Zimbabwe Cholera Control Guidelines
3rd edition

World Health Organization

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Ministry of Health and Child Welfare
Zimbabwe

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Foreword

Cholera is a preventable disease that is often regarded as a barometer of inadequate access to safe drinking water and sanitation. Deaths due to severe illness and dehydration are unnecessary, regrettable and should be considered unacceptable because simple home remedies like Salt and Sugar Solution (SSS) or the now widely available Oral Rehydration Salts (ORS) can prevent the progression of the disease from mild to severe and to death. Following the unprecedented outbreak of cholera, the use of ORS as a household remedy for treatment of diarrhoea is now promoted.

Community health workers report all diarrhoea cases to health workers. Health workers are then expected to notify all diarrhoea cases to the next level on a weekly basis as part of the Rapid Disease Notification System for purposes of surveillance. This is useful in following up surges of diarrhoea cases both within season and out, thereby enabling the Ministry of Health and Child Welfare to detect outbreaks early and initiate rapid response.

Zimbabwe's Integrated Diseases Surveillance & Response Technical guidelines list Cholera among the diseases that must be reported on a daily basis during epidemics. Due to the virulent nature of the disease, it is necessary to monitor it on a daily basis to be able to prevent avoidable illness and death.

The Ministry of Health and Child Welfare is committed to improving the health of Zimbabweans by reducing morbidity and mortality due to diseases, in this case, cholera. The reduction of cholera morbidity and mortality largely depends on the skills of the health worker in disease surveillance & response, availability of logistics and medical supplies, communication and health promotion to the household level and appropriate case management.

This document provides technical guidance to health providers on how to successfully control cholera.

I am grateful to all who contributed resources and technical guidance for the development of this third edition of the national cholera control guidelines. Experiences from the 2008-2009 cholera outbreak informed the revision of these guidelines.

Brigadier General Dr Gerald Gwinji,
Permanent Secretary

Ministry of Health and Child Welfare

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Acronyms

CFR	Crude Fatality Rate
CTC	Cholera Treatment Centre
CTU	Cholera Treatment Unit
EPR	Emergency Preparedness and Response
HTH	High-Test Hypochlorite
MoHCW	Ministry of Health and Child Welfare
MSF	Médecins Sans Frontières
NTU	Nephelometric Turbidity Unit
ORP	Oral Rehydration Point
ORS	Oral Rehydration Salts
SOP	Standard Operating Procedure
WHO	World Health Organisation

Goal

The goal of these guidelines is to provide standardised public health measures for cholera control in order to contribute to reduction of morbidity and mortality due to cholera.
This document is intended to provide a comprehensive framework for the response to an outbreak of cholera.

The purpose of this framework is to provide guidance on;

- early detection of cases of cholera within the community
- prevention of new cases of cholera through intensive health promotion, environmental health campaigns and by ensuring a safe water supply
- reduction of death due to cholera by setting standard treatment protocols

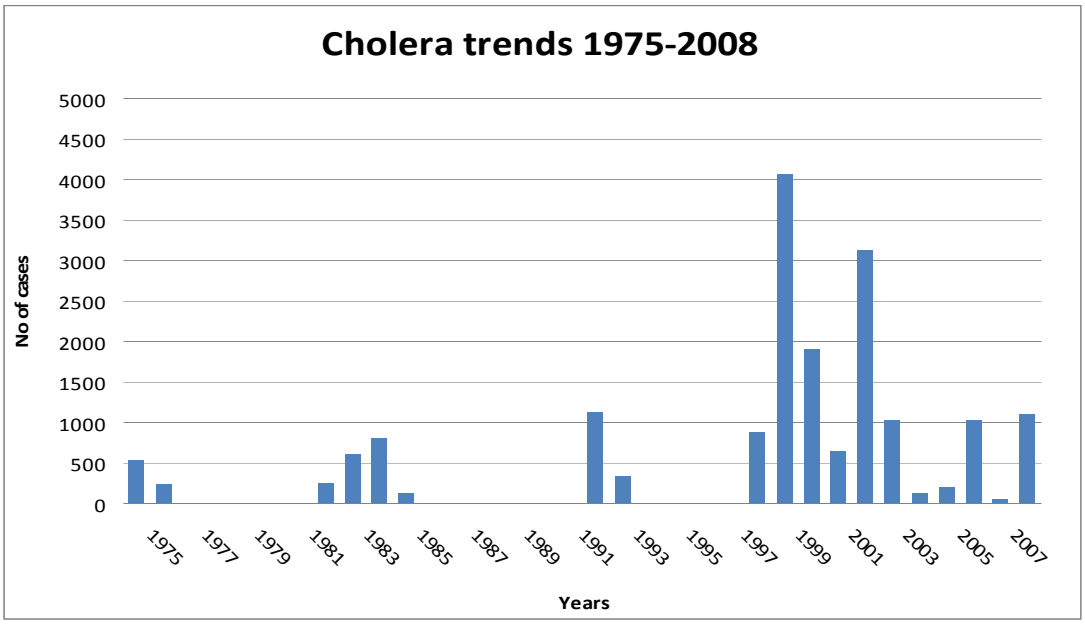
These guidelines are targeted at all health workers who have a responsibility to deal with cholera from national level, the provinces and districts. The health workers at health facilities and cholera treatment centres or units should make these guidelines their primary source of information. These guidelines are also meant for Non Governmental Organisations and other partners supporting cholera responses.

The guidelines should be used to make cholera preparedness and response plans; to carry out those plans during an outbreak and to evaluate the actions taken during the outbreak.

1.0 Introduction

The current seventh pandemic caused by the El Tor biotype of *Vibrio cholerae* O1 began in 1961 in Sulawesi, Indonesia and spread rapidly to other countries in Asia, Europe, Africa and finally to Latin America. The seventh pandemic is still on-going and showing increasing number of cholera cases rather than abating. The first recorded case of cholera in Zimbabwe was in 1972, along the Nyamapanda Border, Mashonaland East Province.

Graph 1: Cholera outbreaks between 1975 and 2008.



Between August 2008 and July 2009, Zimbabwe faced an unprecedented cholera outbreak, which resulted in 98, 592 cases and 4,288 deaths. The cumulative Case Fatality Rate was 4.3%, well above 1%, which is the WHO CFR benchmark.

During the past three decades, intensive research has contributed substantially to the understanding of the epidemiology and clinical management of cholera. It is now known that:

- in more than 80% of cases, cholera may be asymptomatic,
- Of the symptomatic cases, 10 to 20% may progress to severe disease and death, and it may be difficult to distinguish from other types of acute diarrhoeal diseases;
- improved treatment, in most cases by oral rehydration therapy, can reduce cholera case fatality rates to less than 1%;
- in special populations such as internally displaced people, refugees, prisons, schools and high density settings including illegal mining communities, attack rates may be as high as 10 to 15% compared to normal situations where attack rates are usually between one and two percent.
- Mass chemoprophylaxis, and *cordon sanitaire* are ineffective in preventing or controlling outbreaks;

Cholera can be an acute public health problem, with the potential to spread quickly and cause many deaths. Special attention must therefore be given to surveillance,

prevention and control. These guidelines will provide standards for prevention and control of cholera.

2.0 Cholera

Cholera is an acute bacterial enteric disease characterized by sudden onset of profuse watery stool with or without vomiting; in untreated cases it may lead to rapid dehydration, acidosis, circulatory collapse, renal failure and hypoglycemia in children.

Symptomatic cholera usually begins as profuse, watery diarrhoea without fever or abdominal cramps. The stool of cholera patients typically becomes a clear liquid flecked with white mucus, known as "rice-water" stool. It is usually odourless or has a mild fishy smell. Vomiting, which can be severe, and painful leg cramps are common symptoms.

Box 1. Common sources of infection

- Drinking-water that has been contaminated at its source (for example by faecal contaminated surface water entering an incompletely sealed well) or during storage (for example by contact with hands soiled by faeces)
- Ice made from contaminated water.
- Food contaminated during or after preparation
- Fish / Seafood particularly taken from contaminated water and eaten raw or insufficiently cooked.
- Fruit and vegetables particularly taken from contaminated water and eaten raw or insufficiently cooked.
- Fruit and vegetables grown at or near ground level, irrigated with water containing human waste, or "freshened" with contaminated water, and eaten raw

All cases of cholera should be treated immediately. If treatment is delayed or inadequate, death from dehydration and circulatory collapse may follow very shortly.

Only *Vibrio cholerae* serogroup O1 and serogroup O139 are known to cause *epidemics of* cholera. Although *Vibrio cholerae O*139 has not yet been reported in Africa, any population at risk for *Vibrio cholerae O*1 is also at risk for O139.

*Vibrio cholerae O*1 has two biotypes - classical and El Tor. Each biotype has two serotypes - Ogawa and Inaba. The El Tor biotype has caused almost all the recent cholera outbreaks. It causes a higher proportion of asymptomatic infections and survives longer in the environment. It can live in association with certain aquatic plants and animals, making water an important reservoir for infection. The incubation period is usually 1 to 3 days but can range from several hours to 5 days.

Extensive experience has shown that the introduction of cholera into a country cannot be prevented; its spread *within* a country, however, *can* be contained by appropriate control measures.

3.0 Prevention of Cholera

The best means of protection against cholera epidemics are adequate potable water

supplies, sanitation and good personal hygiene.

3.1 Ensuring a safe water supply

Since contaminated water is the usual source of cholera infection, all efforts must be made to provide safe drinking water, as well as safe water for food preparation and hand washing.

a) In urban areas, properly treated drinking water should be made available to the entire population through a piped system, at standpipes. However, during emergencies, water may be provided by tanker trucks.

Box 2 Recommended chlorine levels in water distribution systems in areas affected by cholera

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

- at all sampling points in a piped water system.....0.5 mg/litre
- at standpipes in systems with standpipes .....1.0 mg/litre
- in tanker trucks, at filling .....2.0 mg/litre

Active monitoring is required to ensure that these minimum levels of chlorine are maintained.

b) In rural areas where there is no source of treated water and where water from the wells, protected dug wells, or protected springs is consumed, it must be made safe by boiling or adding a chlorine-releasing chemical such as aquatabs.

Box 3. Making water safe by chlorination

Make a stock solution of chlorine (1% concentration by weight of available chlorine). Add to 1 litre of water:

Product (percent concentration by weight of available chlorine)	**Amount**
Calcium hypochloride (70%)	14 g or
Bleaching powder or chlorinated lime (30%)	33 g or
Sodium hypochlorite (5%)	250 ml or
Sodium hypochlorite (10%)110 ml	

If products with these concentrations of chlorine are not available in the local market, adjust the amount used according to the available concentrations.

Store the stock solution in a cool place in a closed container that is not exposed to light. The stock solution loses effectiveness with time and must be used no later than one month after it has been made.

Use the stock solution to make safe water. Add water to the stock solution to ensure proper mixing:

Water .....added to....., ...Stock solution
10 litres 6 ml
20 litres 12 ml
100 litres 60 ml

Allow the chlorinated water to stand for at least 30 minutes before using it. The residual chlorine level after 30 minutes should be between 0.2 and 0.5 mg/litre.

If the water is turbid (not clear, with a lot of suspended solid matter) filter it before chlorination, or boil it vigorously (as indicated in Box 4) instead of treating it by chlorination

A supply of suitable chemicals for treating water, and narrow-mouthed containers with covers for storing water, are helpful in reducing transmission of cholera within a family.

Household filtration of water can also help to eliminate the Vibrio, but should always be followed by disinfection with chlorine or by boiling.

Boiling is an effective method of water treatment. Chlorination should be recommended mainly in emergency situations. Even when drinking water is safe, infection may still be transmitted by contaminated water used for washing cooking utensils.

Box 4. Making water safe by boiling

To make water safe for drinking and other uses, bring water to a vigorous, rolling boil and keep it boiling for 1 minute. This will kill, or inactivate, *Vibrio cholerae* and most other organisms that cause diarrhoea.

3.2 Environmental Sanitation

Good sanitation can markedly reduce the risk of transmission of *Vibrios.* Poor sanitation may lead to contamination of water sources. Sanitary systems that are appropriate for the local conditions should be constructed with the cooperation of the community.

People will need to be taught how to use latrines, about the dangers of defecating on the ground, or in or near water, and the importance of thorough hand-washing with soap or ash after any contact with excreta. The disposal of children's excreta in latrines needs to be emphasized.

Where large groups of people congregate, for food distributions, agricultural shows, rallies, funerals, religious festivals, etc. particular care must be taken to ensure the safe disposal of human waste and the provision of adequate facilities for hand-washing.

Box 5. Preparing an emergency pit latrine

In an emergency, while a more permanent latrine is being built, a simple pit can be dug as a temporary solution for the disposal of human excreta. It should measure 0.3 x 0.3 metres, have a depth of 0.5 metres, and be at least 30 metres from a well or other source of drinking-water. Where possible, the pit should be at least 6 metres from the nearest house. It should not be located uphill from the water source or dug in marshy soil. The bottom of the pit should never penetrate the ground water table. After each use, a layer of soil should be laid down in the pit. The pit should also be covered each day with a layer of chloride of lime or ash.

3.3 Food safety

Food can be an important vehicle for cholera transmission.

Health promotion activities should be intensified when there is a threat of cholera and should stress the importance of:

- avoiding eating raw food (exception: fruits and vegetables to be thoroughly washed with safe water before consumption);
- cooking food thoroughly;
- eating food while it is still hot, or reheating it thoroughly before eating;
- washing and thoroughly drying all utensils with safe water;
- Keeping cooked food and kitchen utensils separate from uncooked food and

potentially contaminated kitchen utensils); and

- Washing hands thoroughly with soap (or ash) after defecating, or after contact with faecal matter, after changing children's nappies, before preparing or eating food and feeding children.

Street food-vendors and restaurants may pose a special risk during an epidemic. Environmental health workers must be vigilant in inspecting food-handling practices. They should be given the authority to stop street sales or close restaurants when their inspections reveal unsanitary practices. The presence of flies in large numbers indicates poor sanitary conditions, which favour transmission of cholera. Safe and hygienic handling, preparation, storage and serving of food are paramount.

Why food hygiene is important

Good food hygiene is essential to ensure that the food eaten or sold is safe. It will help to protect customers, the reputation of the business, and lead to adherence to the public health law.

Keeping food safe

There are four main ways of preventing food contamination:

- Ensuring food areas are clean
- Ensuring that good standards of personal hygiene are maintained
- Cooking foods thoroughly
- Keeping foods at the right temperature

For more details on food safety see Annex 21..

Personal hygiene

Food can be contaminated during the handling process.

It is important to wash hands during the following critical moments:

- Before handling food
- Before eating
- Before feeding children
- After touching raw food, especially raw meat, poultry and vegetables
- After going to the toilet
- After changing a baby's diaper

The following standard food safety guidelines must be observed at all times:

- Wear clean clothes and if possible an apron when preparing food
- Do not touch face or hair when handling or preparing food

- Cover hair with head covering or net when preparing food
- Cover cuts or sores with clean waterproof dressings
- Wash hands with soap after blowing nose
- Keep persons with diarrhoea and vomiting – or other symptoms of disease away from food preparation areas
- Keep faecal material away from food preparation areas – separate kitchen and toilet areas

Temperature control

Proper cooking kills food poisoning bacteria such as salmonella, campylobacter, E.*coli* O157, *Vibrio cholerae* and other *Vibrio* species. Good temperature control is essential to keep certain foods safe. Products such as prepared ready-to-eat foods, cooked foods, smoked meat or fish, and certain dairy products must, be kept hot or chilled until they are served. If they are not, harmful bacteria could grow or toxins (poison) could form in the food and make the consumer ill.

Chilled food must be kept at or below 8^{o}C (46^{o}C)
Hot food must be kept above 63^{o}C (145^{o}F)

When you cook poultry, pork, minced/chopped meat(for example burgers and sausages) and rolled joints, you should make sure that the centre of the meat reaches a temperature of at least 70^{o}C for two minutes, or an equivalent time/temperature combination . In the absence of a thermometer, for cooked meats and poultry make sure that the juices are clear and no parts of the meat red or pink.

In addition, make sure that cooked food is consumed immediately; do not leave food at room temperature longer than 2 hours, and do not thaw frozen food at room temperature.

Washing hands effectively/properly

To wash hands properly, use clean water and soap (or other means such as wood ashes or dilute bleach). Work up a good lather and make sure you wash your wrists, hands, fingers, thumbs, fingernails, and in between the fingers. Rinse the soap off your hands and dry them thoroughly using a clean towel (not on your clothes or apron) or air dry them.

Alcohol hand rubs may be used to sanitize the hands where water is not readily available. When using an alcohol-based hand rub, apply the product to the palm of one hand and rub hands together. Rub the product over all surfaces of hands and fingers until hands are dry.

For practical hand washing procedures, see Annex 13.

4. Being prepared for a cholera epidemic

In the long term, improvements in the water supply and in sanitation are the best means of preventing cholera. Health officials should provide the necessary advisory service to local

authorities in order to ensure that water and sanitation are a priority in development plans for both urban and rural areas. In an outbreak, however, the best control measures are early detection of cases, appropriate case management and health promotion.

The policy for preparedness in this country places responsibility on everyone to be actively prepared for and limit the effects of an emergency or disaster. The communities' capacity must be built in readiness for emergencies like cholera outbreaks through systematic awareness programs on the hazards of cholera and what to do in case of an outbreak.

In Zimbabwe, management of outbreaks is carried out according to the Public Health Act. The Ministry of Health and Child Welfare has epidemic preparedness and response mechanisms, with emergency preparedness and response committee at all levels of the health delivery system. The EPR committees act as coordinating body for all activities to be conducted in the district or Province in conjunction with all stakeholders. At district level, Rapid Response Teams (RRTs), mainly health experts, are expected to conduct initial investigations and give feedback to the EPR committees. The responsibilities of the EPR committee are listed in Annex 2.

The Civil Protection Unit of the Ministry of Local Government, Rural and Urban Development monitors occurrence of disasters and makes the declaration of emergencies as national disasters.

Epidemic Preparedness and Response Plans

Before an outbreak:

a) Producing and distributing the Epidemic Preparedness and Response Plans.

The following areas should be included when preparing EPR plans.

i) Background information
- Geographical data
- Demographic data
- Socioeconomic and cultural factors
- Epidemiological information

ii) Strategies for preparedness
- Surveillance for epidemic prone diseases
- Laboratory support
- Training of health workers
- Develop and standardise guidelines
- Coordination with various stakeholders
- Contingency stocks of drugs and supplies
- Water quality surveillance
- Participatory Health & Hygiene Education (PHHE)
- Providing other supplies and logistics
- Community mobilization and health promotion
- Establish RRTs and define terms of response

iii) Procedures and responsibilities
- Organizational operating structure
- Monitoring and evaluation
- Activation of EPR plans

- Communication strategy

iv) Cost estimates based on cholera projections

- Human
- Material
- Financial

b) Sensitization of all health staff through orientation and training on cholera epidemic preparedness
c) Training Health Personnel in cholera outbreak management
d) Identify and train community based workers
e) Procurement of stocks of drugs and supplies
f) Strengthening surveillance
g) To mobilize human, material and financial resources for prevention and control
h) Produce and distribute appropriate Health Education materials and relevant guidelines
i) Community mobilization and health promotion

During the Epidemic:

a) Activate the EPR plan
b) Review roles and responsibilities of the EPR Team
c) Coordinate the implementation of the plan of action
d) Mobilize human, material and financial resources for epidemic prevention and control locally
e) Initiate and coordinate community awareness and participation in the control of cholera epidemics
f) Monitor the implementation of outbreak control measures
g) Coordinate assistance for epidemic prevention and control from various partners
h) Reinforce surveillance
i) Monitor resource utilization (drugs, supplies, financial resources and other logistics)
j) Document activities during epidemic and prepare status reports

After the outbreak:

a) Conduct epidemic review and update EPR plans (self evaluation tool – Integrated Disease Surveillance & Response-IDSR)
b) Continue surveillance
c) Prepare epidemic reports
d) Sustain preventive measures - advocate for sustainable safe water and sanitation

The EPR committee must meet regularly whether or not there is an outbreak. As a general rule the team should first compile its EPR plans and should hold monthly meetings. During an epidemic, meetings should be held daily. Surveillance should continue for at least two weeks after the last patient is discharged or dies.

4.1 The Cholera Command and Control Centre (C4) as an epidemic preparedness & response coordination platform

The National Cholera Command and Control Centre (C4) was formed to lead technical coordination unit, chaired by the Director, Epidemiology & Disease Control Department of

the MOHCW and WHO.

The overall objective of the command and control centre is to provide technical guidance and evaluate cholera response activities in close collaboration with the Health, Wash and Logistics clusters. The C4 technical areas include surveillance, case management, water, sanitation and infection control, social mobilization and logistics.

The C4 is intended to:

- Provide strong leadership and coordination for the cholera outbreak response through technical and financial support to the MoHCW and Provincial Health Offices
- Support Health Cluster Coordination and Inter-Cluster Collaboration in epidemic response

Surveillance

- Generate and disseminate weekly epidemiological bulletins, with in-depth data and analysis
- Establish daily contact with each reporting centre in Zimbabwe
- Capture and analyse aggregate data on new admissions and deaths on a daily basis
- Map all cholera treatment centres and units in Zimbabwe
- Map who is doing what where in terms of cholera response

Case management

- Improved facility based management of cholera cases
- Evaluation of case management and infection control practices in CTCs and CTUs.
- Stockpiling of material needed for the management of cholera patients
- Ensuring access to ORS at the community level

Wat san / infection control in health care facilities

- Strengthening water quality surveillance
- Support sanitary inspections and mapping of water facilities
- Conduct assessments of CTCs
- Defining WASH needs in CTCs and CTUs and health facilities
- Mobilizing the necessary resources for a rapid response
- Liaising with WASH cluster partners

Social Mobilization

- Support conduction of KAP surveys identify high-risk human behaviour, socio-cultural beliefs and practices that could facilitate and/or hinder outbreak control measures.
- Liaising with cluster partners to ensure consistency of messages and approaches to the communities with regard to cholera.
- Developing an integrated social mobilization/communication strategy with clearly delineated behavioural goals to reduce the risks in the community.
- Support training community health workers in cholera control

Logistics

- Pre-positioning of strategic stocks in each province to allow rapid mobilization when required and initiate the response.

- support distribution of materials and replenishment of stocks
- Support stock control management

All activities of the C4 will support the Health & WASH Cluster response and be done in close collaboration with the MoHCW and with other clusters involved in the cholera response.

4.2 Training in clinical management of patients with cholera

Provincial and district teams should ensure that medical and paramedical personnel receive intensive and refresher training to ensure that they are familiar with the most effective techniques for management of patients with acute diarrhoea, including cholera. Health workers should be trained in:

- Identification of cholera cases
- Collection of specimens
- Management of cholera cases
- Disease surveillance (including contact tracing)
- Community participation in case management (case identification and management at household level)

Training should be done pre- season, and there should be refresher on-job training during an outbreak.

4.3 Emergency stocks of essential supplies

In order to respond quickly to an epidemic of cholera, and to prevent deaths from the disease, health facilities must have access to adequate quantities of essential supplies, particularly oral rehydration salts, intravenous fluids, appropriate antibiotics, chloride of lime, hypochloride, water dispensers and water treatment tablets.

To prepare for an outbreak, it is essential to maintain Small "buffer stocks" at health facilities, district and provincial levels. An adequate emergency stock should be maintained at national level to replenish stocks at lower levels once exhausted.

For guidance in estimating required essential medical supplies, refer to annex 4, 5 and 6 and cholera control standard operating procedures.

4.4 Surveillance and reporting

An operational disease surveillance system facilitates early detection of cholera.

A cholera outbreak should be suspected if

- a patient older than 5 years develops severe dehydration or dies from acute watery diarrhoea[1]; or
- There is a sudden increase in the daily number of patients with acute watery diarrhoea, especially patients who pass "rice water" stools typical of cholera.

When there is a sudden increase in the number of patients with acute watery diarrhoea,

[1] Cholera does appear in children under 5 years; however, the inclusion of all cases of acute watery diarrhoea in the 2-4 year age group in the reporting of cholera greatly reduces the specificity of reporting. For management of cases of acute watery diarrhoea in an area where there is a cholera epidemic, cholera should be suspected in all patients.

health workers should immediately inform the District office by the fastest possible means. The District Medical Officer should immediately inform the Provincial Medical Officer whilst awaiting laboratory confirmation, so that appropriate control measures can be initiated. The T1 Health Information System form is used to report notifiable (epidemic prone) diseases to the Ministry of Health and Child Welfare. The T1 is in Annex 7.

The information to be reported should include name, address, age and sex of each patient, description of diarrhoea, and date of onset of the illness.

Whenever there is a suspected outbreak, Laboratory and epidemiological investigations should be promptly conducted to determine the cause. The investigations should be carried out by Rapid Response Team (RRT). Members of voluntary organizations, religious leaders, students, and other community members may be encouraged to help in detecting and reporting cases.

5. Early response to the threat of a cholera outbreak

5.1 Notification according to International Health Regulations

Cholera is a notifiable disease according to the Zimbabwe Public Health Act Ch 15:09. Health workers should report suspected cholera cases to the next level immediately using the quickest possible means. Laboratory confirmation should be obtained at the earliest opportunity and also should be reported to the next level.

Box 7. Definition of cholera cases for international reporting

A case of cholera should be suspected when:

- In an area where the cholera is not known to be present, a patient aged 5 years or more develops severe dehydration or dies from acute watery diarrhoea.
- In an area where there is a cholera epidemic, a patient aged 2 years or more develops acute watery diarrhoea, with or without vomiting.

A case of cholera is confirmed when:

- *Vibrio cholerae* is isolated from any patient with diarrhoea.

Once cholera in an area has been confirmed, it is not necessary to confirm all subsequent cases. Treatment or notification of suspected cases of cholera must continue with or without laboratory confirmation of *Vibrio cholerae.* Laboratory surveillance of an epidemic should, should be maintained to monitor antimicrobial sensitivity patterns of the pathogen.

5.2 Rapid Response Teams

A rapid Response Team is team of experts mobilised at short notice to take the lead in conducting the initial investigation of reported and suspected cases or outbreaks to confirm the nature or the event under investigation. It is also the responsibility of the RRT to undertake the preliminary control/containment measures needed to prevent further spread of the disease.

The following are the terms of reference of the team.

- To conduct a preliminary epidemiological investigation aiming at identifying the origin/source, extent and potential for spreading of the event or outbreak under investigation.
- To conduct a clinical examination of the patients affected by the event under investigation.
- To collect relevant samples from the suspected cases for laboratory confirmation. All information related to the samples should be recorded in appropriate forms;
- To dispatch all collected samples and forms to the relevant laboratories for confirmation as quickly as possible;
- To immediately notify the relevant authorities about the findings/results of the investigation and to recommend possible interventions;
- To carry out the preliminary containment and control measures as appropriate according to the findings in the field;
- To prepare a detailed report of the investigation mission;
- To support and coordinate follow-up containment and control measures according to finding/results and the national intervention policies;

Rapid Response Team Core team members:

1. Team Leader
2. Epidemiologist
3. Environmental Health Officer
4. Clinician (Medical Officer)
5. Laboratory Technician/Scientist
6. Health Promotion Officer

Expanded team members:

- Infection Control Nurse/Community Nurse
- Logisticians / Administrators

More detailed information on the functions of Rapid Response Teams may be found in Annex 1.

Responsibilities of the DRRT

The district rapid response team will be responsible for:

- Investigation of rumours/outbreaks and other public health problems
- Proposing appropriate strategies and measures for the rapid containment of the epidemics
- Carrying out initial disease control measures to contain the outbreak
- Preparing detailed investigation report
- Contributing to the post mortem evaluation of the outbreak response.

5.3 Steps by Step Management of the Outbreak

- Contact the next level immediately by telephone, fax, e-mail or any other means possible. Written documentation can be followed later.
- Set up cholera treatment centres (CTCs/ CTUs) as soon as the need arises.
- Estimate the cost to control the outbreak control by opening separate registers for mileage, provisions for supplies, travel and subsistence.
- Daily meetings to review on activities of the day and address the problems from treatment centre to district level.
- Daily updates by DHE to Civil Protection Unit
- All CTCs/ CTUs should discuss and update the line-list and report to the next level by the earliest possible time.
- Districts should update the Province who in turn update the National level on a daily basis
- Daily assessment of the capacity to cope with the outbreak
- Activate and reinforce local surveillance teams (village health workers, community based contraceptive distributors, the traditional leaders, councillors, school health officer and others)
- Follow up all contacts and suspected cases
- Each treatment CTC/CTU must have at least one motorcycle and/or a vehicle
- Identify extra personnel and areas of need.
- Provide on-the-spot training in case management for local health staff
- Supervise appropriate environmental sanitary measures and disinfection;
- Carry out health education activities and disseminate information to the public to prevent panic.
- Arrange for an epidemiological study to establish, if possible, the mode of disease transmission involved in the outbreak.
- Collect stool and environmental specimens, including suspected foods, for submission to a bacteriology laboratory
- Provide the required emergency logistic support, such as delivery of supplies to health facilities and laboratories.

Studies carried out in Zimbabwe have shown that the main risk factors are:

- Attending a gathering especially funerals
- Handling a corpse of a cholera death
- Communal hand washing
- Use of wide-opened water storage containers
- Being a member of the apostolic faith religion
- Not using soap to wash hands
- Use of water from an unprotected source
- Not using a latrine / toilet
- Poor knowledge of cholera

However, few studies have been done on the role of food in cholera transmission. There is a copy of a questionnaire for investigation adapted from Epi info 2002 (Renshwana), which is attached in Annex 20.

5.4 Emergency treatment centres

Cholera can be treated using simple and effective methods, mainly rehydration therapy. If treatment is within the immediate reach of most patients many deaths can be prevented.
Most cases can be treated in existing health centres if rehydration materials, that is oral rehydration salts and intravenous fluid, and antibiotics are available. Health workers should be trained in the appropriate management of cholera.
If appropriate facilities are unavailable or are far away; or if there are too many cases to be handled by existing facilities, it will be necessary to establish emergency treatment facilities in affected communities. Temporary facilities can be established in tents, schools (if they are

closed) and other suitable buildings.
These facilities are set up to provide a rapid and efficient treatment for a large number of patients. Furthermore, while it is advisable to restrict contact between patients and the surrounding community to a minimum. It is not necessary to apply strict isolation measures, such as face masks, gloves, or special clothing for health care staff and visiting family members. As in any unit treating patients with a communicable disease, it is important to have convenient hand-washing facilities for people working with and visiting cholera patients. Disinfection and safe disposal of excreta and vomits is essential.

5.5 Setting up a camp

5.5.1 Site management

There are different recommendations for different situations/circumstances:

In urban settings and refugee camps:
1 CTC + several Oral Rehydration Points (ORPs)

Ideally the CTC should be located inside the existing hospital premises but clearly separated and isolated from the other departments to avoid spread of infection of non-cholera patients. If the hospital premises are not suitable, another site must be found.
In urban/camp settings, It is preferable to have one single CTC and several ORPs rather than setting up multiple CTCs, thereby increasing potential sources of infection.

When affected areas are too far from the CTC, access can become a problem. Ambulances can be provided for referral, or a CTU may be established as an intermediate structure. Use of taxis/buses should be discouraged given the high contamination risk during the journey.

In rural settings:
Establish Cholera Treatment Units (CTU)

The CTU should be located inside the health facility, or close to it. If this is not possible, other existing structures may be used. CTUs may paralyse routine health services as adequate case management is labour-intensive and other health services may suffer from staff shortage. In areas that are far from any treatment facility, it may be possible to decentralise the CTU to the level of the affected villages.

Oral rehydration Points (ORPs)
ORS points have two objectives: to treat patients, and to screen off and refer severely dehydrated patients to CTC/CTU(s). They reduce pressure on overburdened CTCs or CTUs.
They can be decentralised to the community level. The community health worker should receive quick training and regular supplies, to be able to achieve given objectives.

5.5.2. Design of a CTC

Selection criteria

When establishing a cholera treatment centres, the following should be considered when selecting a site:

- Proximity to the affected area.
- Easy accessibility for patients and supplies.
- Protected from winds (there should be wind breaks)
- Adequate space.
- Compatibility with adjacent existing structures and activities
- Availability of adequate potable/safe water supply within a minimum distance to avoid contamination.
- Good drainage from the site
- Provision of waste management facilities (clinical and general waste)
- Availability of sanitary facilities (temporary)
- Provision for extension of CTC (basing on estimation given by epidemiologist)

Setting up a temporary cholera treatment camp

In setting up a cholera camp, you can use an existing building or set up tents. It is important to consider safety of patients and ventilation as high temperatures contribute to dehydration of the patients.
The cholera camp should operate 24 hours a day independently of the other health facilities and therefore the necessary staff has to be recruited. It should be supplied with the necessary medical material specifically for the centre. An enclosure or other form of acceptable screen should be provided around the cholera camp. The various workstations should be clearly labelled and directions provided.

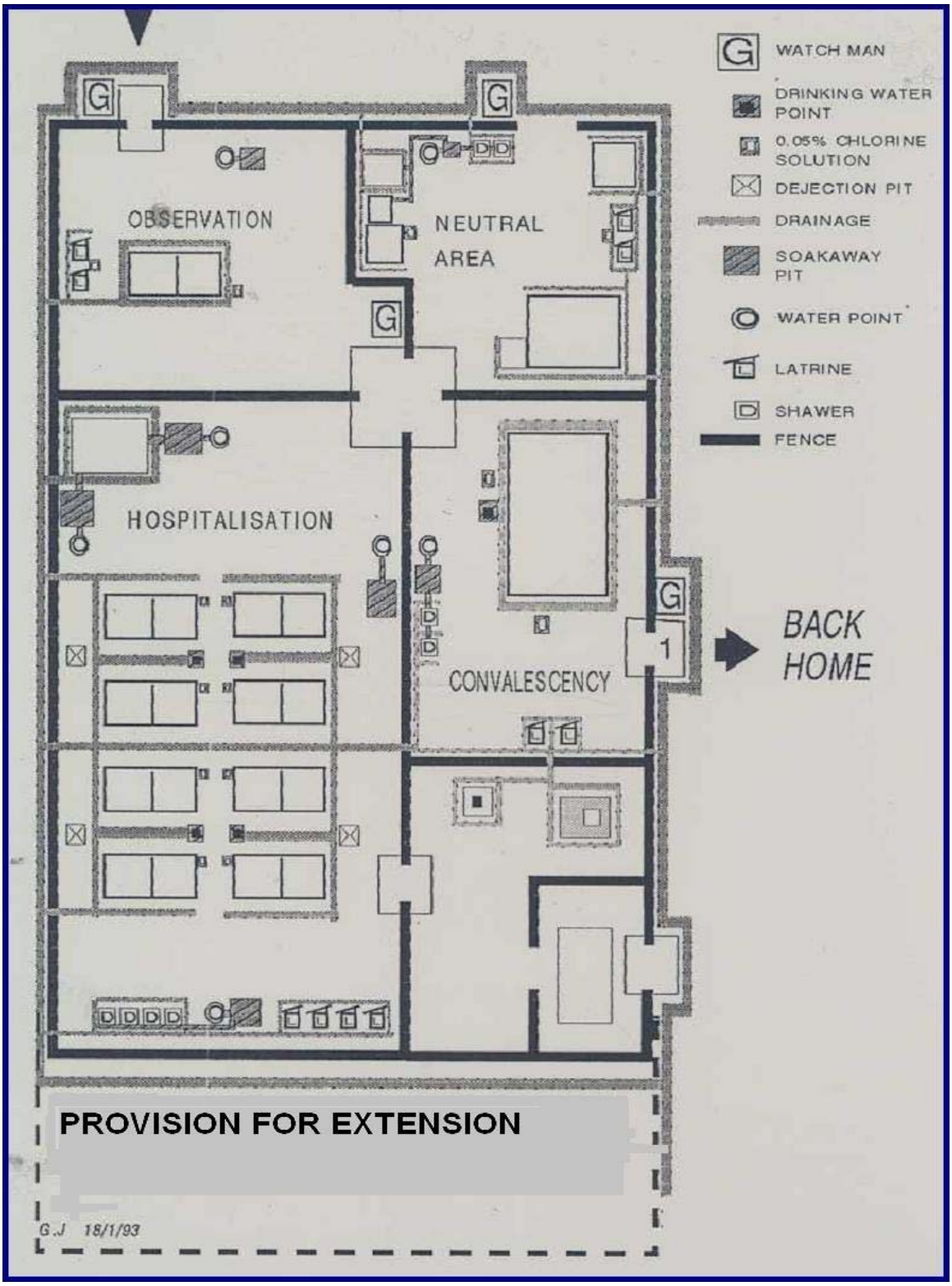
The CTC must be a "closed system" where contamination is introduced through patients, and must be destroyed inside the structure. Under no circumstances should any contamination come out (through patients, water, material, solid and liquid waste etc.).

General rules for a good design:

- Strict necessary movement for staff and patient
- Each zone is a "closed box"
- Systematic disinfection between zones
- Discipline and mutual control for the patient, attendant and staff on hygiene

Good infection control means anything coming out is free of contamination.

The diagram below is an example of a big cholera treatment centre.



Source: MSF Cholera control guidelines (2004)

SECTION 1: Triage and observation

- Patients are examined by a medical person for screening. If cholera, admit; otherwise send to normal dispensary.
- Patients are admitted with 1 attendant (caregiver) if necessary.
- Patients who are admitted are registered in the cholera line list.
- A foot bath should be provided at the entrance.
- Triage and observation can share the same facility
- Toilets and water should be easily accessible for patients.
- Shower facilities should be provided for the patients.
- A disinfection area should be provided for the transporting vehicles and contaminated articles for the patients.
- Tables, chairs, water containers fitted with taps, refuse receptacles should be provided in these areas.
- Provision of safe water
- Establish an ORP corner

SECTION 2: Admissions area

Patients with severe dehydration and/or uncontrollable vomiting must be hospitalised for immediate rehydration.

Each patient lies on a Cholera bed with 1 bucket for stool collection underneath the hole in the bed and 1 bucket for vomit besides the bed. The following should be put in place or provided in the admissions area;

- Separate rooms/tents for males and females where possible.
- Separate rooms for children, the old and pregnant women as risk of abortion increases with cholera
- A foot bath and hand washing facilities (with disinfectant) at the entrance
- Provision for disinfection of soiled linen and clothing.
- Patients should have access to toilets and washing facilities (with disinfectant) or showers (should be provided where possible).
- Cholera beds with receiving buckets, buckets for vomitous and water containers for patients.
- Tables and chairs for staff
- Refuse receptacles
- Patients should be screened by medical staff and categorized according to their status.

SECTION 3: A Convalescence/recovery areas

The convalescence or recovery area is meant for oral rehydration after hospitalisation when less surveillance is required. Patients can stay on mats or benches, as in the observation area. The patients who are no longer vomiting or have diarrhoea and requiring less medical attention can be put in this ward.

- Separate rooms/tents should be provided for males and females.

- A foot bath, hand wash facilities should be provided at the entrance and one for patients.
- Water containers with taps, chairs, tables, ORS bottles are provided in this area.
- Oral rehydration solutions are provided in this area.
- Food is also provided if the patient can start to eat

SECTION 4: A neutral zone

The following sections must be located in a neutral zone free from any contamination; , administration area, rest area, changing room for staff (including showers, toilets), pharmacy and logistic stores, water storage, preparation of chlorine solutions, kitchen,
Logistic store and pharmacy must be organized to **ensure at least 7 days sufficiency**. In case of reduced access/security constraints, stocks should be increased **to avoid any shortage**.

Store rooms

Separate store rooms should be identified for food provisions, drugs and medical supplies

Kitchen

- Should be located away from dirty areas.
- Hand washing facilities fitted with taps or other acceptable dispensing methods should be provided.
- Fly baits should be provided at strategic points.
- Tents should not be used as kitchens
- Provide fire protection facilities.
- Provide safe water for use in the kitchen

SECTION 5: Sanitation

- 50 litres of safe (chlorinated) water is needed per patient per day**. (This includes needs for drinking water, food, hygiene of the patient and the caregiver**
- Recommended latrines should be provided. (1 squat hole to 25 clients) for male and female, including for staff.
- Maintenance schedules should be provided for latrine cleaning.
- Waste generated at the camp should be treated as infectious waste.
- The waste should be decontaminated before disposal and incinerated at the end of each day and when appropriate.
- Label and clearly differentiate each container (drinking water, ORS, chlorine solutions).
- 0.05% chlorine for hand washing, dish rinsing and bathing of soiled patients, 0.2% chlorine for disinfecting floors, beds, clothes and footbaths, and 2% for disinfecting of vomit, faeces and corpses (see further section on chlorination)
- Provisions for washing soiled linen should be put in place

Important remark:
High temperature in tents will encourage patient to come out of the tents, and might even encourage them to go back home before treatment is finished, leading to relapse and

potential contamination of the environment. Tents should be located under safe cool appropriate environments.

SECTION 6: Mortuary

A temporary mortuary within the CTC facilities, but outside treatment area should be provided. For burial and corpse handling, see specific chapter. Removal of the corpse should be done through a separate exit.

Human resources

The various cadres operating at the CTC should be assigned specific roles and responsibilities

Disinfection of patient's bedding and clothing:

- Safe clothes washing facilities, laundry
- Blanket and linen disinfection
- Presence of cholera bed
- Cleaning of beds

Security:

- Fences to avoid unwanted visitors.
- Security guard for information and patient flow control
- Protection of stocks (food, drugs, supplies)

Health education:

- Inside the CTU and at patient's home by disinfection teams if part of the strategy. If patient are admitted in a CTC, we can reasonably suspect a lack of hygiene, or lack of information on hygiene.
- It is advised to organise information session for each patient / ward on health education.

Each staff should receive a clear job description on their responsibilities. A duty roster to ensure sufficient staff and its monitoring must be in place.

5.5.3 Infection control technique, water and sanitation

Chlorine Solution

Chlorine is a powerful disinfectant that can be used to kill *vibrio*.

CAUTION: Chlorine at high concentration is corrosive and toxic to human tissue and metal. It can generate explosive gas at high temperature when mixed with other chemical. It must be handled with appropriate protective equipment (gloves, mask, apron, glasses). It must be stored away from humidity, sun or excessive heat, and stored separately from chemicals.
It is highly recommended that only trained staff dilute chlorine.

Chlorine solution can be reconstituted from various chlorine generating products. Among

them:

- Sodium hypochlorite (liquid)
- Calcium Hypochlorite (granules)
- Chloride of lime (powder)
- Eau de Javel, jik (Bleach)
- High-Test Hypochlorite (HTH)

They all come in various packaging and concentrations. Three concentrations are used for disinfection and infection control in a CTC. Soak away should be provided where these solutions are prepared.

- 0.05%
- 0.2%
- 2%

Table: most commonly used chlorine products and solutions

Starting with	**2% SOLUTION**	**0.2% SOLUTION**	**0.05% SOLUTION**
Calcium hypochlorite 70% active chlorine ("high-test hypochlorite", "HTH")	30 g/litre or 2 tablespoons/litre	30 g/10 litres or 2 tablespoons/10 litres	7 g/10 litres or 1/2 tablespoon/10 litres
Chloride of lime 30% active chlorine ("bleaching powder")	66 g/litre or 4 tablespoons/litre	66 g/10 litres or 4 tablespoons/10 litres	16 g/10 litres or 1 tablespoon/10litres
Sodium hypochlorite solution at 6% active chlorine ("household bleach")	333 ml/litre or 22 tablespoons/litre	333 ml/10 litres or 22 tablespoons/10 litres	83 ml/10 litres or 5 tablespoons/10 litres
USE FOR DISINFECTION OF	**Excreta** **Corpses** **Shoes** **Foot bath**	**Floor** **Utensils** **Beds**	**Hands** **Skin** **Clothes**

Note the following factors affecting the efficiency of disinfection:

- Concentration of the chlorine solution.
- Contact time
- Temperature (e.g. consider where you are storing it)
- Presence of organic matter
- pH
- Presence of calcium or magnesium ions (e.g. hardness of the water used for dilution)

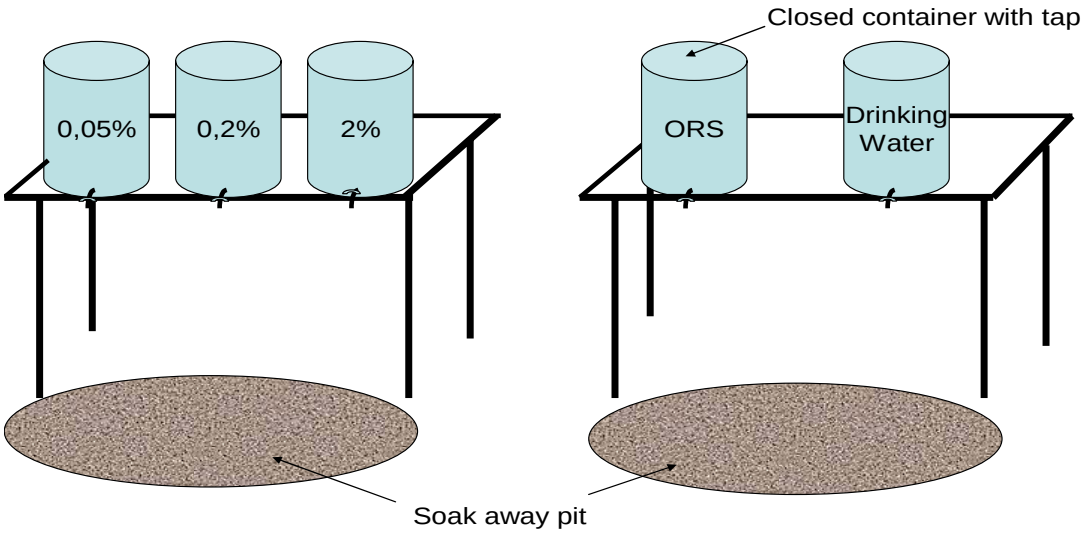
Note: When using High-Test Hypochlorite (HTH) or chloride of lime, do not pour the product directly into the water, but mix it thoroughly in order to avoid the sedimentation of the product at the bottom of the container (white chlorine mud).

Each of these solutions has a lifetime as the percentage of chlorine decreases:

0.05% = 24 hours
0.2% = 3 days
2% = 1 week

Factor affecting the lifetime of a solution:
- Temperature
- Contact with air
- Contact with metallic element
- UV light from the sun

Example of solution management



Improve water quality: Chlorination

Contaminated water can be a significant route of transmission. Tests for *vibrio* presence in water are not widely available but indirect measurement methods can provide a good indication of quality: water turbidity[2], free residual chlorine concentration in mg per ml and presence of faecal bacteria (coliforms).

Chlorination is the most simple and widely available means to ensure safe water; *vibrio cholerae* are destroyed by chlorine, if one can achieve:
- A constant free residual chlorine concentration of 0.3 to 0.5 mg/l measured after 30 minutes contact time to prevent further contamination

[2] Turbidity is the reduction in water transparency due to suspended/dissolved particles such as clay. It is measured in NTU = nephelometric turbidity units.

- Turbidity less than 5 NTU. The higher the turbidity, the less effective the chlorination. In emergency, 20 NTU can be acceptable; if turbidity > 20 NTU, specialist advice is recommended as solid particles can hide contamination that chlorine cannot reach giving a false sense of security.

Priority will be given to water sources identified as of high risk following a sanitary inspection

Protected wells

Chlorination of protected wells[3] is not necessary, except after completion, maintenance or repair. However, when there is a high risk of secondary contamination, (e.g. during water collection, transportation, unsafe water storage practices) bucket chlorination (i.e. direct chlorination of household containers) at the protected source is recommended.

Bucket chlorination

In situations where there is no organised water system or when effective and continual residual chlorine concentration cannot be obtained, bucket chlorination is the recommended option. It aims at providing effective chlorine residual (0.3 to 0.5 mg/litre) in a given water volume where chlorinating wells and/or other water sources is not feasible.
The size of the household container should be known by the person appointed at the well (the chlorinator). Usually in a given context, the population uses the same type of container and volumes are easily known (5, 10 or 20 litre jerrycans or buckets). The trained chlorinators are located next to water sources used for drinking water and chlorinate each family container after they have been filled, with the appropriate amount of chlorine. When there are several water sources, discussions with local authorities are needed to request support from the community, to select the best and most used water points: the goal is to have one chlorinator stationed at each point.

Chlorination of unprotected wells
Not recommended as this is only effective if continual residual chlorine can be achieved. Relying on other indicators can give a false sense of security. **Disinfection of wells and other unprotected sources is not recommended where bucket chlorination can be implemented.**

Remarks: If the dosage of chlorine is too high, the taste of the water is likely to be impossible to drink. In the long term, excessive chlorine in the water can lead to weakening of the bacteria found in the digestive system.

The taste of chlorine in the water is not a guarantee of free residual chlorine and is likely to come from the combination of chlorine with organic matters (unwanted combination).

The residual chlorine must be monitored with residual chlorine test (Lovibond comparator, pool tester, strips, etc.)

[3] Protected well = fully lined with a good sanitary seal and a hand pump.

When water is not chlorinated, the faecal bacteria concentration should not exceed 10 CFU[4] / per 100 ml. This indirectly shows a potential contamination but does not prove the presence of *vibrio*.

Boiling water kills all the *vibrio* in the water and is a good mean to have safe water, but is not realistic in a CTC given the volume needed (50l/day/patient).

5.6 Disinfection techniques

5.61 Use of sprayer

The sprayers must always be available in order to perform immediate disinfection with a 0.2% solution.
The sprayer used should not be metallic, as chlorine corrodes metal.
When not in use, the sprayer should be dismantled and cleaned thoroughly with water before it is further used.
Never use other chemicals or mix other products with chlorine as it can generate toxic components.

5.6.2 Foot bath:

Preparation of foot bath

- A footbath should be made of a water tight material like polythene sheeting.
- Foot baths should be provided at the entrance of the working area.
- A foot bath can be constructed by digging in the ground or by making a frame using bricks or wood with a minimum depth of 115 mm and the width equivalent to the entrance.
- The foot bath should be filled with 40mm disinfectant solution.
- *Schedules for preparation* and changing of disinfectants solutions for the foot baths should be provided.
- *Appropriate foot baths* should be provided for the various rooms/tents in use for management of patients.

Foot bath are primarily for disinfection of shoes, but also should be used in order to limit the flow of patient and staff in the CTC. They contribute to mark the different zones, and prevent unnecessary movement within the structure.

5.6.3 Disinfection of linen

1. Put on appropriate protective clothing which includes overalls, or gowns, plastic apron, plastic/latex disposable gloves, and gumboots.
2. Separate dry and soiled linen
3. Soak in 0.2% sodium hypochlorite for 10 minutes
4. Sluice soiled linen to remove vomitus, excreta and other body fluids

[4] CFU = Colony Forming Unit

5. Discard water used for sluicing into septic tank or toilet
6. Rinse in with clear water
7. Send to laundry or wash

5.6.4 Protective clothing – gumboots, PVC gloves and plastic aprons

1. Put on appropriate protective clothing which includes gowns, plastic apron, plastic/latex disposable gloves, and gumboots.
2. Separate soiled from non soiled
3. Soak in 0.05% chlorine solution
4. Discard water used for sluicing into septic tank or toilet

5.6.5 Cleaning of floors

- Floors should be cleaned using a 0.2% chlorine solution, and scrubbed with a hard brush.
- Schedules for cleaning floors should be put in place.
- Cleaning must be done immediately if excreta or vomit are present on the floor.

When applying chlorine solution on the floor, scrubbing with a hard brush has to be done in order to combine a mechanical action to ensure particle are removed and mixed with the solution.

5.6.6 Hands Washing

Appropriate hand washing can minimize micro-organisms acquired on the hands by contact with body fluids and contaminated surfaces. Hand washing breaks the chain of infection transmission and reduces person to person transmission. Washing with antimicrobial products kills or inhibits the growth of micro-organisms in deep layers of the skin.

All health care personnel and family caregivers of patients must practice effective hand washing. Patients and primary care givers need to be instructed in proper techniques and situations for hand washing.
Compliance with hand washing is, however, frequently sub-optimal. Reasons for these include:

- Low staff to patient ratio
- Lack of appropriate equipment
- Allergies to hand washing products
- Insufficient knowledge among staff about risks and procedures
- The time required, and casual attitudes among staff towards bio-safety.

When should you wash your hands?

- After defecation
- After any contact with stools and vomitous (cleaning up after children or patients)
- Before preparing food
- Before eating food
- Before feeding children.

- After handling patients and/or soiled linen including patient's utensils.

NB: Immersion of hands in bowls of antiseptics is not recommended.

Facilities and materials required for hand washing

Running Water
Hands should be disinfected using chlorinated water using the run to waste method. Use a bucket or other container fitted with a tap which can be turned on and off or 60%-90% alcohol hand rub.

Facilities for drying hands
Use disposable paper towels or air-dry hands.

5.7 Waste Disposal

5.7.1 Solid waste

Solid waste areas (garbage areas) can be a reservoir for *vibrio cholera* as well as a breeding site for vectors as usually there is no functioning removal system. These sites become significant if the waste contaminates the human environment for example a drainage system leading to water supplies, or when people use the waste area to find left over food.

The following should be observed during implementation of waste management implementation.

1. The receptacles should be of acceptable material which can be easily cleaned and disinfected
2. The bins should be fitted with plastic liners
3. Refuse should be separated at source (Wet, Dry, Infectious and ordinary)
4. All refuse receptacles should be placed strategically placed within the wards close to the entrance where they can be easily collected
5. The bins should be collected at the end of each day or when they are full. The bins should be disinfected after collection.
6. Designated personnel should be assigned for refuse management
7. Left over food should not be given to pets but disposed of accordingly
8. All food remains from the wards should be buried at the end of each day

Receptacles should be provided in the following areas
- Screening area
- Wards
- Morgue
- Kitchen
- Within treatment centre

Refuse Disposal

1. Combustible contaminated material shall be incinerated at point of generation
2. All wet refuse not suitable for reuse shall be decontaminated and buried to avoid fly breeding.
3. Fly control method should be applied in cases where refuse pits are used

Excreta Disposal

Excreta (faeces and vomit) from cholera patients are highly infectious, as they contain up to 10^8 *vibrio* per ml; their disposal in latrines is therefore crucial. However not all interventions will be feasible in an outbreak.

Two buckets are necessary per patient, one under the cholera bed for the excreta, the other on the side for the vomit.

Disinfection of excreta:

Excreta and vomitous must be discarded in the latrine, after disinfection. To neutralize and destroy the contamination, 150ml (half a cup) of 2% solution must be poured in for a contact time of 10 minutes before disposal. The container should then be cleaned with 2% solution before it can be used again.

5.7.2 Waste water

Waste water includes surface water runoff, domestic waste water (e.g. from kitchens) and sewage. If not contained properly (e.g. drainage ditches) or if overflowing, it can be a vehicle for contamination of drinking water. Therefore keeping drainage systems open and flowing or providing alternative temporary water supply facilities can reduce the risks associated with waste water.
Particular attention must be drawn to consider rain water as potentially contaminant. Rain water must be drained in a soak away pit in the CTC.

In an urban setting, if waste water is discarded into a sewage system, investigation should be carried in order to ensure it is in good order (no leakage and proper sewage treatment plant downstream)

5.7.3 Vector Control

Flies may be vehicles of cholera transmission. The following measures are recommended:
- Covering food: flies are likely to be a significant source of transmission where food[5] is stored.
- Reducing the fly population in waste areas by clearing the area and spraying insecticide at the specific breeding areas.
- Malaria control measures should be implemented in CTCs particularly in malaria endemic areas.

[5] Flies carry small amounts of vibrios, which can then multiply up to high concentration in warm food,

5.8 Patient's house disinfection

Disinfection of the patient's house is a good strategy to reduce transmission within the household, but often logistically complex in an open setting. Contamination can be destroyed using 0,2% solution in the house, and in the latrine. Health education and cholera prevention can be held in order to avoid further spread.

5.8.1 Safe Burial Practices and Funerals

Transmission often occurs at funeral gatherings where people from uninfected areas interact with those from infected areas. Therefore outbreak control measures should focus on:

- Minimum number of people handling the body. Ideally, health workers should supervise handling and preparation of the corpse for burial
- Health and hygiene promotion with key community and religious leaders[6]
- finding safe, appropriate and acceptable burial procedures
- discouraging funeral feasts to reduce the potential for transmission
- providing hygiene promotion and materials at feasts that cannot be postponed

It is important to discuss with traditional authorities and religious leaders the risks of transmission of cholera through dead bodies. Appropriate burial methods should be adapted for the duration of the epidemic, providing the required equipment if needed (linen, chlorine, etc.) Guidelines for proper funeral management may be found in Annex 12.

5.9 Closure of a CTC/CTU

A CTC maybe closed if no new cases have been reported in two incubations periods, which is 14 days.

5.9.1 Managerial factors

- possibility of integration of remaining cholera patients into a regular health structure
- possibility to isolate patients
- staff remains in the health structure

5.9.2 Technical factors

- Spray all doors, floors, walls, stairs, handles, beds etc. with a 0.2% chlorine solution. Wash away after 10 minutes with clean water.
- Wash carefully wearing protective gear, all buckets that have been used for excreta/vomit with 2% chlorine solution and dry them in the sun. It is important to make

[6] Religious leaders usually preside over burial ceremonies and may be influential in getting their congregrations to accept safe burial practices

sure there is absolutely no organic matter/residues remaining (as these can hide *vibrio cholera*).

- Close latrines and soak-away pits if they were made for the outbreak.
- Burn all mats made with natural materials (e.g. reeds)
- Immerse and disinfect blankets first in **0.2% solution for 10 minutes** then wash as usual and hung to dry.
- Tents still pitched should be soaked with 0,2% solution for 10 minutes, brushed with a hard brush and dried in the sun before being put away. Metallic parts should then be washed with clear water and dried to avoid rust.
- Unless the CTC is located within the grounds of a medical structure wishing to continue using the waste zone upon closure of the CTC, the organics pit should be refilled, and the sharps filled with concrete (to encapsulate the sharps and to protect future users of the land).

6. Management of a patient with cholera

Patients must be treated as rapidly as possible, to reduce the risk of shock. For this reason, all patients with cholera should seek treatment from a trained health worker. During epidemics, when there are many cases but few health workers, grouping cholera patients in a single centre can facilitate treatment and also help to reduce environmental contamination.

6.1 Rehydration therapy

Rehydration is the mainstay of cholera management. The recommended intravenous fluids are Ringers Lactate or Normal Saline if Ringers lactate is unavailable. Plain Glucose solutions are ineffective and may even be dangerous.

While preparing to go to a health facility for treatment, patients with cholera should immediately start increasing the amount of fluids they drink. Sugar-Salt solution, ORS sachets, and other fluids available in the home can be used to prevent or delay the onset of dehydration on the way to the health facility.

Box 9. To make Sugar Salt Solution (SSS) or Oral Rehydration Solution (ORS)

Use the usual drinking-water. Boiled water, cooled before use, or chlorinated water is best.

- 6 level teaspoons of any household sugar, (white or brown)
- half level teaspoon of salt (coarse salt may have to be ground fine) dissolved in
- 750 ml of safe water in a clean container

Oral Rehydration Solution (ORS)

ORS may be available in sachets from various donors in certain situations and these should be used as per instructions.

Cholera patients started on intravenous therapy should be given ORS solution as soon as they can drink, even before the initial intravenous therapy has been completed.
They should then be treated with ORS solution until diarrhoea stops. After rehydration, patients should also be permitted to drink water.

6.1.1 Case management

Assess the severity of dehydration according to the diarrhoea treatment chart.

6.1.1.1 No sign of dehydration:

Give Salt Sugar Solution (SSS) or ORS to the patient.

- 50 ml ORS per kg body weight over 6 hours *plus* ongoing losses
- Send patient home with 4 packets of ORS
- Feeding should be continued
- Patient returns if condition does not improve or deteriorates

6.1.1.2 Some dehydration:

Give SSS / ORS to the patient for both mild and moderate dehydration as indicated below

For the first four hours:

Approximate amount of ORS solution to give in the first 4 hrs:

AGE	<4 months	4 – 11 m	12 – 23 m	2 – 4 years	5 – 14 y	> 15 y
Weight (kg)	< 5	5 – 7.9	8 – 10.9	11 – 15.9	16 – 29.9	> 30
ORS (ml)	200-400	400-600	600-800	800-1200	1200-2200	2200-4000

Reassess after 4 hours: *If improved continue ORS to maintain normal hydration*

After each stool give:

AGE	Approximate ORS amount after each stool in ml	Approximate ORS amount after each stool in household measures
< 2 years old	50 – 100 ml	10 – 20 teaspoons
2 – 10 years old	100 – 200 ml	½ - 1 glass
> 10 years old	As much as tolerated	Minimum one glass

If not improved TREAT AS SEVERE DEHYDRATION

6.1.1.3 Severe dehydration:

For patients over one year of age give

100ml/ kg I.V. in 3 hours as follows:
30ml/kg as rapidly as possible/within 30 minutes and then 70ml/kg in the next 2 $^1/_2$ hours
Give IV drip of Ringer Lactate or if not available normal saline 100 ml/kg as follows:

AGE	Amount of time to give first 30 ml/kg	Amount of time to give remaining 70 ml/kg
≤ 1 year	1 Hour	5 Hours
> 1 year	½ Hour	2 ½ Hours

(Example: For an adult weighing 60kgs give 30mls x 60 = 1800mls within 30 minutes and then 70 mls x 60 = 4200mls over the next 2 $^{1}/_{2}$ hours making it a total of 6 litres of Ringer's lactate) Monitor the patient frequently. Give ORS as soon as the patient is able to drink in addition to the I.V. fluids. Re-assess after four hours. If dehydration is still severe repeat IV therapy as above. If improved treat as some dehydration.

6.2 Supportive measures

6.2.1 Feeding

Patients should start eating food as soon as vomiting stops. Mothers should continue to breastfeed. More information on breastfeeding, infant feeding and cholera may be found in Annexes 15 and 16.

6.2.2 Antibiotics

Antibiotics should be administered to patients with **Severe Dehydration only.**
In severe cases of cholera, antibiotics can reduce the volume and duration of diarrhoea, and shorten the period during which *cholera vibrio* are excreted. They should be given orally as soon as vomiting stops, usually within 3-4 hours after starting rehydration. There is no advantage in using injectable antibiotics, which are expensive. Indiscriminate use of antibiotics in mild cases can quickly use up supplies and hasten the development of antibiotic resistance.

***Sulphadoxine is not effective**, and should not be used. A single dose can cause serious and even fatal reaction.*

Knowledge of antibiotic sensitivity patterns of recent isolates in the immediate area or in adjacent areas is therefore important. Check with the laboratory for the sensitivity of the organism to the antibiotics and give antibiotics that the organism is sensitive to. Antibiotic-resistant *Vibrio cholerae O1* should be suspected if diarrhoea continues after 48 hours of antibiotic treatment.

Table 3: Antibiotic used to treat cholera

Antibiotic[a]	Children	Adults	Pregnant women
Ciprofloxacin Single dose	20 mg/kg	1 g	No
Azithromycin *Single dose*	20 mg/kg	1 g	- 1 g

Table 3: Antibiotic used to treat cholera			
Antibiotic[a]	Children	Adults	Pregnant women
Doxycycline *A single dose*	-	300 mg	- No
Erythromycin *4 times per day for 3days*	12.5 mg/kg	500 mg	500 mg

Note:
No anti-diarrhoeal, anti-emetic, antispasmodic, cardiotonic, or corticosteroid drugs should be used to treat cholera. Blood transfusions and plasma volume expanders are not necessary.

6.4 Complications

Pulmonary oedema is caused by giving *too much IV fluid*, especially when metabolic acidosis has not been corrected. Metabolic acidosis is most likely to occur when normal saline is used for IV rehydration and ORS solution is not given at the same time. It is therefore recommended that ORS be given when IV normal saline is used for rehydration. When the guidelines for IV rehydration are followed, pulmonary oedema should not occur. ORS solution never causes pulmonary oedema.
Renal failure may occur when *too little IV* fluid is given, when shock is not rapidly corrected, or when shock is allowed to recur, especially in persons above the age of 60 years. Renal failure is rare when severe dehydration is rapidly corrected and normal hydration is maintained according to the guidelines.

6.5 Reducing case fatality rate (CFR)

Three key interventions are required in order to reduce the CFR

a) Improve access to care

This ensures easy access to treatment and management of high case load. The activities include:

- Setting up cholera treatment centre
- Setting up temporary treatment centre

b) Appropriate case management

Personnel should be appropriately equipped and trained to manage cholera patients. The activities include:

- Provision of regular supplies
- Training of personnel
- Provision of treatment protocols
- Supervision of health care providers

c) Early case detection

Early detection of cholera cases facilitates early treatment and timely referral. It contributes to a reduction in mortality. The activities should include:

- conducting active case finding
- Cases referred to the nearest treatment centre
- Health education provided at treatment centres and in the community

7. Preventing the spread of an outbreak

People contract cholera from drinking water or eating food contaminated with cholera organisms. Prevention is based on reducing the chances of ingesting *vibrio cholerae*. During a cholera outbreak, efforts must be intensified to promote personal hygiene, sanitary disposal of human and domestic waste, provision of safe water, and safe practices in handling food.

Box 10. Key points for public education to prevent cholera

- Drink only water from a safe source
- Water from unsafe sources should be disinfected (boiled or chlorinated)
- Cook food or reheat it thoroughly, and eat it while it is still hot.
- Food should be covered and stored properly
- Avoid uncooked food unless it can be peeled or shelled.
- Wash vegetables, fruits thoroughly with safe water
- Wash your hands with running water and soap after visiting the toilet, and before preparing or eating food
- Dispose of human excreta promptly in a toilet or in an approved manner (cat sanitation where there are no toilets)

Remember

- With proper treatment, cholera is not fatal
- Take patients with suspected cholera immediately to a health worker for treatment.
- Give increased quantities of fluids (if available, oral rehydration salts solution), *as soon as* diarrhoea starts.

The following are important activities in preventing the spread of cholera:

- Intensify public awareness and health education
- Disinfect patients' clothing, bedding and the home environment
- Supervise funeral proceedings
- Discourage mass feeding
- Encourage early burials
- Discourage the practice of preparing (washing) of corpses
- The refuse bags should be burnt in a pit
- Disinfection and safe disposal of patients excreta and vomitous
- Encourage run-to waste method of hand washing
- Discourage hand shaking

7.1 Ineffective control measures

Chemoprophylaxis

Treatment of an entire community with antibiotics, referred to as *mass chemoprophylaxis*, has been found to be ineffective in limiting the spread of cholera and therefore not recommended. *Selective chemoprophylaxis* may be useful for members of a household, who share food and shelter with a cholera patient as well as in closed settings such as prisons, refugee or Internally Displaced People's (IDP) Camps. The value of selective chemoprophylaxis thus depends on local circumstances. It is justified only if surveillance shows that the secondary attack rate in the community is high, i.e. an average of at least one household member in five becomes ill after the first case occurs in the household.

Note: The decision to give any chemoprophylaxis should be authorised by the Ministry of Health & Child Welfare

Vaccination

The use of the injectable (parenteral) cholera vaccine is not recommended by WHO due to its low protective efficacy and the high occurrence of severe adverse reactions.

An internationally licensed oral cholera vaccine (OCV) is also currently available on the market. This vaccine was proven safe and effective 85–90% after six months in the two years and above, declining to 62% at one year and is available for individuals aged two years and above. It is administered in two doses 10-15 days apart and given in 150 ml of safe water. Its public health use in mass vaccination campaigns is relatively recent and has been mainly in refugee or IDP camps.
(Source: http://www.who.int/mediacentre/factsheets/fs107/en/index.html date accessed: October 2009)

Zimbabwe has not yet adopted the use of vaccination in the control of national cholera epidemics.

Travel and trade restrictions (cordon sanitaire)

- Travel restrictions on both people and goods between or within a country have a very limited role in preventing the spread of cholera. According to WHO, there is no evidence that importation of food from cholera affected countries has been implicated in outbreaks. The isolated cases of cholera that have been related to imported food have been associated with food which had been in the possession of individual travellers. Consequently, WHO believes that food import restrictions, based on the sole fact that cholera is epidemic or endemic in a country, are not justified.
- Ports of entry should be informed of cholera outbreak so as to initiate screening and treatment of travellers from affected countries
- Screening and notification of suspected cases to relevant authorities should be done straight away

- Provision of Health Education at Ports of entry should be carried out especially during epidemics

7.2 Cholera in special settings-Refugee camps, Prisons, Military & police barracks and schools

Though not exhaustive, the above list includes areas which are often crowded and this makes them vulnerable to outbreaks of communicable diseases like cholera. A number of measures may be adopted to prevent further spread of cholera. These include;

- Reporting all cases of diarrhoea in these settings, in order to detect and report outbreaks timely. During outbreaks surveillance should be even more vigorous.
- Cooks, staff members and inmates (in the case of prisons) with symptoms of diarrhoea or vomiting should not be allowed to work in the kitchen or any other place where food is prepared or distributed.
- Special measures should be made to ensure that the institution's water is safe for consumption. It is important to ensure that as much as possible up to 50 litres of water per day is available per person per day. Water surveillance programmes should also include the water in institutions.
- Hand washing facilities with running water and soap or a soap substitute should be made available within the institution.
- The institution head should ensure that toilets should be provided using a ratio of 1 squat for every 25 people.
- Every institution should have a stock of Oral Rehydration Salts (ORS) to treat 100 cases of diarrhoea.
- Health promotion and education should be vigorous all the time, whether there is an outbreak or not, to inculcate proper hygiene practices in these settings.

8. The role of the laboratory

Laboratory analysis of specimens from the first suspected cases is essential to confirm the presence of cholera, and determine susceptibility of the organism to available antibiotics. Once *Vibrio cholera* is isolated from the specimens, it is not necessary to examine specimens from all cases or contacts. In selected number of cases depending on the resources, it will be helpful to follow any change in pattern of resistance to the antibiotics. Laboratory analysis of samples of suspect water, sewage and food may be helpful in investigation of source of the outbreak.

8.1 Initial Specimens

Ideally, specimens should be collected before any antibiotics are given to a patient.

1. A bulk stool:

Bulk stool specimen is ideal and most preferred specimen in the first few cases as it allows investigation and isolation of other organisms that might not be *vibrio*s. If the specimen cannot be processed within 2 hours it should be stored at 4 - 8 degree Celsius.

2. A rectal/stool swab:

A rectal /stool swab in transport media can be collected in all suspected cases. It is also a

preferred sample when specimen is to be transported for longer distances

8.2 Subsequent Specimens

Subsequent stool specimens (bulk stool, rectal /stool swabs) should be collected in the following situations:

- All reported deaths (including post mortem)
- Cases from new areas
- Children less than 2 years of age
- Periodically (every 3rd week) to monitor diagnosis and sensitivity patterns
- To confirm end of outbreak

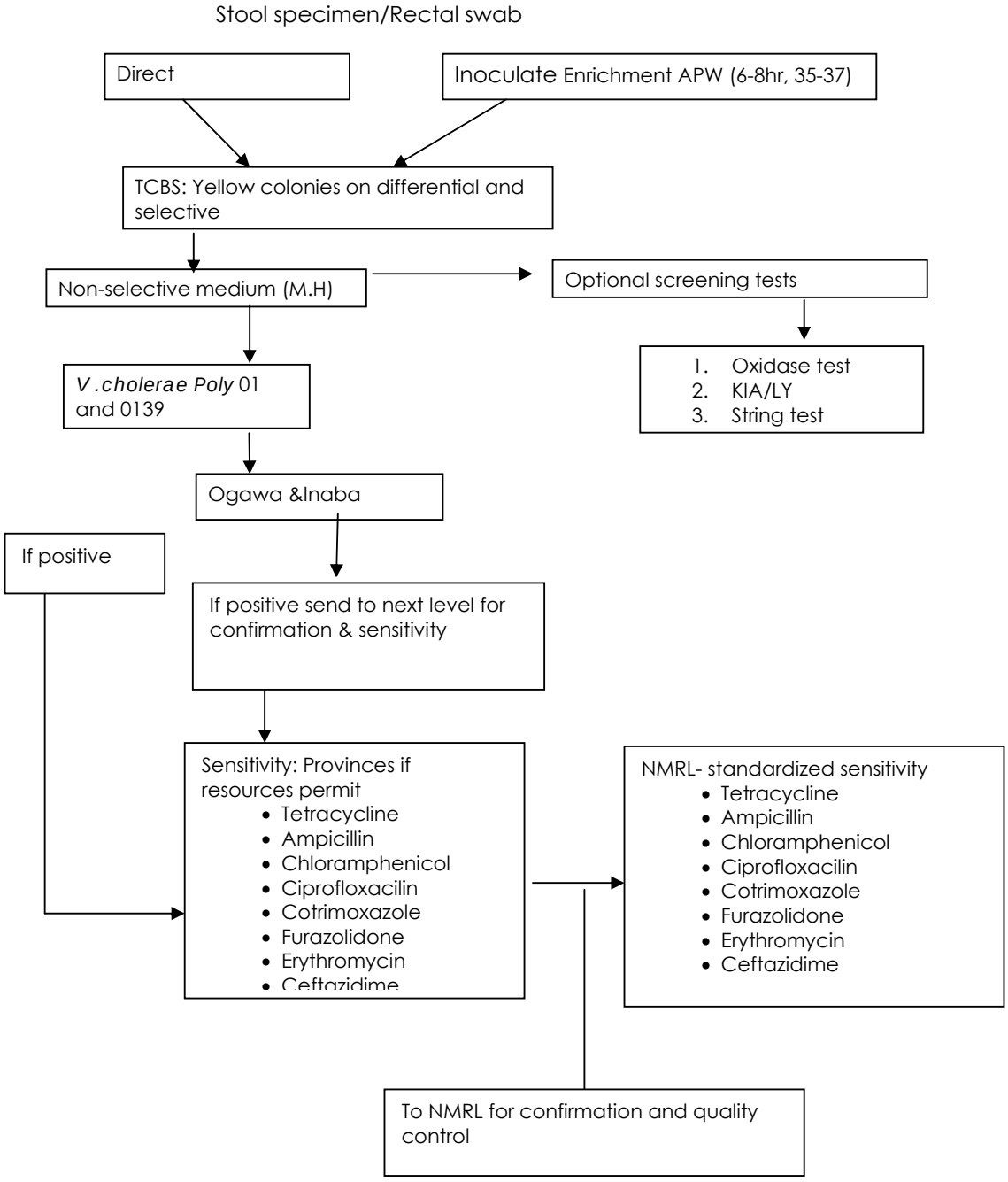
8.3 Handling of Stool Samples

Stool specimens or rectal swabs from suspected cases should be promptly submitted for laboratory examination in a transport medium (e.g. Cary-Blair), a supply of which should be stocked by the local health centre or health office. If the specimen will not reach the laboratory within 2 hours, put it into a tube containing Cary-Blair transport medium. Alkaline peptone water may also be used if the transport time will not exceed 6-8 hours. The specimens should be transported in cold boxes at 4-8 ◦C to maintain specimen integrity.
The specimen should be clearly labelled with the name of the patient for proper identification at the laboratory. The name, age, and address of the patient, the main clinical signs, and the date and time when the specimen was obtained should be written on a request slip and sent with each specimen.

8.4 Laboratory procedures for identification of vibrio cholerae

Identification of Vibrio Cholerae 01 and 0139 serogroups

Flowchart on how to process samples from suspected Cholera cases



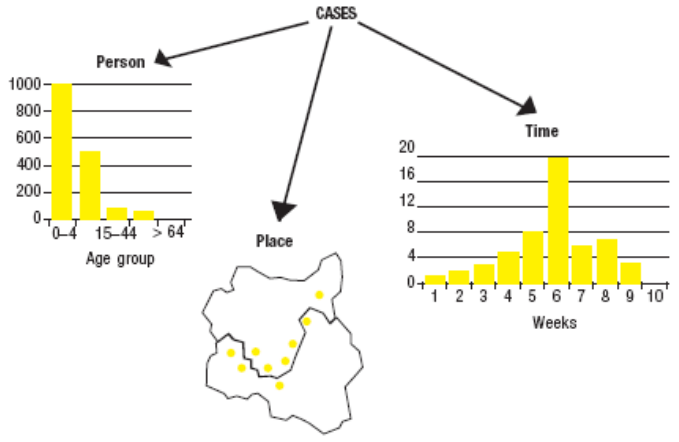
NB: All presumptive positive isolates should be sent to the National Microbiology Reference laboratory for quality control and further characterization using a swift account number 113588.

9.0 Reporting/surveillance

9.1 *Monitor the course of the epidemic.*

Monitoring of the epidemic is vital for outbreak control. Following are some of the elements to be monitored:

- Disease trends in order to assess the effectiveness of the response measures, the extension of the epidemic and risk factors
- Resources assessment of the rational utilization, adequacy and sufficiency and determination of additional needs
- Effectiveness of the response: case fatality rate, incidence
- Implementation of the response: program coverage, meetings of the epidemic management committee etc.
- Data should be analysed by time (epidemiological weeks of the outbreak), place (affected areas) and person (age, sex and other characteristics of affected groups) (see diagram below)



Source: WHO (2004) Cholera outbreak assessing the outbreak response and improving preparedness Geneva: WHO

9.2 After an outbreak

As an outbreak of cholera subsides, emphasis should shift from emergency control measures to preparedness for future outbreaks and long-term efforts to improve the safety of public water supplies and sanitation facilities.

Public health promotion programmes must continually stress the principles of good personal hygiene, the importance of using only safe water, safe disposal of excreta, and safe food practices.

Ideally, a water supply system in urban areas should provide potable water under constant positive pressure through a system piped into private homes. The water should be chlorinated.

In rural areas, water sources should be protected from surface contamination, and latrines should always be situated away from water sources and catchment areas to prevent contamination. The protection of wells should be encouraged.

Cholera will ultimately be brought under control only when water supplies, sanitation, personal hygiene, and food handling practices are safe enough to prevent the transmission of *Vibrio cholerae* O1.

9.3. Report on the outbreak

Outline of the District Outbreak Report

- Geographical area / population
- Cases and deaths
- Case fatality Rate (CFR) / attack rate / incidence rate
- Epidemic response and control
- Time taken to recognize / identify epidemics
- Duration of epidemic and epidemic curve
- Indication of epidemic investigation and results of the investigation
- Results of any study undertaken
- Active case search and yield of the same including contact tracing
- Cause of the outbreak
- Lessons learnt and recommendations for the future
- Cost involved in controlling the outbreak (cost of transport, stationery, drugs and medical supplies, staff time, donations, etc)

A detailed report on the outbreak can be helpful in planning for the next outbreak. As soon as the epidemic has been controlled, write a report and include:

- Details on the response activities. Include dates, places, and individuals involved in any activity. Also include the "Epi" curve, spot map, summary of cases, and the line list of cases
- Any changes that were made to the initial response activities
- Recommended changes to improve epidemic response in the future. For example, you might recommend changes in the vaccination strategy and program to make the vaccination activity more effective. You might recommend changes in the transporting procedure for laboratory specimens to allow specimens to reach the reference laboratory in good condition or more quickly.
- Disseminate the report on the outbreak to all stakeholders.

9.4 Evaluate and document the epidemic response

The following are the key elements for the evaluation:

- The presence of an epidemic preparedness and response plan
- Availability of emergency stocks of drugs, vaccines and supplies during the last 12 months
- Availability of funds for outbreak response
- Presence of a well equipped trained district rapid response team to conduct an outbreak investigation
- Presence of a functional Epidemic Preparedness and Response Committee
- Availability of trained/oriented health staff for the response

These elements should be followed up during integrated supervisory visits.

9.5 Evaluate epidemic control activities

At the end of the outbreak/epidemic the national team in collaboration with the provincial and district epidemic preparedness and response committee should evaluate control activities. This evaluation should focus on the appropriateness of control actions as well as their timeliness and effectiveness.

The evaluation exercise should help to answer the questions in the text box.

Evaluation of outbreak/epidemic control activities

Appropriateness

Were the control activities appropriate as recommended by specific guidelines?

Timeliness

- How long was the lag time between the onset and detection of the outbreak?
- How long was the lag time between the outbreak detection and the implementation of control actions?

Effectiveness

- How long was the duration of the outbreak?
- Were the attack rate and case-fatality ratio "acceptable"

Level of resources mobilised

Were enough resources moblised in terms of: personnel, drugs, vaccines, reagents, supplies, materials, money?

Sensitivity: Provinces if resources permit

- Tetracycline
- Ampicillin
- Chloramphenicol
- Ciprofloxacilin
- Cotrimoxazole
- Furazolidone
- Erythromycin
- Ceftazidime

9.6 Document the outbreak/epidemic

At the end of the outbreak/epidemic, the district health management team should:

- Collect all the documents including minutes of the meeting, activity, process, epidemic report, evaluation report and other relevant documents.
- Prepare a coversheet listing of all the above documents.

Annex 1: Rapid Response Teams (RRTs)

Roles and Responsibilities of team members

Team leader: - Provincial Epidemiology and Disease Control Officer or other representative

Roles and Responsibilities

- Presents available information
- Outlines investigation plans
- Assigns roles and responsibilities
- Oversees team member roles
- Communicates with media
- Communicates with other officials

Epidemiologist

- Verifies the existence of outbreak
- To coordinate the activities of the RRT related to the investigation and containment of suspected or confirmed outbreaks
- Identifies and coordinates control measures
- Institutes case management measures
- Supervises data collection and data analyses
- To liaise with all stakeholders involved in the investigation and response of the outbreak
- To collect all available information from the provincial (sub-national) focal points prior to the field mission and prepare the logistic of the mission in collaboration with the Team Leader;
- To alert all relevant national health authorities
- To notify the next level about the outbreak
- To coordinate all follow-up measures in collaboration with the Team Leader

Environmental Health Officer

- Conduct field investigations
- Case follow up and contact tracing
- Environmental decontamination
- Liaise with stakeholders involved in field investigation
- Enforcing the provisions of the Public Health Act

Clinician

- Advises and assists in managing patients
- Educates, implements, and supervises infection control measures
- Advises on area hospital bed capacity and medical capability
- Advises on collection of clinical specimens from cases/patients

Laboratory Scientist

- Perform laboratory diagnosis to help refine a case definition

- Advise and assure proper specimen collection, transportation, and storage
- Asses area laboratory capability
- Develop a plan for sharing specimens with national or WHO laboratories

Communication Specialist

- Coordinates and assists in communications with media, international community, and officials
- Constructs main messages
- Liaison with community

Expanded Team Roles

- Logistician
- Administrator / Operations Manager
- Manage supplies
- Work with security officer
- Monitor finances
- Arrange transportation
- Monitor communications

Interviewers

- Interview patients, potential cases, doctors
- Collect data, either in person or by phone

Infection Control Officer

- Oversees use and distribution of PPE, decontamination processes within wards,
- Advises health units on proper infection control

Annex 2: Composition of various task forces to deal with cholera

National level (National Task Force on Epidemic Prone Diseases)	Provincial Level	District level
• Minister of Health and Child Welfare • Provincial Medical Directors • Provincial Epidemiology and Disease Control Officers • Provincial Environmental Health Officers • Infection Control Nurses • Director of Health Services • Army Medical Officer • Veterinary Officer • Police • National Laboratory Officer • Chief Pharmacist • Deputy Director of Disease Prevention and Control • Epidemiology and Disease Control Coordinator • World Health Organization Representative • Health Information and Disease Surveillance coordinator • National Epidemic Preparedness and Response Officer • Environmental Health Coordinator • Health Promotion Coordinator • NGOs • Civil Protection Unit (CPU)	• Provincial Medical Director • Provincial Environmental Health Officer • Provincial Epidemiology and Disease Control Officer • Provincial Health Promotion Officer • Provincial Nursing Officer • Provincial Health Information Officer • Provincial Health Services Administrator • Provincial Pharmacist • Provincial Laboratory Scientist • Provincial Administrator • Provincial Veterinary Officer • Regional Education Director • Director City Health Services • NGOs • Police • Army Health Unit	• District Medical Officer • District Environmental Health Officer • District Health Education Officer • District Nursing Officer • District Health Information Officer • District Health Services Administrator • District Pharmacist • District Laboratory Scientist • District Administrator • District Veterinary Officer • District Education Officer • Chief Executive Officer for Rural District Council • Rural District Council Chairman • NGOs • Police • Army health unit

Annex 3: Quick Identification of Cholera Cases Using Standard Case Definition

A patient who is suffering from acute watery or rice watery diarrhoea with or without vomiting and with signs of dehydration and is above 2 years of age should be suspected as a case of cholera during an outbreak. (*In an Epidemic children below 2 years can also be affected).* Acute watery diarrhoea – passage of watery or liquid stools ≥ 3 times in last 24 hours.

Management of patients presenting with acute watery diarrhoea

Patient with acute watery diarrhoea

Look for other associated symptoms e.g., swelling of legs, respiratory difficulty, anemia etc.

Assessment for dehydration- Dhaka Metho Urgently Inform Doctor

Assess	Condition*	Normal	Irritable/Less active*	Lethargic / Comatose*
	Eyes	Normal	Sunken	
	Tongue	Normal	Dry	
	Thirst*	Normal	Thirsty (drinks eagerly)*	Unable to drink*
	Skin pinch*	Normal	Goes back slowly*	Goes back very slowly*
	Radial pulse*	Normal	Reduced	Uncountable or absent*
Diagnosis			If at least 2 signs including one (*) sign is present, diagnose	If some dehydration plus one of the (*) signs are present, diagnose
		No sign of dehydration	**Some Dehydration**	**Severe Dehydration**
Management		A	**B**	**C**

A. No sign of dehydration – ORS

- **50 ml ORS per kg body weight over 6 hours *plus* ongoing** losses
- Send patient to home with 4 packets of ORS
- Feeding should be continued
- Return if condition does not improve or deteriorates

B. Some dehydration – ORS

- 80 ml ORS per kg body weight over 4 – 6 hours *plus* ongoing losses
- Patient should be kept under observation for 6 - 12 hours
- Feeding should be continued
- Reassess the dehydration status frequently - hourly.
- In case of frequent vomiting (>3 times in 1 hour): Treat with I/V fluid

C. Severe dehydration – I/V Sodium, potassium, bicarbonate solution (Ringer's lactate)

- Start I/V fluid immediately (100 ml / kg)

Children < 1 year

30 ml / kg in first 1 hour
70 ml / kg in next 5 hours

Adult and Children > 1 year

30 ml / kg in first ½ hour
70 ml / kg in next 2½ hours

- Encourage the patient to take ORS solution as soon as he/she is able to drink
- Antibiotic after initial rehydration (4-6 hours)

,

Antibiotics in cholera epidemics in Zimbabwe

- Antibiotic should be given to all cases of severe dehydration
- Choice of antibiotics depends on local sensitivity pattern

First line drug for Zimbabwe Cholera epidemic (except in pregnancy)

For adults:

- Ciprofloxacin, Tab PO 1g (500 mg x 2) – single dose after correction of severe dehydration

For children:

- Ciprofloxacin susp. PO 20 mg /kg – single dose after cessation of vomiting (if any)

Second line drug for Zimbabwe Cholera epidemic

For adults:

- Azithromycin, Tab PO 1g (500 mg x 2) – single dose after correction of severe dehydration

For children:

- Azithromycin susp. PO 20 mg /kg – single dose after cessation of vomiting (if any)

Alternative drugs for Zimbabwe Cholera epidemic

- Doxycycline, Cap 300 mg (100 mg x 3) – single dose after food (Adults only, *except in pregnancy*)
- Erythromycin 6 hourly x 3 days according to the age of the patients *(for all only if sensitive)*

ANNEX 4: Estimated minimum supplies required to treat 100 patients during a cholera outbreak

Estimated minimum supplies needed to treat 100 patients during a cholera

Outbreak

Rehydration supplies[1]

- 650 packets oral rehydration salts (for 1 litre each)
- 120 bags Ringer's lactate solution,[2]1 litre, with infusion sets
- 10 scalp-vein sets
- 3 nasogastric tubes, 5.3 mm OD, 3.5 mm ID (16 French), 50 cm long, for adults
- 3 nasogastric tubes, 2.7 mm OD, 1.5 mm ID (8 French), 30 cm long, for children

Antibiotics

For adults:
40 tablets Ciprofloxacin 500 mg (2 tablets per severely dehydrated patient)

For children: **For drug protocol please refer to the EDLIZ and Standard Operating Procedures for cholera control**

If selective chemoprophylaxis is planned, the additional requirements for four close contacts per severely dehydrated patient (about 80 people) are
160 tablets of Ciprofloxacin 500 mg (2 tablets per person)
Or:
Any other drug according to the sensitivity of the vibrios *if available*

Other treatment supplies

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

[1] The supplies listed are sufficient for intravenous fluid followed by oral rehydration salts for 20 severely dehydrated patients, and for oral rehydration salts alone for the other 80 patients

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

Source: WHO (2004) Guidelines for Cholera Control Geneva, WHO

ANNEX 5: List of Requirements for Diagnostic Laboratory Supplies for identification of *Vibrio cholerae*

100 rectal swabs 500 g Cary-Blair medium 3 x 500g TCBS medium 25 g sodium desoxycholate Sensitivity discs Muller Hinton Agar 500 g Klinger's iron agar 500 g nutrient sugar 5 x 2 ml polyvalent O-group 1 cholera diagnostic antiserum Ogawa and Inaba antisera (2 ml of each) 1 kg Alkaline-peptone water culture medium 500 Petri dishes (9cm) 1 000 test-tubes (13 x 100 mm) 1 000 disposable Bijou bottles 1 000 universal bottles 100 strips Oxydase ReagentAntibiotics Sensitivity Discs: (Azithromycin, Ciprofloxacin, , Tetracycline, Doxycycline, , Erythromycin)
For using standard safety precautions when collecting and handling all specimens: Soap, Disinfectant and bucket fitted with tap for setting up hand-washing stations Supply of gloves Disposable bin liners Sharps boxes
For packaging and transporting samples: Cold box with frozen ice packs or vacuum flask Cotton wool for cushioning sample to avoid breakage Labels for addressing items to lab Labels for marking "store in a refrigerator" on outside of the shipping box Laboratory forms and line lists to act as specimen transmittal form marking pen to mark tubes with patient's name and ID number (if assigned by the district)

ANNEX6: List of Requirements of Non-Medical supplies for cholera camp

LIST OF REQUIREMENTS FOR A CHOLERA CAMP

Item	Quantity	Cost	Responsible Person
CAMPING EQUIPMENT			
8-men tents			
4- men tents			
2-men tents			
Cholera beds			
Stretcher beds			
Sleeping bags			
Torches			
Cooler boxes			
Mosquito nets			
Cooking pots			
Utensils			
Gas lamps			
Supplies			
PROVISIONS: Meat, rice, sugar, etc			
Chloride of lime			
Sodium hypochloride			
Aquatabs			
LABOSUTORY CONSUMABLES (see annex 5)			
Lovibond comparator			
Mileage			
DHE - 3 Members			
PHE - 3 Members			
Motorcycle – 2			
Stationery			
Health education materials			
Travel and subsistence			

ANNEX 7: Notification of Infectious diseases Ministry of Health & Child Welfare
T1

Note: All suspected cases of notifiable diseases listed on the cover must be notified to the DMO OR Officer In-Charge of a district by telephone and then followed up with copies of this form to the DMO and PMD/City MOH

From:	TO MOH City: ---------- DMO District: ---------- PMD Province: ----------
---------- *Name of clinic/hospital/area*	

I hereby notify to you that the under-mentioned person ---------- from
is suffering
has died

Diagnosis

Confirmed by laboratory test: Yes -------- No --------

Type of test

Date of onset: ----------

Date of admission/Detention: ---------- case number ----------

Name: ---------- ----------
(First name) *(Surname)*

Age: ---------- Date of birth: ---------- Sex: ----------

Identification particulars: ----------

Physical address on admission/disease detection: ----------

Length of stay (at the above address): ----------
Communal land: ---------- Chief/Chairman----------

Headman/Ward: ---------- Kraal/Village: ----------

Nearest dip-tank/school: ----------

Next of kin: ----------

Usual residential address if different from above: ----------

Name and address of employee/school: ----------

Give physical addresses of places visited during last month and length of stay

Place of probable infection: ---------- Date of onset: ----------

Probable source of infection: ----------Date of probable infection: ----------

Transferred to: ---------- Date of transfer: ----------

Notifying officer: ---------- Title: ----------
(in capitals)
Date: ----------Signature: ----------

Instructions for completing the T1 notification of infectious diseases

For all levels of care

T1 is the form for notification of Infectious Disease. The list of notifiable diseases is as follows:

- Anthrax
- Cholera
- Diphtheria
- Hepatitis (all forms)
- Meningococcal Meningitis
- Plague
- Poliomyelitis
- Rabies
- Typhoid
- Typhus
- Viral Haemorrhagic fever
- Yellow fever

TB (Tuberculosis) and Leprosy are also notifiable, but they continue to be notified on TB Form 4 and TB Form B for TB, and the Leprosy form for leprosy.

Purpose

It has been found necessary to notify the above diseases because:

1. the way in which they spread needs closer monitoring if they are to be controlled;
2. It is important that the PMD(Provincial Medical Director) knows what action has been taken to control the spreading of the diseases;
3. It is a statutory requirement that Zimbabwe reports cases and deaths from these diseases to the WHO(World Health Organization)

Who fills in the T1

Any health worker who comes in contact with any of the notifiable diseases should complete the Form T1 in triplicate.

When to fill in the T1

All suspected and laboratory confirmed cases of the above should be notified immediately to the District Medical Officer by the fastest means possible(telephone if available). The notifying health worker should then complete a T1 form in triplicate.

How to fill in the T1

T1 forms are provided in 150 page pads. They are filled out in triplicate. Use good quality carbon paper each time an entry is being made, so that all the copies are clear enough to read.

Most entries on T1 are self explanatory, but a few notes may be useful

1. **CAPITAL LETTERS** should be used on all entries made.
2. **Double-wording**: Whenever alternatives are given for example (" suffering form" or "has died" or confirmed by laboratory test" or "suspected cases") the incorrect words should be carefully crossed our, or the appropriated box should be ticked.
3. **Age or/ and Date of Birth**: it is important to record the date of birth as well as the age to confirm that the age is accurate because in many cases these do not match. If the age is not known, the estimated age should be given.
4. **Physical address:** This refers to the control geographical area where the person lives; not the postal address (which could be local stop or school).

Annex 8: Laboratory request form

Lab. Ref. No----------
Received----------
Fee charged----------
Code No. ----------
Invoice No. ----------

REQUEST FOR EXAMINATION

Name of the patient----------
Age---------- Sex---------- Race----------Date----------
Hospital no---------- Ward no----------
Clinical data----------

Nature of specimen----------

Examination required----------
Name and address of Doctor in charge (please print) ----------
---
Charge/Non-chargeable? ----------

1. If non-chargeable, give authority----------
2. If chargeable quote medical aid and number----------
3. Name and address of person responsible for fee----------

Doctor's signature

REPORT DATE----------

----------Director

ANNEX 9: line list – Reporting from health facility to district and for use during outbreaks

Line list of cases

Province:---------- **District:----------** **Health Facility:----------**

Case No	Out/ In patient	Name	Physical Address	Sex	Age	Date seen	Date of onset	Signs and Symptoms	Treatment given	Specimen Taken	Lab Result	Outcome & date A-Discharged, D-dead	Place of death	Comments

Note:

- If more than 100 cases occur in a week at a health facility (e.g., for measles, cholera, and so on), do not line list them. Record name, age, sex and physical address only. If previously discharged cases die at a later date, update the status
- Line list to include all community deaths with information on where they occurred and a brief history
- Comments to include information on re-admitted cases, possibility of co-morbidities among others

ANNEX 10: District/CITY log of Suspected Outbreaks and Rumours

Record verbal or written information from health facilities or communities about suspected outbreaks, rumours, or reports of unexplained events. Record the steps taken and any response activities carried out.

Condition or Disease or Event (1)	Number of cases initially reported (2)	Location (Health Centre, village, etc) (3)	Date district/city was notified (4)	Date suspected outbreak was investigated by the district/ city (5)	Result of District/city investigation (Confirmed, Ruled Out, or Unknown) (6)	Date Outbreak Began Date onset index case/ date crossed threshold or first cluster) (7)	Date a case was first seen at a health facility (8)	Date Concrete intervention began (9)	Type of Concrete Intervention that was begun (10)	Date District/city Notified National Level of the Outbreak (11)	Date District /city received national response (12)	Comments (13)

ANNEX 11: Checklist for setting up a cholera treatment Camp

Province: …….. District: ……
Health facility/location …… Date: …….

	Yes	No	Comments
Adequate space			
Water Supply quantity			
Water Supply quality			
Free residual chlorine test			
Accessibility			
Facilities for disposal of stools			
Hand washing facilities			
Solid waste management			
Liquid waste management			
Drainage of site			
Communication			
Infrastructure :			
1. Entry: Foot bath Control entry Disinfectant area (spray pumps)			
2. Screening Triaging Observation facilities			
3, Wards Foot bath Water facilities Drainage Cholera beds & linen Buckets Accessibility to toilets, water Water disposal			
4. Storage Drug supplies/medical supplies Disinfectants Protective clothing			
5. Kitchen Provisions Gas stoves Utensils Cooking facilities Fuel Working surfaces Fly baits Hand washing facilities Food bins Solid waste management facilities Scullery (washing facilities			
6. Staff office Tables and chairs Registers Stationery SOPS (EPR Plans			

Spot Plans and map Line list List of staff and Roaster Programming Cleaning schedules Disinfection schedules Investigation Tool			
7. Staff room/accommodation Beds & Linen Lighting Tents Mosquito nets Ablution facilities			
8. Morgue facilities (Temporary) Stand alone tents Protective clothing Cadaver Chloride of lime Disinfectants			
9. Waste Management Incinerators Refuse pit Soak away pit Needles Fuel Picks and shovels Chloride of lime			
Documentation			
Cleaning schedule			
Fly control schedule			
Infection control procedures			
Operational procedures			
Roles definition			
EPR plan			
Other comments			

ANNEX 12: Funeral Guidelines for Cholera and other formidable epidemic diseases

In terms of the Provisions of the Public Health Act, Chapter 15:09. (Sections 33-34)

Funerals of people who have died of cholera or of any other cause in a community affected by cholera can contribute to the spread of the epidemic. A designated health worker should be present to supervise the funeral.

Handling of the Body at Health Centres

- Wear protective clothing, (gloves, apron, gumboots, mask etc.)
- Disinfect corpse with a strong 2% chlorine solution in a well ventilated area. It is a strong solution and should not be inhaled. (This is only effective for a short time; therefore the family should bury the deceased as soon as possible, preferably within 24 hours of the death).
- Plug the mouth and anus with cotton wool soaked with 2% chlorine solution.
- Bandage the head so that the mouth remains shut.
- Wrap the body carefully and put in a body bag. If not available, the body can be wrapped in plastic sheeting or a cloth sheet soaked in 2% chlorine.
- Disinfect all surfaces that have been in contact with the body with 0.2% chlorine solution
- Wash hands thoroughly with 0.05% chlorine solution or soap.
- Take time to explain to relatives the importance of the above body procedures carried out on the deceased.

Handling of the body within communities

If possible, physical contact with the corpse should be minimized or avoided, but if you have to handle the body the following should be done:-

- **Do not handle the corpse without protection**, such as gloves (or alternatives like plastic).
- Do not empty the intestines of the corpse
- Prepare a 0.2% chlorine solution (or jik) or boiling water to disinfect dead person's clothing and bedding.
- Dip/soak the dead person's clothing and bedding in the boiling water or disinfectant for 10 minutes and then rinse with clean water (chlorine may bleach the clothes).
- Avoid putting your hands into your mouth, touching your face, food, or utensils after touching the corpse.
- Wash your hands thoroughly using soap/ash under running water.

The Funeral Procedure

- The funeral should be held as close as possible to where the person died.
- Bury the dead as soon as possible, preferably within 24 hours of the death.

- The grave should be at least 50m away from a water source and be at least 6feet (1.5m) deep.
- Ensure that there is no hand shaking done at the funeral.
- All mourners should wash hands thoroughly with soap/ash and under clean running water.
- All corpse carriers should wear hand protection e.g. gloves.
- Ensure that all material used i.e. gloves, are properly disposed off. (burn, bury or dump into a pit latrine).

Food Matters at the Funeral

DO NOT PREPARE FOOD. DO NOT EAT FOOD at the funeral. ***Except*** for household cooking to feed ***immediate family members*** of the deceased.

- Persons preparing food for immediate family members should :
  - Wash their hands thoroughly before preparing food and frequently during food preparation.
  - Use clean water for cooking.
  - Wash all fruits and vegetables in safe boiled or chlorinated water.
  - Cook food thoroughly and avoid re-heating.
  - Serve food while hot discouraging sharing of utensils.
  - Discard left-overs in refuse pit or bin.

After the Burial

- Do not distribute soiled clothing before it has been disinfected.
- The entire homestead should be disinfected with the help of the health worker or such person. It is crucial to explain to the household that spraying of chlorine is done to disinfect and that it is not poison. Use a 0.2% chlorine solution for the purpose of household spraying.
- Hygiene education messages should be passed to all mourners.
- Disinfect vehicle used to transport the corpse, using a 0.2% chlorine solution.
  Be aware that if the inside of the vehicle is not plastic or similar, there may be effects (chlorine residue) on the material.

ANNEX13: Steps in Hand washing

Purpose
To protect the patient, staff and care givers from cross infection

Responsibility
Clinicians, Environmental health practitioner, care giver

Steps in hand washing
The hands are washed for a minimum of 10-15 seconds with soap (plain or antimicrobial) and running water (tap or run to waste method)

- Remove jewellery (rings, bracelets) and watches before washing hands,
- Ensure that the nails are clipped short (do not wear artificial nails),
- Roll the sleeves up to the elbow.
- Wet the hands and wrists, keeping hands and wrists lower than the elbows (permit the water to flow to the fingertips, avoiding arm contamination).
- Apply soap (plain or antimicrobial or ash) and lather thoroughly.
- Use firm, circular motions to wash the hands and arms up to the wrists, covering all areas including palms, back of the hands, fingers, between fingers and lateral side of the fifth finger, knuckles, and wrists.
- Rub for minimum of 10-15 seconds.
- Repeat the process if the hands are very soiled.
- Clean under the fingernails.
- Rinse hands thoroughly, keeping the hands lower than the forearms.
- If running water is not available, use a bucket and pitcher.
- Do not dip your hands into a bowl to rinse, as this re-contaminates them.
- Collect used water in a basin and discard in a sink, drain or toilet.
- Dry hands thoroughly with disposable paper towel or napkins, clean dry towel, or air dry them.
- Discard the towel if used, in an appropriate container without touching the bin lids with hand.
- Use a paper towel, clean towel or your elbow/foot to turn off the faucet to prevent re-contamination.

Different from antiseptic disinfection:
Using antiseptics, hand rubs gels or alcohol swabs for hand antisepsis

- Apply the product to the palm of one hand. The volume needed to apply varies by product.
- Rub hands together, covering all surfaces of hands and fingers, until hands are dry.
- Do not rinse.
- Note: When there is visible soiling of hands, they should first be washed with soap and water before using waterless hand rubs, gels or alcohol swabs.
- If soap and water are unavailable, hands should first be cleansed with detergent-containing towellettes, before using the alcohol-based hand rub, gel or swab.

Note: In situations where soap is not available, ash can be used for washing hands

ANNEX 14: Guidelines on preparation of footbaths

1. Identify position for location of footbath
2. Assess drainage of the proposed areas
3. Appropriate foot baths should be provided for the various rooms/tents in use for management of patients and morgue entrances

NATURAL GROUND

Excavate a foot bath with the following dimensions

1. The length should be equivalent to the opening of the entrance to the facility
2. The width should be at least 450 mm
3. The depth should be 115mm
4. The floor of the footbath should be at a gradient which will facilitate drainage
5. The foot bath should be lined with water tight material which can be mounted on a frame
6. Disinfectant should cover a depth o up to 60mm

CONCRETE FLOORS

1. Construct foot bath using wooden floor, bricks or other appropriate material
2. The length of the footbath should be equivalent to the opening of the entrance of the facility
3. The width should be at least 40mm
4. The depth should be 115mm
5. The frame should be fitted with a water tight material.
6. The footbath should be filled with a disinfectant to a depth of 60mm

PREPARATION OF FOOTBATH SOLUTION

Disinfection solution for the footbath can be prepared using a 2% chlorine solution

OR

RECOMMENDED ALTERNATIVE METHOD USING A WOODEN FRAME (SUITABLE FOR BOTH NATURAL AND CONCRETE FLOOR):

1. The length should be equivalent to the opening of the entrance to the facility
2. The width should be at least 1m (2 human steps)
3. The depth should be 50mm
4. The frame should be fitted with a water tight material
5. Put a folded blanket soaked with 2% solution

The disinfection solution should be changed at least 6 hours interval a day but more frequently were accumulation of organic material is observed.

Annex 15: Guidance on infant and young feeding during cholera and other diarrhoea outbreaks

INFANT AND YOUNG CHILD FEEDING DURING DIARRHOEA AND CHOLERA

Guide for Health Workers at Cholera Treatment Centres

On arrival at centre

- A child should be screened for severe mulnutrition at the reception area
- A child with severe acute malnutrition must be rehydrated very slowly and with great caution to avoid overhydration which quickly occurs. Refer to Therapeutic Feeding Centre
- If the breastfed child is too weak to suckle, please seek advice for specialized medical attention
- For children with moderate or no signs of dehydration follow recommendations below
- A mother can continue to breastfeed even if she has cholera, but she needs treatment

Infants under 6 months

- **If exclusively breastfed and no signs of dehydration:**
  - Breastfeed frequently and for as long as possible at each feed
  - If neaessary give expressed breastmilk fed from a clean cup or spoon
  - Give ½ tablet of Zinc once a day for 14 days in a small amount of expressed breastmilk to decrease the length and severity of the diarrhoea and improve growth and appetite
- **If exclusively breastfed and signs of moderate dehydration:**
  - Breastfeed frequently and for as long as possible at each feed
  - Give expressed breastmilk fed from a clean cup if necessary
  - Give ORS
  - Give ½ tablet of Zinc once a day for 14 days in a small amount of expressed breastmilk to decrease the length and severity of the diarrhoea and improve growth and appetite
- **If not breastfed and no signs of dehydration:**
  - If the child is on other modified milks or infant formula, then give at least every three hours
  - Give ½ tablet of Zinc once a day for 14 days in a small amount of infant formula to decrease the length and severity of the diarrhoea and improve growth and appetite
- **If not breastfed and signs of moderate dehydration:**
  - Give ORS in the first 4 hours of rehydration and feed the child full strength infant formula
  - Reassess after 4 hours, if no longer dehydrated, give 50-100mls of ORS after each watery/loose stool
  - Give ½ tablet of Zinc once a day for 14 days in a small amount of infant formula to decrease the length and severity of the diarrhoea and improve growth and appetite

Children over 6 months

- **Fluids to give:**
  - Breastfeed frequently and for as long as possible at each feed
  - If necessary expressed breastmilk fed from a clean cup
  - Other modified milks or infant formula that a child normally takes
  - ORS
  - Boiled clean water in which a cereal has been cooked
  - Mild soups
  - Unsweetened yoghurt drinks such as lacto or sour milk
  - Unsweetened Mahewu
  - Unsweetened natural fresh fruit juice such as orange and mango
- **Fluids not to give**
  - Drinks sweetened with sugar
  - Carbonated soft drinks such as Coca-Cola and Fanta
  - Commercial fruit juices such as Mazoe
  - Sweetened tea, freezit, jolly juice or ice lolo
  - Coffee
- **Foods to give**
  - Nutrient-dense foods that are soft and varied (porridge with peanut butter and mashed beans)
  - Frequent small feeds/soup at least 6 times a day
  - Feed the child slowly and patiently
  - Encourage the child to eat, but do not force
  - 1 tablet of Zinc once a day for 14 days in a small amount of clean boiled water or to be chewed to decrease the length and severity of the diarrhoea and improve growth and appetite

GUIDELINES ON INFANT FEEDING IN EMERGENCIES

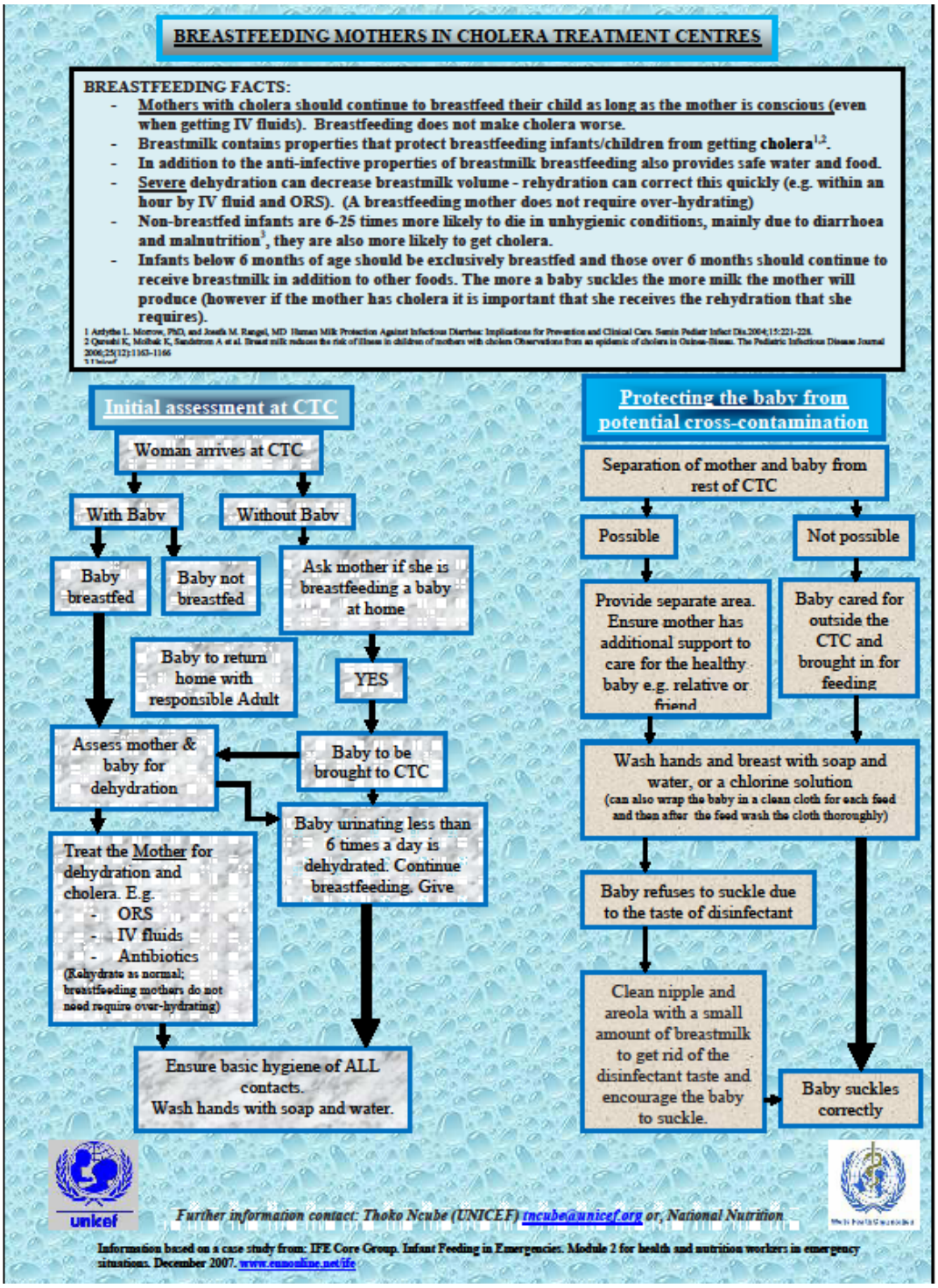
1. In an emergency, mothers should continue breastfeeding since breastmilk is the cleanest and safest food and drink she can give her baby.
2. Women breastfeeding their babies should be actively supported by being given appropriate information, assistance and encouragement to continue breastfeeding, especially if they are experiencing difficulties.
3. Mothers who have stopped breastfeeding, should be encouraged and provided with assistance to start breastfeeding again (i.e. to re-lactate).
4. Only in instances where a baby cannot receive breastmilk, for example when the baby has been orphaned, should alternative feeding options be supported.
5. **Donated (free) or subsidized supplies of breastmilk substitutes (e.g. infant formula) should be avoided.**
6. The decision to accept, procure, use or distribute infant formula in an emergency should be made by an informed nutritionist, in consultation with the National Nutrition Unit.
7. Breastmilk substitutes and other milk products should only be distributed according to recognized strict criteria and only provided to mothers or caregivers for those infants who need them.
8. Donations of bottles and teats should be refused in emergency situations.
9. Breastmilk substitutes, other milk products, bottles and teats must never be included in a general ration distribution.
10. The use of bottles and teats in emergency contexts should be actively avoided and discouraged. Cup feeding should be encouraged instead.

unicef

World Health Organization

JANUARY 2009

Annex 16: Guidance on breastfeeding mothers in CTCs



Annex 17: Monitoring IV infusions

It is extremely important that IV infusions are monitored closely to ensure that the correct amount of fluid is given to each individual patient. During the initial 2 phases of rapid rehydration, drip-rates may be difficult to calculate, as drops may be uncountable. However, these practical measures should be put in place for anyone on IV treatment to reduce complications –

- Tape must be applied to each IV bag hung
- Start time recorded at initial fluid level marked
- Fluid level then marked at regular intervals to follow fluid amounts administered:
    - Phase one - Every 15 minutes
    - Phase two – Every hour
    - Phase three (continuation phase) - Every hour ***plus*** counting drops/ minute

* Remember to record ALL fluids on the fluid balance chart; the amount offered in brackets eg ( ) and the amount given without brackets.

Calculation for continuation rate

Formula breakdown:

Drops per minute=ml/hr x 20/60

Formula breakdown:

Ml/hr = Hourly rate calculated for patients weight (in continuation phase 6ml/kg/hr)

20 = Capacity of IV giving set of drops/ml. * Note – This can vary amongst different brands!!!

60 = minutes Drop in 1 ml is 20, therefore the calculation is Drops/min=ml/hr x 20/60

This table can be used as a quick guide to calculate approximate drops per minute for different fluid amounts:

ML/hr	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**
Drops/min	*17*	*20*	*23*	*27*	*30*	*33*	*37*	*40*	*43*	*47*	*50*	*53*	*57*

ML/hr	**180**	**190**	**200**	**210**	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**
Drops/min	*60*	*63*	*67*	*70*	*73*	*77*	*80*	*83*	*87*	*90*	*93*	*97*	*100*

Infusion schedule for first 24hours in CTC

Children

Age	**First phase: 30ml/kg over:**	**Second phase: 70ml/kg over:**	**Continuation phase: 6ml/kg/hr**
< 1 year	1 hour* (Repeat once if radial pulse is weak or non-detectable)	5 hours	18 hours
1 – 14year	30 minutes* (Repeat once if radial pulse is weak or non-detectable)	2 ½ hours	21 hours

Adults

Age	**1st phase: 1ltr (1000mls) over:**	**2nd phase: 1ltr (1000mls) over:**	**Third phase: 1ltr (1000mls over):**	**Continuation phase: 6ml/kg/hr**
> 15yrs	15 minute *	45 minutes	4 hours (250ml/hr)	19 hours

- Repeat 1st phase if pulse remains weak or non-detectable (therefore 1ltr over 15 minutes).
- Patients should be reassessed frequently and treatment adjusted accordingly.

Annex 18: Sample medical stock inventory and weekly order form

Date order:..... Signature:.....

Oral drugs	Dosage	Beginning stock	Used	In stock	Ordered	Prepared and given
Amoxycillin	250 mg					
Chloramphenicol	250 mg					
Cotrimoxazole	480 mg					
Doxycycline	100 mg					
Furosemide	40 mg					
Mebendazole	100 mg					
Metronidazole	250 mg					
Nystatine	100 000 ui					
O R S	1 bag					
Paracetamol	500 mg					
Quinine	300 mg					
Injectable	**Quantity**	**Beginning stock**	**Used**	**In stock**	**Ordered**	**Prepared and given**
Ampicillin	500 mg					
Ceftriaxone	1 g					
Benzathine Peni	2.4 Mui					
Chloramphenicol	1 gr					
Diazepam	5 mg: ml					
Furosemide	10 mg: ml					
Glucose 50 %	50 ml					
Lidocaine 1 %	20 ml					
Potassium chloride	100 mg/ml					
Quinine	300 mg/ml					
Water for injection	10 ml					
Infusions	**Quantity**	**Beginning stock**	**Used**	**In stock**	**Ordered**	**Prepared and given**
Glucose 5 %	500 ml					
Ringer lactate /hartmann	500 ml					
Ringer lactate /hartmann	1 L					
External use/ Disinfectants						

Cetrimide + Chlorexidine	1 L					
Iodine povidone 200 ml	1 bottle					
Medical materials	**Quantity**	**Beginning stock**	**Used**	**In stock**	**Ordered**	**Prepared and given**
Adhesive tape 2cmx5m	1					
Bandage gauze, 8cmx4m	1					
Cotton wool, 500 g	1 roll					
Gauze compress non sterile	100					
IV placement 16 G	50					
IV placement 18 G	50					
IV placement 20 G	50					
IV placement 22 G	50					
IV placement 24 G	50					
Needle luer 19 G	100					
Needle Luer 21 G	100					
Needle luer 23 G	100					
Scalp vein 21 g	100					
Syringe luer 2ML	100					
Syringe luer 5 ML	100					
Syringe luer 10 ml	100					
Syringe feeding 60 ml, Luer	1 pcs					
Plastic bags for drugs						
Gloves exam Large	100					
Gloves exam Medium	100					
Gloves exam Small	100					
Gloves surg 7	50 pces					
Gloves surg 8	50 pces					
Container needles, 5 l	1					
Container needles, 15 l	1					
Blanket survival	1					
Razor blade disposable	1					
Tube gastric CH 6, Luer	1					
Tube gastric CH 8, Luer	1					
Tube gastric CH10, conical	1					
Tube gastric CH 16, conical	1					
Surgical blades	100					
Thermometer	1					
Tourniquet	1					
Scissors	1					

Annex 19: Sample messages for community education

A. Improving hand-washing practices:

Hand-washing with soap is the most effective way to prevent transmission of some organisms causing infectious diseases. For that reason, promote hand-washing in every family. Hand-washing is particularly important after defecation, after cleaning a child who has defecated, after disposing of a child's stool, before preparing or handling food and before eating.

Hand-washing should be practiced. If possible, water for washing should be stored separately from drinking-water. During an epidemic, soap should be provided to those without it. If soap is not available, ash or earth can be used to scrub the hands.

- Do not dry washed hands with dirty cloths.
- Air-dry wet hands.
- Avoid handshaking especially at large gatherings like funerals.

Message:

ARE YOU PROTECTED FROM cholera?
Washing your hands protects yourself and others from disease.

Always wash:

- after defecation
- after cleaning a child who has defecated
- after disposing of a child's stool
- before and after eating
- before preparing or handling food.

Message:

ARE YOU READY FOR HAND-WASHING?
Do you have

- Clean water X Soap (or if you do not have soap, use ash or earth to scrub your hands)
- Clean cloth for drying or air dry for two minutes.

B. Safe handling of food

Encourage the following food safety practices:

- Wash fruits and vegetables with clean running water before eating, eat immediately after washing.
- Cook food thoroughly and eat whilst hot
- Eat food while it is still hot, or reheat it thoroughly before eating
- Wash and thoroughly dry all cooking and serving utensils after use
- Keep cooked food and clean utensils separate from uncooked foods and potentially contaminated utensils
- Wash hands thoroughly with soap before handling food
- Protect food from flies by means of fly screens.

Message:

DO YOU PREPARE FOOD SAFELY?

Cooking kills germs

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

Washing protects from disease

- 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.

Peeling protects from disease

- Only eat fruits that have been freshly peeled (such as bananas and oranges)

KEEP IT CLEAN: COOK IT. PEEL IT. OR LEAVE IT.

C. Safe disposal of human waste

High priority should be given to ensuring the safe disposal of human waste at all time, and especially during epidemics of diarrhoea. Sanitary systems appropriate for local conditions should be constructed with the cooperation of the community.

Community messages should emphasize:

- Everyone should use latrines properly, including children
- Dispose of children's excreta in a latrine or bury in a hole.
- Avoid defecating on the ground, or in or near the water supply.

When large groups of people congregate—as for fairs, funerals, or religious festivals—, ensure the safe disposal of human waste. If there is no latrine, designate areas for defecation and provide a shovel to bury the excreta.

Message:

ARE YOU PROTECTED FROM Cholera?
DO YOU USE A TOILET OR LATRINE?

Germs that cause dysentery live in faeces. Even a person who is healthy might have cholera germs.

- *Always use* a toilet or latrine. It you don't have one – build one!
- Keep the toilet or latrine *clean*
- *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

D. Clean drinking water and storage

- **Community drinking water supply and storage**

1. *Piped water:*
    - To maintain safety, properly chlorinate piped water.
    - To prevent entry of contaminated groundwater into pipes, repair leaking joints and maintain constant pressure in the system.

2. *Closed wells*: Equip with a well-head drainage apron, and with a pulley, windlass, or pump.

3. *Trucked in water*: If locally available water is likely to be contaminated, drinking water should be supplied by tankers or transported in drums, if it is adequately chlorinated and a regular supply can be ensured. The trucking of water, however, is expensive and difficult to sustain; it is usually considered a short-term measure until a local supply can be established.

- **Home drinking water storage and treatment**

  When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled.

  To prevent contamination of drinking water, families should store drinking water using one of the following types of containers:

  1. *Covered containers* that are cleaned daily and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.

  2. *Narrow-mouthed containers* with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or by a spigot.

  Water used for bathing, washing and other purposes other than drinking need not be treated and should be stored separately from drinking water.

E. **Safe disposal of bodies**

The body fluids of persons who die due to diarrhoea (for example cholera) are still infectious. The nearest health facility should be contacted to carry out a supervised burial if the death is suspected to be due to cholera or any other diarrhoeal disease.

Annex 20: Investigation form

Date of the investigation: ……..

Investigating officer: ……..

Name of patient: ……

Province/City …… **District**……

Ward …… **Village** ……

Age …….**Sex: Male** …….**Female**……. (tick appropriate)

Religion: Traditional …….Christian……. (Indicate denomination) Moslem …….

Others (specify) ……

Date of onset: ……..Date seen: ……

1. What signs and symptoms did the patient present with?

Profuse diarrhoea	☐	Vomiting	☐
Dehydration	☐	Body weakness	☐
Others (specify) ……			

2. How many other people had watery diarrhoea and vomiting during the past seven days at this residence?
1: ……. 2: ……. 3: ……. 4: ……. >4: …….

3. Did the patient receive treatment at home? Yes……. No…….`If yes go to question 4.

4. What type of treatment was received? Please specify

……
……

5. Did the patient seek medical treatment? Yes……. No……. If yes, please specify where (and go to question 6)

……
……

If no, why? (go to question 8)

……
……

6. After how long did the patient seek treatment? Tick appropriate

	Patient
within 12 hours	
24 hours	
36 Hours	
>36 hours	

6b. Treatment given at the health facility (or treatment centre):

Oral fluids……. IV fluids ……. Ciprofloxacin……. Doxycyclin……. Co-trimoxazole …….

Other: Specify: …….

6C: Outcome: improved……. died …….

7. Did the patient;
- Visit anybody suffering from watery diarrhoea (cholera)? Yes……. No…….`
- Receive any visitors with watery diarrhoea (cholera)? Yes……. No…….`
- Take care of a patient with watery diarrhoea (cholera)? Yes……. No…….`
- Participate in preparation of a body for burial Yes……. No…….`

If the answer to the above questions is yes, please indicate when and where below

……
……

7b. Did the patient visit a gathering (funeral, religious or any other)? Yes……. No…….`

If yes, when and where? ……

7c. Did the patient travel to any cholera affected area? Yes……. No…….` If yes, where? When?

……

7d. History of eating in a particular place outside home within past 5 days:
Yes …….No ……. If Yes, specify:

Hotel……. bar ……. neighbour……. food sold at roadside…….

7e. Have you taken any of these foods in the last 5 days? (Specify whether hot or cold)
Fish ……. Milk ……. Mangoes ……. Sadza ……. Rice……. Salad
……. Pineapple…….apples …….cucumbers…….

8. What is your usual source of water for household use? Please specify

……

8b. How far is your usual water source? 500m-1km: ……. 2-4km: ……. >5km …….

9. What type of containers do you use:
- to collect water?
- to store water?

9b. How often are the water containers cleaned and how?
Daily: ……. Every two days: ……. weekly …….

10. How does the household prepare its drinking water?
Boiling ……. Chlorination ……. filtration ……. Others (specify): ……. None…….

10b. Availability of household chlorination chemical e.g. aquatabs, jik, etc

11. Availability of toilet in home: Yes……. No…….
If Yes, what is the state of the toilet? clean……. dirty …….

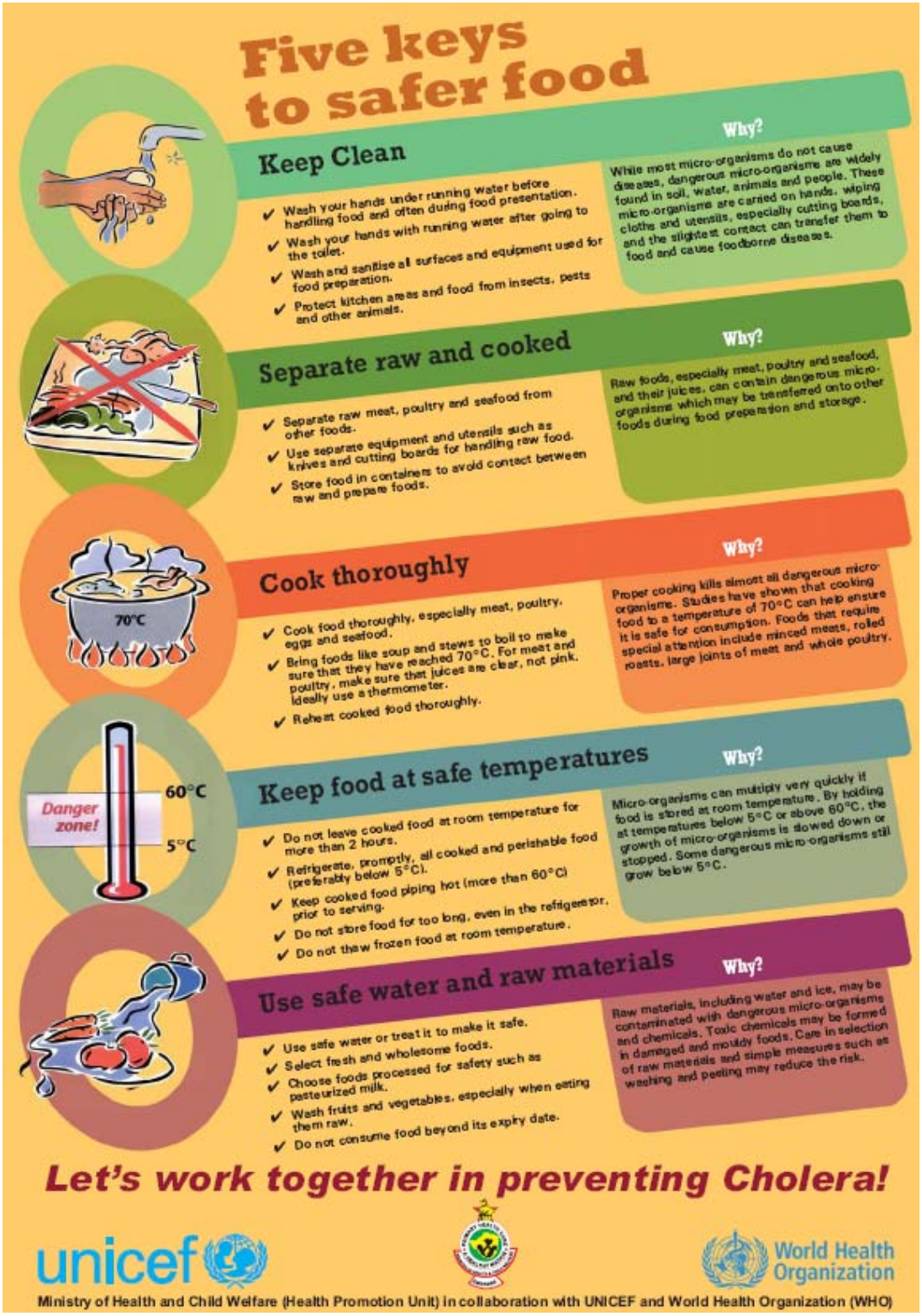
12. Does household have facility for hand washing after latrine use? Yes ……. No…….

13. When do you wash your hands? (Circle the appropriate answer)

After going to the toilet	Yes …….	No…….
Before eating	Yes …….	No…….
After changing diapers	Yes …….	No…….
Before handling food	Yes…….	No…….

14. How do you wash your hands?
Using soap & water ☐ Using water only ☐ sing ash and water ☐
Others (specify): …… (ash, alcohol rubs, etc) ☐
15. Availability of soap for hand washing Yes …….No…….

Annex 21: Five key steps to safer food



Annex 22: CTC/CTU Patient admission and follow up form

CTC/CTU Patient admission and follow up form

Name:……	Date of admission:……..	Time of admission: ……
Address:…….....		
Age:……	Weight:……	Date of onset:……..
Number of diarrhoea episodes in the last 24 hours:……..	Number of vomiting episodes in the last 24 hours:……..	
Description of diarrhoea aspect □Watery □Bloody □Others (specify) ……	Colour of diarrhoea □White □Transparent □Others (specify) ……..	

Initial evaluation

Pulse:	□Present	□Weak/rapid	□None
Condition	□Well/alert	□Restless/irritable	□Lethargic/unconscious
Eyes (sunken)	□No	□Yes	□Yes
Thirst	□Drinks normally	□Thirsty, drinks eagerly	□Not able to drink
Skin pinch	□Goes back quickly	□Goes back slowly	□Goes back very slowly
Dehydration	□None (Plan A)	□Moderate (Plan B)	□Severe (Plan C)

Follow-up monitoring

	Day 1 Date:---/---/---						Day 2 Date:---/---/---			Day 3 Date:---/---/---			Day 4 Date:---/---/---		
Time	First 15 min	+30 min	+1 hr	+3 hr			8am-4pm	4pm-10pm	10pm-8am	8am-4pm	4pm-10pm	10pm-8am	8am-4pm	4pm-10pm	10pm-8am
IVF Cross X a circle for each litre of RL given	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000
ORS Cross X a circle for each cup (200ml) of ORS given							000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000
Diarrhoea Tick(✓) number of stools passed in time period															
Vomit Tick✓ number of vomit passed in time period															
Hydration (A, B or C)															

Date of exit: ---------- □Cured □Defaulted □Transferred □Died

If died, probable cause and time of death: ----------

ANNEX 23: REHYDRATION AND EMERGENCY MEDICAL TREATMENT OF A SEVERE ACUTELY MALNOURISHED PATIENT WITH WATERY DIARRHOEA IN CTC BEFORE REFERRAL TO THERAPEUTIC FEEDING UNIT

KEY MESSAGES

- **Give special attention when you rehydrate the severe acutely malnourished (SAM) patient who is also** severely dehydrated
- Patient with SAM must be slowly rehydrated compared to a well nourished one, because they quickly get over hydrated and may develop heart failure.
- Use preferably low osmolarity ORS[1] (by UNICEF) or normal ORS for the SAM patient who has acute abundant watery diarrhea

REFER AS SOON AS POSSIBLE TO A THERAPEUTIC FEEDING UNIT FOR APPROPRIATE FEEDING IF NOT ABLE TO START FEEDING

I. ASSESS THE NUTRITIONAL STATUS OF ANY PATIENT FOR SEVERE ACUTE MALNUTRITION

LOOK FOR:

- **Bilateral pitting oedema** in the feet, legs and arms, and in severe cases on the face 0R
- **Severe wasting clinical signs**:
  - Front view of the child: the ribs outline is easily seen or prominent; loose skin of the upper arms and of thighs Back view of the child: The ribs and shoulders bones are easily seen or prominent; and muscles are obviously missing from the buttocks
  - When wasting is extreme, there are folds of skin on the buttocks and thighs and it looks as if the child is wearing " baggy pants"

If the patient is well nourished assess the hydration status and rehydrate as usual

MEASURE: MUAC FOR LESS THAN FIVE CHILDREN, WEIGHT AND HEIGHT FOR OTHER PATIENT

- child from 6 to 59 months : weight for height less than -3 SD and/or MUAC less than 115
- From 5 to 19 years the BMI[3] less than -3 SD (see annexes)
- Adult: BMI will be less than 16.00 and he looks as well very wasted and/or has oedema

(MUAC and height not routinely done except for surveys, not sure of relevance in the acute management, plesase crosscheck)

WITH OEDEMA AND/OR SEVERE WASTING (W/H, MUAC, BMI) AND/OR CLINICAL SIGNS THE PATIENT IS SEVERELY ACUTELY MALNOURISHED

If the patient is malnourished carefully assess the hydration status and look for other medical complications Continue breast feeding if the child is still breastfed

2. ASSESSMENT FOR DEHYDRATION

This is difficult because many of the normally-used signs for dehydration are common in a patient with severe acute malnutrition (lethargy, sunken eyes). Ask these questions

- How long has the patient had diarrhea?
- How watery, abundant and frequent are the stools?
- What fluid and how has it been given (assess how much of the fluid was given and the length of time)

If a malnourished patient has profuse watery diarrhea assume he has dehydration

Note down dehydration signs as these will help to assess improvement during rehydration. Useful signs to assess hydration are: eagerness to drink, lethargy, cool and moist extremities, weak or absent radial pulse and reduced or absent urine flow.

If some of these signs improve during rehydration you will know that the rehydration has a good effect.

LOOK FOR OTHER MEDICAL COMPLICATIONS

Assess the patient's general condition and look for specific signs of

Hypothermia: rectal temperature below 35.5[c] and axillary below 35[c].

High axillary temperature: > 38.5c.

Hypoglycemia: if the child has not eaten for more that 4-6 hours and vomiting severely assume hypoglycemia; Blood glucose less than 3 mmol/litre.

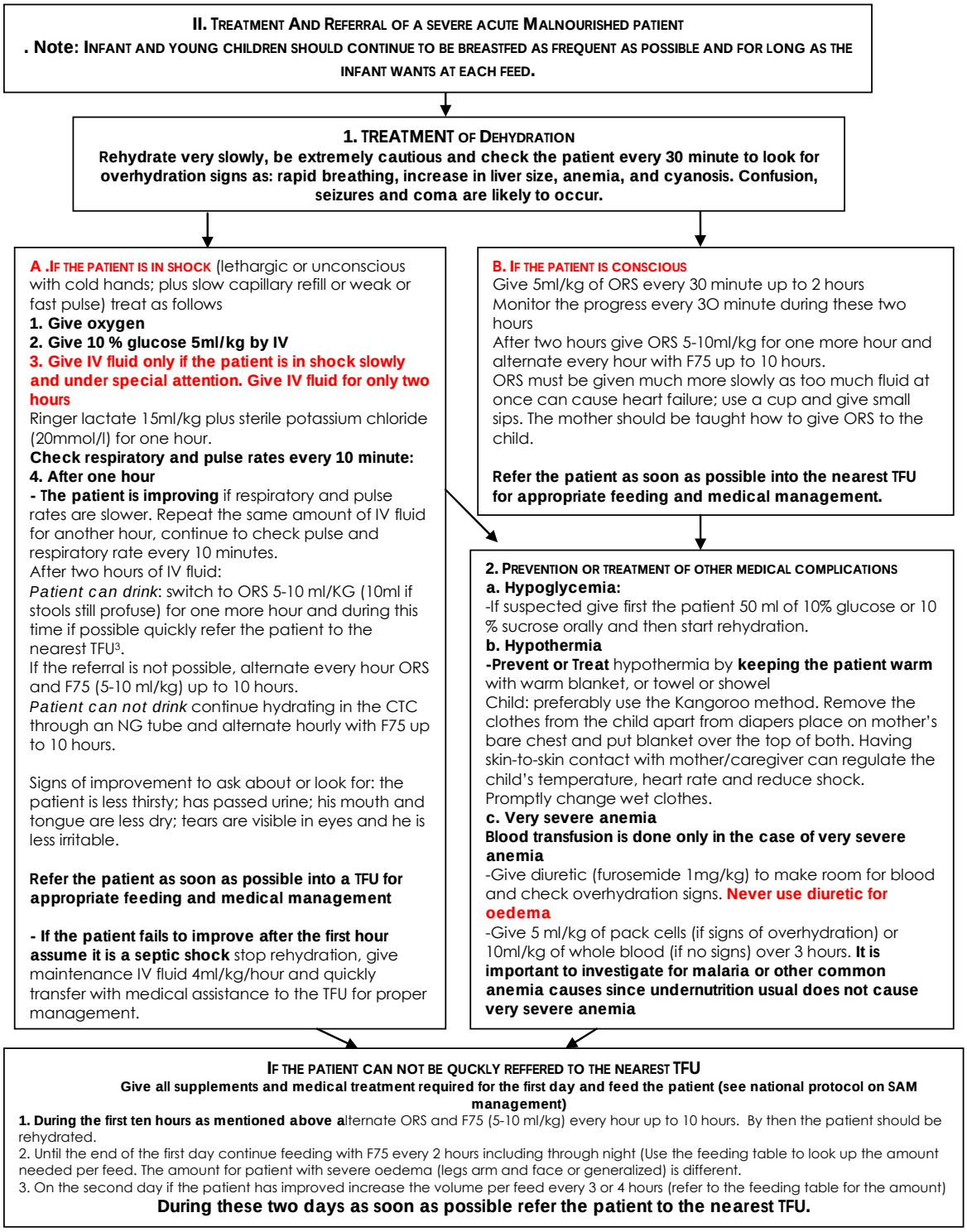
Very severe anemia: extreme pallor of palms and conjunctiva

Shock: can be caused by dehydration, sepsis or anemia the signs are: severe weakness, lethargy or unconsciousness, cold extremities, weak or fast pulse, slow capillary refill.

MUAC Mid upper arm circumference

[1] ReSoMal is recommended for rehydration of the severely dehydrated severely acutely malnourished patient. When acute abundant watery diarrhea is the cause of the dehydration, u**se ORS rather than RESoMal** to avoid hyponatraemia which could lead to death.

[3]Body Mass Index (BMI) is defined as the body weight (in Kg) divided by the square of the height (in meters). BMI tables from 5 to 19 years are given in the annexes.



Reference documents: World Health Organization; Department of Nutrition for Health and Development; Training Course on the Management of Severe Malnutrition: revised version in 2008; The Treatment of Diarrhoea. A Manual for Physician and Other Senior Health Workers. World health Organization 2005.

For Further information please contact Dr Zerbo at WHO or Mrs Chigumira the head of the National Nutrition Unit.