Water and Sanitation Standards in Humanitarian Action

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SUMMARY

The right to water and sanitation is an inextricable human right. Water and sanitation are critical determinants for survival in the initial stages of a disaster. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking and personal and domestic hygienic requirements. The main objective of WASH - (Water supply, Sanitation and Hygenie promotion) programmes in disasters is to reduce the transmission of faeco-oral diseases and exposure to disease-bearing vectors through the promotion of: good hygiene practices, the provision of safe drinking water, the reduction of environmental health risks, the conditions that allow people to a healthy life with dignity, comfort and security.

Keywords: Water; sanitation; disasters; humanitarian response; hygenie promotion; drainage; vector control; waste disposition.

Comprehensive research on water, sanitation and hygiene promotion issues among refugee populations is challenging. Hurdles related to these studies include security restrictions, complex operational conditions, scarce resources, understaffing or high staff turn-over, the difficulty of undertaking thorough measurements during emergency situations and the fact that refugee camps are often forcibly located in isolated locations.[1] There are many examples in recent history which highlight the importance of water and sanitation standards in humanitarian actions, such as the humanitarian crises following the Sudanese Civil war in 1998[2] or Haiti earthquake in 2010.[3]

The right to water and sanitation is an inextricable human right.[4] This right is recognised in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses and accessible sanitation facilities. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking and personal and domestic hygienic requirements.[5]

During the past decade the humanitarian response community has initiated a number of interagency initiatives to improve accountability, quality and performance in humanitarian action. Four of the most widely known initiatives are the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP), Humanitarian Accountability Partnership (HAP), and People In Aid and the Sphere Project. Representatives of the agencies promulgating these initiatives started meeting on a regular basis in 2003 in order to collaborate on common issues and harmonise activities where possible.[6]

Water and sanitation are critical determinants for survival in the initial stages of a disaster. People affected by disasters are generally more susceptible to illness and death from disease, which to a large extent are related to inadequate sa-

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nitation, inadequate water supplies and inability to maintain adequate hygiene.[5]

The main objective of WASH - (Water supply,Sanitation and Hygenie promotion) programmes in disasters is to reduce the transmission of faeco-oral diseases and exposure to disease-bearing vectors through the promotion of:

- good hygiene practices

- the provision of safe drinking water

- the reduction of environmental health risks

- the conditions that allow people to a healthy life with dignity, comfort and security.[6]

Simply providing sufficient water and sanitation facilities will not alone, ensure optimal use and achieve the desired impact on public health. In order to reach the maximum benefit from a response, it is imperative that disaster-affected people have the necessary information, knowledge and understanding to prevent water and sanitation-related diseases and to iclude them in the design and maintenance of facilities.

Provision of sufficient clean water (for which minimum agreed standards exist),[5] adequate sanitation for excreta disposal, and management of medical and other solid waste can reduce diarrhoeal disease, typhoid fever, vector-borne disease, and scabies.[7] Despite efforts for maintaing water and sanitaiton standarts, failures occur due to cultural habits (not boiling the river water) or toilet behaviors (not using soap after after latrine use). Therefore in order to achieve the goal of sufficient water and sanitation standards, health providers also should monitor sanitation and water use activities of the population and focus on bridging the gap between what people know about water, sanitation and hygiene and their actual practices.[8]

The Minimum Standards for Water supply, sanitation and hygiene promotion (WASH)

The WASH (Water supply, sanitation and hygiene promotion) program aims to promote better personal and enviromental hygenie in order to protect health, with protecting the envoriment, promoting health and facilitate access to resources. An effective WASH programme relies on an exchange of information between the agency and the disaster-affected population in order to identify key hygiene problems and culturally appropriate solutions. Hygiene promotion is vital to a successful WASH intervention. The focus on hygiene promotion is both general and specific. In general terms, hygiene promotion is integral to all of the sections and is reflected in the indicators for water supply, excreta disposal, vector control, solid waste management and drainage.[9]

2. Hygenie Promotion

Hygenie promotion is a necessary component of WASH programs in diasters. Hygenie promotion allows people to learn how to prevent and/or mitigate related diseases. Hygiene promotion enables a planned and systematic paradigm to let people learn how to prevent and/or mitigate water, sanitation and hygiene-related diseases. The major element in this program is the promulgation of knowledge, participation and utilization of resources among the affected population.

Men and women of all ages should be made aware of key public health risks. Hygiene promotions ensure that people make the best use of the water, sanitation and hygiene-enabling facilities. There are three key factors to promote these messages:

1. a mutual sharing of information and knowledge,

2. the mobilisation of affected communities,

3. the provision of essential materials and facilities.

Information is disseminated via previously identified spesific social, cultural or religious groups and using appropriate channels of mass communication. Also, interactive hygiene communication methods are utilized wherever feasible in order to ensure ongoing dialogue and discussions among those affected.[10]

There are several main tenant of hygenie promotion

Teaching the community to wash their hands after defecation, after cleaning a child's bottom, and before eating and preparing food. Caretakers of children should be taught using demonstrative techniques the safe disposal of children's faeces and about key behaviours and misconceptions about hygiene promotion activities. Representatives from all user groups should to be involved in planning, training, implementation, monitoring and evaluation of hygiene promotion. That involvement of all groups may facilitate information flow between humanitarian actors and the affected population so that misconceptions where identified, are addressed. In the early stages of a disaster the use of mass media for hygenie promotion may increase its impact on the targeted population. Information should be disseminated using different channels and by targeting different at-risk groups especially those who are illiterate, have communication difficulties and those who do not have access to traditionaldevices to accesss media such as radio or television or internet.[10]

The planning of hygiene promotion must be culturally app-

ropriate and may offer useful opportunities for affected people to monitor their own hygiene improvements. The use of outreach workers or home visitors provides an interactive way to access large numbers of people. In a camp setting, there should be two hygiene promoters per 1,000 members of the affected population. For an effective hygenie promotion activity, all men, women and children of all ages should receive information regarding the priority hygiene items. A basic minimum hygiene items pack consists of water containers (buckets), bathing and laundry soaps, and menstrual hygiene materials. Every housing unit requires two 10–20 litre capacity water containers, one for transportation and one for storage. Soap for bathing (250 mg) and a laundry (200 mg) and additionaly acceptable menstrual hygenie materials for women should be distributed regulary every month. Members of the community should be trained regarding safe and effective use of hygenie items if these are unfamiliar.. Use and satisfaction with distributed hygenie material should be monitored regularly after distribution and necessary adjustments made after receiving feedback.[11]

The affected population may need additional items which are not included in basic hygenie packets such as blankets etc. depending on environmental conditions. Also people with specific needs (e.g. incontinence or severe diarrhoea may require increased quantities of personal hygiene items such as soap). Those who are confined to bed may need additional items, such as bed pans. According to socio-cultural practices, hygenie packages may include tootbrushes, toothpaste, shampoo, razors, combs, nail clippers and diappers. To ensure timely distribution of the hygenie items the cooperation and agreement of the affected population is essential.[11] The components of the aid package should be vetted with community leaders and each item reviewed for need based on envorment and cultural acceptance prior to mass dissemination.

3. Water Supply and Treatment of Drinking-Water in Emergency Situations

Water is essential for life, health and human dignity. In extreme situations having Access to clean water for meeting basic needs has a critical importance. Many times poor hygenie due to insufficient water or consumption of contaminated water is the main reason for spraed of infection. In a disaster, the main priority is to provide safe and equitable access to an adequate amount of water for drinking, cooking and personal and domestic hygiene even if it is of intermediate quality.[12] Therefore location of public water points should be planned sufficiently close to households to enable use of the minimum water requirement.

Water consumption data should be also obtained directly from community sources or household surveys. Data collected using these methods will be more effective than the measurement of water pumped into the pipeline. According to Sphere Standarts, minimal water intake need for a victims survival is 2.5-3 /lt/day and varies with the climate and individual physiology. Total quantity should also include water for basic hygenie practices (2-6 litres per day) and basic cooking needs (3-6 litres per day) bringing the total requirement to 7.5-15 litres per day. This amount is >20 litres according UNHCR standards. (R2) The proximity and sustainability of sufficient quantity of water should be considered. When selecting water sources groundwater and/or gravity-flow supplies from springs are preferable, as they require less treatment and no pumping.[12]

According to Sphere Standards accesibility to water should be limited to 8 hours/day in order to prevent overuse and misuse of the water sources. Approximate flow rates according to guidelines are as follows; 250 people per tap based on a flow of 7.5 litres/minute, 500 people per hand pump based on a flow of 17 litres/minute and 400 people per single-user open well based on a flow of 12.5 litres/minute. All community members should have equitable access to water points regardless of gender or ethnicity. Also, water distribution and pumping times should be planned in consultation with the users including women and minorities. The maximum distance from any household to the nearest water point should be 500 metres and maximum queueing time at a water source 30 minutes.[12]

Water Quality and Emergency Treatment of Drinking Water

Water quality is important to ensure the safety of effected peoples health. Water should be at a sufficient quality to be drunk and used for cooking and also suitable to use for hygenic purposes.

When use of a centrally operated water treatment system is not possible, point-of-use water treatment (PoUWT) at the household level can be an alternative. Drinking water supplies need to be treated during and after an emergency to make them safe. Treatment at the point of use is generally quicker and less expensive, but it can be more difficult to manage than a centeralized system. Only water used for drinking and preparing food needs to be treated.[13,14]

Some pretreatment methods for obtaining potable water are aeration, settlement, filtration and disenfection.

Aeration will remove volatile substances such as hydrogen sulphide and methane which affect taste and odour; reduce the carbon dioxide content of the water; and facilitates sedimentation and filtration of iron and manganese by oxidation. One simple method at the household scale is to rapidely

shake a water container and leave it standing for 30 minutes. This methods allows the suspended solids and some pathogens (such as Guinea worm - dracunculiasis) to settle the bottom of the container.[13]

By filtration contamination will be removed by physically blocking particles. Membrane, sand and ceramic filters are using for filtration. Disinfection methods are boiling, solar disinfection and chemical disinfection. For chemical disinfection chlorine is commonly used in tablet, liquid and powder forms, chlorine will kill most viruses and bacteria however some species of protozoa (notably cryptosporidium) are resistant to chlorine.

Free chlorine residual in disinfected water should be 0.2-0.5 mg per litres and in the case of specific diarrheal epidemic, residual chlorine level should not be less than 1mg per liter. There should be no fecal coliforms at the water distribution unit.[1,14]

Using surveys, possible contamination at the water resources or problems at the transport points can be detected. If any fecal coliforms are present, the water should be treated. Water can be contaminated after delivery to the households, therefore it should be routinely sampled and tested at the point of use. A residual disinfectant such as chlorine should be used to treat water contaminated at the point-of-use.

Community mapping is a particularly effective way of identifying where the public health risks are. WHO recommends the use of its water safety plan (WSP), which is a holistic approach covering hazard identification and risk assessment, an improvement/upgrade plan, monitoring of control measures and management procedures, including the development of supporting programs.[14,15]

Planners should be aware about the risk for potential chemical or radiological contamination risks. When there is sufficient conern, these risks need to be rapidly assessed and addressed with local authorities.

Although taste is not in and of itself a direct health problem, if the safe water supply does not taste good, users may drink from unsafe sources and put their health at risk. To avoid this, hygiene promotion activities are needed to ensure that only safe supplies are used.[14]

4. Waste Disposal

A safe disposal process creates the first barrier to excreta-related disease. It is a major priority in most disaster events and should be addressed with as much speed and effort as the provision of a safe water supply. The main standard of excreta disposal is to maintain the living environment in general and specifically the habitat, food production areas, public centres and surroundings of drinking water sources free from human fecal contamination. After a disaster, demarcation and cordoning off defecation areas, and building communal toilets should be completed as soon as possible. Every member of the community should use these services and for people who do not traditionally use toilets, it is necessary to conduct a concerted hygiene promotion campaign. In urban disasters where there could be damage to existing sewage systems, installing portable toilets or use of septic and/or containment tanks that can be regularly desludged may be required.[16] This occured after Hurricane Katrina in Coastal Mississippi and caused delayes in re-opening hospitals and clinics.

Disaster affected populations need to have adequate, appropriate and acceptable toilet facilities. Those facilites should be sufficiently close to their dwellings, and should allow rapid, safe and secure access at all times, day and night. All excreta containment measures, i.e. trench latrines, pit latrines and soak-away pits, should be at least 30 metres away from any groundwater source. Pits should be at least 1.5 metres above the groundwater table. These distances should be increased for fissured rocks and limestone. In flooded environments toilets or septic tanks have to built in elevated areas in order to prevent a spillage. The distance from dwellings should be no more than 50 metres.[17] Children's faeces need a particular attention, because children have excreta-related infections more frequently and they may not have developed antibodies to infections.[16]

Toilets must have safe access, and there has to be a provision of privacy in line with the cultural norms of the users. Toilets should be kept clean and should be havean adequate supply water or other solutions for hand washing. Containers for disposal of women's hygiene materials should be provided. There should be provision for desludging, transport and appropriate disposal during long-termoperations. Maximum number of people for use of each toilet is 20. The use of the toilets should be arranged by household or by sex. Special toilets may need to be constructed for children, older people and persons with disabilities. The type of sanitation facility adopted depends on the phase of the diasaster and preferences of the intended users, existing infrastructure, local soil characteristics, construction materials and according to the availability of water.[17]

Different excreta disposal types for different phases of a disaster response are listed in the table below. For the first days of a disaster, a demarcated defecation area should be specified. Trench latrines are suitable for use up to two months, also simple pit latrines can be used. For middle term and long term use ventilated improved pit (VIP) latrines, ecological sanitation (Ecosan) systems with urine diversion and sep-

tic tanks are suitable. Public toilets have to be provided in a ratio 3:1 (women:men) and where possible urinals should be provided. Households should be responsible for cleaning and maintanence of shared toilets. People living with chronic illnesses need easy access to a toilet as they frequently suffer from chronic diarrhoea and reduced mobility. Water and clenasing material (toilet paper or another material) should also be provided.[17]

5. Vector Control

Vector- borne diseases are a major health risk following disasters and during refugee crises. Musquitos are responsible for transmission of disease, particularly malaria, which is a leading cause of morbidty and mortality. Musquitos are also vectors for yellow fever, dengue and haemorrhagic fever. Biting flies, bedbugs and fleas can transmit diseases such as murine typhus, scabies and plague. Also non-biting or synathropic flies (house fly, blow fly, flesh fly etc.) play a mojor role in the transmission of diarrheal disseases. Ticks transmit relapsing or hemorrhagic fever, lyme disease, babesiosis and anaplasma; body lice transmit typhus and relapsing fever. Rats and mice are host for vectors eg. fleas, which may transmit Lassa fever, plague among other infections, and they transmit leptospirosis, Hanta virüs and salmonellosis.[18]

Vector-borne diseases can be prevented by measures which prevent the spread of vectors. Decisions about vector control interventions should be based on an assessment of potential disease risk. Factors such as immunity status of affected population (e.g. refugees, internally displaced people (IDPs) - movement from a non-endemic to an endemic area is a common cause of epidemics). Pathogen type, number of vectors, species and increase exposure to the vectors (proximity or pattern of the settlement etc.) influence risk.[18]

One of the key issues in vector-borne disease control is site selection and provision of shelter. To reduce the exposure risk of the affected population to the vectors is a key determinant in diease prevention. With regard to malaria control, for example, camps should be located 1-2 kilometres upwind from large breeding sites, such as swamps or lakes. Often the benefits of locating camps near clean water sources makes his decision challanging. Other initiatives for controlling vectro-borne diseases are maintaining a safe water supply, proper excreta disposal, solid waste management and drainage, provision of health services (including community mobilisation and health promotion), use of chemical agents for vector control, family and individual protection including the use of mosquito netting, and effective protection of food stores. Vector control programs should aim to reduce vector population density, reduce human-vector contact and reduce vector breeding sites.[19]

The impact of vector control programs are measured by monitoring vector-borne disease incidence rates and parasite counts.

Specific environmental engineering measures can be taken to reduce the opportunities for vector breeding. These include the proper disposal of human and animal excreta, proper disposal of refuse in order to reduce the number of flies and rodents, drainage of standing water, and clearing unwanted vegetation cover around open canals and ponds to control mosquitoes and ticks. If these interventions are not sufficient to reduce vector breeding localised chemical control measures or individual protection measures may be needed (eg. spraying affected spaces to reduce the number of the flies). Local experts may have specific knowledge regarding local disease patterns, breeding sites and seasonal changes in vector number at the disaster site.[19]

Enviromental mosquito control aims to eleminate three main mosquitos breeding sites. These species are responsible for transmission of filariasis (Culex&Anopheles), malaria (Anopheles) and yellow fever and dengue (Aedes). Examples of environmental mosquito control include adequate drainage, functional VIP (ventilated improved pit) latrines, keeping lids on squatting holes of pit latrines and on water containers, and keeping wells covered and/or treating them with a larvicide (e.g. for areas where dengue fever is endemic).[19]

Individual vector protection involves timely provision of protection measures such as insectiside-trested materials, tents, curatins, beting nets. Especially insecticide impregnated bed netting is effective for protection not only for musquitos but also body and head lice, fleas, ticks, cockroaches and bedbugs. Long-sleeved clothing, household fumigants, burning coils, aerosol sprays can be used against mosquitoes. Personal hygiene and regular washing of clothes and bedding are the most effective protection against body lice. Mass laundering, and chemical personal treatment are alternative vector protection methods.[20]

6. Solid Waste Management and Drainage

Inadequate solid waste management can cause public health risks of the affected population. These risks can arise from the breeding of flies and rodents and pollution of the surface or groundwater sources. Solid waste disposal should be implemented in close consultation and coordination with the affected population.

All households should have easy access to refuse containers, at least a 100 litre refuse container should be available per 10 households, those containers should be emptied twice a week at minimum. However the waste should be removed

from the living envoriment daily. Communal refuse pits should be located no more than 100 metres from households. All medical waste should be isolated and disposed of separately in properly engineered pits or safe containers in health facilities.

If waste is to be buried on-site in either household or communal pits, it should be covered daily with a layer of soil to prevent attracting flies and rodents. Care should be taken to prevent contamination of the groundwater by material leacing from waste pits.[21]

During the recent Ebola epidemic in Western Africa, many Ebola Treatment units utilized a incineartion facility at each camp to manage contaminated solid waste.

7. Drainage

Pooling surface water may cause health risks by contamination of clean water supplies, vectro breeding, damage to toilets and dwellings and also drowning. Water pools may come from household wastewater, leaking toilets, rain or rising floodwaters. A proper drainage plan is essential to protect the community from health risks and maintain habitable settlements. The plan should address stormwater drainage through site planning and wastewater disposal using small-scale, on-site drainage

Appropriate drainage facilities have to be built to keep dwelling areas free of pooling water. All water distribution points and hand washing facilities should have an effective drainage system to prevent pooling. The drainage system should be desined to protect shelters, paths and all water sanitation facilities from flooding and water erosion.[22]

Conclusion

Water is indispensable for human life and is a priority for survival. Following disasters and during humanitarian relief activities providing safe supplies of water to the affected people is a major challenge. Hygiene and sanitation standards should be implemented into the daily activities of a community as soon as possible in order to protect the population from disease and outbreaks. WHO and Sphere Project have published standards for water and sanitation in humanitarian actions which can guide healthcare workers and other providers bringing humanitarain assistance for an effective response.

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