

# Technical Brief: Handwashing

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## 1 Introduction

Hygiene is the conditions and practices that help to maintain health and prevent the spread of diseases (WHO, 2013). Improving hygiene practices can have a very positive impact on individual, household and community health. Most people practice some form of personal hygiene to keep themselves clean. Good personal hygiene practices include:

- Handwashing
- Bathing
- Washing hair
- Cleaning teeth

This Technical Brief introduces the importance of handwashing to prevent the spread of infectious diseases, like diarrhea, respiratory illnesses and trachoma. It discusses the critical times for handwashing and explains how to wash your hands properly. This Technical Brief also gives an overview of hygiene promotion and the handwashing hardware needed to encourage people to practice handwashing and adopt it as a regular habit.

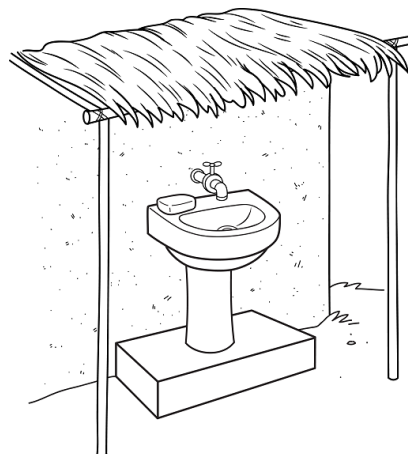
### Definitions

**Defecate:** To discharge feces from the anus.

**Handwashing hardware:** The physical things that people need to properly wash their hands, like soap and water.

**Handwashing software:** Also called hygiene promotion. The approaches to encourage the widespread adoption of handwashing to reduce diarrhea and other infectious diseases.

**Pathogen:** Any living organism that causes disease.



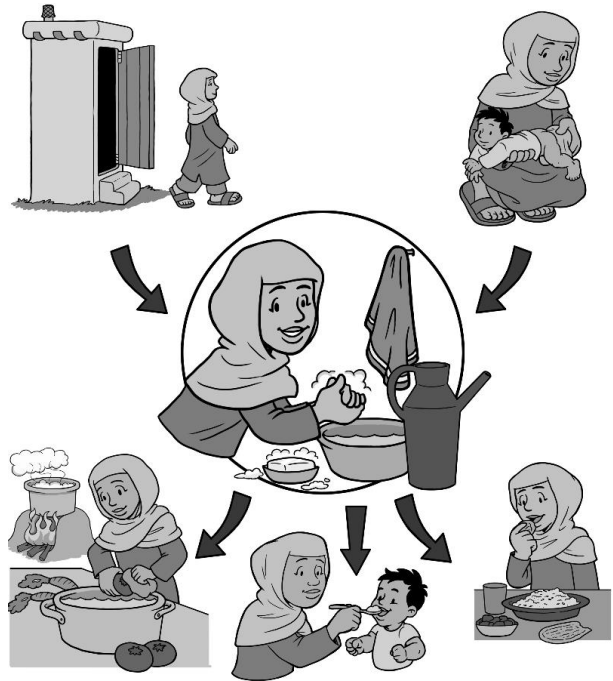
Handwashing station

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## 2 Critical Times for Handwashing

Standard public health messages encourage people to wash their hands at five separate critical times:

1. After defecating
2. After handling child feces or cleaning a child's anus
3. Before preparing food
4. Before feeding a child
5. Before eating



Luby et al. (2011) found that the two most critical times for handwashing with soap:

1. After defecation
2. Before preparing food

The Global Public-Private Partnership for Handwashing with Soap (PPPHW, 2012) also suggests using a “critical times ladder” to promote handwashing with soap. Start with one or two critical times and expand from there.

Promoting fewer critical times for handwashing may be more effective and have greater impact for the following reasons:

- Handwashing at one critical time would be a huge improvement in many situations
- Few programs have been successful in promoting five times for handwashing
- Each critical time is so different
- Messages can get confusing when promoting multiple critical times

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## 3 Correct Method for Handwashing

Handwashing with water is good; handwashing with mud, soil or ash is better; and handwashing with soap is the best (Bloomfield and Nath, 2009; Luby et al., 2011).



### How Do You Wash Your Hands?

1. Wet your hands with clean, running water (warm or cold) and apply soap.
2. Rub your hands together to make a lather and scrub them well; be sure to scrub the backs of your hands, between your fingers and under your fingernails.
3. Continue rubbing your hands for at least 20 seconds.
4. Rinse your hands well under running water.
5. Dry your hands using a clean cloth or air dry them.

(CDC, 2013)

### 3.1 Water

You should use the cleanest water possible water to wash your hands. If enough treated water is available, such as water treated with a filter or chlorine, it should be used to wash hands. If there is only enough treated water for drinking and preparing food, then untreated water from the cleanest possible source should be used for washing hands.

The best way to wash hands is to have a stream of clean water flowing over your hands, to wash the soap, dirt and pathogens away. If only one basin is available for washing hands in, the water in the basin should be disposed of after every person washes their hands in the water.

### 3.2 Soap

Handwashing with soap significantly reduces the number of pathogens on hands compared to washing with water alone. Soap helps to break down the grease and dirt that carry the largest concentration of pathogens. As well, using soap means that more time is spent rubbing hands together to lather and rinse off the soap. This friction helps to dislodge more grease and dirt, and consequently pathogens.

With proper use, all soaps are equally effective at removing pathogens that cause diarrheal disease and respiratory infections. Antibacterial soap is not better than regular soap at stopping the spread of disease.



Washing hands in a basin with soap

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### 3.3 Soil, Mud or Ash

Soil and mud are often used in low income communities as a free alternative to soap for handwashing. However, there are some concerns that using these materials are associated with health risks. Soil and mud may be contaminated with pathogens (e.g., bacteria, viruses, protozoa, helminths) from open defecation or using sewage to irrigate crops, and ash may contain toxic materials depending on what was burned to create the ash, such as plastics or chemicals (Bloomfield and Nath, 2009).

There is very little research on whether (and to what extent) soil, mud or ash may be contaminated with pathogens and be a source of infection. Despite the potential health risks, it is believed that using clean and dried soil and ash is preferable to using nothing at all since they are more effective in removing microorganisms from hands than water alone (Bloomfield and Nath, 2009).

### 3.4 Hand Sanitizers

Hand sanitizers are gel, foam, or liquid solutions that use alcohol to kill the pathogens on your hands. If soap and water are not available, you can use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of pathogens on hands in some situations, but sanitizers do not eliminate all types of pathogens. Hand sanitizers are not as effective when hands are visibly dirty.



#### How Do You Use Hand Sanitizers?

1. Apply the hand sanitizer to the palm of one hand.
2. Rub your hands together.
3. Rub the sanitizer over all surfaces of your hands and fingers until your hands are dry.

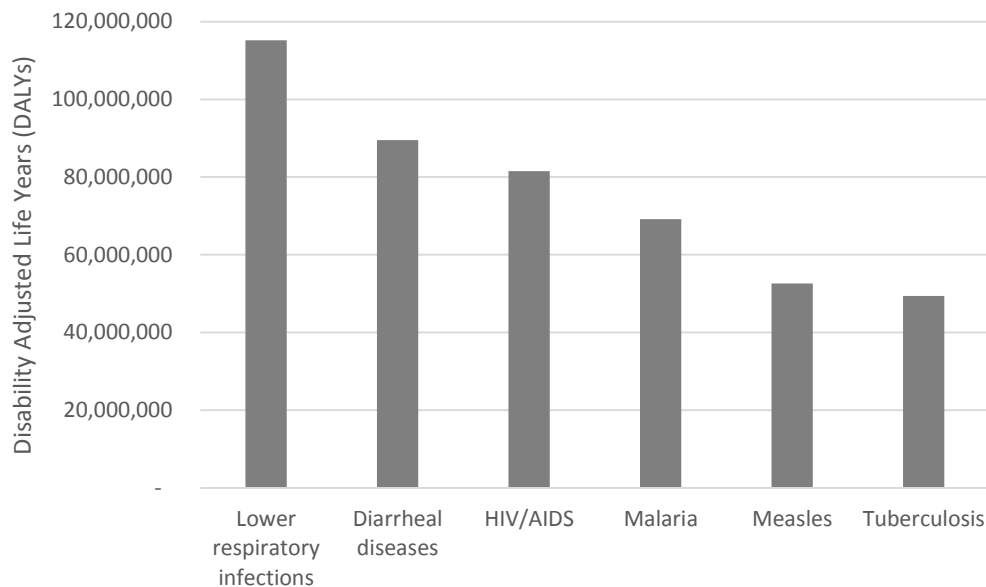
(CDC, 2013)

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## 4 Importance of Handwashing

The hands are the last line of defence against exposure to pathogens that can cause disease. Pathogens can be transmitted directly from unclean hands to the mouth, eye, nose or other area of the skin, or indirectly by handling food or water. Diarrhea, respiratory infections and trachoma are all infectious diseases that can be prevented by handwashing with soap.

**Leading Global Infectious Diseases (2010)**



Note: One DALY equals one lost year of healthy life.

(Credit: IHME, 2013)

### 4.1 Diarrhea

Globally, an estimated 2,000 children under the age of five die every day from diarrheal diseases, and of these deaths 1,800 are linked to water, sanitation and hygiene (UNICEF Canada, 2013). For every child that dies, countless others suffer from poor health and lost educational opportunities leading to poverty in adulthood.

Diarrhea is caused mainly by the ingestion of pathogens, especially in unsafe drinking water, in contaminated food or from unclean hands. The WHO estimates that 88% of diarrheal cases can be prevented by increasing the availability of safe water and improving sanitation and hygiene practices (Prüss-Üstün et al., 2008).



Curtis and Cairncross (2003) estimated that washing hands with soap can reduce the risk of diarrheal diseases by 42-47%. As well, Fewtrell et al. (2005) showed that handwashing can reduce the incidence of diarrhea by 44%.

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### 4.2 Respiratory Infections

Reducing the burden of diarrheal disease is not the only reason for good hygiene. Hygiene also plays an important role in reducing the risk of respiratory infections such as pneumonia and influenza. According to the WHO (2002), acute respiratory infections (ARIs) cause 3.9 million deaths a year. They are the leading cause of childhood morbidity and mortality in the world, and the biggest cause of disability-adjusted life years (DALYs) lost.

Although the research is limited, especially in developing countries, handwashing is associated with a decrease in respiratory infections. Curtis and Cairncross (2003) discuss that growing evidence from developed countries shows that handwashing can substantially reduce the risk of respiratory tract infection (median risk reduction of 45%). As well, Rabie and Curtis (2006) suggest that handwashing with soap can reduce the risk of respiratory infections by about 16%.

### 4.3 Trachoma

Trachoma is a contagious eye disease that is the world's leading cause of blindness, but it is completely preventable through good hygiene practices. Simply washing the face with clean water breaks the infection cycle. It is estimated that 92 million people suffer from trachoma and 8 million are visually impaired or blinded as a result of the disease (Montgomery, 2006).

Trachoma is endemic in the poorest and most remote areas of 56 countries, most of which are located in Sub-Saharan Africa and Southeast Asia. Up to 600 million people live in these areas and are at risk for contracting the disease (Montgomery, 2006).

### 4.4 Vulnerable Populations

Hygiene is of critical importance for vulnerable populations who are more susceptible to infections. This includes people living with HIV/AIDS, the disabled, the elderly, pregnant women and children under the age of five. The most common infections contracted by people living with HIV/AIDS are diarrhea, respiratory infections and skin diseases. The risk of contracting these illnesses can be reduced by handwashing with soap and washing the face and body.



Washing your face and body can also reduce the risk of infection

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## 5 Global Handwashing Practices

The following table shows that the frequency of handwashing around the world is low. While many people wash their hands with water, only a small percentage use soap at critical times (e.g., after defecation).

**Handwashing with Soap Around the World**

Location	Handwashing with Soap	Frequency in Population	Reference
Kerala State, India	After defecation After cleaning up a child	34% 35%	PPPHW
Ghana	After defecation After cleaning up a child	3% 3%	PPPHW
Peru	After defecation After cleaning up a child	6% 30%	PPPHW
Senegal	After defecation After cleaning up a child	31% 26%	PPPHW
Kolkata, India (slums)	After defecation	16%	Sircar et al., 1996
Kyrgyzstan (rural)	After defecation After cleaning up a child	18% 0%	Biran, 1999
Lao	After defecating	23%	EMS & WSP, 2014
Nigeria (rural)	After cleaning up a child	10%	Omotade et al., 1995
Burkina Faso (urban)	After defecation After cleaning up a child	1% 13%	Curtis et al., 2001
Brazil (childcare centres)	After cleaning up a child	16%	Barros et al., 1999
Lima, Peru (shanty town)	After defecation (soap use rare)	12%	Gilman et al., 1993
Northern England (peri-urban)	After cleaning up a child	47%	Curtis et al. 2003

Note: All frequencies were observed, except Sircar et al. which used soap measurements.

(Adapted from World Bank, 2006)

## 6 Promoting Handwashing

If handwashing is so important, then why isn't everyone doing it? Handwashing is about behaviour; changing handwashing practices means changing behaviour. Change can be difficult for many people. We all have routines and habits that we feel comfortable with and enjoy. It is hard for people – especially adults – to change a behaviour that we have been doing for most of our lives. Habitual behaviours are often learned at an early age. The longer someone has been practicing a behaviour, the harder it will be for them to change.



Knowing is not enough. Knowing why, how and when to wash hands is no guarantee that people will actually do it. It is now understood that 'educating' people to practice good hygiene, because it has health benefits, will usually not result in long-term behaviour change. While good health may seem like an obvious benefit, it may not be as strong a motivating factor as other potential benefits. In a review of hygiene research studies from 11 countries, Curtis et al. (2009) found that the key motivations for handwashing include the following:



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- Disgust – washing hands when they became contaminated with something dirty, foul or smelly; feces were found to be particularly repulsive
- Nurture – taking care of young children
- Comfort – being able to sense cleanliness directly, but also as a state of mind
- Affiliation – being a good member of society by joining in and by doing what everyone else is perceived to be doing



### What is the Difference between Hygiene Education and Promotion?

- Hygiene education: All activities are aimed at raising awareness and conveying knowledge of the links between hygiene practices and health. The water, sanitation and hygiene (WASH) sector is gradually moving away from hygiene education to hygiene promotion.
- Hygiene promotion: Systematic approaches to encourage the widespread adoption of safe hygiene practices to reduce diarrheal and other water- and sanitation-related diseases. Hygiene promotion focuses on the things that determine changes in behaviour, which may not necessarily be directly related to knowledge of the health consequences of poor hygiene.

(WaterAid, 2012)

Hygiene promotion builds upon what people know, do and want. It focuses on identifying motivations for behaviour change based on existing practices and beliefs. By identifying motivators of change and finding ways to trigger them, effective hygiene promotion reduces the risky hygiene behaviours and practices among key target groups (WaterAid, 2012).

There are different ways to develop and implement a hygiene promotion program, also called “software”. WaterAid (2012) suggests that hygiene promotion approaches can be divided into the following two groups. There is overlap between the different approaches, as various elements from each can be combined to meet the needs of the local situation.

1. Participatory approaches that work with communities to find sustainable and acceptable solutions, as well as build self-esteem and a sense of responsibility for their decisions:
  - SARAR (Self-esteem, Associative strength, Resourcefulness, Action planning, Responsibility)
  - Participatory hygiene and sanitation transformation (PHAST)
  - Participatory rural appraisal (PRA)
  - Community health clubs
  - Child to child (CtC)
2. Social marketing that uses commercial marketing principles to achieve social benefits, such as changes in attitudes and behaviours.

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## 7 Handwashing Hardware

Although the software side of handwashing remains a key focus of programs, people also need convenient access to appropriate hardware, like soap and water.

A review by Curtis et al. (2009) in 11 countries found that some type of soap and water was available in almost every household. However, it is not enough for soap and water to be present in the home; both must be readily accessible in the right place and at the right time so that we wash their hands. Soap and water must be conveniently placed next to the toilet or where food is prepared and eaten. If somebody needs to get the soap from another part of the home, then they are less likely to wash their hands at critical times (Devine, 2010).

It is more likely that people will practice handwashing if there are convenient, easy and fast ways for them to do so. Enabling products influence a person's opportunity to perform a behaviour, regardless of their ability and motivation to take action. Examples of enabling products for handwashing include:

- Handwashing station (to have water and soap in one place)
- Tippy taps (to store and regulate the flow of water)
- Soap, clean soil or ash (to clean hands)
- Soap nets, soap on a rope or soap dishes (to manage and store soap)

Enabling products need to be available both at home and in public places such as community centres, health facilities and schools. As well, the appearance of enabling products (e.g., the smell and colour of soap) can influence whether or not they will be used, so their design needs to take into account user practices and preferences (Devine, 2010; WaterAid, 2012).

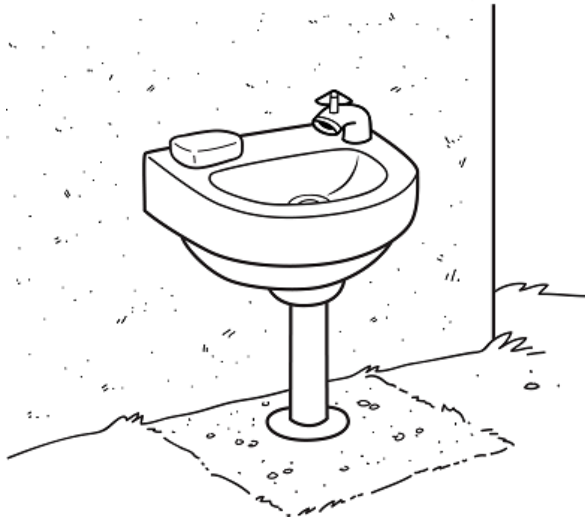
If piped water is available, an indoor or outdoor sink can be installed. The drain pipe can be connected to a sewer or a soak pit.

If no piped water is available, water should be stored in a container that will release a flow of water for handwashing, such as a bucket with a tap. Ideally, a person should be able to use the handwashing container to wash their hands by themselves. Used wash water can fall directly into a soak pit or gravel area below the handwashing container, or it can be collected in a bucket and disposed of in a garden or soak pit.



Disposing of used wash water in a soak pit

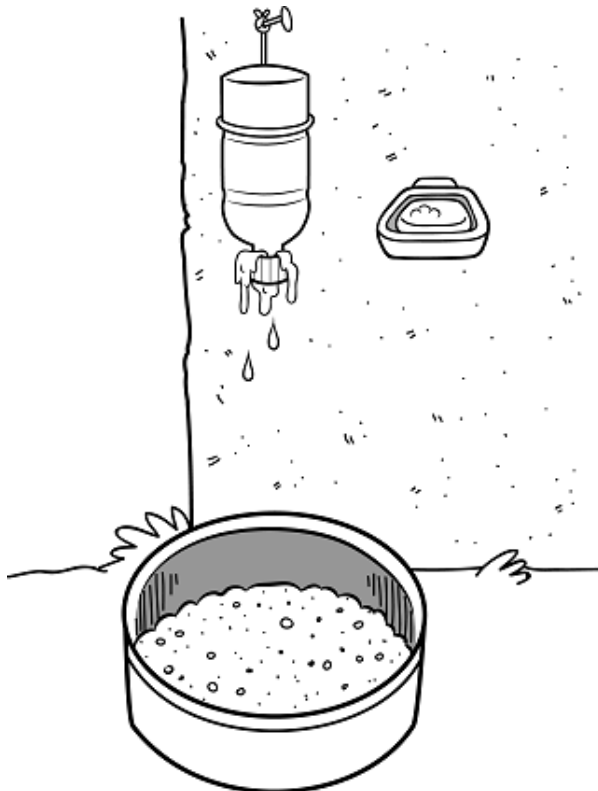
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An outdoor sink with soap. The drain pipe may go to a sewer or soak pit.



A bucket with a tap for handwashing. Used wash water is collected in a bucket below and disposed of in a garden or soak pit.



A handwashing station made from a bottle filled with water and hung upside-down. The lid can be half unscrewed to let water flow out while washing hands. Water is collected in a gravel pit below and infiltrated into the ground.



A tippy tap made from a plastic bottle or jug, with soap.

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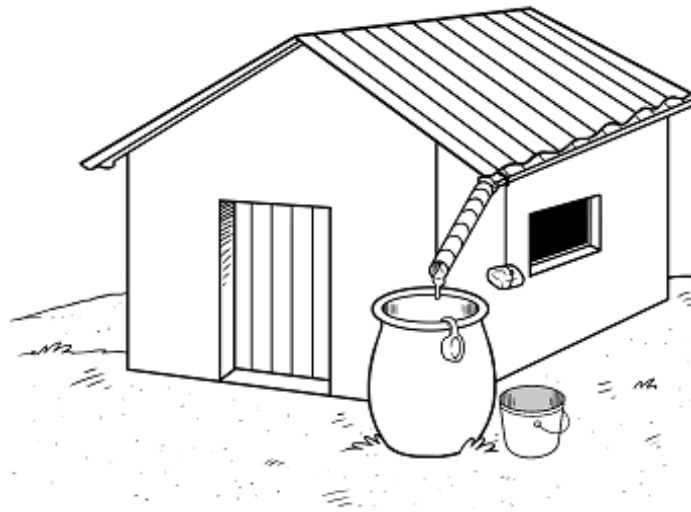
### 8 Sustainability

The Global PPPHW (2012) suggests that the definition of handwashing sustainability is that most of the population washes their hands at the most critical times as a habit (without thinking).

Many hygiene projects are effective in the short-term, but people often go back to their old habits soon after a project ends. For handwashing to become a long-term and sustainable solution you need to have an effective strategy for turning new practices into habits. An effective strategy should include the following elements:

- Finding ways to make new handwashing practices convenient and easy to do
- Making sure that people are experiencing and recognizing the benefits of the new practices
- Making sure that people have the hardware they need to wash their hands
- Eliminating any barriers that might prevent people from practicing handwashing

(Adapted from Global PPPHW, 2012)



Where rainwater is the cleanest water available, soap and a dipper can be added to create a convenient handwashing station.

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## 9 Additional Resources

**CAWST Resources.** Available at: [www.cawst.org/resources](http://www.cawst.org/resources)

- Community Health Promotion Manual: Supports community health promoters to teach and encourage healthy behaviours within communities. It discusses the theory of behaviour change and social marketing as an approach for influencing behaviour.
- Soap Making Fact Sheet: Describes the history of soap, what is soap, how it's made, and two processes to make soap.

**Choose Soap.** Available at: [www.choosesoap.org](http://www.choosesoap.org)

- Choose Soap provides you with a complete, ready-to-use handwashing campaign to promote handwashing in households in low income settings. It draws on ideas and best practices from different fields including hygiene and health promotion, behavioural sciences and marketing. You will find activity scripts, a film, and posters, stickers, and other campaign planning materials; all of which are freely available and ready for download.

**Global Public-Private Partnership for Handwashing with Soap (PPPHW).** Available at: [www.globalhandwashing.org](http://www.globalhandwashing.org)

- The Global PPPHW is a coalition of international stakeholders whose focus is handwashing and child health. Their website provides the latest resources, tools and media related to handwashing.

### Tippy Tap Resources.

- The following documents provide simple and graphic instructions on how to build a tippy tap using locally available resources:
  - How to Build a Tippy Tap Manual. Available in several languages at: [www.tippytap.org/build-a-tippy-tap-manual](http://www.tippytap.org/build-a-tippy-tap-manual)
  - How to Make a Handwashing Bottle Poster. Available at: [http://wedc.lboro.ac.uk/resources/posters/P008\\_Handwashing\\_bottle.pdf](http://wedc.lboro.ac.uk/resources/posters/P008_Handwashing_bottle.pdf)
  - Using Gourds for Handwashing Poster. Available at: [http://wedc.lboro.ac.uk/resources/posters/P009\\_The\\_Mukombe.pdf](http://wedc.lboro.ac.uk/resources/posters/P009_The_Mukombe.pdf)

**Water and Sanitation Program, Enabling Technologies for Handwashing with Soap Database.** Available at: [www2.wsp.org/scalinguphandwashing/enablingtechnologies/](http://www2.wsp.org/scalinguphandwashing/enablingtechnologies/)

- This database provide practitioners with information on various types of handwashing hardware, including purpose, benefits, key product features and specifications, pictures or illustrations, and contacts for further information.

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