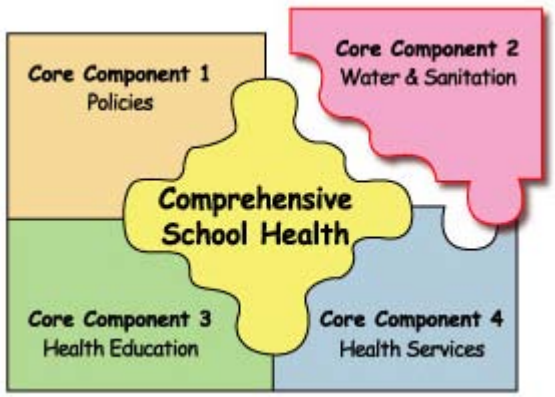
Guidelines for the Provision of Safe Water and Sanitation Facilities in Schools

Description of the tool:
This tool sets out some guidelines and optimal and minimal acceptable standards for the provision of safe water and sanitation facilities in schools.

The information in this tool was adapted by UNESCO from the following publication:

WFP, UNESCO and WHO 1999. *School Feeding Handbook.* Rome, World Food Programme.

Description of the document:
Developed to assist project officers and others involved in WFP-funded school feeding projects, this manual contains practical information on the design, implementation and evaluation of such programmes that anyone planning or currently running a school feeding programme can use. It includes sections describing the rationale for and expected benefits of school feeding; implementation issues related to health and nutrition, ration composition, food safety, water supply and sanitation and deworming interventions; and the fundamentals of monitoring and evaluating the results of programme activities. A variety of model checklists and reporting forms are also found in this publication.



This information supports Core Component #2 of the FRESH framework for effective school health: **water, sanitation & the environment.** It will have a greater impact if it is reinforced by activities in the other three components of the framework.

Guidelines for the Provision of Safe Water and Sanitation Facilities in Schools[i]

1. SAFE WATER SUPPLY

1.1 Introduction

It is well known that safe water and adequate sanitation are the bases for a sustainable solution to the threat of water-related diseases. A high incidence of intestinal diseases associated with lack of safe drinking water and inappropriate means of excreta disposal is a typical picture, especially among schoolchildren in many developing countries of the world. Provision of safe drinking water and basic sanitation, coupled with adequate personal hygiene behaviour, can prevent *viral diseases* such as hepatitis A, *bacterial diseases* such as cholera and typhoid, and *worm infections* such as roundworm, whipworm, hookworm, schistosomiasis and other flukes.

1.2 Optimal Standards for Safe Water Supply at School[ii]

Water Source

Sources of water for drinking fall into three broad categories: 1) *groundwater* (dug wells, boreholes and springs); 2) *rainwater collection;* and 3) *surface water* (rivers, streams, lakes and small dams). Groundwater sources are often of good quality and may simply require protection (such as a well cover or spring protection box) and disinfection. Rainwater collection is most commonly used at household level, but can also be used at school to provide supplementary drinking water provided there is sufficient space for a storage tank and the system is properly maintained (e.g. regular cleaning of the water collection area). On the other hand, surface water sources, such as rivers, streams, ponds and lakes, are normally open to contamination and require extensive treatment before being used for drinking.

Safe water supply should be available on school premises at all times.

Ideally, water should be obtained (where it exists) from the local municipal system, or alternatively, from a groundwater source with arrangements for systematic disinfection of the water.

Water Quantity

The expected demand for safe water will vary considerably between countries depending on cultural hygiene-related habits and the type of water, sanitation and cooking amenities. As a general indication, the consumption of water under ideal conditions can reach 60 litres per day per student in day schools that have flushing toilets and cooking facilities. The following are optimal requirements for water supply facilities at schools:

- Hand washing basins: 1 per 50-100 students
- Showers: 1 per 20 students

Expected water consumption varies from 15-30 litres per day per student in day schools and from 90-140 litres per day per student in boarding schools.

Water Quality

Water quality is determined on the basis of an indicator of faecal contamination, namely the concentration of *Escherichia coli (E. coli)*[iii]. The level of free residual chlorine at the point of water delivery is another indicator. Free residual chlorine should be kept at 0.2-0.5 mg/litre to reduce the risk of microbial regrowth. The detection of chlorine in this concentration range provides an indication of the absence of contamination.

1.3 Minimal Acceptable Standards

While bearing in mind that action should be taken to ensure that the above optimal standards are met, the following are the minimal acceptable standards.

Water Quantity

Everyone requires about two litres of water a day for basic physiological needs.

As a minimum, school students would manage, under difficult conditions and for a limited period of time, with an amount of at least 5 litres of water per day per student for drinking and cooking.

Water Quality

Water can be freed of pathogens (disease-causing microorganisms) by bringing it to a vigorous boil for 1 minute. Boiling, however, has the following main disadvantages:

- fuel is required (about 1 kilogram of wood is needed to boil one litre of water);
- water can be contaminated again when it has cooled.

Chlorine is a very effective disinfectant. Water can be chlorinated at the school level (see Simple Technology for Filtering and Disinfecting Water at School). About 4 grams of active chlorine are required for disinfecting one cubic meter (1000 litres) of water. As active chlorine costs approximately US $ 7 per kilogram, the cost of disinfecting 1000 litres of water, which would cover the minimal acceptable drinking and cooking needs of about 200 students per day, would be about 3 US cents.

Turbidity (cloudiness) can be caused by silt, sand or mud as well as by some microorganisms. *Turbid water should be filtered before it is chlorinated.* There are various types of filters that not only reduce turbidity but also inactivate most pathogens present in the water. Where "commercial candle filters" are not available in the market, household filters can be prepared, as shown in the above-mentioned tool.

Water from unreliable sources should always be disinfected.

Chlorination is preferable to other traditional methods as it is reliable and less expensive. If chlorine compounds are lacking, the water should be boiled.

If the water is stored, it is extremely important to protect it from contamination. The containers used for storing water should be kept clean and rinsed regularly with boiling water or washed out with a bleach solution (one part liquid bleach to five parts of water). After washing with a bleach solution, the surfaces should be rinsed with safe water. Cleaning and disinfecting of tanks should be carried out at least once every six months. The containers should be provided with a tap and a cover to prevent insects, dust and other possible contaminants from entering.

Water taken directly from river channels or lakeshores without treatment is a major health hazard.

2. SANITATION

2.1 Introduction

High priority should be given to observing the principles of sanitary waste disposal. Human excreta always contain large numbers of microorganisms, some of which may cause diarrhoeal diseases such as cholera, typhoid and hepatitis A. When people defecate in the open air, there are numerous ways through which these microorganisms can get into food and water. Once in food, their numbers can increase rapidly in a few hours.

During the rainy season, excreta may be washed away by rain-water and can run into wells and streams. The microorganisms in the excreta will then be carried into water, which may be used for drinking or cooking.

Disposing of excreta safely, isolating it from flies and other insects, and preventing faecal contamination of water supplies would greatly reduce the spread of disease.

Lack of good sanitation may lead to contamination of clean water sources and food.

In many cultures, it is believed that children's faeces are harmless and do not cause disease. This is not true. A child's faeces contain as many germs as an adult's, and it is very important to collect and dispose of children's faeces quickly and safely.

Appropriate facilities for excreta disposal at primary schools is a basic need.

In the absence of such facilities, there is a high risk of occurrence of diarrhoeal diseases through contamination of water and food. As part of the normal school curriculum, children should be taught how to use excreta disposal facilities, about the dangers of defecating on the ground and about the importance of thorough hand-washing with soap or ash after any contact with excreta.

2.2 Optimal Standards for Sanitation at School

Excreta disposal facilities in schools need to be sufficient for the number of students and staff members. Separate blocks for male and female students should be provided. Separate facilities are also commonly built for male and female staff.

Sanitary urinals for boys should be provided separately, be independent of the toilet seats, and be designed for more intensive use. Washing facilities should be available at these places.

Optimal standards for sanitation at school:

- Girls: one toilet cubicle for 25 girls
- Boys: one toilet cubicle for 100 boys and one urinal for 40-6O boys.

There are a number of key points to be addressed when planning sanitation at schools.

- Hand washing basins with clean water and soap must be provided in each toilet block.
- Toilet facilities should be cleaned with soap or disinfectant at the end of every day. Cleaning duties can be the responsibility of the students, operating on a rotation basis. If this is done, then a member of staff should supervise the students to ensure that the toilets are cleaned properly and the students wash their hands properly when they are finished.
- Refuse must be disposed of safely. Bins with well-fitting lids or sacks are the most appropriate containers to prevent flies and vermin from being attracted to refuse. Refuse must be removed regularly and disposed of safely.

There are many different types of excreta disposal facilities. The needs of the users and the resources available should be carefully considered to ensure that the most appropriate type of sanitation is selected. These facilities can range from *ventilated improved pit (VIP) latrines* to modern flushing toilets (where sewerage systems are available).

Schools can be instrumental in promoting different types of sanitation. Students can be involved in the design and implementation of sanitation construction projects. They can also take part in health education by designing posters and notices to reinforce hygiene education messages. Hygiene education should be part of the school's comprehensive health education programme in order to ensure that all students are aware of the risks of poor sanitation and hygiene, and to help them develop good hygiene practices.

2.3 Minimal Acceptable Standards

If there is no municipal sewage system, and if the installation of a local wastewater system is not possible, pit-type latrines are a suitable option. Open defecation fields should not be adopted as a means of excreta disposal.

The simple pit latrine is the cheapest and most basic form of improved sanitation, but has the disadvantage of producing unpleasant odours and allowing flies to breed easily.

Ventilated improved pit (VIP) latrines are an improved type of pit latrine that help remove odours and prevent flies from breeding. A VIP latrine costs more to build and requires more maintenance than a simple pit latrine, but is still relatively low-cost.

A single VIP latrine costs between US S 70-400.

It is fundamental that schools are provided with appropriate excreta disposal facilities. It is very frustrating to children and teachers to study hygiene behaviour as part of the school curriculum but be unable to use appropriate excreta disposal facilities.

A pit latrine should be at least 30 metres away from any water source.

A VIP consists basically of a pit, a cover slab with a squat hole and a vent pipe cast through the slab. A shelter is built, which must be kept semi-dark, and the vent pipe is raised to at least 0.5 metres above the top of the shelter. A durable fly screen should be placed on the top of the vent pipe. It is important that the latrine is well away from high buildings or trees to avoid shading on the ventilation pipe.

2.4 Inspections of School Water and Sanitation Facilities

A sanitary inspection is an on-site inspection of the school facilities to identify actual and potential sources of contamination. The physical structure, the operation of the system and external environmental factors (such as latrine location) are evaluated. This information should be used to select appropriate remedial action to either protect the system or improve it.

Inspections of school water and sanitation facilities should be regularly conducted by a suitably trained person using a simple, clear reporting form. Such forms typically consist of a set of questions structured so that "yes" answers indicate that there is a risk of contamination and "no" answers indicate that the particular risk is absent. The reporting forms can be pictorial to enable them to be easily understood. Such forms and guidelines for the interpretation of results should be established for each different context. The results of such inspections should be communicated to the authorities responsible for sanitary inspections in order to initiate remedial actions, including a more comprehensive survey.

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[i] Excerpted from WFP/UNESCO/WHO 1999. *School Feeding Handbook.* Rome, World Food Programme.

[ii] World Health Organization. *Fact Sheets on Environmental Sanitation. Cholera and Other Epidemic Diarrhoeal Diseases Control.* Prepared by the Robens Institute University of Surrey, UK. Geneva: World Health Organization, 1996.

[iii] A family of bacteria which live in the gut of humans and animals and can get into water through faeces. The presence of E. coli in water is an indicator of faecal contamination. People who drink water in which these bacteria are present are at risk of catching diarrhoeal diseases. Under optimal conditions, the E. coli count should be less than 3 per 100 ml in an occasional sample, but not in consecutive samples. When water availability is a problem, as is the case in emergencies, the water is considered acceptable with an E. coli count of less than 10 per 100 ml, mildly polluted with a count of 10-99, and dangerous with a count of over 100.