Implementing Real-time Disease Surveillance in the Democratic Republic of the Congo (DRC) Using the DHIS2 Platform, 2021–2024

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Abstract

The Democratic Republic of the Congo (DRC), the fourth largest country by population in Africa, routinely experiences epidemics including outbreaks of COVID-19, cholera, measles, and acute flaccid paralysis. The operational response to these outbreaks requires a timely and effective reporting system. The health information system for disease surveillance in DRC currently lacks a systematic approach for capturing laboratory results.

Aims

To address the challenges, we are testing the use of the DHIS2 software for aggregate weekly and case-based surveillance in Haut Katanga Province (pop. 7.5M) to improve the timeliness, quality, availability, and use of surveillance data to detect outbreaks and respond effectively (see Exhibit 1).

Introduction

The DRC’s health surveillance system is reliant on weekly reports from health facilities on priority diseases and immediate individual case reports on paper reports and manual data compilation and lacks a systematic approach for capturing laboratory results.

Context and Aim

To address the challenges, we are testing the use of the DHIS2 software for aggregate weekly and case-based surveillance in Haut Katanga Province (pop. 7.5M) to improve the timeliness, quality, availability, and use of surveillance data to detect outbreaks and respond effectively (see Exhibit 1).

The current analysis aims to present study findings and lessons learned to inform future efforts to strengthen disease surveillance via eIDSR.

Methods

We provided tablets, internet access, and training to head nurses and assistant nurses in 235 responsible health centers and hospitals (a responsible health center gathers data for its facilities in a health area) in 15 of 27 health zones in Haut Katanga Province on the DHIS2 Android application to submit individual case notifications (Method 2) and weekly aggregate surveillance reports.

We also trained data managers from the public health laboratory in Haut Katanga on how to enter laboratory results for cases notified in the eIDSR.

Because of resource constraints, we were not able to equip and train all health zones in Haut Katanga Province; however, we provided the provinces with a complete data set we trained health zone data managers to enter the data for the first 12 non-pilot health zones in the remaining 15 non-pilot health zones and provided a tablet and internet to facilitate this.

The 15 non-pilot health zones began using the system to transmit weekly epidemiological reports and immediate case notifications of priority diseases in October 2022 and in the 12 remaining health zones in March 2023.

The Provincial Health Office (PHO) and Health Zone Offices in the 15 pilot health zones were also trained on how to analyze their data in DHIS2 including identifying quality issues during the initial training in September 2022 and in May 2023.

We conducted supervision visits to the 15 pilot health zones from February to August 2023 and continued to provide remote and in-person support to ensure all 27 health zones and the provincial health office through staff-based in Kinshasa and Haut Katanga.

We gathered the quantitative data for this analysis for the eDHIS2 system and qualitative data from the aggregate weekly format from February to August 2023.

Findings

Among the 15 pilot health zones where health facilities reported their weekly epidemiological data using the DHIS2 Android application on tablets, on average 93% of expected reports were submitted for the 12 non-pilot health zones within one week of the data for their health area; an average of 69% of expected reports were submitted (completeness) from August 2022 to April 2024 (Exhibit 3).

Exhibit 3. Average Completeness of Weekly Reports, 15 Pilot and 12 Non-Pilot Health Zones, August 2023–April 2024

For the 15 pilot health zones, 76% of weekly reports were submitted on time, compared to 18% for the 12 non-pilot health zones (timeliness) from August 2022 to April 2024 (Exhibit 4).

The health worker strike from August to October 2023 negatively impacted reporting.

Among the 15 pilot health zones where health facilities reported their weekly epidemiological data, we found that on average 70% of cases individually notified had laboratory results. This resulted in an overall 20% increase in laboratory reporting (Fig. 3) compared to the previous period when lab tests were not matched to the number of cases individually notified.

Exhibit 4. Average Timeliness of Weekly Reports, 15 Pilot and 12 Non-Pilot Health Zones, August 2023–April 2024

The cholera outbreak and response efforts in January–March 2024 led to having the condition with the highest number of individual case reports in the eIDSR (Exhibit 6).

Exhibit 6. Number of Immediate Case Notification Forms Compared to Aggregate Cases Entered in eIDSR, 15 Pilot Health Zones, by Disease, November 2022–April 2024

Cholera

COVID-19

AIDS/TB/PLAIDS

Yellow Fever

Guinea Worm

To support the cholera outbreak from January to March 2024, we worked intensively to increase the number of cases individually notified in some health zones, more cholera cases were notified compared to cases reported in weekly aggregate reports.

Exhibit 5. Percentage of Immediately Notifiable Diseases Entered in eIDSR Using Individual Case Form Compared to Cases Reported in Weekly Aggregate Report, 15 Pilot Health Zones, November 2022–April 2024

The cholera outbreak and response efforts in January–March 2024 led to having the condition with the highest number of individual case reports in the eIDSR (Exhibit 6).

Exhibit 7. Percentage of Cases With Laboratory Results for Individually Notified Cases in 15 Pilot Health Zones, November 2022–April 2024

Cholera

COVID-19

AIDS/TB/PLAIDS

Yellow Fever

Guinea Worm

Innovative Contribution to Policy and Practice

The eIDSR system integrates laboratory results with case data to strengthen surveillance and response.

The DHIS2 used in the eIDSR system during the study period was capable to generate line lists automatically, demonstrating its utility over the existing manual system.

Use of electronic reporting from responsible health centers to the national health information system is an innovation that could be scaled up to additional provinces. The collection of surveillance data using DHIS2 that connects directly to the national health information system is an innovation that could be scaled up to additional provinces.

Use of dashboards in the eIDSR helped draw attention to health zones and areas with excellent and low reporting and to identify outbreaks in real-time.

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Acknowledgments

This study was supported by Cooperative Agreement Number U2UG00000447 from the Centers for Disease Control and Prevention. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Centers for Disease Control and Prevention, the Department of Health and Human Services, or the U.S. government.

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