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**Epidemic Diarrhoeal Disease Preparedness and Response.
Training and Practice.
Participant's Manual**

World Health Organization
Emerging and other Communicable Diseases,
Surveillance and Control

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TABLE OF CONTENTS

Acknowledgements

| | |
|---|-----------|
| INTRODUCTION | 1 |
| PURPOSE AND OBJECTIVES OF THIS TRAINING COURSE | 2 |
| TARGET GROUP AND TRAINING METHODS: | 3 |
| CHAPTER 1: PREPAREDNESS AND DETECTION | 5 |
| SURVEILLANCE | 6 |
| CASE DEFINITIONS | 7 |
| ROUTINE DATA COLLECTION AND REPORTING OF DIARRHOEA | 7 |
| Exercise A: Forms (group discussion) | 9 |
| TABLES AND GRAPHS | 10 |
| Exercise B: Tables (individual exercise) | 13 |
| Exercise C: Graphs (individual exercise) | 18 |
| DETECTION OF OUTBREAKS | 19 |
| Exercise D: Outbreaks (short answer exercise) | 19 |
| Exercise E: Notifications (group discussion) | 20 |
| LABORATORY | 21 |
| Exercise F: Handling stool specimens (group work) | 27 |
| Exercise G: Handling stool specimens (individual exercise) | 27 |
| SUPPLIES | 28 |
| Exercise H: Supplies (individual exercise) | 31 |
| Exercise I: Non-treatment supplies (individual exercise) | 34 |
| TRAINING HEALTH WORKERS | 35 |
| HEALTH EDUCATION | 35 |
| EPIDEMIC CONTROL COMMITTEE | 35 |
| EPIDEMIC PREPAREDNESS PLAN | 36 |
| Exercise J: Epidemic preparedness plan (individual exercise) | 36 |
| Exercise K: Members of the Epidemic Control Committee (individual exercise) | 38 |
| Chapter recapitulation/summary | 39 |
| CHAPTER 2: RESPONSE | 41 |
| REPORTING: HOW TO REPORT <i>DURING</i> AN EPIDEMIC | 43 |
| Exercise L: Case histories (individual exercise) | 44 |
| Exercise M: Outbreak (short answer exercise) | 45 |

| | |
|---|------------|
| PERSONS AND COMMUNITIES AT RISK | 47 |
| Exercise N: Maps (individual exercise) | 50 |
| Exercise O: Rumours (group discussion) | 51 |
| Exercise P: Risks (individual exercise) | 51 |
| MOBILE CONTROL TEAMS | 53 |
| TEMPORARY TREATMENT CENTRES | 55 |
| Exercise Q: Task list (individual exercise and group discussion) | 61 |
| Exercise R: Cholera outbreak (individual exercise) | 63 |
| IMPROVING CURRENT PRACTICE – HEALTH FACILITY STANDARDS ... | 65 |
| Exercise S: Improving health facility standards (individual exercise) | 66 |
| Chapter recapitulation/summary | 67 |
| | |
| CHAPTER 3: CONTROL MEASURES | 69 |
| HEALTH EDUCATION MESSAGES | 70 |
| Exercise T: Health education (group work) | 75 |
| ENSURING A SAFE SUPPLY OF WATER | 75 |
| Exercise U: Water storage (group work) | 78 |
| FOOD SAFETY | 79 |
| HAND-WASHING | 80 |
| Exercise V: Hand washing (group work – optional) | 80 |
| ENVIRONMENTAL SANITATION | 81 |
| INEFFECTIVE CONTROL MEASURES | 83 |
| Exercise W: Health education drills (group work) | 83 |
| Exercise X: Control measures (short answer exercise) | 84 |
| Chapter recapitulation/summary | 86 |
| EXERCISE Y: Case study (Rivas District outbreak) | 87 |
| ANNEXES | 93 |
| <i>Annex 1: Cholera treatment supplies per population</i> | <i>95</i> |
| <i>Annex 2: Dysentery treatment supplies per population</i> | <i>97</i> |
| <i>Annex 3: Health education messages</i> | <i>99</i> |
| <i>Annex 4: Cholera surveillance case definition</i> | <i>107</i> |
| <i>Annex 5: Chlorine levels in treated water</i> | <i>109</i> |
| <i>Annex 6: How to interpret and use the laboratory results</i> | <i>111</i> |
| <i>Annex 7: Mobile Control Teams</i> | <i>113</i> |
| <i>Annex 8: Food rules</i> | <i>115</i> |
| <i>Annex 9: Ventilated improved pit latrine</i> | <i>117</i> |

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INTRODUCTION

In the long term, the provision and use of safe water, improved sanitation and food safety, and health education towards better personal and environmental hygiene will make infectious diarrhoeal diseases rarer than now. Today, it is not possible to prevent cholera or dysentery from entering a country or a community altogether, but many cases can be prevented. Many lives can be saved through correct case management and through the institution of effective control measures. Being *prepared* is the key to an effective and prompt response to the threat of epidemic diarrhoeal disease.

The proportion of patients who die, or case fatality ratio (CFR), can be as high as 40% in cholera patients in an unprepared community. In a *prepared* community, where trained health workers have the supplies they need, the case fatality ratio can be less than 1%.

Epidemic dysentery has not inspired public fear in the same way that cholera has. Nevertheless, dysentery caused by *Shigella dysenteriae* type 1 is extremely dangerous because many people in a community may become ill, and the case fatality rate can be as high as 10% or more. In a prepared community, where trained health workers have the supplies they need, the case fatality rate from *Shigella dysenteriae* type 1 can be lowered significantly.

Many activities must be done in order for health workers to be prepared to respond effectively to outbreaks. You will learn about additional preparations that must be made. An Epidemic Control Committee is needed to bring about a coordinated response to all aspects of the outbreak. To guarantee correct treatment to all affected persons, you will need to arrange for setting up Temporary Treatment Centres, for mobilizing Mobile Control Teams, and you will need to devise a strategy for assigning staff during an epidemic. You will plan for the necessary supplies and logistics, and will analyse your own situation to reduce the possibility of disease spread in health facilities. You will consider in detail the effective control and prevention measures that will stop the spread of an outbreak. Deciding which populations are at high risk of becoming ill gives you a tool that will help you focus control measures and community health education. Finally, you will make an Epidemic Preparedness Plan for your district or health facility; you should put this plan into action as soon as you return.

PURPOSE AND OBJECTIVES OF THIS TRAINING COURSE

The goal of the training course is to improve the capacity of district level health workers for preparedness and response to epidemic diarrhoeal diseases. At the end of the course district health workers will have the necessary technical skills to:

- | | | | |
|-------------|---------------------------------|---|---------------------------|
| i) | prepare for |) | |
| ii) | detect |) | epidemics of |
| iii) | respond appropriately to |) | diarrhoeal disease |
| iv) | control |) | |

The course includes 2 modules:

- a) A module on case management of diarrhoeal diseases, including cholera and dysentery. Working through this module, you will learn correct case management for patients with these diseases.
- b) A module with three chapters covering preparedness and detection, appropriate response, and control. Within these chapters there is a continuum of activities from preparedness to control; wherever possible, these steps are separated into appropriate chapters, and they are cross-referenced for continuity.

Working through this module, you will learn the following:

- detecting outbreaks of epidemic diarrhoeal disease
- reporting and monitoring outbreaks of epidemic diarrhoeal disease
- taking specimens to send for laboratory confirmation of an outbreak
- planning for supplies needed to respond to an outbreak
- organizing an Epidemic Control Committee
- identifying persons and groups at higher risk
- making a district Epidemic Preparedness Plan
- planning to mobilize Mobile Control Teams
- establishing temporary Treatment Centres and assigning staff during an outbreak
- improving current health facility practice
- target control measures at populations at risk
- carrying out control measures.

Write here what YOU expect from this module

TARGET GROUP AND TRAINING METHODS:

All the participants will be selected according to their involvement or potential involvement in the preparedness and response to epidemics of diarrhoeal diseases. They will be staff working in health districts, both at health centre level and in the district health team. Some elements of training will address only or essentially the health centre level, others will address the district level.

There may be some discrepancies between the recommendations of this document and the realities of the national level (for instance in terms of resources). Please bear in mind that the recommendations in the text may be modified if necessary according to local circumstances.

The approach is similar to that used in the Diarrhoea Case Management Training Course. A facilitator will help you learn the information and skills presented in the course materials, usually through individual discussions. Feel free to ask questions during the course. Go through each module by reading it and working through the various kinds of exercises:

C Short-answer exercise

In a short-answer exercise, you will be asked to write answers to questions about the material you have just read. The correct answers will be given (usually on the following page) so you can check your own work.

C Individual work followed by discussion with a facilitator

In this type of exercise, you will first be asked to write an answer to the exercise. You will then talk to a facilitator, who will review your answers with you and help resolve any questions you may have. The facilitator will give you a copy of the answer sheet for the exercise.

C Individual work followed by group discussion

In this type of exercise, you will first be asked to write an answer to the exercise. When all participants are ready, the facilitator will lead a small group discussion to review the answers. The group discussion will allow you to discuss how the information in the module can be used in your health area.

C Drills

In this type of exercise, a facilitator will ask each of you in turn a short question. Give brief answers.

C Role play followed by group discussion

In this type of exercise, you will be asked to play the role of a person in a situation that might arise in your job. After the role play, the facilitator will lead a group discussion.

CHAPTER 1: PREPAREDNESS AND DETECTION

A strong diarrhoeal disease control program at all levels of the health service is the best preparation for rapid response to an epidemic of cholera or dysentery. If health workers and the community are prepared for an outbreak of diarrhoeal diseases, they can respond quickly when one occurs. With appropriate preparation, case fatality ratios in cholera and dysentery patients can be lowered. To be prepared for an epidemic of diarrhoeal diseases you must have in place the following:

- Surveillance: regular records and report on diarrhoeal diseases:
an outbreak can be recognized as soon as it begins
- Laboratory: ability for laboratory confirmation:
the organism responsible and the antibiotic to which it is sensitive can be identified
- Supplies: a reserve stock of essential supplies:
health workers will have the supplies they need at the beginning of an outbreak
- Training in case management of diarrhoeal diseases:
cases will be correctly treated
- Health Education: improve the awareness of the community towards prevention and early recognition of cholera and dysentery:
cases can be detected and brought for treatment early so that cases and deaths can be prevented, and so that other preventive measures can be carried out and reinforced
- Epidemic control committee and, if relevant, a local one:
this will help ensure a coordinated response to all aspects of the outbreak
- Epidemic Preparedness Plan:
all the above is organized and put into place.

SURVEILLANCE

Surveillance consists of collecting, analysing and interpreting information. An adequate surveillance system makes it possible to detect outbreaks of cholera and epidemic dysentery early, so outbreaks can be quickly controlled and lives saved. Surveillance allows health workers to:

- detect outbreaks early
- estimate how many people become sick and die
- know when and where the disease occurs
- see if the disease is spreading, and where
- estimate supplies and staff needed
- evaluate whether control measures are successful.

Maintain records daily and review records weekly

Health workers in health facilities and in the community should keep daily records of the number of cases of diarrhoea seen. Ideally, the records should be summarized and reviewed each week.

Use routine data to detect epidemics of diarrhoeal disease

Health workers can recognize epidemics using the routine data collected every day at health facilities. You will learn to recognize when there is an unusual increase in the number of cases of diarrhoea. Keeping daily records of cases of diarrhoea, reviewing the records every week, and making tables, graphs and maps to display the information will help you.

Report a suspected outbreak immediately

When health workers suspect an outbreak of cholera or epidemic dysentery, they must *immediately notify* the nearest referral facility or the designated health officer. Waiting for laboratory confirmation before reporting a suspected outbreak is not necessary.

Report regularly during an outbreak

During an outbreak of cholera or epidemic dysentery, health workers monitor the outbreak by counting the number of cases and deaths, and recording where and when cases occurred. A regular report (often weekly) should be sent to the next referral level during an epidemic (see chapter 2, pp 43-44).

| |
|--|
| REMEMBER: SURVEILLANCE MEANS COLLECTING AND ALSO USING THE DATA |
|--|

CASE DEFINITIONS

A case definition is a standard description of a disease. When *all* health workers use the *same* description of a disease, counting the number of cases of the disease that occur is easier, and detecting outbreaks is easier. The case-definitions used in this course are as follows:

Diarrhoea: 3 or more loose or watery stools in a day (24 hours).

Acute diarrhoea: an episode of diarrhoea that lasts less than 2 weeks

Persistent diarrhoea: an episode of diarrhoea that lasts 2 weeks or longer

Dysentery: diarrhoea with visible blood in the stool

The case definition used for reporting a cholera outbreak is as follows:

Suspect a cholera outbreak if:

C a patient older than 5 years develops severe dehydration or dies of acute watery diarrhoea; or

C there is a sudden increase in the daily number of patients with acute watery diarrhoea, especially the patients who pass the “rice water stools” typical of cholera

Suspect an outbreak of dysentery if:

C there is a sudden increase in the daily number of patients with diarrhoea and visible blood in the stools

ROUTINE DATA COLLECTION AND REPORTING OF DIARRHOEA

Description of diarrhoea reporting

When a person with diarrhoea is seen at the health centre, information about the person may be recorded in several places: 1) the patient register, 2) a tally form and 3) a weekly / monthly report form. It may also be put on a graph, a map or a Health Diary Chart. For certain diseases, including cholera, a special form (notifiable or epidemic diseases form) is filled out.

Patient register

The health worker records the following information in the patient register:

- date, name, age (or age group), sex
- residence – address or village
- diagnosis (assessment, complaint)
- treatment.

Other things (such as “repeat visit”) may also be recorded, but the above is essential.

Tally form

The health worker also records the visit on a “tally form”, and may sum the total of the tallies daily, weekly or monthly. The tally form has less information about any particular patient – it has only the condition and the patient's age-group.

Monthly summary form

Once a month, the health worker sends a summary form to the next highest level. This form records information about the preventive and curative activities in a clinic.

Immediate notification form / Epidemic diseases form

This form is used to notify when health workers **suspect** cases of certain diseases. The list of diseases varies, but in most countries health workers are to report cases of cholera, plague, acute flaccid paralysis (AFP), meningitis and yellow fever **immediately**, and to notify of dysentery, tetanus, measles, pertussis very rapidly. Health workers should use the fastest means of communication possible (phone, radio, telegram, envelope to bus driver, etc.); they should not wait for confirmation of these diseases, but report as soon as they suspect a case.

Flow of information

Data from the clinic are sent to the district. The district puts together the information from all the clinics in the district, and forwards it to the provincial level. The province then assembles the information from all the districts and forwards it to the central level. Some information may then be sent to the World Health Organization. District, province and central level must analyse the information and take action based on their analysis. They must also send “feedback” about the data and their analysis to the field. This is important but rarely done.

The role of clinic level health workers in surveillance is to:

- (a) collect information
- (b) fill out and send in forms promptly
- (c) for some diseases (including cholera and epidemic dysentery), interpret information and act on it.

Routine surveillance for diarrhoea provides a baseline for detecting epidemics:

- each health centre should record the numbers of patients with diarrhoea for each month on a Health Chart Diary and a graph
- each health centre should record the numbers of patients with diarrhoea *with blood* for each month on a separate Health Chart Diary and a graph
- even if the numbers are not exact, they will give an general idea of increases and decreases in the number of cases
- many health facilities do not know how many dysentery cases to expect throughout the year – this is because many health facilities did not record “diarrhoea with blood” separately from “diarrhoea” in the past. It is important to begin keeping track of the number of cases of “diarrhoea with blood”, as in the table below:

| Symptom | < 5 years Cases | <5 years Deaths | ≥ 5 years Cases | ≥ 5 years Deaths |
|----------------------------------|--------------------|--------------------|--------------------|---------------------|
| Dysentery (diarrhoea with blood) | | | | |
| Other diarrhoea | | | | |
| Total | | | | |

EXERCISE A: FORMS

Group discussion

What forms do you use in your health centre for routine data?

These will be reviewed and discussed.

TABLES AND GRAPHS

To detect and monitor an outbreak of cholera or of epidemic dysentery, health workers need to know (1) *how many* cases occurred, (2) *where* the cases occurred and (3) *when* the cases occurred. It is much easier to detect and follow epidemics when information about patients is displayed in tables, graphs or maps, rather than in a patient register or on a list. The information can be understood quickly, and it is easier to see patterns and trends.

How to make a table

A table is a set of data arranged in rows and columns. Simple tables are used to summarize information and are often the basis for making a graph or a map. For surveillance and monitoring, tables are often used to show the number of cases and deaths from a given disease that occurred in a given *time*.

You may also make tables to show other types of information such as the numbers and cadre of health workers assigned to certain posts, or the amounts of rehydration supplies that have been distributed to health facilities.

1. **Decide what information** you want to show in the table.
2. **Make an “empty table” (or “dummy table”)** – a table that is complete *except* for the data. This helps you be sure that you have organized your data in a useful way.
 - a) write a **title** that describes what the table will contain - the title should explain who or what is described, the time(s) and the place(s) involved (for example: Cases of Cholera treated at Tinu Clinic, 3-19 June, 1995);
 - b) **draw** the “empty table” with the number of rows and columns needed to show your data - add an extra row at the bottom and an extra column at the right to show totals, as appropriate;
 - c) **label** all the rows and columns, including units of measurement or time.
3. **Count the numbers** of cases (or the number of any other item you are showing).
4. **Fill in the table with the numbers.** Check your work. Are the totals correct, and did you put the correct numbers in the correct row or column?

EXAMPLE:

Empty table

Cases of cholera treated at Tinu Clinic, by day, 3-9 June, 1995

| Date | Number of Cases |
|--------------|------------------------|
| June 3rd | |
| June 4th | |
| June 5th | |
| June 6th | |
| June 7th | |
| June 8th | |
| June 9th | |
| Total | |

Table with the data filled in

Cases of cholera treated at Tinu Clinic, by day, 3-9 June, 1995

| Date | Number of Cases |
|--------------|------------------------|
| June 3rd | 14 |
| June 4th | 18 |
| June 5th | 39 |
| June 6th | 45 |
| June 7th | 50 |
| June 8th | 43 |
| June 9th | 35 |
| Total | 244 |

EXAMPLE:

There is an outbreak of cholera in Dwamish District. The district supervisor receives a weekly report on the number of cases of cholera from every health facility. After getting the reports, he or she puts the information in a table.

The first week in July, Ochoco Health Centre reported 30 cases (3 deaths), Camas Health Post reported 12 cases (2 deaths), and Marsh Temporary Treatment Centre (TTC) reported 49 cases (5 deaths). The second week of July, Ochoco reported 26 cases (3 deaths), Camas reported 12 cases (1 death) and Marsh reported 34 cases (3 deaths).

To prepare the table, the supervisor wrote a title, and then labelled five rows (one for each health facility, one at the top for the column headings, plus one at the bottom for the totals) and four columns (one for each week, one at the left side for the row labels and one at the right side for totals). Next the supervisor wrote in the numbers from the reports. Here is what the table looks like.

Number of cases of cholera (and deaths) in Dwamish District,
by week (3-16 July 1995), by health facility

| Health facility | Cases of cholera (& deaths) 3-9 July | Cases of cholera (& deaths) 10-16 July | Total 3-16 July |
|-------------------------------|---|---|----------------------------|
| Ochoco Health Centre | 30 (3) | 26 (1) | 56 (4) |
| Camas Post | 12 (2) | 12 (1) | 24 (3) |
| Marsh TTC | 49 (5) | 34 (3) | 83 (8) |
| Total Dwamish District | 91 (10) | 72 (5) | 163 (15) |

N.B. Figures between brackets are the number of deaths and are included in the total number of cases (Ochoco 3-9 July: 30 cases, of whom 3 died).

EXERCISE B: TABLES

Individual exercise

The Dwamish District supervisor has just received reports from each health facility giving the number of cases of cholera seen during the 1st, 2nd and 3rd weeks of July.

- Ochoco Health Centre reported 30 cases (3 deaths) for 3-9 July; 26 cases (1 death) for 10-16 July, and 14 cases (0 deaths) for 17-23 July.
- Camas Health Post reported 12, 12 and 20 cases for the same periods (2, 1, 1 deaths).
- Marsh Temporary Treatment Centre reported 49, 34, 28 cases (5, 3, 2 deaths) respectively. Now the district supervisor wants to make a table.

1) Make a table using the above data.

2) Write a title for the table.

3) How many cases are reported in Dwamish District for the third full week of July?

Tell the facilitator when you have finished

How to make graphs

Another way of showing how many cases have occurred in a given time and place is with graphs. When you make a table, you can use it as the basis for making a graph. Graphs are often clearer than a table, because it is easier to “see” changes in the number of cases, especially if you are displaying large numbers or showing a long period of time.

Diarrhoea cases by month

Many clinics make graphs of diarrhoea cases (and cases of other diseases) by month. This is useful because it can show the “expected number” of cases over a period of time. It will also show seasonal variation.

Dysentery cases by week or by day

Making this graph weekly will alert health workers to a sudden increase in the number of cases of bloody diarrhoea. Graphing the dysentery cases by month is not often enough to detect an epidemic – an epidemic might be nearly a month old by the time it was recognized. In an area where there is a high risk of dysentery (because of local conditions, or because of outbreak in a neighbouring district), points can be added to the graph every day.

Nearly all the graphs used for surveillance and monitoring indicate units of time (days, weeks, months or years) along the horizontal axis (the bottom line, also called the X axis) and the number of cases indicated on the vertical axis (the line at the side, also called the Y axis). The point where the two lines meet is called the origin of the graph. The origin represents zero cases, and usually means the beginning of the time period. Examples of a bar graph and a line graph are shown on page 16.

How to make a bar-graph

1. **Decide what information** you want to show in the graph. You can make the graph directly from the patient register if it covers a short period of time and there are not too many cases. If there are many cases, make a summary list or a table to organize your data.
2. **Write a title** that explains what the graph will contain.
3. **Decide on the range of numbers** to show on the vertical axis
 - a) always start with 0 as the lowest number.
 - b) write numbers, going up until you reach a number higher than the number of cases (remember the number may increase in the coming weeks)
 - c) if the highest number of cases for any time period is small, write each number going up the vertical line, starting with 0 at the origin (0, 1, 2, 3, 4, etc); if the total number is large (above 25-50), do not write each number, but choose an interval. For example, for an interval of 5, you would write 0, 5, 10, 15, 20 and so on). For larger numbers choose intervals of 50 (0, 50, 100, 150, 200...) or 100 (0, 100, 200, 300...) or more.
4. **Label the vertical axis**, explaining what the numbers represent.

5. **Label the horizontal axis** and mark the time units on it. The horizontal axis is divided into equal units of time. Usually you will begin with the beginning of an outbreak, or the beginning of a calendar period, such as a month or year.
6. **Make each bar the same width** and covering the same period of time.
7. **Indicate the number of cases.** Above each of the units of time on the horizontal axis (each day or week), indicate the number of cases by finding the number of cases on the vertical axis, and filling in one square for each case, or for every so-many cases, in the column for the day on which the patient was seen. Show deaths by using a different pattern of lines, or a different colour.

How to make a line graph

To draw a line graph, follow the above instructions, but instead of making a bar, draw a cross or make a point where the horizontal and vertical lines cross. The points can be joined to show the trend over time, up or down.

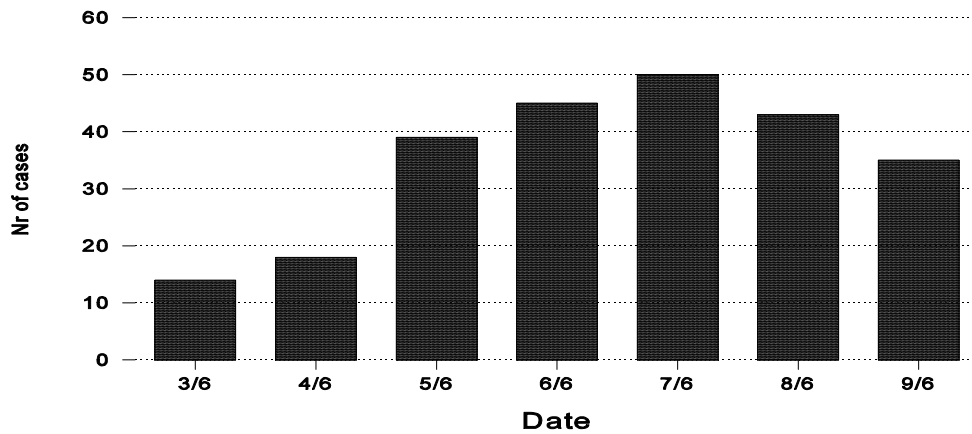
EXAMPLE:

The following table shows the number of cases of cholera seen at Tinu Clinic, 3-9 June, 1995.

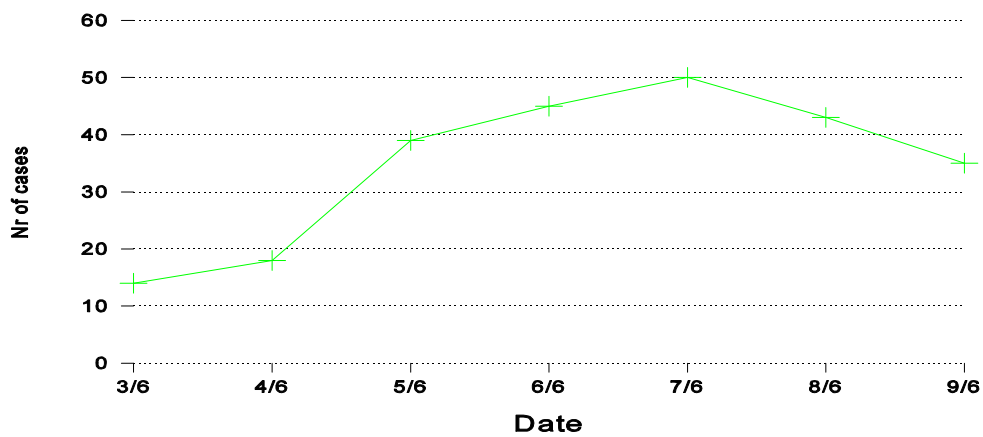
| Date | Number of Cases |
|--------------|------------------------|
| June 3rd | 14 |
| June 4th | 18 |
| June 5th | 39 |
| June 6th | 45 |
| June 7th | 50 |
| June 8th | 43 |
| June 9th | 35 |
| Total | 244 |

Examples of a bar graph and of line graph follow:

**Fig 1. Cases of cholera - Tinu clinic
3-9 June 1995 (bar chart)**



**Fig 2. Cases of cholera - Tinu clinic
3-9 June 1995 (line graph)**

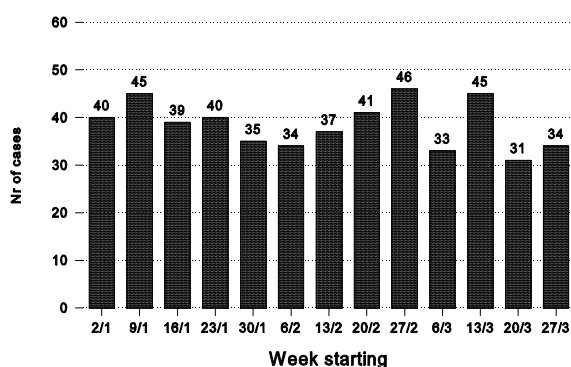


Compare bar graph and line graph.

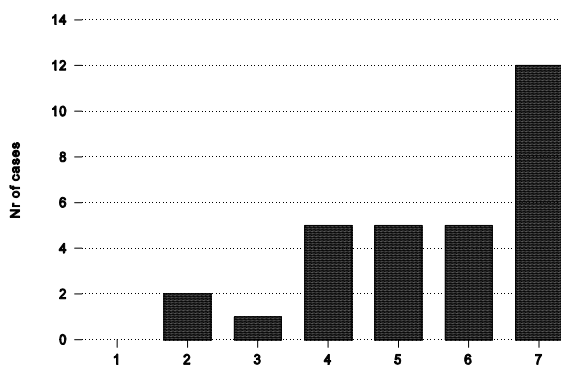
EXAMPLES:

The following graphs show common patterns of disease. Look at them briefly. What can you say about them?

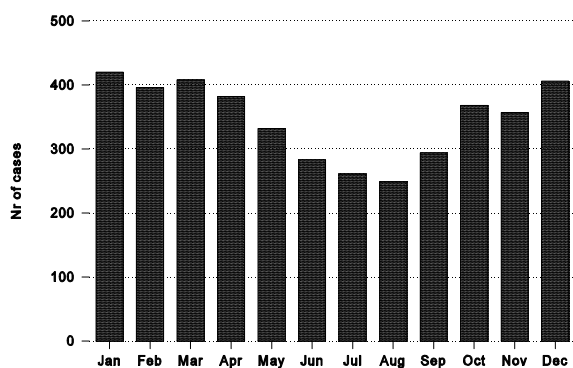
**Fig 3. Cases of dysentery - HC A
January-March 1994, by week**



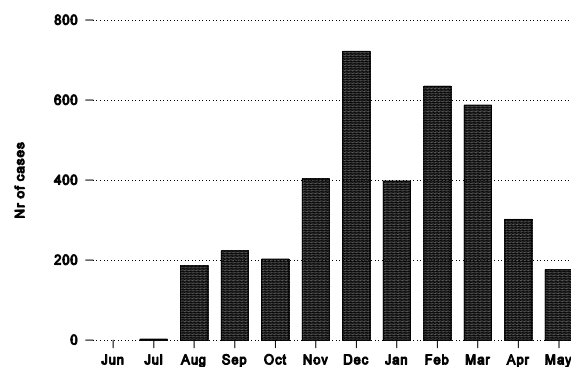
**Fig 4. Cases of dysentery Hills H. Post
1-7 February, by day**



**Fig 5. Cases of diarrhoea - clinic C
1993, by month**



**Fig 6. Cases of cholera - country A
June 1992- May 1993, by month**



Health centre A: very little variation in the weekly number of cases – you would not suspect an outbreak of dysentery.

Hill health post: unusual increase in the number of cases for bloody diarrhoea – you would suspect an outbreak of dysentery.

Clinic C: some seasonal variation, but no unusual increases.

Country A: outbreak of cholera.

EXERCISE C: GRAPHS

Individual exercise

In this exercise, you will make a bar-graph, using the data in the table below.

| Bloody Diarrhoea – Cases and Deaths Hillside Health Post, by day | | |
|---|------------------------|-------------------------|
| Date | Number of cases | Number of deaths |
| May 1st | 0 | 0 |
| May 2nd | 2 | 0 |
| May 3rd | 1 | 0 |
| May 4th | 4 | 1 |
| May 5th | 5 | 0 |
| May 6th | 4 | 1 |
| May 7th | 9 | 2 |

Draw your graph in the space below (graph paper at the end of the module).

Tell the facilitator when you have finished

DETECTION OF OUTBREAKS

An outbreak is an unusual increase in the number of cases of a disease in a given time period

(a large outbreak might be called an epidemic). In order to know if there is an *increase* in the number of cases, you must have an idea of how many cases usually occur.

Cholera

In many parts of the world, cholera occurs rarely or not at all. In an area where the expected number of cholera cases is “zero”, even 1 case of cholera constitutes an outbreak, since it is an unusual increase. In parts of the world where occasional cases of cholera occur from time to time, we talk about an outbreak when there is a sudden increase in the number of cases.

Dysentery

A community usually has some cases of bloody diarrhoea at any time. This usual, or endemic, dysentery has many causes, including the *Shigella* organisms (*S. dysenteriae*, *S. boydii*, *S. flexneri*, *S. sonnei*), *Campylobacter*, *Entamoeba histolytica* and *E. coli*. However, the *only* cause of large-scale outbreaks of dysentery is infection with *Shigella dysenteriae* type 1. A *dysentery outbreak should be suspected when there is an unusual increase* in the weekly number of patients with bloody diarrhoea *or any deaths* from bloody diarrhoea.

EXERCISE D: OUTBREAKS

Short answer exercise

1. At Freetown Health Centre there are usually 1-2 cases of bloody diarrhoea each day, but deaths from dysentery are rare. Last week saw 12 patients with bloody diarrhoea; 3 of them died. Do you suspect an epidemic? Explain your answer.
2. In an area where cholera is not known to occur, 2 adults present with acute watery diarrhoea and severe dehydration. Do you suspect a cholera outbreak?
3. Would you suspect an outbreak if only 1 adult had presented with the above symptoms?
4. In the midst of a cholera epidemic the number of patients with bloody diarrhoea has risen by 50% from 10 to 15 over the last week. What do you suspect?
5. In a local newspaper interview a trader said he was afraid of cholera. In his family two children had died last week of diarrhoea. No one else appears to have died of diarrhoea in his village recently. Suppose the facts were accurate, would this information be sufficient for you to suspect an outbreak of cholera?

How to report a suspected epidemic

Report a suspected outbreak of cholera or of dysentery immediately. Do not wait for laboratory confirmation. Report the cases to the nearest referral facility or to the designated health officer by the most rapid and reliable means available (courier, fax, telegram, etc.).

EXERCISE E: NOTIFICATIONS Group discussion

Write the title (and name if known) and address of the person(s) you should notify of a possible outbreak. Write how you will notify (phone, courier, telegram, fax, etc). List an alternate person to notify if you cannot reach the first one.

Person to notify:

Title (name)

Address and phone number

Alternate person to notify:

Title (name)

Address and phone number

Discuss how you should report suspected outbreaks. Issues you should be prepared to discuss include:

1. What are the local methods of communication? What are the advantages and disadvantages of each one? How quickly will the report be received? How reliable are the different local means of communication?
2. How can the means of communication be improved?
3. What is the best method for *your* health centre? Try to think of one or more alternative methods in case your "best" method is not available.

Method(s) of notification

| Method of Notification | Time needed | Advantages | Availability | Reliability |
|------------------------|-------------|------------|--------------|-------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

LABORATORY

For cholera and dysentery, the role of the laboratory is to:

- C isolate the organism when an epidemic is first reported (to confirm that a suspected epidemic of cholera is really caused by *Vibrio cholerae* O1 or O139, or to confirm that a suspected epidemic of dysentery is really caused by *Shigella dysenteriae* type 1)
- C determine the antibiotic sensitivity of the organism (so that an effective antibiotic can be recommended for use)
- C monitor the antibiotic sensitivity regularly during the epidemic (to be sure the organism has not become resistant).

Once the presence of cholera or epidemic dysentery has been confirmed, it is *not* necessary to examine specimens from all cases or contacts. In fact, this should *not* be done, since it is not needed for treatment or control and it may overwork the laboratory and deplete scarce laboratory supplies.

When you suspect an outbreak of cholera or epidemic dysentery, send in 10-20 specimens to your local or referral laboratory to confirm the organism and test its antibiotic sensitivity.

In order to collect and transport stool specimens to the laboratory you will need to:

- to have transport medium (make sure your centre has some, or order if needed)
- to know the location of your local or referral laboratory
- to know how to collect, pack and send the specimens.

Identifying the local or referral laboratory

What laboratory facilities are available at District or Regional level? The Health Centre should have this information and, ideally, each health centre should know the title and name of the laboratory staff who handle suspected cases of cholera/dysentery.

The district authorities must:

- C regularly check (at least every 3 months) which are the laboratories who have the staff and resources for culture and sensitivity tests (Cholera/*Shigella dysenteriae* type 1)
- C inform health centres accordingly
- C review arrangements for sending of specimens at least once a year with the health centre (What are the methods of transport? How is transport arranged? How is the laboratory informed that specimens are on their way? What provisions are made for safe reception

and conservation of specimens by the laboratory, especially at weekends and outside standard working hours?)

How to collect, pack, and transport a stool specimen

In this section you will learn how to collect, pack, and transport specimens for cholera and dysentery. There are some minor differences as regards transporting specimens between the two diseases, but most of the techniques are the same.

1. *Collect the specimen and place it in Cary-Blair transport medium.*

- a) Collect specimens from up to 10-20 persons who meet the following criteria:
 - C agree to the procedure
 - C onset of illness less than 4 days before sampling
 - C have not received antibiotic treatment for this illness
 - C currently have watery diarrhoea (cholera), or bloody diarrhoea (dysentery).
- b) If possible, refrigerate the Cary-Blair transport medium for one hour before collecting the specimens, so that the stool will be put into a cool medium.
- c) Collect a swab from a freshly passed stool specimen or from a swab of the rectal contents (rectal swab) for each patient (fresh stool is less than 1 hour old):
 - C if collecting from a stool specimen, insert the tip of the swab into the stool and remove; examine the swab to ensure that it has become stained with stool
 - C if collecting directly from the rectal contents (rectal swab), dip a swab into the Cary-Blair medium first, in order to moisten it, then insert the swab 2½ to 3½ centimetres (1-1½ inches) into the rectum and rotate it gently, then remove the swab and examine it to be sure the cotton tip is stained with stool.
- d) Insert the swab immediately into the tube of transport medium, pushing the swab to the bottom of the tube of medium.

(For dysentery patients, repeat steps c) and d) with a second swab, placing this in the same tube as the first swab. Two swabs will increase the likelihood that the laboratory will isolate an organism.)
- e) Break off and discard the top part of the sticks, tightening the screw top firmly.

Additional options for specimens from patients with possible cholera:

The organisms that cause cholera are more hardy than those causing dysentery, and additional options exist for collecting and transporting cholera specimens, even though the recommended transport medium is Cary-Blair. The following instructions **do not apply to dysentery**:

- C if Cary-Blair transport medium is not available, alkaline peptone water can be used to transport the specimen, as long as the specimen is likely to reach the laboratory and be processed within 24 hours
- C if you are certain that the specimen will reach a laboratory and be processed within 2 hours, the rectal swab or liquid stool can be placed in a sterile screw top bottle and taken directly to the laboratory
- C if no transport medium is available, soak strips of blotting paper with liquid stool and send them to the laboratory in carefully sealed plastic bags to prevent drying; this type of specimen is viable for several days, especially if refrigerated.

2. Pack and label the specimen for transport

- a) Label the specimen with the specimen number on the Stool Specimen Data Sheet, the patient's name, and the date of collection. Assign numbers to the specimens in consecutive order. Always write the numbers on the frosted portion of the specimen tube, using an indelible marker pen. If there is no frosted area, write the information on a piece of first-aid tape and fix this firmly on the specimen container.
- b) Use the Stool Specimen Data Sheet to record information on each case.
- c) Pack the specimens in a cold box in such a way that they will not leak or break, and send them as soon as possible.
- d) Dysentery specimens **must be refrigerated** after they are collected. Ship them in a well insulated box with frozen refrigerant packs or wet ice. This will keep specimens refrigerated for up to 36 hours. Pathogens can be recovered from samples in refrigerated transport medium up to 7 days after collection; yield decreases after the first 2 days. If the specimens will arrive at the laboratory within two days, it is enough to keep them at +4°C.
- e) It is best to send cholera specimens refrigerated. However, cholera specimens are less sensitive to temperature than dysentery specimens. If a cool box and ice are not available, cholera specimens can be sent at ambient temperature. Cholera specimens in transport medium sent unrefrigerated will be useable in the laboratory for 7-14 days, depending on ambient conditions. Be sure to check on this duration. Specimens not placed in transport medium will last a shorter time.

3. *Send the specimen*

The laboratory to which specimens are sent to must be informed when specimens are on the way. It is necessary to know the title and the names of the laboratory staff responsible, and also of any deputies. They must be alerted immediately when suspected cases are reported. If transport media are not available, ask for some transport media to be sent urgently.

When specimens are sent it is important to make sure that they arrive during working hours. If specimens are sent by a messenger, the messenger must know the location of the laboratory and the relevant person and the laboratory needs to be informed. Transport can be by bicycle, motorcycle, car, ambulance or public transport. It is necessary to identify the fastest and most reliable way of transport in advance and to make sure that adequate funds are available to reimburse costs for fuel or public transport. It is preferable to send specimens early during the working week, since culturing and antibiotic sensitivity testing will require at least 3-6 working days.

Laboratory results

The results from the specimens will be sent to the District Team. Laboratory results take a minimum of 3 to 6 days, and may take longer getting back to you if you receive a copy. The results will indicate what organisms were identified from the specimens, and what antibiotics the organisms are sensitive to. The district team or another public health authority will interpret the results and make recommendations about antibiotic treatment policy. Once the outbreak has been recognized, it is **not** necessary to obtain laboratory confirmation for every patient.

| |
|--|
| <p style="text-align: center;">REMEMBER</p> |
|--|

| |
|---|
| <p style="text-align: center;">Do not wait for laboratory results before starting treatment/control activities</p> |
|---|

SUMMARY OF STOOL SAMPLING PROCEDURES

| CHOLERA | DYSENTERY |
|--|--|
| <p style="text-align: center;">collect specimens from up to 10-20 patients with the following characteristics</p> <p style="margin-left: 40px;">C agree to the procedure C onset of illness less than 4 days C have not received antibiotics</p> <p style="text-align: center;">and</p> <p style="display: flex; justify-content: space-between;"> Current acute watery diarrhoea Current bloody diarrhoea </p> <p style="text-align: center;">fresh stools or rectal swabs</p> <p style="display: flex; justify-content: space-between;"> ONE in media bottle TWO in media bottle </p> | |
| <p>C Cary-Blair transport media media previously cooled for 1 hour transport container well insulated transport possible for 7-14 days</p> <p>C In alkaline peptone water, if transport time < 24 hours</p> <p>C Blotting paper soaked with liquid stool</p> <p>C Specimen in sterile screw cap bottle, if transport time < two hours</p> | <p>C Cary-Blair transport media only; media previously cooled for 1 hour transport container well insulated; frozen refrigerant packs or wet ice; transport must not last > 2 days.</p> <p>not possible</p> <p>not possible</p> <p>not possible</p> |

STOOL SPECIMEN DATA SHEET
BACTERIOLOGICAL SURVEILLANCE – EPIDEMIC DIARRHOEA

Country _____ Province _____
 Area/Zone _____ Village/Town _____

| No. | Date collected | Date of onset | Name | Age | Sex M/F | Blood in stool? Yes / No | Type of stool* | Antibiotics Yes / No** |
|-----|----------------|---------------|------|-----|------------|-----------------------------|----------------|---------------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| ... | | | | | | | | |
| 20 | | | | | | | | |

* Semi-liquid (SL), watery (W), rice-stool (R), solid (S)

** type of antibiotic, dose and number of days taken.

Collected by: Name & Title _____

Transmit results to: Name & Title _____

Address _____

Phone/Fax/ Telex _____

EXERCISE F: HANDLING STOOL SPECIMENS

Group work

Demonstration: collecting, packing and labelling specimens.

In this exercise, you will watch a facilitator demonstrate how to put a stool specimen in Cary-Blair transport medium, and how to pack the specimen.

1. You will observe the facilitator doing the demonstration.
2. In front of the group, one participant will take a specimen of "fresh stool" and place it in Cary-Blair transport medium, explaining each step.
3. In front of the group, another participant will show how to pack a stool specimen for suspected epidemic dysentery for transport, while explaining each step.

EXERCISE G: HANDLING STOOL SPECIMENS

Individual exercise

Part 1

Send specimens to this laboratory :

Name:

Address:

Phone number:

Part 2

The person responsible for collection and transportation of specimens to the laboratory is (title/name):

Part 3

Method used to transport specimens to the laboratory:

SUPPLIES

Plan for supplies needed during an outbreak

To respond to outbreaks of cholera and *Shigella dysenteriae* type-1 dysentery, health staff need more supplies than usual, particularly oral rehydration salts, IV fluids and appropriate antibiotics. Other non-treatment supplies and logistics material will also be needed. Because one key to saving lives is a *rapid* response, a *reserve stock* of supplies needed for outbreaks must be “pre-positioned” at the health centre and district levels. In this way, essential supplies will be available at the beginning of an outbreak.

- 1) The amount you will need can be calculated and applied to the population of your health facility catchment area.
- 2) Many supplies needed (especially rehydration supplies) are the same for cholera and epidemic dysentery. You can combine your orders so as to avoid duplication. First, calculate the amounts needed for an outbreak of each disease. Then, for each item, look at the amounts needed for cholera and for *Shigella dysenteriae* type-1 dysentery. Order the *larger* amount.
- 3) Keep a small amount of stock in reserve at your health centre – a larger amount can be kept at the district level. During an outbreak, the supplies at the district level can be quickly moved to where they are most needed.
- 4) As soon as you suspect an outbreak, do an inventory of the supplies on hand against the amount needed (see following pages). If you have less than the amount needed, urgently order enough to make up the difference. During an outbreak, regularly check the supplies to make sure you will not run out and order as needed.
- 5) Reorder the reserve stock of pre-positioned supplies every 6 months and put the old stock into the normal delivery system so that none of the supplies becomes outdated.

**Estimated minimum supplies needed to treat
100 persons during a cholera outbreak**

Rehydration supplies

| | | |
|---|-----|--|
| C | 650 | packets oral rehydration salts (ORS), for 1 litre each |
| C | 3 | nasogastric tubes, 5.3 mm OD, 3.5 ID (16 French), 50 cm long for adults |
| C | 3 | nasogastric tubes, 2.7 mm OD, 1.5 ID (8 French), 38 cm long for children |
| C | 120 | bags Ringer's lactate solution, 1 litre, with giving sets |
| C | 10 | scalp-vein sets |

Antibiotics

For adults:

| | | |
|---|-----|-----------------------------------|
| C | 480 | capsules tetracycline, 250 mg, or |
| C | 60 | capsules doxycycline, 100 mg |

For children:

| | | |
|---|-----|---|
| C | 300 | tablets trimethoprim-sulfamethoxazole TMP 20 + SMX 100 mg |
|---|-----|---|

Other supplies

| | | |
|---|----|---|
| C | 2 | large water dispensers with a tap (marked at 5- and 10- litre levels) for making ORS solution in bulk during the outbreak |
| C | 20 | bottles (1 litre) for oral rehydration solution (e.g. empty IV bottles) |
| C | 20 | bottles (0.5 litre) for oral rehydration solution |
| C | 40 | tumblers, 200 ml |
| C | 20 | teaspoons |
| C | 5 | kg cottonwool |
| C | 3 | reels adhesive tape |

These requirements may change according to local policies. The selection of recommended antimicrobials should be based on recent susceptibility testing. Estimates are based on the following assumptions:

- C 20% of cases will have dehydration requiring IV fluids initially, followed by ORS
- C 80% of cases will require ORS only
- C Each severely dehydrated adult requires 3 capsules of 100 mg doxycycline or 24 capsules of 250 mg tetracycline
- C Each severely dehydrated child requires 15 tablets of TMP 20-SMX 100.

If Ringer's lactate solution is unavailable, normal saline may be substituted.

Bulk preparation is not recommended outside outbreak situations.

For an outbreak of **cholera**, plan to treat initially:

| | | |
|-----|---------------------------|---------|
| 20 | cases for a population of | 10 000 |
| 100 | cases for a population of | 50 000 |
| 200 | cases for a population of | 100 000 |

To estimate the amount of supplies needed for initial treatment in your area, multiply the catchment population by 0.2% (experience has shown that this is a useful figure) - this is the estimated number of persons who might become ill initially. To multiply your catchment population by 0.2%, multiply it by 0.002 (not 0.02), or divide it by 500, or divide it by 1000 and multiply the result by 2.

**Estimated minimum supplies needed to treat
100 persons during a *Shigella dysenteriae* type 1 outbreak**

Rehydration supplies

- C 100 packets oral rehydration salts (ORS), for 1 litre each
- C 20 bags Ringer's lactate solution, 1 litre, with giving sets
- C 5 scalp vein sets

Antimicrobials

For adults

- C 1 600 one-gram tablets of nalidixic acid (adults)

For children

- C 400 one-gram tablets of nalidixic acid (children)

Other supplies

- C 1 large water dispenser with a tap (marked at 5- and 10- litre levels) for making oral rehydration solution in bulk during the outbreak
- C 5 bottles (1 litre) for oral rehydration solution (e.g. empty IV bottles)
- C 5 bottles (0.5 litre) for oral rehydration solution
- C 10 tumblers, 200 ml
- C 5 teaspoons
- C 5 kg cotton wool
- C 3 reels adhesive tape

Sanitary/hygienic supplies

- C 20 kg hand soap (200 grams of hand soap per person per month)
- 30 boxes of soap for washing clothes
- 2 one-litre bottles of cleaning solution (2% chlorine or 1-2% phenol)

Antimicrobial susceptibility **must** be checked at the beginning of the outbreak. These requirements may change according to local policies. Estimates are based on the following assumptions:

- C 20% of cases are children ~ 5 years, all treated with antimicrobials
- C 80% of cases are > 5 years old, all treated with antimicrobials
- C 20% of cases will have dehydration requiring ORS
- C 10% of cases will have dehydration initially, followed by ORS requiring IV fluids
- C Each family will be given soap for washing the clothes and bed linen of the ill person.

These reserve supplies are usually kept at district level as the slower onset of dysentery outbreaks allows time for stocks to be moved to the health centre. Other antimicrobials may need to be substituted for nalidixic acid, depending on local antimicrobial susceptibility patterns.

For an outbreak of **dysentery**, plan to treat initially:

| | | |
|-----|---------------------------|---------|
| 20 | cases for a population of | 10 000 |
| 100 | cases for a population of | 50 000 |
| 200 | cases for a population of | 100 000 |

To estimate the amount of supplies needed for initial treatment in your area, multiply the catchment population by 0.2% (experience has shown that this is a useful figure) to find the estimated number of persons who might become ill initially. To multiply your catchment population by 0.2%, divide it by 500, or multiply it by 0.002 (not 0.02), or divide it by 1000 and multiply the result by 2.

EXERCISE H: SUPPLIES

Individual exercise

How to estimate the initial amount of supplies needed for a cholera outbreak (0.2% ill initially). The table below gives you an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area to the nearest 5000. You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the "10 000" and "5000" columns to those in the "20 000" column). Write the amount needed at your health facility in the empty column on the right.

| ITEM | Population (+ numbers expected to fall ill) | | | | | | Your area |
|---|---|--------|--------|--------|--------|---------|-----------|
| | 5 000 | 10 000 | 15 000 | 20 000 | 50 000 | 100 000 | |
| | (10) | (20) | (30) | (40) | (100) | (200) | |
| Rehydration supplies | | | | | | | |
| ORS packets (for 1 litre each) | 65 | 130 | 195 | 260 | 650 | 1 300 | |
| Nasogastric tubes (adults) 5.3/3.5 mm (16 Flack) 50 cm | 1 | 1 | 1 | 2 | 3 | 6 | |
| Nasogastric tubes (children) | 1 | 1 | 1 | 2 | 3 | 6 | |
| Ringer's lactate bags, 1 litre, with giving sets | 12 | 24 | 36 | 48 | 120 | 240 | |
| Scalp vein sets | 2 | 3 | 4 | 5 | 10 | 20 | |
| Antibiotics | | | | | | | |
| Tetracycline caps., 250 mg (adults) | 48 | 96 | 144 | 192 | 480 | 960 | |
| Doxycycline, 100 mg (adults) | 6 | 12 | 18 | 24 | 60 | 120 | |
| TMP 20 mg + SMX 100 mg tablets (children) | 30 | 60 | 90 | 120 | 300 | 600 | |
| Other treatment supplies | | | | | | | |
| Large water dispensers with tap (marked at 5-10 litres) | 1 | 1 | 1 | 2 | 2 | 4 | |
| 1 litre bottles for ORS solution | 2 | 4 | 6 | 12 | 20 | 40 | |
| 0.5 litre bottles for ORS solution | 2 | 4 | 6 | 12 | 20 | 20 | |
| Tumblers, 200 ml | 4 | 8 | 12 | 16 | 40 | 80 | |
| Teaspoons | 2 | 4 | 6 | 8 | 20 | 40 | |
| Cotton wool, kg | ½ | 1 | 1½ | 2 | 5 | 10 | |
| Adhesive tape, reels | 1 | 1 | 1 | 2 | 3 | 6 | |

How to estimate the initial amount of supplies needed for a dysentery outbreak (0.2% ill initially). The table below gives you an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area to the nearest 5000. You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the "10 000" and "5000" columns to those in the "20 000" column). Write the amount needed at your health facility in the empty column on the right.

| ITEM | Population (+ numbers expected to fall ill) | | | | | | Your area |
|--|---|--------|--------|--------|--------|---------|-----------|
| | 5 000 | 10 000 | 15 000 | 20 000 | 50 000 | 100 000 | |
| | (10) | (20) | (30) | (40) | (100) | (200) | |
| Rehydration supplies | | | | | | | |
| ORS packets (for 1 litre each) | 10 | 20 | 30 | 40 | 100 | 200 | |
| Ringer's lactate bags, 1 litre, with giving sets | 2 | 4 | 6 | 8 | 20 | 40 | |
| Scalp vein sets | 1 | 1 | 2 | 2 | 5 | 10 | |
| Antibiotics | | | | | | | |
| Nalixidic acid, 1 g (adults) | 160 | 320 | 480 | 640 | 1600 | 3200 | |
| Nalixidic acid, 1 g (children) | 40 | 80 | 120 | 160 | 400 | 120 | |
| TMP 20 mg + SMX 100 mg tablets (children) | 30 | 60 | 90 | 120 | 300 | 600 | |
| Other treatment supplies | | | | | | | |
| Large water dispensers with tap (marked at 5-10 litres) | 1 | 1 | 1 | 1 | 1 | 2 | |
| 1 litre bottles for ORS solution | 1 | 1 | 2 | 2 | 5 | 10 | |
| 0.5 litre bottles for ORS solution | 1 | 1 | 2 | 2 | 5 | 10 | |
| Tumblers, 200 ml | 1 | 2 | 3 | 4 | 10 | 20 | |
| Teaspoons | 1 | 1 | 2 | 2 | 5 | 10 | |
| Cotton wool, kg | ½ | 1 | 1½ | 2 | 5 | 10 | |
| Adhesive tape, reels | 1 | 1 | 1 | 2 | 3 | 6 | |
| Hand soap, kg | 2 | 4 | 6 | 8 | 20 | 40 | |
| Boxes of soap for washing clothes | 3 | 6 | 9 | 12 | 30 | 60 | |
| 1-litre bottle of cleaning solution (2% chlorine or 1-2% phenol) | 1 | 1 | 1 | 1 | 2 | 4 | |

Tell the facilitator when you have finished

Non-treatment supplies and logistics

You have calculated the amount of *treatment supplies* that should be available at the outset of an outbreak of cholera or *Shigella dysenteriae* type 1 dysentery. Now consider what other supplies (*non-treatment supplies*) will be needed, and what kinds of logistical arrangements should be made to be prepared for an outbreak.

The arrangements and equipment will vary according to the size, location and resources of the health facility. For example, “communicating with other levels” could be done by telephone, by radio, by fax, by telex, by courier or in person, depending on the circumstances of the health facility. As you read the list below, consider what is appropriate for your health facility. You will also consider some of these issues as you discuss how to mobilize supplies when an outbreak occurs.

Transport and communications

Supplies and/or arrangements are needed for:

- C prompt and reliable delivery of supplies and equipment
- C rapid transport of laboratory specimens
- C moving staff
- C reliable communication for reporting and for communicating with other levels
- C maintaining contact with the community.

Water

Supplies are needed for:

- C treating water
- C testing the amount of residual chlorine in treated water (if this is done)
- C storing water safely.

Disposal of excreta and semi-solid waste

Supplies may be needed for:

- C providing or supervising arrangements for excreta disposal in health facilities, and at large gatherings
- C incineration of semi-solid waste
- C transport of semi-solid waste.

EXERCISE I: NON-TREATMENT SUPPLIES

Individual exercise

If you have experienced an epidemic, make a list of the “other supplies” you have found useful. If you have not experienced an epidemic, think of supplies you may need. Are the supplies available or do they have to be mobilized? Who would mobilize them? Use the table below for your answers. Keep this list practical, using 2-3 examples per category.

| Type | Availability | Who can mobilize? | Comments |
|--|--------------|-------------------|----------|
| Transport and Communications | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Water | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Disposal of excreta & semi-solid waste | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Other | | | |
| | | | |
| | | | |
| | | | |

NB: Show this completed list to your local Epidemic Preparedness Committee on return, asking them for advice on how to make it more useful for your district.

Tell the facilitator when you have finished and are ready for discussion

TRAINING HEALTH WORKERS

This is dealt with in the case management module.

HEALTH EDUCATION

This is dealt with in Chapter 3 on Control (pages 69 to 74), and Annex 3.

EPIDEMIC CONTROL COMMITTEE

The Epidemic Control Committee is responsible for preparing for an outbreak of diarrhoeal disease and for coordinating the response to outbreaks that do occur. There should be an Epidemic Control Committee at the national level, and similar committees may be set up at the provincial, district or local levels. For epidemic control at health centre level you should use your local committee responsible for health.

An epidemic can have extensive effects, especially because of the public reaction to cholera: the committee should include members from departments and sectors other than health, e.g. Water, Administrative authorities and the people with influence in the community (religious leaders, Councillors, elders, etc.).

To *prepare for an epidemic*, the committee:

- C writes an Epidemic Preparedness Plan
- C maintains a reserve stock of essential supplies
- C coordinates surveillance of diarrhoeal diseases.

When *coordinating the response to the epidemic*, the committee coordinates the following:

- C reporting the numbers of cases and deaths
- C organizing special training
- C obtaining, storing and distributing supplies
- C implementing, supervising and evaluating control measures.

Examples of tasks performed by members of the committee, other than health workers:

- C participate in the water chlorination
- C supervise funeral practices during the outbreak
- C contribute to the health education of the community
- C assist in sanitation activities.

EPIDEMIC PREPAREDNESS PLAN

An Epidemic Preparedness Plan for your district or health facility is a guide that will help you prepare for and respond to outbreaks rapidly and efficiently. The plan should specify exactly:

- C what will be done
- C who will do it (and an alternate person if possible)
- C what resources or supplies are required.

EXERCISE J: EPIDEMIC PREPAREDNESS PLAN Individual exercise

While working through this Module, you have already made parts of the plan. In this exercise, you will make a draft of an Epidemic Preparedness Plan for your district or health facility, using the worksheet on the next page. This plan may not be final, but it will guide you when you return to your health facility, as you work with other staff to make the final one.

When you have made the final plan for the health facility or district, you may want to keep a detailed version of the plan (like that in the worksheet) with the copy of this module. Make a wall-poster which just shows the main activities of the plan, in the order in which they should be done. Write this plan either for a *health centre*, or for *district level*.

This example shows the headings you should use:

| Activity | Person responsible (and alternate) | Resources / supplies needed | When ? (time for activity) |
|---------------------------|---|--|--|
| Report suspected cases | Medical Officer J. Nurse N. (alt) | Phone/use of police radio Notification forms | Immediately as soon as a case is suspected |
| Send specimens | Laboratory technician B. General worker M. (alt) | Transport media, Cold box for dysentery Forms Transport to laboratory | Send 10-20 specimens when they can be collected. |
| Make safe water available | Head teacher K. Village headman (alt) | Chlorine Containers | Throughout epidemic. |
| ... | ... | ... | ... |

If other participants from your health facility or your district are attending the course, work in a group with them. The facilitator will give you paper for a rough copy – use the next page for your final copy of the Epidemic Preparedness Plan.

Worksheet for Epidemic Preparedness Plan

| Activity | Person responsible (and alternate) | Resources & supplies needed | When? (Time of activity) |
|--------------------------------------|---|--|-------------------------------------|
| Surveillance | | | |
| - Report cases/deaths | | | |
| - investigate rumours | | | |
| - ... | | | |
| Outbreak detection | | | |
| - identify risks | | | |
| - map cases | | | |
| - ... | | | |
| Supplies | | | |
| - list needed supplies | | | |
| - maintain reserves | | | |
| - request supplies | | | |
| - ... | | | |
| Coordination | | | |
| - set up Emergency Preparedness Plan | | | |
| - ... | | | |
| Logistics | | | |
| - obtain transport | | | |
| - ... | | | |
| Control | | | |
| - sanitation | | | |
| - health education | | | |
| - ... | | | |

Tell the facilitator when you have finished

EXERCISE K: MEMBERS OF THE EPIDEMIC CONTROL COMMITTEE

Individual exercise

In this exercise, you will propose names of people at your health facility / area to be members of the Epidemic Control Committee. *What does a committee member do?* Think about who can fulfil the roles and write their names in the spaces below. Some people may have more than one responsibility. Propose alternates, in case some members are not available at the time of an outbreak.

If these committees have already been organized in your area, write the names of the current members in the spaces below.

| Epidemic Control Committee | | |
|----------------------------|------|-----------|
| Role | Name | Alternate |
| Chair the Committee | | |
| | | |
| | | |
| Inform the media | | |
| | | |
| | | |
| Coordinate volunteers | | |
| | | |
| | | |
| | | |
| | | |
| Logistics | | |
| | | |
| | | |
| | | |

Tell the facilitator when you have finished

SUMMARY OF CHAPTER ON PREPAREDNESS

Routine data collection and reporting

- C *Identify and discuss forms*
- C *Identify means of communication*
- C *Prepare tables, graphs, maps*

Detecting outbreaks

- C *Identify cases*
- C *Use tables, graphs, maps*

Arranging for laboratory confirmation

- C *Collecting, preparing, sending stool specimens*

Identifying and collecting supplies

- C *Treatment supplies for cholera*
- C *Treatment supplies for dysentery*
- C *Non-treatment supplies*
- C *Logistical supplies*

Training

Health education

Preparing for an outbreak with the community

- C *Setting up the Epidemic Control Committee*
- C *Setting up the Epidemic Preparedness Plan*

CHAPTER 2: RESPONSE

The actions you take to treat ill people and to stop the outbreak from spreading constitute the response to the outbreak. Begin the activities listed below as soon as you *suspect* an outbreak, without waiting for confirmation of the outbreak. You should also begin many of the activities when you are notified of an outbreak in a neighbouring area. If there is an Epidemic Diarrhoeal Disease Preparedness Plan, put it into effect; if there is no plan, quickly make an outline of one. The Epidemic Control Committee will coordinate the response, so if no Committee is in place, set one up quickly. Many of these activities can be done at the same time, by different people. In a small health centre, though, one or two people may be responsible for doing nearly everything. In that case, they should try to do them in the order given on the list.

As soon as you suspect an outbreak, you should:

The first day

- C **Treat patients** for their illness using the skills you have learned in the first module. *Appropriate treatment of cholera and dysentery will save lives.*
- C **Immediately send** a report to the designated officer, or the next referral level. *Report all suspected cases.*
- C **Brief the staff on** what is to be done. *Inform the staff about the preparedness plan.*
- C **Send stool specimens** to the designated laboratories. *Send the specimens as soon as possible. If you do not have Cary-Blair medium for sending Shigella specimens, request some at the same time as you send the notification of cases.*
- C **Begin and maintain line-listings** (register), tables, graphs, maps for the affected areas. *Start the line-listing with the first case. Make the tables and graphs when some cases have accumulated. This will help you monitor the outbreak and detect new affected areas. When you know the number and location of cases that occur each day (or week), it is easier to predict the amount of supplies and staff needed; it is also easier to decide whether or not to open Temporary Treatment Centres or to send Mobile Control Teams.*
- C **Activate the Epidemic Control Committee** (or create one).
- C Organize and carry out **simple investigations** of the area where the cases come from. *Results from even simple investigations may help identify the causes of the outbreak and may also identify groups at high risk for illness.*

- C Begin to **carry out control measures**. *Although you may not fully carry out all control measures when you first suspect an outbreak, many measures are useful in a community at any time. Review the list of effective control measures and be sure that you are ready to carry them out fully.*

The first week

- C **Check essential supplies and equipment**. *Throughout the outbreak, you must be aware of the amount of supplies available in the affected areas, and the amount that is in reserve. Order needed supplies immediately. When you suspect an outbreak of epidemic dysentery, make a detailed inventory of the recommended antibiotics. In addition, consult the Control of Diarrhoeal Diseases Programme to find out the antibiotic most recently advised for your area.*
- C **Request additional training in case management** for health workers, if necessary. *Focus on the treatment of the disease you suspect.*
- C Request assistance from the **Mobile Control Teams** if additional help is needed. *You may decide that additional help is not necessary, but the members of the Mobile Control Team should be alerted and ready to go.*
- C Review and rehearse the plans for **Temporary Treatment Centres**. *Even if you do not open a Temporary Treatment Centre, you should be ready to open one. Practising the plan will show you any problems while you still have time to solve them.*
- C Intensify **health education** efforts.

When an outbreak has been confirmed

- C continue all the activities listed above
- C *fully* implement control measures
- C send in stool samples periodically
- C regularly check supplies
- C intensify public education.

REPORTING: HOW TO REPORT DURING AN EPIDEMIC

EXERCISE L: CASE HISTORIES

Individual exercise

In this exercise you will consider the order in which the steps to respond to an epidemic should be done. Read the case histories and *decide what you would do next*. The health workers in the case histories have tried to carry out the response steps in the order they have been written previously, but in each case a problem has arisen before the health workers had carried out all the steps. Write short answers that give one or two important steps (not more) that should be done to solve the problem. After all have written their answers, the group will discuss them.

- 1) There has been an unusual increase in cases of bloody diarrhoea at your clinic. Some patients are very ill. Since there is no confirmed outbreak of epidemic dysentery, you treated the patients with the antibiotic recommended for endemic dysentery, but with poor results.

- 2) A week later, one dysentery patient has died. Relatives have come to take the body back to the village for the funeral.

- 3) There has been a cholera outbreak in the district for a few months. Now it appears to have spread to a village 15 km from your health centre, which is the closest one. Many patients come to you late, with severe dehydration. They report that some people in the village are dying in their homes.

Tell the facilitator when you are ready for the discussion

EXERCISE M: OUTBREAK

Short answer exercise

There is an outbreak of cholera in Blue Lake District. Look at the number of cases of cholera reported from the four health centres in the district for the first four weeks of May. Crater Health Centre did not send in any report for weeks 2, 3 or 4 and Egret Health Centre did not send a report for the third week.

| Cholera cases (deaths) in Blue Lake District May 1995, by week, by Health Centre | | | | | |
|---|----------------|---------------|---------------|------------|-----------------|
| | Hood H.C. | Crater H.C. | Pine H.C. | Egret H.C. | Total for week |
| Week 1 | 20 (3) | 20 (8) | 20 (2) | 1 | 61 (13) |
| Week 2 | 44 (3) | — | 17 (1) | 0 | 61 (4) |
| Week 3 | 32 (2) | — | 11 (0) | — | 43 (2) |
| Week 4 | 20 (1) | — | 7 (0) | 1 | 28 (1) |
| Total | 116 (9) | 20 (8) | 55 (3) | 2 | 193 (20) |

1. Which health centre has had the most patients?
2. Where is the number of cases increasing?
3. Which facility has the highest number of deaths per cases (case fatality ratio)?
4. Which centre would you recommend be visited first? Why?

Answers to Exercise M:

Answers:

1. You do not know which health centre has had the most cases, since reporting is incomplete. Crater Health Centre may in fact have the most cases.
2. The number of cases does not appear to be increasing at any of the centres. However, it is impossible to know from the data available whether cases are increasing or decreasing at Crater Health Centre.
3. The case fatality ratio is the proportion or percentage of ill people who die. It is calculated by dividing the number of deaths reported during a period by the number of new cases reported during the same period. Here it is $8/20$, or 40%, for Crater Health Centre in week 1. From the available information, Crater Health Centre has the highest case fatality ratio.
4. The district health team should probably visit Crater Health Centre to find out:
 - why they are having difficulty reporting
 - if they are having difficulties with treatment
 - if their case fatality rate is still high
 - if they need additional help and supplies.

PERSONS AND COMMUNITIES AT RISK

Persons who do things that make it likely they will ingest cholera or dysentery organisms are at risk of becoming ill. In addition, once they have become ill, certain people have a greater chance of becoming *severely* ill or dying than do other people with the same illness. You must be able to identify persons and communities at risk and reduce their risk.

The following are at risk of becoming ill:

- C those who do not wash their hands when and as they should (before eating, after defecation or after contact with stools)
- C those who do not dispose of stools properly
- C those who do not consume safe water or who do not store it properly
- C those who do not cook or who do not eat food safely.

In general, people should follow the advice contained in the Health Education messages (see Control Chapter 3, pp. 70-75, and Annex 3) to avoid being at risk.

Among people with diarrhoea, some are especially at risk of severe illness or death:

- C those with diarrhoea who do not seek treatment until they are severely dehydrated are more likely to die of dehydration than those who seek treatment as soon as they have diarrhoea
- C a dysentery patient whose complications are recognized late is in more danger of severe complications or death
- C dysentery patients who take the wrong antibiotics (whether from a doctor, a pharmacist or a drug vendor) are in danger.

You should identify high-risk individuals and groups in your catchment area *before* an outbreak occurs. To identify groups at risk of becoming ill, or at greater risk of dying if they develop diarrhoea, use your knowledge of your area and of how epidemic diarrhoeal diseases are transmitted. Make lists of at-risk areas, and mark them on maps, if possible.

When you know who is at risk, and why they are at risk, then you should try to reduce the risk even before an outbreak occurs. If you are successful, then those people may not become ill, even if there is an outbreak in the area. When an epidemic is present, try to identify people who are at risk of becoming ill, or people who are at risk of severe illness or death once they are ill. In addition, try to identify specific risk factors associated with that epidemic. You may learn about specific risk factors when you interview patients and their families and when you review the information in your line-listings.

Work with the community to find practical ways to reduce the risks. Some people may need materials and outside help to reduce their risks (e.g. chlorine solution or soap, or supervision of a funeral); others may only need information and advice on how to reduce their risk (e.g. instructions on treating water, or on how to prepare food safely).

EXAMPLE:

The nurse, sanitary officer and health educator at Quivira Health Centre made maps of the catchment area to show possible areas of high risk for diarrhoeal disease.

Everyone in the area has safe water, except Ibi neighbourhood where people get water from the river, and New Ebor. New Ebor is a recent settlement of migrants from an area affected by drought. Sanitation is good everywhere except in New Ebor, which is upstream of the town. The people of New Ebor are used to defecating in the bush, and health workers are certain that they are contaminating the river, before it flows through the town.

The team realized that high risk areas were neighbourhoods of New Ebor (no safe water and defecation in the bush) and Ibi (water from the river, downstream from New Ebor).

How to use a map to detect an outbreak.

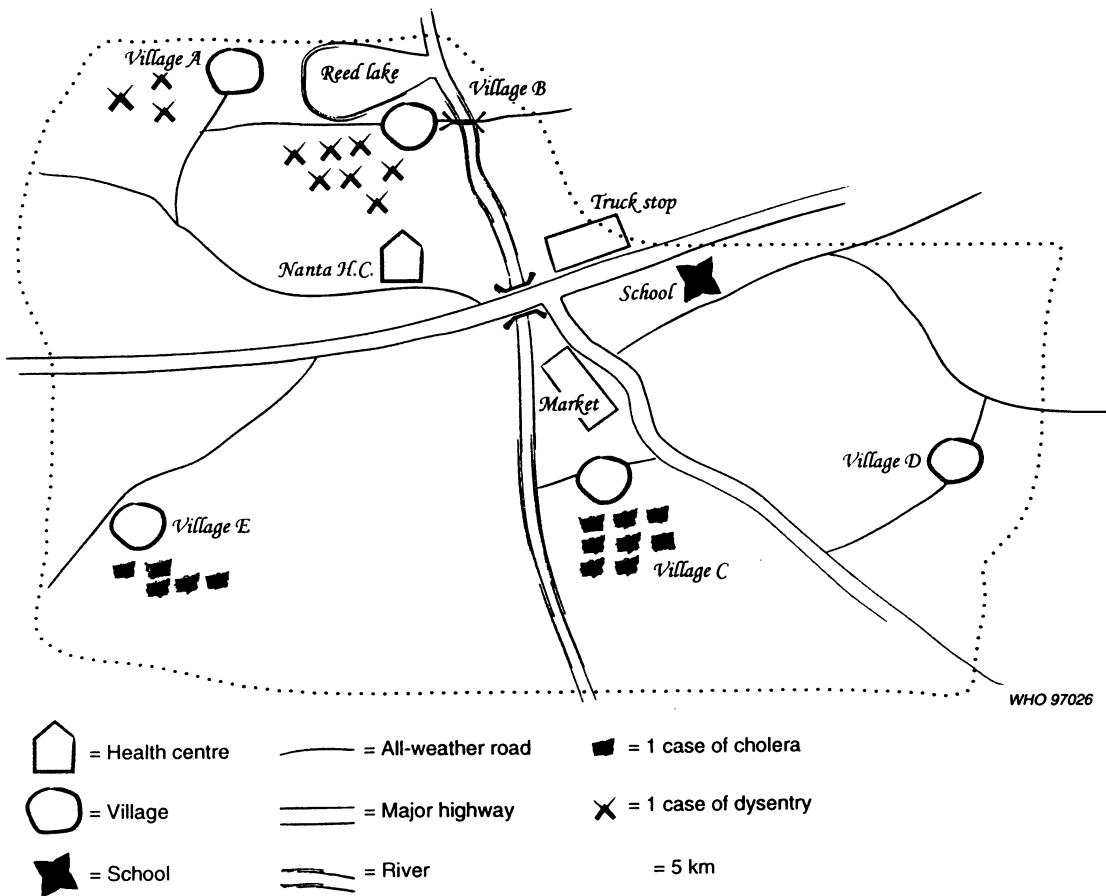
A map of the catchment area of your health facility will help you detect and monitor outbreaks. It will also help you as you carry out control measures. If you have one, use a map that shows settlements, water sources, health facilities and major transport routes. If you do not have such a map, make a rough sketch that shows those features. You might also show the location of markets, institutions (such as schools) and geographic features (mountains and bodies of water). Mark the border of the catchment area of your health facility and make a key that explains any symbols you use.

You may show where cases of disease occur by writing directly on the map. If you plan to use the same map for a long time, it is better to mark the location of cases by using coloured pins (or straight pins with bits of coloured paper attached).

EXAMPLE:

This map shows the catchment area of Nanta Health Centre. The nurse has shown the location of each case of cholera and of each case of epidemic dysentery.

Map of Nanta Health Centre catchment area



EXERCISE N: MAPS
Individual exercise

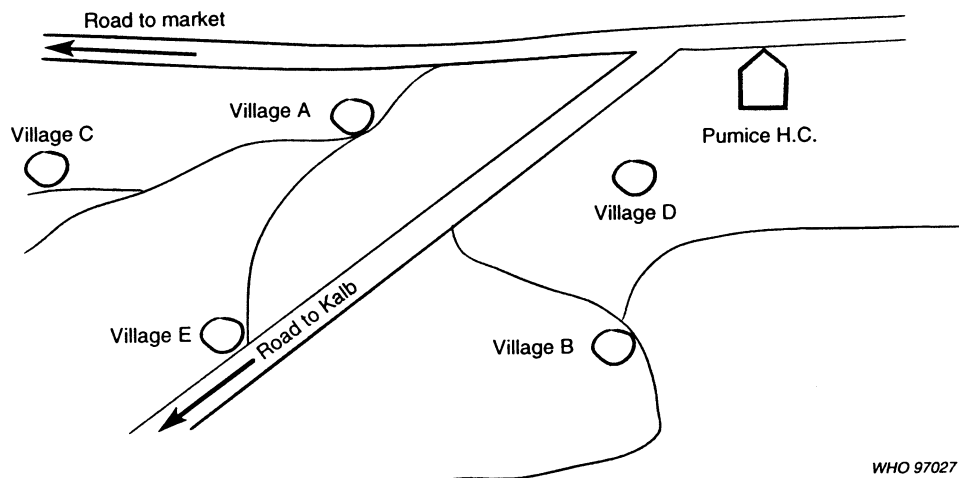
1) Look at the information on the following table.

| Village* | Cases of Dysentery – Pumice District | | | |
|--------------|--------------------------------------|-----------|-----------|-----------|
| | May | June | July | August |
| A | 3 | 2 | 2 | 1 |
| B | 4 | 5 | 5 | 4 |
| C | 1 | 4 | 9 | 18 |
| D | 7 | 5 | 4 | 2 |
| E | 9 | 4 | 3 | 2 |
| Total | 24 | 20 | 23 | 27 |

* All villages have about the same population size

Show the location of the cases of dysentery in July and August on the map. Use these symbols:

● = one case of dysentery in July ○ = one case of dysentery in August



WHO 97027

2) The total number of cases in the district has been about the same from May to August. Is there any evidence of an outbreak of dysentery? Explain your answer.

Tell the facilitator when you have finished

How to use other (non-routine) data to detect an epidemic

You may not hear of an outbreak of diarrhoeal disease from the reports of health workers, especially if the outbreak occurs in a very remote area, in an area where there are no health workers, or in an area where health workers send in their reports late, if at all. You should be alert to any information that suggests an outbreak. Investigate the following:

- C any report of a death from diarrhoea of a person five years or older (even if this was not an official report), or any report of a death from bloody diarrhoea
- C a newspaper or radio account of an outbreak of diarrhoeal disease
- C information from police, teachers, traders or travellers concerning many cases of diarrhoea
- C unusual requests for the supplies that are used for treating patients with diarrhoea.

EXERCISE O: RUMOURS

Group discussion

You learn from a newspaper report that a primary school has closed because so many students have diarrhoea. Discuss this report in your group (10 minutes). What other "non official" reports might lead to the discovery of an outbreak of diarrhoeal disease?

EXERCISE P: RISKS

Individual exercise

Read about these people and decide if they are doing anything that puts them at risk of becoming ill or of dying from diarrhoea. Write a *few* words to explain why they are at risk, and how to reduce the risk. Be prepared to discuss your answers, and to discuss who might be at risk in *your* area.

1. Mrs R.'s husband died of cholera last month. Now she works in the market from 8:00 a.m. to 6:00 p.m., six days a week. She gets up early to cook porridge and vegetables, and leaves this out for the children to eat while she is gone. She taught the children to wash their hands before eating. She no longer breast-feeds the 3-month-old baby, so an older daughter feeds him a little cool porridge and gives him plenty of milk from a bottle.

2. During a cholera outbreak, schoolchildren buy undamaged bananas from a street vendor, and eat them.

3. On a busy ward with many dysentery patients, the nurses encouraged patients and families to wash at the same wash-stand used by the nurses. After a while, the nurses noticed that the patients and families left the wash-stand a mess, and soap was used up very quickly when many people were using it. Because of this, the nurses asked the patients and families to wash in a separate place, 10 metres away.

4. Mrs D. is careful to wash and dry her hands after using the toilet. She washes her hands with ashes and plenty of water. She dries her hands thoroughly on the edge of her long skirt.

5. Mr N. has been the cook for Domtim Hospital for years. He always washes his hands with soap and water before preparing food. He cooks all food until it is thoroughly hot. During any diarrhoeal disease outbreak, he boils all water used in the kitchen, except water used to make ice. He cleans his cutting board frequently, and never allows contact between cooked and raw food.

6. The S. family is trying to observe the rules of hygiene they learned about at the health centre. The mother always washes her hands before preparing food and before feeding the children. Although they do not have a latrine, she makes sure that the children wash their hands well with soap after they defecate in the bush.

Tell the facilitator when you have finished and are ready for the discussion.

Guidelines for a brief visit to a community where there is an outbreak

When a small team visits the community (village or neighbourhood) where an outbreak is suspected, they should try to do the following before leaving:

- find and treat additional cases (keep records of the numbers of cases and deaths)
- collect good quality stool specimens, if 10 specimens have not already been collected
- teach the community how to prevent the disease from spreading, what to do if they become ill and where to go for treatment
- update any health workers in the community on case management
- leave supplies and equipment (e.g. ORS, supplies for water treatment)
- recommend general control measures, and any specific ones that are obviously needed
- meet with the community and its leaders to explain what the team found, and what the community should do.

Logistics and supplies

Planning for number and type of supplies was covered in the previous chapter. When an epidemic is suspected, these pre-placed supplies need to be mobilized to areas where they are needed most.

MOBILE CONTROL TEAMS

A mobile control team may be available in your district and may be sent to help when there is an outbreak of cholera or dysentery in an area where the local health services have no experience in controlling the disease, or where there are too few health workers or not enough supplies. Instructions for forming mobile control teams are in the following box.

Members of the team

The mobile control team includes one or more of the following types of health workers:

- clinically trained health workers (doctors, nurses, assistants)
- experts in environmental health and sanitation
- health educators
- support personnel (driver, guards, helpers, etc.).

There may also be a laboratory expert, especially for the early phases of the outbreak.

The members of the team should be trained to:

- establish and operate Temporary Treatment Centres
- provide on-the-spot training in case management for local health staff
- supervise environmental sanitation measures and disinfection
- carry out public education and give information to the public to prevent panic
- arrange for a study to find out how the disease is being transmitted
- collect stool and other specimens for submission to the laboratory, and
- provide logistical support, such as delivery of supplies, to health facilities and laboratories.

The members of the team should be selected *before* an epidemic, the equipment and supplies and logistical support should also be identified before an epidemic.

After getting any training they need to become up to date, the members should meet periodically to review their responsibilities and to be sure that they can respond quickly when needed.

TEMPORARY TREATMENT CENTRES

Even during an outbreak of cholera or of dysentery, most patients can be treated in existing health facilities. However, during some outbreaks, particularly cholera, health officials may decide to set up a Temporary Treatment Centre. The purpose of a Temporary Treatment Centre is to provide rapid and efficient treatment for many patients. A Temporary Treatment Centre is *not* used to quarantine patients.

How to decide whether to open a Cholera Temporary Treatment Centre

Early in an outbreak, the Epidemic Control Committee, or concerned health staff, should meet and decide whether patients can be taken care of at existing health facilities. The committee should also plan how the outbreak might affect the usual services provided by health facilities. They should consider these factors:

- C Are there enough health workers to care for the patients?
When there are many very ill patients, you must operate the treatment facility 24 hours a day, even if it is not normally open that long.
- C Are the existing buildings adequate?
Is there enough space? Are arrangements for sanitation adequate? There must be convenient hand-washing facilities for people working with and visiting patients. The safe disposal of excreta and vomit is essential. Can tents be used to house additional patients?
- C Are the existing health facilities too far from the site of the outbreak?
Patients should be able to reach the facility with little delay, so they can be treated quickly.
- C If many patients were cared for at the existing health facility, would it be possible to offer the usual health services?
Ongoing services (curative care immunization, child health, family planning) should be disturbed as little as possible during an outbreak.

How to choose a site for a Temporary Treatment Centre

A Temporary Treatment Centre should be in a place where patients can be adequately treated, and that patients can reach easily. It might be in an existing health facility, in an existing building, such as a school or community hall. If there is no suitable building, the Temporary

Treatment Centre could be set up in a tent in a field. When planning where to site a temporary treatment centre, look for a place that has the following characteristics (or where they can be arranged quickly):

- C an adequate water source
- C good drainage away from the site
- C easy to clean
- C provisions for disposal of excreta, of vomit, of medical and other waste
- C convenient hand-washing facilities
- C good access for patients and supplies (consider the distance and availability of transport)
- C adequate space (preferably divided into rooms or separate areas for patient care, kitchen, stores, staff area, etc.).

You probably cannot change the layout of a building, but plan how to make the best use of the space available. Try to organise the layout, and patient and staff flow to accommodate the following:

- C an entry / observation ward (this could be for screening and observation)
- C a ward for patients who are very ill and require intensive care
- C ward for patients who are recovering
- C toilets (latrines) / waste disposal
- C convenient hand-washing stations
- C storeroom(s)
- C kitchen
- C washing and cleaning areas
- C staff room and staff accommodation
- C provision for administering ORS
- C space for patients who died.

After you have planned how to use the space, think through all the activities that will take place at the Temporary Treatment Centre. “Walk through them” in your imagination, to be sure your plan will work smoothly. It is even better if you can arrange a “rehearsal” at a possible Temporary Treatment Centre site. Consider the following points:

- C Where will patients go first? Where will patients go next? “*One-way*” flow is best.
- C Will family members accompany the patient? How many?
- C Are water and cleaning supplies close to the area where the most stool and vomit are likely to be?
- C Is the kitchen placed away from sources of contamination?
- C Are hand-washing stations available to all staff and to patients and caretakers?
- C Are the arrangements for stool disposal convenient to use?

Use the checklist on the following page to assess the suitability of a site.

| Temporary Treatment Centre checklist | | |
|---|--------------------------|---------------------------|
| Address of site: | | Person to contact: |
| % in box if the answer is Yes ? in box if you can solve the problem quickly O in box if problem cannot be solved easily | % ? O | Comments |
| Good water supply | <input type="checkbox"/> | |
| Good access for patients and supplies | <input type="checkbox"/> | |
| Adequate facilities for disposal of stools | <input type="checkbox"/> | |
| Adequate facilities for hand-washing | <input type="checkbox"/> | |
| Adequate facilities for disposal of other waste | <input type="checkbox"/> | |
| Good drainage of site | <input type="checkbox"/> | |
| Reliable communications available | <input type="checkbox"/> | |
| Easy to clean | <input type="checkbox"/> | |
| Rooms or space for | | |
| – Entry ward | <input type="checkbox"/> | |
| – Very ill patients | <input type="checkbox"/> | |
| – Recovering patients | <input type="checkbox"/> | |
| – Washing and cleaning areas | <input type="checkbox"/> | |
| – Storage | <input type="checkbox"/> | |
| – kitchen | <input type="checkbox"/> | |
| – Staff room/accommodation | <input type="checkbox"/> | |
| – Morgue facilities | <input type="checkbox"/> | |
| Other comments | | |

| |
|---|
| Temporary Treatment Centre sketch* |
|---|

*Use this space for a sketch or additional comments. If there is a local model for TTCs, obtain a copy.

How to staff a Temporary Treatment Centre

The Temporary Treatment Centre should be staffed by health workers who have been trained in the case management of diarrhoea. In addition to clinical staff, the Temporary Treatment Centre will need auxiliary staff, such as patient attendants, drivers, cleaners, cooks and general helpers.

If a family member will stay with the patient to provide general nursing care and feed the patient, you may need less staff. Clinical staff should concentrate on the treatment of patients, and look for others who can temporarily take over routine or clerical work. However, professional staff must teach and closely supervise nonprofessional caretakers.

A Temporary Treatment Centre operates 24 hours a day: to predict how many staff will be needed, ask yourself the following questions for each room (or area with a different function) and then prepare a roster (see also Exercise R):

- 1) “*What will happen in this room during each shift?*”
- 2) “*What types of staff are needed to accomplish those activities?*”
- 3) “*How many of each type of staff?*”

Although many health workers think of their role as mainly *treating* patients with cholera and dysentery, health workers also have important responsibilities in prevention and control activities. Clinical health workers, with environmental health and laboratory staff, and health educators, form a team that prepares for and responds to epidemics.

If a health facility is well prepared, the staff can probably continue to provide the usual services of the health facility when an outbreak does occur. However, if an outbreak is very large or very sudden, some staff may have to be reassigned from their regular duties to treat patients at the health facility or may be sent to a Temporary Treatment Centre, or to work with a Mobile Control Team.

More staff may be needed to provide 24-hour, 7-days-a-week treatment services. If possible, request extra staff.

When there is not enough staff to do the required work, some usual clinic services may have to be suspended, but they should be resumed as soon as possible. It may be necessary to hire helpers for some simple tasks (e.g. digging pits for stool disposal), or to get volunteers from the community.

Planning staff assignments

- 1) Make a *list of the tasks* that need to be done.
See the list below for possibilities.
- 2) For each task, decide *which type of health worker* will be assigned.
During an outbreak, you should make the best use of the staff that is available. This means people may not always do their accustomed work. To be efficient:
 - a) clinical staff should do clinical work
 - b) skilled clinical workers, should not do clerical and routine
 - c) experienced staff may be more helpful teaching and supervising than doing the work that they normally do
 - d) conduct on-the-spot training so staff can do new or additional tasks
 - e) volunteers or temporary workers can do certain unskilled tasks.
- 3) Decide *how many staff* will be needed for each task
One person can probably do several small tasks. For example, at different times, one person could be responsible for doing the supply inventory, making line listings and sending reports, sending laboratory specimens, supervising the kitchen, and so on. On the other hand, you may have to assign several full time staff for the treatment of cases and to carry out control measures.
- 4) Draw up a *duty roster*.

EXAMPLES: Staff assignments during an outbreak

Involving the community

When the Mobile Control Team from Tillicum District arrived at the location of a cholera outbreak, they knew that the team was too small to do all the work needed. They involved the community from the beginning. They brought the community health worker up to date on case management and she helped in the Temporary Treatment Centre. The school teacher in Spring Village volunteered to help with record keeping and to manage the supplies, so the clinical members of the team would have more time with patients. Village leaders and schoolchildren were instructed to teach about control measures and to look for ill people.

Training refugees to help at the camp health centre

When an explosive outbreak of cholera at a refugee camp overwhelmed the capacity of the health centre in the camp, the staff asked for additional health workers from the district hospital. When the new health workers arrived, few of them could speak the refugees' language. This made patient care and health education difficult.

The clinic staff gave additional training in cholera case management to several community health workers in the camp. Other refugees translated for ill patients and translated for the health educators. Some refugees acted as general helpers at the clinic. Although nearly all the refugees volunteered to help, those who maintained the latrines were paid.

EXERCISE Q: TASK LIST
Individual exercise and group discussion

List the tasks that need to be done *at your health facility* during an outbreak of cholera or epidemic dysentery and write the name(s) of the person(s) who would be responsible. Work in groups if there are other participants from the facility or district.

| Task / Responsibility | Name & Title | Trained for task? |
|--|--------------|-------------------|
| Surveillance and Reporting | | |
| send report to district health office | | |
| make line listing of cases | | |
| ... | | |
| Case Management | | |
| assess patients | | |
| Give ORS | | |
| ... | | |
| | | |
| | | |
| Preventing Spread at the Health Facility | | |
| removal of excreta | | |
| supply of clean water | | |
| ... | | |
| | | |
| Control Measures | | |
| health education | | |
| Improve water supply | | |
| ... | | |
| | | |
| | | |

Ask yourself the following questions

- C how many time does the same name and title appear? Can you suggest other persons?
- C are there tasks for which you need more than one person?

How to equip a Temporary Treatment Centre

All Temporary Treatment Centres must be able to guarantee case management of patients, facilities for hand washing and safe disposal of waste. If the Temporary Treatment Centre is in an existing health facility, adequate equipment may be available. However, most equipment may have to be brought to a Temporary Treatment Centre in another type of building, or to one that is not in a building.

Every Temporary Treatment Centre needs:

- C essential treatment and care supplies, including gloves for putting up IV
- C materials for collecting and sending stool specimens
- C supplies for treating, testing and storing drinking-water
- C supplies and arrangements for hand-washing
- C equipment and arrangements for stool and other waste disposal
- C patient supplies
(plates, cups, basins, beds (cholera beds if possible), plastic sheets or other bedding)
- C kitchen equipment
- C laundry, cleaning and disinfection equipment
(buckets, brooms, mops, basins, stirrers, leak-proof plastic bags)
- C tables or desks, chairs
- C stationary items and forms for patient care, for reporting cases and for inventory
- C shelving or tables for stores, locks
- C mortuary facilities.

The following are often useful, depending on the location of the site, and whether it is in an existing building:

- C radio
- C plastic sheeting
- C a source of power and/or arrangements for lighting
- C equipment / arrangements for staff accommodations.

Equipment for strict isolation measures (such as face masks, gloves or special clothing) is *not* needed, although contact between patients and the surrounding community must be kept to a minimum.

EXERCISE R: CHOLERA OUTBREAK

Individual exercise

Read about the situation, and answer the questions.

1. During the rainy season, the Chief Medical Officer of Ngoronga District received a radio message about an outbreak of cholera in a remote area. There is no clinic there, and the only trained health worker is a volunteer community health worker. Four villages are affected, located 1 km apart. Because of the rains, the roads cannot be used, and the boat journey takes 3 days from the nearest town. There is no landing strip.

What would you do next?

2. The team assembled their supplies, and arrived in 3 days. They inspected each village and decided to set up the Temporary Treatment Centre in a large open shed in Village B, because it was central to the other affected villages and because people trusted the village health workers who lived in Village B and were used to coming to her when ill. Village A had a school building that might have been used, but the building did not have a good supply of water. Although the radio was in Village C, that village was low-lying and there was no possible site that had good drainage.

Every evening, the team met to discuss what had happened that day. After the first day, they realized there was a problem with the way they had arranged the Temporary Treatment Centre. It had seemed logical to put both the kitchen and the area for cleaning and disinfection near the supply of water. However, to save time, cleaners and family members carrying contaminated articles took short cuts through the cooking area. In addition, they washed contaminated articles upstream from the kitchen and water source.

What would you do?

3. On the second day, the team noticed that patients and families were defecating just outside the area set aside for recovering patients, even though there was a latrine. The team found that the latrine was filthy and had it cleaned. Even then, the latrine was not sufficient for the number of patients and family.

What would you do?

4. By the end of the second day, there were large puddles of mud outside each "ward". The team had done an excellent job being sure all staff, patients and family washed their hands, but had not thought of where the discarded water would go.

How would you solve this problem?

Tell the facilitator when you have finished

IMPROVING CURRENT PRACTICE – HEALTH FACILITY STANDARDS

Cholera and dysentery may spread inside a health facility. Health staff need to practise good hygiene, and patients should be helped with their hygienic needs.

Every health facility ought to have guidelines that specify the standards and procedures that will be followed at the health facility. The guidelines should include the standards listed below, which are designed to prevent the spread of diarrhoeal disease. The precise way they are implemented will depend on the size and location of the facility, and the type of equipment that is available.

Health facility standards

Water

- There should be **40-60** litres of water available per patient per day for drinking, cleaning, bathing, and washing clothes, to prevent transmission of disease
- Drinking-water is stored separately from water for other uses
- All drinking-water is treated (levels of chlorine are tested regularly)
- If drinking-water is stored in containers, only safe containers are used and there is a safe way to take water from the containers.

Hand-washing

- All staff, patients and caretakers and visitors have convenient, visible facilities for washing their hands with soap, or special chlorine solution*
- All patients, caretakers and visitors are taught and encouraged to wash their hands
- All staff wash their hands before and after examining patients.

* If soap or chlorine solution are unavailable, mud or ash can be used.

Food safety

- Health facility staff who prepare meals follow the guidelines for safe food preparation and storage
- Health workers who care for patients with dysentery or cholera do not prepare or serve food.
- Patients, caretakers and visitors are taught rules for safe food preparation and storage.

Sanitation and disposal of waste

- All liquid human waste is disposed of in a toilet, flush pit or a latrine or it is buried
- Semi-solid waste is incinerated
- Soiled bedding, clothing and other articles are washed and disinfected frequently, and only in a designated area.

EXERCISE S: IMPROVING HEALTH FACILITY STANDARDS

Individual exercise

In this exercise, you will think of your own health facility, and note whether the priority preventive steps are observed there. Read the detailed descriptions of the steps. If the step is *always* observed, put / or **Y** in the **YES** box. If it is not always done, or is done incompletely, or not done all the time, put / or **N** in the **NO** box. For each **NO** box you check, write briefly how you would improve the situation.

Steps that Reduce the Spread of Diarrhoea in Health Facilities

| Preventive step always taken | Yes (always) | No | If "no" what action must be taken? |
|--|-----------------|----|---------------------------------------|
| There is plenty of water for hand-washing | | | |
| There is enough soap for hand-washing | | | |
| Hand-washing facilities are accessible | | | |
| Hand-washing facilities are very visible | | | |
| All health workers wash hands with soap between patient examinations | | | |
| All health workers wash hands with soap after using the toilet and <i>after any contact with stools</i> | | | |
| Health workers who care for patients with cholera or dysentery do not prepare food for patients | | | |
| Health workers who care for patients with dysentery or cholera wash hands before serving, or do not serve food to patients | | | |
| Stools and vomit are disposed of in a latrine or toilet, or are buried | | | |
| Clothes and bed linen of dysentery patients are washed and disinfected frequently | | | |

Tell the facilitator when you have finished

SUMMARY OF CHAPTER ON RESPONSE

Undertake case management

- *Treat cases*
- *Check and order supplies*
- *Conduct case management training*

Reinforce surveillance and reporting

- *Identify and report cases*
- *Make line listings, tables, graphs and maps to follow the outbreak*
- *Collect and send stool specimens to confirm an outbreak, and to monitor antibiotic susceptibility*
- *Identify personas and communities at risk, and reduce risks*

If appropriate, call the mobile control team and set up a treatment control centre

- *Select a site*
- *Ensure staffing, including staffing rosters*
- *Collect supplies and equipment*

Prevent spread of disease at health facility, through the following:

- *Safe drinking-water for patients, visitors and staff*
- *Water and soap for hand-washing for patients, visitors and staff – preferably in easily accessible, highly visible locations*
- *Staff wash hands with soap before and after examining each patient*
- *Persons who care for diarrhoea patients do not prepare or serve food*
- *Stools disposed of in latrines or toilets, or by burial*
- *Washing and disinfection of clothes and bed linen*
- *Proper disposal of bodies*

Carry out control measures and educate the community

Cooperate with the Epidemic Control Committee to promote effective measures for prevention and control:

- *Safe drinking-water*
- *Hand-washing with soap or ash*
- *Food safety*
- *Safe disposal of excreta*
- *Disinfection of clothing, personal articles and the environment (dysentery outbreaks)*
- *Proper disposal of bodies and funeral precautions*

CHAPTER 3: CONTROL MEASURES

Control measures are activities undertaken to prevent the spread of cholera or epidemic dysentery once it has been introduced into an area. Effective control measures can decrease the number of people who eventually become ill or die. Ineffective control measures use valuable resources and have no significant impact on the epidemic.

Although preventing cholera or epidemic dysentery from entering a country or region is not possible, effective control measures can stop the diseases from spreading. To understand control measures, you must understand how cholera and dysentery are spread.

In this section you will learn how to prevent the spread of cholera and epidemic dysentery, and why ineffective control measures do not work.

How Cholera is spread

Cholera spreads when people ingest water or food contaminated by *Vibrio cholerae*. The following are common sources of infection:

- C *Drinking water contaminated at its source or during storage:*
For example, when surface water contaminated by stools enters an incompletely sealed well, or when hands soiled by stools contaminate stored water. Ice made from contaminated water can also be a source of infection.
- C *Food contaminated during or after preparation:*
For example, milk, cooked rice, lentils, potatoes, beans, eggs, and chicken.
- C *Seafood:*
Particularly shellfish, taken from contaminated water and eaten raw or insufficiently cooked.
- C *Fruit and vegetables:*
Including vegetables grown at or near ground level and fertilized with human waste (night soil), vegetables irrigated with water containing human waste, and vegetables that have been “freshened” with contaminated water, and then eaten raw.

How epidemic Dysentery is spread

Epidemic dysentery spreads when people ingest the *Shigella dysenteriae* type 1 organism. Transmission is probably mostly through person-to-person contact, and through contaminated food or water. The infectious dose is very low – as few as 10-100 organisms can cause disease. During dysentery, *Shigella* are excreted in large numbers in the stool. They can survive a long time, e.g. in kitchen refuse for 1 to 4 days, in fresh water for up to 11 days, and in soiled linen for up to 7 weeks.

Effective and ineffective control measures:

Although there are differences in how the cholera and epidemic dysentery are spread, the same types of control measures are effective against both diseases. Effective control measures help prevent cholera and epidemic dysentery and other diarrhoeal diseases. Ineffective control measures do *not* stop the diseases from spreading. They can be *dangerous* because they waste time and effort and may give the community a false sense of security.

| Effective control measures | Ineffective Control Measures |
|--|---|
| <ul style="list-style-type: none"> – Health education messages – Ensuring a safe supply of water – Food safety – Hand washing – Environmental sanitation – Disinfection – Safe practices at funerals | <ul style="list-style-type: none"> – <i>Cholera vaccine (1996)</i> – <i>Travel restrictions</i> – <i>International trade restrictions</i> – <i>Quarantine</i> – <i>Mass chemoprophylaxis*</i> <p style="margin-left: 20px;">* <i>Selective chemoprophylaxis may be considered, but results are often disproportionate to the effort undertaken</i></p> |

HEALTH EDUCATION MESSAGES

Health workers must know how diarrhoeal diseases are spread, and how they can be prevented. They must also have skills to transmit this information to the community. All health education messages need to be intensified during an outbreak.

The following are key points for public education about cholera and epidemic dysentery

- C Drink only water from a safe source or water that has been disinfected (boiled or chlorinated)
- C Cook food or reheat it thoroughly, and eat it while it is still hot
- C Avoid uncooked food unless it can be peeled or shelled
- C Wash your hands after any contact with excreta and before preparing or eating food
- C Dispose of human excreta promptly and safely

Remember

With proper treatment, cholera and epidemic dysentery are not usually fatal
 Take patients with suspected cholera to a health worker immediately
 Take patients with bloody diarrhoea to a health worker for treatment
 Give increased quantities of fluid (ORS solution if available) as soon as diarrhoea starts

Sample public health messages can be found below. Annex 3 also includes health education messages. Messages must be adapted to local conditions and translated into local languages.

Three simple rules for preventing cholera and dysentery

1. Boil or chlorinate your drinking-water.
2. Cook your food.
3. Wash your hands.

**Are you protected from cholera and dysentery?
Drink only safe water**

Is your drinking-water boiled or treated?

Even if it looks clean, water can contain cholera and dysentery germs.

Water for drinking can be made safe in two ways:

- ! *Boil* it to kill cholera and dysentery germs; bring water to a boil, and keep it boiling for 1 minute
- ! *Chlorine* kills cholera and dysentery germs; use 3 drops of *chlorine solution* for each litre of water, mix well, and leave it for half an hour before drinking.

KEEP IT CLEAN: BOIL OR CHLORINATE YOUR DRINKING-WATER

**Are you protected from cholera and dysentery?
Is your drinking-water stored safely?**

Clean water can become contaminated again if it is not stored safely.

Store drinking-water in a clean container with a small opening or a cover. Use it within 24 hours.

Keep the water out of the reach of children and animals.

Pour water from the container – do not dip a cup into the container.

KEEP IT CLEAN: STORE YOUR DRINKING-WATER SAFELY

**Are you protected from cholera and dysentery?
Do you prepare food safely?**

Cooking kills cholera and dysentery germs

- ! Thoroughly cook all meats, fish and vegetables
- ! Eat them while they are hot.

Washing protects from cholera and dysentery

- ! Wash your *hands* before preparing or serving food.
- ! Wash your *dishes and utensils* with soap and water
- ! Wash your *cutting board* especially well with soap and water.

Peeling protects from cholera and dysentery

- ! Eat only fruits that have been freshly peeled, such as oranges and bananas

KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT!

Are you protected from cholera and dysentery?

Do you wash your hands?

The germs that cause cholera and dysentery are invisible. They can be carried on your hands without your knowing it.

Always wash your hands:

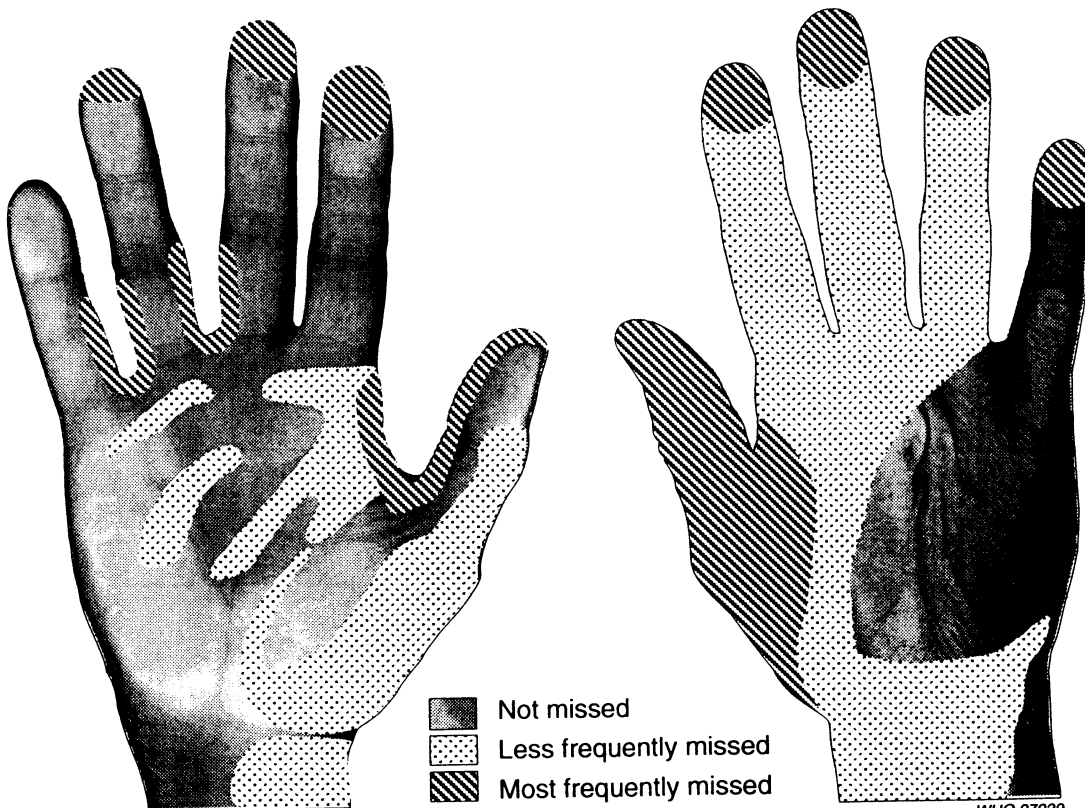
- after you use the toilet or latrine, or clean up your children
- before you prepare or serve food
- before you eat and before you feed your children.

This is the best way to wash your hands:

- Always use soap or ash
- Use plenty of clean water
- Wash all parts of your hands – front, back, between the fingers, under the nails.

KEEP IT CLEAN: WASH YOUR HANDS

AREAS MISSED DURING HAND-WASHING



**Are you protected from cholera and dysentery?
Do you use a toilet or latrine?**

Cholera and dysentery germs live in stools. Even a person who is healthy might have the germs in the stools.

- ! *Always* use a toilet or latrine. If you do not have one, build one
- ! Keep the toilet or latrine clean
- ! Dispose of *babies' stools* in the toilet or latrine (or bury them)
- ! *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

**Are you prepared for cholera?
What should you do if you get cholera?**

Cholera can be treated.

The biggest danger of cholera is the loss of water from the body. Do not panic, but act *quickly*.

- ! Drink Oral rehydration Solution (ORS) mixed with safe water (boiled or treated)
- ! Go immediately to the health centre. Continue drinking as you go.

FIND OUT NOW WHERE YOU CAN GET ORS
FIND OUT NOW HOW TO MIX ORS

EXERCISE T: HEALTH EDUCATION

Group work

In this exercise, you will review the suggested health education messages about effective measures for preventing cholera and dysentery.

You will then prepare health education messages and posters, using the effective measures described in the module.

Make sure that:

- C you are reaching the target population
- C the instructions are easy to follow by people in the area and are practical
- C people in the area find the messages clear, and easy to understand
- C you have chosen the best ways to transmit the information in the messages
- C you are using local organizations and locally available means of communication.

ENSURING A SAFE SUPPLY OF WATER

Access to safe water is a basic requirement for health, and it is more critical when there is an outbreak of diarrhoeal disease. Since contaminated water can be the source of cholera and epidemic dysentery, every effort must be made to provide safe drinking-water, and safe water for food preparation and for personal hygiene.

Each person should have at least 20 litres of water a day for drinking, cooking and washing. Health facilities need 40-60 litres per patient a day to maintain adequate levels of hygiene. Every family should know how to treat water so that it will be safe for drinking.

Piped water, or water that is delivered in trucks or drums, must be adequately chlorinated. Environmental sanitation workers can test water to be sure that the amount of chlorine is adequate (see Annex 5).

Other sources of water are usually contaminated (e.g. rivers, shallow wells), so you must take measures to reduce the risk of people becoming ill. You may have to close the water source or provide another source of safe water. If that is not possible, be sure that people using the water know how to make it safe.

How to make water safe by chlorination

Chlorination is a practical way to make drinking-water safe. Where fuel is expensive, it is less expensive than boiling water. To chlorinate water, you add a stock solution of chlorine to water – the amount depends on how much water you are treating.

1) *Make a stock solution of chlorine.*

To make a stock solution, add the listed amount of one of these products to 1 litre of water:

| Product | Local name or local product | Amount for 1 litre |
|---|-----------------------------|--------------------|
| Calcium hypochlorite powder (70%)* <i>or</i> | | 15 grammes |
| Bleaching powder/Chlorinated lime (30%)* <i>or</i> | | 33 grammes |
| Sodium hypochlorite solution (3.5%)* <i>or</i> | | 350 ml |
| Sodium hypochlorite solution (5%)* <i>or</i> | | 250 ml |
| Sodium hypochlorite solution (10%)* <i>or</i> | | 110 ml |

* percentage indicates the concentration by weight of available chlorine

If products with the above concentrations of chlorine are not available, adjust the amount used according to the concentration available.

Store the stock solution in a closed container, in a cool dark place that does not admit light. Use the stock solution within one month. Do not swallow! Keep out of reach of children.

2) *Measure water containers to know how much chlorine solution to use*

There are many different types of water containers, in many sizes. To treat water in a container with chlorine solution, you must know how many litres the container holds.

Use a known litre measure (such as a graduated cylinder or a 1 litre IV fluid bottle) and count how many litres it takes to fill the container you want to measure.

If the local container is manufactured (such as a drink or oil bottle), and each container is the same size, you may measure that type of container once. When containers are not all the same size (such as clay pots), you should measure each of them, as follows:

- 1) Empty the container.
 - 2) Fill the container with water, pouring in one litre at a time; when the container is nearly full, pour in half a litre at a time.
 - 3) Count how many litres of water are needed to fill the container.
 - 4) Calculate how many drops of chlorine stock solution are needed to treat that number of litres of water. For every litre, 3 drops of chlorine solution are needed.
 - 5) Write down the number of drops needed, or if the family is not literate, make marks that show the number of drops of chlorine solution needed. If you can, write this on the container itself.
- 3) *Use the stock solution to make water safe.*
 Put the following amount of the stock solution into the water container then add the water to the stock solution so that it will mix well.

| Stock solution in container | Add water |
|-----------------------------|------------|
| 0.6 ml or 3 drops | 1 litre |
| 6 ml | 10 litres |
| 60 ml | 100 litres |

Let the chlorinated water stand for 30 minutes before using it. If the water is cloudy or turbid (not clear), with a lot of suspended solid matter:

- C filter it before chlorination to take out particles, or
- C boil it vigorously instead of treating it by chlorination.

Environmental health experts can test water using DPD (diethyl-p-phenylenediamine) kits to see if the levels of residual chlorine are high enough so that the water is safe for drinking.

These are the recommended levels for an area where there is an epidemic of cholera or dysentery (Annex 5):

- C at all sampling points in a piped water system 0.5 mg/litre
- C at stand posts in systems with stand posts 1.0 mg/litre
- C in tanker trucks, at filling 2.0 mg/litre
- C in water treated with stock solution of chlorine 0.2-0.5 mg/litre

How to store and use water safely

Once water is safe, it must be stored and used safely, or it can become contaminated again. The following steps can be taken to prevent recontamination.

Store water in a narrow-mouthed container with a cover.

For family use, drinking-water should be stored in a narrow-mouthed container with a cover. The opening should be so small that a hand cannot fit in. If possible, store drinking-water apart from water for other uses. Do not let young children or animals have access to the family's drinking-water.

Pour water from the container.

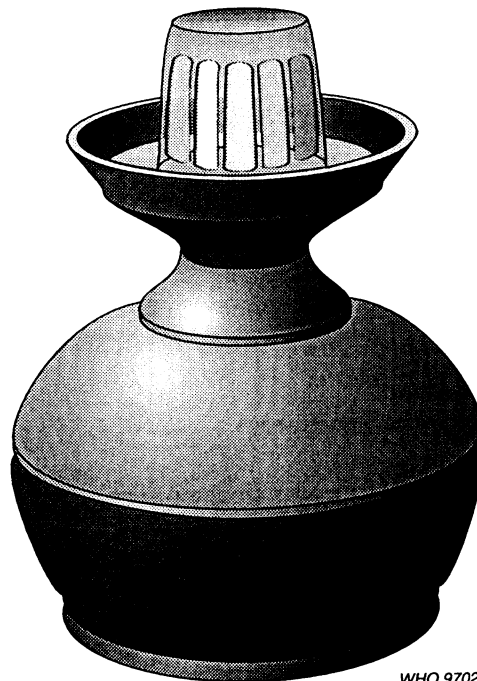
Water should be poured from the container. If that is not possible, a long-handled dipper, which is not used for anything else, should be used to take water from the container. The container should be cleaned every day with soap and water, or with chlorine stock solution.

EXERCISE U: WATER STORAGE

Group work

In this group exercise, you will:

- inspect water containers and decide if they are suitable for home water storage
- watch a demonstration of treating water with chlorine solution
- decide how much chlorine solution should be added to local containers to treat the amount of water they hold
- practise using chlorine solution to treat the volume of water found in the common types of containers.



WHO 97028

FOOD SAFETY

Cholera and dysentery can be transmitted through contaminated food. Food may be contaminated before, during or after preparation. Raw or undercooked seafood, and foods cooked and then kept at room temperature for several hours are especially dangerous. Fruits and vegetables may be contaminated if they were fertilized with human waste (nightsoil), irrigated with contaminated water or “freshened” with contaminated water.

Everyone who prepares food should follow the food safety rules listed in the health education messages in Annex 3 (see also the more detailed rules in Annex 8).

Feeding of infants

Remember “breast is best”. WHO recommends that infants should be breast-fed exclusively until the age of 4-6 months.

Food vendors

Street food vendors and restaurants may pose a special risk during an epidemic. Public health workers should inspect their food-handling practices, and stop sales when they find unsanitary practices until the practices have been corrected through education or improved equipment. See the more detailed rules in Annex 8.

Food safety at gatherings

Where many people gather (e.g. at a market, at a transport hub or for a funeral), especially when they eat food from the same source, diarrhoeal diseases can spread easily. Health staff can supervise gatherings, especially funerals, to ensure that there are provisions for disposal of stools and for proper hand-washing. Food preparation and serving at funerals should be discouraged; but if that is not possible, they should be closely supervised.

HAND-WASHING

People can prevent the transmission of cholera and dysentery by washing their hands. Careful and frequent hand-washing is especially important to stop the transmission of dysentery. If soap is expensive, or not available, ashes or mud can be used instead.

Children, as well as adults, should wash their hands.

When should you wash your hands?

- C after defecation
- C after any contact with stools (cleaning up after children or patients)
- C before preparing food
- C before eating food
- C before feeding children.

How should you wash your hands?

- C use plenty of clean water
- C use running water or pour water *over* the hands
- C use soap or ashes
- C clean the tops and bottoms of the hands, between the fingers, and under the nails
- C rinse
- C let your hands dry in the air, or dry them with a **clean** cloth.

What should you **not** do when washing your hands?

- C do **not** use the same basin for several people
- C do **not** dry hands on the same towel for everyone.

EXERCISE V: HAND WASHING (optional) Group work

In this exercise, you will role play how to teach others to wash and dry their hands properly.

ENVIRONMENTAL SANITATION

In the long term, cholera and dysentery will become rare as environmental hygiene and water supplies improve. However, in areas where sanitation is poor, you must use temporary measures to guarantee that stools are disposed of safely when there is an outbreak of diarrhoeal disease.

The methods to apply are:

- C not to defecate on the ground or near a water supply
- C to wash hands with soap or ash after any contact with stools
- C to dispose of children's stools in toilets, in latrines, or to bury the stools
- C to build and use latrines (see instructions for ventilated improved pit latrine, Annex 9)
- C if there is no latrine, to bury the stools away from water sources, as a temporary measure.

Disinfection and washing of clothing and bedding

In unhygienic living conditions, a patient's surroundings are sure to become contaminated and must be cleaned. *Never* wash a patient's articles, particularly clothes, in a river or pond that might be a drinking-water source, or near a well.

- C drying clothes in the sun can help disinfect them,
- C wash clothes using soap and plenty of water,
- C if possible, boil or disinfect clothing and bedding (chlorinated lime, or ready-made 2% chlorine solution, or 1-2% phenolic preparations can be used as disinfectants),
- C wash utensils with boiling water, or in disinfectant solution for 30 minutes.

Disposal of stools and of other waste

Cholera

At home or at a small health centre, put cholera stools in a latrine or bury them. In a larger health facility, sterilize or bury liquid wastes. To sterilize liquid wastes (stool, vomit), mix them with a disinfectant, such as cresol, lysol, or bleach.

Dysentery

Dispose of stools of dysentery patients in a latrine or toilet (or bury them).

Other waste

The best method is incineration, if the incinerator is designed to destroy contaminated semi-solid waste. If there is no incinerator, the waste should be burned and then buried.

Safe practices at funerals

Funerals may bring people from uninfected areas to an infected area, from which they can carry cholera or dysentery back home. A health worker should supervise hygienic practices before and during the funeral.

The following recommendations apply to funerals which take place during outbreaks, even if the person did not die of cholera or dysentery.

C hold the funeral soon after death

C limit the size of funeral gatherings

C discourage ritual washing of the dead

C discourage funeral feasts

C ensure that people who clean up and prepare the body in the hospital do not prepare food or serve food

C ensure very careful hand-washing with soap and clean water before food is handled.

INEFFECTIVE CONTROL MEASURES

The measures described in this section do not stop the spread of epidemics. However, pressure to use them may come from a frightened public or from uninformed officials. When ineffective measures are carried out, it gives a *false* sense of security, and wastes time and resources that could be used on efforts that are truly effective.

Vaccination

No vaccine currently exists for *Shigella dysenteriae* type 1. The old parenteral cholera vaccine is not recommended. Two new oral cholera vaccines offer high-level short-term protection; they are available for use in travellers in a few countries, but are not yet recommended for large scale public health use.

Trade and travel restrictions (*cordon sanitaire*)

It is not possible to detect and isolate all infected travellers, most of whom have no signs of illness. A *cordon sanitaire* requires setting up check-posts and restricting movement. This diverts substantial resources from more effective control measures. Trade and travel restrictions disrupt the economy of an area, which may encourage suppressing information about outbreaks.

Mass chemoprophylaxis for cholera

Mass chemoprophylaxis – treating an entire community with antibiotics – does not limit the spread of cholera. In some places, it contributed to making the *vibrio* resistant to antibiotics, which deprives severely ill patients of a valuable treatment.

Selective chemoprophylaxis is usually not recommended. It is justified only if surveillance shows that the secondary attack rate in the community is high (an average of at least one household member in five becoming ill after the first case occurs in the household). If selective chemoprophylaxis is used, it should be given to all close contacts as soon as possible after the initial case is recognized. The prophylactic dose of antibiotics is the same as the therapeutic dose. Doxycycline is preferred because only a single dose is needed.

Antibiotic chemoprophylaxis for dysentery

Giving people antibiotics for dysentery *before* they become ill does not prevent dysentery and worsens the problem of antibiotic resistance. It should *never* be done.

EXERCISE W: HEALTH EDUCATION DRILLS

Group work

In this exercise, the facilitator will ask each of you in turn a short question about health education messages. You should give a brief answer. You may use your health education module (see Annex 3) to find the answers, but the time allowed for each answer is very short.

EXERCISE X: CONTROL MEASURES**Short answer exercise:**

Read the following statements – some are true and some are false.

- If you think the statement is true, write a **T** in front of the statement.
- If you think that it is false, write an **F**.

Example:

T Dysentery can be spread by person-to-person contact.

1. ___ If water looks turbid or cloudy, passing it through a filter eliminates cholera *vibrios*.
2. ___ People who eat food prepared for the funeral of someone who died of cholera can avoid getting cholera by washing their hands *very thoroughly* before eating.
3. ___ Babies' stools should be disposed of in a toilet or latrine, or buried.
4. ___ To make water safe for drinking add 1 drop of chlorine solution to each litre of water.
5. ___ Use treated drinking-water within 24 hours.
6. ___ Detecting all travellers who are infected with cholera is not possible, because most of them do not appear ill.
7. ___ Avoid uncooked food unless it can be peeled or shelled.
8. ___ Although ineffective control measures do not stop an outbreak from spreading, they do no harm, and they show the public that authorities are responding.

Answers to Exercise X:

Answers

- 1 **False** Filtering water does not eliminate cholera vibrios or Shigella. However, cloudy or turbid water may be filtered *before chlorination*. Or it may be boiled vigorously instead of being chlorinated.
- 2 **False** If the *food itself* is contaminated, people who eat it may get sick, no matter how clean their hands are.
- 3 **True**
- 4 **False** You must add 3 drops of chlorine solution to each litre of water.
- 5 **True**
- 6 **True**
- 7 **True**
- 8 **False** Implementing ineffective control measures can cause harm.
 - 1) Mass chemoprophylaxis for cholera, or giving drugs for dysentery to people who are not ill may lead to resistance in the causative organisms. It often means that a more expensive drug must be used in the future.
 - 2) Implementing measures that do not work waste time, effort and money that could be devoted to measures that really save lives.
 - 3) If the public has a *false sense of confidence*, because they believe health authorities are doing something, they may neglect to carry out control measures, such as food and water safety, in their homes and workplaces.

SUMMARY OF CHAPTER ON CONTROL**Identify and carry out effective control measures**

- C Health education messages*
- C Ensure a safe supply of water and store this safely*
- C Ensure food safety for the community and for particular circumstances (infants, food vendors, gatherings)*
- C Washing hands*
- C Environmental sanitation (including disinfection, and safe disposal of bodies)*

Identify and discuss ineffective measures

EXERCISE Y: CASE STUDY

Rivas District outbreak

Read the descriptions and then write *brief* answers to the questions (write key words instead of complete sentences). You may look in your modules, if you need help in answering the questions. Notify the facilitator if you cannot understand a question, and when you have finished. There will be a discussion afterwards.

BACKGROUND

Rivas District has a population of 100 000. About half the people live in Rivas Town, and the others live in scattered villages. The town, which has piped water and sewerage, includes a very crowded neighbourhood, Bayside, where sanitation is poor and there is no trained health worker. Village A is a prosperous farming village, with a well-functioning health centre. Most families have latrines and get water from a borehole. Some people in Village A use shallow wells during the rainy season (October to March) because the wells are closer than the borehole. Village B (about 5000 people) is further from the town, on poor roads, and has a health post staffed by a nurse who has not been trained in case management of diarrhoea in years. The nurse is unhappy at being posted to a rural clinic, and often escapes to town. Water is from shallow wells and the river, and very few families have latrines.

The district shares a border with the neighbouring country, and there is much traffic across the border, especially during the yearly festival in Rivas Town. There was an outbreak of cholera in 1991, but none has been reported since then. The District Medical Officer wants to be sure the district is ready if another outbreak occurs.

Q 1: *What are the main things that should be done to prepare for an outbreak?*

Q 2: *If cholera or epidemic dysentery should appear in the district, are there groups or individuals at high risk of getting ill? Are there any at high risk of dying, once they are ill? Name them and explain why you think they are at risk.*

High risk of getting ill:

High risk of dying once ill:

WEEK OF 9-15 JANUARY

The District Medical Officer has made an Epidemic Preparedness Plan. On Monday, the District Medical Officer gets a phone call from the nurse in village A. The nurse is concerned because a 4-year-old boy from the village presented to the clinic with severe dehydration caused by acute watery diarrhoea, and died while being treated.

Q 3: *Should the District Medical Officer start the Epidemic Preparedness Plan? Explain why or why not.*

The nurse from village A calls again on Tuesday. She has treated the sister, the mother and the father of the boy who died, all for acute watery diarrhoea. She has also treated 6 other people from village A for acute watery diarrhoea. The District Medical Officer asked the nurse to tell him the age of each patient, their degree of dehydration and the outcome of their treatment. These were the cases:

| Patient | Degree of dehydration | Outcome |
|--------------------|-----------------------|-----------|
| 14-year-old sister | severe | recovered |
| 50-year-old father | mild | recovered |
| 45-year-old mother | moderate | recovered |
| 20-year-old woman | severe | recovered |
| 28-year-old man | moderate | recovered |
| 5-year-old boy | severe | recovered |
| 10-month-old girl | severe | recovered |
| 65-year-old man | severe | died |
| 3-year-old boy | mild | recovered |

Q 4: *On the list above, put a check next to each patient who meets the case-definition for reporting a case of cholera.*

Q 5: *Should the District Medical Officer start the Epidemic Preparedness Plan? Explain why or why not.*

The District Medical Officer decided to call a meeting of the Epidemic Control Committee.

Q 6: *What four things do you think the Epidemic Control Committee should do first?*

Q 7: *What are the duties of the Epidemic Control Committee?*

WEEK OF 16-22 JANUARY

There have been more cases of cholera in village A. The nurse and the District Medical Officer investigated the cases in village A. They found that, about a week before the four-year-old became ill, he and his family had attended the funeral in village B of a man who died of diarrhoea. The District Medical Officer checked the records, and found that the nurse posted to village B had not sent in any reports for two months.

Q 8: *What should the District Medical Officer do?*

Q 9: *What control measures should NOT be carried out?*

WEEK OF 23-29 JANUARY

The District Medical Officer receives a laboratory report that confirms cholera.

The Rivas Epidemic Control Committee decides to send a Mobile Control Team to village B to open a Temporary Treatment Centre.

Q 10: What should the team look for when choosing a site for the Temporary Treatment Centre?

When they arrived in village B, the Mobile Control Team found that cases that met the cholera case-definition had been occurring there since before the first cases in village A. The first cases in village A happened in the week of 9-15 January. The team made this table:

| Village B | 2-8 Jan | 9-15 Jan | 16-22 Jan | 23-29 Jan |
|-----------|---------|----------|-----------|-----------|
| Cases | 15 | 50 | 65 | 51 |
| Deaths | 3 | 5 | 3 | 0.00 |

*Q 11: In what week was there the highest number of deaths?
In what week did patients with suspected cholera have the greatest risk of dying?*

Q 12: How could the deaths have been prevented?

Cholera has arrived in Rivas Town and is spreading in the crowded Bayside neighbourhood. The town officials urge the District Medical Officer not to say there is an outbreak, because the town's yearly festival is only two weeks away, and they fear that people will not come when there is news of an outbreak.

Q 13: What should the District Medical Officer do?

The epidemic has declined in villages A and B, but continues in the town. Water testing has shown that the town's piped water is not sufficiently chlorinated. An environmental health technician also discovered that people in Bayside area had dug holes down to the water mains and pierced the mains. This created little "wells" from which they got water. It also allowed contamination into the water mains.

Q 14: What should be done?

Teams were sent to Bayside to look for patients and to educate the community there on prevention measures. These are the problems that the team found:

- a) the residents could not afford soap
- b) the residents could not afford the fuel needed to boil their water
- c) men who worked far from home usually carried a home-cooked lunch with them to work, and ate the lunch 6-8 hours after it had been cooked.

Q 15: What advice should the team give to solve each problem?

- a) (soap)

- b) (fuel needed to boil the water)

- c) (home-cooked lunch eaten 6-8 hours after it had been cooked).

WEEK OF 6-12 FEBRUARY

The District Medical Officer did send notification of the urban outbreak of cholera, and began an intensive health education campaign. Many people came to the festival, although fewer than in the past. Many visitors arrived from the neighbouring country.

Q 16: What precautions should be observed to safeguard the health of the people who attend the festival?

Health officials in the neighbouring country got news of the cholera outbreak the day before the festival ended. They read about it in the newspaper and immediately ordered border guards to screen all returning travellers for signs of diarrhoea, and to isolate those who were ill.

Q 17: Will this keep the outbreak from spreading? Explain your answer.

WEEK OF 13-19 FEBRUARY

The outbreak ended.

Q 18: What should the District Medical Officer and the communities involved do now?

| |
|---|
| Tell the facilitator when you have finished and are ready for the discussion |
|---|

ANNEXES

Annex 1: Cholera Treatment Supplies per Population
(0.2% of the population expected to fall ill initially)

How to estimate the initial amount of supplies needed for a cholera outbreak (0.2% ill initially). The table below gives you an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area to the nearest 5000. You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the “10 000” and “5000” columns to those in the “20 000” column). Write the amount needed at your health facility in the empty column on the right.

| ITEM | Population (+ numbers expected to fall ill) | | | | | | Your area |
|---|---|--------|--------|--------|--------|---------|-----------|
| | 5 000 | 10 000 | 15 000 | 20 000 | 50 000 | 100 000 | |
| | (10) | (20) | (30) | (40) | (100) | (200) | |
| Rehydration supplies | | | | | | | |
| ORS packets (for 1 litre each) | 65 | 130 | 195 | 260 | 650 | 1 300 | |
| Nasogastric tubes (adults) 5.3/3.5 mm (16 Flack) 50 cm | 1 | 1 | 1 | 2 | 3 | 6 | |
| Nasogastric tubes (children) | 1 | 1 | 1 | 2 | 3 | 6 | |
| Ringer's lactate bags, 1 litre, with giving sets | 12 | 24 | 36 | 48 | 120 | 240 | |
| Scalp vein sets | 2 | 3 | 4 | 5 | 10 | 20 | |
| Antibiotics | | | | | | | |
| Tetracycline caps., 250 mg (adults) | 48 | 96 | 144 | 192 | 480 | 960 | |
| Doxycycline, 100 mg (adults) | 6 | 12 | 18 | 24 | 60 | 120 | |
| TMP 20 mg + SMX 100 mg tablets (children) | 30 | 60 | 90 | 120 | 300 | 600 | |
| Other treatment supplies | | | | | | | |
| Large water dispensers with tap (marked at 5-10 litres) | 1 | 1 | 1 | 2 | 2 | 4 | |
| 1 litre bottles for ORS solution | 2 | 4 | 6 | 12 | 20 | 40 | |
| 0.5 litre bottles for ORS solution | 2 | 4 | 6 | 12 | 20 | 20 | |
| Tumblers, 200 ml | 4 | 8 | 12 | 16 | 40 | 80 | |
| Teaspoons | 2 | 4 | 6 | 8 | 20 | 40 | |
| Cotton wool, kg | ½ | 1 | 1½ | 2 | 5 | 10 | |
| Adhesive tape, reels | 1 | 1 | 1 | 2 | 3 | 6 | |

Annex 2: Dysentery treatment supplies per Population

(0.2% of the population expected to fall ill initially)

How to estimate the amount of supplies needed for a Dysentery outbreak (0.2% ill initially). The table below gives you an estimate of the amount of supplies you will need according to the number of people in your area. To find the amounts needed for each item, look in the column under the approximate population of your catchment area to the nearest 5000. You may add several columns (e.g. if your health facility serves 35 000 people, add the amounts in the "10 000" and "5000" columns to those in the "20 000" column). Write the amount needed at your health facility in the empty column on the right.

| ITEM | Population (+ numbers expected to fall ill) | | | | | | Your area |
|--|---|--------|--------|--------|--------|---------|-----------|
| | 5 000 | 10 000 | 15 000 | 20 000 | 50 000 | 100 000 | |
| | (10) | (20) | (30) | (40) | (100) | (200) | |
| Rehydration supplies | | | | | | | |
| ORS packets (for 1 litre each) | 10 | 20 | 30 | 40 | 100 | 200 | |
| Ringer's lactate bags, 1 litre, with giving sets | 2 | 4 | 6 | 8 | 20 | 40 | |
| Scalp vein sets | 1 | 1 | 2 | 2 | 5 | 10 | |
| Antibiotics | | | | | | | |
| Nalixidic acid, 1 g (adults) | 160 | 320 | 480 | 640 | 1600 | 3200 | |
| Nalixidic acid, 1 g (children) | 40 | 80 | 120 | 160 | 400 | 120 | |
| TMP 20 mg + SMX 100 mg tablets (children) | 30 | 60 | 90 | 120 | 300 | 600 | |
| Other treatment supplies | | | | | | | |
| Large water dispensers with tap (marked at 5-10 litres) | 1 | 1 | 1 | 1 | 1 | 2 | |
| 1 litre bottles for ORS solution | 1 | 1 | 2 | 2 | 5 | 10 | |
| 0.5 litre bottles for ORS solution | 1 | 1 | 2 | 2 | 5 | 10 | |
| Tumblers, 200 ml | 1 | 2 | 3 | 4 | 10 | 20 | |
| Teaspoons | 1 | 1 | 2 | 2 | 5 | 10 | |
| Cotton wool, kg | ½ | 1 | 1½ | 2 | 5 | 10 | |
| Adhesive tape, reels | 1 | 1 | 1 | 2 | 3 | 6 | |
| Hand soap, kg | 2 | 4 | 6 | 8 | 20 | 40 | |
| Boxes of soap for washing clothes | 3 | 6 | 9 | 12 | 30 | 60 | |
| 1-litre bottle of cleaning solution (2% chlorine or 1-2% phenol) | 1 | 1 | 1 | 1 | 2 | 4 | |

Annex 3: Health education messages

Three simple rules for preventing cholera and dysentery

1. Boil or chlorinate your drinking-water.
2. Cook your food.
3. Wash your hands.

Are you protected from cholera and dysentery? Drink only safe water

Is your drinking-water boiled or treated?

Even if it looks clean, water can contain cholera and dysentery germs.

Water for drinking can be made safe in two ways:

- ! *Boil* it to kill cholera and dysentery germs; bring water to a boil, and keep it boiling for 1 minute
- ! *Chlorine* kills cholera and dysentery germs; use 3 drops of *chlorine solution* for each litre of water, mix well, and leave it for half an hour before drinking.

KEEP IT CLEAN: BOIL OR CHLORINATE YOUR DRINKING-WATER

**Are you protected from cholera and dysentery?
Is your drinking-water stored safely?**

Clean water can become contaminated again if it is not stored safely.

Store drinking-water in a clean container with a small opening or a cover.
Use it within 24 hours.

Keep the water out of the reach of children and animals.

Pour water from the container – do not dip a cup into the container.

KEEP IT CLEAN: STORE YOUR DRINKING-WATER SAFELY

**Are you protected from cholera and dysentery?
Do you prepare food safely?**

Cooking kills cholera and dysentery germs

- ! Thoroughly cook all meats, fish and vegetables
- ! Eat them while they are hot.

Washing protects from cholera and dysentery

- ! Wash your *hands* before preparing or serving food.
- ! Wash your *dishes and utensils* with soap and water
- ! Wash your *cutting board* especially well with soap and water.

Peeling protects from cholera and dysentery

- ! Eat only fruits that have been freshly peeled, such as oranges and bananas

KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT!

**Are you protected from cholera and dysentery?
Do you wash your hands?**

The germs that cause cholera and dysentery are invisible. They can be carried on your hands without your knowing it.

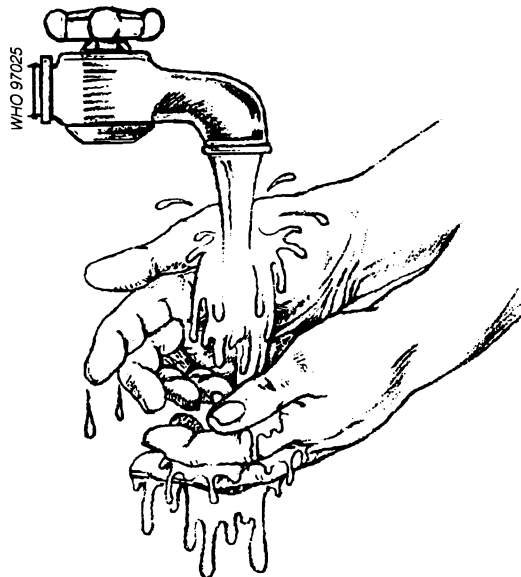
Always wash your hands:

- after you use the toilet or latrine, or clean up your children
- before you prepare or serve food
- before you eat and before you feed your children.

This is the best way to wash your hands:

- Always use soap or ash
- Use plenty of clean water
- Wash all parts of your hands – front, back, between the fingers, under the nails.

KEEP IT CLEAN: WASH YOUR HANDS



**Are you protected from cholera and dysentery?
Do you use a toilet or latrine?**

Cholera and dysentery germs live in stools. Even a person who is healthy might have the germs in the stools.

- ! *Always* use a toilet or latrine. If you do not have one, build one
- ! Keep the toilet or latrine clean
- ! Dispose of *babies' stools* in the toilet or latrine (or bury them)
- ! *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

**Are you prepared for cholera?
What should you do if you get cholera?**

Cholera can be treated.

The biggest danger of cholera is the loss of water from the body.
Do not panic, but act *quickly*.

- ! Drink Oral rehydration Solution (ORS) mixed with safe water (boiled or treated)
- ! Go immediately to the health centre. Continue drinking as you go.

FIND OUT NOW WHERE YOU CAN GET ORS
FIND OUT NOW HOW TO MIX ORS

Annex 4: Cholera case definition for surveillance and reporting

A case definition is a standard description of a disease. When *all* health workers use the *same* description of a disease, counting the number of cases of the disease that occur is easier, and detecting outbreaks is easier. The case-definitions used in this course are as follows:

Diarrhoea: 3 or more loose or watery stools in a day (24 hours).

Acute diarrhoea: an episode of diarrhoea that lasts less than 2 weeks

Persistent diarrhoea: an episode of diarrhoea that lasts 2 weeks or longer

Dysentery: diarrhoea with visible blood in the stool

The case definition used for reporting a cholera outbreak is as follows:

Suspect a cholera outbreak if:

C a patient older than 5 years develops severe dehydration or dies of acute watery diarrhoea; or

C there is a sudden increase in the daily number of patients with acute watery diarrhoea, especially the patients who pass the “rice water stools” typical of cholera

Suspect an outbreak of dysentery if:

C there is a sudden increase in the daily number of patients with diarrhoea and visible blood in the stools

Annex 5: Chlorine levels in treated water

Check chlorine levels in treated water

Environmental health experts can test water using DPD (diethyl-p-phenylenediamine) kits to see if the levels of residual chlorine are high enough so that the water is safe for drinking. These are the recommended levels for an area where there is an epidemic of cholera or dysentery.

Recommended chlorine levels in water distribution systems in areas affected by cholera or epidemic dysentery

The minimum levels of free residual chlorine necessary for safe water are:

| | | |
|---|--|--------------------|
| C | at all sampling points in a piped water system | 0.5 mg/litre |
| C | at stand posts in systems with stand posts | 1.0 mg/litre |
| C | in tanker trucks, at filling | 2.0 mg/litre |
| C | in water treated with stock solution of chlorine | 0.2 - 0.5 mg/litre |

Annex 6: How to interpret and use the laboratory results

In most countries, the programme for control of diarrhoeal diseases (CDD) recommends antibiotics for the treatment of dysentery, cholera and epidemic dysentery. Because antibiotic resistance is a serious problem (particularly for *Shigella dysenteriae* type 1 dysentery), the decision about which antibiotic to use is only made at the national level, or sometimes at the provincial level. At those levels, public health officials base their decision on the results of antimicrobial susceptibility received from *many* hospitals and clinics, and can decide what is best for the country or region.

Use the laboratory results to confirm an outbreak. At the health centre and small hospital level, health workers use the results of laboratory tests to *confirm whether or not there is an outbreak* of cholera or of epidemic dysentery in their area.

The laboratory report. The report form that the laboratory returns to the health centre may look different from one laboratory to another. Laboratory reports usually contain the following information:

- information that identifies the specimen (name of patient, the health facility, a number)
- the date the specimen was obtained, the date the specimen was received at the laboratory, and the date of the report
- the source of the specimen (blood, stool, CSF, exudate, urine, etc)
- the names of any microorganisms isolated
- whether the organism is susceptible or resistant to certain antibiotics. Depending on local circumstances, laboratories may test for susceptibility to those antibiotics most commonly used in the area, or they may use pre-packed kits for testing. A pre-packed kit may not include all the antibiotics which might be used, or may include extra antibiotics.

Confirmation of an outbreak of cholera. If the report lists “cholera” or specifies “*Vibrio cholerae* O1” or “*Vibrio cholerae* O139”, then an outbreak of cholera has been confirmed.

Confirmation of an outbreak of epidemic dysentery. A laboratory report of *Shigella dysenteriae* type 1 confirms an outbreak of epidemic dysentery¹. Reports of other *Shigella* species (*S. flexneri*, *S. sonnei*, *S. boydii*) do *not* confirm an outbreak of epidemic dysentery, because only *Shigella dysenteriae* type 1 causes large and prolonged outbreaks. Because *Shigella dysenteriae* type 1 is difficult to isolate, you may receive a result that says “No growth”, or “No organism isolated”.

Do **not** change the antibiotic used for *Shigella dysenteriae* type 1 *on the basis of a laboratory report*. Even if the laboratory sends information on antibiotic susceptibility, health workers at health centres and small hospitals must not change the recommended antibiotics. In addition, *Shigella dysenteriae* type 1 may be sensitive to certain antimicrobials in the laboratory, yet not be effective in people. When an outbreak has been confirmed, health workers should use the antibiotics recommended by the Control of Diarrhoeal Diseases Programme.

¹ Another organism that can cause outbreaks of dysentery is *Escherichia coli* O157. Outbreaks of *E. coli* O157 are less common than outbreaks due to *Shigella dysenteriae* type 1. If you receive a report of *E. coli* O157, inform your supervisor and do not give antibiotics based on the sensitivities on the laboratory report. Serious complications may occur after illness with *E. coli* O157, and the case management is different from that of *Shigella dysenteriae* type 1.

Annex 7: Mobile control teams

A mobile team may be sent to help when there is an outbreak of cholera (and sometimes of epidemic dysentery) in an area where the local health services have no experience in controlling the disease, or where there are too few health workers or where there are not enough supplies.

Members of the Team

The Mobile Control Team includes one or more of the following types of health workers: clinically trained health workers (doctors, nurses, assistants), experts in environmental health and sanitation, health educators and various support personnel (driver, guards, helpers, etc.). There may also be a laboratory expert, especially for the early phases of the outbreak.

The members of the team should be trained to:

- C establish and operate Temporary Treatment Centres
- C provide on-the-spot training in case management for local health staff
- C supervise environmental sanitation measures and disinfection
- C carry out public education and give information to the public to prevent panic
- C arrange for a study to find out how the disease is being transmitted
- C collect stool and other specimens for submission to the laboratory
- C provide logistical support, such as delivery of supplies, to health facilities and laboratories.

The members of the team should be selected *before* an epidemic; the equipment and supplies and logistical support should also be identified before an epidemic.

After getting any training they need to become up to date, the members should meet periodically to review their responsibilities and to be sure that they will be able to respond quickly when needed.

Annex 8: Food rules

(Adapted from *WHO golden rules for food preparation*)

- 1. Cook foods thoroughly** – thorough cooking will kill the pathogens, but remember that the temperature of *all parts of the food* must reach at least 70°C. Do not eat uncooked foods, unless they can be peeled or shelled.
- 2. Eat cooked foods immediately** — when cooked foods cool to room temperature, microbes begin to grow. The longer the wait, the greater the risk. Eat cooked foods just as they come off the heat.
- 3. Store cooked foods carefully** – if you must prepare foods in advance or want to keep leftovers, or when there is delay between cooking and eating food (as with restaurants or food vendors), store foods in a refrigerator or ice box below 10° C, or keep them hot at 60° C or higher. This is vital if you plan to store food for more than 4 hours. Foods that have been stored must be thoroughly reheated before eating. *Food for infants must be eaten immediately after being prepared, and not stored at all.*
- 4. Reheat cooked foods thoroughly** — reheating foods thoroughly is the best protection against bacteria that may have grown during storage (low temperatures slow the growth of bacteria, but do not kill them). Reheating means that *all parts of the food* reach at least 70°C. Eat food while it is still hot.
- 5. Avoid contact between raw and cooked foods** — safely cooked food can become contaminated through even the slightest contact with raw food. This contamination can be direct (raw food touches cooked food), or indirect (cooked food is put on a cutting board where raw food was cut, or cut with the same knife).
- 6. Wash hands repeatedly** — wash your hands thoroughly before you start to prepare food and after every interruption (especially if you use the toilet, or clean up a baby). Wash your hands after preparing raw foods, such as fish or shellfish. If you have an infection on your hand, bandage or cover it before preparing food. Household pets (dogs, cats, birds, turtles) can carry dangerous microbes that pass from your hands into food.
- 7. Keep all kitchen surfaces clean** — foods are easily contaminated, and every surface used for food preparation must be kept absolutely clean. Every food scrap, crumb or spot is a potential source of bacteria. Cloths used for washing or drying food preparation surfaces should be changed every day and boiled. Cloths used for cleaning the floor should be washed every day.
- 8. Use safe water** — safe water is just as important for preparing food as for drinking. If there is doubt, bring water to a strong boil before adding it to food that will not be cooked further, or for making ice. Be especially careful with water used to prepare meals for infants.
- 9. Protect foods from insects, rodents and other animals** — storing foods in closed containers is your best protection.
- 10. Choose foods processed for safety** — many foods, such as fruits or vegetables, are best in their natural state, but some are safer when processed. For instance, pasteurized milk is preferable to raw milk; lettuce needs thorough washing. For cholera, canned, dried and acid

Annex 9: Ventilated improved pit latrine

A *ventilated improved pit latrine* is a practical means of disposing of human stools and may be a good solution for rural areas. A latrine 2 metres deep with an opening of 1 metre by 1 metre can be used by a family of five for 2-4 years.

Locate the latrine:

- C 30 metres or more from a well or source of drinking-water
- C 6 metres or more from the nearest house, if possible
- C *not* uphill from a water source
- C *not* in marshy soil.

The edges of the pit should be raised above ground level to prevent rain or other water from draining into it. The latrine should have a concrete or wooden slab that reaches the walls of the structure. The slab will be more durable and resistant if it is built of concrete reinforced with steel wires that are at least 8 mm in diameter, and 150 mm apart.

The slabs and floor should be washed daily and disinfected regularly with cresol or bleaching powder.

After the pit is two-thirds full (1.3 metres high), fill it with soil, compact the soil and dig a new latrine.

To keep bad smells and flies to a minimum, improve ventilation with a vertical vent, topped by a fly screen.

