Evaluation of Rwanda's COVID-19 Response from the Perspectives of Decisionmakers and Frontliners

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Abstract

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Introduction

After more than a year since the first detection of the Severe Acute Respiratory Syndrome Coronavirus 2, commonly known as COVID-19, the virus spread globally and has had drastic social and economic impacts. Presently, safe, and effective vaccines as well as a strong public health response remain the best strategy to control the pandemic. Rwanda took a proactive approach in the preparedness and response guidelines and strategies, and implementation of interventions to respond to this pandemic. This evaluation provides an evaluation of these policies, and response interventions implemented as well as strengths, challenges, and lessons learned from the perspectives of the professional involved in the response.

Methods

This evaluation consisted of a literature review to identify and describe the preparedness and response policies designed and implemented to respond to the COVID-19 pandemic. It also consisted of key informant interviews with professionals involved in different sectors of pandemic responses to identify the strengths, challenges, and lessons learned. The Rapid and

Rigorous Qualitative Data Analysis (RADaR) technique was used to draw key themes were drawn from the interviews.

Results

Findings from the study identified three main themes as part of the response which was (1) coordination and comprehensive planning, (2) risk communication and public awareness, and (3) response interventions. It also identifies the key lessons learned and recommendations from the respondents.

Conclusion

This study provided a local, on-ground perspective on the management of the pandemic in Rwanda. The Government of Rwanda developed and implemented country-wide policies and cross-cutting response interventions to minimize the spread and impact of COVID-19. However, there are still lessons and challenges to take into consideration for a better, more effective response that minimizes the spread and severity of COVID-19 as well as the socioeconomic impacts.

Introduction

On March 11th, 2020, the World Health Organization (WHO) declared a COVID-19 pandemic due to its uncontrolled global spread and severity (Rwanda Biomedical Center, 2020). Since its declaration, the COVID-19 pandemic has had an enormous toll globally and has accelerated with millions of cases and deaths and with the emergence of multiple variants and has caused severe economic disruptions (Rutayisire et al., 2020). The introduction and administration of the vaccines have brought some hope for the better management and possible 'end' of this pandemic; however, gross vaccine inequities threaten global progress (Byanyima, W, 2021). This pandemic warrants an effective and ongoing strategic international, national, and communal public health response to prevent further spread, hospitalization, and death and to mitigate the social and economic impacts (Alwan et al., 2020).

In the early stages of the pandemic there had been predictions and expectations that the African continent would be hit the hardest (Binagwaho et al., 2020). According to an assessment of Global Health Security in 2019, most African countries were considered "least prepared" to respond to epidemics and pandemics (Global Health Security Index, 2019). Nevertheless, in the first year of the pandemic, African countries have recorded substantially less COVID-19 incidence and mortality compared to other parts of the world, with the exception of South Africa (Nachega, et al., 2021). This has raised questions and theories among scientists, researchers, global health professionals, and others as to why this is the case. Some explanations and theories include low-to-absent testing capacity due to weak health systems, poverty, young African population, genetic immunity, among others (Rutayisire et al., 2020). On the other hand, others have suggested coordinated national and regional responses, ongoing public health interventions response interventions such as lockdowns, travel restrictions, contract tracing among others, and previous experiences with handling previous and current epidemics and pandemics (Nachega, et al., 2021).

Rwanda is one of the countries that took early and proactive measures and has been adapting its preparedness and response strategies and interventions continuously in real-time to adapt to the epidemiological situation (Hitimana et al., 2020). The first confirmed Coronavirus case in Rwanda was detected on March 14th, 2020, which prompted a national lockdown among other preparation and response measures (Rwanda Biomedical Center, 2021). Prior to the first case, the country had been preparing for the pandemic with mass infection prevention control campaigns emphasizing the importance of handwashing and physical distancing and strengthening its supply chain of testing kits (Binagwaho et al., 2020).

While these measures may have had a substantial impact on the spread of COVID-19 in Rwanda, the process, challenges, and facilitators of how the policies and interventions were developed and implemented are still not clear. This evaluation was designed to understand the Rwandan Government's and Key Stakeholder's response to the pandemic, both in its policies and the implementation of those policies. The study objectives for this evaluation include (1) describe the national COVID-19 preparedness and response policies including their overall goals and specific objectives (2) identify the specific public health measures implemented and their respective guidelines followed or recommended (3) identify the strengths, challenges, and lessons learned in Rwanda's COVID-19 response from the perspectives of the key respondents.

Methods

In this evaluation, I conducted a literature review of publicly available peer-reviewed articles and grey literature and conducted eight key informant interviews with decision-makers, managers, and frontliners. These interviews and secondary data evaluated the strengths, challenges, and lessons from managing the pandemic. These interviews were designed to understand the roles that professionals played not only in informing policy decisions but also in implementing public health responses to the COVID-19 pandemic and the perceived challenges, strengths, and lessons.

Literature Review

I conducted a literature review of publicly available secondary data such as published research papers, articles, and grey literature such as Government documents, guidelines, and reports from WHO, Africa CDC among others. The main guiding documents that describe the COVID-19 Preparedness and Response Policies are the first and second Coronavirus Diseases 2019, National Preparedness and Response Plan, Standard Operating Procedures for Preparedness and Response to Coronavirus Disease (COVID-19) Outbreak, WHO 2019 Novel Coronavirus Strategic Preparedness and Response Plan, Health and Social Impact of Physical Distancing for COVID-19 in Africa among others.

Key Informant Interviews

I conducted eight semi-structured Key Informant Interviews (KIIs) to discuss the challenges, strengths, and lessons of the COVID-19 preparedness and response strategies. These were audio recorded with the consent of the participants. The main study population was the professionals involved in different sectors of the pandemic response in Rwanda including professionals from the National Epidemic Preparedness and Response Committee, COVID-19 Joint Task Force, National Reference Laboratory, World Health Organization, Procurement, and Logistics Management, COVID-19 Epidemiologic Surveillance Team, IT and Data Management. These interviews were Semi-Structured Interviews and took place over Zoom.

With consent from the participants, the KIIs were recorded, and transcripts were created from these recordings. Using the Rapid and Rigorous Qualitative Data Analysis: The "RADaR" technique, the transcripts were organized, reduced, and analyzed in Microsoft Excel and Word. The responses were categorized in multiple tables based on the key question that were asked which were the Roles, Challenges, Strengths, Lessons, COVAX, and Additional Comments. In each table, I added the responses from the interviews by the different participants. The Phase 1 table included the raw data i.e., the entire transcripts. In phase two and three tables, the transcripts were reduced to the most relevant response to the questions. In the RADaR technique, I use both Microsoft Excel and Word to organize the qualitative data from transcripts and will end with the list of quotes to be used in this evaluation (Watkins, 2017). Appendix 1 provides a framework of how the RADaR technique was used for analysis.

Results

Preparedness & Response Policies

When the first case was detected, this prompted a swift national response that included the immediate closure of schools, churches, airports, and a two-month national lockdown in March 2020 (Binagwaho et al., 2020). National and regional lockdowns are intended to slow down the spread of the virus, prevent the health care system from being overwhelmed while providing time to prepare for the pandemic response (Alwan et al., 2020). Phase 1 and 2 liftings of the lockdown were carefully measured according to additional health services and laboratory capacities, which would allow adequate management of anticipated new cases. Moreover, prior infrastructure from Ebola and HIV epidemic preparedness strategies were adapted to meet national needs (Binagwaho et al., 2020).

In March of 2020, the Government of Rwanda formed and activated the National Epidemic Preparedness and Response Coordination Committee which established the multisectoral coordination structures such as National Steering Committee to develop national preparedness and response plan and set up structures to implement interventions (Rwanda Biomedical Center, 2020) (Karim et al, 2021). The National Preparedness and Response Plans are used to guide the preparedness, detection, and response to COVID-19 (Rwanda Biomedical Center, 2020). The initial National COVID-19 Preparedness and Response Plan came to an end in August of 2020. The January-December 2021 National COVID-19 Preparedness and Response Plan was created based on the lessons learned from the first pandemic response for a more effective and sustainable response. Its goal is to contain the COVID-19 pandemic, mitigate its societal impacts, and enhance the resilience of the health system. The first National COVID-19 Preparedness and Response Plan were budgeted for $73,741,760 and the second was budgeted for $243 Million including $129 Million for the establishment of the National Health Laboratory Services (Rwanda Biomedical Center, 2021).

Some of the plan's objectives include ensuring a coordinated and synchronized response, timely detection of and response to positive COVID-19 cases, reduced risk of mortality through appropriate clinical care, promotion of infection prevention and control measures, continuity of essential services, health education, and public awareness and the enhanced logistical and operational management. These objectives would be achieved through the ten intervention pillars of the national response which are (1) National Planning and Coordination, (2) Epidemiological Surveillance and Points of Entry, (3) Risk Communication and Community Engagement (RCCE), (4) Logistics and Operations, (5) Infection Prevention and Control (IPC), (6) Case Management, (7) Laboratory, (8) Continuity of Services, (9) Data Management, (10) Vaccination.

Coordination and Comprehensive Planning

A key theme from the KIIs was Coordination and Comprehensive Planning. The national preparedness and response plan detailed the coordination structures, strategies, activities, and costs of the response. Some of the heading structures set up were the National Epidemic Preparedness & Response Coordination Committee, the National Steering Committee, and the Joint Task Force Coordination (JTFC) with Central, Provincial, and District level command posts. These structures were set up to manage the pandemic by developing and implementing policies and guidelines, as well as actions and strategies for the prevention and response measures at all governing levels. In

addition, they were advising senior leadership on strategies and next steps regarding COVID-19 response and the next steps to take to slow down the spread. The coordination teams and structures of response were involved in advising the senior leadership on adopting the WHO and CDC guidelines for response to the Rwandan context. Some of the respondents reported that the decision-makers and implementers deliberated the kinds of initiatives and guidelines to follow and implement. A member of the National Steering Committee detailed the activities preparedness planning and activities by saying:

> *"...we are aware that we had an outbreak already in China and it appeared later that it was going to be a pandemic. Knowing it, we started to prepare ourselves so that we are ready anytime we have cases of COVID-19 in the country"*

Procuring resources and supplies for the prevention and treatment of COVID-19 was a vital part of the response. From personal protective equipment (PPEs) for frontliners and other personnel to medical supplies such as ventilators in the isolation centers. Some of the key stakeholders in the response oversaw the procurement and management of the available and limited supplies such as lab equipment, lab consumables, and reagents tests kits were available in the health facilities, isolation centers, and elsewhere in the country. However, the respondents reported challenges in the procurement of health commodities due to the national and global lockdowns, travel restrictions, the closing of manufacturing factories and companies, and the hoarding of materials. This severely limited the procurement of COVID-19 related supplies and other essential medicines. In addition, as one of the participants noted, the countries that produced these medical and preventative supplies also put restrictions on their exportation to reserve them for their own populations. To respond to this challenge, the Government of Rwanda negotiated outside of the conventional methods and tapped into their networks of embassies and connections to negotiate for supplies and used Rwandair, the national airline, to obtain and transport the PPE, vaccines, and other supplies.

Respondents agreed that the Health Sector could not have responded to and managed this pandemic alone. The multisectoral response included the involvement of different actors, sectors, development partners, and ministries such as local government, law enforcement, public transportation, and other sectors and services. Although this multisectoral collaboration was necessary to bring in different voices, resources, and support together in the planning and implementation of the response, there were challenges in the alignment and harmonization of the plans. One respondent mentioned:

> *"From different teams, different people, different organizations, different institutions, different partners. All doing things that may not necessarily be aligned with your plans. The veterinarian, agronomist, economist, someone completely different field trying to dictate or to inform to direct what to do on field or in response...But the good thing is at the end of the day the top leadership made it clear that we go by science, and we follow what MINSante (MOH), and RBC are advising us to do."*

Public Awareness

The Risk Communication and Community Engagement team was created to have a unified COVID-19 source of information and combat any misinformation. There were mass media campaigns and public awareness messages aired via Radio, TV, LED Screen, social media, etc., to encourage people to practice social distancing, hand hygiene, and wearing masks and details regarding any changes on the curfews, lockdowns, and others measures. In addition, this is how Public Health notices were communicated and done so frequently to ensure that the public was aware of the upcoming curfews or details on how much capacity a public space occupies. In addition, people could call a Toll-free number and WhatsApp number about any concerns of COVID-19 symptoms. The participants detailed how local leaders were engaged to ensure community members were aware of any guidelines or interventions and could provide feedback regarding these changes. Ultimately what enhanced compliance with measures was transparency and feedback from leadership which leads to public trust. One of the respondents mentioned:

"I think it was just because of the trust established through feedback and constant communication that people didn't hesitate to come. And they had already seen that the virus has taken so many lives, so when they came, they were really convinced and willing and happy that the vaccine is finally here."

The third theme that emerged from the interviews related to different types of response interventions: non-pharmaceutical public health measures, surveillance and laboratory activities/capacities, and COVID-19 vaccine roll-out.

Non-pharmaceutical Public Health Measures

To contain the spread, the Government of Rwanda, Ministry of Health, Rwanda Biomedical Center, and other key stakeholders planned for and implemented several non-pharmaceutical public health measures to mitigate the spread of COVID-19. These ranged from encouraging personal and hand hygiene when in public, there is the mandatory use of facemasks and face coverings, and physical distancing requirements, daily health monitoring (i.e., temperature and symptom checks) at entrance points of public spaces and requiring the installment of handwashing stations in busy areas like business centers, banks, and other locations. In addition, there have been several closures of public spaces that may attract large crowds such as schools, religious grounds, markets, gyms, and others. To date, some of these spaces have already been opened fully or partially. There were even stricter measures such as a nearly two-month national lockdown from March to May of 2020 and several other district-level and provincial lockdowns. The decisions to fully or partially close or open public spaces have been deliberated and implemented by several stakeholders including the National Epidemic Preparedness and Response Coordination Committee and the COVID-19 National Steering Committee (Karim et al, 2021).

The WHO recommended that all confirmed positive cases be isolated and receive care in health facilities (Rwanda Biomedical Center, 2020). During the national lockdown, some health centers, hotels, and boarding schools were repurposed into isolation sites for COVID-19 patients (Karim et al, 2021). Robots were introduced in the Isolation Centers to minimize the risk of the spread of COVID-19 and to protect healthcare workers in isolation centers whereby health providers would have fewer visits to each patients' room.

However, with increased COVID cases, including severe, mild, and asymptomatic cases, treatment centers became unsustainable and at capacity. Especially as the country began opening; schools, health centers, markets, and other public and private services had to be fully operational. Home-Based Care (HBC) was introduced to adapt to the re-opening of the country and reduce the cost of operation for Isolation Centers. The majority of patients, about 70%, were either mild or asymptomatic and could be isolated and managed from home (Rwanda Biomedical Center, 2020). To be eligible for Home-Based Care one had to have a laboratory-confirmed positive COVID-19 test, be asymptomatic or have mild symptoms is not high-risk (i.e., over the age of 65 or living with co-morbidities) and have adequate space for HBC such as room for isolation and toilet or latrine in vicinity among others (Rwanda Biomedical Center, 2020).

Surveillance and Laboratory Activities

Rwanda Biomedical Center implemented mass testing activities including testing of international travelers, people in refugee camps, high-risk occupations such as people working in the market, motor drivers, truck drivers, etc. One of them was the street surveys commonly known as Kigali Drive Through where testing sites were set up near busy roads. Volunteers and Epidemic Surveillance personnel would then provide free COVID-19 tests to people such as pedestrians, motor drivers, bus drivers, car drivers, and passengers if they agreed to participate.

In February of 2020, 5 screening teams that consisted of 10 people each were deployed to the Kigali International Airport. At the time this was the only testing site in the country and was later expanded to other sites such as the Petit Stade near the Amahoro stadium in Kigali and eventually different testing sites outside of Kigali. Initially, these screeners would test travelers that showed symptoms (high temperature, cough, shortness of breath, etc.,) as well as those coming from high-risk zones such as China and other parts of Europe. As WHO declared a global pandemic in March, that particular testing criteria was taken out and everyone regardless of where they were traveling from was tested. There were other mass testing activities as well as contacting tracing that followed the contacts of confirmed and suspected cases. In April 2020, there were testing activities of truck drivers coming in from Tanzania that were transporting goods between both countries. There were also testing activities of people that came in contact with these truck drivers including shopkeepers, sex workers, and health care workers.

At the beginning of the pandemic, the National Reference Laboratory (NRL) was the only laboratory in the country that tested COVID-19 samples. This caused some challenges in the testing capacity including insufficient staff and testing resources. This resulted in longer turnaround times for testing and disseminating results as well as strained the few laboratory staff. One solution was decentralizing the laboratory to other provinces, hiring and training more staff, and using morning and evening shifts to reduce the strain and pressure put on the few staff. One of the participants said:

> *"So, the national reference labs wasn't the only one doing tests for COVID. Right now, there's one in Bugesera, there's one in Gisenyi, there's one in Nyamata...And most of them started out with NRL staff and then they trained their NRL people that were local to that area. It was a weakness but now it is a strength*."

Initially, Rwanda did not have the laboratory testing capacity for the Polymerase Chain Reaction (PCR) COVID-19 tests which were considered a "gold standard" for detecting and diagnosing COVID. One solution was the 'Pooling Strategy' where 10-20 COVID-19 PCR samples were pooled in one batch and tested together. This method increased the number of samples being tested at one point with the same resources.

COVID-19 Vaccine Roll-Out

The third theme that emerged was COVID-19 Vaccinations. Before Rwanda received the first batch of vaccines, the Vaccine Task Force was initiated for the preparation and financing for the vaccine mainly through COVAX which is a vaccine alliance between the WHO, GAVI, and CEPI. Members of this task force placed orders to get the vaccine through the COVAX facility and the Government of Rwanda mobilized funds for payment of these vaccines. It was estimated that at least 20% of the Rwandan population would need a vaccine as soon as possible to cut the transmission. This task force strategic planning for the financing and distribution of vaccines and created a road map for the cold-chain system as well as determined the distribution of vaccines, who would receive priority and how would there be equitable distribution. The priority groups have been people with co-morbidities, people 65 years and older, frontliners, and hard-to-reach populations.

Like other aspects of the pandemic response, the COVID-19 Vaccine preparation, distribution, and administration included multisectoral and community involvement. Local community leaders were engaged to inform different communities and associations about the vaccination plans and were also encouraged to engage with community members for vaccine uptake. Even though Rwanda is committed to vaccinating its population, global vaccine inequity remains a major concern. A few countries in the world, High-Income Countries, have access to the majority of vaccines and have already administered these vaccines. One participant mentioned:

> *"The challenge remains when are we getting the next vaccine?... But even for myself as an African right now, I'd like to see more justice and equity and fairness in having access to vaccines, because we all hope to vaccinate our people."*

Lessons Learned and Recommendations by the Respondents

Rwanda's COVID-19 response has been effective in reducing the morbidity and mortality of COVID-19 and has one of the lowest incidence rates in Africa (Karim et al, 2021). Despite the country's success in managing the pandemic, there were still challenges and lessons learned which were reported by the interviewees. Below are recommendations to the Ministry of Health and Rwanda Biomedical Center as well as any other key stakeholders based on the lessons reported by the participants. These include (1) the continued investments in epidemic and pandemic preparedness, (2) investments in research, development, and technology, and (3) the facilitation of proactive leadership and equity-centered response.

Investing in epidemic and pandemic preparedness

With the threat of future epidemics and pandemics, it is vital to continue to invest in epidemic and pandemic preparedness. One way is through the investment and management of human recourses with a focus on Health Care Professionals. This pandemic has challenged and strained the capacity of health systems and it has also brought attention to the country's human resource and staffing needs (Mehta et al, 2021). With the global lockdowns and travel restrictions, Rwanda, like many other countries had to look inward and find solutions making it necessary to mobilize and manage local resources and expertise. Mehta et al, noted that the was an internal drain of human resources due to the focus on and push for health care workers to join COVID-19 response efforts which were felt more significantly in LMICs. The National Strategies for Health Professionals Development 2020-2030 details the interventions, recommendations, and investments to ensure the availability of a trained and qualified health workforce that is equitably distributed in the country (Republic of Rwanda, n.d.). From the interviews, several respondents noted the importance of long-term investments in training and retaining local health professionals and other significant professionals for frontline work. I also recommend increasing the capacity of epidemic response team(s) so as not to disrupt the provision of other important health services. One participant mentioned:

"A pandemic can occur anytime means we need to strategize and invest strategically in human resource development. Because at one point where we need with a lot of epidemiologists, a lot of statisticians, a lot of IT experts, you can't create those expertise in one morning."

Another way to better prepare and respond is to decentralize the response mechanisms and personnel. At the very beginning of the pandemic, the response was highly centralized in Kigali which overwhelmed the response personnel and resources. For example, initially, the National Reference Laboratory, based in Kigali, was the only one in the country testing for COVID-19 and disseminating results. So, decentralizing the response to involve the Provincial and District-level Command Posts and personnel was a necessary and effective move. Decentralization was also beneficial in the management of human recourses. Health Care Workers faced high levels of stress and exhaustion from the long work hours, and some chose not to visit their families due to fear and risk of transmitting COVID-19 (Mehta et al, 2021). The introduction of the shift system, where some staff would work morning and others night shifts, enabled frontliners to rest and have time outside of work. Task-sharing and task-shifting was another alternative used. Whereby nonspecialized workers would also be trained and engaged in response activities. During lockdown with schools closed, medical students and recent graduates volunteered, and some were hired in various aspects of the response including epidemiologic surveillance and part of laboratory facilities.

An additional strategy is to increase investment in and capacity for the Public Health Emergency Operation Centers (PHEOCs). PHEOCs are physical or virtual spaces where people assemble to address public health emergencies through strategic management, resource mobilization, and others (World Health Organization, n.d.). During the early stages of the response, Rwanda initiated command centers that acted as PHEOCs, however, they had not yet met the minimum standards but there have been efforts to increase the capacity (Rwanda Biomedical Center, 2021). Having PHEOCs would be one step in increasing preparation and response efforts.

Investing in Research, Development, and Technology

Another lesson learned from the respondents is the importance of investing in research, development, and technology. During the pandemic, technologies such as include thermal scanning cameras, digital surveillance, smart bracelets, drones, robots, and geo-hotspot mapping (Geographic Information Systems) were used to respond faster and better but also to minimize the risk and spread of disease. Robots were used to test the temperature of severe COVID-19 patients in treatment centers which reduced the number of visits made by HCWs thereby reducing their risk of exposure. One study showed that combining the use of technology with traditional contact tracing methods was quite effective in reducing the HCW's workload and exposure to COVID-19 (Nachega et al, 2021). In addition, the Rwandan Pharmaceutical sector, which relies heavily on imports, experienced disruptions in the supply chain of essential medicines and immunization which left local pharmacies and larger medical storages running out of stock (Uwizeyimana et al, 2021). It is crucial to managing existing stocks, especially in unprecedented times as well as invest in local pharmaceutical production.
Although there were still some challenges in using technology and using it to its maximum. One being encouraging and convincing staff to shift from using paper-based approaches and using tablets and other technologies. The pandemic showed that it is possible to implement change faster and more efficiently using science and technology. For example, using Health Information Systems for faster and comprehensive management information. Health information systems enabled faster and more informed evidence-based decision-making. Below a participant explains it well by saying:

"We came to realize that you need strong health information system for faster and comprehensive management information for evidence-based decision...And not taking good decision on time, especially as you manage with the pandemic, you are missing opportunity for reducing the incidence of the disease"

Currently, there are multiple, safe, and efficacious COVID-19 vaccines that can and should be distributed globally to minimize spread, hospitalization, and death associated with COVID-1935. The COVAX pillar was introduced to address the inequities in vaccine distribution and have 20% of each country's population vaccinated by the end of 2021 (Berkley, 2020). However, countries in the Global South received vaccines much later compared to other regions and in limited quantities. The African continent is lagging behind in obtaining and distributing vaccines. Some have referred to this gross vaccine inequity as vaccine apartheid and nationalism (Byanyima, 2021).

Rwanda and other African countries need to continue to harness science, research, and development and develop manufacturing and laboratory testing capacities. GAVI and COVAX have eased the process of African countries and other LMICs to obtain and administer COVID-19 vaccines, although there is still a question of sustainability. This goes beyond the COVID-19 pandemic; Africa has the highest incidence of mortality from infectious diseases and yet does not have adequate manufacturing capacity for lifesaving vaccines (Makenga et al, 2019). There are less than 10 African vaccine manufacturers and majority of them focus on internal country markets and little exportation (World Health Organization Africa, 2021). Charity is not the

answer and Rwanda, as well as other African countries, cannot rely on vaccine donations. Instead, there needs to long-term investments for vaccine productions.

Facilitating a Pro-active and Equity-Centered Leadership

The final recommendation is to facilitate a pro-active leadership and equity-centered approach. This type of leadership could establish trust between Government on all levels, and communities. Public trust is crucial when implementing interventions and response measures such as lockdowns, curfews, or wear masks. Other enabling factors include frequent and consistent communication and feedback from communities. The leadership was receptive to feedback from communities, which may have led to higher acceptability and less resistance to measures or interventions. In addition, this pandemic response required the coordination between different ministries, sectors, and International Non-Governmental Organizations. This approach was not only strategic but would not have been possible without the intentional leadership that brought people together. This goes beyond the local and national level affairs. Rwanda being a land-locked country is another reason why clear and aligned regional collaboration was necessary. The need for a clear understanding of how matters such as travel, and trade look like in the context of a pandemic is necessary.

The COVID-19 Task Force had the difficult task of balancing efforts to minimize the spread of the virus while also minimizing the socioeconomic impacts of these interventions (Nachega, et al., 2021). As effective as this pandemic response has been in reducing the spread and minimizing mortality and morbidity, many people's lives and livelihoods were negatively impacted by the response measures (World Bank Group, 2021). For example, despite the national lockdown slowing down the spread of COVID-19, it exacerbated the social and economic challenges. In addition to the loss of jobs, there were cases of food insecurity. Some of these challenges were addressed, particularly that of food insecurity, there were social welfare programs and food distributions that were initiated and spearheaded by the City of Kigali with support of partners and community members[7]. One respondent mentioned:

"The population did not fully understand the strict measures because they were struggling. People were hungry from not working."

However, Alwan et al, noted that although lockdowns exacerbated some of the social and economic inequities and increased risk for poor mental health outcomes, these effects would have been worse in countries that did not establish pandemic response plans and interventions. Moving forward, there is a need for equity-focused response plans and guidelines that ensure the protection and needs of the poorest and most marginalized (World Bank Group, 2021).

Limitations

The study was limited by several factors. Although I was able to obtain some of the publicly available guidelines and policies, there were mainly national and continental level and there were no regional level guidelines were referenced. This may not provide a comprehensive overview of all the COVID-19 related policies. In addition, only eight interviews were conducted, most of which had a focus on and experiences in Kigali. This may not be representative of the regional COVID-19 response experiences. This may not have captured the full array of achievements and

challenges that occurred during the implementation of these policies and interventions. In addition, this evaluation only focused on Rwanda which may limit generalizability to other African countries although that was not within the scope of this evaluation. Nevertheless, this study provided a multidimensional picture of response with a focus on the lived experiences of decision-makers and frontliners and provides a local, on-ground perspective on the management of the pandemic in Rwanda.

Summary and Conclusion

This evaluation demonstrated that the Government of Rwanda developed and implemented strong and country-wide policies, including a coordinated and comprehensive planning process and communication strategy, implemented cross-cutting response interventions, investing in efforts to strengthen epidemiological surveillance and laboratory capacity and quality, and developed plans for a rapid COVID-19 vaccine rollout with a broad geographic reach. However, from the literature review and KIIs, there were a broad array of challenges reported. One of the challenges the respondents mentioned was balancing the response efforts to minimize spread, mortality, and morbidity associated with COVID-19 while also maintaining people's livelihoods. Many Rwandans rely on the informal and agriculture sector for work so the national and regional lockdowns, as well as curfews, disrupt their daily wages. The social and economic effects of the pandemic and lockdowns hit the most impoverished communities the hardest. Other challenges were the financial, human resource, and supply chain limitations and constraints that were exacerbated by the pandemic.

This pandemic has exposed how underprepared and underfunded countries are as it pertains to Global Health Security. It has exposed the vulnerabilities in health systems, the political priorities, or lack thereof, the complexities of human behaviors among others. That is why the health system needs to be strengthened and better prepared and more resilient for potential emergency threats. As discussed throughout the evaluation, Rwanda took a proactive approach in the preparation of and response to the pandemic even before the first case was detected and worked to minimize the spread and impact of COVID-19. However, there are still lessons and challenges to take into consideration for a better, more effective response that minimizes the socioeconomic impacts and poor population health outcomes.

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Appendix

Below are examples of the Data Tables using the RADaR technique as well as the interview questions and original study questions.

Phase 1 Table

Phase 1 Table			
Transcript	Question	Response	Notes

Phase 2 Table

Phase 2 Table				
Transcript	Question	Response	Notes/Summary	Quote

Final Summary Tables

Roles		
Transcript	Summary	Quote

Strengths		
Transcript	Summary	Quote

Interview Questions:

1) What role(s) have you played in the COVID-19 Preparedness and Response?
2) What would you say have been the key strengths in Rwanda's COVID-19 response and implementation strategies?
3) What would you say have been the key challenges in Rwanda's COVID-19 response and implementation strategies?
4) What are the key lessons from managing and responding to the pandemic?
5) What role do you or your organization play in the preparation for the financing, acquisition, and distribution of the COVID-19 vaccine to the Rwandan population?
    a. How will it ensure equitable distribution?

Original Study Questions:

1) Describe Rwanda's COVID-19 Preparedness and Response Policies.
    a. What are the overall goals and specific objectives of the preparedness and response plan?
    b. Who were key players and stakeholders involved in the implementation, and scale-up of the COVID-19 response plan?
    c. What are their roles and responsibilities?

2) Identify the specific public health measures/nonpharmaceutical interventions implemented to respond to and mitigate the pandemic
    a. What are the specific guidelines followed in implementing evidence-based public health measures?
    b. Do these guidelines follow the recommended or standard guidelines?

3) Identify the strengths, challenges and lessons learned in Rwanda's COVID-19 Preparedness and Response Plans and Interventions.
    a. What are their strengths?
        i. How were the strengths enhanced?
    b. What are the key challenges and existing gaps?
        i. How were the challenges addressed?
    c. What are the lessons learned from managing and responding to the pandemic?