

Water, sanitation and hygiene (WASH) in health-care facilities in emergencies

Health-care facilities play a vital role within the community by providing essential medical care at all times including during emergencies. Any incident which causes loss of infrastructure, energy supply, loss of equipment, loss of staff or staff attrition, interruption to supply chains, or patient surge - such as sudden communicable disease epidemics, natural disasters (e.g. floods, earthquakes), or conflict - requires a holistic health response and recovery effort which includes actions to assess and restore basic WASH services.



The importance of WASH in health-care settings

In some developing countries, more than a quarter of patients may become infected during their stay in a health-care facility. In emergency situations, health-care facilities may quickly become overcrowded with injured people or people suffering from infectious disease. During the response to a disaster, it is important to restore and strengthen standards of WASH to avoid health-care facilities becoming the epicentre of outbreaks of diseases (e.g. cholera).

Key interventions

The following interventions are based on the WHO publication *WASH in health-care facilities in emergencies (2012)*. All the interventions should be carried out to an acceptable standard so infection routes in the health-care setting are blocked.

- **Water quality.** Ensure that water for drinking, cooking, personal hygiene, medical activities, cleaning and laundry is treated and safe. Chlorine is the most commonly-used disinfectant for drinking-water in emergencies (see technical note 11). When used in low-turbidity water, it is very effective at inactivating and

destroying pathogens. All water supplies in health-care facilities, regardless of use, should be chlorinated so there is at least 0.5mg/l free chlorine residual at the tap. During diarrheal disease epidemics this should be increased to 1.0mg/l at the tap.

- **Water quantity.** Ensure that sufficient quantities of water are available for infection control activities, in addition to laundry, bathing, handwashing, drinking and medical procedures (see box 17.1). This may require interventions to repair the water supply (or power supply if the water system requires power to function), assure adequate quantities of fuel, install basic emergency water treatment units,

carry out bulk chlorination or organise water tankering. It may also involve the installation of temporary water storage facilities such as demountable steel water tanks, bladder tanks or polyethylene tanks.

- **Water access and facilities.** Ensure that there are sufficient numbers and coverage of appropriate and functional water collection points and water related facilities. Ensure there appropriate and functional laundering and drying stations (one per 80 inpatients), in addition to appropriate and functional bathing facilities (one shower cubicle per 40 inpatients). Hot water may need to be provided depending on context (cold climates).



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- Handwashing facilities.** Ensure that there are functional handwashing facilities with water, soap and safe wastewater disposal in every location where health-care is provided (wards, consulting rooms, delivery rooms, operating theatres, etc.), service areas (kitchen, laundry, sterilization, laboratory, waste zone and mortuary) and toilets. This may be carried out using simple equipment, such as a jug of water, a basin and soap. If available, alcohol-based handrubs may be used for rapid, repeated decontamination of clean hands. However soap and water should be available for soiled hands.
- Handwashing behavior.** Ensure that staff carry out clinical handwashing before and after every shift, directly before and after every patient contact (even if wearing gloves), directly after handling infectious materials, and when entering and leaving high risk areas such as delivery rooms, surgeries, isolation areas. This may require disciplinary measures for non-compliance.
- Excreta disposal.** Ensure that there are sufficient numbers of clean, accessible, appropriate and safe toilets (one per 20 users) for staff, patients and carers that do not contaminate the health-care setting or water supplies. This can be as basic as providing pit latrines with levels of privacy that are acceptable to users.
- Cleaning and disinfecting.** Ensure that the health-care facility has sufficient materials (detergent, mops, buckets, chlorine) and staff to routinely clean and disinfect environmental surfaces. Consider providing additional cleaning materials, installing plastic sheeting to facilitate cleaning in temporary facilities, and training cleaning staff in infection control measures. A cleaning schedule should be established so that all areas of the health-care facility are routinely cleaned and disinfected (see box 17.2).
- Health-care waste management.** Ensure safe segregation, collection, transport, treatment and disposal of health-care waste. Consider providing sufficient numbers of durable and safe colour-coded containers in all rooms where wastes are generated, creating a dedicated and fenced waste storage and disposal zone, and ensuring staff have appropriate personal protective equipment and are trained in waste management.
- Overcrowding.** Ensure that wards are not overcrowded and there is at least 1-2m between beds to reduce droplet and contact based transmission risks. In emergencies this may require working with the health-care facility management to identify and establish new locations for temporary wards such as car parks, courtyards, or spare wards.



- Personal protective equipment.** Ensure that there are sufficient stocks of personal protective equipment (e.g. disposable gloves, single use plastic aprons, single use face masks, overalls, eye glasses, boots, thick gloves, gowns). Ensure that all staff actually use the correct type of personal protective equipment for the tasks they are performing.

Table 17.1 Recommended minimum water quantities for health-care facilities during emergencies

Use the following table to calculate the recommended minimum quantity of water for different needs in the health-care facility.

Activity	Quantity of Water Required
Staff	5 litres/person/day
Outpatients	5 litres/consultation
Inpatients	40–60 litres/patient/day
	15 litres/carer/day
Operating Theatre or Maternity Unit	100 litres/intervention
Dry / Supplementary Feeding Centre	0.5–5 litres/consultation (depend on waiting time)
Wet Supplementary Feeding Centre	15 litres/consultation
Inpatient Therapeutic Feeding Centre	30 litres/patient/day
	15 litres/carer/day
Cholera Treatment Centre	60 litres/patient/day
	15 litres/carer/day
Acute Respiratory or Isolation Ward	100 litres/patient/day
	15 litres/carer/day
Viral Hemorrhagic Fever Isolation Ward	300–400 litres/patient/day
	15 litres/carer/day

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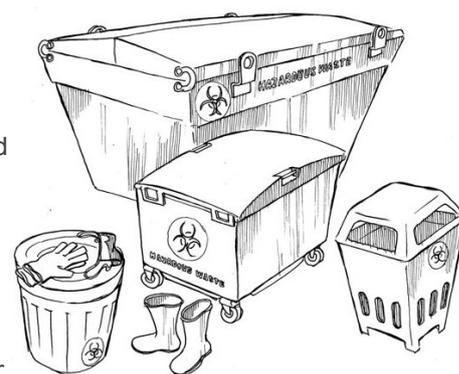
- **Wastewater disposal.** Ensure that wastewater from cleaning, handwashing, bathing, or laundering is disposed rapidly and safely without contaminating the health-care setting, water supplies or surrounding communities. Consider installing soak-aways equipped with grease traps.
- **Stormwater management.** Ensure that stormwater does not enter any areas where health-care is delivered, and does not carry potentially infectious material away from the health-care setting into the community. In practice this can be as simple as ensuring that drainage ditches and canals exist, and they are unblocked, properly sized, leveled, and functional.
- **Disease vector control.** Ensure patients, staff and carers are protected from disease vectors. Remove vector breeding sites, ensure kitchen and health-care wastes are properly disposed, windows and doors are equipped with screens, food areas are protected by rodent traps and

adequate room sealing, and inpatient beds are equipped with insecticide treated mosquito nets.

- **Food safety.** Ensure all food that is stored, prepared, and consumed by patients, staff and carers is safe. Ensure that raw and cooked foods are kept separate at appropriate storage temperatures, food handling is carried out with utmost cleanliness, food is thoroughly cooked, and safe water is used in food preparation.
- **Hygiene promotion.** Ensure that patients, and carers are informed of essential hygiene behaviours repeatedly, starting within 30 minutes of arrival and then continuously throughout their visit.

Management of WASH services in isolation areas

Isolation areas may need to be established for the management of patients during outbreaks of highly infectious diseases such as Cholera or Viral Hemorrhagic Fever. These isolation areas should ideally be



located away from the rest of the rest of the health-care facility. Some key interventions are as follows.

- **Dedicated services.** Ensure that isolation areas are fenced and have their own dedicated, functional and safe toilets, showers, laundry, changing area, and health-care waste disposal facilities. This may involve establishing new WASH services in the isolation area.
- **Entrances and exits.** Ensure that entrances and exits of isolation areas have functional foot baths or sprayers with 0.2% chlorine, handwashing stations and permanent guards. This may involve providing basic equipment (handwashing stations, soap, backpack sprayers, chlorine, buckets, mixing spoons, bowls) and training guards to limit the number of people entering the isolation area in addition to ensuring everyone entering and leaving disinfects their hands and feet.
- **Disinfection of wastes.** Ensure that all infectious wastes, excreta and body fluids created in the isolation area are disinfected with 2% chlorine solution and disposed safely within the isolation area. Ensure that no potentially infectious wastewater flows out of the isolation area and no potential pathogenic reservoir including wastes, food, food containers, or soiled clothing is carried out of the isolation area.

Table 17.2 Recommended cleaning frequencies for health-care facilities

Routine cleaning should be organized by classifying the health-care facility into three areas, each with a specific cleaning routine.

Activity	Location
Daily sweeping:	<ul style="list-style-type: none"> • Offices and other non-patient areas
Daily wet mopping with water and detergent:	<ul style="list-style-type: none"> • Waiting areas • Consulting rooms • Non-infectious disease wards • Pharmacy
Daily cleaning with a detergent or 0.2% chlorine solution, or whenever soiled and after each intervention (in the case of operating suites and delivery rooms) Use separate cleaning equipment for each room	<ul style="list-style-type: none"> • Infectious disease or isolation wards • Operating suites and delivery rooms • Intensive care units and premature baby units • Casualty departments • Laboratory • Laundry and sterilization services • Kitchen • Toilets • Morgue

WASH Disaster preparedness and risk reduction

Health-care facilities play a vital role in the community and it is essential that preparedness actions are undertaken to ensure they have sufficient resilience to withstand potential disasters. The following tasks should be considered.

- **Backup arrangements.** Ensure back-up arrangements for water and power (e.g. backup pumps, generators, treatment units).
 - **Protective arrangements.** Ensure that critical WASH equipment and supplies are adequately protected from natural disaster (e.g. floods, cyclones) or conflict damage. This can be as simple as installing sandbags.
 - **WASH stockpiles.** Estimate the expected weekly consumption of critical WASH supplies (fuel, soap, chlorine, detergent, disposable gloves, disposable aprons, water treatment chemicals, water pump and water treatment unit spare parts, health-care waste bags, body bags etc.) under various likely emergency response scenarios (earthquakes, floods, landslides, conflict, mass population
- displacement, disease outbreaks, etc.) and ensure sufficient stockpiles.
- **Preventative maintenance.** Ensure that critical WASH equipment (e.g. pumps, generators, water treatment units) are kept well maintained.
 - **Training.** Ensure that all WASH staff members have been adequately trained on WASH emergency response actions. Develop job action sheets that briefly list essential duties and resources required for WASH personnel during emergency response activities.
 - **Surge capacity.** Maintain a reserve roster of trained WASH personnel that can be drawn on in times of disaster.
 - **Overflow capacity.** Calculate maximal patient admission capacity, determined not only by available space but also based on resources and staffing availability. Identify physical spaces (car parks, courtyards, spare wards), staffing and supplies required for temporary expansion of inpatient capacity. If necessary, identify additional sites that may be converted to patient care areas (e.g. hotels,



schools, community centres).

- **Infection control readiness.** Ensure that infection control protocols (especially those for handwashing, use of personal protective equipment and health-care waste management) are strictly followed during normal operation so good practice is already instilled for periods of emergency response.
- **Vaccinations.** Ensure staff have the appropriate vaccinations.
- **Coordination.** Ensure there is a designated health-care facility emergency focal point or committee to ensure appropriate coordination and management of emergency WASH provision.

Further information

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