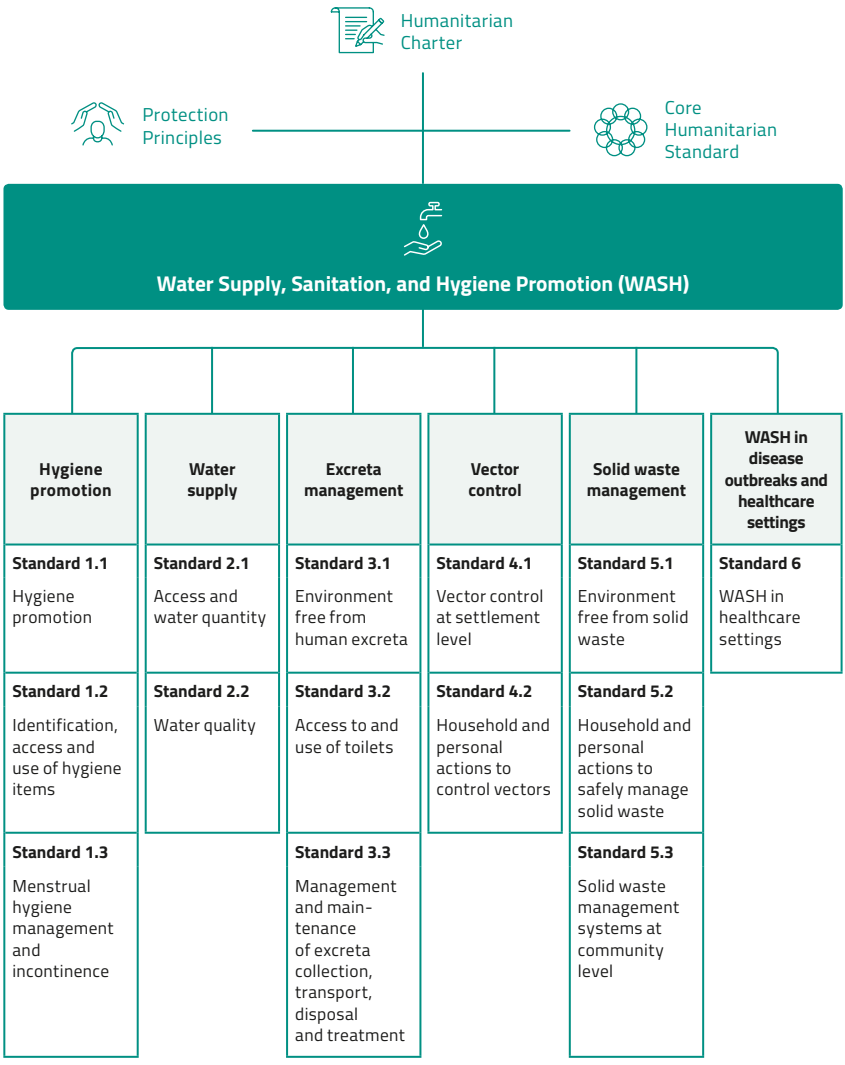
Water Supply, Sanitation and Hygiene Promotion



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Essential concepts in water supply, sanitation and hygiene promotion

Everyone has the right to water and sanitation

The Sphere Minimum Standards for water supply, sanitation and hygiene promotion (WASH) are a practical expression of the right to access water and sanitation in humanitarian contexts. The standards are grounded in the beliefs, principles, duties and rights declared in the Humanitarian Charter. These include the right to life with dignity, the right to protection and security, and the right to receive humanitarian assistance on the basis of need.

For a list of the key legal and policy documents that inform the Humanitarian Charter ⊕ *see Annex 1: Legal foundation to Sphere*.

People affected by crises are more susceptible to illness and death from disease, particularly diarrhoeal and infectious diseases. Such diseases are strongly related to inadequate sanitation and water supplies and poor hygiene. WASH programmes aim to reduce public health risks.

The main pathways for pathogens to infect humans are faeces, fluids, fingers, flies and food. The main objective of WASH programmes in humanitarian response is to reduce public health risks by creating barriers along those pathways ⊕ *see Appendix 2: The F diagram*. The key activities are:

- promoting good hygiene practices;
- providing safe drinking water;
- providing appropriate sanitation facilities;
- reducing environmental health risks; and
- ensuring conditions that allow people to live with good health, dignity, comfort and safety.

In WASH programmes, it is important to:

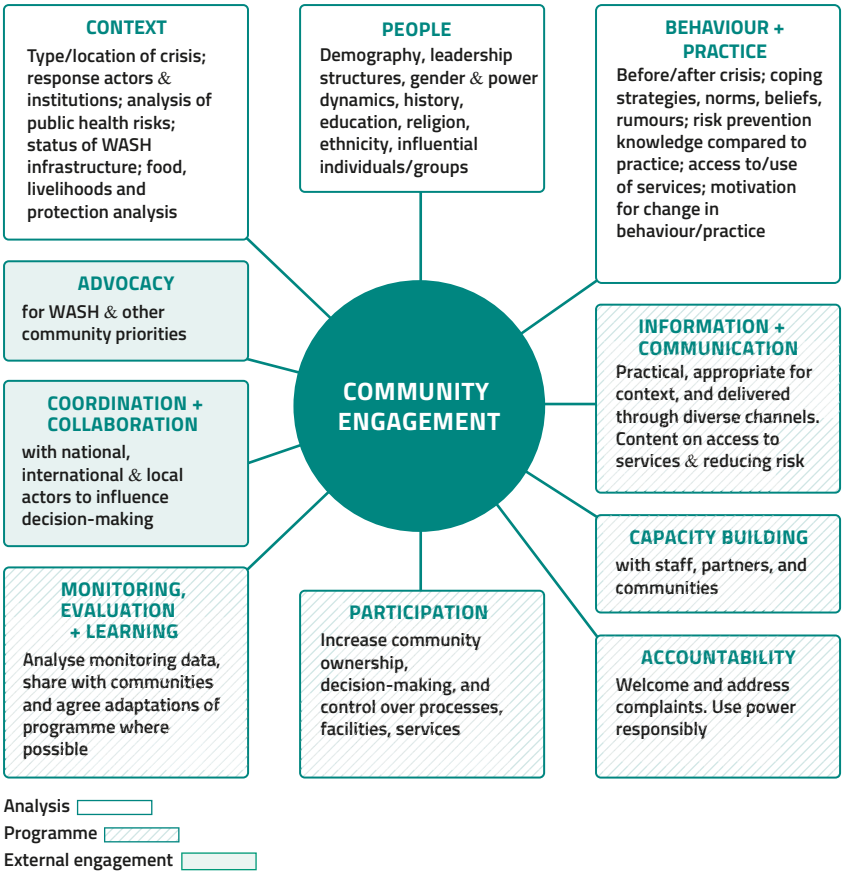
- manage the entire water chain: water sourcing, treatment, distribution, collection, household storage and consumption;
- manage the entire sanitation chain in an integrated manner;
- enable positive healthy behaviours; and
- ensure access to hygiene items.

Community engagement is crucial

Community engagement in WASH is a dynamic process connecting the community and other stakeholders so that people affected by the crisis have more control over the response and its impact on them. Effective engagement links communities and response teams to maximise community influence to reduce public health risks,

provide appropriate, accessible services, improve programme quality and establish accountability. It explores the capacity and willingness of the community to manage and maintain WASH systems ⊕ *see Figure 4 WASH Community Engagement*.

Engaging with the community creates an essential understanding of perceptions, needs, coping mechanisms, capacities, existing norms, leadership structures and priorities, as well as the appropriate actions to take. Monitoring and evaluation, including feedback mechanisms, demonstrate whether WASH responses are appropriate or need to be adjusted. ⊕ *see Core Humanitarian Standard Commitments 4 and 5*.



WASH Community Engagement (Figure 4)

WASH requires particular considerations in urban areas

Community engagement can be harder in urban areas, where the population density is higher and at-risk groups are less visible. However, in urban areas, public spaces, media and technology can provide the opportunity for broader and more

efficient dialogue. Diverse ownership of assets (household in rural areas, public–private mix in urban areas) affects the choice of response options and methods of delivery.

A combination of approaches is needed

Market-based assistance can efficiently and effectively meet WASH needs, such as by ensuring access to hygiene items. Cash-based assistance (direct cash and/or vouchers) should be complemented by other WASH activities, including technical assistance and community engagement. For implementation, options vary from infrastructure construction to hygiene promotion and community mobilisation. Generators or temporary toilets can be provided immediately, while an overhaul of water treatment services is a long-term project. Quality control and technical assistance are critical to ensure health and safety. Technical assistance should be timely and appropriate. It should be consistent, accessible and achievable to deliver sustainably.

WASH responses should enhance long-term community goals and minimise environmental impact. Integrated water and sanitation management should meet human needs and protect the ecosystem. This can influence the choice of technology, timing and phasing of activities, community engagement, private sector and market engagement, and financing options.

These Minimum Standards should not be applied in isolation

The right to adequate water and sanitation is linked to the rights to shelter, food and health. Effective progress in achieving the Minimum Standards in one area influences progress in other areas. Close coordination and collaboration with other sectors as well as coordination with local authorities and other responding agencies helps ensure that needs are met, that efforts are not duplicated, and that the quality of WASH responses is optimised. For example, where nutritional standards are not met, the urgency to meet the water and sanitation standards is higher because people's vulnerability to disease has increased. The same applies to populations where HIV prevalence is high. Cross-references throughout the Handbook suggest some potential linkages.

Where national standards are lower than the Sphere Minimum Standards, humanitarian organisations should work with the government to progressively raise them.

International law specifically protects the right to water and sanitation

The right includes access to a sufficient, safe and affordable water supply for personal and domestic use, and private, safe and clean sanitation facilities. States are obliged to ensure this right during crises ⊕ *see Annex 1: Legal foundation to Sphere.*

Safe water and appropriate sanitation facilities are essential to:

- sustain life, health and dignity;
- prevent death from dehydration;

- reduce the risk of water-, sanitation- and hygiene-related diseases; and
- allow for adequate consumption, cooking, and personal and domestic hygienic requirements.

The right to water and sanitation is part of the universal rights essential for human survival and dignity, and state and non-state actors have responsibilities to fulfil the right. During armed conflict, for example, attacking, destroying, removing or making water installations or irrigation works useless is prohibited.

Links to the Protection Principles and the Core Humanitarian Standard

Water use affects protection. Armed conflict and inequity affect water security for individuals and groups. Multiple demands for water for consumption and domestic and livelihoods purposes can cause protection concerns if short- and long-term activities are not designed appropriately. Protection in WASH responses is often considered from the perspective of personal protection and safety, recognising particular vulnerability during water collection, defecation or menstrual hygiene management. Such personal protection elements are essential, but wider protection concerns are fundamental, too. Simple measures from the start, such as locks on toilet doors, adequate lighting and facilities segregation can reduce the risk of abuse or violence.

Adapted and inclusive programming is essential to avoid discrimination, reduce potential risks and improve usage or quality of services. For example, ensure that persons with disabilities can access hygiene facilities, and that women or children have appropriately sized containers in which to carry water. Engaging individuals and communities in all stages of the response can help incorporate protection considerations into WASH programmes.

Aid workers should be trained on child safeguarding and know how to use referral systems for suspected cases of violence, abuse or exploitation, including of children.

Civil–military cooperation and coordination should be carefully considered for humanitarian organisations, particularly in conflicts. Perceptions of neutrality and impartiality may affect community acceptance. Humanitarian organisations may have to accept military help in some situations, for example in transportation and distribution. However the impact on humanitarian principles must be carefully considered and efforts made to mitigate protection risks ⊕ *see Humanitarian Charter,* and *Settings with domestic and international military forces* in *What is Sphere?*

In applying the Minimum Standards, all nine Commitments in the Core Humanitarian Standard should be respected as a foundation for providing an accountable WASH programme.

1. Hygiene promotion

Diseases related to water, sanitation and hygiene cause significant preventable sickness and death in crises. Hygiene promotion that supports behaviours, community engagement, and actions to reduce the risk of disease is fundamental to a successful WASH response.

A standardised approach that relies mostly on teaching messages and distributing hygiene items is unlikely to be very effective. Risks—and the perception of risks—vary across contexts. People have different life experiences, coping strategies, and cultural and behavioural norms. It is important to adapt approaches based on analysis of these factors as well as context. Effective hygiene promotion relies on:

- working with the community to mobilise action and contribute to decision-making;
- two-way communication and feedback on risks, priorities and services; and
- access to and use of WASH facilities, services and materials.

Hygiene promotion should build on people's own knowledge of risk and disease prevention to promote positive health-seeking behaviour.

Monitor activities and outcomes regularly to ensure that hygiene promotion and WASH programmes evolve. Coordinate with health actors to monitor the incidence of WASH-related diseases such as diarrhoeal disease, cholera, typhoid, trachoma, intestinal worms and schistosomiasis ⊕ *see Essential healthcare – communicable diseases standards 2.1.1 to 2.1.4* and *Health systems standard 1.5*.

Hygiene promotion standard 1.1: Hygiene promotion

People are aware of key public health risks related to water, sanitation and hygiene, and can adopt individual, household and community measures to reduce them.

Key actions

1. Identify the main public health risks and the current hygiene practices that contribute to these risks.
   - Develop a community profile to determine which individuals and groups are vulnerable to which WASH-related risks and why.
   - Identify factors that can motivate positive behaviours and preventive action.

2 Work with the affected population to design and manage hygiene promotion and the wider WASH response.

- Develop a communications strategy using both mass media and community dialogue to share practical information.
- Identify and train influential individuals, community groups and outreach workers.

3 Use community feedback and health surveillance data to adapt and improve hygiene promotion.

- Monitor access to and use of WASH facilities, and how hygiene promotion activities affect behaviour and practice.
- Adapt activities and identify unmet needs.

Key indicators

Percentage of affected households who correctly describe three measures to prevent WASH-related diseases

Percentage of target population who correctly cite two critical times for handwashing

Percentage of target population observed to use handwashing stations on leaving communal toilets

Percentage of affected households where soap and water are available for handwashing

Percentage of affected population who collect water from improved water sources

Percentage of households that store drinking water in clean and covered containers

Percentage of carers who report that they dispose of children's excreta safely

Percentage of households using incontinence products (pads, urinal bottles, bed pans, commode chairs) who report that they dispose of excreta from adult incontinence safely

Percentage of affected households who dispose of solid waste appropriately

Percentage of people who have provided feedback and say that their feedback was used to adapt and improve WASH facilities and services

Local environment is free of human and animal faeces

Guidance notes

Understanding and managing WASH risks: Prioritising and reducing WASH risks in the initial phase of a crisis can be challenging. Focus on the use of safe water, excreta management and handwashing, as these are likely to have the greatest

impact on preventing disease transmission. Assessing WASH-related public health risks and steps to reduce them will require an understanding of:

- current use of WASH facilities and services;
- access to essential household hygiene items ⊕ *see Hygiene promotion standards 1.2 and 1.3*;
- current coping strategies, local customs and beliefs;
- social structures and power dynamics in the community;
- where people go for healthcare (including traditional healers, pharmacies, clinics);
- who is responsible for operating and maintaining WASH infrastructure;
- disease surveillance data linked to WASH;
- social, physical and communication barriers to accessing WASH facilities and services, particularly for women and girls, older people and persons with disabilities;
- income-level variations; and
- environmental conditions and seasonal trends for diseases.

To maintain motivation, behavioural change and practice need to be easy. Facilities should be convenient and accessible for all users, safe, dignified, clean and culturally appropriate. Include both men and women in hygiene promotion activities, as active hygiene support by men may have a decisive influence on behaviours in the family.

Community mobilisation: Work with existing structures, ensuring that paid or voluntary opportunities are equally available to both women and men. Respected community and faith-based leaders, outreach workers and trusted local actors such as women's or youth groups can facilitate mobilisation and preventive action.

Allocating two outreach workers per 1,000 people is common. Outreach workers and volunteers should have good communication skills, be able to build respectful relationships with local communities, and have a thorough understanding of local needs and concerns. If needed, incentives for outreach workers should be agreed through a local coordination forum to promote equity and avoid disruption.

Community health workers may have similar roles to WASH outreach workers, but different responsibilities ⊕ *see Health systems standard 1.2: Health workforce*.

Working with children: Children can promote healthy behaviours to their peers and family. The department of education or social services can identify opportunities to promote hygiene in schools, residential care and child-headed households, and to children living on the street. Involve the children in developing the messages ⊕ *see INEE and CPMS Handbooks*.

Communication channels and approaches: Provide information in multiple formats (written, graphic, audio) and languages to make it as widely accessible as possible. Adapt for children and persons with disabilities and develop and test messages

to ensure they are understandable across differences in age, sex, education level and language.

Community-level dialogue is useful for problem solving and action planning. Mass media can reinforce general information with a broader reach. Both are useful if targeted at specific audiences. Design appropriate feedback mechanisms with users and monitor their effectiveness. Communicate feedback to the community, encouraging them to respond in turn ⊕ *see Core Humanitarian Standard Commitment 5*.

Handwashing with soap is an important way to prevent transmission of diarrhoeal diseases. Handwashing facilities need a regular supply of water, soap and safe drainage. Position facilities so that handwashing happens before touching food (eating, preparing food or feeding a child) and after contact with excreta (after using the toilet or cleaning a child's bottom) ⊕ *see Water supply standard 2.2: Water quality.*

Promoting the use of toilets: A key issue for hygiene promotion staff is the inclusive use of excreta disposal facilities and materials. In addition to concerns about cleanliness and smell, major deterrents for people using toilets are embarrassment, cultural taboos, physical accessibility and concerns about privacy and safety ⊕ *see Excreta management standard 3.2: Access to and use of toilets*.

Collecting, transporting and storing drinking water safely is key to reducing contamination risks. Households need separate containers for collecting and storing drinking water ⊕ *see Hygiene promotion standard 1.2* and *Water supply standards 2.1 and 2.2*.

People on the move: Find opportunities to engage with people on the move, either by travelling with them temporarily or meeting them at rest areas. Use communication channels such as radio, SMS, social media groups and free hotlines to provide hygiene information and solicit feedback. Design the "household items" package to support this by including mobile phones or solar chargers, which will also enable people to communicate with their families, access information and provide feedback.

Hygiene promotion standard 1.2: Identification, access to and use of hygiene items

Appropriate items to support hygiene, health, dignity and well-being are available and used by the affected people.

Key actions

1. Identify the essential hygiene items that individuals, households and communities need.

- Consider different needs of men and women, older people, children and persons with disabilities.

- Identify and provide additional communal items for maintaining environmental hygiene, such as solid waste receptacles and cleaning equipment.

2 Provide timely access to essential items.

- Assess availability of items through local, regional or international markets.

3 Work with affected populations, local authorities and other actors to plan how people will collect or buy hygiene items.

- Provide information about timing, location, content and intended recipients of cash-based assistance and/or hygiene items.
- Coordinate with other sectors to provide cash-based assistance and/or hygiene items and decide on distribution mechanisms.

4 Seek feedback from affected people on the appropriateness of the hygiene items chosen and their satisfaction with the mechanism for accessing them.

Key indicators

All affected households have access to the minimum quantity of essential hygiene items:

- two water containers per household (10–20 litres; one for collection, one for storage);
- 250 grams of soap for bathing per person per month;
- 200 grams of soap for laundry per person per month;
- Soap and water at a handwashing station (one station per shared toilet or one per household); and
- Potty, scoop or nappies to dispose of children's faeces.

Percentage of affected people who report/are observed using hygiene items regularly after distribution

Percentage of household income used to purchase hygiene items for identified priority needs

Guidance notes

Identify essential items: Adapt hygiene items and hygiene kits to the culture and context. Prioritise essential items in the initial phase (such as soap, water containers, and menstruation and incontinence materials) over the "nice to have" items (such as hair brush, shampoo, toothpaste, toothbrush). Some groups will have specific requirements ⊕ *see Guidance notes - At-risk groups* (below).

Water containers: Identify 10–20-litre water containers for collecting and storing drinking and domestic water. The size and type of containers should be appropriate for the age and carrying capacity of those who usually collect water.

Containers should have lids, be clean and covered. Storage containers should have a narrow neck or tap to ensure safe collection, storage and consumption of drinking water.

If the water supply is intermittent, provide larger storage containers. In urban settings or where supplies are centralised, household storage should be enough for ordinary consumption (including peak consumption, where relevant) between refills.

At-risk groups: Some people will need different or greater quantities of personal hygiene items because of their age, health status, disability, mobility or incontinence. Persons with disabilities or who face barriers to mobility may need additional items. This includes extra soap, incontinence items, water containers, bed pans, a commode chair or plastic covers for mattresses. Ask people or their carers if they need help collecting and disposing of their waste in a way that respects their dignity. Consult with them and their families or carers on the most appropriate support.

Market-based programming for hygiene items: Provision of hygiene items should support local markets where possible (for example by providing cash or vouchers or improving warehouse infrastructure). A market assessment and household income analysis, including gender roles in expenditure decisions, should inform the plans for access and use of hygiene items. Monitor whether or not the market is providing the quantity and quality of products, and adjust if necessary ⊕ *see Delivering assistance through markets*.

Distribution: Prioritise the safety and security of the population when organising any distribution ⊕ *see Protection Principle 1*.

Set up a dedicated distribution team. Inform people in advance of the timing, location, list of items and any eligibility criteria. Counter discrimination or stigmatisation and, if necessary, distribute to households or through separate distribution lines. Identify and address any barriers to accessing distribution locations or distribution systems, specifically for women and girls, older people and persons with disabilities.

Replenish consumables: Establish a reliable regular supply of consumables such as soap and menstruation and incontinence materials.

Coordination of joint distributions: Plan shared community consultations to understand needs and coping mechanisms across sectors. Address multiple needs at the same time for the convenience of the target population and to save time and money across sectors. Ensure that households can safely transport home all their items following distribution.

People on the move: Where people are on the move, confirm transportability of hygiene items (such as travel-sized soap). Let people select the items they want, rather than issuing standardised kits. Establish a system to collect and dispose of packaging waste where people are on the move.

Hygiene promotion standard 1.3: Menstrual hygiene management and incontinence

Women and girls of menstruating age, and males and females with incontinence, have access to hygiene products and WASH facilities that support their dignity and well-being.

Key actions

1. Understand the practices, social norms and myths concerning menstrual hygiene management and incontinence management, and adapt hygiene supplies and facilities.
2. Consult women, girls and people with incontinence on the design, siting and management of facilities (toilets, bathing, laundry, disposal and water supply).
3. Provide access to appropriate menstrual hygiene management and incontinence materials, soap (for bathing, laundry and handwashing) and other hygiene items.
    - For distributions, provide supplies in discrete locations to ensure dignity and reduce stigma, and demonstrate proper usage for any unfamiliar items.

Key indicators

Percentage of women and girls of menstruating age provided with access to appropriate materials for menstrual hygiene management

Percentage of recipients who are satisfied with menstrual hygiene management materials and facilities

Percentage of people with incontinence that use appropriate incontinence materials and facilities

Percentage of recipients that are satisfied with incontinence management materials and facilities

Guidance notes

Addressing menstrual hygiene management and incontinence in crises: Successfully managing menstrual hygiene and incontinence helps people to live with dignity and engage in daily activities. In addition to providing access to hygiene items, it is important to consult with users about disposal mechanisms at home as well as in communal facilities and institutions such as schools. Toilet facilities should be adapted and space provided for laundry and drying facilities ⊕ *see Excreta management standards 3.1 and 3.2*.

Taboos about menstruation: Menstruation beliefs, norms and taboos will affect the success of the response. Investigating these issues may not be possible during the initial or acute phase of the crisis, but it should be done as soon as possible.

Incontinence may not be a widely used term in some contexts, even within the medical profession. Incontinence is a complex health and social issue that occurs when a person is unable to control the flow of their urine or faeces. It can lead to a high level of stigma, social isolation, stress and an inability to access services, education and work opportunities. Prevalence may seem low, as many people will keep it a secret, yet a wide range of people may live with incontinence. This includes:

- older people;
- persons with disabilities and those facing mobility barriers;
- women who have given birth–including girls, who are at increased risk of fistula;
- people with chronic illnesses such as asthma, diabetes, stroke or cancer;
- girls and women who have experienced gender-based violence or have undergone female genital mutilation;
- people who have had surgery such as removal of the prostate;
- women going through the menopause; and
- young children and children psychologically affected by conflict or disaster.

Poor incontinence hygiene management can be a major source of disease transmission in emergencies. Access to much higher amounts of water and soap is critical. People with incontinence and their carers each need five times as much soap and water as others. People who are incontinent and immobile need to consult health or disability specialists to learn how to prevent and manage infections and bed sores, which can be fatal.

Supplies and facilities: Discuss options with affected people to understand their preferences for: disposable or reusable materials; disposal mechanisms in homes, schools, health centres and communal facilities; laundry and drying facilities; and toilet and bathing facilities. Consider age-specific norms and preferences, as the type and quantity of supplies may change over time. Provide demonstrations for unfamiliar materials.

Different types of pads are required for faecal and urine incontinence, and for different levels of severity of incontinence. Sizing is important for safe use. Supply both urine and faecal incontinence pads in a range of sizes and types.

Consider proximity to toilets for people with incontinence. Some people may be able to prevent incontinence episodes if they can access the toilet quickly. A toilet commode chair, bed pan and/or urinal bottle may need to be supplied.

Minimum supplies: *For both menstrual hygiene management and incontinence:*

- a dedicated container with lid for soaking cloths and storing pads/cloths; and
- rope and pegs for drying.

For menstrual hygiene:

- either absorbent cotton material (4 square metres per year), disposable pads (15 per month) or reusable sanitary pads (six per year), as preferred by women and girls;
- underwear (six per year);
- extra soap (250 grams per month) ⊕ *see Hygiene promotion standard 1.2: Identification, access to and use of hygiene items*.

For incontinence, supplies will depend on the severity and type of incontinence and people's preferences. A suggested minimum is:

- either absorbent soft cotton material (8 square metres per year), disposable incontinence pads (150 per month) or reusable incontinence underwear (12 per year);
- underwear (12 per year);
- extra soap (500 grams bathing and 500 grams laundry per month);
- two washable leak-proof mattress protectors;
- additional water containers;
- bleach or similar disinfectant cleaning product (3 litres of non-diluted product per year);
- bed pan and urinal bottles (male and female), toilet commode chair (as appropriate).

Replenishment of supplies: Plan how and when to replenish materials. Cash-based assistance or in-kind distributions may be used in different ways over time. Explore options for small enterprises to provide materials or for people to make their own protection materials ⊕ *see Delivering assistance through markets*.

Schools, safe spaces and learning centres: Support for WASH in schools and safe spaces should consider the WASH infrastructure and the training provided to teachers. Facilities should have a discrete disposal mechanism a container with a lid, with collection and disposal system or a chute from the toilet to an incinerator. Install well-maintained and sex-segregated WASH facilities with hooks and shelves for menstrual hygiene supplies.

Encourage teachers to adopt menstrual hygiene management education as part of standard lessons. Train teachers to:

- support girls' menstrual hygiene practices;
- keep menstrual hygiene supplies at school;
- support students who experience incontinence due to the psychological effects of the crisis ⊕ *see INEE Handbook*.

Shelter: Work with the shelter sector to ensure there is adequate privacy for menstrual hygiene and incontinence management in the household or communal shelter. This may include using privacy screens or separate areas for changing.

People on the move: Offer menstrual hygiene and incontinence management supplies as people pass through supply points.

2. Water supply

Inadequate water quantity and quality is the underlying cause of most public health problems in crisis situations. There may not be sufficient water available to meet basic needs, so supplying a survival level of safe drinking water is essential. The priority is to provide an adequate quantity of water, even if it is of intermediate quality. This may be necessary until Minimum Standards for both water quantity and quality are met.

Taps, wells and pipes often fall into disrepair due to conflict, natural disaster or lack of functional maintenance systems. In conflict, depriving access to water may be used as an intentional strategy by parties to the conflict. This is strictly prohibited in international humanitarian law.

Consult community members and relevant stakeholders to understand how they use and access water, whether there are any access limitations, and how these may change seasonally.

Water supply standard 2.1: Access and water quantity

People have equitable and affordable access to a sufficient quantity of safe water to meet their drinking and domestic needs.

Key actions

1. Identify the most appropriate groundwater or surface water sources, taking account of potential environmental impacts.
   - Consider seasonal variations in water supply and demand, and mechanisms for accessing drinking water, domestic water and water for livelihoods.
   - Understand different sources of water, suppliers and operators, and access to water within communities and households.
2. Determine how much water is required and the systems needed to deliver it.
   - Work with stakeholders to locate waterpoints that allow safe and equitable access for all community members.
   - Establish operation and maintenance systems that assign clear responsibilities and include future needs for sustainable access.
3. Ensure appropriate waterpoint drainage at household and communal washing, bathing and cooking areas and handwashing facilities.
   - Look for opportunities to reuse water, such as for vegetable gardens, brick-making or irrigation.

Key indicators

Average volume of water used for drinking and domestic hygiene per household

- Minimum of 15 litres per person per day
- Determine quantity based on context and phase of response

Maximum number of people using water-based facility

- 250 people per tap (based on a flow rate of 7.5 litres/minute)
- 500 people per hand pump (based on a flow rate of 17 litres/minute)
- 400 people per open hand well (based on a flow rate of 12.5 litres/minute)
- 100 people per laundry facility
- 50 people per bathing facility

Percentage of household income used to buy water for drinking and domestic hygiene

- Target 5 per cent or less

Percentage of targeted households who know where and when they will next get their water

Distance from any household to the nearest waterpoint

- <500 metres

Queuing time at water sources

- <30 minutes

Percentage of communal water distribution points free of standing water

Percentage of water systems/facilities that have functional and accountable management system in place

Guidance notes

Water source selection should consider:

- availability, safety, proximity and sustainability of a sufficient quantity of water;
- need for and feasibility of water treatment, whether bulk or at household level; and
- social, political or legal factors affecting the source control of water sources might be controversial, especially during conflicts.

A combination of approaches and sources is often required in the initial phase of a crisis to meet survival needs. Surface water sources, despite requiring more treatment, may be the quickest solution. Groundwater sources and/or gravity-flow supplies from springs are preferable. They require less treatment, and gravity-flow does not require pumping. Monitor all sources regularly to avoid over-extraction ⊕ *see Shelter and settlement standard 2: Location and settlement planning.*

Needs: The quantity of water needed for drinking, hygiene and domestic use depends upon the context and phase of a response. It will be influenced by factors such as pre-crisis use and habits, excreta containment design and cultural habits ⊕ *see Understanding and managing WASH risks* in *Hygiene promotion standard 1.1* and *Excreta management standard 3.2*.

A minimum of 15 litres per person per day is established practice. It is never a "maximum" and may not suit all contexts or phases of a response. For example, it is not appropriate where people may be displaced for many years. In the acute phase of a drought, 7.5 litres per person per day may be appropriate for a short time. In an urban middle-income context, 50 litres per person per day may be the minimum acceptable amount to maintain health and dignity.

The consequences of providing different quantities of water should be reviewed against morbidity and mortality rates for WASH-related diseases. Coordinate with other WASH actors to agree on a common minimum for quantity in context. For guidance on determining water quantities for human, livestock, institutional and other uses ⊕ *see Essential healthcare – communicable diseases standards 2.1.1 to 2.1.4* and *WASH Appendix 3*. For emergency livestock water needs ⊕ *see LEGS Handbook*.

Needs	Quantity (litres/person/day)	Adapt to context based on
Survival: water intake (drinking and food)	2.5–3	Climate and individual physiology
Hygiene practices	2–6	Social and cultural norms
Basic cooking	3–6	Food type and social and cultural norms
Total basic water	7.5–15	

Minimum basic survival water needs: Water needs will vary within the population, particularly for persons with disabilities or facing mobility barriers, and among groups with different religious practices.

Measurement: Do not simply divide the quantity of delivered water by the population served. Household surveys, observation and community discussion groups are more effective methods of collecting data on water use and consumption than measuring the volume of water trucked or pumped, or handpump use. Triangulate water system reports with household reports.

Access and equity: Waterpoints include communal bathing, cooking and laundry facilities and toilets, as well as institutional settings such as schools or health facilities.

The minimum quantity targets (see key indicators above) assume that the waterpoint is accessible for about 8 hours a day of constant water supply. Use these targets with caution, as they do not guarantee a minimum quantity of water or equitable access.

Water and sanitation responses should address the needs of both host and displaced populations equitably to avoid tension and conflict.

During design, consider that needs vary across age groups and sex, as well as for persons with disabilities or those facing mobility barriers. Locate accessible waterpoints sufficiently close to households to limit exposure to any protection risks.

Inform the affected population of when and where to expect the delivery of water, their entitlement to equitable distribution, and how to give feedback.

Round-trip and queuing time: Excessive round-trip and queuing times indicate an inadequate number of waterpoints or inadequate yields at water sources. This can lead to reduced individual water consumption and increased consumption from unprotected surface sources, and result in less time for tasks such as education or income-generating activities. Queuing time also affects the risk of violence at the tap stand ⊕ *see Protection Principle 1* and *Core Humanitarian Standard Commitment 1*.

Appropriate water containers: ⊕ *See Hygiene promotion standard 1.2: Identification, access to and use of hygiene items*. Where household-level water treatment and safe storage (HWTSS) is used, adjust the number and size of containers. For example, a coagulant, flocculation and disinfection process will require two buckets, a straining cloth and a stirrer.

Market-based programming for water: Analyse how households accessed water and containers before and after the crisis. This simple market assessment should inform decisions about how to provide sustainable access to water in the short and long term. Determine how to use, support and develop the water market, considering a combined approach of household cash-based assistance, grants and technical capacity building with vendors or suppliers, or other means. Track the monthly market prices (water, fuel) for household expenditure over time, and use these trends to inform changes in programme design ⊕ *see Delivering assistance through markets.*

Payment: Water costs should be no more than 3–5 per cent of household income. Be aware of how households are covering higher costs during the crisis and take steps to counter negative coping mechanisms ⊕ *see Protection Principle 1*. Ensure that finance systems are managed in a transparent way.

Management of the water systems and infrastructure: Work with the community and other stakeholders to decide on the siting, design and use of waterpoints (both immediate and long-term plans). This includes bathing, cooking and laundry facilities, toilets, and institutions such as schools, markets and health facilities. Use feedback to adapt and improve access to water facilities.

Consider the previous and current water governance structures, the ability and willingness of people to pay for water and sanitation services, and cost-recovery

mechanisms. Consider capital investment in water supply systems that offer longer-term savings or economies of scale. Compare alternatives such as solar pumping or a piped water system with water trucking, especially in protracted crises in urban areas and communal settlements.

Provide people with the means to operate and maintain water systems through WASH committees or partnerships with the private or public sector.

Use of bottled water: Treated water is more cost-effective, appropriate and technically sound than bottled water, because of transport, cost, quality and waste generation. Exceptions can be made for the short term (for example, people on the move). Establish an appropriate plastic waste management system.

Laundry, washing and bathing facilities: If household private bathing is not possible, provide separate facilities for men and women that ensure safety, privacy and dignity.

Consult with the users, particularly women, girls and persons with disabilities, to decide the location, design and safety of facilities. Consider access to hot water for bathing and laundry during specific contexts, such as responding to scabies, and during climatic variations.

Drainage from waterpoints, laundry areas, bathing facilities and handwashing stations: In constructing and rehabilitating water distribution and usage points, ensure that wastewater does not pose a health hazard or breeding ground for problem vectors. Establish an overall drainage plan in coordination with site planners, the shelter sector and/or municipal authorities.

Design WASH systems and infrastructure to comply with the drainage requirements. For instance, the pressure rating at tap stands, the size of the waterpoint and/or laundry apron, and the height from the tap to the bottom of the water containers should be appropriate ⊕ *see Shelter and settlement standard 2: Location and settlement planning*.

Water supply standard 2.2: Water quality

Water is palatable and of sufficient quality for drinking and cooking, and for personal and domestic hygiene, without causing a risk to health.

Key actions

1. Identify public health risks associated with the water available and the most appropriate way to reduce them.

- Protect water sources and regularly renew sanitary surveys at source and water points.

2 Determine the most appropriate method for ensuring safe drinking water at point of consumption or use.

- Treatment options include bulk water treatment and distribution, with safe collection and storage at the household level, or household-level water treatment and safe storage.

3 Minimise post-delivery water contamination at point of consumption or use.

- Equip households with safe containers to collect and store drinking water, and the means to safely draw water for drinking.
- Measure water quality parameters (free residual chlorine (FRC) and coliform-forming units (CFU)) at point of delivery and point of consumption or use.

Key indicators

Percentage of affected people who collect drinking water from protected water sources

Percentage of households observed to store water safely in clean and covered containers at all times

Percentage of water quality tests meeting minimum water quality standards

- <10 CFU/100ml at point of delivery (unchlorinated water)
- ≥0.2–0.5mg/l FRC at point of delivery of delivery (chlorinated water)
- Turbidity of less than 5 NTU

Guidance notes

Maintaining a safe water chain: Water-related diseases pose a risk to the integrity of the water chain. The barriers to faecal–oral transmission include excreta containment, covering food, handwashing at key times, and safe collection and storage of water ⊕ *see Hygiene promotion standard 1.1*; *Excreta management standard 3.2* and *Appendix 2: The F diagram*.

A risk assessment of the water chain, from the water source to the drinking water storage container, includes:

1. sanitary survey of the waterpoint;
2. observation of use of separate containers for water collection and storage;
3. observation of clean and covered drinking water containers; and
4. water quality testing.

Where there is a high likelihood of unsafe water, these actions can highlight apparent risks without carrying out labour-intensive household water-quality testing.

A sanitary survey assesses conditions and practices that may constitute a public health risk at the water point. It considers the structure of the water point,

drainage, fencing, defaecation practices and solid waste management practices as possible sources of contamination. The survey also examines water containers in the household.

Water quality: When commissioning a new water source, test the water for physical, bacteriological and chemical parameters. Do this before and after local seasonal fluctuations. Do not neglect the analysis of chemical parameters (such as fluoride and arsenic levels) that can lead to long-term health issues.

Faecal coliform bacteria (>99 per cent of which are *E. coli*) indicate the level of human and animal waste contamination in water and the possible presence of other harmful pathogens. If any faecal coliforms are present, treat the water. Even if *E. coli* is not found, water is prone to recontamination without a residual disinfectant.

Where water is chlorinated (prior to distribution or household-level treatment) carry out spot checks in households by measuring FRC and treat where necessary. The frequency of water delivery, temperature and length of time water is stored all affect household FRC measurements (chlorine dissipation).

Promoting protected sources: People may prefer unprotected water sources such as rivers, lakes and unprotected wells for reasons of taste, proximity and social convenience. Understand their rationale and develop messages and activities that promote protected water sources.

Palatable water: If safe drinking water does not taste good (due to salinity, hydrogen sulfide or chlorine levels that people are not used to), users may drink from better-tasting but unsafe sources. Use community engagement and hygiene activities to promote safe drinking water.

Water disinfection: Water should be treated with a residual disinfectant such as chlorine if there is a significant risk of source or post-delivery contamination. The risk will be determined by population density, excreta disposal arrangements, hygiene practices and the prevalence of diarrhoeal disease. Turbidity should be below 5 NTU. If it is higher, train users to filter, settle and decant the water to reduce turbidity before treatment. Consider short-term double-dose chlorination if there is no alternative. Be aware that chlorine dissipation varies depending on the length of storage and temperature range, so factor this into dosing and contact times ⊕ *see Appendix 6: Household water treatment and storage decision tree*.

Quantity versus quality: If it is not possible to meet Minimum Standards for both water quantity and quality, prioritise quantity over quality. Even water of intermediate quality can be used to prevent dehydration, decrease stress and prevent diarrhoeal diseases.

Post-delivery contamination: Water that is safe at the point of delivery can become contaminated during collection, storage and drawing of drinking water. Minimise this through safe collection and storage practices. Clean household or settlement storage tanks regularly and train the community to do so ⊕ *see Hygiene promotion standards 1.1* and *1.2.*

Household-level water treatment and safe storage (HWTSS): Use HWTSS when a centrally operated water treatment system is not possible. HWTSS options that reduce diarrhoea and improve the microbiological quality of stored household water include boiling, chlorination, solar disinfection, ceramic filtration, slow sand filtration, membrane filtration, and flocculation and disinfection. Work with other sectors to agree household fuel requirements and access for boiling water. Avoid introducing an unfamiliar water treatment option in crises and in epidemics. Effective use of HWTSS options requires regular follow-up, support and monitoring, and is a prerequisite to adopting HWTSS as an alternative water treatment approach ⊕ *see Appendix 6: Household water treatment and storage decision tree*.

Water quality for institutions: Treat all water supplies for schools, hospitals, health centres and feeding centres with chlorine or another residual disinfectant ⊕ *see Appendix 3: Minimum water quantities: survival figures and quantifying water needs*.

Chemical and radiological contamination: Where hydrogeological records or knowledge of industrial or military action suggest that water supplies may carry chemical or radiological public health risks, carry out a chemical analysis. A decision to use possibly contaminated water for longer-term supplies should only follow a thorough analysis of the health implications and validation with the local authorities.

3. Excreta management

An environment free of human excreta is essential for people's dignity, safety, health and well-being. This includes the natural environment as well as the living, learning and working environments. Safe excreta management is a WASH priority. In crisis situations, it is as important as providing a safe water supply.

All people should have access to appropriate, safe, clean and reliable toilets. Defaecation with dignity is a highly personal matter. Appropriateness is determined by cultural practices, people's daily customs and habits, perceptions, and whether individuals have used sanitation facilities before. Uncontrolled human defaecation constitutes a high risk to health, particularly where population density is high, where people are displaced, and in wet or humid environments.

Different terms are used in the WASH sector to define excreta management facilities. In this Handbook, "toilet" means any facility or device that immediately contains excreta and creates the first barrier between people and the waste ⊕ *see Appendix 2: The F diagram*. The word "toilet" is used in place of the word "latrine" throughout the Handbook.

Containment of human excreta away from people creates an initial barrier to excreta-related disease by reducing direct and indirect routes of disease transmission ⊕ *see Appendix 2: The F diagram*. Excreta containment should be integrated with collection, transport, treatment and disposal to minimise public health risks and environmental impact.

Evidence of human faeces in the living, learning and working environment can indicate protection issues. People may not feel safe using facilities, especially in densely populated areas.

For this chapter, "human excreta" is defined as waste matter discharged from the body, especially faeces, urine and menstrual waste. The standards in this section cover the whole excreta chain, from initial containment to ultimate treatment.

Excreta management standard 3.1: Environment free from human excreta

All excreta is safely contained on-site to avoid contamination of the natural, living, learning, working and communal environments.

Key actions

1. Establish facilities in newly constructed communal settlements or those with substantially damaged infrastructure to immediately contain excreta.

2 Decontaminate any faeces-contaminated living, learning and working spaces or surface water sources immediately.

3 Design and construct all excreta management facilities based on a risk assessment of potential contamination of any nearby surface water or groundwater source.

- Assess the local topography, ground conditions and groundwater and surface water (including seasonal variations) to avoid contaminating water sources and inform technical choices.

4 Contain and dispose of children's and babies' faeces safely.

5 Design and construct all excreta management facilities to minimise access to the excreta by problem vectors.

Key indicators

There are no human faeces present in the environment in which people live, learn and work

All excreta containment facilities are sited appropriately and are an adequate distance from any surface or groundwater source

Guidance notes

Phasing: Immediately after a crisis, control indiscriminate open defaecation as a matter of urgency. Establish defaecation areas, site and build communal toilets, and start a concerted hygiene campaign. Prevent defaecation near all water sources (whether used for drinking or not) and water storage and water treatment facilities. Do not establish defaecation areas uphill or upwind of settlements. Do not establish them along public roads, near communal facilities (especially health and nutrition facilities) or near food storage and preparation areas.

Conduct a hygiene promotion campaign that encourages safe excreta disposal and creates a demand for more toilets.

In urban crises, assess the extent of damage to existing sewerage systems. Consider installing portable toilets or use septic or containment tanks that can be regularly desludged.

Distance from water sources: Ensure faecal material from containment facilities (trench latrines, pits, vaults, septic tanks, soakaway pits) does not contaminate water sources. Faecal contamination is not an immediate public health concern unless the water source is consumed, but environmental damage must be avoided.

Where possible, conduct soil permeability tests to determine the speed at which waste moves through the soil (infiltration rate). Use this to determine the minimum distance between containment facilities and water sources.

The infiltration rate will depend on soil saturation levels, any extraction from the source, and the nature of the excreta (more watery excreta will travel faster than less watery excreta).

If soil permeability tests cannot be conducted, the distance between containment facilities and water sources should be at least 30 metres, and the bottom of pits should be at least 1.5 metres above the groundwater table. Increase these distances for fissured rocks and limestone, or decrease them for fine soils.

In high groundwater table or flood situations, make the containment infrastructure watertight to minimise groundwater contamination. Alternatively, build elevated toilets or septic tanks to contain excreta and prevent it from contaminating the environment. Prevent drainage or spillage from septic tanks from contaminating surface water or groundwater sources.

If contamination is suspected, immediately identify and control the source of contamination and initiate water treatment. Some water contaminants can be managed with purification treatment methods such as chlorination. However, the source of contaminants such as nitrates needs to be identified and controlled. Methaemoglobinaemia is an acute but reversible condition associated with high nitrate levels in drinking water, for instance ⊕ *see Water supply standard 2.2: Water quality*.

Containment of children's faeces: Infants' and children's faeces are commonly more dangerous than those of adults. Excreta-related infection among children is frequently higher, and children may not have developed antibodies to infections. Provide parents and caregivers with information about safe disposal of infants' faeces, laundering practices and the use of nappies (diapers), potties or scoops to manage safe disposal.

Excreta management standard 3.2: Access to and use of toilets

People have adequate, appropriate and acceptable toilets to allow rapid, safe and secure access at all times.

Key actions

1 Determine the most appropriate technical options for toilets.

- Design and construct toilets to minimise safety and security threats to users and maintenance workers, especially women and girls, children, older people and persons with disabilities.
- Segregate all communal or shared toilets by sex and by age where appropriate.

2 Quantify the affected population's toilets requirements based on public health risks, cultural habits, water collection and storage.

3 Consult representative stakeholders about the siting, design and implementation of any shared or communal toilets.

- Consider access and use by age, sex and disability; people facing mobility barriers; people living with HIV; people with incontinence; and sexual or gender minorities.
- Locate any communal toilets close enough to households to enable safe access, and distant enough so that households are not stigmatised by proximity to toilets.

4 Provide appropriate facilities inside toilets for washing and drying or disposal of menstrual hygiene and incontinence materials.

5 Ensure that the water supply needs of the technical options can be feasibly met.

- Include adequate supply of water for handwashing with soap, for anal cleansing, and for flush or hygienic seal mechanisms if selected.

Key indicators

Ratio of shared toilets

- Minimum 1 per 20 people

Distance between dwelling and shared toilet

- Maximum 50 metres

Percentage of toilets that have internal locks and adequate lighting

Percentage of toilets reported as safe by women and girls

Percentage of women and girls satisfied with the menstrual hygiene management options at toilets they regularly use

Guidance notes

What is adequate, appropriate and acceptable? The type of toilet adopted will depend on the phase of the response, preferences of the intended users, existing infrastructure, the availability of water for flushing and water seals, the soil formation and the availability of construction materials.

Generally, toilets are adequate, appropriate and acceptable if they:

- are safe to use for all of the population, including children, older people, pregnant women and persons with disabilities;
- are located to minimise security threats to users, especially to women and girls and people with other specific protection concerns;

- are no more than 50 metres from dwellings;
- provide privacy in line with users' expectations;
- are easy to use and keep clean (generally, clean toilets are used more frequently);
- do not present a hazard to the environment;
- have adequate space for different users;
- have inside locks;
- are provided with easy access to water for handwashing, anal cleansing and flushing;
- allow for the dignified cleaning, drying and disposal of women's menstrual hygiene materials, and child and adult incontinence materials;
- minimise fly and mosquito breeding; and
- minimise smell.

Provide people who have chronic illnesses, such as HIV, with easy access to a toilet. They frequently suffer from chronic diarrhoea and reduced mobility.

Monitor use and the percentage of people who report that the toilets meet their requirements. Use this information to understand which groups are not satisfied and how to improve the situation. Consider access and use by sex and age, persons with disabilities or facing mobility barriers, people living with HIV and people with incontinence.

Accessibility: The technical option chosen should respect the right of all people, including persons with disabilities, to safely access sanitation facilities. Accessible toilets, or additions to existing toilets, may need to be constructed, adapted or bought for children, older people and persons with disabilities or incontinence. As a guide, single-access gender-neutral toilets with ramps or level entries, with enhanced accessibility inside the superstructure, should also be made available at a **minimum ratio of 1 per 250 people**.

Safe and secure facilities: Inappropriate siting of toilets may make women and girls more vulnerable to attack, especially at night. Ensure that all at-risk groups, including women and girls, boys, older people and others with specific protection concerns feel and are safe when using the toilets during both day and night. Adequately light facilities and consider providing at-risk groups with torches. Ask the community, especially those most at risk, how to enhance their safety. Consult stakeholders from schools, health centres and clinics, child-friendly spaces, marketplaces and nutrition feeding centres.

Note that it is not sufficient to consult only with women and children about safe and dignified WASH facilities, as in many contexts men control what women and children are allowed to do. Be aware of these social hierarchies and power dynamics, and actively engage with decision-makers to reinforce the right of women and children to safely access toilets and showers.

Lighting at communal facilities can improve access but can also attract people to use the lighting for other purposes. Work with the community, especially those most at risk of threats to their safety, to find additional ways to reduce their exposure to risks.

Quantifying toilet requirements: Consider how to adapt toilet requirements in context to reflect changes in the living environment before and after the crisis, requirements in public areas and any specific public health risks. During the first phases of a rapid-onset crisis, **communal toilets are an immediate solution with a minimum ratio of 1 per 50 people**, which must be improved as soon as possible. A **medium-term minimum ratio is 1 per 20 people**, with a ratio of 3:1 for female to male toilets. For planning figures and number of toilets ⊕ *see Appendix 4*.

Household, shared or communal? Household toilets are considered the ideal in terms of user safety, security, convenience and dignity, and the demonstrated links between ownership and maintenance. Sometimes shared facilities for a small group of dwellings may be the norm. Communal or shared toilets can be designed and built with the aim of ensuring household toilets in future. For example, leaving sanitation corridors in settlements provides the space to build communal facilities close to shelters and then build household facilities as budgets allow. Sanitation corridors ensure access for desludging, maintenance and decommissioning.

Communal toilets will also be necessary in some public or communal spaces such as health facilities, market areas, feeding centres, learning environments and reception or administrative areas ⊕ *see Appendix 4: Minimum numbers of toilets: community, public places and institutions*.

Communal sanitation facilities built during a rapid response will have specific operation and maintenance requirements. Payment for toilet cleaners may be agreed with communities as a temporary measure, with a clear exit strategy.

Water and anal cleansing material: In designing the facility, ensure enough water, toilet paper or other anal cleansing material is available. Consult users about the most appropriate cleansing material and ensure safe disposal and sustainability of supply.

Handwashing: Ensure that the facility allows for handwashing, including water and soap (or an alternative such as ash) after using toilets, cleaning the bottom of a child who has defecated, and before eating and preparing food.

Menstrual hygiene management: Toilets should include appropriate containers for the disposal of menstrual materials in order to prevent blockages of sewerage pipes or difficulties in desludging pits or septic tanks. Consult with women and girls on the design of toilets to provide space, access to water for washing, and drying areas.

Excreta management standard 3.3: Management and maintenance of excreta collection, transport, disposal and treatment

Excreta management facilities, infrastructure and systems are safely managed and maintained to ensure service provision and minimum impact on the surrounding environment.

Key actions

1. Establish collection, transport, treatment and disposal systems that align with local systems, by working with local authorities responsible for excreta management.
   - Apply existing national standards and ensure that any extra load placed on existing systems does not adversely affect the environment or communities.
   - Agree with local authorities and landowners about the use of land for any off-site treatment and disposal.
2. Define systems for short- and long-term management of toilets, especially sub-structures (pits, vaults, septic tanks, soakage pits).
   - Design and size sub-structures to ensure that all excreta can be safely contained and the pits desludged.
   - Establish clear and accountable roles and responsibilities and define sources of finance for future operation and maintenance.
3. Desludge the containment facility safely, considering both those doing the collection and those around them.
4. Ensure that people have the information, means, tools and materials to construct, clean, repair and maintain their toilets.
   - Conduct hygiene promotion campaigns on the use, cleaning and maintenance of toilets.
5. Confirm that any water needed for excreta transport can be met from available water sources, without placing undue stress on those sources.

Key indicator

All human excreta is disposed of in a manner safe to public health and the environment

Guidance notes

Desludging is the removal of (untreated and partially treated) excreta from the pit, vault or tank, and transport to an off-site treatment and disposal facility.

If desludging is required, it must be designed into operation and maintenance processes and budgets from the start.

Sullage or domestic wastewater is classified as sewage when mixed with human excreta. Unless the settlement is sited where there is an existing sewerage system, domestic wastewater should not be allowed to mix with human excreta. Sewage is difficult and more expensive to treat than domestic wastewater.

Planning: Initially, plan for an excreta volume of 1–2 litres per person per day. Long term, plan for 40–90 litres per person per year; excreta reduces in volume as it decomposes. Actual volume will depend on whether water is used for flushing or not, whether material or water is used for anal cleansing, whether water and other material is used for cleaning toilets, and the diet of the users. Ensure that household water from cleaning and cooking or from laundry and bathing does not enter the containment facilities, as the excess water will mean more desludging. Allow 0.5 metres at the top of the pit for backfill.

For specific public health situations such as cholera outbreaks ⊕ *see WASH standard 6: WASH in healthcare settings.*

Local markets: Use locally available materials and labour for toilet construction where appropriate. This enhances participation in the use and maintenance of the facilities.

Excreta containment in difficult environment: In floods or urban crises, appropriate excreta containment facilities can be especially difficult to provide. In these situations, consider raised toilets, urine diversion toilets, sewage containment tanks and temporary disposable plastic bags with appropriate collection and disposal systems. Support these different approaches with hygiene promotion activities.

Excreta as a resource: Excreta is also a potential resource. Technology is available to convert processed sludge into energy, for example as combustible bricks or as biogas. Ecological sanitation or composting processes recover organic fractions and nutrients from a combination of human waste and organic kitchen waste. The resulting compost can be used as a soil conditioner or fertiliser for household gardens.

4. Vector control

A vector is a disease-carrying agent. Vectors create a pathway from the source of a disease to people. Vector-borne diseases are a major cause of sickness and death in many humanitarian settings. Most vectors are insects such as mosquitoes, flies and lice, but rodents can also be vectors. Some vectors can also cause painful bites. Vectors can be symptomatic of solid waste, drainage or excreta management problems, inappropriate site selection, or broader safety and security problems.

Vector-borne disease can be complex, and solving vector-related problems may require specialist advice. However, simple and effective measures can prevent the spread of such diseases.

Vector control programmes may have no impact if they target the wrong vector, use ineffective methods, or target the right vector in the wrong place or at the wrong time. Controls must be targeted and based on the life cycles and ecologies of the vectors.

Control programmes should aim to reduce vector population density, vector breeding sites, and contact between humans and vectors. In developing control programmes, consult existing studies and seek expert advice from national and international health organisations. Seek local advice on disease patterns, breeding sites and seasonal variations in vector numbers and disease incidence.

The standards in this section focus on reducing or eliminating problem vectors to prevent vector-borne disease and reduce nuisance. Vector control across multiple sectors is required ⊕ *see Shelter and settlement standard 2*, *Essential healthcare – communicable diseases standard 2.1.1* and *Food assistance standard 6.2*.

Vector control standard 4.1: Vector control at settlement level

People live in an environment where vector breeding and feeding sites are targeted to reduce the risks of vector-related problems.

Key actions

1 Assess vector-borne disease risk for a defined area.

- Establish whether the area's incidence rate is greater than the World Health Organization (WHO) or national established norm for the disease.
- Understand the potential vector breeding sites and life cycle, especially feeding, informed by local expertise and knowledge of important vectors.

2 Align humanitarian vector control actions with local vector control plans or systems, and with national guidelines, programmes or policies.

3 Determine whether chemical or non-chemical control of vectors outside households is relevant based on an understanding of vector life cycles.

- Inform the population about potential risks that originate from chemical control of vectors and about the schedule for chemical application.
- Train and equip all personnel handling chemicals with personal protective equipment (PPE) and clothing.

Key indicator

Percentage of identified breeding sites where the vector's life cycle is disrupted

Guidance notes

Communal settlements: Site selection is important to minimising the exposure of the affected population to the risk of vector-borne disease. This should be one of the key factors when considering possible sites. To control malaria, for example, locate communal settlements 1–2 kilometres upwind from large breeding sites such as swamps or lakes, but ensure the availability of an additional clean water source. Consider the impact a new settlement site can have on the presence of problem vectors in neighbouring host communities ⊕ *see Shelter and settlement standard 2: Location and settlement planning*.

Assessing risk factors: Base decisions about vector control responses on an assessment of potential disease and other risks, as well as on epidemiological and clinical evidence of vector-borne disease problems. Review suspected and confirmed cases during the previous two years in the defined area. Other factors influencing this risk include:

- immunity status of the population, including previous exposure and nutritional and other stresses;
- movement of people from a non-endemic to an endemic area during displacement;
- pathogen type and prevalence, in both vectors and humans;
- vector species, numbers, behaviours and ecology (season, breeding sites) and how they potentially interact; and
- increased exposure to vectors as a result of proximity, settlement pattern, shelter type, existing individual protection and avoidance measures.

Removing or modifying vector breeding and feeding sites: Many WASH activities can have a major impact on breeding and feeding sites, including:

- eliminating stagnant water or wet areas around water distribution points, bathing areas and laundries;

- managing solid waste storage at household level, during collection and transportation, and at treatment and disposal sites;
- providing lids for water containers;
- managing excreta;
- cleaning toilet slabs and superstructures to dissuade vector presence;
- sealing offset toilet pits to ensure no faeces enters the environment and problem vectors do not enter the pits;
- running hygiene promotion programmes on general cleanliness; and
- keeping wells covered and/or treating them with larvicide, for example where dengue fever is endemic.

The three main species of mosquitoes responsible for transmitting disease are:

- *Culex* (filariasis and West Nile virus), which breed in stagnant water with organic matter, such as in toilets;
- *Anopheles* (malaria and filariasis), which breed in relatively unpolluted surface water such as puddles, slow-flowing streams and wells; and
- *Aedes* (dengue, yellow fever, chikungunya and Zika virus), which breed in water containers such as bottles, buckets and tyres.

Biological and non-chemical control: Biological control introduces organisms that prey on, parasitise, compete with or reduce populations of the target vector species. For example, larvivorous fish and freshwater crustaceans can control *Aedes* mosquitoes (vectors of dengue). One of the most promising strategies is the use of *Wolbachia* endosymbiotic bacteria, which has been targeted towards reducing dengue virus transmission. Biological control has been effective in certain operational environments, and evidence points to it being effective at scale.

While biological control avoids chemical contamination of the environment, there may be operational limitations and undesired ecological consequences. Biological control methods are only effective against the immature stages of vector mosquitoes and are typically restricted to use in large concrete or glazed clay water-storage containers or wells. The willingness of local communities to accept the introduction of organisms into water containers is essential. Community involvement is desirable when distributing the control organisms and in monitoring and restocking containers when necessary.

Environmental engineering responses: Several basic environmental engineering measures reduce vector breeding, including:

- proper disposal of human and animal excreta, properly functioning toilets, and keeping lids on the squatting hole of pit toilets;
- proper disposal of solid waste to control insects and rodents;
- ensuring good drainage in settlements; and
- draining standing water and clearing vegetation around open canals and ponds to control mosquitoes.

Such measures will reduce the population density of some vectors. It may not be possible to have sufficient impact on all the vector breeding, feeding and resting sites within or near a settlement, even in the longer term. If so, consider localised chemical control or individual protection measures. Spraying infected spaces may reduce the number of adult flies and prevent a diarrhoea epidemic or help to minimise the disease burden if employed during an epidemic. Indoor residual spraying will reduce the adult density of mosquitoes transmitting malaria or dengue. Toxic baits will reduce rodent populations.

National and international protocols: The WHO has published clear international protocols and norms that address both the choice and the application of chemicals in vector control, as well as the protection of personnel and training requirements. Vector control measures should address two principal concerns: efficacy and safety. If national norms regarding the choice of chemicals fall short of international standards, then consult with and lobby the relevant national authority for permission to adhere to the international standards.

Protect all personnel handling chemicals by providing training, protective clothing and bathing facilities and restricting the number of hours they spend handling chemicals.

Coordination with malaria treatment: Implement malaria vector control strategies simultaneously with early diagnosis and treatment with anti-malarials ⊕ *see Essential healthcare – communicable diseases standard 2.1.1: Prevention.*

Vector control standard 4.2: Household and personal actions to control vectors

All affected people have the knowledge and means to protect themselves and their families from vectors that can cause a significant risk to health or well-being.

Key actions

1. Assess current vector avoidance or deterrence practices at the household level as part of an overall hygiene promotion programme.
   - Identify barriers to adopting more effective behaviours and motivators.
2. Use participatory and accessible awareness campaigns to inform people of problem vectors, high-risk transmission times and locations, and preventive measures.
   - Follow up specifically with high-risk groups.
3. Conduct a local market assessment of relevant and effective preventive measures.
   - Consider strengthening markets to provide a sustainable source of preventive measures.

- Make a procurement, distribution and implementation plan for vector control items in collaboration with the community, local authorities and other sectors if local markets are unable to meet the demand.

4 Train communities to monitor, report and provide feedback on problem vectors and the vector control programme.

Key indicators

Percentage of affected people who can correctly describe modes of transmission and effective vector control measures at the household level

Percentage of people who have taken appropriate action to protect themselves from relevant vector-borne diseases

Percentage of households with adequate protection for stored food

Guidance notes

Individual malaria protection measures: Timely, systematic protection measures such as insecticidal tents, curtains and bed nets help protect against malaria. Long-lasting insecticidal nets also give some protection against body and head lice, fleas, ticks, cockroaches and bedbugs. Use other protection methods like long-sleeved clothing, household fumigants, burning coils, aerosol sprays and repellents against mosquitoes. Support the use of such methods for those most at risk, such as children under five years, people with immune deficiencies and pregnant women.

High-risk groups: Some sections of the community will be more vulnerable to vector-related diseases than others, particularly babies and infants, older people, persons with disabilities, sick people, and pregnant and breastfeeding women. Identify high-risk groups and take specific action to reduce that risk. Take care to prevent stigmatisation.

Social mobilisation and communication: Behavioural change is required at both individual and community levels to reduce both vector larval habitats and the adult vector population. Social mobilisation and communication activities should be fully integrated into vector prevention and control efforts, using a wide variety of channels.

Individual protection measures for other vectors: Good personal hygiene and regular washing of clothes and bedding are the most effective protection against body lice. Control infestations by personal treatment (powdering), mass laundering or delousing campaigns. Develop and use treatment protocols for new arrivals in the settlement. A clean household environment, effective waste disposal and appropriate storage of cooked and uncooked food will deter rats, other rodents and insects (such as cockroaches) from entering houses or shelters ⊕ *see Hygiene promotion standard 1.1: Hygiene promotion.*

5. Solid waste management

Solid waste management is the process of handling and disposing of organic and inorganic solid waste. This involves:

- planning solid waste management systems;
- handling, separating, storing, sorting and processing waste at source;
- transferring to a collection point; and
- transporting and final disposal, reuse, re-purposing or recycling.

Waste can be generated at the household, institutional or community level and includes medical waste. It may be hazardous or non-hazardous. Inadequate solid waste management poses a public health risk as it can create favourable habitats for insects, rodents and other disease vectors ⊕ *see Vector control standard 4.1: Vector control at settlement level*. Untreated waste can pollute surface water and groundwater. Children may play in poorly managed solid waste, risking injury or sickness. Waste pickers, who earn money from collecting reusable materials from waste dumps, may be at risk of injury or infectious disease.

Solid waste can block drainage systems, generating stagnant and polluted surface water, which may be a habitat for vectors and create other public health risks.

These standards do not cover treatment or disposal of chemical effluents or leachates. For sources of advice on handling and treating hazardous waste ⊕ *see References and further reading*. For sources of advice on handling and treating hazardous waste. For medical waste ⊕ *see WASH standard 6: WASH in healthcare settings.*

Solid waste management standard 5.1: Environment free from solid waste

Solid waste is safely contained to avoid pollution of the natural, living, learning, working and communal environments.

Key actions

1. Design the solid waste disposal programme based on public health risks, assessment of waste generated by households and institutions, and existing practice.

- Assess capacities for local reuse, re-purposing, recycling or composting.
- Understand the roles of women, men, girls and boys in solid waste management to avoid creating additional protection risks.

2 Work with local or municipal authorities and service providers to make sure existing systems and infrastructure are not overloaded, particularly in urban areas.

- Ensure new and existing off-site treatment and disposal facilities can be used by everyone.
- Establish a timeline for complying as quickly as possible with local health standards or policies on solid waste management.

3 Organise periodic or targeted solid waste clean-up campaigns with the necessary infrastructure in place to support the campaign.

4 Provide protective clothing for and immunise people who collect and dispose of solid waste and those involved in reuse or re-purposing.

5 Ensure that treatment sites are appropriately, adequately and safely managed.

- Use any safe and appropriate treatment and disposal methods, including burying, managed landfill and incineration.
- Manage waste management sites to prevent or minimise protection risks, especially for children.

6 Minimise packing material and reduce the solid waste burden by working with organisations responsible for food and household item distribution.

Key indicator

There is no solid waste accumulating around designated neighbourhood or communal public collection points

Guidance notes

People on the move will discard items that are heavy or no longer needed. Solid waste generation at distribution points may increase tensions with host populations. The volume of solid waste will increase if distributed household items do not meet real needs. This solid waste is likely to be of different materials to that generated locally and may need to be treated or disposed of differently.

Urban areas: Urban solid waste management infrastructure may be integrated with other service systems. Work with existing authorities and systems to accommodate the extra solid waste burden.

Protection for waste handlers: Provide protective clothing for everyone involved in solid waste management. At a minimum, provide gloves. Ideally, also provide boots and protective masks. When necessary, provide immunisation against tetanus and hepatitis B. Ensure soap and water is available for washing hands and face. Inform and train staff on the correct ways to transport and dispose of

waste and of the risks associated with improper management ⊕ *see Essential healthcare – communicable diseases standard 2.1.1: Prevention*.

Waste handlers can be stigmatised as dirty or poor. Community consultation can help to change attitudes. Ensuring waste handlers have appropriate equipment and are able to maintain cleanliness will also help.

Communal settlements and rural areas: Household solid waste disposal may be possible, and even preferred, in communal settlements and areas with lower population densities. Base the size of domestic solid waste burial or burning pits on household size and an assessment of the waste stream. Household pits should be properly fenced to prevent children and animals accessing them, and ideally be located at least 15 metres from dwellings.

For neighbourhood or communal collection points, initially provide a 100-litre container for every 40 households. Provide one container per ten households in the longer term, as household waste production is likely to increase over time. As a guide, a 2.5-person maintenance team should be available per 1,000 persons.

Reuse, re-purpose and recycle: Encourage reuse, re-purposing or recycling of solid waste by the community, unless doing so presents a significant public health risk. Consider the potential for small-scale business opportunities or supplementary income from waste recycling, and the possibility of household or communal composting of organic waste.

Solid waste management standard 5.2: Household and personal actions to safely manage solid waste

People can safely collect and potentially treat solid waste in their households.

Key actions

1. Provide households with convenient, adequately sized and covered storage for household waste or containers for small clusters of households.
   - Consider household preference for the number and size of containers for reuse and recycling.
2. Provide clearly marked and fenced public neighbourhood collection points where households can deposit waste on a daily basis.
3. Organise a system to regularly remove household and other waste from designated public collection points.
4. Ensure that solid waste burial or burning pits at household or communal levels are safely managed.

Key indicators

Percentage of households with access to a designated neighbourhood or communal solid waste collection point at an acceptable distance from their dwelling

Percentage of households reporting appropriate and adequate waste storage at household level

Guidance note

Planning: The amount of solid waste that people generate depends on how food is obtained and cooked, and which activities are carried out within or near the household. Variations can be seasonal and often reflect distribution or market schedules. Assume that one person generates 0.5 kilograms of solid waste per day. This equates to 1–3 litres per person per day, based on a typical solid waste density of 200 to 400kg/m^3.

Solid waste management standard 5.3: Solid waste management systems at community level

Designated public collection points do not overflow with waste, and final treatment or disposal of waste is safe and secure.

Key actions

1. Ensure that institutions such as schools and learning spaces, child-friendly spaces and administrative offices have clearly marked, appropriate and adequate covered on-site storage for waste generated at that location.
2. Provide clearly marked and fenced storage for waste generated in communal areas, especially formal or informal marketplaces, transit centres and registration centres.

Key indicators

Percentage of schools and learning centres with appropriate and adequate waste storage

Percentage of public markets with appropriate and adequate waste storage

Percentage of solid waste pits or incinerators at schools, learning centres, public markets and other public institutions that are managed safely

Guidance notes

Market waste: Marketplaces need particular attention, as communal areas often lack designated ownership and responsibility for solid waste management. Treat most market waste in the same manner as domestic solid waste.

Abattoir waste: Ensure that slaughtering is hygienic and complies with local laws. Much of the solid waste produced by abattoirs and fish markets can be treated as domestic solid waste but pay special attention to their liquid waste. If appropriate, dispose of this waste in a covered pit next to the abattoir or fish processing plant. Run blood and other liquid waste into the pit through a slab-covered channel to reduce insect access to the pit. Make water available for cleaning purposes.

6. WASH in disease outbreaks and healthcare settings

WASH and health actors both work to reduce public health risks, prevent disease transmission and control disease outbreaks. Strong coordination with government structures and partners – across the two sectors – is needed to address public health risks in the community and in healthcare settings. This standard builds on WASH standards 1–5 and the Health chapter, which should be consulted in their entirety and guide all technical interventions.

Infection prevention and control (IPC) is a key activity in disease prevention in any situation as well as for outbreak response. It is critical for the patient, the healthcare worker and the community. It is the responsibility of health agencies to ensure Minimum Standards are met in healthcare settings, but doing so often requires structured collaboration and support from WASH actors.

Good and consistently applied WASH practices, in both the community and healthcare settings, will reduce transmission of infectious diseases and help control outbreaks. Minimum actions in this standard apply to ongoing response and highlight areas to scale up in the event of an outbreak.

Community-based outbreak response

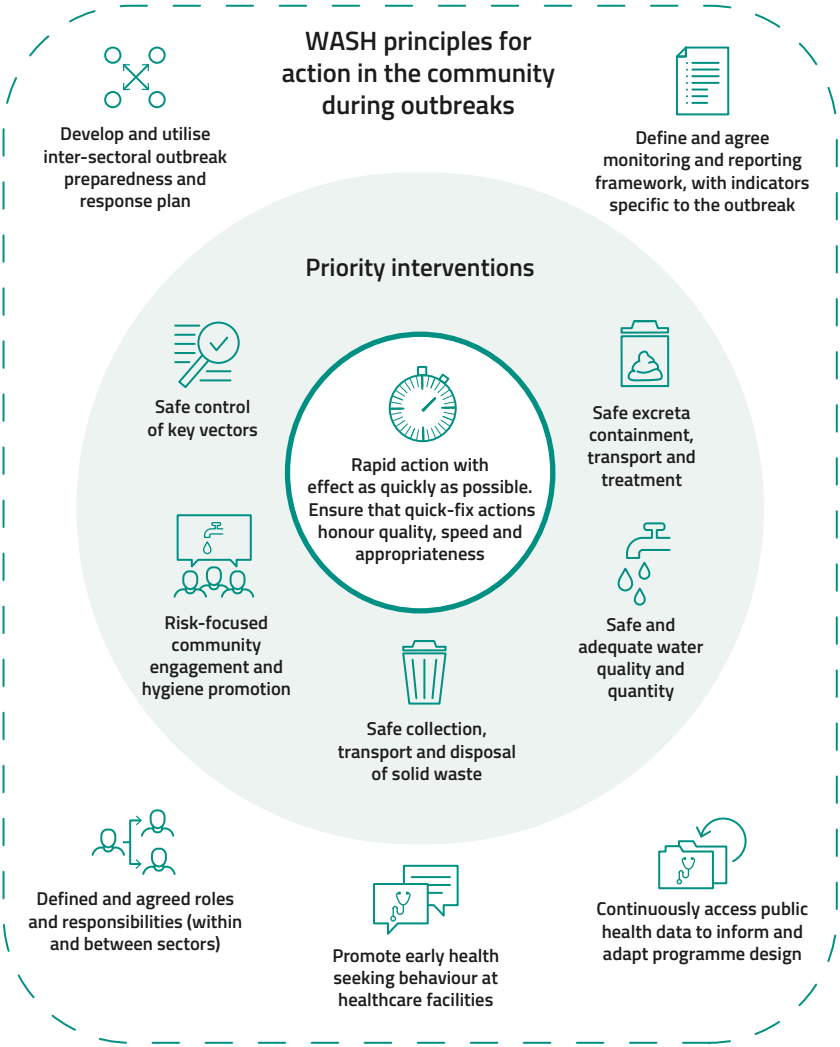
It is not always practical to respond to every component of WASH. Focus on the immediate public health risk and build trust and accountability with the communities. Prioritise response based on epidemiological findings, assessment of risk factors, transmission routes (especially beyond faecal–oral), expected impact of each intervention and available resources.

Community engagement remains a key component of outbreak response in order to prevent the spread of disease. Existing community perceptions and beliefs can support or hinder a response, so it is important to understand and address them. Some social norms may need to be modified to prevent disease transmission. For example, work with the community to find alternative forms of greeting to replace handshaking.

Encourage specific disease prevention and treatment measures within the affected community. This can include using mosquito nets to prevent malaria, or oral rehydration salts and zinc (for children) for diarrhoea.

If community outreach workers perform active case finding or related tasks, they must be trained. Integrate all data into the overall outbreak investigation and response. Quick tracking of the spread of the outbreak and who it affects is critical for a timely response, and integrated data in a common system will prevent double counting or missing key areas ⊕ *see Essential healthcare – communicable diseases standard 2.1.4: Outbreak preparedness and response*.

During any disease outbreak always follow up-to-date technical guidance, as emerging diseases will have different risks and impact. Extensive guidance exists on IPC in specific disease prevention and control, and this must be followed as a priority ⊕ *see References below*. This standard provides a minimum of issues to be considered and describes the collaboration between WASH and health sectors. The diagram below provides an overview of key community-based WASH actions during an outbreak. For health actions, ⊕ *see Essential healthcare – communicable diseases standards 2.1.1 to 2.1.4*.



WASH principles for action in the community during outbreaks (Figure 5)

Standard 6: WASH in healthcare settings

All healthcare settings maintain minimum WASH infection prevention and control standards, including in disease outbreaks.

Key actions

1. Provide a reliable water supply of sufficient quantity and quality, appropriate to the healthcare setting.

- Store at least 48 hours' worth of safe water (0.5mg/l free residual chlorine) to ensure a constant supply.
- **Outbreaks:** Increase water quantities and adapt chlorine solutions according to disease type, risk and needs.

2. Provide sufficient excreta disposal facilities to limit disease transmission.

- Provide commode chairs and bucket toilets for those facing mobility barriers.
- Clean sanitation facilities (toilets, showers, washing area) with water and detergent. Avoid using strong detergents in toilets.
- **Outbreaks:** Provide excreta disposal facilities in each zone of the healthcare setting.
- **Outbreaks:** Adapt materials and supplies for the specific disease, such as cholera beds and excreta or vomit buckets.
- **Outbreaks:** Determine any extra precautions needed for cleaning, decommissioning and desludging excreta facilities and equipment.

3. Provide enough cleaning materials and equipment for healthcare workers, patients and visitors to maintain hygiene.

- Provide handwashing stations at key locations with safe water, soap or alcohol rub. Air dry or use "once only" towels.
- **Outbreaks:** Provide handwashing stations in each zone.
- **Outbreaks:** Set up additional hygiene practices, such as chlorine foot baths or spraying (depending on the disease) and handwashing before putting on or removing personal protective equipment (PPE).
- **Outbreaks:** Provide patients with specific hygiene items and training before discharge.

4. Maintain a clean and hygienic environment.

- Clean floors and horizontal work surfaces daily with water and detergent.
- Clean and disinfect potentially contaminated surfaces with a 0.2 per cent chlorine solution.
- Clean, disinfect or sterilise reusable medical devices depending on risk before each use.

- Disinfect all linen with 0.1 per cent chlorine solution after soaking if visibly soiled; sterilise all linens for operating theatres.
- **Outbreaks:** Increase disinfectant strengths for cleaning floors and contaminated surfaces. Consider special mechanisms for disinfecting linen.

5 Handle, treat and dispose of waste correctly.

- Segregate healthcare waste at point of generation using the three-bin method.
- Train all healthcare workers in waste segregation and management.
- Ensure that designated teams should wear PPE to collect, treat and dispose of waste (minimum: gloves and boots).
- **Outbreaks:** Increase waste-handling precautions, using full PPE based on disease type.

6 Ensure all healthcare workers, patients and carers use appropriate PPE.

- Provide PPE for the type of exposure and category of isolation precautions.
- Train healthcare workers, patients and others in the facility to select, use and remove PPE.
- **Outbreaks:** Assess the type of anticipated exposure and adapt PPE to type of transmission.

7 Manage and bury the dead in a way that is dignified, culturally appropriate and safe according to public health practices.

- Consider local traditions as well as the need for identification and return of deceased to families.
- **Outbreaks:** Identify alternatives with the community if usual practices are unsafe.
- **Outbreaks:** Train and equip teams with appropriate PPE to carry out burials.

Key indicators

All healthcare workers clean their hands, using soap or alcohol rub, before and after every patient contact

All patients and carers wash their hands before handling or eating food and after going to the toilet

All handwashing stations have soap or alcohol rub (or 0.05 per cent chlorine solution in outbreaks)

Number of handwashing stations

- Minimum: one station for every ten inpatients

Drinking water quality at point of delivery

- Minimum: 0.5–1mg/l FRC

Quantity of safe water available

- Minimum: 5 litres per outpatient per day

- Minimum: 60 litres per patient per day in cholera treatment centre
- Minimum: 300–400 litres per patient per day in viral haemorrhagic fever treatment centre

Number of accessible toilets

- Minimum: four in outpatient facilities (separated for men, women, children and healthcare workers)
- Minimum: 1 per 20 inpatients (separated for men, women, children and healthcare workers)

Guidance notes

Infection prevention and control programming is essential in all healthcare settings, including ambulances and community health programmes. It requires development of guidelines on standard precautions, transmission-based precautions and clinical aseptic techniques. Include a dedicated infection prevention and control team in each setting and training for healthcare workers. Surveillance systems should monitor healthcare-associated infections and antimicrobial resistance. Settings should have appropriate staffing and workload. Beds should contain one patient only. Healthcare should be provided in a safe and appropriate environment, built with sufficient WASH infrastructure and equipment to maintain safe hygiene practices ⊕ *see Health systems standards 1.1 and 1.2*.

Water quantity and quality: When calculating amounts of water required, refer to the values in Appendix 3 and adjust for the situation, ⊕ *see Appendix 3: Minimum water quantities*. Mobile clinics should aim to provide the same WASH standards as for outpatients, including access to a safe water source and toilets. Ensure at least a 48-hour supply (and storage) per facility. For outbreaks such as Ebola and cholera, allow for 72 hours' supply. For the foundations of community WASH programmes ⊕ *see Water supply standards 2.1* and *2.2*.

The following chlorine solutions are required for different uses in healthcare settings.

Chlorine solution	Healthcare facility activity
0.05%	Handwashing Laundry (after cleaning)
0.2% (cholera) **0.5% (Ebola)**	Wiping horizontal work surfaces after cleaning (for cholera only) Cleaning materials, aprons, boots, cooking utensils and dishes Rinsing bedpans, buckets Cleaning surfaces contaminated with body fluid Preparing dead bodies (Ebola)
2%	Preparing dead bodies (cholera) Added to excreta and vomit buckets (cholera)
1%	Mother solution for chlorinating water

Excreta management: ⊕ *See Excreta management standards 3.1 to 3.3* for guidance on excreta management generally and *Hygiene promotion standard 1.3: Menstrual hygiene management and incontinence* for specific information on materials.

Provide technically and culturally appropriate toilet facilities with separate locked and well-lit toilets with sufficient space for carers to assist patients. All sanitation facilities (toilets, showers, washing area) should be cleaned with water and detergent. Avoid using strong disinfectants inside toilets (particularly for septic tanks), as it disrupts the natural biodegradation processes of some pathogens.

During outbreaks, take extra precautions when cleaning, decommissioning or desludging excreta facilities and equipment (for example, chlorine solution for cleaning, treatment with quicklime or chlorine).

Greywater: As a minimum dispose of greywater using a grease trap and soakaway pit. Ensure it is fenced off to prevent tampering by the public.

Healthcare waste contains infectious organisms such as HIV and hepatitis B, which can also contaminate soil and water sources. Use a minimum three-bin method to collect and segregate waste as soon as it is created:

Category	Example	Container colour/label
General waste **Not hazardous**	Paper	Black
Used sharps **Hazardous, infectious**	Needles, scalpels, infusion sets, broken glass, empty vials	Yellow, labelled "SHARPS", leak-proof and puncture-proof
Not sharps **Hazardous, infectious**	Materials contaminated with body fluids, such as swabs, dressings, sutures, laboratory cultures	Yellow, labelled and leak-proof

Further segregation may be needed, including for pathological (human tissue), pharmaceutical and chemical (laboratory reagents) waste. Collect segregated waste from the medical area at least daily, and immediately if highly infectious. Use trolleys to transport waste using a fixed route to designated areas with restricted public access. Waste containers, trolleys and storage areas must be disinfected regularly. Vaccinate all healthcare waste handlers for hepatitis B and tetanus.

Treat and dispose of waste depending on the available facilities:

Category	Treatment and disposal
General	Recycle, burn, or bury Municipal landfill
Used sharps	Sharps pit Encapsulate and bury in landfill Incinerate (not vials) then bury in ash pit (with caution, as sharps may not be blunted)

Category	Treatment and disposal
Infectious (not sharps)	Burial pit (cover waste with quicklime) Incinerate then bury in ash pit Autoclave or chemically treat
Pathological	Depends on socio-cultural norms: Burial pits (for example, placenta pit) or burial sites Cremation
Pharmaceutical	Follow national guidelines if possible or return to supplier Encapsulate and dispose in landfill Special incinerators (>1,200 degrees Celsius)
Chemical waste	Follow national guidelines if possible or return to supplier Small amounts can be incinerated or encapsulated Treat in treatment plant or rotary kiln

Incinerators should exceed 900 degrees Celsius and have dual chambers. Low-quality incinerators produce toxic emissions and air pollutants and do not completely sterilise. All pits and incinerators should be built to existing national and international standards and be safely operated, maintained and decommissioned.

Personal protective equipment (PPE) is mandatory for compliance with IPC protocols and to ensure that patients, families and staff are not put at further risk.

Assess the type of exposure anticipated (splash, spray, contact or touch) and the disease transmission category. Use equipment that is well-fitted, durable and appropriate (such as fluid-resistant or fluid-proof).

Basic PPE protects wearers from exposure to blood, body fluid, secretions or excretions. It includes: gloves when touching infectious material; gowns/aprons when clothes or exposed skin is in contact with infectious material; face protection such as masks, goggles or shields to protect from splashes, droplets or sprays. Additional PPE (or basic PPE at additional times) may also have to be worn depending on type of disease transmission: contact (e.g. gown and gloves when in patient environment); droplet (surgical masks within 1 metre of patient); and airborne (particulate respirators).

Place single-use PPE in waste bins (such as 220-litre barrels) at the entrance to the undressing area. Collect and take bins to a designated waste management area. Place reusable PPE such as heavy-duty gloves and goggles in bins containing a 0.5 per cent chlorine solution. Clean, launder, repair and store appropriately.

A 0.5 per cent chlorine solution should be available for washing gloved hands after each undressing step. Provide a separate 0.05 per cent chlorine solution hand-washing stand as the final step in the undressing process.

Management of the dead: Promote safe, dignified and culturally appropriate burial of dead persons, including identification of all persons. Let people identify their family members and conduct funerals. Do not dispose of bodies

unceremoniously in mass graves. Mass burial may be a barrier to obtaining the death certificates necessary for making legal claims. Consider potential legal issues when burying the victims of violence ⊕ *see Health systems standard 1.1: Health service delivery*.

Special precautions, such as preparing the dead with chlorine solution, may be needed during outbreaks, depending on the disease pathogen and its transmission. Rituals for cleansing and caring for the dead can increase the possibility of disease transmission, but failure to respect cultural sensitivities could lead to burials happening in secret and being unreported.

Healthcare workers and burial teams should wear PPE at all times. Support community burial workers with psychosocial services. Work with community leaders to prevent stigmatisation of people performing this role.

Decommissioning: Consult the community, local authorities and humanitarian actors to decide how to decommission a temporary healthcare setting during a response.

Appendix 1
Water supply, sanitation and hygiene promotion initial needs assessment checklist

This list of questions is primarily for use to assess needs, identify resources and describe local conditions. It does not include questions that will determine the external resources needed to supplement those immediately and locally available.

General

- How many people are affected and where are they? Disaggregate the data by sex, age, disability and so on.
- What are people's likely movements? What are the security factors for the affected people and for potential relief responses?
- What are the current, prevalent or possible WASH-related diseases?
- Who are the key people to consult or contact?
- Who are the vulnerable people in the population and why?
- Is there equal access for all to existing facilities, including at public places, health centres and schools?
- What special security risks exist for women, girls, boys and men? At-risk groups?
- What water, sanitation and hygiene practices were the population accustomed to before the crisis?
- What are the formal and informal power structures (for example, community leaders, elders, women's groups)?
- How are decisions made in households and in the community?
- Is there access to local markets? What key WASH goods and services were accessible in the market before the crisis and are accessible during the crisis?
- Do people have access to cash and/or credit?
- Are there seasonal variations to be aware of that may restrict access or increase demands on labour during harvesting time, for example?
- Who are the key authorities to liaise and collaborate with?
- Who are the local partners in the geographical area, such as civil society groups that have similar capacity in WASH and community engagement?

Hygiene promotion

- What water, sanitation and hygiene practices were people accustomed to before the crisis?
- What existing practices are harmful to health, who practises these and why?

- Who still practises positive hygiene behaviour and what enables and motivates them to do this?
- What are the advantages and disadvantages of any proposed changes in practice?
- What are the existing formal and informal channels of communication and outreach (such as community health workers, traditional birth attendants, traditional healers, clubs, cooperatives, churches and mosques)?
- What access to the mass media is there in the area (for example, radio, television, video, newspapers)?
- What local media organisations and/or non-governmental organisations (NGOs) are there?
- Which segments of the population can and should be targeted (for example, mothers, children, community leaders, religious leaders)?
- What type of outreach system would work in this context (for example, community hygiene volunteers or workers or promoters, school health clubs, WASH committees) for both immediate and medium-term mobilisation?
- What are the learning needs of hygiene promotion staff and community outreach workers?
- What non-food items are available and what are the most urgently needed based on preferences and needs?
- Where do people access markets to buy their essential hygiene items? Has this access (cost, diversity, quality) changed since the crisis?
- How do households access their essential hygiene items? Who makes the decisions regarding which items to buy and prioritise?
- How effective are hygiene practices in healthcare settings (particularly important in epidemic situations)?
- What are the needs and preferences of women and girls for menstrual hygiene practices?
- What are the needs and preferences of people living with incontinence?

Water supply

- What is the current water supply source and who are the present users?
- How much water is available per person per day?
- What is the daily and weekly frequency of the water supply availability?
- Is the water available at the source sufficient for short-term and longer-term needs for all groups?
- Are water collection points close enough to where people live? Are they safe?
- Is the current water supply reliable? How long will it last?
- Do people have enough water containers of the appropriate size and type (collection and storage)?
- Is the water source contaminated or at risk of contamination (microbiological, chemical or radiological)?

- Is there a water treatment system in place? Is treatment necessary? Is treatment possible? What treatment is necessary?
- Is disinfection necessary? Does the community have problems with water palatability and acceptance associated with chlorine taste and smell?
- Are there alternative sources of water nearby?
- What traditional beliefs and practices relate to the collection, storage and use of water?
- Are there any obstacles to using the available water supply sources?
- Is it possible to move the population if water sources are inadequate?
- What are the alternatives if water sources are inadequate?
- Are there any traditional beliefs and practices related to hygiene (for example, during the Haiti cholera outbreak the disease was associated with voodoo culture)? Are any of these beliefs or practices either useful or harmful?
- What are the key hygiene issues related to water supply?
- Do people buy water? If so where, at what cost and for what purposes? Has this access (the cost, quality, regularity of delivery) changed?
- Do people have the means to use water hygienically?
- Are waterpoints and laundry and bathing areas well drained?
- Are soil conditions suitable for on-site or off-site management of problem water from waterpoints and laundry and bathing areas? Has a soil percolation test been carried out?
- In the event of rural displacement, what is the usual source of water for livestock?
- Will there be any environmental effects due to possible water supply intervention, abstraction and use of water sources?
- What other users are currently using the water sources? Is there a risk of conflict if the sources are utilised for new populations?
- What opportunities are there to collaborate with the private and/or public sector in water provision? What bottlenecks and opportunities exist that could inform the response analysis and recommendations?
- What operation and maintenance duties are necessary? What capacity is there to fulfil them in the short and long term? Who shall be accountable for them?
- Is there an existing or potential finance mechanism or system that can recover the operation and maintenance costs?
- How does the host population access water and ensure that its water is safe at the point of use?

Excreta disposal

- Is the environment free of faeces?
- If there is open defecation, is there a designated area?
- Are there any existing facilities? If so, are they used? Are they sufficient? Are they operating successfully? Can they be extended or adapted?

- Are the facilities safe and dignified: lighted, equipped with locks, privacy screens? Can people access the toilet facilities during the day and night? If not at night, what are the alternatives?
- What excreta management practices does the host population practice?
- Is the current defecation practice a threat to water supplies (surface or groundwater) or living areas and to the environment in general?
- Are there any social – cultural norms to consider in the design of the toilet?
- Are people familiar with the design, construction and use of toilets?
- What local materials are available for constructing toilets?
- Is there an existing acceptance of and practice for composting?
- From what age do children start to use the toilet?
- What happens to the faeces of infants and young children?
- What is the slope of the terrain?
- What is the level of the groundwater table?
- Are soil conditions suitable for on-site excreta disposal?
- Do current excreta disposal arrangements encourage vectors?
- Are there materials or water available for anal cleansing? How do people normally dispose of these materials?
- Do people wash their hands after defecation and before food preparation and eating? Are soaps or other cleansing materials with water available next to the toilet or within the household?
- How do women and girls manage menstruation? Are there appropriate materials or facilities available for this?
- Are there any specific facilities or equipment available for making sanitation accessible for persons with disabilities, people living with HIV, people living with incontinence or people immobile in medical facilities?
- Have environmental considerations been assessed: for example, the extraction of raw materials such as sand and gravel for construction purposes, and the protection of the environment from faecal matter?
- Are there skilled workers in the community, such as masons or carpenters and unskilled labourers?
- Are there available pit emptiers or desludging trucks? Currently, is the collected faecal waste disposed of appropriately and safely?
- What is the appropriate strategy for management of excreta – inclusive of containment, emptying, treatment and disposal?

Vector-borne diseases

- What are the vector-borne disease risks and how serious are they?
- What daily or seasonal patterns do local vectors follow in relation to reproduction, resting and feeding?
- Are there traditional beliefs and practices (for example, the belief that dirty water causes malaria) that relate to vectors and vector-borne disease? Are any of these beliefs or practices either useful or harmful?

- If vector-borne disease risks are high, do people at risk have access to individual protection?
- Is it possible to make changes to the local environment (especially by, for example, drainage, scrub clearance, excreta disposal, solid waste disposal) to inhibit vector breeding?
- Is it necessary to control vectors by chemical means? What programmes, regulations and resources exist regarding the use of chemicals for vector control?
- What information and safety precautions need to be provided to households?

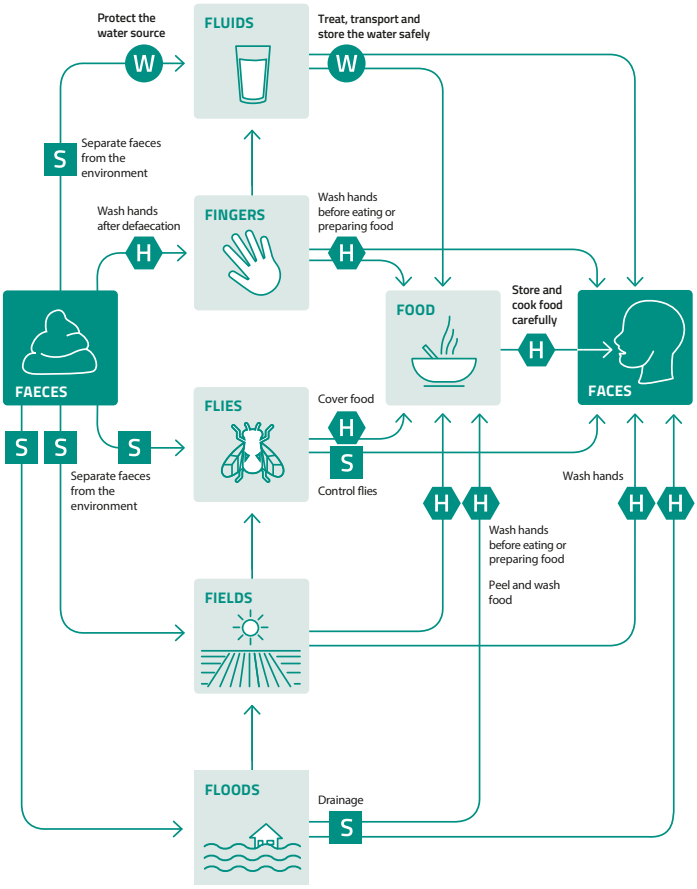
Solid waste management

- Is accumulated solid waste a problem?
- How do people dispose of their waste? What type and quantity of solid waste is produced?
- Can solid waste be disposed of on-site or does it need to be collected and disposed of off-site?
- What is the normal solid waste disposal practice for affected people (for example, compost and/or refuse pits, collection system, bins)?
- Are there medical facilities and activities producing waste? How is it disposed of? Who is responsible?
- Where are disposable sanitary materials disposed of (for example, children's nappies, menstruation hygiene materials and incontinence materials)? Is their disposal discreet and effective?
- What is the effect of the current solid waste disposal on the environment?
- What solid waste management capacity do the private and public sectors have?

Appendix 2
The F diagram: faecal–oral transmission of diarrhoeal diseases

W WATER
S SANITATION
H HYGIENE

Barriers can stop the transmission of disease; these can be primary (preventing the initial contact with the faeces) or secondary (preventing it being ingested by a new person). They can be controlled by water, sanitation and hygiene interventions.



NOTE The diagram is a summary of pathways; other associated routes may be important. Drinking water may be contaminated by a dirty water container, for example, or food may be infected by dirty cooking utensils. © WEDC

The 5 Fs: faeces, fluids, fingers, flies, food (Figure 6)

Source: Water, Engineering and Development Centre (WEDC)

Appendix 3
Minimum water quantities: survival figures and quantifying water needs

Surviving needs: water intake (drinking and food)	2.5–3 litres per person per day (depends on climate and individual physiology)
Basic hygiene practices	2–6 litres per person per day (depends on social and cultural norms)
Basic cooking needs	3–6 litres per person per day (depends on food type, social and cultural norms)
Health centres and hospitals	5 litres per outpatient 40–60 litres per in-patient per day 100 litres per surgical intervention and delivery Additional quantities may be needed for laundry equipment, flushing toilets and so on
Cholera centres	60 litres per patient per day 15 litres per carer per day
Viral haemorrhagic fever centre	300–400 litres per patient per day
Therapeutic feeding centres	30 litres per in-patient per day 15 litres per carer per day
Mobile clinic with infrequent visits	1 litre per patient per day
Mobile clinic with frequent visits	5 litres per patient per day
Oral rehydration points (ORPs)	10 litres per patient per day
Reception/transit centres	15 litres per person per day if stay is more than one day 3 litres per person per day if stay is limited to day-time
Schools	3 litres per pupil per day for drinking and hand washing (Use for toilets not included: see Public toilets below)
Mosques	2–5 litres per person per day for washing and drinking
Public toilets	1–2 litres per user per day for hand washing 2–8 litres per cubicle per day for toilet cleaning
All flushing toilets	20–40 litres per user per day for conventional flushing toilets connected to a sewer 3–5 litres per user per day for pour-flush toilets
Anal washing	1–2 litres per person per day
Livestock	20–30 litres per large or medium animal per day 5 litres per small animal per day

Appendix 4
Minimum numbers of toilets: community, public places and institutions

Location	Short term	Medium and long term
Community	1 toilet for 50 persons (communal)	1 toilet for 20 persons (shared family) 1 toilet for 5 persons or 1 family
Market areas	1 toilet for 50 stalls	1 toilet for 20 stalls
Hospitals/medical centres	1 toilet for 20 beds or 50 outpatients	1 toilet for 10 beds or 20 outpatients
Feeding centres	1 toilet for 50 adults 1 toilet for 20 children	1 toilet for 20 adults 1 toilet for 10 children
Reception/transit centres	1 toilet for 50 individuals 3:1 female for male	
Schools	1 toilet for 30 girls 1 toilet for 60 boys	1 toilet for 30 girls 1 toilet for 60 boys
Offices		1 toilet for 20 staff

Source: Adapted from Harvey, Baghri and Reed (2002)

Note: Where the context allows, aim for shared family toilets or, even better, household toilets from the onset in order to build acceptance, ownership and culturally appropriate sanitation interventions.

Note: the community, the same number of bathing facilities as toilets per 50 persons (short-term) or 20 persons (long-term) should be provided.

Appendix 5
Water- and sanitation-related diseases

1 . Environmental classification of water-related infections

Category	Infection	Pathogenic agent
1) Faecal–oral (water-borne or water-washed)		
a) Diarrhoeas and dysenteries	Amoebic dysentery	Protozoon
	Balantidiasis	Protozoon
	Campylobacter enteritis	Bacterium
	Cholera	Bacterium
	Cryptosporidiosis	Protozoon
	E. coli diarrhoea	Bacterium
	Giardiasis	Protozoon
	Rotavirus diarrhoea	Virus
	Salmonellosis	Bacterium
	Shigellosis	Bacterium
	Yersiniosis	Bacterium
b) Enteric fevers	Typhoid	Bacterium
	Paratyphoid	Bacterium
	Poliomyelitis	Virus
	Hepatitis A	Virus
	Leptospirosis	Spirochaete
	Ascariasis	Helminth
	Trichuriasis	Helminth
2) Water-washed		
a) Skin and eye infections	Infectious skin diseases	Miscellaneous
	Infectious eye diseases	Miscellaneous
b) Other	Louse-borne typhus	Rickettsia
	Louse-borne relapsing fever	Spirochaete
3) Water-based		
a) Penetrating skin	Schistosomiasis	Helminth
b) Ingested	Guinea worm	Helminth
	Clonorchiasis	Helminth
	Diphyllobothriasis	Helminth
	Paragonimiasis	Helminth
	Others	Helminth
4) Water-related insect vector		
a) Biting near water	Sleeping sickness	Protozoon
b) Breeding in water	Filariasis	Helminth
	Malaria	Protozoon
	River blindness	Helminth
	Mosquito-borne viruses	Virus
	Yellow fever	Virus
	Dengue	Virus
	Others	

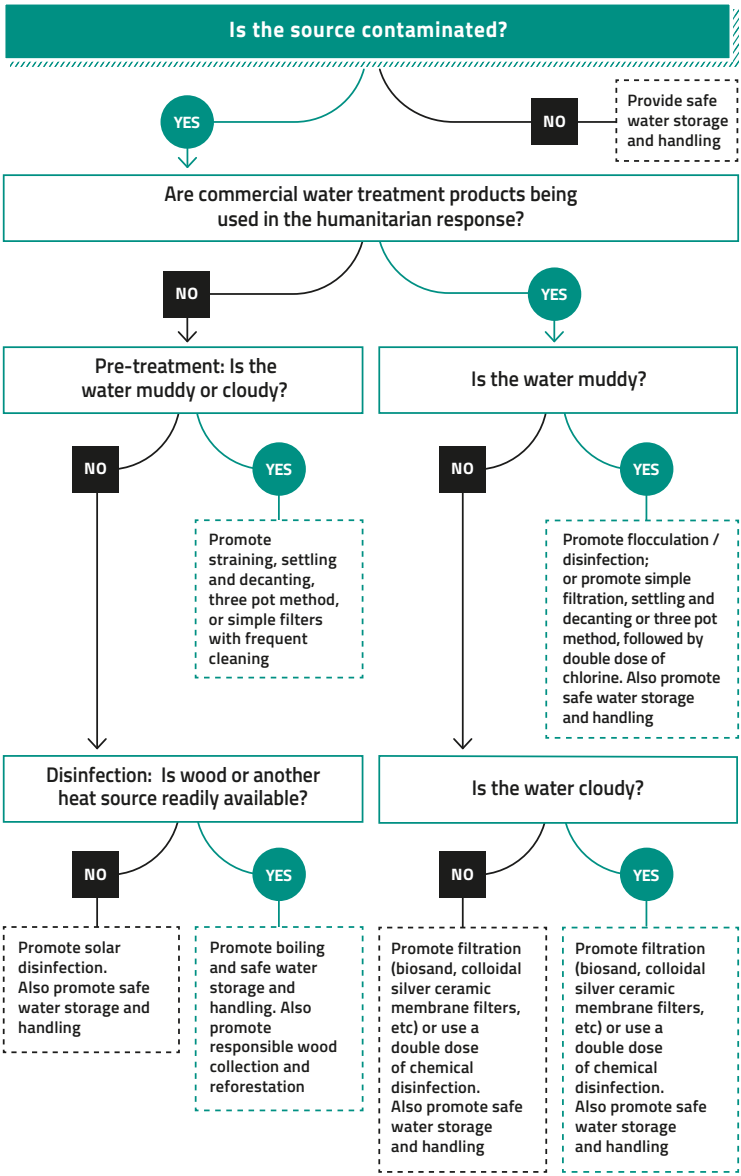
Source: ACF: Water, Sanitation and Hygiene for Populations at Risk, Annex 5, page 675

2. Environmental classification of excreta-related infections

Category	Infection	Pathogenic agent	Dominant transmission mechanisms	Major control measure (engineering measures in italics)
1) Faecal–oral (non-bacterial) Non-latent, low infection dose	Poliomyelitis Hepatitis A Rotavirus diarrhoea Amoebic dysentery Giardiasis Balantidiasis Enterobiasis Hymenolepiasis	Virus Virus Virus Protozoon Protozoon Protozoon Helminth Helminth	Person to person contact Domestic contamination	Domestic water supply Improved housing Provision of toilets Health education
2) Faecal–oral (bacterial) Non-latent, medium, or high infectious dose Moderately persistent and able to multiply	Diarrhoeas and dysenteries Campylobacter enteritis Cholera *E. coli* diarrhoea Salmonellosis Shigellosis Yersiniosis Enteric fevers Typhoid Paratyphoid	 Bacterium Bacterium Bacterium Bacterium Bacterium Bacterium Bacterium Bacterium	Person to person contact Domestic contamination Water contamination Crop contamination	Domestic water supply Improved housing Provision of toilets Excreta treatment before reuse or discharge Health education
3) Soil-transmitted helminths Latent and persistent with no intermediate host	Ascariasis (roundworm) Trichuriasis (whipworm) Hookworm Strongyloidiasis	Helminth Helminth Helminth Helminth	Yard contamination Ground contamination in communal defaecation area Crop contamination	Provision of toilets with clean floors Excreta treatment before land application
4) Beef and pork tapeworms Latent and persistent with cow or pig intermediate host	Taeniasis	Helminth	Yard contamination Field contamination Fodder contamination	Provision of toilets Excreta treatment before land application Cooking and meat inspection
5) Water-based helminths Latent and persistent with aquatic intermediate host(s)	Schistosomiasis Clonorchiasis Diphyllobothriasis Paragonimiasis	Helminth Helminth Helminth Helminth	Water contamination	Provision of toilets Excreta treatment before discharge Control of animals harbouring infection Cooking

Category	Infection	Pathogenic agent	Dominant transmission mechanisms	Major control measure (engineering measures in italics)
6) Excreta-related insect vectors	Filariasis (transmitted by *Culex pipiens* mosquitoes) infections Infections in categories 1–4, especially I and II, which may be transmitted by flies and cockroaches	Helminth Miscellaneous	Insects breed in various faecally contaminated sites	Identification and elimination of potential breeding sites Use of mosquito netting

Appendix 6
Household water treatment and storage decision tree



Source: Adapted from IFRC (2008) Household water treatment and safe storage in emergencies manual

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