

Sentinel Surveillance For Early Detection Of COVID-19 in Malawi

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Background

- As of 30th June 2022, 86,506 COVID-19 cases and 2,645 deaths were detected cumulatively in Malawi through the routine national surveillance system that relies on retrospective passive reporting of cases from testing sites.
- Limited financial resources, rapid onset, high numbers of COVID-19 cases and a simultaneous massive cholera outbreak from March 2022 rapidly overwhelmed the national routine surveillance system.
- To address these gaps and efficiently identify community transmission and emerging variants in the country, the Public Health Institute of Malawi (PHIM) established a COVID-19 sentinel surveillance system to monitor SARS-CoV-2 infection trends, and circulating variants, and inform the nation's response.

Methods

- The sentinel surveillance was established in July 2022 in 5 health facilities (HF) and 2 busy land points of entry (POE) (Figure 1 and picture).
- At each HF, 10 symptomatic and 5 asymptomatic persons of any age were systematically sampled per day. We used WHO integrated COVID-19 and Flu case definition to identify symptomatic patients.
- Ten travelers ≥ 5 years at the POEs were similarly sampled.
- All consenting participants provided a nasopharyngeal (NP) swab for RT-PCR test on site using GeneXpert machines and COVID-19 epidemiological, vaccine and clinical data were collected a tablet using the Open Data Kit (ODK) application and routed to the server on a real-time basis.
- SARS-CoV-2 positive samples were sent to the national reference laboratory for genomic sequencing.

COVID-19 sentinel surveillance in Malawi identified cases and trends that were not detected by the routine surveillance system, especially during a low incidence period and when other concurrent public health emergency outbreaks were occurring



Figure 1. COVID-19 sentinel surveillance COVID-19 sentinel surveillance team orientation being conducted at the Mzuzu urban health facility surveillance site, 19th June 2023

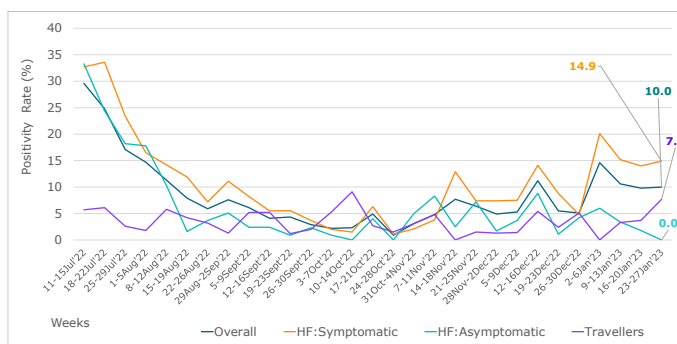


Figure 2. Trend for overall, among symptomatic, asymptomatic and travelers COVID-19 positivity rate over time, sentinel surveillance, Malawi, 11th July 2022 – 27th January 2023. HF = Health Facility

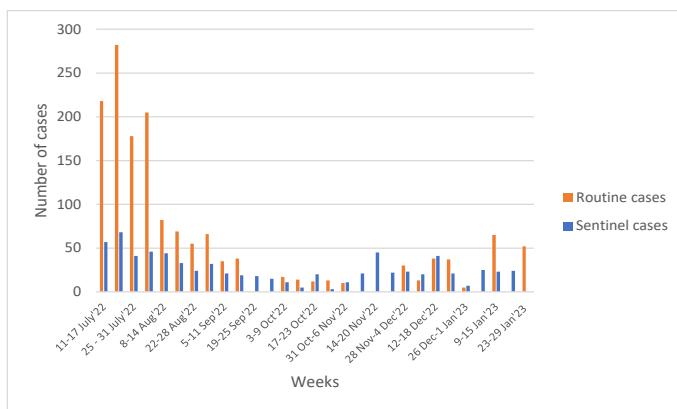


Figure 3. Number of COVID-19 cases reported through the routine surveillance and the sentinel surveillance, Malawi, 11th July 2022 – 27th January 2023

Results

- Between July 11, 2022 and January 27, 2023, 10,448 NP samples were collected and tested.
- From the HFs, the overall cumulative positivity rate (PR) was of 8.0%: 9.0% in symptomatic participants (weekly PR range 0-53.9%), 6.3% in asymptomatics (weekly PR range 0-33.3%). The cumulative PR among travelers was 3.4% (weekly PR range 1.2-9.1%) (Figure 2).
- PR decreased over time up to end October 2022 then trended slightly upward and was generally low among travelers (Figure 2).
- We found a significant association between testing seropositive for SARS-CoV-2 and occupation (employees and students had higher PRs), having previously tested negative to COVID-19, having tested positive to COVID-19 within the previous month, being in contact with a positive case in the previous 14 days and being partially vaccinated.
- More than two thirds (68.8%) of the SARS-CoV-2 positive cases were not vaccinated against COVID-19.
- All the 214 sequences analyzed were assigned to the Omicron variant and the two main circulating SARS-CoV-2 strains were BA.4 and BA.5.

Conclusions

- When compared to the routine surveillance (47 testing facilities), during the whole period the sentinel surveillance detected 22% to 167% of the cases every week (Figure 3).
- Due to other competing public health emergencies (massive nationwide cholera outbreak), some cases were not included in the routine system but captured in the sentinel surveillance.
- Trends in PR between symptomatic and asymptomatic were similar, highlighting the need to target both groups with testing and preventive measures. The ongoing detection of infections among travelers, despite instituted COVID-19 travel restrictions, indicates the need for continued surveillance in POEs and provides an opportunity to detect novel variants coming into the country.

Highlights

- ✓ 10,448 NP samples collected
- ✓ PR decreasing over time
- ✓ Overall PR for specific groups:
 - HF – Symptomatic: 9.0%
 - HF – Asymptomatic: 6.3%
 - HF: Overall: 7.2%
 - POE/Travellers: 3.4%
- ✓ Vaccination status of COVID-19 positives
 - Fully vaccinated: 7.4%
 - Partially vaccinated: 23.8%
 - Not vaccinated at all: 68.8%

* NP: nasopharyngeal; PR: positivity rate; HF: health facilities, POE: points of entry

