

**Outbreak of Cholera in Iraq during a Humanitarian Crisis, 2015:
A Teaching Case-Study**

Student's Guide

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Abstract

Cholera is an infectious disease caused by the consumption of contaminated food or water with the bacterium *Vibrio cholerae*. *V. cholera* has many subgroups; only two (O1 and O139) of them can lead to outbreaks. Recent cholera outbreaks were all caused by *V. cholera* O. The availability of safe water and sanitation is vital for controlling transmission of cholera and other waterborne diseases. Several Cholera outbreaks were reported in countries of the Eastern Mediterranean Region (EMR) in the last decade, including Afghanistan, Djibouti, Iraq, Pakistan, Sudan, Somalia and Yemen. Cholera is endemic in Iraq; it was first reported in Basrah, in the year 1820. Over the last 5 decades, Iraq experienced many epidemics all together because of underdevelopment and infrastructure damage as a result of wars and conflicts. In addition to bad sewage system, shortages in the supply of safe water exacerbated several outbreaks in the last decade.

In Iraq, cholera outbreak was declared by the Iraqi Ministry of Health (MoH) in 2015, during a humanitarian crisis. The outbreak continued to rapidly spread throughout the country, and by October 2015, a total of 1,656 cases were confirmed. This case study is based on the actions taken by the Iraqi MoH during this outbreak to prevent the spread of cholera, where it targeted around 255,00 displaced persons above the age of 1 with a 2-dose oral cholera vaccine (OCV). Individuals who received vaccines were in refugee camps, internally displaced persons camps, and collective centers. This case study is designed to train basic level field epidemiology trainees or any other health care workers who work in fields related to public health and develop their skills to investigate and respond to outbreaks based on cholera outbreak in Iraq, in 2015. It is administrable in 2-3 hours. The case study is used as an optional training material, provides the trainees with the expertise to investigate an outbreak in preparation for the actual real-life experience of such outbreaks.

Keywords: Outbreak, Cholera, vibrio Cholera, Humanitarian Crisis, Iraq

How to Use the Case Study?

General instructions: This case study should be used as adjunct training material for novice epidemiology trainees to reinforce the concepts taught in prior lectures. The case study is ideally taught by a facilitator in groups of about 20 participants. Participants are to take turns reading the case study, usually a paragraph per student. The facilitator guides the discussion on possible responses to questions. The facilitator may make use of flip charts to illustrate certain points. Additional instructor's notes for facilitation are coupled with each question in the instructor's guide to aid facilitation.

Audience: This case study was developed for novice field epidemiology students. These participants are commonly health care workers working in the county departments of health whose background may be as medical doctors, nurses, environmental health officers or laboratory scientists who work in public health-related fields. Most have a health science or biology background.

Prerequisites: Before using this case study, participants should have received lectures on disease surveillance and outbreak investigation.

Materials needed: Flash drive, flip charts, markers, computers with MS Excel

Level of training and associated public health activity: Novice – Outbreak investigation

Time required: 2-3 hours

Language: English

Goal of Case Study

Develop skills to investigate and respond to outbreaks based on cholera outbreak in Iraq, in 2015.

Learning Objectives

At the conclusion of the teaching session, participants will be able to:

1. Define outbreak, endemic, and epidemic
2. Describe surveillance system.
3. Discuss the WHO / Ministry of health recommended control measures for epidemic.
4. Calculate attack rate and case fatality rate.
5. Compare between affected areas in terms of cases, deaths, socio-demographic characteristics and districts affected.

Introduction

Cholera is an infectious disease caused by the consumption of contaminated food or water with the bacterium *Vibrio cholerae*. *V. cholera* has many subgroups; only two (O1 and O139) of them can lead to outbreaks. Recent cholera outbreaks were all caused by *V. cholera* O. The availability of safe water and sanitation is vital for controlling transmission of cholera and other waterborne diseases. Several Cholera outbreaks were reported in countries of the Eastern Mediterranean Region (EMR) in the last decade, including Afghanistan, Djibouti, Iraq, Pakistan, Sudan, Somalia and Yemen. Cholera is endemic in Iraq; it was first reported in Basrah, in the year 1820. Over the last 5 decades, Iraq experienced many epidemics all together because of underdevelopment and infrastructure damage as a result of wars and conflicts [1-3]. In addition to bad sewage system, shortages in the supply of safe water exacerbate several outbreaks in the last decade [1].

Iraq has 18 provinces and the Ministry of Health organizes the health authority, which controls all health facilities (public and private sectors) at the central and peripheral levels. It has an estimated total population of 35 million; it has 19 Health Directorates, 135 Health Districts and 1350 Health Surveillance Sites 22.

In Iraq, cholera became an endemic disease, strikes in epidemic form almost every 10 years but with irregular outbreaks. Iraq is facing major disasters caused by the destruction of infrastructure with a shortage of electricity and safe drinking water, particularly in poor districts and refugee camps, which help waterborne diseases, including cholera, to appear. The sewage disposal facilities have also been severely damaged or obstructed [2].



Source: Worldometer (<https://www.worldometers.info/maps/iraq-political->

Part 1: Story

Roughly 3.3 million internally displaced persons (IDPs) were dispersed across Iraq in 2015 as a result of increased violence by an armed anti-government group and subsequent counter-insurgency operations by Iraqi government and coalition forces, and Iraq was hosting more than 20,000 Syrian refugees as a result of ongoing conflict between the government and several opposition groups in Syria. Due to the large number of displaced populations residing in camps, informal settlements or temporary placement sites (collective centers), the risk of communicable disease epidemics in Iraq is increased. Such sites are generally overcrowded and have inadequate housing provisions and limited access to sanitation facilities, safe drinking water, nutritious food and basic health care services. Such risk factors, coupled with austerity measures and their impact on health services, contributed to cholera transmission in Iraq.

On 30th August 2015, an outbreak was declared by the Iraq Ministry of Health (MoH). On the 15th of September; activation of the Cholera Control and Command Center followed the declaration of outbreak. The outbreak continued to spread rapidly across the country, and by October 2015, a total of 1,656 laboratory-confirmed cases of *Vibrio cholerae* had been reported from 15 of 18 governorates; 1,000 (representing 60%) of these cases were reported in southern and central governorates of Babylon and Baghdad.

Part 1 Questions:

Question 1. What possible risk factors may be imposed by living in IDP camps?

Question 2. What is the difference between endemic and epidemic?

Question 3. Was the response to the outbreak by forming the Cholera Control and Command Center prompt enough?

Question 4. Should this event be reported to the World Health Organization (WHO) Why? If yes, by whom?

Part 2: Methods

WHO recommended oral cholera vaccines (OCVs) as a complementary method for effective prevention and control of cholera, in addition to the primary intervention of safe water, sanitation and hygiene measures (WaSH). WHO prequalifies three OCVs: Dukoral, Shanchol, and Euvichol. A global OCV stockpile was founded in early 2013, with initial support from several donors, and supported by Gavi, the Vaccine Alliance, for funding support. The stockpile is managed by the International Coordinating Group, which consists of four decision making partners: the International Federation of Red Cross and Red Crescent Societies; Médecins Sans Frontières; the United Nations Children's Fund; and the WHO, which also acts as the Secretariat.

When the 2015 cholera outbreak in Iraq began, the Iraq MoH and implementing partners immediately began preparing a vaccination campaign using the OCV to supplement WASH and other measures to prevent cholera. The 2-dose OCV campaign targeted around 255,000 people who are more than 1 years of age living in identified refugee camps, IDP camps, and community centers due to increased cholera risk due to living conditions. The delivery of 510,000 OCV doses in Iraq has been the largest outbreak and humanitarian response to date from the global OCV stockpile. As part of the required monitoring and assessment activities for these deployments, the MoH asked partners to conduct a vaccination coverage survey to determine vaccine compliance, awareness of OCV programs, explanations for vaccine acceptance or non-acceptance and any adverse events reported after the campaign.

Part 2 Questions:

Question 5. What role do you think the laboratory plays in this scenario? Should we collect samples for testing?

Question 6. What are your recommendations for sample collection, transportation, and testing?

Question 7. The team leader asked you to revise the WHO recommendations, what are the immediate measures you would recommend?

Question 8. What is importance of conducting a vaccination coverage survey?

Part 3: Results

In the year 2015, Iraq faced an epidemic of cholera that began during the third week-on September-through all its governorates. The total number of admitted cholera cases confirmed by the laboratory till 6/11/2015 is 2651 cases, and only two reported deaths.

The deaths were one male from Baghdad and one female from Babylon; their age was fifty years and thirty years respectively; they died due to irreversible circulatory collapse and renal failure due to delay in reaching the hospital. By November 6, 2015, a total number of 2651 were identified as confirmed cholera cases

The number of cases was estimated to be 1691 to the eleventh of October 2015, added to it through the MoH's official daily report, and the addition of confirmed cases of 960 cases of cholera to raise the total to 2651 confirmed cases by November 6, 2015.

Part 3 Questions:

Question 9. What is the definition of an outbreak?

Question 10. How many confirmed cholera cases are required for the County Director of Health (CDH) to declare the existence of a cholera outbreak?

Question 11. What kind of preparations do you think the investigation team should undertake before heading out to the field? Provide answer in terms of scientific and administrative activities.

Question 12. Summarize the steps of an outbreak investigation.

Part 4: Discussion

All data were obtained using application Survey123. It has been installed on electronic tablets to track survey teams in real-time data entry and global positioning system (GPS). During this humanitarian crisis, data was entered electronically, and the survey teams were tracked using GPS to control the spatial pattern of selected households and data quality. Within each household, all persons in each of three age groups (1–4 years, 5–14 years, and >15 years of age) were interviewed.

In a humanitarian emergency the aim of vaccination is to efficiently reduce the risk of disease to protect a population during periods of extreme vulnerability. Due to massive population movements and overcrowding, the risk of cholera epidemics among displaced populations may be increased. Furthermore, the lack of access to clean water, proper sanitation and shelter are also associated risk factors for cholera epidemics. OCV use has been recommended by the World Health Assembly (WHA) and WHO in the sense of a humanitarian emergency to minimize morbidity and cholera mortality. Also, because of the global rise in cholera incidence, the WHA called for an integrated and comprehensive approach to cholera prevention in 2011. It included rapid provision of safe water, effective case management at health facilities, enhanced case detection through early warning surveillance and laboratory confirmation, and cholera vaccination.

Part 4 Questions:

Question 13. What is a case definition?

Question 14. What is the difference between active surveillance and passive surveillance?

Question 15. What type of surveillance would be most appropriate for use during the cholera outbreak? Why?

Question 16. Suggest suspected, probable, and confirmed case definitions for a cholera case for use in this investigation.

Question 17. Where would you suggest that the team look for additional cases?

Part 5: Case study conclusion

Iraq's government launched the first round of the oral cholera vaccine program with help from WHO and UNICEF. The program resulted in 229,000 refugees and internally displaced persons (IDPs) being vaccinated across 62 camps in 13 governorates. There were no concerns regarding the vaccine. In the first week of December, the second round of vaccinations will began to complete the recommended dosing regimen and optimize clinical protection in the target population. Moreover, Oral cholera vaccination should be part of a comprehensive and integrated program that also includes clean water, better sanitation and hygiene to ensure maximum protection against cholera and other diarrheal diseases.

Part 5 Questions:

Question 18. Based on the preliminary findings above, what control and prevention measures do you think the investigating team should recommend?

Question 19. What actions would you take to engage the community while implementing prevention and control measures?

Question 20. As a member of the team, what forum/channels would you use to share findings with all the relevant partners?

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