

Chapter 5

Outbreaks of acute diarrhoeal disease

Purpose of assessment

The purpose of this rapid health assessment is to:

- confirm that an epidemic of acute diarrhoeal disease exists and estimate its geographical distribution;
- estimate its health impact; and
- assess existing response capacity and identify the most effective control measures to minimize the outbreak's ill effects.

Background

In many places, diarrhoeal diseases are endemic with seasonal peaks. However, when serious outbreaks of acute diarrhoeal disease occur, the common cause is either:

- *Shigella dysenteriae* type 1 (Sd1), which causes bacillary dysentery, or
- *Vibrio cholerae* serogroup O1 or O139, which causes cholera

Shigella dysenteriae type 1 (Sd1)

This is the most virulent of the four serogroups of shigellae, and is often resistant to most of the common antimicrobials. The illness caused by Sd1 often includes abdominal cramps, fever, and rectal pain. Less frequent complications with Sd1 include sepsis, seizures, renal failure, and haemolytic/uraemic syndrome. The organism is highly infectious, and readily transmitted by direct person-to-person contact as well as by food and water.

Shigella dysenteriae type 1 always should be considered as a possible cause of the outbreak when there is an unusual increase in the weekly number of cases of bloody diarrhoea or deaths from bloody diarrhoea.

Vibrio cholerae O1 and O139

Cholera has spread widely since 1961 and now affects at least 98 countries.

Most people infected have no symptoms or only mild diarrhoea. However, those with a severe case of the disease can die within hours of onset from fluid/electrolyte loss through profuse diarrhoea and, to a lesser extent, vomiting. Although high death rates can occur when treatment is unavailable, case fatality can be reduced to below 1% with proper facilities and care. The organism is

spread almost exclusively by ingestion of food or water contaminated directly or indirectly by faeces or vomit from infected individuals.

A cholera outbreak should be suspected if either or both of the following occur:

- a patient older than five years develops severe dehydration or dies from acute watery diarrhoea;
- there is a sudden increase in the daily number of patients with acute watery diarrhoea, especially patients who pass the “rice water” stools typical of cholera

Conducting the assessment

The rapid assessment consists of confirming an outbreak of acute diarrhoeal disease, assessing the impact on health, the existing response capacity, and additional immediate needs.

The assessment team should be equipped with specimen containers and sufficient transport media (such as Cary-Blair) for collecting specimens to analyse at the closest competent laboratory

Confirming an outbreak of acute diarrhoeal disease

Confirming the clinical diagnosis and collection of specimens

This can be carried out by examining a number of cases. Confirming the outbreak and implementing control measures should not await laboratory results. However, for both dysentery and cholera, reliable laboratory techniques are essential for confirming the clinical diagnosis and determining antimicrobial sensitivities.

Initial case definition

As in all rapid epidemic assessments, this is an important first step for guiding early field investigations and identifying cases. Standard case definitions for suspected cases of acute diarrhoeal disease are.

- In an area where the disease is not known to be present, a patient aged five years or more develops severe dehydration or dies from acute watery diarrhoea.
- In an area where there is a cholera epidemic, a patient aged five years or more develops acute watery diarrhoea, with or without vomiting.¹
- A case of cholera is confirmed when *Vibrio cholerae* O1 or O139 is isolated from any patient with diarrhoea.
- Bacillary dysentery is confirmed by evidence of acute onset of bloody diarrhoea with visible blood in the stool.

¹For management of cases of acute watery diarrhoea in an area where there is a cholera epidemic, cholera should be suspected in all patients aged two years or more. However, the inclusion of all cases of acute watery diarrhoea in the two- to four-year age group in the reporting of cholera greatly reduces the specificity of reporting

Assessing the impact on health

Case-finding and estimating geographical distribution

In endemic areas, cases of cholera and bacillary dysentery occur every year, usually with seasonal peaks. Therefore, it is extremely important for the rapid assessment to determine whether there are significantly more cases than should be expected.

Active case-finding is needed to determine the size of the outbreak, based on the initial case definitions. Cholera and bacillary dysentery can be distinguished by their clinical presentations (see p. 38).

Collecting information on a representative sample of cases

Focus on what is already known about patterns of spread for both bacillary dysentery and cholera to identify possible sources of the outbreak and means of spread. The case-fatality ratio should be calculated and used to assess the adequacy of patient management.

The case-fatality ratio should be <1% for cholera, and from 1% to 10% during epidemics of Sd1.

- *Cholera*: Because spread can occur by contaminated food and water, or more rarely by person-to-person contact in overcrowded conditions, ask questions about possible types of exposure.
- *Bacillary dysentery*: Because spread can occur through contaminated food or water or direct person-to-person transmission, ask questions to determine how spread is occurring.

Analysing the information

Time: When did the cases occur? Is their number increasing? Did many people become ill at the same time at the outbreak's beginning?

- Draw a simple graph to show the number of cases reported per day so far.
- If the diarrhoeal disease outbreak has affected a wide area, construct simple graphs for the different areas affected, showing the number of cases reported per day.

Place: Where have cases occurred? Is the outbreak spreading? How is it spreading?

- Map cases geographically, by date of onset.

Use maps that identify water sources, settlements, health facilities and major transport routes. If they are not available, sketch a rough map including this information. This helps to identify at-risk areas and their relation to road and rail links and existing health facilities, which are important for organizing a rapid response.

Person: Which groups are at greatest risk (e.g. age, occupations)? How many cases are there so far, or could there be in the future?

- Calculate overall attack rates.
- Calculate age-specific and sex-specific attack rates.
- Estimate the number of cases in the future.

In past epidemics, attack rates for clinical cholera have been about 0.2%. However, in a severe epidemic the attack rate has been as high as 1%. In order to calculate supply needs for the first weeks, a bacillary dysentery attack rate of 2% can be assumed. Information on the treatment of cholera and dysentery is contained in Box 1.

Assessing local response capacity and immediate needs

The following questions are guidelines for assessing the local response capacity and determining the need for outside resources.

Response capacity of local health services

- What steps have local health officials taken to organize the epidemic response? Is there a plan of action, standardized reporting procedures, and trained staff?
- Are guidelines for management prepared and followed? What is the case-fatality ratio?
- Are all supplies for treatment readily available (oral rehydration salts (ORS), antibiotics, intravenous (IV) fluids, soap, and chlorine)?
- What links have been established with key community leaders (e.g. to facilitate health education, improve case detection, and protect water sources)?
- Are health facilities accessible to the affected populations? Are temporary treatment centres needed?
- Are there sufficient trained health workers to treat cases properly?
- Are resources being diverted to ineffective control measures, such as trade or travel restrictions?

Local epidemiological surveillance

- Are there sufficient trained personnel, vehicles, laboratory and communications support to maintain surveillance? Is outside help needed?
- Are more extensive field investigations needed?
- Can surveillance of diarrhoea cases and environmental sources (particularly sewage, using Moore swabs) be maintained until *Vibrio cholerae* O1 or O139 is no longer isolated from people and the environment in non-endemic areas?

Presenting results

In presenting the results of the assessment, indicate the following information.

- Whether there is an outbreak of acute diarrhoeal disease.
- If the clinical diagnosis is confirmed by laboratory tests.
- The number of cases and deaths so far.
- The geographical distribution of the cases.

- The size of the population at risk.
- If the outbreak is spreading and where.
- Whether antimicrobial sensitivities have been assessed.
- Whether emergency plans for epidemic control have been implemented.
- Whether national and international reporting is occurring.
- How satisfactory the case management is.

Box 1. Treatment of cholera and dysentery

Cholera

The mainstay of treatment is ORS or — in severe cases — intravenous fluids until oral fluids can be taken. Antimicrobial treatment will shorten the duration of illness, decrease excretion of vibrios and reduce fluid loss — but is not essential for successful treatment and should be reserved for severe cases only.

Epidemic dysentery (Sd1)

Selection of appropriate antimicrobials should be based on laboratory results of resistance patterns.