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Disease Surveillance System of Bangladesh: Combating Public Health Emergencies

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Objective

a) To observe trends and patterns of diseases of public health importance and response
b) To predict, prevent, detect, control and minimize the harm caused by public health emergencies
c) To develop evidence for managing any future outbreaks, epidemic and pandemic

Introduction

Disease surveillance is an integral part of public health system. It is an epidemiological method for monitoring disease patterns and trends. International Health Regulation (IHR) 2005 obligates WHO member countries to develop an effective disease surveillance system. Bangladesh is a signatory to IHR 2005. Institute of Epidemiology, Disease Control and Research (IEDCR <www.iedcr.gov.bd>) is the mandated institute for surveillance and outbreak response on behalf of Government of the People's Republic of Bangladesh. The IEDCR has a good surveillance system including event-based surveillance system, which proved effective to manage public health emergencies. Routine disease profile is collected by Management Information System (MIS) of Directorate General of Health Services (DGHS). Expanded Program of Immunization (EPI) of DGHS collect surveillance data on EPI-related diseases. Disease Control unit, DGHS is responsible for implementing operational plan of disease surveillance system of IEDCR. The surveillance system maintain strategic collaboration with icddrr,b.

Methods

The IEDCR is conducting disease surveillance in several methods and following several systems. Surveillance data of priority communicable disease are collected by web based integrated disease surveillance. It is based on weekly data received from upazilla (sub-district) health complex on communicable disease marked as priority. They are: acute watery diarrhea, bloody dysentery, malaria, kala-azar, tuberculosis, leprosy, encephalitis, any unknown disease. Government health facilities at upazilla (sub-district) send the data using DHIS2. During outbreak, daily, even hourly reporting is sought from the concerned unit.

Moreover, IEDCR conducts disease specific specialized surveillance systems. Data from community as well as from health facilities are collected for Influenza, nipah, dengue, HIV, cholera, cutaneous anthrax, non-communicable diseases, food borne illness. Data from health facilities are collected for antimicrobial resistance, rotavirus and intussusception, reproductive health, child health and mortality, post MDA-surveillance for lymphatic filariasis transmission, molecular xenomonitoring for detection of residual Wucheria bancrofti, dengue (virological), emerging zoonotic disease threats in high-risk interfaces, leptospirosis, acute meningo-encephalitis syndrome (AMES) focused on Japanese encephalitis and nipah, unintentional acute pesticide poisoning among young children. Data for event based surveillance are collected from usual surveillance system as well as from dedicated hotlines (24/7) of IEDCR, media monitoring, and any informal reporting. Case detection is done by syndromic surveillance, laboratory diagnosed surveillance, media surveillance, hotline, cell phone-based surveillance. Dissemination of surveillance is done by website of IEDCR, periodic bulletins, seminar, conference etc. Line listing are done by rapid response teams working in the surveillance sites. Demographic information and short address are listed in the list along with clinical and epidemiological information. Initial cases are confirmed by laboratory test, if required from collaborative laboratory at US CDC (Atlanta). When the epidemiological trend is clear, then subsequent cases are detected by symptoms and rapid tests locally available.

Results

In 2017, 26 incidents of disease outbreak were investigated by National Rapid Response Team (NRRT) of IEDCR. In the same year, 12 cases of outbreak of unknown disease was investigated by NRRT of IEDCR at different health facilities. Joint surveillance with animal health is being planned for detection and managing zoonotic disease outbreaks, following One Health principles. Department of Livestock, Ministry of Environment and icddrb are partners of the joint surveillance based on One Health principles. Disease Control unit of DGHS, district and upazilla health managers utilizes the disease surveillance data for public health management. They analyze also the surveillance data at their respective level to serve their purpose.

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Conclusions

A robust surveillance is necessary for assessing the public health situation and prompt notification of public health emergency. The system was introduced at IEDCR mainly for malaria and diarrhea control during establishment of this institute. Eventually the system was developed for communicable disease, and recently for non-communicable diseases. It is effectively used for managing public health emergencies. Notification and detection of public health emergency is mostly possible due to media surveillance. Data for syndromic surveillance for priority communicable diseases is often not sent timely and data quality is often compromised. Tertiary hospitals are yet to participate in the web based integrated disease surveillance system for priority communicable diseases. But they are part of specialized disease surveillances. Data from specialized surveillance with laboratory support is of high quality.

Evaluation of the system by conducting research is recommended to improve the system. Specificity and sensitivity of case detection system should also be tested periodically.

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