



Evaluation of Rapid COVID-19 Testing at the Community Level in Kenya

Use of antigen rapid diagnostic tests to detect SARS-CoV-2 at community gathering points in Kiambu County

WHY IS RAPID SARS-COV-2 TESTING IMPORTANT?

The outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that leads to COVID-19 caused widespread disruption to lives across the world as governments took measures to mitigate its spread. SARS-CoV-2 has been very difficult to control as it is highly infectious and often transmitted before an individual has symptoms or by asymptomatic individuals. SARS-CoV-2 antigen rapid diagnostic tests (Ag-RDTs) are easy to use, affordable, and provide quick, point-of-care results, enabling testing to be conducted at decentralized levels. Once SARS-CoV-2-infected individuals are identified, isolation and contact tracing methods can help to reduce further transmission. By targeting high volume community venues, health workers can reach many individuals with Ag-RDTs in a short amount of time. Targeting all individuals, irrespective of the presence of symptoms, will help identify more SARS-CoV-2 infections as well as geographic areas where SARS-CoV-2 may be spreading in communities.

WHAT DID THE STUDY EXPLORE?

This cross-sectional study was designed to determine the acceptability of rapid SARS-CoV-2 testing and estimate the SARS-CoV-2 case detection rate, positivity rate among participants, and costs associated with testing.

- **ACCEPTABILITY:** What proportion of individuals agreed to be tested with SARS-CoV-2 Ag-RDTs? What were reasons given for refusing testing?
- **CASE DETECTION RATE:** For every 100 individuals tested, how many tested positive for SARS-CoV-2?
- **POSITIVITY:** What proportion of individuals tested positive for SARS-CoV-2 using Ag-RDT and PCR tests? How many infected individuals had COVID-19 symptoms? What factors were associated with SARS-CoV-2 infection?
- **COST:** What was the cost per individual tested? How much did it cost to identify one infected individual? What were the main cost drivers?

HOW WAS THE STUDY CONDUCTED?

Fifty high-volume venues were selected in 12 sub-counties of Kiambu County. Before each testing event, a series of stakeholder meetings were held with community leaders and community health volunteers (CHVs) near the venues to raise awareness about COVID-19 and gain their support. Coordination teams comprised of Ministry of Health (MOH) staff took the lead in preparing and conducting the testing events. CHVs mobilized community members before and during the events through one-on-one discussions, flyers, and announcements at churches, markets, and other institutions. At the event, information was provided about SARS-CoV-2, rapid testing, and vaccination. Ag-RDT was offered to all individuals ages two years and above. Only individuals who had tested positive for SARS-CoV-2 in the past two weeks were excluded from the study. Individuals who declined testing were asked about reasons why. Individuals who accepted Ag-RDTs were asked to provide consent to join the study. Participants testing positive for SARS-CoV-2 were asked to provide a sample for PCR testing and were referred for counseling, home-based care, or hospitalization. Participants who tested negative but had COVID-19 symptoms were also asked to provide a sample for PCR testing. Participants who tested negative and had no symptoms were referred for on-site vaccination.

WHO PARTICIPATED IN THE STUDY?



3,174
participants
were tested
using Ag-RDTs

Of the 4,062 individuals aged 2 years and older who were screened, 3,290 individuals (81%) were enrolled in the study. Of these, 116 participants later refused testing by Ag-RDT.

Of the individuals who refused to be tested at screening, 747 agreed to share their reasons for refusal with the study team.

Among participants enrolled:



64% were male

39 was the median age



63% had received at least one dose of COVID-19 vaccine

2%

were previously diagnosed with SARS-CoV-2

WHAT INFORMATION WAS COLLECTED?



A **structured questionnaire** collected information on demographics (such as age and gender), vaccination status, history of COVID-19 illness, and current presence of COVID-19 symptoms. Reasons for testing refusal were also collected.



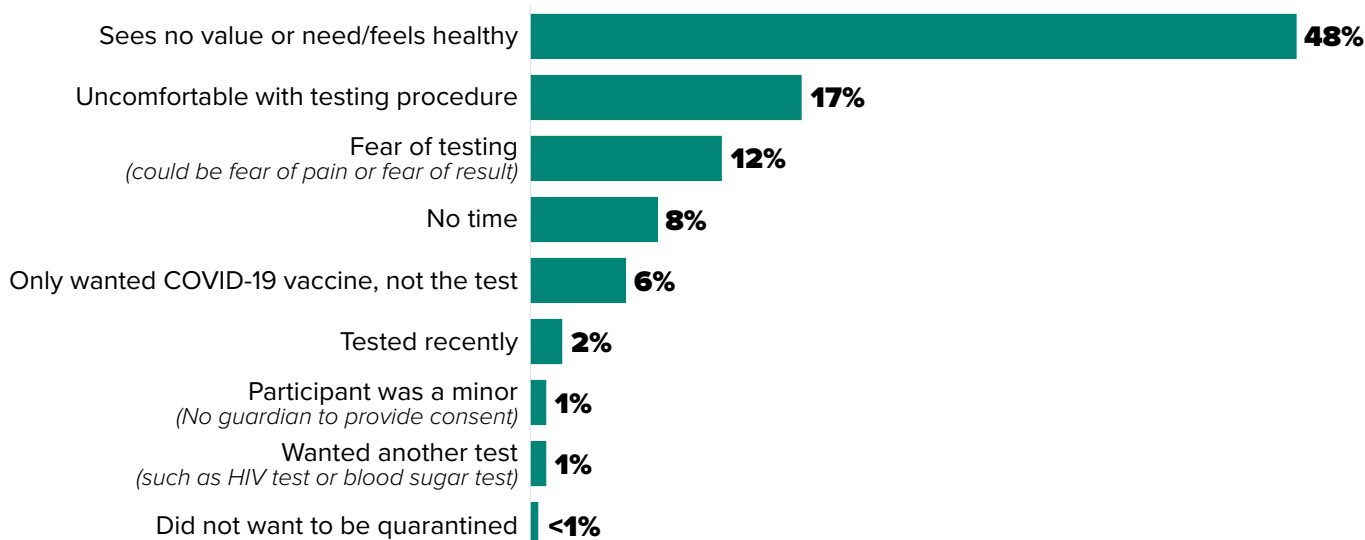
Ag-RDT and PCR results were collected and analyzed to determine the positivity rate among participants.

WHAT WERE THE KEY RESULTS?

78% of individuals at the testing events agreed to be tested, demonstrating that **community-based Ag-RDT was acceptable.**

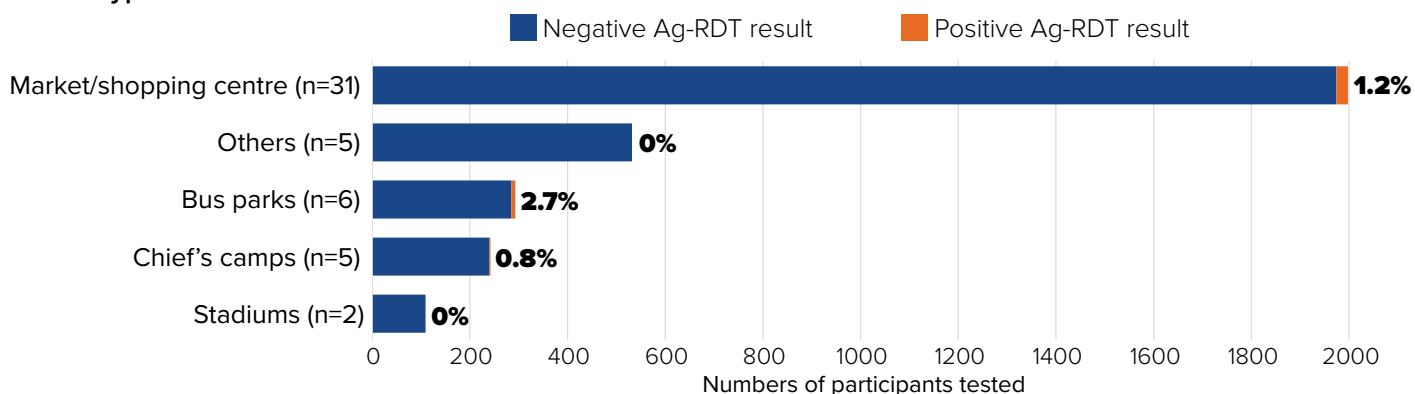
The main reasons given for refusing testing were seeing no value or need for testing, discomfort with the testing procedure, fear of testing, and no time.

Reported reasons for refusing SARS-CoV-2 testing (n=747)



The case detection rate was low at only 1 infected individual per 100 persons.

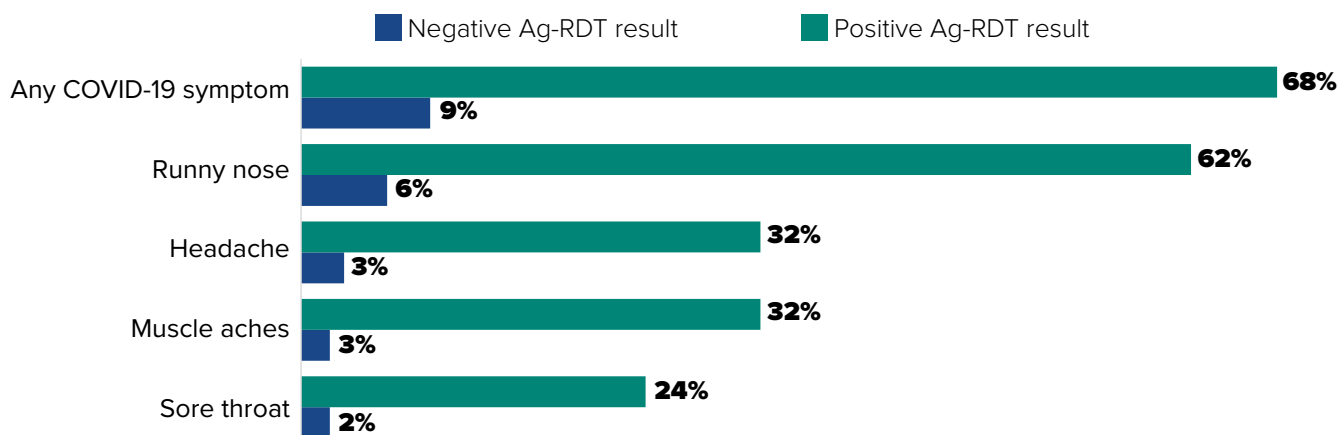
Number of participants with negative and positive SARS-CoV-2 Ag-RDT results (and positivity rate) by venue type



Of the 3,174 participants tested, 34 individuals tested positive for SARS-CoV-2. Over half of participants were reached at markets or shopping centres, however, there were no meaningful differences by venue.

Overall, 90% of study participants reported having no COVID-19 symptoms in the previous 10 days. As expected, the percentage of participants reporting symptoms was much higher among those who tested positive for SARS-CoV-2 compared to those who tested negative (68% vs. 9%).

Percentage of participants reporting COVID-19 symptoms by test results



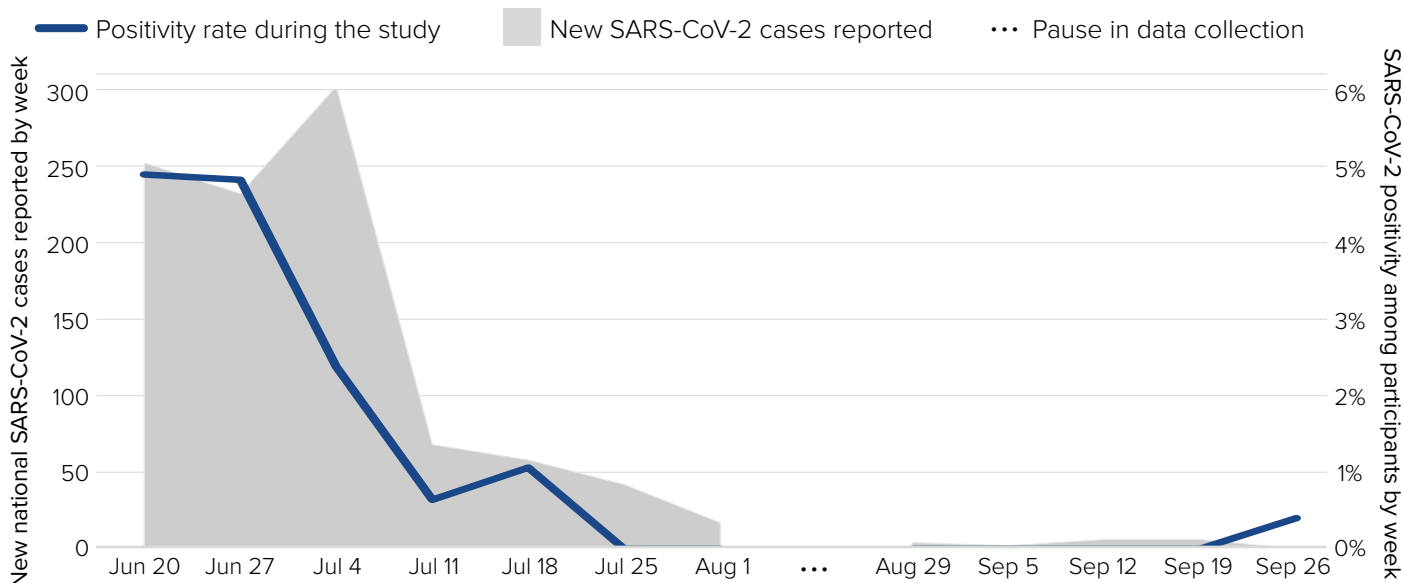
Runny nose, headache, muscle aches, and sore throat were the most commonly reported symptoms; however participants also mentioned general weakness, loss of taste or smell, difficulty breathing, chest pain, nausea/vomiting, and diarrhoea as symptoms. Among participants with symptoms, 30% of individuals who tested positive and 5% of individuals who tested negative reported that they sought medical care in the previous 10 days.

About one in three individuals who tested positive for SARS-CoV-2 were asymptomatic, which indicates that mass testing can improve the identification of asymptomatic SARS-CoV-2 cases.



The SARS-CoV-2 positivity rate trend was similar to the trend of the overall number of new SARS-CoV-2 cases nationally by week.

Comparison of study SARS-CoV-2 positivity rate and national SARS-CoV-2 cases reported during the data collection period, June 20 - September 26, 2022



The testing period and presence of COVID-19 symptoms were the only factors associated with SARS-CoV-2 positivity. No associations were found between positivity and factors such as gender, venue type, exposure history, or vaccination status.

Testing costs seemed to be reasonable, indicating that SARS-CoV-2 rapid testing in community settings could be a useful strategy to identify asymptomatic individuals.

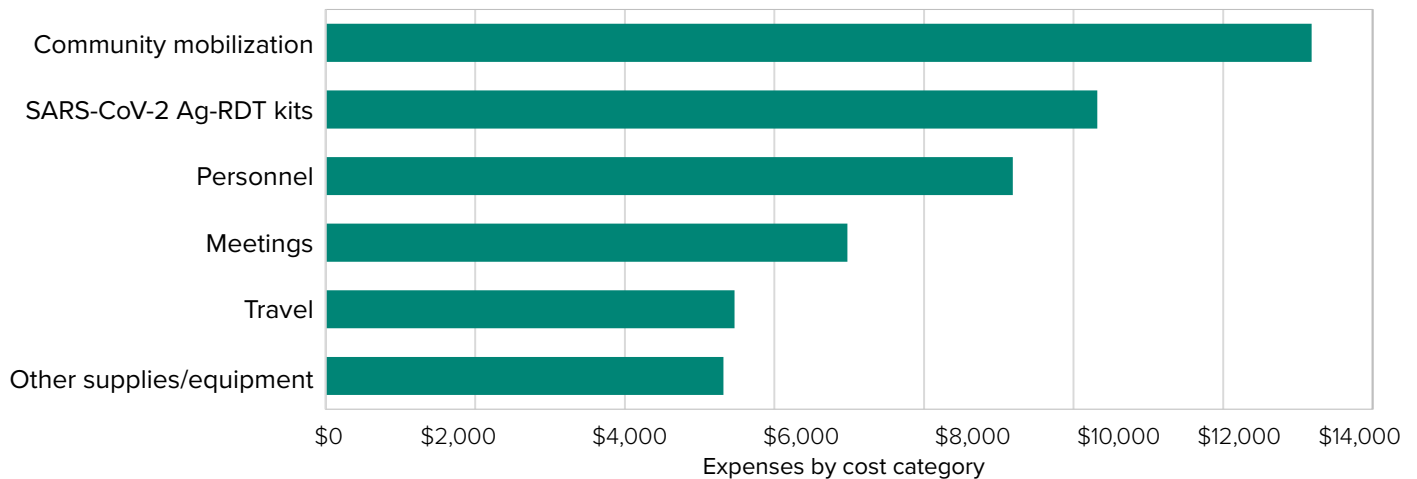


USD \$15.89
per individual tested



USD \$1,484
per individual diagnosed
with SARS-CoV-2

Costs of mass SARS-CoV-2 rapid testing by cost category



The total cost of the intervention was \$50,446. Community mobilization was the largest cost driver at 26% of all costs, followed by the purchase of the test kits (21%) and personnel expenses (18%).

WHAT IMPORTANT LESSONS WERE LEARNED?

- Stakeholder engagement and mobilization activities were critical to implementing the testing activities. Community awareness support provided by the community health volunteers increased attendance at the event as well as the willingness of community members to get tested.
- Integration of testing with vaccination seems to be a good approach and likely improved participant turn out. The majority of participants wanted to receive a vaccine if they tested negative.
- Testing in markets and shopping malls may be an effective way to identify individuals infected with SARS-CoV-2 as we found both the volume of people and the acceptability of testing high in these locations.
- Particularly when COVID-19 cases in a country are on the rise, including SARS-CoV-2 testing of both symptomatic and asymptomatic individuals could be an important gauge of both infection hotspots and community transmission.

KEY TAKEAWAYS

- Our study showed it is feasible to conduct mass SARS-CoV-2 Ag-RDT in community settings in Kenya and this could be a useful approach to identify infected individuals.
- 78% of individuals attending the events accepted rapid testing.
- The main reason reported for refusing testing was that individuals felt healthy and did not feel there was a need for them to test.
- Positivity decreased over time in correspondence with the trend of daily national case rates during those periods.
- The costs related to testing seem reasonable at US\$15.89 per individual tested.