Using evidence and analysis for an adaptive health system response to COVID-19 in Uganda in 2020

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In association with
Training and Research Support Centre

in the
Regional Network for Equity in Health in East and Southern Africa (EQUINET)

EQUINET Case study paper

November 2020

With support from the
Open Society Policy Centre

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Cite as: Kadowa I (2020) 'Using evidence and analysis for an adaptive health system response to COVID-19 in Uganda in 2020', EQUINET Case study paper, Ministry of Health Uganda: Kampala, TARSC, EQUINET: Harare.

Acknowledgements: Appreciation goes to all the pillars in the COVID-19 national response, particularly those that have contributed to the data and information in this report. Thanks to the Strategic Committee of the Ministry of Health for the overall guidance of the national response to COVID-19 pandemic, some of whose decisions have been documented here. The idea for this paper came from discussions in the Equity Watch Cluster with different country actors in the region and internationally on the need to document how different forms of evidence are used in decision-making for an adaptive response to COVID-19. Dr Rene Loewenson, TARSC, framed terms of reference for the paper and implemented technical review and technical edit. The paper was copy edited by Virginia Knight. The financial support from Open Society Policy Centre is acknowledged.

Executive summary

Uganda reported its first confirmed case of COVID-19 on 21 March 2020. The country has since implemented a series of public health measures to limit the spread of the virus. The pandemic has progressed from imported cases through sporadic community cases to stage four, with widespread community transmission.

This paper documents how evidence and analysis were used to support decision-making for an adaptive health system response to COVID-19 in Uganda in 2020. The paper was implemented under the umbrella of the Regional Network for Equity in Health in East and Southern Africa (EQUINET) with support from the Training and Research Support Centre.

A desk review was thus implemented using published and grey literature covering the period from February to October 2020 to document the nature and organisation of different data and related evidence used to support projections, planning and decision-making on the surveillance, prevention, care and health system response to COVID-19. The desk review also looked at how evidence was used and communicated across different actors to support adaptive responses.

A well-structured mechanism was established to drive the national and district COVID-19 pandemic response. The overall co-ordination of the central/national COVID-19 response was placed under the leadership of a multisectoral National Task Force, chaired by the Prime Minister. At local government level, COVID-19 district task force co-ordinated and guided the district response. Various other structures took on specific roles for managing strategic planning, implementation and the scientific advice.

In the early stages of the pandemic, given its novel nature, the evidence came from the experience of countries with earlier timelines of the pandemic. Uganda also leveraged its experience from prior management of Ebola and other epidemic diseases. Assessing the risk from imported cases, the first response organised evidence and resources to stop or limit imported cases by enhanced surveillance at points of entry at airports and land borders. The nationwide lockdown provided time to better understand and plan for the evidence, measures and resources to deepen the response.

With Uganda's location in the East African Community (EAC) there is high potential for cross-border movement. Testing and tracking was done to prevent cases imported by cargo trucks, with a region-wide system that shared evidence and measures digitally across the EAC. The regional system reduced the burden and cost of testing at points of entry, enabled mutual recognition of COVID-19 test results among EAC states; faster clearance of cargo, better cross-border communication and sharing of test results, and stronger collaboration of law enforcement, customs and immigration at border crossings.

The input of domestic evidence grew as the pandemic progressed. COVID-19 surveillance was implemented within an existing national integrated disease surveillance and response framework. Village heath teams (VHTs) distributed in every village played an important role in supporting this surveillance system.

Polymerase chain reaction (PCR) antigen testing for SARS-COV-2 has played a critical role in early detection, confirmation and understanding the progression of the pandemic. It has also been critical for Uganda's public health preventive measures and in planning for the response across all the pillars. Testing expanded and refocused to suspected community cases, and two rapid assessment surveys were done to determine prevalence in specific groups and areas identified at potentially higher risk. The laboratory test results have been used to

support and facilitate enhanced surveillance and contact tracing, supported by rapid response teams and contact tracing teams. Hot-spot districts have been targeted and supported on a priority basis with intensified surveillance, contact tracing, and testing alongside enhanced community engagement. The data generated from the health facilities provided disaggregated information on the factors affecting severity and case fatality and have guided the expansion of bed numbers, ICU facilities, medicine supplies and the deployment of health workers.

Rapid assessment surveys informed the phased easing of the lockdown due to the low community transmission of cases in the nation-wide sample and led to enhanced preventive measures at border districts. After the second rapid assessment survey, buffer zone lockdown restrictions were lifted in low-risk districts. The evidence from the two rapid assessment surveys has also been accompanied by intensified communication of the Presidential directives on public measures, while supporting guidance such as using masks in public places, by government's local procurement of masks for the entire population older than 6 years and by initiatives to locally produce key technologies.

The COVID-19 information hub, print and social media, TVs and the plethora of FM radio stations scattered across the country have helped communicate evidence to the public and a wide range of stakeholders. A toll-free call centre for COVID-19 response receives public information and calls, including on suspected cases and alerts. Standard operating procedures and guidelines are broadcast at regular intervals in the electronic and print media.

This communication has assisted in developing and implementing key measures and compliance with them. Measures are reviewed by the organisational structure set up to manage the national response, to address emerging weaknesses and identify and share good practices. A range of innovations in information technology has greatly improved access to and use of real time data to inform decision-making.

The expanded response and evidence for it have generated challenges. These include the likely burn-out of the health work force due to overwork, stress and psychosocial problems. The exclusive use of rt-PCR as the diagnostic of choice has assured the validity of test results, but has had high cost implications for the national response and limited test coverage. As in other African countries, there are challenges in accessing PCR test kits. Efforts to introduce antigen RDTs after their approval may assist in this.

The comprehensive institutional framework has helped to support the use of evidence, linking institutions to pillars of the response. All pillars of the response are conducting an in-depth review of the implementation of their area of response in a process that was ongoing at the time of the response, with recommendations being made on how to readjust the strategies. Other mechanisms for evaluating the response include public feedback through the Ministry of Health media outreach and toll-free call centres, regular meetings among the different pillars, and in the Strategic, Scientific and NTF meetings.

Uganda's response to COVID-19 has been dynamic, responding to different sources of evidence, and through different institutional channels and actions, which themselves are generating evidence and experience that inform the response. The control measures put in place have slowed the spread of the pandemic, have delayed widespread community infection and contributed to the few reported deaths so far. A Lancet Commission report presented at the 75th United Nations General Assembly ranked Uganda among the ten countries that had achieved suppression of the pandemic in August 2020.

1. Background

The World Health Organization (WHO) declared the outbreak of corona virus disease (COVID-19) to be a public health emergency of international concern on 30 January 2020. Just over a month later on 11 March 2020, the WHO declared COVID-19 to be a worldwide pandemic. By that time, following its initial reporting from Wuhan-Hubei Province in China, the SARS-COV-2 virus, the cause of COVID-19, had infected over 118,000 people across 114 countries, territories (WHO, 2020d).

Uganda reported its first confirmed case on 21 March 2020, as an imported case. By April 2020 there were sporadic community cases and by August the country had more widespread community infection (GoU, 2020e).

1.1 Objectives

This paper aims to document how evidence and analysis were used to support decision-making for an adaptive health system response to COVID-19 in Uganda in 2020. The paper was implemented under the umbrella of the Regional Network for Equity in Health in East and Southern Africa (EQUINET) with support from the Training and Research Support Centre. It seeks to contribute to national and regional exchange and learning on the health systems response to COVID-19 and to pandemics generally.

Work was thus implemented covering the period from February to October 2020 to document:

- The nature and organisation of different data and related evidence used to support projections, planning and decision-making on the surveillance, prevention, care and health system response to COVID-19.
- How evidence was reviewed, used and communicated across different actors to support adaptive responses, to share lessons and make adaptations in the response.
- The good practice examples from the experiences on measures for an adaptive, effective health system response to COVID-19.

1.2 Methods

A desk review of secondary data on Uganda's response to the COVID-19 pandemic was implemented from August to October 2020, covering the period from February to October 2020. It documented the evidence used to inform Uganda's COVID-19 pandemic preparedness and response. Published literature was searched from online libraries, particularly Google Scholar. The search terms covered the country (Uganda), key areas of the COVID-19 response: data, evidence, decision-making and impact.

Evidence was also obtained from official documents and reports, including: situation reports and documents on the Africa CDC and WHO official sites; documents on the Government of Uganda Ministry of Health's official online COVID-19 'info Hub'; published operational plans, guidelines and procedures, publicly available incident situational reports, survey reports and daily updates on COVID-19 response. Unpublished reports and minutes of key response and strategic meetings were reviewed to support relevant interpretation of information, while maintaining privacy and confidentiality of the evidence.

1.3 Ethical considerations

The evidence used in the report was publicly available secondary aggregate-level data and information in publications, presentations and reports. No primary data or individual person-identifying information was used**.**

2. COVID-19 in Uganda

With the rapid spread of COVID19 globally, Uganda enhanced its preparedness to be able to rapidly detect and respond to imported cases. A whole-of-government response to the pandemic was triggered (GoU, 2020a). It built on previous responses to earlier viral haemorrhagic fevers and highly infectious disease outbreaks, such as of Ebola in 2000, 2007 and 2011; Marburg in 2012 and 2017 and Crimean Congo haemorrhagic fever in 2017 (WHO, 2020b; Mbonye et al., 2012).

Uganda is geographically located in the East African community, a landlocked country bordered by Democratic Republic of Congo, Rwanda, United Republic of Tanzania, Kenya and South Sudan. The total population in 2016 was 41.5 million, with an average life expectancy at birth of 63 years. Half the population is under 15 years of age (the world average is 27%) and women have, on average, five children. Uganda hosts over one million refugees, predominately from South Sudan, and is the third largest refugee-hosting nation in the world (World Bank, 2020).

Figure 1: Map of Uganda

Source: Wikimedia commons, 2020

2.1 The institutional response to COVID-19

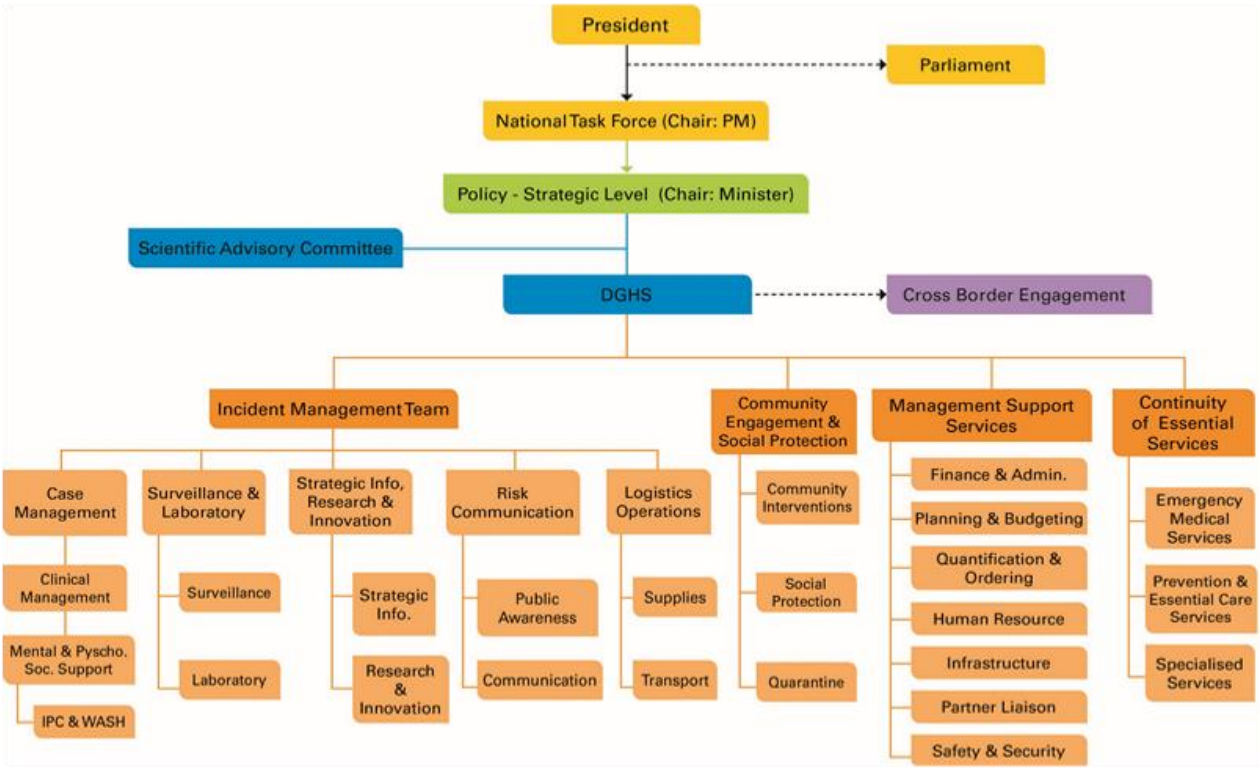
A well-structured mechanism was established to drive the national and district COVID-19 pandemic response. The overall co-ordination of the central/national COVID-19 response was placed under the leadership of a multisectoral National Task Force (NTF) established in the Prime Minister's Office, to enable it to advise the Cabinet and guide the government's overall actions and response. The NTF includes political and technical leaders from key government sectors such as health, security, trade, transport and finance, and the private sector, and is chaired by the Prime Minister.

At local government level, COVID-19 district task forces were established to co-ordinate and guide the district response to the pandemic, similarly composed of the political and technical experts at that level (Gou, 2020a).

A Strategic Committee was established under the leadership of the Minister of Health. It included key partners, including WHO, US-CDC, UNICEF, representatives of civil society and professional bodies such as the Uganda Medical Association. The committee was responsible for mobilising resources and providing strategic and technical guidance in relation to the national response. An Incident Management Team implements the decisions of the NTF and the Strategic Committee in relation to the pandemic response in the country.

A Scientific Advisory Committee (SAC) with members drawn from academics and scientists was established to lead research, innovation, to generate scientific evidence and to use this to advise the NTF. The SAC sits at an independent venue in Makerere University, College of Health Sciences. The responsibility for public reporting on the pandemic lies with the President, NTF, and the Minister of Health (see the organogram of the structure in *Figure 2 below*).

Figure 2: Organogram of the institutional structure of the COVD-19 response in Uganda



Source: GoU, 2020a.

This COVID-19 co-ordination and response structure was established and operationalised even before the first index case in Uganda. It has played an important and proactive role in steering the development of the National Preparedness and Response plan for COVID-19, as well as the different guidelines and standard operating procedures (SOPs) applied to guide the pandemic response at different levels. These documents highlight the key actions and interventions required for collective and individual responses to reduce exposure to the virus and limit the spread of the pandemic. Some guide care and case management, quarantine guidelines, laboratory protocols, standards for points of entry, among other areas (GoU, 2020e).

The government was thus prepared and acted early in responding to the threat of the pandemic. By February, the public was already complying with the public health guidance to avoid shaking hands, hugging others and to regularly wash hands with soap and water or sanitize with alcohol-based hand sanitizers, as one of the ways to prevent COVID-19 transmission.

2.2 Response to different phases of COVID-19

With the rapid worldwide spread of the virus, the country introduced enhanced screening measures for COVID-19 at the border points of entry and at the international airport for all arriving travelers (Kitara and Ikoona, 2020). Previously developed screening measures for Ebola Viral Disease (EVD) at the international airport and border points of entry were activated to detect imported cases (WHO, 2020a). Port health staff at international borders and at the international airport were oriented to implement a COVID-19 screening protocol that included mandatory screening for flu-like symptoms and temperature measurement of arriving travelers (GoU, 2020a).

The government introduced a 14-day mandatory institutional quarantine for all travelers from high-risk countries. Countries were categorised into high and low risk based on the active and cumulative number of COVID19 cases reported from them, according to WHO reports (Kitara and Ikoona, 2020). The enhanced screening at the airport helped to detect the first case of COVID-19, a returning Ugandan businessman who arrived at Entebbe International Airport from Dubai, in the United Arab Emirates (UAE) (Olum and Bongomin, 2020). UAE was not in the Ministry of Health's high-risk category at the time of his arrival.

With the threat of further imported cases, the NTF advised the President to strengthen measures. He accordingly announced strict lockdown measures on 26 March, completely closing all borders and the international airport. All public gatherings such as churches, concerts and sports activities were prohibited; and schools, bars and night clubs were closed (GoU, 2020h). A dusk-to-dawn curfew was imposed from 1900 to 0530 hours. Essential services such as food markets were permitted to continue trading, but with strict hygiene guidelines and social distancing. Personnel needed for the COVID-19 response and vehicles for transport of food and agricultural products and inputs were also allowed to continue activities. Farming was allowed and encouraged during the lockdown.

The interstate movement of cargo trucks was also not prohibited by the lockdown measures. Their crew, however, were limited to two people per truck, one a driver and an accompanying assistant. However, the movement of trucks posed a major risk in terms of importation and further spread of the virus (Kiwanuka et al., 2020). Truck drivers were thus subjected to enhanced screening at the points of entry, and their movement restricted to stops only at gazetted rest and seclusion points to limit mixing with the local populace. Compliance with these measures were closely monitored and enforced by security personnel. Further measures such as mandatory COVID-19 testing using PCR tests at the border points of entry were introduced for all truck drivers, with only those testing negative permitted entry to Uganda (GoU, 2020h). Those testing positive were repatriated to their country of origin in designated trucks with trained personnel observing infection control measures with information shared with the source country for their care. Their trucks were disinfected and a replacement driver assigned from the company for the rest of the journey. UN and Humanitarian cargo flights were allowed, but with those on them quarantined for the period of their stay.

Once the pandemic trajectory was clearer, lockdown measures were gradually lifted. The first easing on 5 May was made when the country had a total of 97 cases reported and no deaths (Lumu, 2020). This decision was based on advice from the SAC scientists on the absence of community transmission based on the first rapid assessment survey (GoU, 2020f). Subsequently, factories, hardware shops, garages, metal workshops, restaurants were allowed, as well as the movement of public and private vehicles, but with strict requirements to follow standard operating procedures, particularly regarding handwashing, temperature checks and social distancing. As lockdown measures were gradually lifted, the directives on the mandatory use of masks in public places and the observance of physical distancing were

communicated. Government launched a mass distribution of masks across the country for all people 6 years and older (UNICEF, 2020).

From imported cases only in April 2020, sporadic community cases were recorded in May-June, while by August community infection was widespread through diffuse lines of transmission (see *Figure 4* and the later discussion). While cases of COVID-19 continue to rise in the community, the number of deaths is still low, with a high rate of recoveries, discussed later.

By 30 September, a cumulative total of 8,129 COVID-19 cases were reported, with 4,260 recoveries and 75 deaths related to COVID-19. The case fatality rate (CFR) was 1% (GoU, 2020b). By that time, the country was registering 1,300 cases and four deaths weekly. The Kampala Metropolitan area was most affected, with 2,735 total cases and 47 deaths. There were also reports of localised outbreaks, with 104 of the 137 districts reporting cases, and with 87 districts having active transmission, defined as cases reported within the last 14 days (GoU, 2020i). The reasons for this distribution are discussed later.

Given this situation, the Ugandan Government shifted focus towards strengthening community interventions. While in the early stage of the pandemic, the main focus was on implementing measures to stop and limit the importation of cases into the country from international and cross border travel, in the current phase of community transmission, the response has been adapted to include measures to reduce the severity and fatality of infection and to avert negative socio-economic effects of the pandemic (GoU, 2020i). The measures include early detection and referral of cases, massive community engagement to ensure compliance with preventive measures, shielding vulnerable populations from exposure and scaling- up health facility capacities to avert severe cases and deaths.

3. Evidence supporting the response

The data and evidence used to inform planning and review of responses came from external and internal sources, drawing on external sources in the early stages and experience from countries with earlier timelines of the pandemic given its novel nature, and with growing input of domestic evidence as the pandemic progressed.

3.1 International data

In early 2020, before the first case was reported in Uganda, there was no pandemic data generated within the country data. The response thus relied on reports from outside agencies, mainly from WHO, complemented by evidence from the online Worldometer database daily updates and from reports, papers and media from countries affected earlier in the pandemic. The early evidence derived from these external sources showed a rapid spread of COVID-19 across countries and regions, and reports of high case fatality, especially for elderly people and those with co-morbidities such as hypertension, diabetes, cancer and immuno-suppressive conditions (WHO, 2020d). The prevalence of these co-morbidities was relatively high in Uganda, with reported data indicating a prevalence of hypertension of 26.4% (Guwatudde et al., 2015), of diabetes of 7.6% (Chiwanga et al., 2016) and of HIV/AIDS of 6.2% (GoU, 2017).

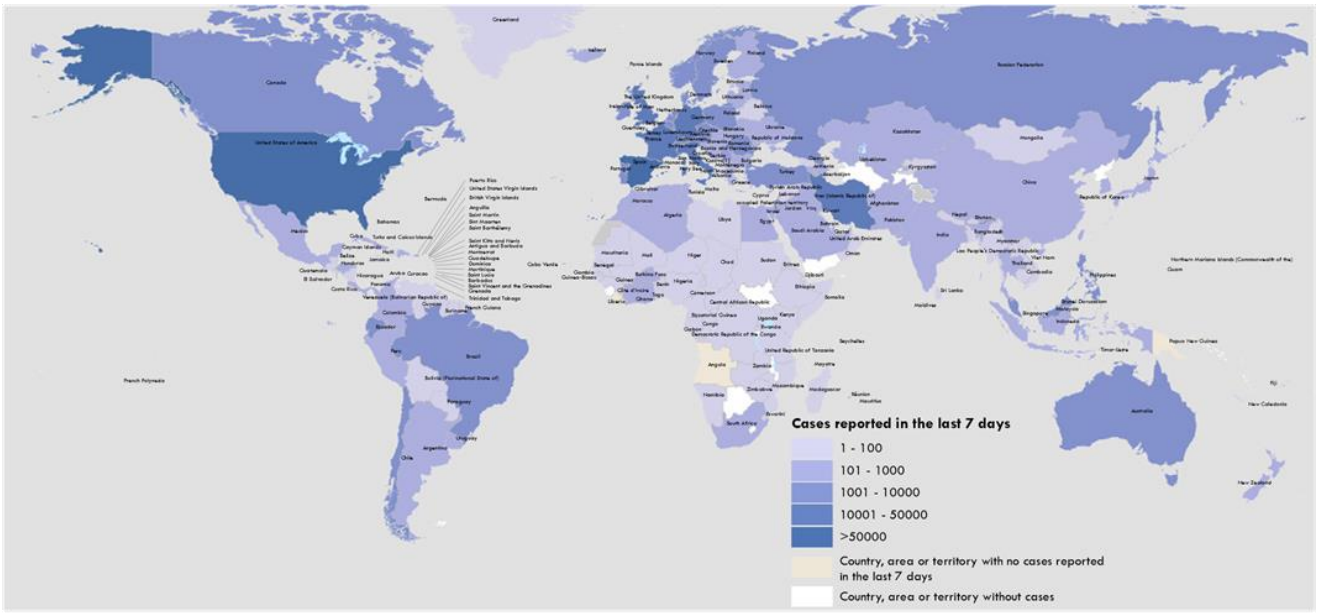
Evidence from countries with earlier epidemics in western Europe and the United States highlighted that people over the age of 65 years were also most affected by severe complications of and mortality from COVID-19 (WHO, 2020d). Uganda's population is largely young with 48.1% of the population below the age of 15 years, and 49.4% between 15 and 65 years, with only 2.5% above 65 years of age (GoU, 2014). This, however, did not blur the

efforts to protect all age groups through public health measures put in place to prevent exposure to the virus.

It was apparent that people traveling across borders, especially from countries with high incidence and prevalence, were most at risk of exposure. While Uganda is not a hub with the same density of international travel as neighbouring Kenya, a substantial number of people travel for trade, education, work and leisure between Uganda and what were the more severely affected countries in the early stages, such as China. This implied that the higher risk at that stage was of importing COVID-19 into the country, especially through Uganda's international airport at Entebbe (GoU, 2020a; Kitara and Ikoona, 2020).

As a result, on March 11th and even before its first reported case on 21 March, the government announced a 14-day quarantine of all arriving passengers from 16 countries deemed by WHO to be high risk, as shown in *Figure 3,* including the United Kingdom, other western European countries, the USA and China, with travel restriction placed on people travelling to and from those countries.

Figure 3: Global distribution of COVID-19 cases reported between 24 and 31 March 2020



[1] All references to Kosovo in this document should be understood to be in the context of the United Nations

The boundaries and names shown and the designations used on this map do not imply the expression of any

Data Source: WHO and ministries of health

Source: WHO (2020e).

With Uganda's location in the East African Community (EAC) and thus potential for movement across these borders, efforts were made to harmonise the response to this international evidence through bilateral dialogue between Uganda and Kenya governments and subsequently within the wider EAC region. One focus was to find ways to limit the spread of the coronavirus through the movement of interstate trucks bringing cargo across the region's land borders. This is further discussed in a later section.

3.2 Evidence gathered within Uganda

Uganda has an enhanced surveillance strategy focused on alert management and active case search, laboratory-, community-, health-facility- and point-of-entry (POE)-based surveillance, accompanied by contact tracing and quarantining (GoU, 2020a).

Uganda's pre-existing EVD preparedness and response experience informed the surveillance infrastructure and response to COVID-19. Together with partners, Uganda had already invested more than US$18 million in preparedness and readiness for an EVD or other viral haemorrhagic disease outbreak (WHO, 2020a). These measures in early 2019 included training more than 10,000 health workers on infection prevention and control, psychosocial support, surveillance, safe and dignified burials, and other aspects of the response to outbreaks. This training enabled a rapid cascading of COVID-19 prevention and control measures throughout the country.

COVID-19 surveillance was implemented within an existing national integrated disease surveillance and response framework, supported by partners such as WHO, United States Centers for Diseases Control (US-CDC), Infectious Disease Institute of Makerere University (IDI) and the African Field Epidemiology Network (AFENET). The data informing this response came from alerts and diagnosis of suspected cases, contacts, travelers at POEs and repatriated citizens; from health facilities, including isolation or treatment centres; and from quarantine centres (GoU, 2020d). Isolation centres are health facility spaces used to manage positive cases while quarantine centres are facilities for the stay and monitoring of any exposed persons. Hotels were mainly used for this latter purpose.

Village heath teams (VHTs) are distributed in every village of the country and played an important role in supporting this surveillance system. As the first point of contact with households, they have been instrumental in delivering coronavirus preventive messages to families and individuals within their communities (WHO, 2020a). Together with local authorities, the VHTs also report individuals with suspected symptoms and cases to the district surveillance teams for follow-up intervention.

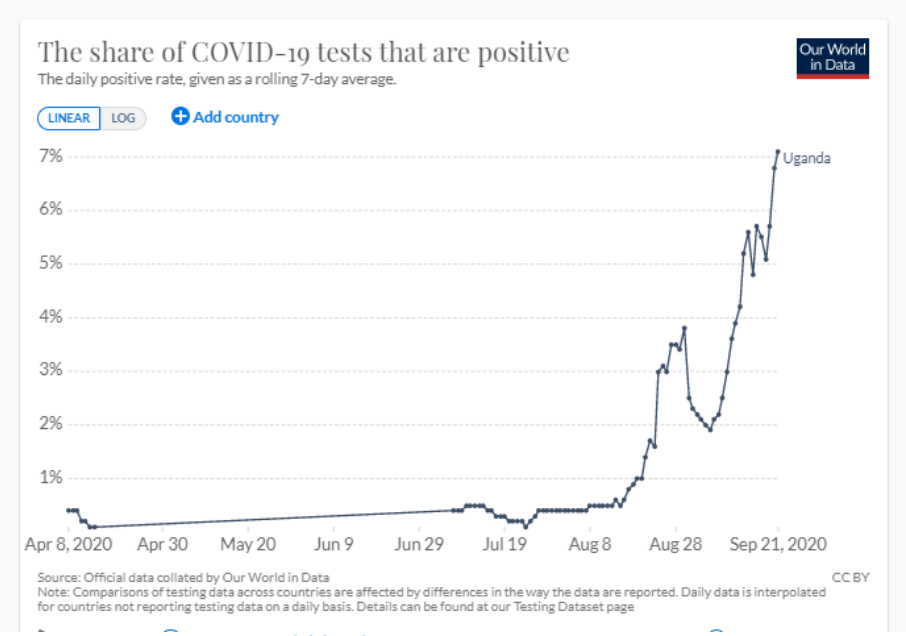
Polymerase chain reaction (PCR) antigen testing for SARS-COV-2 has played a critical role in early detection, confirmation and understanding the progression of the pandemic. It has also been critical for Uganda's public health preventive measures and in planning for the response across all the pillars.

The test adopted in Uganda for diagnosis of COVID-19 is the reverse transcriptase PCR (rtPCR). The country thus ramped up its capacities for laboratory testing in terms of laboratory infrastructure, information technology, rtPCR testing capacities and access to diagnostics (GoU, 2020a). In the earliest phase, only the Uganda Virus Research Institute was accredited to conduct these rtPCR tests (WHO, 2020a). However, as the case numbers increased, this capacity was expanded to twelve laboratories, including two in the private sector, enabling increased case detection. Further, accredited laboratories were strategically established at the major POEs with Kenya, Tanzania and South Sudan, that is at Malaba/Busia, Mutukula and Elegu, respectively, to reduce the turnaround time between testing and results from 96 hours to between 24 and 48 hours.

All those tested positive are promptly isolated, their contacts traced to the widest extent possible and quarantined for 14 days, as the duration of the incubation period (GoU, 2020d). The country initially started generating local data from such PCR testing around 10 March 2020, with all returning citizens/residents tested on arrival at the airport, in quarantine sites and at the border POEs, including truck drivers and their contacts. Subsequently, in July, as a response to the possible risk of community transmission, PCR testing was expanded and refocused on suspected community cases based on symptoms or contacts with confirmed cases. The close link between expanded testing, the reliability and validity of case numbers as evidence of progression of the pandemic made it relevant to both widen testing and assess the share of tests that are positive.

By 23 October a cumulative total of 445,526 tests had been done (GoU, 2020b) of which 11,041 were positive, equivalent to 40 tests per confirmed case. This is above the WHO suggested 10-30 tests per confirmed case as a general benchmark of adequate testing. *Figure 4* adjacent indicates that test positivity in Uganda, while initially very low, rose quite sharply after August 10 which is about the same time the case numbers grew. As testing rates improved, the case data may also be more reliable, particularly after late September when it went above 5%.

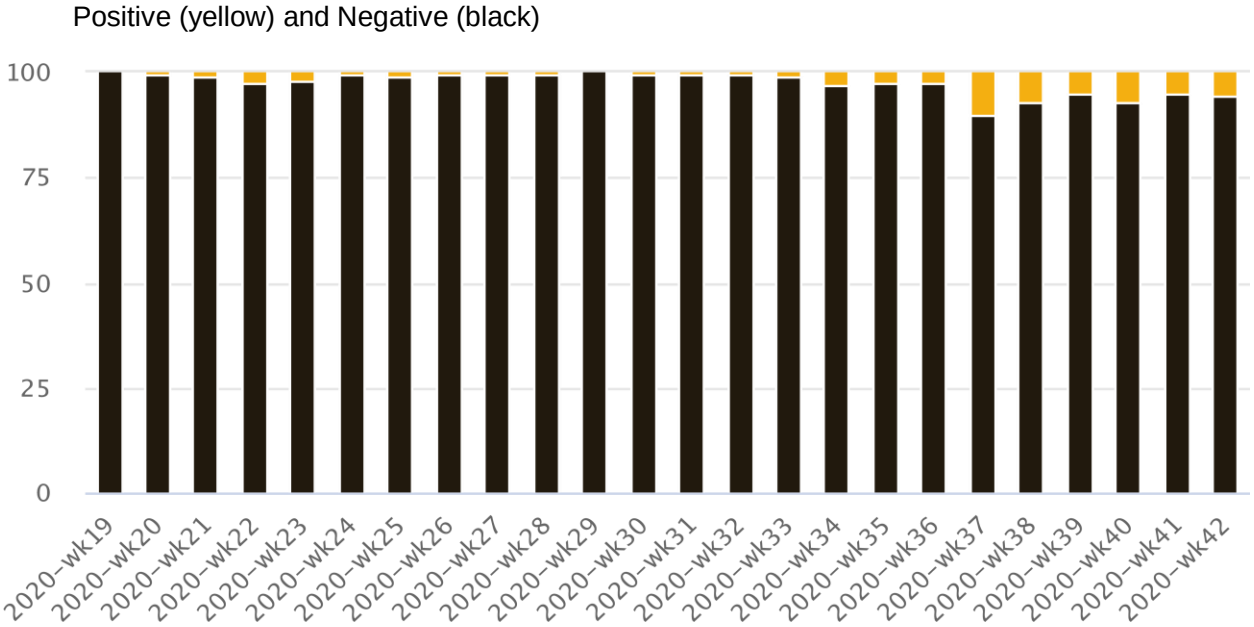
Figure 4: Share of tests that are positive, April-September 2020



Source: Our world in data, 2020.

The test positivity rate rose to a high of 10% in the 37th week of the pandemic in late September. It has since fallen to around 5% in week 42 (23 October), as shown in *Figure 5*.

Figure 5: Positivity rate of PCR tests in Uganda



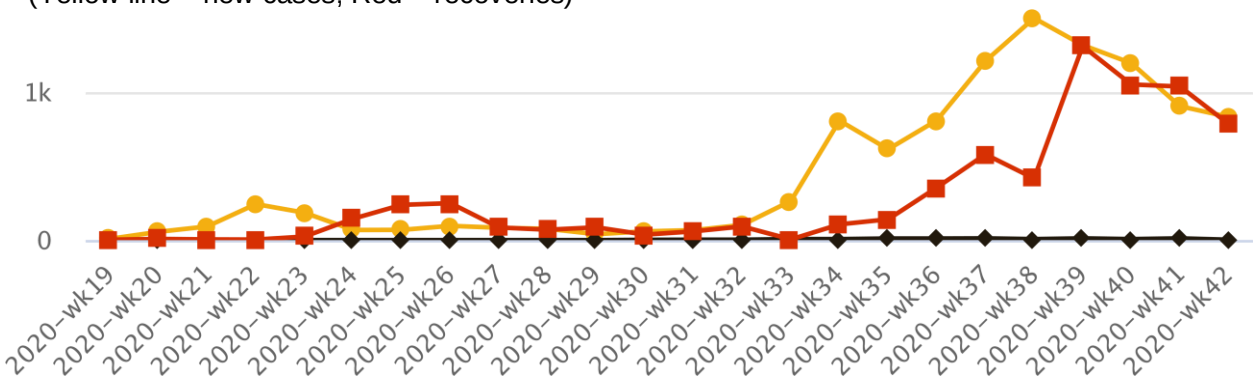
Source: GoU, 2020b.

All actors in Uganda have viewed testing and access to the capacities and diagnostics as critical for guiding the public health response to the pandemic, in terms of assessing the progression of the pandemic, the effectiveness of control measures and in triggering contact tracing, isolation and treatment. With the opening of air travel on 1 October, it has become mandatory for travelers to have

a negative COVID-19 test result to be allowed to travel into or out of the country. For planning and review, COVID-19 test data are disaggregated by gender, district location, occupation and, as discussed later, within specific risk groups.

By 23 October, Uganda had a cumulative total of 11,041 cases, of whom 7,107 had recovered and 98 had died. After 13 weeks of maintaining extremely low levels, new cases increased after August 2020, peaking in September and subsequently declining in October (GoU, 2020d) as shown in *Figure 6* below.

Figure 6: Number of new COVID-19 cases and recoveries, 30 April to 23 October, 2020
(Yellow line = new cases; Red = recoveries)



Source: GoU, 2020d.

The rising numbers shown in *Figure 6* reflect the current phase of more widespread community transmission resulting from the easing of lockdown measures, with increased community activity and interactions in larger gatherings, including election campaign meetings, burials and illegal house parties. Other factors contributing to the rise in August and September were incorrect or non-use of face masks and congestion in public transport, notwithstanding guidelines and SOPs in these areas (GoU, 2020i). Hence, while case numbers can provide important evidence for imposing or lifting pandemic control measures, these factors suggest that wider socio-economic evidence is also needed to sustain controls and to promote adherence.

4. Evidence generated within the response system

This section discusses how various institutions that contribute to the response generate and organise the evidence from different sources.

4.1 From laboratory management information systems

The Central Public Health Laboratory developed an app (RESTRACK-UG) to track the movement of the collected sample from the collection point to the testing laboratory. This app builds on a pre-existing system for referral of laboratory samples from lower health facilities to the relevant laboratory. It was then adapted for use in tracking the collection and transportation of COVID-19 samples up to the testing laboratories.

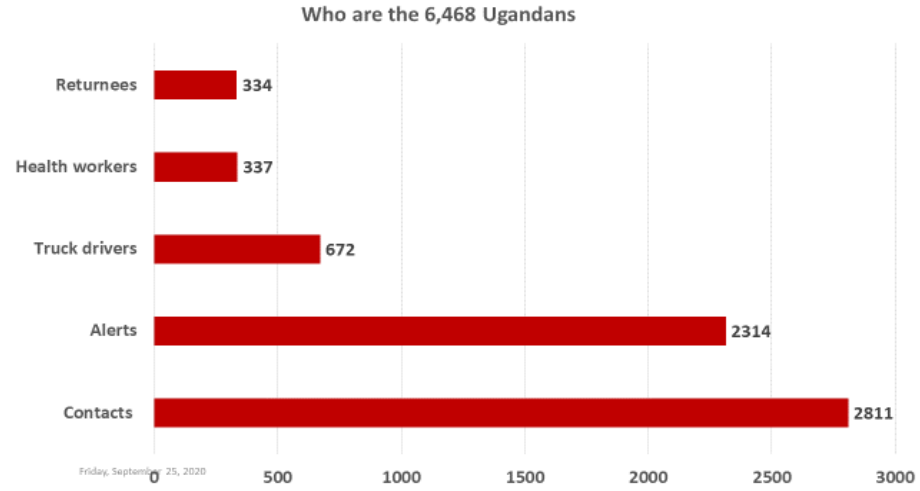
Once the samples are tested and the results obtained, all the COVID-19 accredited testing laboratories in Uganda upload their results into an online electronic Laboratory Information Management System (LIMS). This LIMS has a component for dispatching results called an ‘electronic results dispatch system’, which can be translated into a printable report that is accessible by those who have access to the system (GoU, 2020d). The test results are

disaggregated into different categories, namely:

- Ugandan citizens who have just returned to the country and are in quarantine or self-isolation, termed returnees.
- Healthcare workers.
- Foreign and national truck drivers.
- People who are suspected to have been exposed or have symptoms and have therefore called the surveillance call centre (termed 'alerts'); and
- People listed as contacts of positive cases who themselves test positive.

Figure 7 below shows, for example, the distribution of the positive cases in Uganda between these five groups, using the cumulative data as of 21 September 2020. The larger numbers are in the last two categories, that is the 'alerts' and the contacts of positive cases.

Figure 7: COVID-19 cumulative cases by category, Uganda, 21 September 2020



Source: GoU, 2020b.

The COVID-19 daily update summarises the situation in terms of cumulative cases, active cases, recoveries and deaths. This information is uploaded in the Health ministry's public domain electronic COVID-19 Response info Hub (at https://covid19.gou.go.ug/). This hub is further discussed later in the paper as a key source of information for a variety of audiences. An Emergency Operation Centre acts as a situation room to monitor this and other daily data and evidence to identify areas needing more rapid intervention.

4.2 From points of entry and on cross-border movement

A large number of cargo trucks cross Uganda's international land borders, some transiting through into DRC, Rwanda, Burundi and South Sudan. In April 2020, when surveillance at Uganda's POEs was tightened, the district health information system (DHIS2) integrated an adaptation of an Electronic Integrated Disease Surveillance Response (eIDSR) tracking system. This system tracks and captures real-time data and monitoring using an app that is downloaded to drivers' mobile phones (Behumbiize, 2020). On arrival at the POE, truck drivers undergo mandatory COVID-19 screening and specimen collection before being cleared to enter the country. The DHIS2 Android Capture App then captures the bio data, other particulars and destination of the drivers and any others with them. Once cleared to travel, the drivers are issued with a travel pass with a unique QR code that is checked and verified at designated checkpoints. If the screening test implemented at the POE is positive, health authorities can identify the drivers' last checkpoint and intended destination and using GPS can track, isolate and treat the driver.

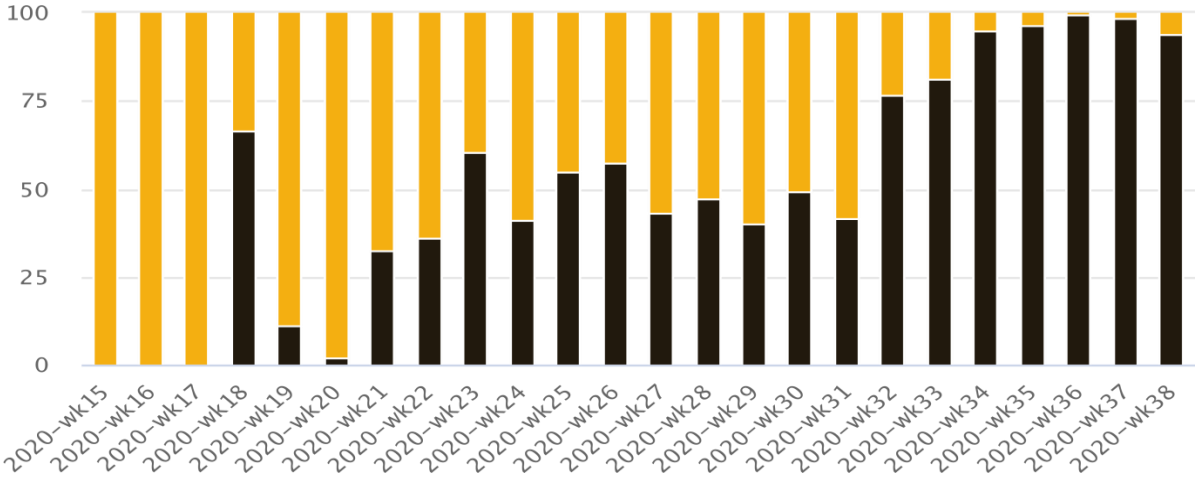
Testing all interstate truck drivers for COVID-19 at POEs to prevent imported cases from neighbouring countries generated delays, long queues and costs for these economic sectors and for the COVID-19 response. To address those challenges, the member states in the EAC with support of some development partners developed the EAC Regional Electronic Cargo and Drivers Tracking System (RECDTS), located at the EAC Headquarters in Arusha, Tanzania (EAC, 2020).

RECDTS aims to ensure and monitor a pool of drivers and crew who are negative for COVID-19. The tracking system for this shares relevant information electronically across borders. An EAC COVID-19 negative test results certificate is issued that is usable across the region, while the electronic sharing facilitates ease of information exchange across borders in a transparent manner among Uganda, Kenya and Tanzania, the three EAC countries. The RECDTS was rolled out in August 2020 and is integrated within the Ugandan systems described in this section (Behumbiize, 2020). Before a trip, all truck drivers and crew members undertake a mandatory COVID-19 test in a designated accredited laboratory, with such laboratories in each EAC member state. All authorised and accredited testing laboratories are linked to the online platform. After testing, an electronic COVID-19 'Negative Certificate' is generated with QR barcode for authentication and validation by relevant authorities at the points of entry, screening points and seclusion zones. This electronically generated COVID-19 'Negative Certificate' is valid for 14 days, a period mutually agreed on by the EAC countries, taking the incubation period of COVID-19 into account.

The system aims to facilitate the smooth movement of cargo and avoid over burdening the health system or the drivers with frequent testing. There is no guarantee that the drivers may not be exposed to the virus within the 14-day period. To limit this risk of exposure, drivers are required to only stop at gazetted seclusion points where regular temperature and symptom screening is done.

These systems have been effective in tracking imported cases related to cross-border trucking. However, as local transmission in communities increased relative to imported cases, the ratio of imported to locally detected cases changed, as shown in *Figure 8*, calling for a system that could inform the response within the community.

Figure 8: Imported (in yellow) vs. local (in black) COVID-19 cases, 22 April to 23 October 2020



Source: GoU, 2020b

4.3 From integrated disease surveillance of local transmission

As community transmission has increased, more attention has been given to deployment of contact tracing applications. One Ugandan company, Defining Technologies, developed a contact tracing app that alerts users and the Ministry of Health if a person has been in contact with a COVID-19 positive person. It uses the smart phone and global positioning system (GPS). It is reported to have 5,000 users and was donated to the NTF to help in rapid contact tracing.

Two rapid assessment surveys have so far been conducted to determine the prevalence of COVID-19 in the community as a form of risk assessment to inform appropriate response. These surveys used PCR tests (rather than the often used antibody tests) and so were able to more accurately assess levels of current infection in the community.

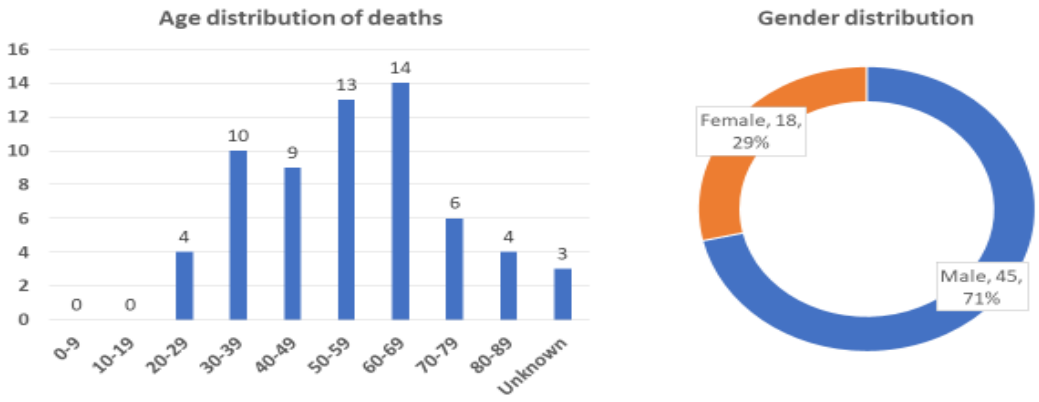
The first survey was conducted in mid-April when the country was at critical stage and the status and epicentre of community transmission needed to be determined. The survey covered specific populations and areas; these included: markets; truck drivers and communities along their routes; border crossing points and communities living in these areas; health workers; security forces and factories and their workers. The assessment covered eight districts across the country, judged for their features to have higher risk, with a total sample of 10,000 people. This first survey found some evidence of community transmission of COVID-19 in the country, albeit with a low 0.028% of people in the sample positive, or 28 in every thousand people (GoU, 2020f). There was variation amongst the different groups tested. For enforcement personnel of road laws, on transport routes, the prevalence was 0.093% (93/1,000), for staff at border crossings it was 0.052% (52/1,000) and for households in the general community it was 0.037% (37/1,000). Each group, received training and communication on preventive measures, taking their specific risks into account, and improved protection measures were identified for those most at risk.

The second survey was conducted in August 2020, also using PCR tests, to estimate the level of COVID-19 infection in high-risk population sub-groups and areas in 10 border districts of Uganda. This survey included healthcare workers, road law enforcement officers, commercial sex workers, community members, taxi driver and ‘touts’ (assistants who manage passengers), market vendors, fishing communities, factory workers and mobile money agents, as well as people in refugee camps and prison cells.

This survey found 15 positive cases out of 12,500 tests, or a positivity rate of 0.12%, over four times higher than the proportion positive in the first survey. Market vendors comprised 40% of all the positive cases, road law enforcers 26.7%, and community households 20% (GoU, 2020g). The results were used to develop and implement responses specifically related to the risks faced by market vendors and road law enforcers, as well as measures directed at the general public. To sustain such assessments, sentinel sites are being established in selected health facilities in the assessed high-risk areas.

Health facility data have also contributed to the community level surveillance. Positive cases are admitted for isolation in designated COVID-19 hospitals. These facilities report the signs and symptoms present in COVID-19 cases or those that develop while in isolation, as well as the co-morbidities. This information is recorded from the time of admission to recovery or death. The evidence is used to identify the distribution of such risk factors for severe or fatal outcomes, such as shown in *Figure 9* on the age and gender of all health facility COVID-19 deaths, using cumulative data as of 21 September 2020.

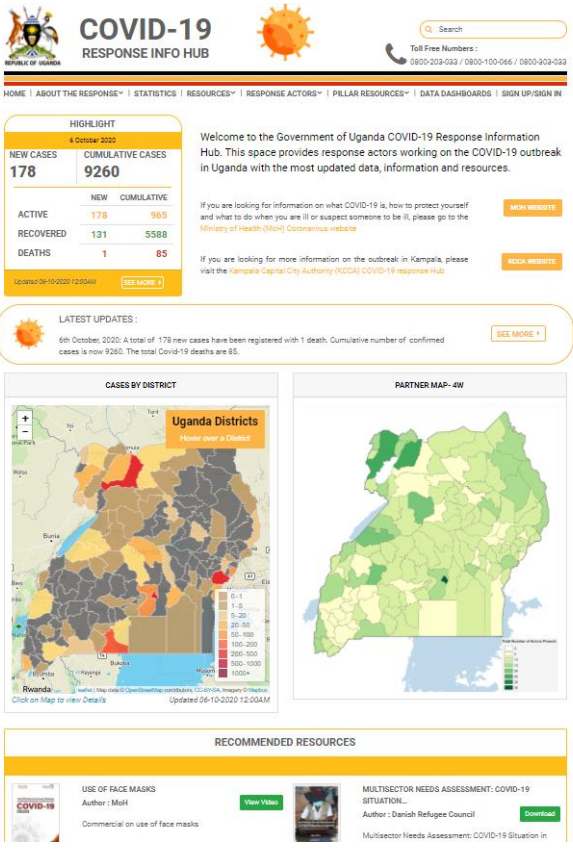
Figure 9: Age and gender distribution of deaths in Uganda



Source: GoU, 2020b.

4.4 Communicating the evidence in public domain

A government, web-based information hub on COVID-19, the *COVID-19 Response info Hub,* summarises the statistics, interventions and reports in a 'one-stop' online centre at https://covid19.gou.go.ug/ (GoU, 2020b). A screen shot of the hub is shown adjacent.



The data are analysed and displayed on the dashboard. It is easily accessible for use by the different pillars and teams involved in the response and by policy- makers, researchers, the media and the public.

The hub provides real time data on how the pandemic is unfolding to support rapid and evidence-based decision making for the wide range of stakeholders involved in or affected by the response. It is updated daily with current information on test results, recoveries, active cases, deaths, cases by district and other relevant information from the different arms of the public health response system, including the social determinants related to exposure from the assessment surveys and monitoring, described earlier.

5. Using the evidence to support an adaptive response

An adaptive system generates wider system learning that can be carried forward to future health challenges. This section explores how the evidence presented in the prior sections has enabled such adaptive responses and any challenges noted.

5.1 Using evidence to support the early response

The country's surveillance system has been growing throughout the many different outbreaks experienced. It is designed to promptly detect diseases, from the community level through village health teams (WHO, 2020a). As noted earlier, before any cases were registered in Uganda, the country used available evidence from WHO and from affected countries such as China to plan for the pandemic (GoU, 2020a). Uganda developed a comprehensive Corona Virus Preparedness and Response plan, various guidelines and SOPs, risk communication and widely disseminated public awareness messages. These messages relied heavily on the scientific evidence on COVID-19 provided to member states by the WHO (WHO, 2020c). The categorisation of countries into risk categories, meant that travelers from high-risk countries were subjected to the compulsory institutional quarantine and only released after testing negative on the last day (Kitara and Ikoona, 2020). Those from low-risk countries were required to fill in a surveillance form and proceed to their homes for self-quarantine, while being monitored daily by surveillance rapid response teams. The evidence was used to implement infection prevention and control measures; capacity building for health workers and a re-organisation of service delivery points, while also ensuring continuity of care (Lumu, 2020). The government activated the EVD infrastructure at border POEs, increased capacities and introduced screening at POEs (Kiwanuka et al., 2020).

After the first case was detected, the same **international evidence and experience** led to a series of measures to limit transmission of the virus. These included closure of the international airport and ground crossing points through land and water and a nationwide lockdown, closing schools, churches and other points of major gathering, such as bars and night clubs, freezing public and private transport and introducing a dawn-to-dusk curfew (GoU, 2020i). The planning of these actions was based on evidence that showed how such actions limited the risk of exposure and transmission in other countries and to give the country time to prepare and expand its capacity to respond to the pandemic (WHO, 2020c).

In regards to refugees, according to the UN Refugee Agency close to 1.5 million refugees live in Uganda, largely from South Sudan, Democratic Republic of Congo, Burundi, Somalia, Rwanda and Kenya. As of June 2020, the reported cumulative refugees who tested positive for COVID-19 were 52 and all recovered (UNHCR, 2020). On 1 July, the Government of Uganda temporarily re-opened her border with the Democratic Republic of Congo (DRC) to give safe haven to thousands of refugees fleeing escalating violence in the eastern DRC.

5.2 Using evidence for the response to an unfolding pandemic

As the pandemic unfolded in the country, the data collected informed how the responses were adapted to address new local evidence. An increase in positive cases involving truck drivers and their crew led to the shift of focus to the POEs with enhanced screening of all truck drivers (GoU, 2020b). It also led to the institutionalised surveillance reporting at the POEs by both MOH Surveillance and the Ministry of Internal Affairs through the Immigration section (Igoye, 2020).

Earlier sections described the **testing and follow up of cross border truck drivers** and the subsequent establishment of the regional EAC RECDTS to facilitate cross-border movement and avoid delays and burdens for drivers and sectors (EAC, 2020). These responses used information from cases, and the monitoring they set up provided new information on the transmission of the pandemic and risk factors. The RECDTS led to innovations such as the electronic test status, digital verification of transit documents and travel authorisations and their tracking by law enforcement, customs and immigration at border crossings and other strategic locations along the transit corridors (EAC, 2020). This system thus provided a response for the regional economic community, but also facilitated cross-border sharing of information relating to the movement of cargo trucks and their drivers and the health of the

drivers (GoU, 2020d). This initiative has generated learning that will be shared with other regional economic communities, including the Inter-Governmental Authority on Drought (IGAD), Southern Africa Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). A tripartite meeting of these three regional economic communities is planned.

The rapid assessment surveys produced findings that informed a number of key decisions. The first informed the phased easing of the lockdown due to the low community transmission of cases in the nation-wide sample (GoU, 2020f). On Tuesday 26 May 2020, after the release of the results of the first rapid assessment survey, Uganda eased lockdown restrictions nationwide, with the exception of the 43 border districts. These remained under tight restrictions on movement and acted as buffer zones in cross-border transmission. The rapid assessment survey findings led to enhanced preventive measures at these border districts to avoid cross-border interactions. They also led to engagement of market vendors to wear face masks and observe social distancing and regular hand hygiene. The findings also led to targeted communication with other risk groups such as health workers, law enforcers, truck drivers, people living along the transport corridor and commercial sex workers. After the second rapid assessment survey in mid-June, based on the findings, buffer zone lockdown restrictions were lifted in 29 of the 43 border districts that were considered low risk, leaving 14 border districts with a higher percentage of cases under continued lockdown (GoU, 2020g).

The evidence from the two rapid assessment surveys has also been accompanied by intensified communication of the Presidential directives on public measures, including the use of masks in public places, the observance of physical distancing measures and intensified personal hygiene of regular hand washing with soap and water or use of alcohol-based hand sanitizers. To strengthen compliance with mandatory use of masks while in public, the government procured masks locally for the entire population older than 6 years. Distribution has been completed in high-risk districts and is ongoing in other areas (UNICEF, 2020). To date 13.5 million masks have been distributed out of the estimated 38 million required for the total population of 42 million. The requirement for mandatory wearing of masks in public has accelerated discussions on local pharmaceutical and technology production in Uganda and in the wider EAC, with efforts to support local production of essential medical products such as masks, sanitizers and ventilators (Olayinka et al., 2020). In June, Makerere University in Uganda unveiled a locally manufactured low ventilator, now at clinical trial phase. Several local companies have come forward to produce sanitizers, face masks, including the N95 type and other PPE (personal protective equipment). A logistic information management system monitors the adequacy and stock status of all these product requirements for the response. The National Medical Stores uses an existing system that is able to handle logistics of procurement, storage and distribution.

While expecting an increase in the number of COVID-19 cases following the lifting of most lockdown measures, the Ministry of Health is working to decentralise all aspects of the response to district task forces and continues to expand its testing, quarantine, isolation, and case management capacity (UNICEF, 2020). Hot-spot districts have been targeted and supported on a priority basis with intensified surveillance, contact tracing and testing alongside enhanced community engagement. Workplaces that were allowed to open were tasked to develop SOPs with guidance from the Ministry of Health for the safe opening of their businesses. In order to limit exposure, the Ministry of Public Services issued a standing instruction that only 30% of essential public servants should physically report for duty and that the rest should work online (GoU, 2020c).

Having a testing strategy that provides reliable and valid information on case incidence has been critical for the response. **The laboratory test results** have been used to support and

facilitate enhanced surveillance and contact tracing. Rapid response teams were set up to evacuate positive cases to isolation facilities, and contact tracing teams organised to trace all listed contacts of positive cases, isolate/quarantine them for the incubation period of the virus (14 days), only releasing them after a negative test. The data generated from the health facilities have guided the expansion of bed numbers, ICU facilities, medicine supplies and the deployment of health workers.

Enhanced surveillance before August assisted in slowing down the spread of the virus. It has also raised the demand to deploy rapid response teams, contact tracing and facilities for isolation and quarantine. One challenge is the likely burn- out of the health work force due to overwork, stress and psychosocial problems. All contacts of the positive cases arising from the tests conducted must be listed, traced, quarantined or isolated, monitored and tested. The surveillance pillar reviews the process and results daily and any emerging issues such as delayed results are adaptively addressed. For instance, the delayed turnaround time for test results at the POEs led to deployment of mobile laboratories at the high burden POEs and also introduction of Genexpert machines in some for quick testing.

Using only rtPCR has led to a demand for adequate laboratory capacities, and the limited supply of essential laboratory equipment and test kits in Uganda has posed a challenge, as it also has in other parts of Africa (Oladipo et al., 2020). The exclusive use of rtPCR as the diagnostic of choice has assured the validity of test results, but has had high-cost implications for the national response and limited test coverage. The country has not been spared shortages of test kits due to global supply demands. To ensure availability of kits and to reduce the financial burden on the government, cost recovery for tests was introduced in August for truck drivers, travelers and people who voluntarily wanted to know their status. The initial cost was US$65 per test, but this has since been revised downwards to $50 to make it affordable for the public. No charges are raised on suspected cases, contacts or those on treatment. Pooled testing, used in other countries, has not been used in Uganda. The Ministry of Health is now making efforts to introduce rapid antigen tests (RDTs) to test symptomatic cases after their recent approval by WHO and by the Uganda National Drug Authority (GoU, 2020i). This will assist in expanding testing coverage.

The facility data have helped to support the service response and the organisation of care. In March 2020, there were 55 intensive care unit (ICU) beds with the necessary life-support equipment in public hospitals nationwide (Atumanye et al., 2020). Some experts estimated that Uganda would require 1,000 equipped ICU beds to be able to handle the pandemic (Gitta, 2020). However, a few cases have required ICU services. The limited number of ICU beds has also been addressed by providing reliable and consistent oxygen supplies and expanding ICU facilities in 14 regional referral hospitals designated to manage COVID-19 cases. The available ICU beds complete with life support have been increased from 55 to over 137 and they are occasionally used for severe patients of COVID-19 (GoU, 2020d).

5.3 Communication and innovation as critical levers

A key part of the adaptive response is the **communication of evidence and information** to the public, and the measures that they imply. Evidence has been gathered and regularly used to design, plan and assess measures and their implementation. The COVID-19 information hub, print media (public and private), social media, TV and the plethora of FM radio stations scattered across different regions of the country have helped communicate evidence to the public and a wide range of stakeholders. A toll-free call centre for COVID-19 response receives public information and calls, including reporting any suspected cases and alerts. This has helped in quick response to any suspected case or alerts by the district teams or the national response teams. The sector specific SOPs such as those for restaurants, markets, public transport are shared through targeted dissemination.

Communication of evidence has assisted in developing and implementing key measures and in the compliance with them. Measures are reviewed by the organisational structure set up to manage the national response, noted earlier. Emerging weaknesses in implementation are identified and addressed. Good practices are identified, shared with relevant actors and scaled to strengthen the response. Implementation of guidelines and SOPs are monitored by the relevant authorities in collaboration with the incident management team and reported on in the response pillar review meetings for appropriate remedial actions and decision-making by appropriate pillars.

Innovations in information technology have greatly improved access to and use of real time data to inform decision-making for the response. The RECDTS use of information technology was described earlier, as were the online platforms tracking tests from sampling to results, and reporting on results. The country's surveillance system has grown overtime and is supported by several digital applications: GoData is a field data collection platform focusing on case investigation variables. An Open Data Toolkit collects, aggregates, stores and manages data. mTrack provides real time monitoring of health data through mobile phones. U-reports is a social messaging tool and data collection system, enabling citizen engagement and feedback, with a dashboard that facilitates case investigation, contact follow up, visualisation of transmission chains, data exchange as well as supervision, assessment and reporting. For quick decision-making, the government COVID-19 response Info Hub provides real time data on how the pandemic is unfolding. Many of these systems were already in place, making it easier to adapt them for the COVID-19 response.

5.4 Evaluating the effectiveness of the response

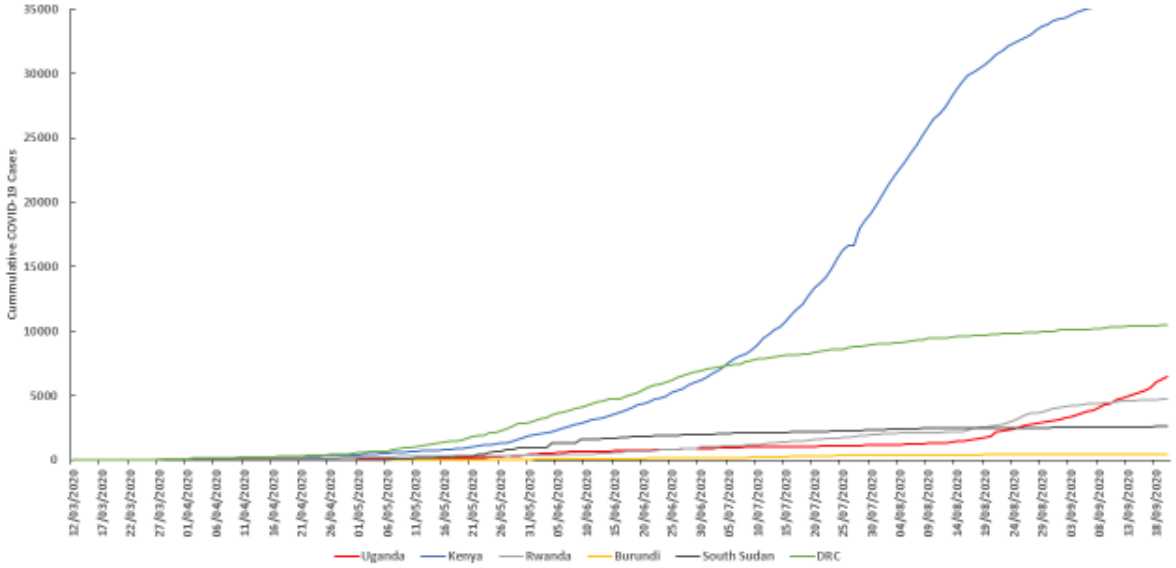
The control measures put in place by the government have had positive impact in slowing the spread of the pandemic, delaying widespread community infection and contributing to the few reported deaths to date. The population response and compliance with the guidelines for the prevention of infection has been impressive, although there is a creeping laxity in observing social distancing, hand washing and wearing masks in public (GoU, 2020d). This has been attributed to reduced fear of the virus, given the few deaths recorded to date. However, the community engagement pillar is now actively involving communities in the response from the grassroots level, working with the network of village health teams, and with cultural and religious leaders at all levels.

Evidence of the outcomes helps to judge the impact of the measures used (*Figure 10,* below overleaf) on the progression of the pandemic in selected countries in East and Central Africa, including Uganda).

Uganda has managed to prevent significant importation of cases, despite being a landlocked country dependent on cross-border trade and has until recently maintained a relatively low level of local transmission. A Lancet Commission report presented at the 75th United Nations General Assembly ranked Uganda among the ten countries that had achieved suppression of the pandemic by August 2020 (Sachs et al., 2020).

More formal evaluations are also underway to provide evidence for ongoing strategic review. The Scientific Advisory Committee has supported innovation and research around the response, synthesizing and linking evidence to key decisions being made to integrate science and evidence. An Inter-Action-Review is providing a mid-term learning of the best practices, impact and enabling factors in the response. Currently, all the pillars of the response mechanism are undertaking the review. The report from this evaluation will be reviewed by the strategic committee and subsequently used by the NTF for policy guidance on the mode the response will take in the coming months.

Figure 10: Comparative analysis of the COVID-19 pandemic in selected East and Central African countries, 12 March to 21 September 2020



Source: GoU, 2020d.

6. Discussion and conclusions

Uganda has moved from imported cases through sporadic community cases to stage 4 of the pandemic with wide spread community infection characterised by diffuse transmission lines (GoU, 2020h).

The use of available evidence has been critical in planning the response, in designing interventions and in reviewing and adjusting design and implementation in light of the changing profile of the pandemic.

Multiple data sources have been used, including testing in the community, contacts of travelers particularly truck drivers, returnees and those in quarantine; laboratory testing; health facility data, rapid assessment surveys, feedback from VHTs, evaluation surveys; online platforms and so on. The data sources are embedded in the implementation mechanisms and pillars, linking evidence to implementation and vice versa. Regularly gathering evidence, including the conduct of two rapid assessment surveys, has enabled the country's response to be grounded on science and evidence-based decisions. Introduction of enhanced surveillance at the POEs (borders), mandatory testing of truck drivers and introduction of the RECDTS for cross-border cargo traffic have provided measures to prevent cross-border transmission, and have also generated cross-border information systems and sources of evidence for all countries in the EAC.

Several factors have enabled the gathering, communication and use of evidence. The electronic organisation of data has helped inform more rapid decision-making, as is required in a pandemic. Having an accessible online COVID-19 response info hub has helped make evidence immediately accessible for the institutions responsible for operations, such as the Emergency Operating Centre and the Incident Management team, thus enabling deployment of rapid response teams to respond to alerts, and the contact tracing system and deployment of other logistic support. It has also enabled key information to be accessible to the public and

other stakeholders, recognising the challenges that arise when not moving in tandem with the population or losing community trust in the actions, intentions and messages, especially when livelihoods are affected.

The comprehensive institutional framework shown in *Figure 2* has helped support the use of evidence, linking institutions to pillars of the response. A Comprehensive Inter-Action-Review is enabling an evaluation of the implementation of the response and control measures. All pillars of the response are conducting an in-depth review of the implementation of their area of response in a process that was ongoing at the time of the response, with recommendations being made on how to readjust the strategies. Other mechanisms for evaluating the response include public feedback through the Ministry of Health media outreach and from the toll-free call centres, from regular meetings between and amongst the different pillars, and in the Strategic, Scientific and the NTF meetings and reports.

The response has exposed limitations in the institutional and operational capacity in many countries (Igoye, 2020), Uganda's fast actions to institute control measures and multisectoral response was built on pre-existing capacities in surveillance and response from earlier epidemics. The experiences of countries affected earlier and the lockdown provided a window of opportunity for the country to learn about the virus and prepare the capacity to respond to the pandemic.

Testing is a cornerstone of the response, calling for expanded testing capacities (TARSC/EQUINET, 2020). The laboratory test results have been central to informing the response and laboratory capacity has expanded. This has been achieved through increased equipment, infrastructure and training, with expanded laboratories, improved turnaround time between testing and results, with mobile labs and GeneXpert Machines deployed to areas of high demand, like POEs. Uganda's use of the rtPCR for testing has enabled accurate evidence, but at a huge financial cost. As in other African countries, there are challenges in accessing PCR test kits (Oladipo et al., 2020). Efforts to introduce antigen RDTs after their approval may assist in this (GoU, 2020i). The evidence derived from the laboratory test results has been the mainstay for the response.

Uganda's response to COVID-19 has been dynamic, responding to different sources of evidence through different institutional channels and actions, which are generating evidence and experience that inform the response. As the pandemic has continued, government is now building on capacities, evidence and experience from past efforts, while organising testing, contact tracing, quarantining in public facilities when self-quarantine or self-isolation is not feasible; ensuring safe working conditions and PPE for health workers and others; and co-ordinating the overall response (GoU, 2020e).

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Acronyms

AFENET	Africa Field Epidemiology Network
COVID-19	Corona Virus Disease
DHIS2	Digital Health Information System Software 2.
EAC	East Africa Community
eIDSR	Electronic Integrated Disease Surveillance
EQUINET	Regional Network for Equity in Health in East and Southern Africa
GoU	Government of Uganda
IDI	Infectious Diseases Institute
LMIS	Laboratory Management Information System
MoH	Ministry of Health
NTF	National Task Force
POE	Point of Entry
RDS	Results Dispatch System
RECDTS	Regional Electronic Cargo and Drivers Tracking System
rtPCR	Reverse Transcriptase Polymerase Chain Reaction
SAC	Scientific Advisory Committee
SOP	Standard Operating Procedure
UNICEF	United Nations Children's Education Fund
WHO	World Health Organization

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

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