency index is based on the Oxford University School of Government pandemic database that collates publicly available information on pandemic-response across nine policy areas to derive a composite measure of overall stringency on a scale of 0-100 at national level (Hale et al., 2021).

Sources: Hale et al., 2021; GAVI 2021; Onafeso et al., 2021; Umvilighozo et al., 2020; UNICEF, 2021a; WHO, 2020a; World Population Review, 2021.

The public and private sector responses to COVID-19 are described in sections 3.1–3.5, focusing on five main areas, namely: stewardship; prevention methods; port health; treatment and care; laboratory services; health technology innovation; access; and distribution. Particular attention is paid to the implications of the mix of public and private sector roles for the speed, comprehensiveness, coverage and equity of the response, and the mobilisation, equity, affordability, pooling and equity of finance for the response; diversion of or contribution to resources for other key services; and co-ordination across providers, programs and sectors within and across countries; and in relation to the integration of public rights, participation and accountability. The sub-sections findings are shown in tables with discussion beneath.

3.1 Stewardship

Table 3 provides detailed information on stewardship roles and responsibilities for each ESA country.

Table 3: Stewardship roles and responsibilities

Country	Public health sector	PFP health sector	PFNFP health sector
Angola	A multidisciplinary taskforce developed a response plan involving 23 stakeholders and implemented a National Contingency Plan. Government closed informal activities not complying with prevention measures and provided RCCE.	Trained community-based agents for RCCE and donated WASH products and food.	Non-governmental organisations (NGOs) and faith-based organisations (FBOs) participated in RCCE.
Botswana	Set up a presidential task force for overall oversight and coordination of the multi-sectoral response. The Ministry of Health and Wellness co-ordinates the health response and developed a comprehensive multi-sectoral response plan for nationwide RCCE. Government sourced \$1.1m from the European Union to support the response.	-	Support training of media personnel in evidence informed RCCE.
DRC	Government declared a state of emergency and set up a multi-sectoral national committee to devise strategies to address the pandemic and a presidential COVID-19 task force to guide the health system and broader response and decisions. Government developed and implemented an RCCE strategy, established an M&E system for COVID-19; Government sourced additional resources to support pandemic preparedness and response (\$47.2m from World Bank) and activated a public health emergency operations centre for COVID-19.	-	Implemented RCCE and provided aid to conflict areas. PATH assessed and responded to COVID-19 with <i>BlueSquare</i> , WHO and Gates Foundation provided financial and technical assistance to government for rapid establishment of a national COVID-19 digital data collection, integration and analysis system.
Eswatini	Government developed a stakeholder engagement plan for the COVID-19 response, established a COVID-19 Task Team to co-ordinate response strategies and mobilised resources. Sectoral and multisectoral interventions were activated across the country. RCCE carried out using various channels.	-	UNICEF and ICRC supported RCCE using community volunteers.
Kenya	Government embarked on nation-wide media campaigns to educate citizens and sourced for additional funding to support the COVID-19 pandemic response from the World Bank (\$50m).	-	Deployed community social workers to raise public awareness on COVID-19 prevention measures and psychosocial support to affected communities. Community health workers also provided support, such as for grief management and RCCE.
Lesotho	Government declared a state of emergency, followed by a 'COVID-19 state of disaster-induced emergency' and established a national emergency command centre which was later replaced with a National COVID-19 Secretariat (NACOSEC) to oversee the response. A national COVID-19 strategy was	-	-

Country	Public health sector	PFP health sector	PFNFP health sector
	developed and adopted. Public health COVID-19 regulations were put in place to deal with non-compliance to prescribed measures and penalties. The army was deployed to enforce response measures.		
Madagascar	Government created a national COVID-19 task force. resource mobilisation (e.g. \$75m from World Bank, UNICEF support to WASH, AfDB, etc). Ministry of Health developed standard protocols.	Participation in national Taskforce.	Involvement in RCCE, distribution of WASH products.
Malawi	A Cabinet Taskforce on COVID-19 was initially formed but later dissolved due to irregularities; a new Special Presidential Committee on COVID-19 was set up. Government implemented community sensitisation messaging and surveillance. A multi-sectoral health cluster committee reviews and endorses the decisions made by the Health Emergency Technical Committee. Both Committees include bilateral and multilateral partners, such as WHO, UNICEF, FAO, USAID, CDC, both at local and international level and meet weekly to co-ordinate preparedness and response. The Treasury mobilised resources from both internal and external sources. The National Disaster Preparedness and Relief Committee chaired by the Secretary to the President and Cabinet and comprising controlling officers from all government ministries, provides policy guidance and leadership in the implementation of the response plan. Establishment of three mobile logistics bases with potential to serve as isolation centres.	Played a critical role in complimenting government efforts in response to the pandemic. Mobile phone companies support connectivity solutions between remote communities and health centres and information dissemination through social media.	The United States Embassy launched the COVID-19 private partnership fund aimed at strengthening the efforts of the private sector and bolstering the ongoing response efforts. UNICEF supporting procurement of WASH supplies.
Mauritius	A high-level committee on COVID-19 was set up, chaired by the Prime Minister and multisectoral incident management system were activated. Preparedness and response plans were developed and RCCE was undertaken, including daily briefings on evolution of the epidemic and ongoing engagement of stakeholders. The COVID-19 responses were included in the Health Sector Strategic Plan 2020–2024. Additional resources were sourced from various partners. Other measures included sanctioning of fake news, activation of emergency procurements and centralised storage of medical materials for the COVID-19 response for better stock management, monitoring and distribution. COVID-19 resources were mobilised from bilateral and multilateral partners.	Participated in RCCE and developed mobile apps for use in RCCE.	Financing of COVID-19 operations and participation in RCCE.
Mozambique	Established an emergency commission at national level to co-ordinate the COVID-19 response. Implemented RCCE and managing misinformation. Sourced resources to support the response and assist the private sector including local production of	Developed the <i>upSCALE</i> app, supported ongoing efforts in RCCE and use of telemedicine.	Participated in RCCE and provided technical assistance. Mobilisation of financial and in-kind resources to support the

Country	Public health sector	PFH health sector	PFNFP health sector
	masks. Specifically, with resources from the African Development Fund (ADF) under the Government of Mozambique crisis response budget support for COVID response, social protection and economic recovery.		COVID response. Mobilised special support for coordination of a humanitarian response in North Mozambique.
Namibia	Undertook public awareness campaigns using various modes, established a toll free line for symptom self-reporting.	-	-
South Africa	Set up a national command council, which includes nineteen cabinet ministers, the National Police Commissioner, the head of the South African National Defence Force (SANDF) and a secretariat. Scheduled Presidential addresses on policy issues on COVID-19 via radio and TV. Department of Health website was updated regularly with COVID-19 updates and ongoing RCCE. Decentralised procurement of PPE . Set up information management systems for monitoring and reporting the key indicators for COVID-19. Government allocated resources for the COVID-19 response and set up a Solidarity Fund for additional resource mobilisation. Centralised vaccine procurement through the Solidarity Fund .	Through the Solidarity Fund supported water, food and PPE to community health workers. Some private practitioners provided free online medical consultations. Private laboratories are part of the national reporting system. The ventilator project , a collaboration between private and public sector, produced 20,000 ventilators in December 2020. Private sector contributions to the Solidarity Fund led to upfront payments for vaccines. Private sector contributions have been marketed under the National Business Initiative as responses to COVID-19. Undertook workplace-related RCCE.	Monitoring access to essential services such as food and water. NGOs and community networks supported access to housing, water and food, advocacy for provision of medical supplies, availability of medical equipment and triage. Advocated for reduced cost of testing, access to water, basic supplies and food. Monitoring access to health technology and vaccine hesitancy. CSOs and NGOs involved in RCCE efforts.
Tanzania	Produced several guidance documents on COVID-19. Internal and external resources allocated for COVID-19 activities. In the early stages, the Minister of Health provided briefings on cases but this was later stopped. A national task force committee for COVID-19 (with fourteen members) was formed by the President, to analyse and draw recommendations on measures that Tanzania can take up including measures for prevention, treatment and vaccine uptake.	The Tanzania Private Sector Foundation stopped business entities from exploiting people through unjustified price hikes for goods and services. Financial donations were made to support health workers on the frontline.	-
Uganda	Set up a National Taskforce on COVID-19. Prescribed prevention and control measures. Embarked on resource mobilisation to support operations related to the response.	-	Supported RCCE activities using various modes (TV, radio, social media, print, etc). Advocated for increased budget support to the blood bank. Embarked on blood donation campaigns to help sustain

Country	Public health sector	PFP health sector	PFNFP health sector
			blood transfusion services. Generated evidence for advocacy on gender, mental health, maternal health, human rights and sexual and reproductive health (SRH). Advocated for prudent use and equitable allocation of COVID-19 funds.
Zambia	The Public Health Emergency Operations Centre (PHEOC) was operationalised and the multisectoral incident management system activated. RCCE is ongoing using various modes: radio, TV, social media, daily press briefings by the Minister of Health. Developed a COVID-19 contingency plan and set up a Contingency Fund through the Office of The Vice President, Disaster Management and Mitigation Unit to finance procurement of medical supplies and equipment associated with the response. Sourced additional funding from development partners (World Bank \$90m, etc). Centralised donations to ensure accountability, set up stringent systems for targeted audit of COVID fund/resources/donations, Publicised list of donated items and target audience. Parliamentarians engaged in RCCE in their constituencies. Established a dedicated call centre for the public to report concerns and receive information on the disease.	Participated in RCCE, donated free airtime for radio/TV and donated advertisement for COVID-19 messages.	Participated in RCCE and provided technical assistance. Also provided finance for operations related to the COVID-19 pandemic.
Zimbabwe	Developed a COVID-19 response plan and established national and subnational taskforces. A central command centre was put in place to co-ordinate the response. Ministry of Finance released funds to support implementation of COVID-19 activities. Ministry of Health developed various guidelines to help standardise implementation. Only the public transport system was permitted to operate to help adherence to regulations. Government mobilised resources for payment of risk allowances to frontline health workers for 12 months, expedited procurement of COVID-19 supplies and provided support for local industries with capacity to produce basic food stuffs and pharmaceuticals. Undertook RCCE using various modes. Translation of COVID-19 IEC materials into local languages, braille and sign language. Providing updates on COVID-19 situation.	Donations from private entities were handled centrally from State House. Undertook traditional and online RCCE, provided daily COVID-19 updates. Participated in taskforce activities.	NGOs and churches involved in resource mobilisation and RCCE. Provided daily COVID-19 updates and tackled myths and misconceptions.

Sources: AfDB, 2020; Amesho et al., 2020; AMREF, 2020; Budget Enquirer, 2020; CEHURD 2020a; Chan Sun and Lan Cheong Wah, 2020; Colombo, 2020; EQUINET SC members 2021; Feldman et al., 2021; Government of Mauritius 2020; Government of Zimbabwe, 2020; Haffajee, 2020; IOM 2020; Irura 2020; Jerving, 2021; Marotta et al., 2021; Nachega JB et al., 2020a,b; Obasa et al., 2020; PATH, 2020; Shale, 2020; Siewe et al., 2020; The Independent, 2020; UNICEF, 2021b; WHO, 2021c; World Bank, 2020a,b; Xinhuanet, 2021; ZNPHI, 2020.

The evidence in *Table 3* points to some general findings.

Co-ordination of the response

All member states established a national system for coordination of the COVID-19 response by creating national multi sectoral taskforces/committees, followed by development of national plans to guide both the public and private sector response across all IHR core capacities. The response involved both health and non-health interventions to address the economic and social consequences of the pandemic (Africa News, 2020; AfDB, 2020). In countries where there was an existing humanitarian crisis, response plans were tailored to the particular crisis in coordination with international agencies such as IOM, ICRC, UNICEF, World Bank, AfDB (Columbo, 2020; AfDB, 2020; World Bank, 2020a,b; Ebrahim et al., 2021). In some countries, the private sector formed coalitions to raise resources to support funding of the response, such as the [Solidarity Fund](#) in South Africa, [Safe Hands Kenya](#) and, at a continental level, the [Africa Medical Supply Platform](#). What was less clear in the findings regarding equity was how comprehensive the information flow and interaction in co-ordination mechanisms was, and how far the resources raised were pooled within wider public funds.

Public communication and dialogue, including digitally

All member states implemented a multipronged approach to RCCE. While the public sector focused on public health education and providing scheduled briefs on the evolution of the pandemic, private sector stakeholders participated in training and some provided operational finances. Multimedia approaches to RCCE involved social media, national broadcasting, chatbots, free toll lines, pamphlets, newsletters, daily briefings and updates on the pandemic, national addresses by heads of state and other measures for public attention (Chan Sun and Lan Cheong Wah, 2020; Amesho et al., 2020; Obasa et al., 2020).

When significant policy changes like lockdowns or de-escalation of restrictions were implemented, the health minister or head of state delivered national addresses using radio and television, followed by posting of speeches on social media. For example, in Zambia, the Minister of Health issues daily briefings to the nation and the Head of State delivers presidential speeches either during the opening of parliament or as a special national address on the pandemic (ZNPFI, 2020). Additionally, country information is collected by various international agencies in real time, to ensure transparency on the evolution of the pandemic.

A range of kinds of private sector collaboration with local or central government in RCCE were implemented, particularly from the PNFP private sector. In Mozambique, community volunteers used applications – apps– to communicate with their constituents. In other countries, in the PFP sector, telecommunication companies provided free airtime or internet bundles as part of their corporate social responsibility (Feldman et al., 2021; Columbo, 2020). Private not-for-profit civil society organisations (CSOs) and NGOs dedicated time and media space to COVID-19 messaging in line with public sector guidance to ensure uniformity of information and in a united effort against misinformation and myths. Tanzania was the exception and stopped releasing statistics on COVID-19 after 4 May 2020, and banned private sector dissemination of information on the pandemic. This has since been lifted and a new taskforce on COVID-19 has been formed to guide the future government response and engage the COVAX facility on vaccine provision (Kato, 2021; Mfinanga et al., 2021; Jerving, 2021).

Monitoring pandemic spread, information and data management

To monitor pandemic spread, countries used existing information and surveillance systems for disease outbreaks, Influenza-like Illness/Severe Acute Respiratory Syndrome-like Infections (ILI/SARI) or other systems specifically developed to enable timely collation of COVID-19 data (Uyoga et al., 2021; Randlemanana et al., 2021). The public and stakeholders were kept informed through daily briefings by the responsible agency, posting of information on institutional websites at stipulated times using online dashboards, institutional bulletins, or other means (Chan Sun and Lan

Cheong Wah, 2020). Both public and private sector agencies were required to report through a single national monitoring and evaluation (M&E) system as a way of coordinating information flow. Notifiable diseases are by law, generally reported to relevant authorities, and to the WHO (IHR, 2005). The documents reviewed did not elaborate how comprehensively PFP and PNFP information on COVID, beyond the legal duty for case notification, was included in the public system. NGOs and CSOs in some countries were, however, reported to keep parallel tallies of various COVID-19 related data to validate information released by public authorities.

Ensuring, contracting and managing supply chains for essential health commodities

Governments in the respective countries made efforts to ensure supplies of essential health, food and hygiene products by allocating supplementary budgets for bulk procurement of emergency medical supplies, engaging the private sector to donate to COVID-19 solidarity funds and giving tax waivers on imports of selected essential commodities (Irura, 2020; Gehre et al., 2021; Juma et al., 2020; Columbo, 2020). Philanthropic organisations donated commodities such as PPE to governments in the ESA region (Columbo, 2020) and the AU, in collaboration with airlines, enlisted member states to open their airspace for movement of commodities and deployment of medical counter measures across Africa (NAP, 2020).

In countries where POE restrictions were applied, and in response to AU recommendations, some ESA countries including South Africa, Zambia, Uganda and Kenya, kept cargo planes and truckers operational by air and road respectively, including to enable movement of commodities needed for the pandemic. To protect consumers, government agencies instituted regulation of unwarranted price hikes with penalties against suppliers found exploiting the public. In some countries, the private sector was given a role in the distribution of pharmaceutical products for the COVID-19 response in communities. While memoranda of understanding were used to assign these responsibilities, the specific rights and duties in them were not clear in public domain documentation.

Ensuring, pooling, allocating and public accountability on resources.

ESA governments used existing laws and instituted systems for transparency and accountability of financial and material resources provided for COVID-19. For example, in Zambia, special audits were instituted to oversee how funds and donations were used, while donations and intended recipients were publicised in each ministerial statement on the pandemic (ZNPFI, 2020). In South Africa, the [Solidarity Fund](#) provided an example of a public-private sector pooling mechanism, with all pledges, allocations and disbursements from funders listed, along with beneficiaries and put in the public domain.

Where reports of corruption or misuse of mobilised funds were made, this was likely to have a negative impact on public trust, as well as on equity in resource allocation for high-need communities. The pandemic provided impetus and public demand for transparency and accountability in resource use and allocation to ensure services reach the intended beneficiaries, but information on how far this was achieved varied across countries. *Table 3* indicates that there were irregularities, such as in Malawi, where the co-ordination mechanism was reconstituted in response.

3.2 Prevention

Table 4 provides the information found in the documents on prevention roles and responsibilities for each ESA country.

Table 4: Prevention roles and responsibilities

Country	Public sector	Private for-profit	Private not-for-profit
Angola	State of emergency declared with bi-partisan support. Measures implemented included quarantine, social distancing, closure of borders with limited exceptions, suspension of schools, restaurants and public events, and limited transportation.	Donations of hygiene products and supported tracking of families under quarantine. Undertook mass testing for high risk groups.	Donated PPE, medicines and other supplies to the health sector. Financial support for the response.
Botswana	Implemented lockdowns, banned social gatherings, closed schools and businesses. Put in place mandatory government quarantine of all people arriving in Botswana or those with suspected exposure, movement permits for local travel for essential commodities. Effectuated prison releases as part of efforts to decongest prisons in a bid to reduce risk of transmission among prisoners. Acquired vaccines under the COVAX facility on 27 March 2021 in addition to earlier donations from the Indian government. Set up isolation facilities for cross border drivers.	Production of WASH products (WASH centres, soaps, buckets, sanitisers, etc).	Provided financing for prevention commodities.
DRC	Declared a state of emergency, lockdown was first enforced in Kinshasa and then later across the country. Congolese returnees were recommended to stay on a 14-day self-quarantine. Schools and universities were shut, and mass gatherings of more than 20 individuals were prohibited. Compulsory masking and managing compliance.	-	Monitoring adherence to prescribed measures.
Kenya	Mandated use of face masks immediately after the first COVID-19 case was detected in March 2020. Embarked on fumigation of infection hotspots, for example, markets, public transport and hospitals. Mandatory handwashing prior to entry of any public premises and before boarding public transportation. Revised protocols and policies on conducting funerals and handling of deceased remains . Imposed restrictions on public gatherings. Sentinel surveillance using global influenza surveillance and response systems (GISRS).	Safe Hands Kenya supported WASH implementation, face masks and disinfection of public places in informal settings. Local SMEs produce PPE, handwashing stations and sanitisation equipment. Developed apps for contact tracing using mobile data.	CSOs partnered with government in providing face masks, gloves, sanitisers, medical supplies, soap, water and food rations to affected informal settlements across Kenya.
Lesotho	Lockdown led to movement restrictions, closure of businesses except essential services, and restrictions on public gatherings.	Complying with prescribed measures.	-
Madagascar	Implemented curfew, stay-at-home order, closure of non-essential businesses and social distancing in order to prevent or limit the spread of the virus in the country. Intensified contact tracing.	-	UNICEF supported disinfection of learning institutions.
Malawi	Suspended public gatherings of more than 100 people. Updated the Malawi Public Health Act of 1948 to include strategies for managing the COVID-19 pandemic: Social distancing, hand washing and mask mandates in public places. Started rolling out vaccination program.	Production of WASH products (WASH centres, soaps, buckets, sanitisers, etc). Adherence to prescribed measures in the work places.	Human rights defenders prevented implementation of lockdown through a court order. UNICEF and WaterAid supported procurement of WASH supplies.
Mauritius	Implemented fourteen-day quarantine for eligible individuals, mask mandates in public spaces, social distancing, closed schools and converted recreation	Hotels converted into quarantine centres through engagement with	-

Country	Public sector	Private for-profit	Private not-for-profit
	facilities into quarantine centres. Restricted time and access for shopping; shoppers allowed out on a roster based on alphabetical order and allowed only thirty minutes in premises. Effective contact tracing of all the persons who have been in contact with the COVID-19 cases. ILI/SARI surveillance enhanced at hospitals, borders, laboratories and in the community.	government. Local production of masks and sanitisers.	
Mozambique	Declared a state of emergency: mandatory school closures, strict limitations on workplaces, markets, public transportation, religious services and leisure activities. Effected prison releases as part of efforts to decongest prisons in a bid to reduce risk of transmission among prisoners. Managing compliance.	Distribution of water, sanitation and hygiene (WASH) products (WASH centres, soaps, buckets, sanitisers, etc).	Monitoring adherence to prescribed measures. Training of community volunteers on IPC.
Namibia	Suspension of public gatherings, closure of schools, churches and gyms. Prohibition of sale of alcohol and street vending. Work from home and online, only essential services or workers allowed on the streets. Selected groceries and pharmacies opened based on a roster. Rapid response team deployed mainly in the capital as no cases elsewhere. Restrictions imposed on travel in and out of the country. Mandatory 14-day quarantine for those entering the country at a designated place. Closed borders with RSA and neighbouring countries followed by staged lockdown.	Production or distribution of WASH products (WASH centres, soaps, buckets, sanitisers, etc)	-
South Africa	Declared a state of emergency in March 2020. Implemented measures such as social distancing, hand washing, closed schools and reduced public gatherings. Stopped alcohol sales for some time. Staged lockdowns commensurate with number of cases. Instituted arrests for non-adherence to self-isolation and quarantine requirements. Set up quarantine/isolation facilities and repurposed hostels and hotels for free COVID-19 quarantine. Effected prison releases as part of efforts to decongest prisons in a bid to reduce risk of transmission among prisoners. Prioritised testing for high risk contacts. Combating vaccine hesitancy and misinformation. Procured AstraZeneca and Pfizer vaccines through the COVAX facility.	Distribution of WASH products and PPE. Funds from the solidarity fund contributed to procurement of test kits and testing facilities in private hospitals and clinics. Hotels repurposed for quarantine. Adopted workplace prevention as part of the occupational safety, hygiene and compensation. Engagement with medical insurance scheme members on vaccination programme. Donations to the vaccine acquisition programme. Developed apps for contact tracing using mobile data.	CSOs embarked on various community mobilisation campaigns. Donation of test kits to selected facilities. Advocacy campaigns for vaccine allocation and uptake.
Eswatini	Declared a national state of emergency early on in the pandemic followed by partial lockdown. Contact tracing and social distancing. Restrictions on public gatherings to no more than 20 people. Mandatory 14-day quarantine for exposed persons or travellers.	Compliance to prescribed prevention measures.	Distribution of WASH products in communities
Tanzania	Temporal closure of schools in the first wave of 2020. Encouraged self-isolation for symptomatic cases. Closed public gatherings except places of worship and schools. Trading places remained open. Quarantine of symptomatic travellers. Hand washing	Hand washing facilities and temperature monitoring at entry points to buildings.	Hand washing facilities and temperature monitoring at entry points to buildings. NGOs and development partners donated PPE.

Country	Public sector	Private for-profit	Private not-for-profit
	facilities and temperature monitoring at entry points to buildings. Not subscribed to the COVAX vaccine facility. No lockdowns. Adopted traditional remedies that were thought to boost immunity.		
Uganda	Voluntary self-isolation or quarantine and social distancing. Closure of all schools and academic institutions. Suspension of public gatherings of more than ten people. Factories, hotels, large plantations, markets and public transport were to operate while following standard operating procedures issued by the Ministry of Health. Banning of public transportation and later private transport, and closure of non-essential shops. Mask mandates in public places. Managing compliance.	Production of WASH products (WASH centres, soaps, buckets, sanitisers, etc). Developed apps for contact tracing using mobile data.	Monitoring adherence to prescribed measures. NGOs adopted workplace testing for COVID-19 in readiness for reopening after lockdown. COVID-19 measures integrated into institutional occupational health guidelines/policies. Distributing PPE in communities and advocacy for translation of materials on COVID-19 into local languages and distributing them to high risk groups
Zambia	Procurement and distribution of disinfectants and PPE including gloves, face masks, aprons and hand hygiene supplies. Mandatory reporting, quarantine, isolation and testing as per new COVID-19 regulations. Closure of any premises that pose a public health threat linked to COVID-19. Restrictions on public gatherings, social distancing, closing of schools and places of worship, encouragement of remote work. Contact tracing.	Private sector donations from individuals, private companies, philanthropic organisations, professional bodies. Provision of PPE to staff and clients in work places. Remote working arrangements were mostly implemented.	Donated PPE, sanitisers, hygiene products and RCCE. Adopted working remotely.
Zimbabwe	Banned non-essential services for 21 days. Effected a lockdown except for grocery stores and health facilities. Restrictions on trading hours for retail outlets. Banned sale of alcoholic beverages. Restrictions on mass gatherings, including religious gatherings, up to a maximum of 50. Quarantine of returning residents at designated places. Deployed rapid response teams. Exposed individuals put on self-isolation in line with WHO guidelines, while at the same time, some civil liberties were denied. Human rights abuses alleged on the part of military and police in the process of enforcement. Cancelled sporting events. Restricted visits to hospital patients – only allowed one person once a day. Introduced regulations for workplace COVID-19 testing. Prioritising health workers and other frontline staff for vaccination	Local production and or distribution of WASH products (WASH centres, soaps, buckets, sanitisers, etc). Adherence to prescribed measures. Designated private facilities as quarantine and isolation centres. Adherence to prescribed measures. RCCE and enforcement of the law banning importation and sale of second-hand clothes.	Psychosocial support to COVID-19 affected households. Bulk water supply. Use of private facilities as quarantine and isolation centres.

Sources: Abdool Karim, 2020; All Africa Global Media, 2020; Amesho et al., 2020; Chan Sun and Lan Cheong Wah, 2020; Columbo, 2020; Dube 2020; EQUINET SC, 2021; Gehre et al., 2021; Government of Mauritius 2020; Government of Zimbabwe, 2020; Gyeltshen et al., 2021; Haider et al., 2020; ICP COVID 2020; IMF, 2020; Irura 2020; Juma et al., 2020; Júnior et al 2021; Matzopoulos and Parry, 2020; Mfinanga et al., 2021; Mkize, 2020; Muntingh'i 2021; Murewanhema, 2021; Obasa et al., 2020; Ochu et al., 2021; OSEAC, 2020; Osseni, 2020; Shale, 2020; Siewe et al., 2020; Randremanana et al., 2021; Simulundu et al., 2020; Uganda MOH 2020; United Nations Zimbabwe, 2020; Uyoga et al., 2021; Whembolua and Tshiswaka, 2020; WHO, 2021b,c; ZNPHI, 2020.

The evidence in *Table 4* points to some general findings.

Supporting ventilation, water and other inputs that prevent transmission

Production and distribution of WASH products (WASH centres, soap, buckets, sanitisers, etc.) was prioritised in most countries (Ochu et al., 2021; Obasa et al., 2020; ZNPHI, 2020). Particularly in the early phase of the pandemic, both public and private sector actors participated in ensuring setting up of WASH stations and sanitising bays at entrances to buildings in compliance with prescribed measures. Some governments put in place mechanisms to support local small and medium enterprises to produce soaps, sanitisers and innovations in soap and sanitiser dispensers to support implementation of preventive measures (Wangari et al., 2021; Gehre et al., 2021). International and local PNFPs partnered with the public sector to address access to WASH products in rural and underserved areas (Irura, 2020). Some governments partnered with the private sector to create WASH centres in schools, places of worship, markets and other gathering places (Ochu et al., 2021; Obasa et al., 2020; ZNPHI, 2020). What is less clear from the documents found is how far these collaborative initiatives translated into the longer term investments needed to address social inequalities in such environmental determinants.

Lockdowns, physical distancing

Governments in all ESA countries used their administrative and legal authority to apply a public health response in the public sector and to regulate private sector and population activity where needed. The measures included restrictions on mass gatherings, school closures, restrictions on working arrangements or local travel, encouraging work from home policies, ecommerce and prescription of physical distancing in all public places, which, in some countries, was enforced by state security personnel (Umviligihozo et al., 2020; Amesho et al., 2020; Resnick et al., 2020). Partial or stringent lockdowns were implemented depending on the evolution of COVID-19 cases in the sequence of pandemic waves (Haider et al., 2020; Resnick et al., 2020). Both the public and private health sectors re-arranged delivery of services for chronic conditions so as to reduce face-to-face interaction, such as by limiting operating hours, providing multi-month supplies or increasing the time between refills for those on long term treatment and, in a few cases, using telemedicine. Telecommunication companies and other private sector players partnered with the health sector to deliver some services remotely (Amesho et al., 2020). Tanzania's non-implementation of lockdowns was in part to prevent disrupting peoples' access to essential health services, trade and jobs (Mfinanga et al., 2021). As noted in the introduction, lockdowns had negative impacts on people's incomes, jobs, food supplies and access to services, particularly for the lowest income communities, pointing to the potential for widening inequalities as a result of these measures. The documents reviewed and formal information systems provided less information on the distribution of impact of these measures than on their level of implementation.

Testing and tracing, quarantining and monitoring compliance

The public sector, in collaboration with some private sector personnel in technical committees, developed standard guidelines for testing and contact tracing in line with the existing systems for epidemic preparedness and response (ZNPHI, 2020; Columbo, 2020; Murewanhema, 2021;), after which, both public and private sectors ensured implementation and adherence to the guidelines (Onafeso et al., 2021; Amesho et al., 2020; Simulundu et al., 2020). Quarantine measures were put in place by government agencies and the private sector's role was to ensure compliance with the prescribed measures. In some countries, NGOs and the private sector partnered with the public sector to provide housing, food and psychosocial support for those in quarantine (Chan Sun and Lan Cheong, 2020; Juma et al., 2020; Irura and Bett, 2020; Uyoga et al., 2021).

Private sector entities partnered with the public sector to develop technological or community-based innovations for contact tracing, such as the role of community volunteers 'APE' in Mozambique and a chatbot for information in the DRC (Feldman et al., 2021; Juma et al., 2020). In Kenya, Uganda and South Africa, the private sector developed contact tracing systems using mobile data tracking, leading to real time notification and improved contact tracing (Ochu et al., 2021). Geographical

information systems (GIS) mapping was also commonly applied for ease of follow up and identification of hotspots to help target measures to high risk locations (ZNPFI, 2020). What is less well documented is how far apps provided by the private sector were legally regulated to ensure privacy of health information.

Vaccine outreach

All ESA member states, except Tanzania, subscribed to the GAVI co-ordinated COVAX facility which is assisting countries to access vaccines proportional to their population. By the time of writing, 15 out of 16 member states had their vaccine allocations for rounds 1–3 (Feb–May 2021) with some already commencing vaccination campaigns, mainly using AstraZeneca (GAVI, 2021). Botswana, Angola and South Africa sourced additional vaccines from Pfizer, which requires an ultra-cold chain (GAVI, 2021), while Zambia, South Africa, Zimbabwe and others have imported other vaccines (J&J, SinoPharm, SinoVac) directly from pre-qualified manufacturers, based on national guidelines and regulations (Kato, 2021; GAVI, 2021; Nsofor, 2021). Eswatini and Botswana received 20,000 and 30,000 doses of vaccine donations respectively directly from the Indian Government while Zimbabwe received about 200,000 doses from the Chinese Government (WHO AFRO, 2021; WHO, 2021c).

Public vaccine deployment plans have been developed including plans for tackling vaccine hesitancy in co-operation with non-state organisations and media. The PFP and PNFP sectors have participated in vaccination campaigns and staff training, provided logistical support and, in some countries, have purchased vaccines directly, such as for medical insurance clients, or through contribution to pooled public funds. In South Africa, medical aid societies have played a role in cross subsidising the uninsured, using vaccines from public sector supplies in a bid to replenish public funds for procurement of more vaccines (EQUINET SC member, personal communication). This is a changing field and it is likely that further developments have taken place since the timing of this report. The subsidies and distribution of benefit in the public-private mix involved in vaccine production hubs being set up in some African countries, such as South Africa, is a new area not covered in this review, which needs further investigation.

3.3 Port health

Table 5 provides the information found on port health roles and responsibilities for each ESA country.

The evidence here points to some general findings. ESA member states implemented various border measures to limit pandemic spread at air, road and where relevant marine POEs. These were public sector roles using public health authorities and personnel, with private sector roles largely being in compliance and communication to travellers and transporters.

Table 5: Port Health Roles and Responsibilities

Country	Public sector	Private for-profit	Private not-for-profit
Angola	Quarantining travellers entering the country commenced before Angola reported a case. Closure of borders with limited exceptions and limited transportation. POE screening for travellers.	-	-
Botswana	Active screening at all POEs and especially among drivers coming from the border with South Africa. Pre-emptive border closures were implemented. Trained staff at all POEs.	-	-
DRC	Imposing restrictions on the borders. Flights from COVID-19–infected countries were suspended. Implemented POE screening of travellers.	-	-
Eswatini	Restricted border crossings for goods, travellers (both residents and citizens). Mandatory 14 day quarantine of travellers and closed airports.	-	-
Kenya	Disease prevention, safety and surveillance at POE	Development of a	-

Country	Public sector	Private for-profit	Private not-for-profit
	as part of regional efforts. Renovated quarantine facilities at POE. Border closures.	driver tracking system for EAC member states	
Lesotho	Closed border and airport. Screening at POE		
Madagascar	POE screening all incoming passengers; Closing the country to all air-traffic.		
Malawi	No border closures; airports remained open.		
Mauritius	Enhanced screening of passengers at POEs. Compulsory quarantine for all returning Mauritius residents. Travel restrictions for high risk countries.	-	Provided cargo services for emergency medical supplies
Mozambique	Closed borders. Set up screening procedures at POEs.		IOM supports border management. AfDB provided support for border tracking technology.
Namibia	Imposed travel restrictions, closed borders with RSA and neighbouring countries. Closed airports early on and later, when reopened, those entering the country by August 2020 were required to show 72hr negative test results. Mandatory fourteen-day quarantine for those entering the country. Embarked on training sniffer dogs to identify COVID-19 at POE.	-	-
South Africa	Closed borders to international travel and embarked on POE screening of travellers.	-	CSO advocacy protecting migrants' rights.
Tanzania	Banned international flights but later opened airports. All ports remained open. Initially ordered quarantine for asymptomatic travellers. Some level of temperature checks at POE.	-	-
Uganda	Temporary border closure to non-Ugandan citizens and mandatory quarantine for Ugandan citizens returning from high-risk countries. International airport and all other border points of entry were closed, except for cargo aeroplanes and trucks.	Transporting cargo for essential supplies.	CEHURD distributed IEC materials in local languages to commercial sex workers and provided PPE in border towns
Zambia	Active surveillance at POE and health care facilities. Travellers entering the country undergo mandatory quarantine up to fourteen days in designated places. Specialised training for airport staff including immigration, customs and security at all POE. Mandatory screening of international travellers: including truckers, bus operators, and passengers at POE. Restrictions on non-essential foreign travel.	Donation of dry port space for cross-border drivers of essential medical and other supplies to undergo health checks. Airlines provided cargo services for medical supplies.	Support to contact tracing at POE.
Zimbabwe	Total lockdown effected 30 March 2020. Banned local and international travel. Border and airport closure. Screening at all international airports.	Donated PPE and equipment to the immigration department and port health staff	NGOs and churches donated PPE to port workers

Sources: AfDB, 2020; Amesho et al., 2020; Bushira et al., 2021; Chan Sun and Lan Cheong Wah, 2020; Columbo, 2020; EQUINET SC 2021; Gehre et al., 2021; Government of Mauritius 2020; Gyeltshen et al., 2021; Haider et al., 2020; IMF, 2020; Murewanhema, 2021; Nachega et al., 2020a,b; Obasa et al., 2020; Ochu et al., 2021; OSEAC, 2020; Randremanana et al 2021; United Nations Zimbabwe, 2020; Uyoga et al 2021; Whembolua and Tshiswaka 2020; WHO 2021b,c; World Bank 2020a,b; ZNPHI, 2020.

Border closures, noted earlier, were either pre-emptive or reactive. In the first wave, all countries subjected arriving passengers to some form of screening, with those found to be symptomatic or with

a positive PCR test, proceeding to quarantine/isolation at designated centres for 14–21 days depending on the country. In later stages of the pandemic, arrivals were required to show a negative PCR test taken within 48–72 hours on arrival and countries issued travel advisories.

EAC states collaborated in an innovative scheme with the private sector to develop and implement a driver tracking system, combined with laboratory services and digital certificate as a regional co-operation to enable cross-border cargo traffic, to overcome trade barriers described earlier (Ochu et al., 2021; Gehre et al., 2021).

3.4 Treatment and care

Table 6 provides information on treatment and care by country for each ESA country.

Table 6: Treatment and care roles and responsibilities

Country	Public sector	Private for profit	Private not for profit
Angola	Government updated training materials for case management with support from partners. Field hospitals were established and treatment centres opened to manage COVID-19 cases.	Supported training of community-based agents. Jack Ma Foundation donated ventilators to MOH.	WHO deployed public health specialists in Luanda and beyond to ensure equity. Cuba sent 244 medical personnel and medical supplies for COVID-19.
Botswana	Set up isolation facilities, repurposed some of the existing hospitals and clinics for COVID-19 case management.	Private facilities implemented treatment guidelines and IPC measures.	WHO procured PPE and thermometers, which were immediately deployed for use on the frontline.
DRC	Developed COVID-19 pandemic preparedness and response plans and protocols for health facilities. Set up triage and isolation facilities. Procured PPE and infection prevention products and conducted training of health workers in IPC.	-	-
Kenya	Set up COVID-19 isolation facilities in health centres. Training frontline health workers in IPC. Recruited more health workers for case management. Home-based care for mild cases and hospitalisation for severe cases.	Schools and hotels used as isolation centres for patients in need of institutional care.	-
Lesotho	Set up isolation facilities for management of symptomatic cases.	-	Supported training of frontline health workers.
Madagascar	Mobilised resources to meet lack of oxygen in the hospitals. Coordination of referrals between private and public health facilities. Updated treatment guidelines and ensure dissemination in both the public and private sectors.	Partnered with the national taskforce to import and adapt cylinders for medical oxygen. Management of mild cases and referral of severe cases to public health facilities.	UNICEF and partners supported procurement of medical oxygen for hospitals. USAID supported procurement of medical supplies for both the public and private sectors.
Malawi	Recruitment of 2,000 additional health workers. Renovation of some wards in public health facilities to act as treatment centres. Case management guidelines developed for home-based and hospital-based management of COVID-19 cases. Government repaired old ventilators and procured 20 more. Improved supply of PPE to health workers. Trainings held for health workers and volunteers.	-	Financing for rehabilitation or expanding medical oxygen facilities
Mauritius	Set up isolation facilities and provided PPE to health workers. Isolation of health workers	Private hospitals implemented IPC	-

Country	Public sector	Private for profit	Private not for profit
	during their working shifts with provision of accommodation, quarantining and testing at the end of their work shifts. Contact tracing, rapid response teams, observation of those in quarantine by trained health workers. Continuous training in case management	measures.	
Mozambique	Oxygen support readiness and capacity varied across provinces and facilities. Expanded isolation facilities with financing from ADF.	-	-
Namibia	Repurposing sections of hospitals into ICUs.	-	-
South Africa	Frontline healthcare workers prioritised for PPE and intensive care unit admission. Re-prioritisation of health service delivery to COVID-19 patients. Setting up of temporary and field hospitals in some jurisdictions (e.g. Hospital of Hope at the Cape Town International Convention Centre). The National Institute for Occupational Health provided an extensive online training programme for occupational health and safety particularly focused on health workers.	Implementing IPC in private hospital wards. Private hospitals provided ICU care and ventilation for severe COVID-19 patients.	Hospice support. CSOs advocated for continuity for routine essential services for patients with (e.g.) TB, HIV, sexual and reproductive health, etc. Financing for rehabilitation or expanding medical oxygen facilities
Eswatini	Setting up isolation facilities.	-	-
Tanzania	Treatment of symptomatic cases as they arise. Designated hospitals for COVID-19 case management.	Management of symptoms using standard operation procedures (SOPs).	Management of symptoms as per national SOPs. Financing for rehabilitation or expanding medical oxygen facilities
Uganda	Set up isolation facilities in both public and private hospitals to care for COVID-19 patients requiring hospitalisation and other institutional support.	Collaboration with the public sector to provide additional facilities for treatment and support.	Supporting patients admitted to COVID-19 isolation facilities. Advocacy for prioritisation of health worker needs for PPE. CSOs in collaboration with Ministry of Health advocated for sexual and reproductive health (SRH) to be recognised as essential services to be prioritised, ensuring uninterrupted service delivery for SRH during lockdown. CSOs provided legal aid and logistical support for human rights violations during lockdown (especially for clinical social workers and health workers). Financing for rehabilitation or expanding medical oxygen facilities.
Zambia	Set up isolation facilities in all districts to manage COVID cases free of charge. Training of health workers, port health staff and rapid response teams. Repurposed and expanded facilities for management of severe COVID-19 cases. Deliberate efforts made to minimise interruption of essential health services, e.g. child health; maternal health; reproductive health; surgical	Some private clinics had admission centres including seamless referral systems to the public facilities for patients requiring oxygen therapy. Reduced visitations to	Supporting patient and health workers in isolation facilities with psychosocial support and food packages. Support government to expand oxygen services for COVID-19 patients.

Country	Public sector	Private for profit	Private not for profit
	depts; cancer hospital; etc. Prioritising procurement of PPE for frontline health workers and in case of them contracting COVID-19 there were designated units for their management to minimise loss of already limited frontline staff. Collaborating with private sector to ensure standardised training, application of standard guidelines and protocols and continued oversight. Ongoing monitoring of patient outcomes via incident management system frameworks. Resource mobilisation to expand or rehabilitate medical oxygen plants.	hospitals as part of IPC measures in line with government recommendations.	
Zimbabwe	Reserved 425 hospital beds and five ventilators for COVID-19 patients in a tertiary care hospital in Harare. Upgrading all infectious disease centres across the country. Ring fenced PPE for health workers	Repurposed five private hospitals as COVID-19 centres with capacity of approximately 650 beds and 20 ventilators in Harare and Bulawayo.	Capacity building for health workers

Sources: Amesho et al., 2020; CEHURD, 2020b,c; Chan Sun and Lan Cheong Wah, 2020; Columbo 2020; Denhard et al., 2021; EQUINET SC members Malawi, South Africa, Uganda, Tanzania and Zimbabwe, 2021; Gehre et al., 2021; Government of Mauritius 2020; Haffajee, 2020; Ihekweazu and Agogo, 2020; Katsidzira et al., 2020; Khadka, 2021; Nachega et al., 2020a,b; Obasa et al., 2020; VOA, 2021; UNICEF, 2021b; WHO, 2021b; World Bank 2020a,b; ZNPHI, 2020.

The evidence in *Table 6* points to some general findings

Treatment and care, for mild and severe COVID-19

Public and private health facilities repurposed sections or departments of hospitals to meet the demand for beds and provide treatment in line with standard procedures during peak times, including for oxygen facilities, with oxygen plants owned by the private sector (UNICEF; 2021b). The demand for oxygen support is noted to have exceeded supply (Feldman et al., 2021; Juma et al., 2020), with oxygen deficits during case surges related to increased case fatality, such as reported in Malawi, South Africa, Uganda and Zambia (VOA, 2021). Private sector (PFP and PNFP) and international agencies have supported financing to improve medical oxygen production capacity in some countries, such as Kenya, Malawi and Tanzania (Khadka, 2021). Both public and private hospitals provided care and in some countries, health workers who contracted COVID-19 received care in designated treatment centres or wards (Haffajee, 2020). Community health workers and NGOs in Kenya were instrumental in RCCE and in offering psychosocial support (AMREF, 2020; IOM 2020). NGOs provided additional support services for patients and bereaved family members in the form of food packages and psychosocial support (Irura, 2020; Wangari et al., 2021; AMREF, 2020). Some countries like Zimbabwe, Namibia, RSA and Zambia have provided unconditional social cash transfers to vulnerable households (Rutayisire et al., 2020). The Africa CDC has provided guidelines for diagnosis and management of people with persistent COVID-19 symptoms, (termed 'long COVID-19' (Africa CDC, 2021), but there was no information on how far ESA countries have integrated management of 'long COVID-19' into their systems, nor any documentation of inequalities in its longer term impacts.

Ensuring training, infection control and PPE for health workers

Health worker training was undertaken by both the public and private sectors as part of case management (Ihekweazu and Agogo, 2020; ZNPHI, 2020). Specific training for enhanced infection prevention was undertaken to limit health workers' infection risk (ZNPHI, 2020). Non-state actors played a role in advocacy for prioritisation of PPE for health workers (Juma et al., 2020).

Sustaining services for other conditions during COVID-19

During the surge periods of the pandemic, countries made deliberate efforts to minimise disruptions to routine and essential health services, including by hiring more health workers to ensure wider service continuity, allocating specific days for refills for people with chronic conditions or family planning services and monitoring quality of care indicators to ensure early detection of declines in access and health outcomes for non-COVID-19 cases (Feldman et al., 2021; Uyoga et al., 2021; Obasa et al., 2020; Katsidzira et al., 2020). In some countries, private sector buildings were repurposed to support the need for more bed spaces (Obasa et al., 2020; Nachega et al., 2020; Ghere et al., 2021; Chan Sun and Lan Cheong Wah, 2020).

3.5 Laboratory services and health technology innovation

Table 7 provides information on laboratory services and health technology innovation roles and responsibilities for each ESA country.

Table 7: Laboratory services and health technology innovation roles and responsibilities

Country	Public sector	Private for profit	Private not for profit
Angola	Expanded testing by investing \$7m for setting up a new testing centre of up to 6,000 samples per day using RT-PCR and ELISA. Testing facilities were established to other geographical regions in the country in a bid to expand access. An additional \$3.5m was sourced from the US Government to expand laboratory capacity. The military assisted with distribution of test kits	Private sector donations to the responses such as the Jack Ma Foundation, donated testing swabs to the health ministry. Set up new lab infrastructure for diagnosis, contact tracing and mass testing for high risk groups.	Financial support to expand diagnosis and treatment: US Government supported \$3.5m towards lab and testing supplies, training and protocols for contact tracing.
Botswana	Mandatory testing. Decentralised laboratory capacity after initially depending on sending samples to RSA. National Lab has since opened satellite testing centres in selected districts with sizeable populations and key POEs. Replaced manual lab information management systems with electronic systems to improve timely relay of information to collection points for appropriate action. Trained lab staff in new testing protocols and repurposed existing equipment for COVID-19 testing.	-	WHO procured reagents and test kits, thereby allowing the decentralisation of testing capacity throughout the entire country
DRC	Set up mobile laboratories for community-based COVID-19 testing using prior experience from the Ebola epidemic.	-	Supporting medical staff training; procuring test supplies.
Kenya	Collaboration with private sector to set up laboratories capable of detecting SARS-CoV-2. Set up mobile laboratory including in other EAC member states, combining a rapidly developed regional electronic health certificate tracking system with laboratories, kept supply chains functional and created training opportunities for laboratory staff. Undertook seroprevalence testing among blood donors. Designated laboratories with COVID-19 diagnostic equipment, test kits and reagents. Trained laboratory staff. Set up community event-based surveillance.	Private sector to set up laboratories capable of detecting SARS-CoV-2	Support to expand testing capacity.

Country	Public sector	Private for profit	Private not for profit
Lesotho	Travellers are required to show a negative test within 72hr before arrival.	Collaboration in testing facilities.	-
Madagascar	Expanded existing influenza surveillance to include COVID-19 by testing those with ILI/SARI, samples collected from private and public hospitals. Rapid tests and RT PCR using existing options and full genome sequencing carried out	Samples collected from both private and public health institutions	CSOs involved in expanding testing among key populations who are known to have a high burden of HIV
Malawi	Establishment of nine laboratories across the country to conduct tests on suspected cases.	Collaborating with the private sector in strengthening laboratory capacity.	-
Mauritius	Mass screening of frontline staff by rapid tests, PCR for lab confirmation of cases. Enhanced testing capacity. Implemented an electronic COVID-19 laboratory information management system.	PCR testing in private hospitals	-
Mozambique	Expanded testing capacity with support from partners such as UN agencies and the African Development Fund.	-	Support towards expanding testing for COVID-19.
Namibia	Set up three testing laboratories: National Institute of Pathology (NIP), Pathcare and University of Namibia. Set up isolation facilities for testing and management of cases by repurposing sections of hospitals into ICUs. No mass testing.	-	-
South Africa	Expanded testing capacity including mobile testing. Testing is now reserved for hospitalised patients with suspected COVID-19 and healthcare workers. National Health Laboratory Services developed new methods for processing PCR samples to speed up testing turn around.	Provision of testing facilities at hospitals and clinics.	-
Eswatini	Expanded rapid and molecular testing facilities under the national reference laboratory network.	-	-
Tanzania	Testing for COVID-19 provided at a fee \$100 regardless of citizen status and mandatory for all travellers. Testing is voluntary for other citizens.	-	-
Uganda	Makerere University school of public health with the Ministry of Science, Technology and Innovation embarked on local development of an open design low-cost ventilator, adapting open access designs that will be valuable to Uganda even beyond the COVID-19 pandemic.	-	-
Zambia	Laboratory testing at various centres (RDT and PCR). Laboratory testing capacity established at the University Teaching Hospital Virology Laboratory and at the School of Veterinary Medicine at the University of Zambia, Tropical Diseases Research Centre and private hospitals. Testing facilities later decentralised to include all provinces with public, private and academic institutions offering testing. Repurposed existing testing facilities for TB and HIV to include COVID-19. Tests for travellers cost	Private and academic institutions involved in offering testing facilities.	Continued to complement government through resource mobilisation and donations to laboratory services; essential health technology; capacity building of staff.

Country	Public sector	Private for profit	Private not for profit
	US\$50-\$150. Phylogenomic analysis of the patient's SARS-CoV-2 strain. Forensic pathology scaled up countrywide, to determine cause of death and comorbidities in those brought in dead. f		
Zimbabwe	Resources mobilised from development partners and the private sector to purchase laboratory services and essential health technology. Government ensured the capacitation of public laboratories like the National Microbiology Reference Laboratory and Harare Central Hospital. A number of institutions of higher learning including the Harare Institute of Technology have been involved in the manufacture of ventilators and other health equipment. Support given to health facilities from national to community level. Oxygen and ventilators in short supply.	Private laboratories conducting tests. Capacity building of staff	Complement government through resource mobilisation and donations to laboratory services; essential health technology; capacity building of staff

Sources: AfDB, 2020; All Africa Global Media, 2020; Amesho et al., 2020; Budget Enquirer, 2020; Chan Sun and Lan Cheong Wah 2020; Columbo, 2020; EQUINET SC, 2021; Gehre et al., 2021; Government of Mauritius, 2020; Haffajee, 2020; Mucheleng'anga and Himwaze 2020; Nachega et al., 2020a; Obasa et al., 2020; Rendremanana 2021; Simulundu et al., 2020; Uyoga, 2021; WHO, 2020c; WHO AFRO, 2020; World Bank, 2020a,b; ZNPFI, 2020.

Laboratory services

As a response, ESA countries procured consumables and used both national and regional laboratory capacities for PCR and RDT testing. The EAC has developed regional laboratory networks as part of regional capacity strengthening efforts (Ochu et al., 2021). All countries repurposed existing laboratories in both the public and private sectors to include testing for SARS-COV-2, (Ochu et al., 2021; Ihekweazu and Agogo, 2020). The public sector provided accreditation of the quality of laboratory management systems and, in some countries, mobile laboratories were used to expand access (Nachega et al., 2020a; Obasa et al., 2020). However, the level of enforcement in practice in the private sector was not indicated in the documents reviewed. As the pandemic progressed, countries repurposed existing testing platforms for infectious diseases (TB and HIV) to include COVID-19 testing (Obasa et al., 2020; Gehre et al., 2021; Ihekweazu and Agogo, 2020; Chan Sun and Lan Cheong Wah, 2020; Rendremanana et al., 2021; ZNPFI, 2020). Some, such as Zambia, South Africa, Mauritius and Madagascar, initiated genome sequencing to identify variants in circulation (Simulundu et al., 2020; Rendremanana 2021; Obasa et al., 2020). Country level testing capacity was extended in laboratory networks at sub-national level to reduce turnaround time for results (ZNPFI, 2020; Columbo, 2020; Obasa et al., 2020). Most countries abandoned mass testing approaches due to supply chain challenges, but existing influenza surveillance programmes provided an opportunity to build in-community and hospital-based testing/surveillance collecting samples from private and public services for SARS-CoV-2, such as in Madagascar, Mauritius, Zambia and South Africa (Simulundu et al., 2020; Rendremanana et al., 2021). Routine testing in the public sector was generally said to be at no cost, but tests offered for travel ranged from \$50 to \$150. A number of countries implemented seroprevalence surveys to better understand the distribution, burden and variants of SARS-CoV-2 (Table 7; Uyoga et al., 2021; Simulundu et al., 2020).

Health technology innovation, access and distribution

Public and private initiatives in some countries collaborated to develop prototypes of ventilators that were later commissioned for use, such as Uganda, Tanzania and South Africa, (Ochu et al., 2021; EQUINET SC member personal communication – South Africa, Uganda). In other countries, the public-private programmes led to the production of locally produced test kits (Kenya and South Africa) and ventilators (Uganda, South Africa and Zimbabwe). In Zambia, a brewery company re-

organised their manufacturing to include local production of sanitisers, while tertiary institutions in Zimbabwe got involved in production of PPE, in Kenya, firms expanded large scale production of PPE, and in RSA, PFP firms produced mobile sprayers for disinfection of public spaces (Ochu et al., 2021). As innovations, blood donations from public and private hospitals were used for some seroprevalence surveys (Kenya, Madagascar) and autopsy studies done to assess infection rates in Zambia (Uyoga et al., 2021; Mucheleng'anga and Himwaze 2020).

4. Discussion

The response to the COVID-19 pandemic in the ESA region appears to be comprehensive aided, in part, by improvements in systems for IDSR implementation in Africa, albeit with varying progress across countries (Ihekweazu and Agogo, 2020), and by the lag time between the Asian pandemic and its entry into Africa, which enabled enactment of preparedness measures (Li et al., 2021). Further investigation is merited on why some ESA countries performed better than others, given that performance was not always related to prior IHR core capacity scores, as noted in other regions globally. It does appear that ongoing improvements in IDSR implementation will benefit countries' capacity to effectively respond to current and future public health threats (Ihekweazu and Agogo, 2020). Pre-existing health system challenges and wider contextual challenges also played a role, such as in the DRC and Mozambique, which meant that systems were overstretched in their efforts to effectively respond (Ebrahim et al., 2021; IGC, 2020).

The different responses by countries, from no lockdowns, to partial or full lockdowns and POE closures, some lasting for prolonged periods, were noted to have negative impacts on low-income households with the least resources or coping strategies. Differences in testing capacity and the ability to detect and control cases led to inequitable access to testing, perpetuating community transmission due to delays in detection and quarantine of those infected. Here too, the lowest income communities are likely to be more affected.

While public sectors engaged private sector providers to expand access to testing facilities in each country, including in cross-country collaboration models, the public sector remained hampered by shortfalls in supplies for testing and PPE for health workers, generated by wider inequalities in purchase of supplies between high- and low-income countries. Key services like contact tracing faced resource limitations for rapid response teams, including covering difficult terrains in remote settings.

Where systems are stressed, the burden often falls on the lowest income communities and while the private sector can provide complementary services, in ESA countries, the public sector is generally the key provider for low-income communities. Hence, for example, poor availability and physical access for elderly people at high risk of severe disease deters their access to health facilities, an issue noted in Angola, DRC, Madagascar and Mozambique, where travel time could be as much as six hours (Geldsetzer et al., 2020). Stress and disruption of essential health services was noted to lead to increased maternal deaths in Angola and the DRC, in a 2020 study (WHO, 2020e).

Such service shortfalls directly affect equity but if they weaken public trust they may also lead to lower adherence to prevention measures in more vulnerable communities that already have less accessible services, transport constraints, overcrowded home and community settings. Lack of funds for more costly private services, or prevention and social protection alternatives, all raise the risk of infection in these communities (Murewanhema, 2021; Murewanhema and Mukumidze, 2020; Randremanana et al., 2021; Haider et al., 2020; Obasa et al., 2020; Mugabe, 2020).

4.1 Implications of the public and private mix for the nature of the response.

What have the findings shown of the implications for the public-private mix found in the response to COVID-19 and in addressing the challenges to equity?

For a co-ordinated response and alignment of actors

Public and private sector collaboration has been promoted at both continental level and within the ESA region (Nachega et al., 2021; Hagan et al., 2020). The findings point to multiple forms of co-operation within countries in: training health workers; awareness and prevention activities; innovative strategies for supporting trade and transport flows; mobilisation of resources; and technical support.

The Africa COVID-19 Response Fund described in the findings, is one example of a public-private partnership initiative by the AU and Africa CDC to mobilise resources and support for the COVID-19 response from the PFP sector, including procurement of commodities and essential supplies, support for local production and expanding outreach of RCCE (Africa News, 2020). The EAC cargo driver tracking system described earlier is a multi-country example from the region that kept supply chains functional, created training opportunities for staff and supported access to laboratory services for participating countries (Gehre et al., 2021; EAC, 2020). Such a collaborative, cross-border response calls for trust and transparency between partners, and shared procedures and requirements across partners and countries (WHO AFRO, n.d).

The development of country contingency or response plans was public sector led with support from international agencies in most of the ESA countries, and integration of sectoral, private, technical and social stakeholders, particularly as the pandemic progressed. To co-ordinate multiple actors in the COVID-19 response, countries set up multi-sectoral committees or taskforces and used them to guide the response across all pillars, ensure inclusive timely decision making and alignment of all stakeholders to agreed recommendations and guidance. What was less clear from the documentation was how far this alignment took place in practice.

The collaborations between public and private healthcare providers were, however, found to support the continuum of care across providers, to co-ordinate resource mobilisation, RCCE and laboratory and POE operations, and to support production, procurement and distribution of essential health technologies enabling the necessary comprehensiveness across sectors (Columbo, 2020; Gyeltshen, 2021). It was not clear in the documentation how far these mechanisms included representation from the social/community organisations most affected by the pandemic and the responses to it, particularly given their levels of health need and vulnerability in relation to responses such as lockdowns, noted earlier, and of emergency restrictions curtailing their ability to access NGO support as noted in Angola (Columbo, 2020; World Vision, 2020).

For the nature and comprehensiveness of the response

The scale of spread and impact of the pandemic noted in the introduction called for multi-sectoral resources and responses and from multiple actors. As also noted above, the findings indicate that public leadership and PFP and PNFP sectors and communities, continental, regional and international agencies, all played a role, particularly to ensure comprehensive health and non-health interventions.

International and PNFP agencies and community health workers also played a role in supporting equity in the response by supporting resources and interventions for outreach of public sector services, RCCE, service uptake, PPE, care and social protection in high-need communities and underserved areas (IOM, 2020; Columbo, 2020; UNICEF 2021b). However, the equity impact was not assessed or reported in the documents found. Africa CDC, WHO, UNICEF, PATH, GAVI, the World Bank and other international agencies also provided support to PFP efforts to address issues related to commodities, technology, trade and other activities (Rutayisire et al., 2020; Columbo, 2020).

In countries with large PFP health sectors, (such as South Africa, Kenya and Zimbabwe) the private sector has supported key areas of the service response. For example, in South Africa, testing rates are reported to be about five times higher in private facilities than in public facilities (Rutayisire et al., 2020; EQUINET SC member personal communication). Where public health services face

constraints in terms of adequate trained health workers, medicines and surveillance coverage, private service providers may increase coverage and be seen to offer better quality services (Columbo, 2020). However, these private sector services depend on ability to pay, thus excluding many of those most at risk of and vulnerable to COVID-19 and potentially amplifying existing inequalities in health and related systems (Williams, 2020).

For addressing gaps and challenges in the response

The findings indicate that the public sector was legally and institutionally responsible for the comprehensiveness and coverage of the response. Public sectors implemented this duty even while facing the system deficits noted in the introduction. The findings showed examples of innovative approaches to meet these challenges, such as by repurposing existing testing platforms for TB, HIV and other infectious diseases in both public and private sectors (Ochu et al., 2021). The PFP and PNFP sectors helped to fill gaps, such as by repurposing private hotels or schools to provide beds and isolation centres during surges, supporting tracking using mobile data and smartphone apps, inputting to and implementing guidelines and providing ICU referral services, oxygen and supporting laboratory capacities for genome sequencing to inform response measures (Chan Sun and Lan Cheong Wah, 2020; Gehre et al., 2021; ZNPHI, 2020; Randremanana et al., 2021; Simulundu et al., 2021; Osseni, 2020).

This stimulus of co-operation to address gaps was important for the public health response and helped to address shortfalls in existing systems. For example, accessing samples from both public and private sector facilities was key to expanding the already existing ILI/SARI surveillance to detect SARS-CoV-2 in communities in Madagascar and Mauritius (Randremanana et al., 2021; Chan Sun and Lan Cheong Wah, 2020).

4.2 Implications of the public-private mix for equity in the response

For equity in coverage, financing and social protection

Globally, mechanisms such as the COVAX facility noted in the findings responded to the recognition that equity and solidarity between countries are essential for an effective public health response in a pandemic. However, the findings also noted shortfalls and challenges in delivering on this intention, in both the COVAX facility and the ability to use private markets largely controlled by and servicing higher income countries. A casualty of this was the fall in vaccine supplies in the region after suspension of vaccine exports from India. Continental collaboration in the AU and Africa CDC, and regional collaboration efforts between the public and private sectors sought to address these challenges. Internationally they sought to advance the 'TRIPS Waiver' proposal at the World Trade Organisation (WTO) to advance local production of key health commodities. More recently, gaps in oxygen supplies within and across countries has drawn attention, given its consequences for rising case fatality rates (Denhard et al., 2021; VOA, 2021). Peter Piot noted in a VOA article that, "The gap in medical oxygen availability is one of the defining health equity issues, I think, of our age." (VOA, 2021:1).

For the public sectors of ESA countries, as noted earlier, border closures and reduced international trade and mobility affected economic resources and public revenues, making countries vulnerable to acquiring new debt to meet the public sector and social protection demands raised by the pandemic (Gondwe, 2020). While the findings report on measures taken to keep trade routes open and support private sector activities, the loss to public revenues was a major challenge for public leadership and equity, especially if increased debt brings loan conditionalities that further constrain public spending.

The findings report many examples of PFP contributions in contributing resources and of PNFP sectors in supporting outreach to community level. As noted in the Africa Report "Africa's exemplary Covid-19 response would not be so successful without the participation of the private sector. Their support has spanned Covid-19 prevention, diagnostics, therapeutics and emergency care." (Nsofor, 2021:1).

The findings also suggest, but with less supporting documentation, issues that support equity in these contributions. These include mechanisms for centrally pooling and allocating resources; avoiding fee barriers to use of services; ensuring private sector commodity support is provided in both public and private sectors; and ensuring transparency and public information provision on such service and resource contributions. In Madagascar, for example, a shortage of medical oxygen was addressed by engaging PFP producers to distribute to both public and private sector facilities (UNICEF, 2021b).

There are reports of challenges to these equity measures within the private sector itself. PFP providers were reported to be facing their own liquidity crisis due to declines in out-of-pocket expenditure, increasing costs for implementing recommended IPC measures and deferred payments from insurance companies (Williams, 2020). Their response was to increase prices for services even while governments took action to cap prices and regulate quality of care. Closures of small businesses, job and income losses not only affected peoples' ability to meet rising costs, but also potentially weakened participation in formal medical insurance systems (Shadmi et al., 2020).

Planning for inclusion of hard to reach areas and groups appears to be critical in the pandemic response. Beyond these resourcing and supply constraints, however, the findings also point to other factors affecting equity in coverage. In some countries, rural areas appeared to be less well covered by measures, while physical distancing and stay at home measures were difficult for low-income households to implement, given crowded accommodation and insecure incomes. The findings note that the PNFP sector provided support for distribution of face masks, gloves, sanitisers, medical supplies, soap, water and food and engaging in RCCE in rural communities, with young people and in informal settlements (Irura, 2020; Obasa et al., 2020; Marotta et al., 2021). These inequalities are intensified when lockdowns disrupt incomes, social networking and create service disruptions, notwithstanding social protection efforts made.

The equity impacts of these disruptions to households, health services and private sector activities can be judged from the nature of the deficits but need to be properly investigated in the region, as closing inequalities is a vital part of the design of any recovery moving forward. The findings report some of the health impacts as being: increased maternal deaths; a rise in gender-based violence; delays or cancellation of childhood immunisation programmes; rises in illness and injury due to disruptions in emergency services and services for other conditions; loss of schooling for young people; and disrupted services for those living with chronic conditions and for sexual and reproductive health (Feldman et al., 2021; Murewanhema and Mukumidze, Wangari et al., 2020; Korir, 2020; John et al., 2020; Mutavati et al., 2020; UNICEF, 2020). In Mozambique, for example, the gender inequality arising from these disruptions was noted, particularly for women using short term contraceptive methods or requiring emergency contraceptives (Leight et al., 2021).

The findings report various ways the public, PFP and PNFP sectors responded to these disruptions, including through provision of multi-month supplies for HIV, TB and other chronic conditions, social media information to support information on services, social cash transfers, reduced tariffs on utilities and food packages among other measures already noted. However, the findings suggest that a more systematic assessment of the equity impacts of COVID in the region needs to be carried out from household to regional level, to better assess which measures were more effective in addressing these impacts and which are still outstanding.

For social agency and public accountability

As already noted, the pandemic had multiple social consequences, including increased gender-based violence and human rights violations during lockdowns such as the deployment of military personnel in communities to enforce public health measures, and loss of access to key services and resources that help deal with these challenges, including health services and courts (John et al.,

2020; Mutavati et al., 2020; Kyeyune, 2020; Obasa et al., 2020; Dube, 2020; Shale, 2020). In Malawi, observed stigmatisation and discrimination against confirmed cases of COVID-19, and health workers being denied use of public transport for fear of spreading infection, signal the potential for much wider levels of social impact than is formally reported (Masina, 2020; Pensulo 2020). However, the pandemic has also stimulated many positive social contributions as noted in this report. Earlier sections note the inclusion of PNFP sectors, NGOs and CSOs in collaboration mechanisms, joint actions, outreach activities, information sharing and other processes. It was also noted that CSOs played a role in transparency of reporting on and social accountability of service provision and resources obtained and disbursed, including by developing their own information, research and monitoring systems and through social media and advocacy. However, this critical dimension of equity appeared to be more weakly documented in the documents sourced and is an area where further assessment is needed, within an analysis of the pandemic's equity impacts.

5. Conclusions and areas for policy dialogue

The COVID-19 pandemic requires a comprehensive multi-sectoral response, solidarity and effective collaboration across actors, from household to national, regional and global level. It has exposed inequalities and weaknesses in societies, in economies and in health and other systems, but has also generated an impetus to address these inequalities and weaknesses, many of which have been longstanding. Any response thus needs to balance tackling a 'health emergency' with preventing disruption of key socio-economic activities and services, while also avoiding violations of human rights and worsening of existing inequalities. It also needs to address inequalities in any recovery processes.

The findings indicate that public leadership, capacity and authority is essential to bring PFP, PNFP and especially community voice into these issues in a way that builds collaboration, communication and aligns actors and does so in a manner that builds trust, co-operation, information sharing, mutual interest and accountability.

Many of the findings demonstrate that the pandemic catalysed critical contributions from private sector collaborations and many innovations from both the public and private sectors. However, these varied within and across countries, with varying degrees of inclusion, impact on pre-existing and new inequalities as well as varying degrees of alignment, coverage and information sharing. The findings point to important collaborations across countries regionally and at continental level to support responses, but also highlight how global inequalities shape some of the shortfalls in equity in the pandemic response.

While there are specific suggestions arising from the findings, overall it is suggested that a more comprehensive equity analysis of the pandemic impact, the responses and their impact needs to be carried out within the region to inform recovery plans. If the pandemic is found to have widened inequality, then future responses, recovery plans and prevention and preparedness must certainly address it.

Within this broader context, the findings suggest important areas for future policy dialogue to integrate learning on the public-private mix in the response, including sharing learning, good practice and policy measures in the following areas.

- a. *Strengthening public sector leadership and co-ordination* that exerts authority – to ensure equity while being strategic, accrediting and including the various actors affected and integrating responsiveness to changing conditions and issues arising, and providing flexibility, clarity on rights, duties and transparency of information in a way that generates the trust and understanding needed for effective partnership. Public leadership calls for unified M&E systems, effective use of tax, procurement and purchasing regulations and other incentives. It also implies improved routine surveillance, as well as building on existing

surveillance programmes such as SARI/ILI surveillance, mortality surveillance via verbal autopsy and IDSR, to take on new challenges while linking information to planning and action in a manner that encourages widening integration of surveillance in routine programmes in both the public and private sectors, and information sharing between sectors.

- b. Planning for and ensuring *public capabilities for key dimensions of a comprehensive response*, and particularly: those that are focused on healthy environments, workplaces and public settings; prevention activities (including testing, tracing and support); and care and social protection to support equity. *Aligning critical private sector capabilities and partnership for public and private services and for investment in, stimulation and support of innovation and local production in health technologies; to maintain commodity supply chains; ensure laboratory capacities that enable flexibility and co-operation to switch platforms in response to key challenges; and to ensure a continuum of prevention, care and support between the public and private sectors. It also calls for demand-side measures, mechanisms and interventions* to effectively integrate community structures, networks, voice and agency to reach household level.
- c. Integrating measures to ensure equity in *financing mechanisms*, particularly in emergency financing, ensuring pooling of private resources within funding pools that enable public accountability, allocation mechanisms that integrate equity in who benefits, embedding mechanisms for management, transparency and accountability in resource mobilisation and allocation that build confidence among stakeholders.
- d. Integrating *human rights* as a lens for framing and assessing the duties and responses of public and private actors in a manner that balances the enforcement of pandemic responses with upholding the rights of communities, service implementers, frontline workers and migrants, mobile and displaced populations, and that assesses and builds legal, social and institutional capabilities to meet demands. A more systematic assessment of current laws, practices and procedural justice systems in the region against key UN, international and continental rights frameworks could usefully guide this.
- e. Strengthening *regional co-operation as a basis for international co-operation* in: key innovations in e-health, laboratory networks, training programmes, biosafety networks; containment approaches; local production systems for essential health technologies; information and analysis; and cross country exchange of good practice and learning, including examples of equitable and effective forms of public-private mix.

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7. Acronyms

CSO	Civil Society Organisation
EQUINET	Regional Network for Equity in Health in East and Southern Africa
EQUINET SC	Steering Committee
EAC	East African Community
ESA	East and Southern Africa
ICU	Intensive Care Unit
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
ILI/SARI	Influenza-like Infection/Severe Acute Respiratory Illness
IPC	Infection Prevention and Control
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organisation
PCR	Polymerase Chain Reaction
PFP	Private-For-Profit
PFNP	Private-Not-For-Profit
PHIEI	Public Health Emergency of International Concern
POE	Port of Entry
PPE	Personal Protective Equipment
RCCE	Risk Communication and Community Engagement
SARI	Severe Acute Respiratory Illness
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
TARSC	Training and Research Support Centre
WASH	Water and Sanitation Hygiene

Equity in health implies addressing differences in health status that are unnecessary, avoidable and unfair. In southern Africa, these typically relate to disparities across racial groups, rural/urban status, socio-economic status, gender, age and geographical region. EQUINET is primarily concerned with equity motivated interventions that seek to allocate resources preferentially to those with the worst health status (vertical equity). EQUINET seeks to understand and influence the redistribution of social and economic resources for equity-oriented interventions. EQUINET also seeks to understand and inform the power and ability people (and social groups) have to make choices over health inputs and their capacity to use these choices towards health.

EQUINET implements work in a number of areas identified as central to health equity in east and southern Africa

- Protecting health in economic and trade policy
- Building universal, primary health care oriented health systems
- Equitable, health systems strengthening responses to HIV and AIDS
- Fair Financing of health systems
- Valuing and retaining health workers
- Organising participatory, people centred health systems
- Promoting public health law and health rights
- Social empowerment and action for health
- Monitoring progress through country and regional equity watches

EQUINET is governed by a steering committee involving institutions and individuals co-ordinating theme, country or process work in EQUINET from the following institutions:

TARSC, Zimbabwe; CWGH, Zimbabwe; University of Cape Town (UCT), South Africa; CEHURD Uganda; University of Limpopo, South Africa; SEATINI, Zimbabwe; REACH Trust Malawi; Ministry of Health Mozambique; Ifakara Health Institute, Tanzania; Kenya Health Equity Network; Malawi Health Equity Network, SATUCC and NEAPACOH

For further information on EQUINET please contact the secretariat:
Training and Research Support Centre (TARSC)
Box CY651, Causeway, Harare, Zimbabwe Tel + 263 4 705108/708835
Email: admin@equinetafrica.org
Website: www.equinetafrica.org

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