UGANDA NATIONAL INSTITUTE OF PUBLIC HEALTH
Quarterly Epidemiological Bulletin: October– December, 2020
Volume 5 / Issue 4 /Article No. 3

Automating Early Warning System for Timely Detection of Outbreaks in Uganda; A Solution to Rapid Response and Containment of Public Health Emergencies: : A Policy Brief

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Summary

Delayed detection of outbreaks results into increased transmission of diseases within communities and health care facilities. Although there is improved reporting by health facilities at district level, there is no automated mechanism to quickly analyse trends of diseases against the expected number on cases in a specific time period / threshold, immediately detect surges and provide reports for verification and action. A policy on creation and use of a monitoring system or automated mechanism to quickly analyse all the data collected from the surveillance system and promptly create reports that are used for informed decision making and public health actions should be in place.

Introduction

Public health surveillance is critical for planning, implementation, and evaluation of public health practices. In Uganda, various types of surveillance are used within the national programmes including: 1) focussed location e.g. health facility and community based surveillance; 2) sentinel surveillance which is a designated health facility or any reporting site used for early warning of epidemics; 3) laboratory surveillance used for detecting events and 4) disease specific surveillance with activities aimed at targeted data for specific diseases.

In 1998, surveillance systems were weak and parallel in Africa and inefficient for outbreak preparedness and response to public health emergencies. The World Health Organization (WHO) proposed the integrated disease surveillance and response (IDSR) strategy to strengthen public health surveillance and response. In 2001, Uganda adapted the IDSR strategy and has since improved surveillance. An assessment conducted in 2007 to evaluate performance of the IDSR since its adaptation showed improvements in performance

including improved reporting at district level, an increase in timeliness of reporting from district and central levels, an increase in analysed data, the case fatality rate for cholera and meningitis (targeted disease) reduced due to improved response and increased funding for IDSR (1). Another assessment conducted in 2016 additionally highlighted improvements of 69 to 100% in completeness of monthly reporting; monthly reporting from 59 to 78%, weekly from 40 t0 68%. Additionally the case fatality rate for cholera had reduced from 3,2% in 2012 to 2,1% in 2016 (2).

Context and importance of the problem

There is value in innovating early warning systems. In 2012, Uganda piloted a malaria monitoring system in Kabale and Rukingiri districts which automatically generated and analyzed malaria related data on a weekly basis. Electronic reports were disseminated by email to the National Control Programme. This monitoring system detected two malaria outbreaks in Kabale (3). Public health interventions were immediately mounted to respond to the malaria surge.

There is late detection of outbreaks using the current surveillance system which in turn leads to delayed response to public health emergencies. Although high pathogen diseases like Ebola Virus disease (EVD) can easily be detected due to their virulent nurture, other diseases of outbreak potential like malaria, typhoid, diarrhoea, and others might go unnoticed until the health system is overwhelmed.

Delayed detection of outbreaks results in increased transmission of diseases within communities and health care facilities. Although there is improved reporting by health facilities at district level, there is no automated mechanism to quickly analyse trends of diseases against the expected number of cases or threshold in a specific time period, immediately detect surges, and provide reports for verification and action. The manual approach to analysis of surveillance data is time consuming and cannot provide small unit (district/ sub county/ health facility) detailed trend analysis to inform quick decisions.

An automated mechanism to analyse all surveillance data collected from health facilities in the districts is critical for early detection, response, and containment of outbreaks at source with minimal transmission and deaths.

Critique of policy options

The World Health Organization through the International Health Regulations (IHR) recommends strengthening capacities to detect, assess, notify, and report events (4). This requires a surveillance system in place to collect information which Uganda has already developed. Additionally, the regulation requires the country to have prompt mechanisms to quickly detect surges or disease outbreaks which is still weak due to the slow analysis of all surveillance data.

Policy recommendations

The Ministry of Health should invest in creating a monitoring system or automated mechanism to quickly analyse all the data collected from the surveillance system and promptly create reports that are used for informed decision making and public health actions

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