

case study

Demonstration of the utility of end-to-end digital tools to strengthen strategies for COVID-19 testing in South Africa: a case report on the best practices, challenges, and lessons learned.



A part of the





At a glance

Partners:

- Mpumalanga Department of Health, South Africa
- Ezintsha
- Foundation for Innovative New Diagnostics (FIND)

Technology:

- Vantage COVID-19 Solution
- Community Outreach Solution (Vantage Community Screening App)

Technology Partners

- Microsoft

Location

- Mpumalanga, South Africa



The challenge

South Africa accounts for close to half of Africa’s confirmed COVID-19 cases. The country has one of the highest testing rates in the continent, and various digital tools have been deployed to support implementation of screening and testing interventions. However, these tools are often fragmented, preventing end-to-end visibility into the case management process.

For example, mass screening in communities and registration of Person Under Investigation (PUIs) for COVID-19 often only captures screening data up to the point of PUI registration. Furthermore, testing data occurs in different electronic platforms, and there is no automated mechanism to link it back to screening data. And lastly, South African national COVID-19 data reports on numbers screened and numbers tested, but not the number of PUIs, although this population is the critical connection between the two steps.

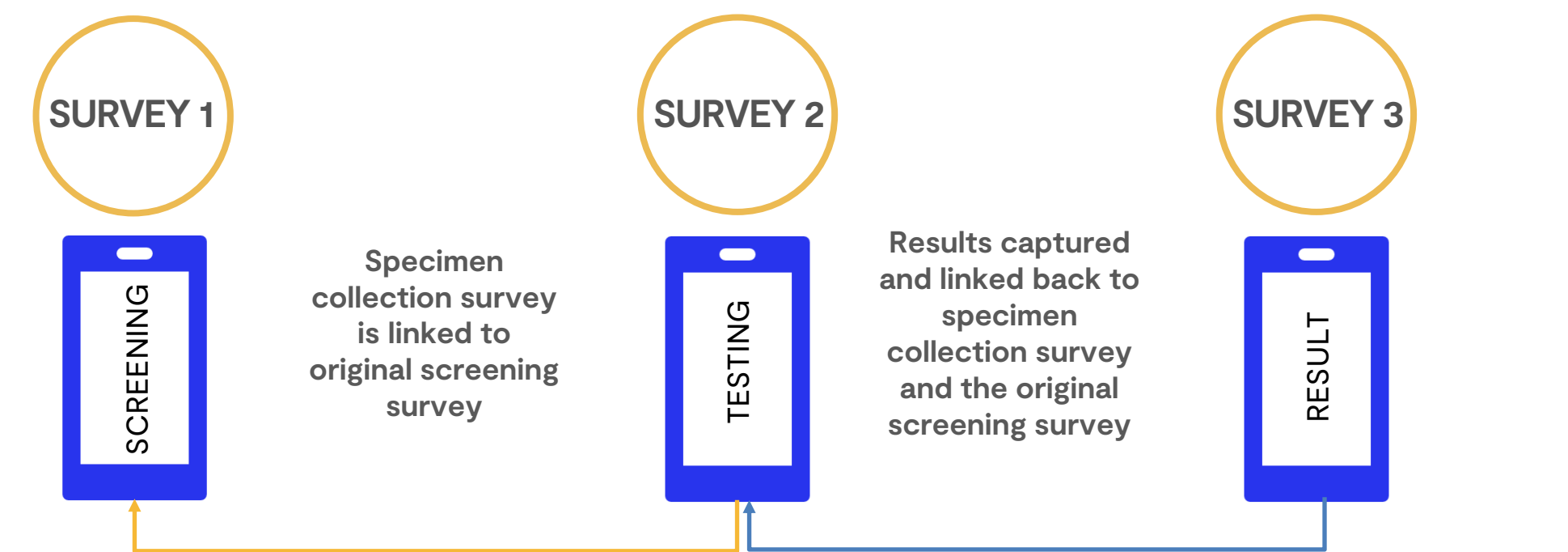
This obscures the understanding of the diagnostic cascade and the linkage of presumptive cases (also called PUIs), to screening and testing.

The response: Technology

Vantage Health Technologies, together with the Mpumalanga Department of Health (DoH), the Foundation for Innovative New Diagnostics (FIND), and Ezintsha embarked on a study to demonstrate the **use of digital tools in capturing end-to-end diagnostic data**. The study set out to support a better understanding of screening and linkage to testing for SARS-CoV-2 in two districts, Gert Sibande and Nkangala, in the Mpumalanga Province, South Africa.

The Vantage Community Outreach solution was configured to capture the full end-to-end cascade of screening and polymerase chain reaction (PCR) testing data, focusing on linkage to specimen collection and testing for PUIs. The solution leveraged off the Siyayinqoba Sisonke application developed by Vantage Health Technologies and used for mass community screening by Mpumalanga Department of Health. In addition to linking the various surveys, the solution also provided automated alerts for outstanding specimen collections – a significant contributor to increase linkage to testing.

The Vantage Community Screening Apps worked as follows:



case study

Results

11,566

individuals were screened

977

met the Department of Health (DoH) criteria to be registered as PUIs (8% of 11,566)

808

were correctly registered as PUIs in the Vantage application (83% of 977)

416

of the registered PUIs had a complete testing record (screening, specimen collection and results) (51% of 808)

57

of PUIs with complete testing records, tested positive for COVID-19 (14% of 416)

Outcomes

88%



of Persons Under Investigation having their specimens collected and of these,

75%



were collected within three days of screening

The response: People & Process

To support implementation of the optimized digital tool, a revised workflow was developed in alignment with the existing protocols at facilities. A demo of the tool and the workflows were used for training implementing teams at all sites.

Daily monitoring of study indicators took place during the course of the study, which allowed for near real-time engagement with the implementing teams. This proved to be a critical factor for course-correcting on operational challenges that arose during implementation.

Facility visits by the Vantage Health Technologies support team allowed for further technical assistance or troubleshooting as required, and a two-way communication channel so that facilities were able to share with the support team any qualitative feedback to be captured into the weekly report as a complement to the quantitative indicators.

Key findings

The high rate of asymptomatic disease suggests that up to half of cases may be missed by the current, symptom-based testing algorithm. Expanding eligibility criteria for testing could help to bridge this gap.

One in five PUIs were not correctly identified and registered, highlighting the need for regular training and supervision on implementation of national testing guidelines—especially since these are likely to evolve often as more evidence on optimal testing guidelines emerges.

While linkage from screening to specimen collection was high, this is likely because both steps took place at the same location. The low number of PUIs identified in the community (as opposed to at the facility) who also had their specimens collected on-site (four out of 100) illustrates the limited capacity for specimen collection outside of health facilities. This could present a bottleneck to expanding community testing as point-of-care antigen tests become more widely available.

Key learnings

Establishing correct use of digital technologies by HCWs requires intensive mentoring and quality assurance to ensure that the data captured through these tools is useful. It is essential for frontline personnel to understand how the data they capture on discrete activities connects with broader surveillance and response efforts, and for facility managers to be equipped to interpret these data and take action where needed.

Real-time data analysis, coupled with feedback loops and personnel engagement, improved accountability and performance, especially with regards to understanding of, and adherence to, diagnostic protocols. While resource constraints make it difficult for health systems to sustainably implement the degree of feedback that this study provided, routine analysis of cascade data may help to prioritize critical gaps that should be prioritized for closer supervision and support.

Automating data transfer between the different digital solutions being implemented in the COVID-19 response – such as immediate transfer of results from laboratory data systems to case management tools used by frontline workers – is important to reduce turnaround time, ensure more coherent end-to-end data and minimize additional workload for HCWs.

Conclusion

The study showed that the introduction of a digital tool is not a “silver-bullet” solution, but needs to be accompanied by support for the teams responsible to use the data captured in the tool to navigate the challenges present in their respective environments.

All of the above calls for a holistic digital strategy that recognizes the broader constraints that have an impact on the implementation of digital tools. These learnings will help to shape the collaborating institutions’ future work on the use of digital tools to strengthen COVID-19 responses, and to inform policy and program recommendations in these areas.