WHO-EM/CBI/060.02/E

Training manual for cluster representatives and health volunteers

Module 2

Emergencies, environmental health and food safety

World Health Organization
Regional Office for the Eastern Mediterranean

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Contents

Module 2

Introduction

Poverty is the most serious challenge that humankind currently faces. A healthy life, free from starvation and disease, is the right of each and every person. Diseases are one of the main obstacles that stand in the way of community efforts to overcome poverty. The spread of disease increases poverty and poverty accelerates the spread of disease. Improving health status through investment in health improves economic and social outcomes and thus can alleviate vulnerability and offer an exit route out of poverty. Indeed, healthy children are better able to learn and healthy adults are better equipped to work and care for their families. The health sector thus has sufficient grounds to justify its engagement in poverty reduction initiatives, for which it has to develop both the skills and infrastructure necessary to work in partnership with other sectors and the community.

The Regional Office for the Eastern Mediterranean has successfully advocated to Member States the importance of involving communities as active partners in the delivery of comprehensive primary health care. Experience from different countries of the Region implementing community-based initiatives (CBI) programmes has shown that organized and aware communities are able to significantly improve health indicators, especially related to immunization coverage, access to water and sanitation, mother and child health, tuberculosis and malaria control and healthy lifestyles. Community-based initiatives have been so successful in countries that Member States have begun to institutionalize the programme in a sustainable manner as part of the government structure. Community participation in health care programmes is now increasingly being recognized as an innovative and effective approach.

Cluster representatives and health volunteers in CBI-implementing areas of the Region have been assisting in the implementation of priority health programmes at the community level, while maintaining strong linkages with health services and health workers operating in the area. They are trained by specially selected trained nurses and technicians working in the nearest health facility to the CBI site supervised by members of the CBI intersectoral team and related technical programmes at the district level. However, there is a growing need to empower them, not only with the transfer of health messages, but also as partners in health planning and in its implementation. Responding to the challenge, the community-based initiatives programme of the Regional Office produced this training manual for cluster representatives and health volunteers in coordination with the 17 relevant technical units in the Regional Office. Its publication represents a starting point towards the integration of community-based initiatives into all health-related programmes at community level and its use facilitates the ability of health programmes to work closely with communities to involve them in a sustainable way at grass-roots level.

In using this manual health volunteers and cluster representatives will be trained on their specific roles and responsibilities and will be made aware of simple and timely actions to prevent and manage common diseases and health-related issues. It is expected that more extensively trained community representatives and health volunteers will be able to assist the health system in improving the access of the target population to primary health care services and in helping to ensure the provision of timely health services to the entire population. This manual has been successfully field-tested in several countries of the Region and it is

expected that Member States will translate the manual into local languages and use it as a guideline for community involvement in health actions. Countries of the Region can adapt and adopt the material in accordance with their specific needs, culture and local situation. It should be updated periodically to accommodate new health issues and challenges.

The manual comprises four modules.

Module 1. Family health: Birth and emergency planning; Birth spacing; Child health, Nutrition and Dental hygiene

Module 2. Emergencies, environmental health and food safety: Emergency planning, First aid, Healthy environment, Food and chemical safety

Module 3. Communicable diseases: Tuberculosis; AIDS and sexually transmitted infections; Malaria; Childhood diseases and immunization

Module 4. Noncommunicable diseases: Noncommunicable diseases; Prevention of control of blindness; Active and healthy ageing and old age care; Mental health and substance abuse; Tobacco and health

Unit 6
Emergency planning

Contents

Emergency planning

Learning objectives

The objectives of this session are to:

- explain the basic concepts of natural hazards and their impact, local risks and vulnerabilities that communities are exposed to;
- raise awareness of human and other resources within communities;
- provide the knowledge and information needed to develop an emergency preparedness and response plan;
- orient cluster representatives and health volunteers on implementation of locally-based plans.

Expected outcomes

After completion of this session cluster representatives and health volunteers will:

- have the capacity to develop hazard specific emergency preparedness and response plans;
- have the capacity to access local resources in an emergency and identify all stakeholders involved;
- have knowledge of basic search, rescue, evacuation and first aid procedures;
- have the basic skills to conduct immediate needs assessment after any event;
- be able to establish and maintain an emergency information management system through appropriate coordination.

Introduction

Many countries in the Region have faced emergencies or disasters from various hazards, including: earthquakes, droughts, cyclones and floods to civil unrest, wars and conflicts, leading to millions of people being displaced, injured or killed.

First-responders to an emergency are often individuals from within the community itself. They have to rely on each other and on local resources to cope before any external assistance reaches them. So it is important to build the capacity of communities focusing on the availability of local resources. It has been shown that mortality rates for some types of emergencies can be reduced by 10% by simply placing the injured in a "coma" position. If preparedness measures are taken seriously, families and the whole community can learn this type of self-reliance. External humanitarian assistance may arrive too late or it may be inappropriate. It is important to have an adequate analysis of the situation in order to seek the external assistance that a situation demands in order to strengthen the community's ability to cope.

The first responders to a disaster are the victims who take action to protect lives, whether digging out a neighbour from the rubble after an earthquake, sifting through the garbage to find things to sell and arranging food to eat when drought turns grinding poverty into famine. It is neighbours who first extend the hand that not only provides physical assistance but the mental support to cope with the trauma. The community are aware of locally-available resources and facilities (such as sources of water, roads, etc.) that can facilitate external assistance.

Emergency preparedness

The development of emergency preparedness programmes requires that communities be actively involved at all levels of planning and implementation of programmes. It is important that the community understands the risks and their own vulnerabilities in order to be prepared and to be able to respond to emergency situations. Risk communication to communities is therefore vital in order to save lives.

In short, emergency preparedness is necessary to minimize the impact of hazards on communities and also to prepare the community to respond on time and effectively by building the capacity of the community. It is important to conduct an assessment of various risks to identify the vulnerabilities of different categories of the population exposed to specific risks, such as older people, people with physical disabilities, pregnant women, children, people with chronic illness, such as patients needing dialysis, diabetics, individuals with heart and kidney disorders, etc. and the poor.

Other vulnerabilities include: frequency of disasters; geographical location; communities with low levels of income; populations with a high percentage of under-15-year olds; high numbers of people with physical disabilities; older people; chronic patients; malnutrition; low levels of immunization rates; hard-to-reach people due to poor infrastructure; high illiteracy rates; lack of experience of community organization; lack of communication technology; lack of access to safe drinking-water; large distances between places where people live and the first health care facility, etc.

Coordination among stakeholders such as local authorities, local charity groups, nongovernmental organizations and the Red Crescent Society is vital when planning for preparedness, response and recovery in order to minimize the impacts of hazards and also to respond adequately to emergencies and disasters. This also helps in optimally using any limited resources. It is always useful to have a hazard-specific checklist available within the community that includes the different types of vulnerability and how to address these vulnerabilities in order to reduce risks.

The basic elements of emergency preparedness within a community are: defining the roles and responsibilities of all stakeholders within the community; preparing a contingency plan that clearly defines the different hazards, their impact, risks incurred and vulnerability; training and simulation on the plan, communicating risks to the community and developing awareness of the resources available within a community and how to access them.

Community preparedness

In terms of preparedness, community participation is important as it:

- ensures sustainability of activities and programmes on preparedness, response and recovery;
- strengthens community awareness, knowledge and practices to address vulnerabilities and minimize risks;
- allows the application of local resources, knowledge and expertise, provides opportunities for participating in effective policy-making processes and can identify best practices within a community which contribute to enhancing the resilience of a community;
- ensures and strengthens coordination and cooperation between professional staff, volunteer organizations and the population itself;
- forms the basis for an effective information management system.

It is important to understand that a community can only be effective in a disaster situation if capacity-building in terms of training, knowledge-sharing and drills are part of the overall strategy for preparedness, response and recovery at community level. This eventually becomes a part of overall national development programmes through appropriate planning and policy support.

Sustainable development is best achieved by allowing emergency-experienced communities to take part in the design, management and implementation of internal and external assistance activities as only they have adequate knowledge of the locality, its culture and practices. The community often has the best knowledge of its members and local resources for rescue and rehabilitation, for example, in relocating orphaned children, single women and older people without any support. Preparing and empowering the community is cost effective and can significantly reduce morbidity and mortality. Involving the communities in preparedness issues basically ensures ownership of the plans that facilitates easy implementation, decreases local suspicion of foreign aid and helps communities to recover faster.

Resources are most easily pooled at the community level and every community possesses capabilities of their own. Sustained development is best achieved by allowing emergency-experienced communities to design, manage and implement internal and external assistance programmes as they have the local knowledge. Excessive

or inappropriate external assistance can destroy self-reliance and normal social and economic patterns, as well as increase both vulnerability and dependence on provincial, national and international organizations.

Local hazards, risks and vulnerabilities

It is essential to have knowledge of local risks and hazards, including the causes, the damage created and identification, knowledge and experience of past emergencies. Knowing how to prepare for an emergency in relation to the possible risks and hazards, focusing on hygiene and nutrition aspects and how individuals and families can prepare and protect themselves in such an event is critical. It is important that the community themselves are involved in preparedness planning and in identifying the needs and who are the most vulnerable groups. Knowing where evacuation points are and being able to assist in guiding the community in the case of an evacuation is also critical.

Concepts of disaster management include preparedness, response, recovery and an early warning system. Information about the community and available resources is essential, this information includes knowledge of: the location of health facilities; available health staff in the community; the location of temporary shelters for displaced people; alternative water sources; back-up power; availability of essential items; the number of families; the number of males and females under the age of 15 and over the age of 60; vulnerable groups (people with physical disabilities, older people); and families most at risk.

Effective information management encompasses communication skills and coordination. Basic first aid training includes search and rescue evacuation, especially for specific events, i.e. how to remove injured people from under rubble. Basic needs assessment after an event includes knowing what type of basic information needs to be collected in the first few hours of an emergency, i.e.:

- adequate information related to geographical distribution of the area affected, accessibility and extent of the damage of infrastructure;
- a rough estimate of the number of dead/injured/displaced;
- what services are available;
- the degree of physical damage;
- what are the most important needs;
- knowing whom to report information to;
- awareness of existing communication systems to pass on information.

The management of dead bodies involves assisting with the appropriate burial of dead bodies and in their identification,

also informing the community of collection points for unidentified bodies.

The area of mental health has a vital role to play in a post-disaster situation. Psychological counselling involves: calming individuals and providing warm comfort; signalling empathy and understanding for the situation of an individual; acknowledging the anomaly of the experience; respecting and recognizing the normality of an individual's reactions; not pathologizing or medicalizing the reactions; not overwhelming people with information; offering assistance or referring individuals for practical help; and providing support that is integrated in a network of comprehensive assistance (medical, legal, psychosocial).

Personal protection measures in different types of emergencies

The following measures must be observed by all persons in all types of emergency.

- Do not use the telephone except to call for help in order to leave telephone lines free to organize the response.
- Listen to messages broadcast by radio and the media to keep yourself informed of developments.
- Carry out official instructions given over the radio or by loudspeaker.
- Keep a family emergency kit ready. Provide families with alternatives (available in the home). Households should learn how to make simple bandages or slings for broken arms from scarves or other household items.
- In all different types of emergency, it is better to: be prepared than to get hurt; to obtain information in order to be organized; and to wait rather than to act too hastily.

Floods

What to do beforehand

Individuals should find out about risks in the area where they live. For example, people who live in areas downstream from a dam should know the special signals (such as foghorns) used when a dam threatens to break. Small floods can be foreseen by watching the water level after heavy rains and regularly listening to the weather forecast. The forecasting of floods is very difficult, although locals often know the time of year when floods are expected.

During a flood the following measures must be observed by all persons:

- turn off the electricity supply to reduce the risk of electrocution;
- protect people and property: as soon as the flood begins, take any vulnerable people (children, older people, people who are sick and people with disabilities) to an upper floor; whenever possible, move personal belongings upstairs or go to raised shelters provided for use in floods;
- beware of water contamination, if the taste, colour or smell of the water is suspicious, it is vital to inform the authorities;
- evacuate danger zones as ordered by the local authorities. It is essential to comply strictly with the evacuation advice given. Authorities will recommend that families take with them the emergency supplies they have prepared;
- stock pile some dry food in order to be able to manage immediately after a flood;
- know how to purify water easily in order to avoid waterborne diseases.

After a flood

When a flood is over, it is important that people do not return home until told to do so by the local authorities, who will have ensured that buildings have not been undermined by water.

The following measures must be observed by all persons:

- wait until the water is declared safe before drinking any that is untreated;
- clean and disinfect any room that has been flooded;
- sterilize or wash with boiling water all dishes and kitchen utensils;
- dispose of any food that has been in or near the water, including canned foods and any food kept in refrigerators and freezers;
- dispose all consumables (drinks, medicines, cosmetics, etc.) that came into contact with flood water.

Earthquakes

What to do beforehand

The movement of the ground in an earthquake is rarely the direct cause of injuries; most injuries are caused by falling objects or collapsing buildings. Many earthquakes are followed (several hours or even days later) by further tremors, usually of progressively decreasing intensity. To reduce the destructive effects of earthquakes a number of precautions are essential for people living in high-risk areas.

- ensure that all electrical and gas appliances in houses, together with all pipes connected to them, are firmly fixed;
- avoid storing heavy objects and materials in high positions;
- hold family evacuation drills and ensure that the whole family knows what to do in case of an earthquake;
- prepare a family emergency kit.

During an earthquake it is important that people:

- keep calm and not panic;
- stay indoors if already there but move to the central part of the building;
- keep away from the stairs, which may collapse suddenly;
- take shelter under the brim/frame of the door;
- stay outside if already there but keep away from buildings to avoid collapsing walls and keep away from electric cables;
- park any vehicle you are driving but keep away from bridges and buildings.

After an earthquake the following measures must be observed by all persons:

- obey the authorities' instructions.
- avoid re-entering damaged buildings as tremors may start again at any moment.
- provide first aid to the injured and alert the emergency services in case of fire, burst pipes, etc.
- avoid going to look at the stricken areas: this will hamper rescue work.
- keep emergency packages and a radio near at hand.
- make sure that water is safe to drink and food stored at home is fit to eat (in case of electricity cuts affecting refrigerators and freezers).

Clouds of toxic fumes

What to do beforehand

Explain that people in an area of risk must:

- find out about evacuation plans and facilities;
- familiarize themselves with the alarm signals used in case of emergency;
- equip doors and windows with the tightest possible fastenings;
- prepare family emergency kits;
- go to the top floor of the building and seal the windows and the doors properly with tape.

During an emergency the following measures must be observed by all persons:

- not use the telephone; leave lines free for rescue services;
- listen to the messages given by radio and other media;
- carry out the instructions transmitted by radio or loudspeaker;
- close doors and windows;
- seal any cracks or gaps around windows and doors with adhesive tape;
- organize a reserve of water (by filling wash basins, baths, etc.);
- turn off ventilators and air conditioners.

After an emergency the community must:

- comply with the authorities' instructions and do not go out until there is no longer any risk;
- carry out necessary decontamination measures.

Man-made disasters

What to do beforehand

Explain that people in a high-risk area must:

- find out about evacuation plans and facilities (shelters), if they are not available, then stay in the middle of the house far from windows in order to be protected from shattering glass;
- familiarize themselves with the alarm signals used in case of an emergency;
- be vigilant, avoid listening to rumours and rely on an authoritative source for information (always seek the primary source of information);
- prepare family emergency kits and medicines for patients with chronic diseases;
- ensure availability of an adequate supply of food and water that can be stored without electricity;
- ensure all personal documentation is in a safe place.

During an emergency the following measures must be observed by all persons:

- not use the telephone;
- be aware of messages given by media and local radios;
- equip doors and windows with the tightest possible fastenings;
- comply with instruction given to stay alive (do not resist);
- do not go out unless it is absolutely necessary.

After an emergency the following measures must be observed by all persons:

- comply with the authorities' instructions and do not go out until there is no longer any risk;
- provide assistance to your family;
- assist others in the provision of basic needs such as water, food and shelter;
- support the identification of bodies, reunify separated families and help in case of displacement;
- provide first aid to the injured and alert the emergency services in case of fire, burst pipes;

- refer individuals to the nearest health facility and report any suspected public health threat;
- build social cohesion to provide support to distressed families.

The role of community representatives and health volunteers

The role of cluster representatives and health volunteers includes identifying core community representatives. The role of the community representatives and health volunteers should be clearly articulated and differentiated from the role of health professionals to avoid duplication of efforts. Clear channels of communication should be established between cluster representatives, health volunteers and the local authorities and a coordination framework is needed for improved performance in terms of preparedness, response and recovery.

The community representative's role is to:

- be easily accessible at any time;
- identify the boundaries of a community (could be village based, ethnic or others);
- act as a local focal point for disasters and take a leading role in motivating the community in order to be prepared;
- be able to control the fluidity of a situation in case an emergency erupts and during the recovery phase;
- deploy previously identified community resources;
- have an awareness of best practices and previous lessons learnt;
- update the community ensuring transparent information sharing;
- assist with the planning and implementation of local preparedness, response and recovery plans;
- assist with massive displacements and the reunification of separated family members;
- identify and coordinate local nongovernmental organizations and civil society groups who may provide support in case of emergency;
- assist with massive evacuations and the reunification of families;
- provide mental strength and confidence to the affected.

The health volunteer's role is to:

- know the location of vulnerable people in his/her assigned area;
- know the location of basic utilities, such as water sources, electricity, health facilities, schools, mosques and sanitation facilities;
- create awareness of the various hazards and incurred risks at local level, as well inform of appropriate personnel protection methods;
- participate in training in basic search, rescue, evacuation and first aid, and in turn, train the community using role play and presentations;
- assist with the reunification of separated family members;
- assist with the identification of the dead and assist with management when needed;
- assist with visual rapid assessments (i.e. the number of the dead, physical damage, condition of survivors, including vulnerable groups).

Annex 1

Pre- and post-test

The following test should be given to trainees before and after training.

A) In the event of any disaster, who is immediately available to aid those affected?

1. The Ministry of Health. ☐
2. Nongovernmental organizations. ☐
3. The community. ☐
4. United Nations' agencies. ☐

B) Emergency preparedness is necessary for the community because it:

1. reduces the impacts of some disasters. ☐
2. assists in activating an appropriate and timely response. ☐
3. ensures access to local resources and knowledge. ☐
4. all of the above. ☐

C) What is the first thing a community should know in order to be prepared?

1. awareness of different disasters and risks associated in their area. ☐
2. awareness of partners working with them. ☐
3. where to ask for help in the event of a disaster. ☐
4. how to run away from the locality. ☐

D) What does a community mainly need to be prepared?

1. high technology equipment. ☐
2. a large sum of cash. ☐
3. commitment and motivation to save lives. ☐
4. technical support to understand their environment. ☐

E) Which of the following is more important to consider while planning for community preparedness?

1. stakeholders within the community. ☐
2. available resources and assets in the community. ☐
3. lessons from previous disasters. ☐
4. all of the above. ☐

Unit 7
First aid

Contents

First aid

Learning objectives

The objective of this session is to enable cluster representatives and health volunteers to:

- identify underlying causes of different types of unintentional injuries;
- learn about basic measures to promote a safe environment and protect people from unintentional injuries, especially children and young people;
- learn basic first aid measures to manage different types of unintentional injuries.

Expected outcomes

After completion of this session cluster representatives and health volunteers will be able to:

- enhance community awareness to promote a safe environment;
- build community skills in injury prevention, especially among children, women and older people;
- administer basic immediate first aid in the absence of medical help to reduce the severity of injuries.

Introduction

Although mostly preventable, injuries are a leading cause of unnecessary loss of life, injury and disability every year among young children (due to their poor risk assessment), late adolescents (primarily driven by their risk-taking behaviour) and males. Applying minor safety measures and interventions in the community, e.g. in the street, home, school, play yard, and provision of quality first aid measures administered soon after injury could save precious lives and limit permanent damage.

Injury prevention and first aid

Burns

Burns are a very common cause of injury and death, especially among women, and children between the ages of 5 and 14 years old. Burns are the only type of unintentional injury where females have a higher rate of injury than males. Almost all burns happen in the home. Local customs of using open fires for cooking and heating, together with the wearing of loose-fitting clothing, particularly among teenage girls are associated with an increased rate of burns among young women.

Burns can result from dry heat (fire), moist heat (steam, hot liquids), and electricity, chemicals and radiation (sunlight). The outcome of burns is highly determined by the extent of smoke inhalation. Children's burns commonly occur in the kitchen at home.

Types and body sites of burns include:

- Scalds: the trunk and upper extremities;
- Flame-related burns: the lower extremities;
- Contact burns: the hands;
- Electrical burns: there may be little external evidence of the burn but extensive internal damage. Small children who bite or suck on extension cords can burn their mouth and lips;
- Chemical burns: the site depends on whether the chemical is ingested, splashed or inhaled.

In order to prevent burns preventive measures, such as the introduction and enforcement of use of smoke alarms, residential sprinklers and fire-safe lighters, and laws regulating the temperature of hot-water taps have proved to be highly effective.

Other suggested measures for the community are to:

- keep young children away from fire, matches and stoves;
- keep stoves on a flat, raised surface out of reach of children;
- keep petrol, lamps, candles, hot irons, electric wires out of reach of children;
- cover electric points and sockets to prevent access;
- ensure that heaters are switched off before going to sleep in households using liquid petroleum gas for cooking;
- never strike a match, use a lighter or switch a light on or off if there is a smell of gas;
- never smoke cigarettes at home. Always use child resistant lighters;
- avoid storing highly flammable fuel and liquids at home and exposing them to the sun or other sources of heat.
- keep a functioning fire extinguisher appliance in the kitchen;
- improve heating and lighting equipment in homes;
- separate cooking areas from living areas.

Figure 1. An example of a first degree burn

Types of burns

The treatment of burns depends on their severity and depth. Burns can be categorized into three types.

First degree burns

First degree burns, or minor burns, affect only the outer layer of skin. The skin is red, swollen and painful. Mild sunburn with no blistering or brief contact with a heat source causes such burns. These types of burns usually heal in less than a week and do not require treatment (Figure 1).

Second degree burns

Second degree burns affects the skin's outer and inner layers. The skin is intensely red, swollen, develops blisters and feels very painful (Figure 2).

Third degree burns

Third degree burns affects all layers of skin. Even fat, muscle and bone may be affected. The area may appear black or dry and white. There may be little or even no pain with more serious burns. Such burns can occur with electric shocks, burning clothes, gasoline fires, etc. These burns are serious and individuals with third degree burns should be immediately referred to hospital after first aid has been administered (Figure 3).

First aid for burns

Is someone has a first degree burn, cool the skin by immediately placing the burnt area of skin under cool running water for at least 5–10 minutes, or immerse in cold water. This will reduce pain and swelling.

Figure 2. An example of a second degree burn

Figure 3. An example of a third degree burn

If someone has a second degree burn cover the burn with a clean, loose gauze bandage and keep the wound clean. Elevate the burnt area so that it is higher than the rest of the body, if possible. Do not put ice on the burn, burst any blisters or remove anything that is sticking to the burn. Do not use ointments, creams or antiseptic or anaesthetic sprays. Refer the individual to a health facility if the burn covers a large area or if there is fever or pain and swelling which does not subside within two days.

If someone has third degree burns, it is important that the following actions are taken immediately.

- Stop the source of the heat, or turn off the power if the burns are due to electricity.
- If someone's clothes catch on fire, immediately wrap the person in a blanket or clothing and roll him or her on the ground to extinguish the fire;
- Check for signs of breathing or a pulse, if a person is unconscious and not breathing, give mouth-to-mouth resuscitation. Lay the person flat on their back and tilt their head back slightly. Hold their nostrils closed and blow into their mouth. Blow hard enough to make the person's chest rise. Count to three and blow again. Continue until the person starts to breath (Figure 4).

If the person is still not breathing normally, coughing or moving, begin chest compressions. Push down on the chest gently (push down between 1.5 to 2 inches) 15 times right between the nipples. Pump at a rate of 100 compressions per minute. Continue with another two breaths and 15 chest compressions until help arrives (Figure 5). The person should be immediately referred to the nearest health facility after receiving first aid.

- Cover the area of the burn using a cool, moist, clean bandage or clean, moist cloth or towels.
- Elevate the burnt area higher than the rest of the body if possible.
- Refer the person with burns to the nearest hospital.
- Do not: remove burnt clothing, but make sure that the person is no longer in contact with smoldering material; immerse severe large burns in cold water; use ointments, creams or antiseptic or anaesthetic sprays.

Figure 4. How to perform mouth-to-mouth resuscitation

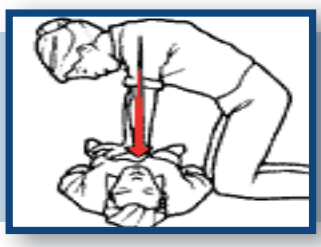


Figure 5. How to perform chest compressions

Falls, broken bones

Children's bones are soft and may resist breakage more easily than adult's. The bones of older people, especially older women, are sometimes dangerously thin and can break easily. More than three quarters of accidents involving broken bones take place in the home. Broken bones require immediate treatment as they may cause future deformities and restrict movement if they are not properly taken care of.

Preventing falls and injuries

Serious falls can be prevented by:

- discouraging children from climbing onto unsafe places or by ensuring that children are not left unattended in unsafe places;
- ensuring stairs, windows, balconies and roof tops are fitted with railings;
- ensuring that entrances to unsecured rooftops are locked.

Children should be taught not to play near roads and to be aware of the danger of running out into the street without looking in both directions first. Always walk on the side of the road facing traffic.

Women should get an adequate amount of calcium in their diet of which milk is a good source. Exercise, such as walking, should be encouraged as it helps to increase bone strength. Proper lighting, eye glasses and special support instruments/structures, such as railings, can be used to try and prevent falls among older people in bathrooms, along the sides of beds and on stairs.

The community should be mobilized to: promote safe road designs, clear pavement areas of relevant standard height, create special paths for motorized and non-motorized wheeled vehicles and encourage road designs respecting different road users e.g. pedestrian crossings. Raising awareness and promoting responsible behaviour on the road includes: respecting traffic lights and adopting safe driving habits, such as no speeding, using seat belts and child restraints for passengers of four-wheeled vehicles and helmets for motorbikes and bicycles and ensuring visibility on the road. Discouraging driving under the influence of alcohol or drugs.

Signs of a broken bone

If you suspect an individual has broken a bone, look for: heavy bleeding; deformation of the limb or joint; pain caused by applying gentle pressure on the bone; the piercing of the skin by the bone; or immobility of the bone or joint. Administer immediate first aid while arrangements for transport to a hospital are being made. Stop any bleeding by applying pressure to the wound with a sterile bandage or a clean piece of cloth. Immobilize the injured area by applying a splint: do not try to re-align the bone. A splint can be made from rolled-up newspapers, a cane or a wooden plank. The splint can be held in place with a cloth or a string. For an injured leg, tie the injured leg to the uninjured one and put padding between the legs.

Check that the splint is not too tight, as a tight splint can stop blood circulation in the limb. Check for swelling or a blue tinge to the appearance of the skin. If there is swelling or unusual skin colour, immediately loosen the splint. For a broken arm, make a sling from a piece of cloth and place the forearm in it and tie the ends of the cloth around the neck.

For bruises and sprains apply an ice pack to limit the swelling and to relieve pain or immerse the injured area in cold water. Do not apply ice directly onto the skin but

instead wrap the ice in a towel or a piece of cloth.

Treating suspected shock

If a person feels faint or is breathing in short, rapid breaths lay them down with their head slightly lower than their trunk and, if possible, elevate the legs. Keep the person warm. Transfer the individual to a hospital as quickly as possible.

Head injuries

Head injuries can cause damage to the scalp, skull, brain or neck. Bleeding may start in the brain within the first 24 hours following a head injury despite the fact that there is no external wound or only a very small wound visible on the scalp. This is very dangerous. It is important that a person with a head injury is closely watched for signs of serious injury in a hospital during the first 24 hours following an accident.

Some of the danger signs to look for after a head injury include:

- loss of consciousness, confusion, drowsiness;
- inability to move any part of the body or weakness in an arm or leg;
- severe headache;
- stiffness of the neck;
- vomiting;
- bleeding from the mouth, nose or ears;
- loss of vision, blurred or double vision;
- convulsions/fits.

First aid

Any movement to an injured head, neck or back can result in paralysis or death. Immobilize the neck and head of the injured person in the position in which they were found. Place rolled towels on either side of the head and neck and tie and wrap in place, or hold the head, neck and shoulders perfectly still, using both arms, one on each side of the head, until medical care is available.

Control bleeding from the scalp by applying pressure around the edges of the wound. Apply a bandage around the head, leaving long strips of the loop to apply pressure on the wound. Monitor the breathing and pulse of the injured person. Do not give the person anything to eat or drink and do not elevate their legs.

Cuts and wounds

Sharp and pointed objects, knives, scissors, broken glass, etc. are the most common causes of cut or wound injuries. Wounds arising out of these injuries can result in loss of blood and can be serious. Children are especially at risk if left unattended if they have access to sharp objects.

Preventing cuts and wounds

Glass bottles should be kept out of the reach of young children, and homes and play areas should be kept free from broken glass and other sharp objects. Household waste, including broken bottles, should be carefully disposed of. Children should be taught about the risks of playing with broken glass, knives, scissors and other sharp objects.

First aid

For minor cuts and wounds

Wounds should be washed with clean (boiled and cooled) water and the skin around the wound should be bathed. The wound should be covered with a clean cloth and a bandage placed over it.

For serious cuts and wounds

Apply gentle pressure with a clean cloth or bandage to stop the bleeding. If bleeding is heavy, raise the injured area to above the level of the chest and press firmly against the wound with a pad made of clean cloth. Hold the pressure continuously for 15 to 20 minutes until the bleeding stops. If the blood spurts or continues to flow after continuous pressure, refer the injured person to the nearest health facility for stitches to be applied to the wound.

Clean the wound with clean water. Soap can be used to clean the area surrounding the wound.

Put a bandage on the wound. Do not tie the bandage too tightly to allow for any potential swelling.

Change the dressing at least once daily or whenever it becomes wet or dirty.

Watch for signs of infection. Look for redness, drainage, swelling and pus. If any of these conditions are present, refer the injured person to the nearest health facility.

Refer the injured person for a tetanus injection after first aid has been administered as this will protect the individual against tetanus.

If the bleeding does not stop, or if there are signs of infection, refer the individual immediately for appropriate treatment at a health facility. If a piece of glass or other object is lodged in the wound, do not try to remove it. It may be preventing the bleeding and removing it could make the injury worse. Do not put any plant or animal material on the wound, as this could cause infection or tetanus. Refer the injured person to the nearest health facility after administering first aid.

Drowning

Drowning is the fourth leading cause of accidental death. It is even more common among children ranking thirteenth as the overall cause of death among children under 15 years old, with the 1–4 year age group appearing at greatest risk. It takes very little water for a child to drown. In fact, as little as a few inches of water in a bath tub, sink or shower can kill an infant in less than two minutes. Uncovered toilet bowls are also unsafe for young children.

Preventing drowning

Children

Never leave a child unsupervised at any time near water, swimming pools or any large body of water. Wells, bath tubs and buckets should always be covered. If possible, children should be taught to swim from a very young age. Children should be taught about the dangers of swimming in fast-flowing streams, and swimming alone. If there are any swimming pools in the locality they should be protected by a secure fence. Quality water floaters, e.g. floating wings, should be promoted for children.

Adults

Individuals should never swim alone in unknown waters. Before diving always check the depth of the water.

At the community level

Community measures to prevent drowning include building bridges or securing water crossings, placing clear instructions and information on the safety of water currents on seashores. Also using life guards to supervise and enforce security measures. Vessels should be regularly inspected and

security enforced. The number of passengers should be within the recommended capacity for the vessel and quality safety jackets should be available and their use enforced.

Rescue and first aid

Rescuing a drowning person. Get the victim out of the water if you can do so safely. Before getting into the water to rescue another individual make sure that you are not putting yourself at risk. Saving a drowning person carries risk. If it is feasible, first try to reach the person with a pole or an extended hand or rope. Approach the person from behind. Try to talk to the person to calm them. Tell them to extend his or her hands away from you.

Monitor breathing and pulse. If the victim is not breathing, perform mouth-to-mouth resuscitation. Water should come out from the lungs when the individual starts to breath.

Take cold, wet clothes off the victim. Remove wet garments from the person and cover them with something warm.

The victim should receive medical advice as lung problems are common after a near-drowning episode.

Poisoning

Drug overdoses may be unintentional or intentional. Unintentional poisoning represents a serious danger, particularly to small children. Bleach, insect and rat poison, kerosene and household detergents can kill or permanently injure a child. Many poisons do not need to be swallowed to be dangerous. They can kill, cause brain damage, blindness or permanent injury if they: are inhaled; get onto the skin or clothes or get into the eyes. Ingestion of medications was responsible for almost one third of unintentional poisonings in children under 14 years of age, followed by cleaning agents. Older children in resource-limited settings and environments, e.g. labour markets and agricultural and dumping sites may be exposed to extractive metal industries, pesticides or toxic substances, including lead, mercury and organophosphates. At home, younger children may come into contact with toxins brought into the home on the clothes or shoes of their siblings or may be exposed to toxins leached into water or sprayed in the air.

Prevention

Children should be protected and discouraged from engaging in the labour market. The community should proactively promote the rights of children and their protection.

Environmental safety measures should be applied in communities to ensure a safe environment, these should include: the avoidance of waste dumping, the assurance that industry posing an environmental hazard is placed outside residential areas and away from schools, regular environmental safety inspections and accreditation systems, food and beverage safety standards and inspections and enforcement on the use of pesticides.

Poisons, medicines, bleach, acid and liquid fuels, such as paraffin (kerosene), should never be stored in bottles that may be mistaken for refreshments. All such liquids and poisons should be kept in clearly marked tightly sealed containers and kept out of children's sight and reach. Detergents, bleaches, chemicals and medicines should be kept in their original containers, locked in cupboards or put high on shelves where children can not reach them. Aspirin is a common cause of accidental poisoning.

Medicines intended for adults can kill small children. Only medicines prescribed by doctors should be given to children. Before taking medicines, read the label to ensure that it is the correct medication. The overuse of antibiotics can cause deafness in children.

Signs of poisoning include:

- burns or redness around the mouth and lips, which can result from drinking certain poisons.
- breath smells like chemicals, such as gasoline or paint thinner.
- burns, stains and odours on the person, their clothing or in the surrounding area.
- empty medication bottles or scattered pills.
- vomiting, difficulty in breathing and confusion.

First aid

If poison is spilled onto clothes, remove the clothing. If poison gets onto the skin or into the eyes, wash the skin or eyes with a large amount of cool or lukewarm water for 20 minutes or until help arrives. Take the poison container (or any pill bottles) to the hospital. Monitor the victim's breathing and pulse—give mouth-to-mouth resuscitation if the victim is not breathing. If a child has swallowed a poison, do not try to make the child vomit as this may make them more ill. Arrange immediately for the victim to be taken to a hospital.

Choking

Choking occurs when a foreign object becomes lodged in the throat or the windpipe, blocking the flow of air. Pieces of food or small objects swallowed by children can cause choking. As choking cuts off oxygen to the brain, it represents a life-threatening emergency.

Preventing choking

Young children like to put things in their mouths. Play and sleeping areas should be kept free of small objects such as buttons, beads, coins, seeds and nuts. Very small children should not be given peanuts, hard sweets or food with small bones or seeds and should always be supervised during meals. Children's food should be cut or torn into small pieces.

Signs of choking include: inability to talk; difficulty in breathing or noisy breathing; inability to cough forcefully; skin, lips and nails turning blue; loss of consciousness. Administer first aid immediately. If the victim can speak, cough or breathe, do not interfere—let him or her try to cough up the object. If an object is lodged in a child's throat and is not released quickly, try to remove the object from the child's mouth by putting a finger into their mouth, but be very careful not to push the food or object back into the airway. If the object is still lodged in the throat, take the following steps.

For infants and small children:

1) Assume a seated position and rest your forearm on your thigh. Hold the infant in your forearm.
2) Thump the infant gently but firmly five times in the middle of the back using the palm of your hand.
3) If this does not work, hold the infant face up on your forearm with their head lower than their trunk. Using two fingers placed at the centre of the infant's breast bone, between the nipples give five quick chest compressions.

4) Repeat until the object is dislodged. If the object can not be dislodged take the child to the nearest health facility immediately.

For older children and adults:

Stand behind the person with your arm around their waist. Tip the person forward slightly. Form a clenched fist with your thumb against the victim's body above the navel and below the rib cage. Put your other hand over your fist and give a sharp inward and upward thrust into the victim's abdomen, as if trying to lift the person. Repeat until the object is dislodged.

If the object can not be dislodged, immediately take the individual to the nearest health facility.

Electric shock

An electric burn may appear minor or not show on the skin at all, but the damage can extend deep into the tissues beneath the skin. If a strong electric current passes through the body, internal damage, such as a cardiac arrest, can occur. Sometimes the jolt associated with the electric current can throw a victim, and a fall may result in broken bones or injury.

Preventing an electric shock

Explain that in order to prevent electric shocks, the following actions should be taken.

- Cover all electric sockets with tape or safety caps so that children can not put their fingers inside.
- Replace worn out or bare electric wires.
- Never use electric appliances near water.
- Never turn electric switches on or off with wet hands, or while standing in water.
- Always know the location of fuse boxes and circuit breakers in the house.
- Switch off the main electricity supply to a house before undertaking repairs.
- Do not touch electric wires that fall after a storm.

First aid

The person who has been electrocuted may still be in contact with the electrical source so check if this is the case before touching the person as the electrical current can pass through you.

Turn the source of electricity off if possible. If it is not possible to turn off the source of the electricity, move the source away or move the victim using a non-conducting object made of plastic, wood or cloth, such as a dry stick, a loop, dry rope or cloth and throw it around the victim's leg or arm to drag them away from the live wire. Stand on something dry, such as a rubber mat, wooden plank or a pack of newspapers before removing the person.

Check for signs of circulation (breathing, pulse, coughing or movement). If these signs are not visible, give mouth-to-mouth breathing immediately.

Prevent shock. Lay the person down with their head slightly lower than their trunk with their legs elevated.

Cover the affected areas. Cover any burned areas of skin with a sterilized gauze bandage, if available, or a clean cloth. Do not use a blanket or towel. Loose fibres can stick to the burns. Arrange an immediate transfer to the hospital.

Snake bites

Most snakes are not poisonous, however, to reduce the risk of snake bite, avoid picking

up or playing with snakes even if you believe them not to be poisonous. Most snakes avoid people and bite only when they are threatened. Wear heavy boots when walking in areas in which snakes live.

First aid

Calm the victim and get them to lie as still as possible. Moving about could spread the venom further around the body. Immobilize the part of the body that has been bitten. Remove any jewellery from the person who has been bitten as the swelling tends to progress rapidly. Apply a loose splint to restrict movement of the affected area, but make sure it is loose enough in order that it will not restrict the blood flow. Keep the affected area/limb below the level of the heart, if possible.

Do not: use a tourniquet, apply cold or ice to the bite, cut the wound or try to suck out the venom. Arrange immediate transfer to a hospital.

Dog bites

A dog bite is dangerous as it carries the risk of rabies, which is a disease that kills.

Preventing a dog bite

Explain that in order to prevent dog bites, the following actions should be undertaken.

- Never leave a small child alone with a dog.
- Teach children not to tease animals, not to wave, throw stones, pull an animal's tail or scream close to a dog.
- Do not suddenly run from a stray dog.
- Do not feed a dog using your hands.

First aid

For minor wounds. If a bite barely breaks the skin and there is no danger of rabies, treat it as a minor wound. Wash the wound with clean water and apply a bandage.

For deep wounds. Control the bleeding through applying direct pressure on the wound with a clean dry cloth. Elevate the wounded area higher than the person's heart.

For suspected rabies. A dog with an unknown immunization status may carry the risk of rabies. All victims of dog bite should be considered for vaccination against rabies and tetanus. Refer the dog bite victim to a health facility for treatment and vaccination and report to the local health facility so they can get and transfer the dog or its head for further investigation.

Annex 1

Pre- and post-test

Put a tick in the box next to any statement you believe to be the correct answer. There may be more than one correct answer to each question.

A) How would you treat a person with a first degree burn?

1. Suggest they take herbal medicine. ☐
2. Refer them immediately to the nearest health facility. ☐
3. Cool the skin by placing it in or under cool running water for at least 5 to 10 minutes. ☐
4. Ask them to wait for one week. ☐

B) What should you do if a person has a minor cut or wound?

1. Place the person in cold water. ☐
2. Wash the wound with clean water and bandage it. ☐
3. Prescribe paracetamol. ☐
4. Refer the injured person for a tetanus injection. ☐

C) Signs of poisoning include:

1. vomiting, difficulty breathing and confusion. ☐
2. stiffness of the neck. ☐
3. burns or redness around the mouth and lips. ☐
4. piercing of the skin by the bone. ☐

D) More than three quarters of accidents involving broken bones take place:

1. in the street. ☐
2. in water. ☐
3. in the home. ☐
4. at school. ☐

E) Signs of choking include:

1. skin, lips and nails turning blue. ☐
2. inability to cough forcefully. ☐
3. deformation of a limb or joint. ☐
4. empty medication bottles or scattered pills. ☐

Unit 8
Healthy environments

Contents

Healthy environments

Learning objectives

The objectives of this session are to enable cluster representatives and health volunteers to:

- understand the importance of maintaining good personal and environmental hygiene in preventing diseases;
- list common diseases which result from unsafe drinking-water, poor sanitation and inadequate personal and household hygiene;
- understand the basic measures necessary for maintaining a clean drinking-water supply, ensuring safe disposal of excreta and other wastes and ensuring good personal and housing hygiene;
- understand how to protect sources of drinking-water;
- understand the importance of community participation in promoting healthy environments.

Expected outcomes

After completion of this session cluster representatives and health volunteers will be able to:

- promote personal and environmental hygiene, and understand the importance of having access to safe drinking-water, supply system, safe disposal of excreta and other household wastes;
- increase community awareness of waterborne diseases;
- inspect and advise on maintaining clean community water supply sources and safe disposal of excreta and household waste;
- assess whether local communities' water sources are practically protected;
- engage community support and participation in improving domestic hygiene and ensuring a healthy environment in general.

Introduction

Unsafe drinking-water, poor sanitation, improper disposal of excreta and other household waste, and inadequate personal and household hygiene contribute to an environment in which waterborne diseases can spread. Community participation in improving and sustaining water sources and making them safe for drinking, safely disposing of human excreta and other household waste and ensuring good personal and domestic hygiene is critical in ensuring cleaner and healthier environments for everyone.

Personal and domestic hygiene

Hand-washing is important for good health. Washing hands with soap and water removes germs, rinsing is not enough—both hands need to be rubbed with soap.

Figure 1. Hand-washing before and after certain activities

Hands should be washed with soap and water: after using the toilet; cleaning a child who has defecated; handling animals and raw foods; and before preparing, serving and eating food (Figure 1).

Children are easily infected with worms, which make them weak and sick. Worms and their eggs can be found in human and animal faeces and urine, in surface water and soil, and in poorly cooked meat. Children should be prevented from playing near latrines, toilets or defecation areas. Shoes should be worn near latrines to prevent worms from entering the body through the skin and feet. Children living in areas where worms are common should be treated between two and three times a year with a recommended deworming medication.

Bathing

Regular bathing with soap (at least 2–3 times per week) is important for cleanliness and the prevention of hygiene-related diseases of the skin and eyes. Children's faces in particular should be washed thoroughly at least twice daily. A dirty face attracts flies, which can spread the germs they carry from person to person. The eyes may become sore or infected and vision may be impaired or lost if the eyes are not kept clean and healthy. Good oral hygiene should be ensured by cleaning the teeth regularly, in the morning, before and after meals and before bedtime.

Community hygiene

Some important health measures can be undertaken by the community as a whole, such as the protection of water sources, the proper disposal of solid waste and excreta, the drainage of wastewater, adequate market hygiene, improving animal-rearing practices and ensuring safer food hygiene

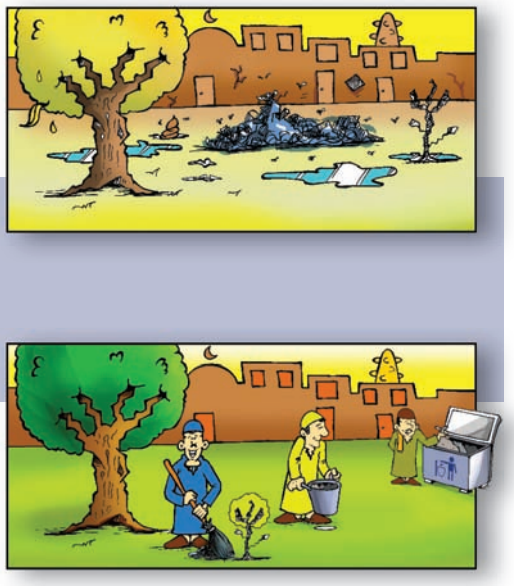


Figure 2. Improving community hygiene

at community eating places and from street vendors. Cluster representatives can play an important role in improving community hygiene through improved inspection and community awareness and mobilization (Figure 2).

Ensuring cleaner markets and public places

It is important that market places have arrangements for a clean piped water supply, sanitary public latrines, sanitation practices and garbage disposal. Many vegetable and fruit sellers sprinkle vegetable and fruit with water, so it is important that they have access to safe water. Piles of garbage produce a bad odour and spread disease. The community can be encouraged to work on a self-help basis and consider charging a small user fee to pay for garbage disposal and to ensure the availability of clean water and adequate sanitation.

Enhancing hygienic animal-rearing practices

Animal excreta contain germs that can cause disease. Animals should be kept away from households, particularly cooking areas and drinking-water sources. Preferably, animals should be kept in compounds at least 100 m away from water sources and 10 m from houses. Animals should be kept clean and waste should be disposed of properly, away from homes and water sources.

Ensuring availability of clean drinking-water

Clean water is essential to maintain good health. Clean water has no colour, smell or taste, looks clear and is free of germs. Water can be contaminated by: dangerous chemicals; sewage or waste from latrines or septic tanks; industrial waste being discharged into drains, rivers or streams; waste from livestock grazing near a water source; and floods containing sewage, garbage and human excreta. Contaminated water causes dangerous diseases such as: diarrhoea, cholera, dysentery, typhoid, jaundice and abdominal worms.

Sources of drinking-water

Communities use water from a variety of sources, including lakes, ponds, rivers,

Figure 3. Activities which contaminate water sources

springs, wells, bore holes and rainwater. Communities may draw water directly from the source or the water may collect in storage tanks and come through a pipe to a common village tap or through a system of pipes to individual house connections. To ensure that the water is safe for drinking potable, the water supply should be protected and the water should be treated before use. Protection of drinking-water sources must be promoted and communities must be motivated and mobilized to improve and maintain water sources.

Characteristics of clean water sources

To ensure a clean water source it is necessary that:

- the water source is fully enclosed or protected (capped) and no surface water is allowed to run directly into it.
- people do not step into the water while collecting it.
- latrines are located as far away as possible from the water source (10–15 m) and preferably are downstream of the water source and not on higher ground.
- solid waste, animal or human excreta and other pollution sources are located as far away as possible from the water source.
- there is no stagnant water source water within 5 m of the water source.
- if wells are used, collection buckets are kept clean and off the ground or a hand pump is used.

Community action for promoting and ensuring clean drinking-water

As development and maintaining water sources requires long-term commitment, it is important to involve the community in all stages of planning, implementation and monitoring. Cluster representatives may survey water resources based on the given information and present the results to the village development committee for discussion and to mobilize the community to undertake corrective action. The following community actions are suggested to keep local water sources clean and safe for drinking (Table 1).

Methods of water treatment at domestic and community level

Methods of water treatment at domestic and community level include: boiling; filtration (process of removing contaminants and other harmful microorganisms) and chlorination. There are several methods of filtration.

Chlorination

Bleaching powder or chlorine tablets can be used to disinfect water. Chlorine may

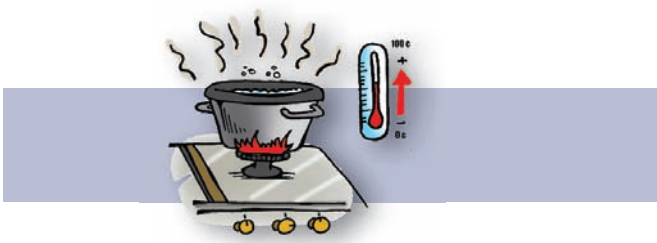


Figure 4. Boiling water

Figure 5. Chlorinating water

be added to clean water but if it is added to dirty water it will be absorbed by the dirt in the water. It is important that when cleaning storage tanks the following steps are followed:

- Remove the cover of the tank and ensure that the tank is empty.
- Using a clean cloth or brush wash the inside of the tank with soap.
- Wash the tank out properly making sure that all the soap is gone.
- Leave the tank to dry ensuring that nothing gets inside it.
- Fill the tank with clean water, add bleaching powder or chlorine tablets and cover tightly.
- Leave the bleach for at least 30 minutes before using the water.

Large tanks with a capacity of 400 gallons or more must be cleaned at least four times a year, and especially before and after the rainy season. Drums and barrels should be cleaned more regularly as water in these is used up more quickly.

Bleach should be used according to the measurements given in Table 2.

Solar disinfection or simply putting water in transparent plastic bottles or larger containers and exposing it to the sun on the roof of houses for two days can also render it safe.

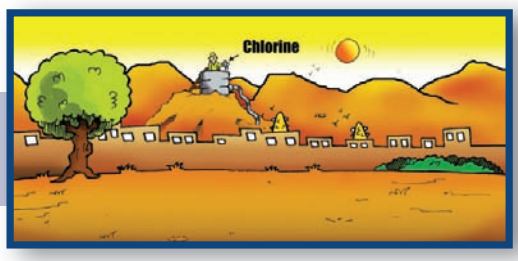


Figure 6. Large chlorinated water tank

Safe storage and handling of water

Water collected from a clean source or water treated in the household may become contaminated as a result of poor storage and/or handling. All water containers must be cleaned particularly the inside of the container. It is best to thoroughly wash storage containers with soap or bleaching powder. The container should then be rinsed so that the soap is completely washed away. The top of the water container should be covered tightly to stop dust and other contaminants falling into the drinking-water. Contact with dirty fingers and hands should be avoided. The water container should preferably be fitted with a tap, however users must not wipe the tap with dirty hands. When scoops (ladles) are used to take water out of the container they should be clean and left inside the container. They should never be placed on the floor.

Community-based management, surveillance and water quality monitoring

The community should be fully informed about the quality of water they are consuming. Cluster representatives may discuss the issue with their village development committee and form a community-based water and sanitation committee. This committee will physically inspect all the water sources using a checklist and inform the village development committee of their findings and ensure that any necessary follow-up is undertaken. If there is any suspicion about the quality of water, the assistance of the relevant water and sanitation authorities should be sought. Sharing results of water quality testing can be a powerful way of building community support for promoting the better management of water quality.

Table 1. Community actions to ensure the safety of water sources

Water source	Community action
Pond	Clean the surrounding area so that it is not littered with garbage or excreta. Avoid washing or bathing near the source of the water. Prevent animals from drinking water from a pond and from grazing near a pond. In areas with malaria the grass and shrubs around the side of the pond embankment close to the water should be cleared to ensure that conditions are not created for mosquito breeding. Water from a pond is not safe for drinking. It will need treatment by filtration and disinfection by boiling or chlorination before it is safe to drink.
River	Collect water as far upstream as possible. Mobilize the community to agree and decide upon fixed spots for collecting water for drinking, bathing, washing clothes and watering animals, for instance, clothes can be washed at a river but in a place lower down from the spot where drinking-water is being collected. Water from a river is not good for drinking unless it is treated before drinking. It will need treatment by filtration and disinfection by boiling or chlorination before it is safe to drink.
Spring	The source of a spring must be covered and well protected. Water may be gathered using an outlet pipe installed at the source. The whole area should be fenced and a ditch dug above a spring to prevent surface water entering it. The collection area should be covered with concrete beneath the outlet pipe for people to place jerry cans and buckets for carrying water. A drainage line should be installed for draining spilled water to prevent pooling and becoming a mosquito breeding site. A storage tank may be needed so that flowing water is stored for use instead of going to waste. If springs are located at elevations, the communities may plan a gravity pipe system to direct water close to homes. During rains there is danger of the spring water becoming contaminated; during such a situation, water may be treated at home before drinking.
Well	Prepare an impermeable floor (e.g. using concrete slabs) at least 1 m wide around the well. Ensure good drainage to prevent stagnation of water within 2 m. Fit a cover to the opening of a well with a slab and above the surface of the ground so that water from the surrounding can not enter the well. Use a separate bucket for drawing water from a well which is clean and does not touch the ground. It should be attached to the top of the well. Water from the well bucket should be directly poured in to the collection bucket, so that well water is not contaminated. No latrine or garbage should be located within 10–20 m from the well. Line the inside with stones/bricks. A pumping installation is a safer method for a clean water supply.

Table 1. Community actions to ensure the safety of water sources *(continued)*

Rainwater	In areas where rainwater is collected during rainy season, Ensure that: the surface on which rainwater is collected, such as roof tops, are thoroughly cleaned at the start of the rainy season. Dust and birds' faeces may contaminate water. the collecting tank is thoroughly cleaned and scrubbed using bleach, it is covered and maintained. a filter/mesh covers the top of the collecting tank. a water tap is installed at the base of the tank. rainwater is treated before drinking.

Improving sanitation

Safe disposal of human and animal excreta and household waste is a priority. Many illnesses such as diarrhoea, polio, hepatitis A and E, cholera, dysentery and parasitic infestations come from germs and eggs found in human faeces. If the germs get into water or onto food, hands, utensils or surfaces used for preparing and serving food, they can be swallowed and cause illness. If faeces are left exposed, flies are attracted to it and can carry the germs to food and drink which is consumed by people.

The single most important action to prevent the spread of germs is to dispose of all faeces—both human and animal—in a safe way. Latrines need to be cleaned frequently. Animal faeces should be kept away from the house, paths and areas where children play. If the use of latrines is not possible, faeces should be buried immediately.

Managing solid waste in households

Cluster representatives and health volunteers should train and encourage households on the proper management of household waste. Household waste should be collected in bins which are placed in corners of the house. Household waste can be effectively minimized by carrying food and other purchases in reusable bags, such as cloth bags, rather than using plastic bags and also by segregating the waste for burying or burning.

Table 2. Measurement of bleach according to volume of water

Bleach	Volume of water
half a cup	400 gallon tanks (1.5 cubic m)
three teaspoons	oil drums (45 gallons or approximately 170 L)
half a teaspoon	5 gallon buckets (approximately 19 L)
six drops	2 litre bottles (approximately. 9 L)

Fruit and vegetable waste, leaves and animal dung should be put in a separate hole or in a heap away from the house and source of water and mixed with soil. After a few months it will soon become compost and can be used as a fertilizer. It can be protected by proper fencing which will make it safer for the local community.

Collect the remaining solid waste in a container or make a tidy pile of it and burn it once a week away from the village to avoid problems with smoke and the smell.

Managing solid waste in the community

Households may transport their solid waste to a common disposal site or to community collection points. Community collection site points should be arranged at places, such as markets and bus stations, by placing containers such as oil drums where large numbers of people congregate and where food is prepared, sold and eaten. Vegetable waste should not be disposed of at the same points unless it is emptied on a daily basis. All waste from these collection points should be collected and taken to a designated disposal site. It can be transferred by hand cart, animal cart or wheelbarrow. Waste should be preferably collected by people wearing protective clothing and trained in safe disposal measures.

Safe disposal of solid waste at community level

A common community disposal point should be arranged by the community for the safe disposal of community solid waste by digging a large pit. The waste can then be burnt regularly or buried with earth.

The community should ensure that:

- the pit is located outside populated areas and at least 20 m away from the nearest house;
- it is in a hollow and not on a hill or elevated surface;
- it is at least 100 m away from a river, well or spring and there is a fence around it;
- waste is piled up in the pit and is not scattered around;
- surface water can not enter into it.

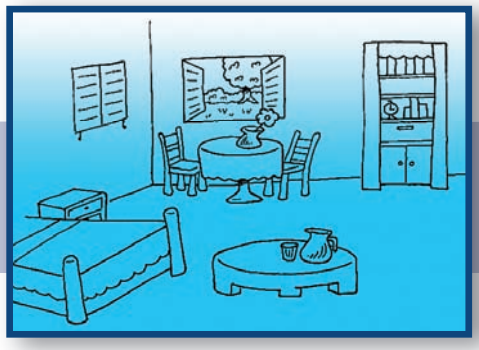
Improving domestic hygiene

Crowded conditions give rise to poor hygiene by increasing the transmission of diseases, such as tuberculosis, and by providing places for insects to breed and transmit diseases. Poor domestic hygiene leads to food and water contamination within the home. Poor indoor air quality leads to respiratory problems, and inadequate lighting leads to eyesight problems. Stress and depression is increased for people living in poor housing, and structurally unsafe houses can cause injuries.

Ventilation

Adequate ventilation in the home is important for the control of damp. The use of kerosene, wood, charcoal and dung used for cooking or heating can represent a serious health threat as a result of the indoor pollution. The smoke contains harmful substances which cause diseases such as bronchitis and asthma. These diseases can help spread tuberculosis. Women and children spend more time at home and are at greater

risk. It is important the household smoke and fumes should be expelled quickly and efficiently through adequate ventilation. More windows, especially in the cooking areas positioned in a way that allows for good circulation of fresh air will keep indoor air cleaner.



Lighting

Poor indoor lighting leads to eyesight problems and depression, particularly among women and children. Adding more windows, especially facing the sun can be an effective way to let in more natural light. This is also important as sunlight has disinfectant properties.

Prevention of disease vectors in the home

The following simple measures can prevent vectorborne diseases that are transmitted by flies, insects, mosquitoes, rats, mice and cockroaches.

- Food and water should be kept covered.
- Solid waste and garbage should be adequately disposed of.
- Latrines should be used.
- Pools of water should be prevented from collecting in and around the house to become breeding sites for mosquitoes.
- Animals should be reared away from houses.
- Windows and doors should be covered with mesh screens and be kept shut at night.
- Insecticide-treated bednets should be used.
- Walls should have a smooth hard surface that can be easily washed and should have no holes or cracks in which insects, bugs or rodents can live.
- Houses should be kept clean and tidy to significantly reduce the transmission of disease.

Annex 1

Pre- and post-test questionnaire

The following test should be given to trainees before and after training.

1) Cite at least three occasions when hands should be washed.
2) What is required for effective hand-washing?
3) Cite three measures which the community can take to ensure better hygiene.
4) Cite two simple kinds of treatment at home that can markedly enhance drinking-water safety.
5) Cite three precautions that should be taken to ensure that clean water is not re-contaminated during its handling and storage at home.
6) Cite three measures that the community can take to enhance the safety of water sources.
7) What is the single most important sanitation measure that needs to be taken to prevent the spread of germs?
8) Cite three conditions a community landfill (used for the disposal of solid waste) should satisfy.
9) Cite three health problems associated with poor housing.
10) Cite three measures that need to be taken to minimize problems linked to disease vectors at home.

Unit 9
Food and chemical safety

Contents

Food and chemical safety

Learning objectives

The objectives of this session are to enable cluster representatives and health volunteers to:

- understand the methods of transmission and ways to prevent foodborne diseases;
- identify general symptoms of foodborne diseases;
- identify common household chemicals and be aware of safety measures.

Expected outcomes

After completion of this session cluster representatives and health volunteers will be able to:

- raise community awareness of basic principles to ensure safer food;
- raise awareness of safe hygienic practices among shopkeepers and food handlers;
- educate families and households on ways of ensuring chemical safety at home.

Introduction

Food can be contaminated by dangerous germs and chemicals. Germs can live and multiply in food such as meat, chicken, rice, fish, eggs, fruit and vegetables. Foodborne diseases occur because of basic errors either in farming practices, storage, transportation, or food preparation in restaurants, canteens or homes. Many foodborne diseases could be prevented if those who prepare meals were trained in basic food safety. Contamination happens directly, or indirectly, from hands, towels, cloths, cutting boards, utensils and pets. Germs are not the only cause of foodborne illness, chemicals also cause foodborne illness. Many people die as a result of eating unsafe food or drinking-water contaminated by harmful germs or chemicals. Ensuring food safety from common chemicals kept in homes is an important issue.

Diagnosing foodborne illness

Symptoms that are indicative of foodborne illness include: stomach pain; vomiting; diarrhoea; fever; headache; symptoms last more than three days; blood in stools.

Food poisoning

As soon as symptoms appear in an individual, especially diarrhoea, they should be given fluids to avoid dehydration. The sick person should be advised not to handle or prepare food, however, if this can not be avoided hands should be washed with soap and water. If food poisoning is suspected, the sufferer should be referred to the nearest health facility.

Five keys to safer food

The five keys to safer food include: cleanliness; separating raw and cooked food; cooking food thoroughly; keeping food at safe temperatures; and using safe water and fresh food (Figure 1).

Cleanliness. Wash your hands before handling food, during food preparation and after going to the toilet. Wash and sanitize all surfaces and equipment used for food

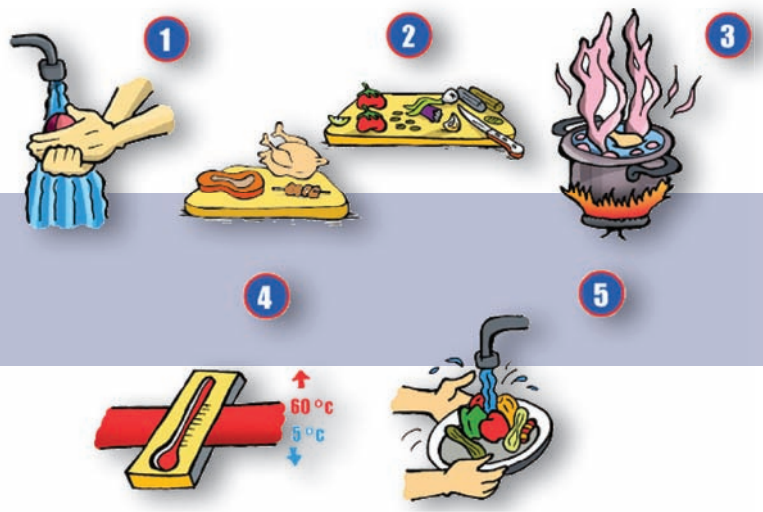


Figure 1. Five keys to safer food

preparation. Protect kitchen areas and food from insects, pests and animals.

Separate raw and cooked food. Separate raw meat, poultry and seafood from other foods. Use separate equipment and utensils, such as knives and cutting boards, for handling raw foods. Food should be stored in containers to avoid contact between raw and prepared foods.

Cook food thoroughly. It is important to cook food thoroughly, particularly meat, poultry, eggs and seafood. Bring foods such as soup to the boiling point to ensure that they have reached 70° C. When cooking meat and poultry ensure that the juices from the meat are clear, not pink. Reheat cooked food thoroughly.

Keep food at safe temperatures. Do not leave cooked food at room temperature for more than 2 hours. Refrigerate promptly all cooked and perishable food (preferably below 5º C). Keep cooked food hot (more than 60º C) prior to serving. Do not store food for too long even in the refrigerator. Do not thaw frozen food at room temperature.

Use safe water and fresh food. Use safe water or treat the water to make it safe and select fresh foods. Choose foods processed for safety, such as pasteurized milk. Wash fruit and vegetables, especially if they are to be eaten raw. Do not use food beyond its expiry date.

Chemical safety

Commonly used chemicals in households may cause serious accidents, due to unsafe improper handling, storage, use and disposal of these chemicals. The toxicity of most of these chemicals poses a major hazard to human beings who are in contact with them. Children are more likely to be exposed to the harmful effects of chemicals as they may be unable to read the warning labels and not recognize the danger posed by ingesting these chemicals. Many chemicals do not even need to be swallowed in order to be dangerous. They can cause poisoning if they are inhaled or get onto the skin or into the eyes. It is important that all such chemicals are stored, used and disposed of properly. Common household chemicals include:

- petroleum and petroleum products (kerosene oil; paraffin; lubricating oils; diesel);
- acids, corrosives, caustics, bleaching agents (used for cleaning/washing);
- detergents, soap, shampoos, shaving creams;
- agricultural chemicals such as pesticides, fertilizers;
- air fresheners, deodorants, perfumes;
- spirits, antiseptic solutions;
- medicines.

Safe storage and proper disposal of chemicals

For the safe storage and proper disposal of chemicals the following points must be borne in mind.

- Do not keep chemicals in drinking bottles, jars or cups as they may be mistaken for drinks.
- All medicines, chemicals and poisons should be stored in their original containers and be tightly sealed.
- Keep chemicals out of the reach of children, at a reasonable height and under lock and key.
- Containers of chemicals and medicines should be properly labelled.
- Empty containers of dangerous chemicals may be properly disposed of by burning and/or burying properly.

The role of cluster representatives and health volunteers in ensuring food and chemical safety

Cluster representatives and health volunteers should enhance the awareness of the community, shopkeepers, food vendors and consumers about the cause and effect of the consumption of unsafe food through simple, practical messages and demonstrations. The five key rules of food safety can be used for health education. Educate families, households and the community on the hazards from toxic effects of household chemicals and their safe storage, proper use and disposal. Take corrective actions through persuasive methods and use a simple checklist to ensure that shopkeepers, vendors and food handlers are adopting food safety procedures. The results of the inspection may be shared with the community in meetings of the community/ village development committee. The social pressure of the community will help non-compliant vendors to change attitudes. School teachers must be involved in this activity to ensure that the same activities are being undertaken in the schools.

Inspection of shops

If trained to inspect shops, cluster representatives and health volunteers should use the following checklist.

Cluster representatives and health volunteers must ensure that shopkeepers selling food do the following.

Eating places must be properly maintained to ensure that they do not become a source of disease and should be periodically checked to ensure that: clean water is available for drinking and washing and a separate sanitation facility away from the kitchen is available; plates and utensils are washed properly with washing liquid; the staff display good personal hygiene; food is freshly prepared daily and food spilled or not used is disposed of; kitchen and eating places are kept clean and are free from flies and insects.

Street food vendors can present a serious health risk as they often have little access to clean water and sanitary facilities. They commonly cook and handle food with dirty hands. Raw food stuff too can not be kept in safe storage and is easily contaminated by germs. Food from such street vendors may be very dangerous and cause serious food poisoning. It is important that communities understand its importance and develop a mechanism for inspecting the food sold by street vendors. Street vendors may be trained and helped to prepare safe food and offer it in a hygienic manner.

Table 1. Checklist for the inspection of shops

No	Activity	Status	
1.	In terms of the display check the material items that catch your eye	Organized	Not organized
		☐	☐
2.	Check the food items	Perishable	Not perishable
		☐	☐
3.	Check the chemical items	Packaged	Not packaged
		☐	☐
4.	Check the racks where food and chemicals are located for cracks, etc.	Safe	Not safe
		☐	☐
5.	Chemicals and food separated and distanced	Separated	Not separated
		☐	☐
6.	Items such as flour, sugar and rice, which are kept in open sacks, should be covered	Covered	Not covered
		☐	☐
7.	No chemical should be put on top of, or near, these sacks	Arranged	Not arranged
		☐	☐
8.	All food cans must display the dates of manufacture and expiry	Clear dates	Not clear
		☐	☐
9.	Any canned food that has passed the expiry date should be thrown away	Thrown away	Present
		☐	☐
10.	Any can showing bulking/pressure must be thrown away	Thrown away	Present
		☐	☐

Table 2. Checklist for food safety

No	Activity	Status	
1.	Shopkeepers must wash their hands before touching food items	Running water available	Running water not available
		☐	☐
2.	The scale should be cleaned if food items such as flour, sugar or rice, are weighed	Followed	Not followed
		☐	☐
3.	A clean piece of paper should be placed in the tray of the scale when weighing sticky food substances such as dates, halwa and cheese, etc.	Clean paper exists	Clean paper does not exist
		☐	☐
4.	The shopkeeper should not use insecticides or rodenticides near food items	Kept separate	Not separated
		☐	☐

Annex 1

Pre- and post-test questionnaires

Teaching methodology

The main objective of this training module on food safety is to provide information that will motivate food handlers to change their behaviour and habits. In order to motivate such changes, information must be presented in an interesting and cohesive way.

Please tick True or False

Table 1. Pre- and post-test questionnaire to evaluate improvements in food vendors' knowledge relating to food safety

	True	False
Key 1 Keep hands and equipment clean		
1. It is important to wash hands before handling food	☐	☐
2. Kitchen cloths can spread microorganisms	☐	☐
Key 2 Separate raw and cooked foods		
3. You can use the same chopping board for raw and cooked foods as long as there are no visible juices/residues	☐	☐
4. When food is in cold storage there is no need to keep it separate	☐	☐
Key 3 Cook food thoroughly		
5. Cooked food needs to be thoroughly reheated	☐	☐
6. Meat should have clear juices to show that it is properly cooked	☐	☐
Key 4 Keep food at safe temperatures		
7. Cooked meat should be left at room temperature to cool before refrigerating	☐	☐
8. Cooked food should be kept piping hot before it is served	☐	☐
Key 5 Use safe water and raw material		
9. Unsafe food can be identified by the way it looks and smells	☐	☐
10. Washing fruit and vegetables before eating can reduce the risk of food poisoning	☐	☐

Table 2 questionnaire should be used by cluster representatives and health volunteers to evaluate improvements in the community's knowledge of food safety.

Table 2. Pre- and post-test questionnaire to evaluate attitudes in food vendors' knowledge relating to food safety

	Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Key 1 Keep hands and surfaces clean					
Frequent hand washing during food preparation is a waste of time					
Keeping surfaces clean in my kitchen is important to me					
Key 2 Separate raw and cooked foods					
Keeping raw and cooked food separate is important to prevent my family from becoming sick					
I think it is important to use different knives and chopping boards for raw and cooked foods					
Key 3 Cook food thoroughly					
I think that some meats can be made safe without thorough cooking					
I think that soups and stews should be boiled to ensure that they are safe					

Table 2. Pre- and post-test questionnaire to evaluate attitudes in food vendors' knowledge relating to food safety *(continued)*

	Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Key 4 Keep food at safe temperatures					
Thawing food at room temperature is safe, quicker and more convenient for me					
I think it is safe to leave cooked food out of the refrigerator for more than two hours					
Key 5 Use safe water and food					
I think that mouldy food is safe to eat if the mould is cut off					
It is important to me that I shop for food where I trust the vendor					

Table 3 questionnaire should be used by cluster representatives and health volunteers to evaluate improvements in community behaviour towards food safety.

Table 3. Pre- and post-test questionnaire to evaluate improvements in self-reported behaviour of food vendors to food safety

	Always	Most of the time	Sometimes	Not often	Never
Key 1 Keep hands and surfaces clean					
I wash my hands before and during food preparation					
I clean surfaces and equipment used for food preparation before each meal					
Key 2 Separate raw and cooked foods					
I use separate equipment and chopping boards for raw and cooked food					
I separate raw and cooked food in cold storage					
Key 3 Cook food thoroughly					
I check that meats are cooked thoroughly by checking that the juices are clear or by using a thermometer					
I reheat cooked food until it is piping hot					

Table 3. Pre- and post-test questionnaire to evaluate improvements in self-reported behaviour of food vendors to food safety *(continued)*

	Always	Most of the time	Sometimes	Not often	Never
Key 4 Keep food at safe temperatures					
I thaw frozen food at room temperature					
After I have cooked a meal I leave the food out for not more than two hours					
Key 5 Use safe water and food					
I check and throw away food which has passed its expiry date					
I wash fruit and vegetables before eating them					

Annex 2

Role play activity

The target audience for this activity are schoolchildren and the activity involves washing hands with hot water and soap. The purpose of the activity is to: draw attention to personal hygiene; identify hands as a source of contamination; and demonstrate correct hand-washing techniques. The materials needed for this activity are: cooking oil; cinnamon; hand-washing facilities including cold and warm water; soap and a brush.

Pre-activity discussion

Trainers should discuss the importance of hand-washing and the times at which it is most important (before and after certain activities). Trainers should emphasize the idea that although to our eyes, our hands may look clean they may be contaminated by many invisible germs. Explain that germs are so tiny that they cannot be seen.

Method

- Choose three pupils to cover their hands in cooking oil.
- Cover their oil-coated hands with cinnamon. The cinnamon represents germs.
- The three pupils should wash their hands vigorously for 20 seconds as follows:

    Pupil 1: washes hands with cold water and no soap.
    Pupil 2: washes hands with warm water and no soap.
    Pupil 3: washes hands with warm water and soap.

When pupils have finished washing their hands they should show their hands to the class.

Discussion questions

The trainer should discuss the following questions with the children.

1) How do you get rid of germs from your hands?
2) What is the result of only using cold water and no soap to wash hands?
3) What is the effect of using warm water with no soap to wash hands?
4) What is the effect of using warm water and soap?
5) What is the effect of rubbing the hands together?
6) Which hand-washing method is most effective?
7) Which hand-washing method is least effective?