

## Commentary

# The Role of Field Epidemiology in the Disasters: Yemen Cholera Outbreak Example

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## Abstract

In 2011, Yemen Field Epidemiology Training Program was established to strengthen health workforce capacity. The program is a variant of the international Field Epidemiology Training Programs that were built on the 'Learning while doing' Center for Disease Control Epidemic Intelligence Service. As the world's worst cholera outbreak hits Yemen and turned the dire humanitarian situation into a disaster, the Program proved itself as an important tool for strengthening the national public health preparedness and response. Through focusing on timely investigation, adherence to standard case definition, proper case management, effective infection control practice and strengthening surveillance system, the Program participated effectively in the outbreak containment. Recent surveillance data confirm a decline in suspected cases over the past month in some of the most affected governorates.

**Keywords:** Cholera; Disaster; Field Epidemiology Training Program; Outbreak; Response; Public Health Empowerment Program; Yemen

## Commentary

The Yemeni health system is facing increasingly complex health challenges with high risk of emerging and re-emerging of infectious diseases and natural and man-made disasters. Therefore, the Ministry of Public Health and Population (MoPHP) gives much attention to the urgency of strengthening the national public health preparedness and response through strengthening health workforce capacity [1].

In 2011, MoPHP has established the Yemen Field Epidemiology Training Program (Y-FETP) with support from the Center for Disease Control (CDC). The program -later on- gained support of the World Health Organization (WHO), the Training Program in Epidemiology and Public Health Interventions Network (TEPHINET) and the Eastern Mediterranean Public Health Network (EMPHNET) [2]. The Y-FETP is a variant of the international FETP model that was built on the CDC Epidemic Intelligence Service (EIS) that was established in 1951 [3-4].

Y-FETP started initially with an advance two-year training based on a philosophy of 'Learning while doing' where the residents analyze and evaluate surveillance systems, conduct field

investigations to respond to public health emergencies, and publish and present scientific research to guide decision making [1]. More recently, a three-month Public Health Empowerment Program (PHEP) focusing on training on basic epidemiology has been developed with support from EMPHNET. The PHEP is targeting governorates' and districts surveillance officers aiming to help taking informed decisions and interventions against outbreaks and communicable and non-communicable illnesses at the governorates' and districts levels [5].

Since establishment, the Y-FETP proves itself as strengthening tool for the national public health preparedness and response as well as for health workforce capacity building. During the five-year span, the Y-FETP residents successfully conducted 65 outbreaks investigations, 52 surveillance analyses, 26 surveillance evaluations, 22 planned studies and presented 34 oral and 22 poster presentations at the international, regional and national scientific conferences [6].

More recently, the Y-FETP showed its strong presence and success as Yemen has faced the world's worst cholera epidemic since the end of April 2017. In the span of four months, cholera epidemic in Yemen has spread nearly to the whole country turning the dire humanitarian situation for the conflict-affected population into a disaster. As of 30 August 2017, a total of 591,100 suspected cases with 2,035 deaths have been reported in 96% of the Yemeni

governorates and 90% of the districts [7]. The Y-FETP works under the leadership of the MoPHP and in coordination with partners (especially WHO and UNICEF) in responding to such upsurge in cholera transmission through the following activities:

### **Assessing Cholera Epidemic Response Activities in “Hot Districts”**

Based on WHO guidelines [8], the Y-FETP residents and graduates conducted an assessment of the cholera epidemic response at the “Hot Districts”- with high caseload- to inform planning for improved preparedness and response. Such an assessment provided a comprehensive overview of the epidemic response and pinpointed the main strengths and weaknesses of the response. Through this assessment, residents monitored the functions of the Cholera Treatment Centers (CTCs) and Oral Rehydration Corners (ORCs) that were established by MoPHP and partners (e.g. WHO, UNICEF, NGOs) and provided technical guidance for proper case management reinforced the infection control practices. The residents ensured proper provision of CTCs’ drugs, materials, equipment, and supplies as well as analyzed data and produced weekly epidemiologic trends, to be disseminated regularly. The assessment provided recommendations for rapid containment of the current epidemic and suggested accurate measures to improve preparedness for and response to future outbreaks.

### **Supporting Hot Districts Micro-planning for Cholera Epidemic Response**

Based on the Y-FETP assessment of the cholera response activities, the residents and graduates were deployed to support “Hot Districts” to develop Districts Epidemic Response Plans (DERPs) and introduce appropriate measures to control and contain the epidemic. The overall goal of the DERPs is to reduce occurrence and to minimize morbidity and fatality of cholera through effective prevention and timely response via implementing the following measures:

- Implement coordination mechanisms for the response at the national and governorate levels
- Enhance cholera surveillance
- Ensure proper case management and infection control and prevention
- Enhance environmental control procedures in response to outbreaks
- Ensure effective monitoring and evaluation of cholera responses Through such microplanning exercise, the Y-FETP residents highlighted the following key areas to ensure effective response to the cholera epidemic:
- The epidemiological surveillance system needs to be improved

- The cholera alert system needs to be strengthened
- The case management and infection control activities need to be enhanced
- The availability of drugs and the regular provision of supplies to Cholera Treatment Centers must be ensured
- Sensitization activities are essential to stop the transmission of the disease
- Since the main cause for the persistence of cholera is the lack of access to clean water and sanitation facilities as well as poor hygienic practice, there is dire need for strengthening WASH activities e.g. improve water quality and raise awareness regarding adequate hygiene practices.
- Most importantly the success in implementing the developed plans and achieving results are largely contingent on the availability of necessary resources.

### **Coordinating Cholera Response in the Hot Districts**

The MoPHP and the WHO appointed the Y-FETP residents to lead the control activities at the districts with highest caseload. The overall objectives are to provide technical guidance and to evaluate cholera response activities in these “Hot Districts”. Together with the districts’ health teams, the Y-FETP residents and graduates offered strong leadership and coordination for the cholera epidemic response. They provided technical support to the Districts’ Health Offices, and supported coordination and inter-cluster and multi-disciplinary collaboration in the epidemic response. Such support concentrates on the following technical areas:

- Surveillance
- Case management and infection control
- Water, sanitation and hygiene
- Social mobilization
- Logistics and supplies

### **Conducting Cholera Outbreak Field Investigations and Helps Rapid Containment**

The Y-FETP conducted three cholera outbreak investigations that constituted the 1st confirmed outbreaks in the second wave of cholera that was started on April 27, 2017. While investigating the outbreaks in the field, residents and graduates met with relevant stakeholders at the local level where they shared the preliminary findings and recommendations on how to prevent the further spread and recurrence of these outbreaks. The teams presented the findings to their colleagues and the relevant MoPHP officials during the biweekly Y-FETP resident’s meeting. Outbreak reports in English and Arabic were developed and shared at governorate and central levels and posted at the Y-FETP website: <http://www.yfetp.com/>

## Strengthening Health Manpower Capacity in Surveillance and Outbreak Investigation

To increase the effectiveness of response to the Cholera Outbreak in Yemen, Y-FETP in partnership with EMPHNET is running on job 3-months PHEP targeting surveillance officers at governorates' level to enable them to take informed decisions in interventions against outbreaks and the spread of communicable and non-communicable illnesses. This training will be expanded in the near future to involve Rapid Response Teams (RRTs) and surveillance officers in 98 high priority districts out of the 309 which reported cholera cases. These RRRs will be responsible for house-to-house behavioral change activities enabling people to protect themselves from cholera and other water-borne diseases [9].

## Participating in Cholera Committees, Scientific Meetings and Operational Research

As part of the Y-FETP continuous scientific merit and presence, the Y-FETP hosted the Cholera Technical Committee meetings with strong participation from relevant MoPHP departments and the National Central Public Health Laboratories (NCPHL) as well as the WHO, UNICEF. The Y-FETP also, participated as a member of the Cholera Task Force headed by the Minister of Health and the Scientific Committee headed by the Undersecretary for Primary Health Care. The Y-FETP is currently working with Department of Field Epidemiology and Training Epicentre, Paris and Médecins Sans Frontières - France in conducting a study to investigate risk factors for cholera transmission during an outbreak situation in Yemen. Furthermore, the Y-FETP launched recently a special supplement to the 7th issue of the Y-FETP newsletter posted at the program website (<http://www.yfntp.com/>) to update the public health community on cholera situation and Y-FETP contributions in response activities.

Through all these Y-FETP concentrated efforts, Y-FETP participated effectively in containment of the current cholera outbreak. Recent surveillance data confirm a decline in suspected cases over the past month in some of the most affected governorates. The weekly number of cases have been decreasing for 6 consecutive weeks since the week 26 [10].

## Conclusion

The Y-FETP work-based training model prove to be an effective tool for strengthening the capacity of the Yemen health

workforce. This is achieved through hands-on, real-life experiences in the work-setting that could improve institutional capacity and strengthen response and containment measures for outbreaks. It is providing a practical example of health systems strengthening through health workforce capacity development for facing disasters and emergency situations. This model can be replicated in countries with similar health workforce capacity challenges that are facing disasters and emergencies.

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**Conflict of Interest Statement:** The authors disclose any financial competing interests.

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