Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Syndromic surveillance with monthly aggregate health systems information data for COVID-19 pandemic response in Neno, Malawi: a monitoring study

Moses Banda Aron, Emilia Connolly, Fabien Munyaneza, Donald Fejfar, Isaac Mphande, George Talama, Chiyembekezo Kachimanga, Brown Khongo, Isabel Fulcher

Published Online March 31, 2022

Partners in Health, Neno, Malawi (M B Aron MPH, E Connolly MPH, F Munyaneza MPH, I Mphande MSc, G Talama MBBS, C Kachimanga MBBS, B Khongo MBBS)**; Partners in Health, Boston, MA, USA** (D Fejfar BSc)**; Harvard Medical School, Boston, MA, USA** (I Fulcher PhD)

Correspondence to: Mr Moses Banda Aron, Partners in Health, Neno PO Box 56, 00000, Malawi **maron@pih.org**

Abstract

Background In the context of diminutive COVID-19 screening and testing, syndromic surveillance can be used to identify areas with higher-than-expected SARS-CoV-2 symptoms for targeted public health interventions. We used syndromic surveillance to monitor potential SARS-CoV-2 outbreaks in 14 health facilities in the Neno district of rural Malawi.

Methods We monitored three indicators identified as potential symptoms of SARS-CoV-2 infection: the proportion of outpatient visits for fast-breathing cases in children under 5 years (FBC<5); the proportion of suspected malaria cases confirmed as non-malaria in children under 5 years (NMC<5); and the same indicator in individuals aged 5 years and older (NMC≥5). We extracted data aggregated by month and at the health facility-level from the District Health Information System. With data from January, 2016, to February, 2020, as a baseline, we used a linear model with a negative binomial distribution to estimate expected proportions for the indicators in absence of the COVID-19 pandemic with 95% prediction intervals (PI) for March, 2020, to July, 2021. We compared the observed proportions to the expected rates, focusing on the first two waves of infections (June to July, 2020, and January to March, 2021).

Findings The proportion of FBC<5 was consistently higher than expected, with a peak in May, 2020, when 2·5% of outpatient visits were fast breathing cases in children younger than 5 years of age (compared with the expected rate of 0·8% [95% PI 0·4–1·5]). NMC<5 was as expected throughout the study period. The NMC≥5 indicator remained as expected, except for increases in suspected cases tested negative for malaria, to 31·3% (from the expected 18·6% [95% PI 12·3–28·7]) in November, 2020, and to 32·5% (from the expected 21·7% [95% PI 14·2–32·2]) in July, 2021.

Interpretation An increase in FBC<5 and NMC≥5 before observed COVID-19 waves might indicate SARS-CoV-2 infections that were missed before robust testing. This tendency was not seen in NMC<5, which can represent differences in symptomatology leading to decreased health-seeking behaviours for this age group. Syndromic surveillance can allow for real-time responses at facilities, including increased and focused testing and screening to identify potential SARS-CoV-2 infections.

Funding Supported by Canadian Institutes of Health Research.

Contributors

MBA, EC, DF, and IF contributed to the design of the study, methods, and analysis of the data. All authors contributed to the analysis, interpretation, and discussion of results. All authors have seen and approved the final version of the abstract for publication. All authors had full access to all the data in this abstract and had final responsibility for the decision to submit for publication.

Declaration of interests

We declare no competing interests.