

COVID-19 Rwanda response updates

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INTRODUCTION

Rwanda's response activities continue to be led through a multi sectoral, multi-partners approach: The Prime Minister and the National Epidemic Preparedness & Response Coordination Committee (NEPRCC) continue to lead response activities via the COVID-19 Joint Task Force Committee (JTFC). Since March 2020, the JTFC works with expert advisory teams from the Ministry of Health, Ministry of Defense, Ministry of Finance and Economic Planning, the Ministry of Internal Security and the Ministry of Local Government as well health focused international organizations, for the management of COVID-19.

Rwanda's COVID-19 response activities are implemented through the COVID-19 national Incident Management and Coordination Structure (Figure 1):

Members of the command post, under different cells develop mathematical models to predict Rwanda's outbreak and use epidemiological models to forecast COVID-19 supply needs under different simulated scenarios. The command post also develops and presents to advisory teams different lockdown exit strategies with subsequent epidemiological effects/impacts.

Early identification of cases, prompt isolation, testing and contact tracing continue to play major roles in allowing the country to better manage the global pandemic. Cases are mainly identified through surveillance systems at points of entries

(now mostly at land borders), at community and health facility levels as well as through contact tracing and active case search focusing on populations at high-risk.

However, measures to slow down the spread of COVID-19, particularly lockdown series came with strong social economic impacts. Rwanda's recent national Social Protection Response and Recovery Plan reported that people, particularly informal workers, were likely to face reduced income opportunities with prolonged implementation of lockdown measures.

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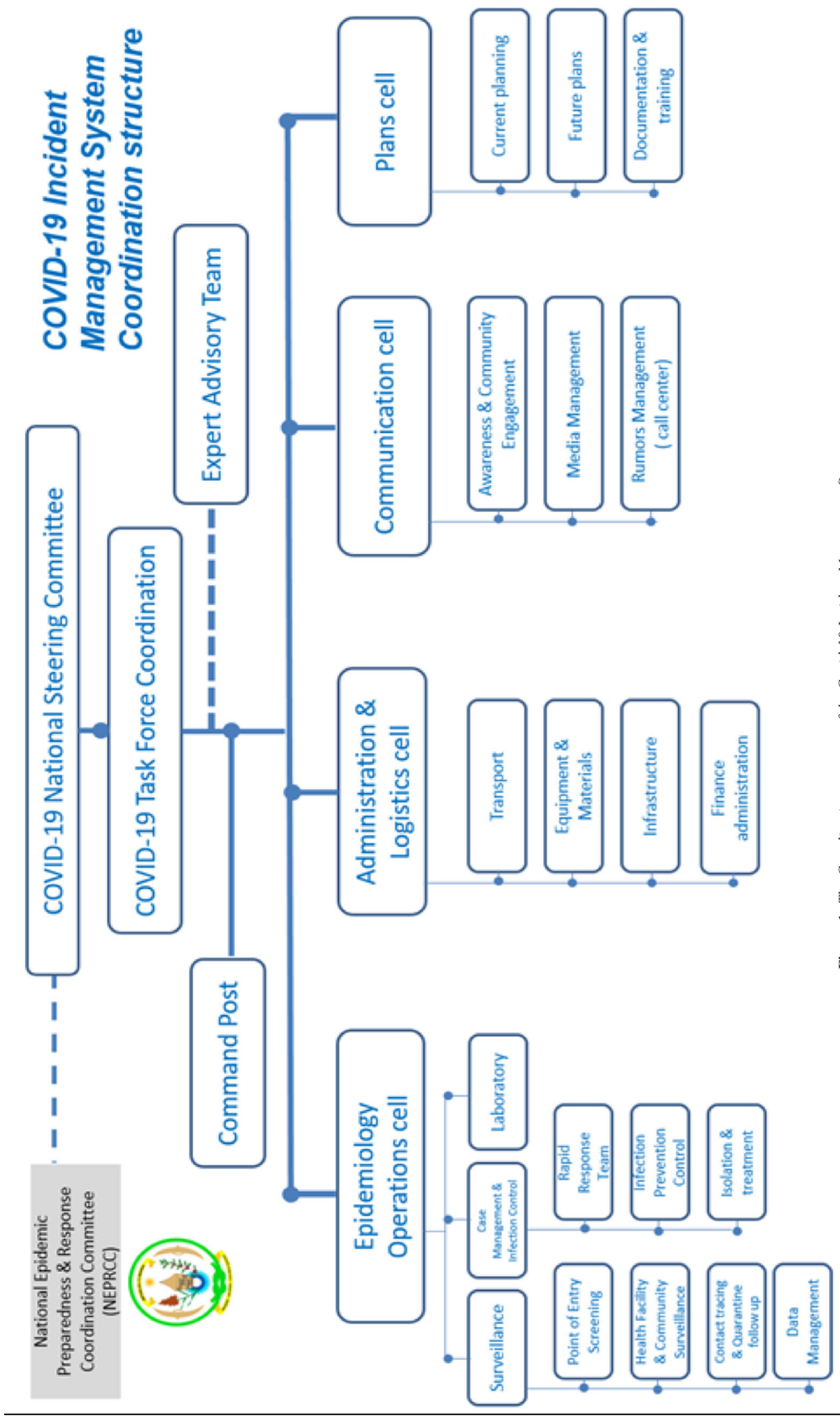


Figure 1: The Coordination structure of the Covid-19 Incident Management System.

Consequently, on May 4th 2020, Rwanda eased its total lock down and allowed businesses, public transport to resume but under well-defined health and safety measures. Progressively, to further allow social protection and economic recovery, the county has been releasing more services, such as allowing motorbike riders back in the transport system and promoting local/ internal tourism. The narrative below shows the country's status following the uplift of total lockdown.

RWANDA COVID-19 CURRENT KEY HIGHLIGHTS

- A total cumulative number of 878 cases with an increase in local cases linked to importation in mid-June compared with previous days and months (Figure 2).

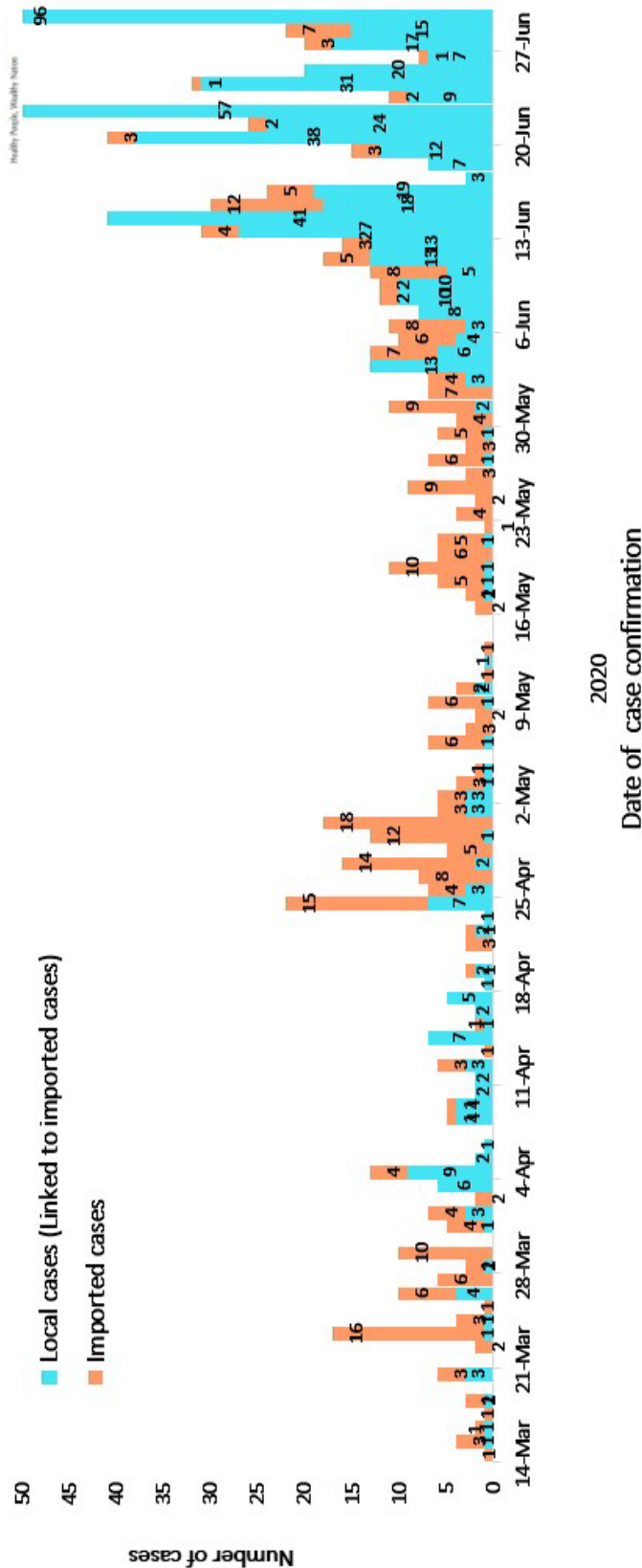


Figure 2: COVID-19 confirmed cases in Rwanda (RBC)

- About 85% of all new cases (all mild/ moderate), registered from April to date, are truck drivers crossing from the Rusumo boarder in the Eastern province, and citizens of Rusizi district in the western part of the country.
- Total Recoveries/ Discharges: 413 cases and
- Two deaths (all Rwandan imported cases)

Although current cases are mostly clustered in the Eastern and Western provinces of the country, a few local cases are also being recorded in Kigali-suggesting possible community transmissions. To understand the dynamism of the outbreak, the COVID-19 command post has been implementing community testing strategies in different parts of the city. This has resulted into two-weeks partial lockdowns of a few villages in Kigali.

SURVEILLANCE

Quality data and holistic surveillance is still proven to be crucial for accurate assessment of the disease progression and for timely response strategies.

To reinforce surveillance systems, active case finding and the management of COVID-19, sub- national command posts were created in all districts across the country to ensure district and provincial health systems are better prepared and supported to manage COVID-19. Screenings are currently established at 31 entry points (at the Kigali International Airport and 30 land and water border entries). Staff working at these points use surveillance screening documents distributed early this year. All re-opened public spaces are mandated to have in place hand washing stations and temperature monitoring devices. It is also mandatory for everyone in public to use a mask.

To protect healthcare workers and other front liners, Rwanda is minimizing the level of interaction between healthcare workers and COVID-19 patients. Recently, the country introduced artificial intelligence strategies whereby robots are now used in treatment centers for temperature monitoring and other basic clinical assessments.

The country introduced other digital solutions such as the use of GIS and GPS tracking systems to monitor truck drivers' movements and reduce the need for the Rwanda national police to escort trucks from borders to quarantine sites. Together

with countries in the region, there are discussions to harmonize data sharing mechanisms to allow timely exchange of drivers' data records to reduce reliability on paper documents.

LABORATORY

Presently, Rwanda uses RT-PCR method for SARS-CoV-2 testing on manual platforms with ABI Thermo Fisher, BioRad and Rotor-Gene equipment available at the National Reference Laboratory (NRL) alongside automated platforms from Roche. Thus far, SARS-CoV-2 testing has been conducted at the NRL, with a testing output ranging between 1000 and 2500 samples per day. Identification of hotspots has led to recent activation of testing sites in both Kirehe and Rusizi. These sites are each equipped with one BioRad and Rusizi has an Abbott m2000.

The current workflow of COVID-19 testing in Rwanda is described below.

» Specimen collection

In Rwanda, oro-pharyngeal swabs are collected by wiping the tonsil and posterior pharyngeal wall with one swab and immersion of the swab heads into the viral transport media that contains an antibiotic to suppress bacteria and fungi contamination as well as a phenol red PH indicator to ensure medium integrity.

» Specimen transportation

Specimens are transported in cooler boxes to the testing sites immediately after collection.

» Laboratory diagnostic testing

SARS-CoV-2 testing is conducted by lab technicians trained to use real time reverse transcription-polymerase chain reaction (RT-PCR) methods. The current algorithm uses a multiplex RT-PCR assay based on the detection of Orflab and N gene (2019-nCoV RNA RT-PCR, DAAN Gene Co., Ltd. Of Sun Yat-sen University, 19, Xiangshanv Road, Guangzhou Hi-Tech Industrial Development Zone, China) as initial screening test while the LightMix RT-PCR kit (TIB MOLBIOL Synthese labor GmbH, Eresburgstr. 22-23, D-12103 Berlin, Germany), based on the detection of the E and RdRp genes, is used for confirmation purposes [2,3].

A recently operational Roche cobas 6800 is being used at NRL as a screening and confirmatory platform as well.

Pooling approach for massive testing

In Rwanda, an algorithm and a proof of concept based on a mathematical model was developed and provides evidence for sample pooling [4]. Pooling for SARS-CoV-2 testing is defined as combining multiple patient samples in a single test with subsequent individual testing of positive pools,

resulting in cost and human resources savings while retaining clinical accuracy compared to individual patient sample testing. The pool sizes in Rwanda are of 20 samples, although 50 samples have proven to be effective as well and could thus be applied.

When a pool's result is positive, all samples included in the pool are retested individually. Pooling may be useful in resource constrained settings where overall prevalence remains low and details are provided in the network section.

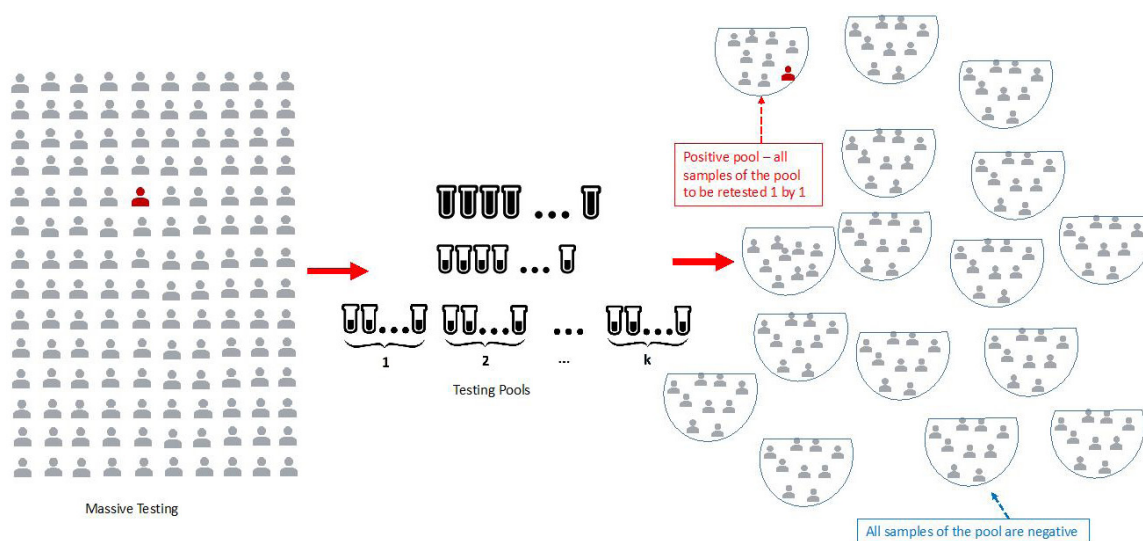


Figure III 2: Pooling approach for massive testing

RISK COMMUNICATION AND COMMUNITY ENGAGEMENT

Health education and public awareness have shown impact in addressing and controlling COVID-19. In Rwanda, education campaigns are ongoing through megaphones at community levels through the national radio, the national television and on different social media platforms and other private stations. Education contents emphasize hand washing and observing social distancing as effective prevention strategies for COVID-19. Further education is provided by The National

Police Task Force, community health workers and local village leaders to reinforce understanding on the importance of the "Stay at home campaign".

In conclusion, Rwanda's efforts to address COVID-19 show a controlled pandemic situation with less complicated cases, even though the country is currently registering more cases. This success is mainly due to strong surveillance systems, holistic contact tracing and the progressive scaling up of testing capacities. Continuous population awareness will further strengthen existing efforts.

REFERENCES

[1] Rwanda Economic recovery plan May 2020 – December 2021 : A Coordinated response to mitigate the economic impact of COVID-19

[2] Corman VM, Landt O, Kaiser M, et al. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. Euro Surveill 2020;25(3).

[3] Chan, JF, Yip CC, To KK, et al. Improved molecular diagnosis of COVID-19 by the novel, highly sensitive and specific COVID-19-RdRp/He1 real-time reverse transcription-PCR assay validated in vitro and with clinical specimens. *J Clin Microbiol* 2020;58(5).

[4] Mutesa, L., Ndishimye, P., et al., A strategy for finding people infected with SARS-CoV-2: optimizing pooled testing at low prevalence. <http://arxiv.org/abs/2004.14934>