

Module 9

WASH Water, Sanitation and Hygiene

Summary

Handwashing with clean water and soap is the single most effective technique to protect public and individual health. It can prevent distribution of diseases like flu, diarrhoea, hepatitis A, cholera, and etc..

1.5 million children die each year worldwide from diarrhoea. Handwashing with soap could reduce child deaths from diarrhoea by 44%. In this module, the interconnection between water, wastewater, hygiene and human health is discussed connecting new information with information of previous modules. Some historical data about WASH are given as well.

Objectives

Pupils are informed about the importance of handwashing in order to prevent of a number of health risks they might face in their every day life; they are encouraged to create the habit of handwashing; and furthermore, to inform the community about the importance of handwashing and its role to prevent diseases.

Keywords and terms

Handwashing, faecal-oral mechanism, diseases of dirty hands, private hygiene, public health, pathogens

Preparation/ material

Materials	Preparation
For the demonstration of correct technique of hand washing: sink, water, soap, towel	Check that soap and a towel are there.

WASH Water Sanitation and Hygiene

Introduction – Historical data about WASH

Looking far back into history, mankind has been making observations for a very long time about the importance of safe collection and treatment of human and animal excreta to protect public and individual health. The first hygienic toilets were used in ancient times (see pictures below).



Stone toilet found in 8th century BCE house in the City of David, Jerusalem
Source: http://en.wikipedia.org/wiki/City_of_David



Roman public toilets, Ostia Antica
Source: http://en.wikipedia.org/wiki/Ostia_Antica

We can learn about the importance of toilets and health-behaviour, for example, from museums about toilets, like in India and Germany. It might be interesting for you to know that the most sophisticated toilet was built for the spaceships. The spacecraft Soyuz had an on-board toilet facility since its introduction in 1967. In 2008 Russia sold the technology to NASA for their International Space Station for 19 million USD. The system recycles urine into water.

In some countries there are very strict taboos that prescribe specific behaviour for the protection of public and private health. In India, the left hand is the dirty hand, and the right hand is the clean hand. In Japan, it is strictly forbidden to sneeze and clean your nose in public, and hands have to be washed immediately after.

1. Hand-washing: the most important component of personal hygiene

Hands must always be washed after visiting the toilet, before processing food or drinks, and before putting anything into your mouth. Handwashing is the most important component of personal hygiene for the

prevention of public and personal health. Hands are washed with clean water and soap. Hands are first wetted with water, soaped and then intensively brushed. At the end they have to be rinsed with clean water. If absolutely clean material for drying is missing, it is better leave the hands dry by themselves. In case dirty material is used to dry the hands, handwashing does not have any positive effect.

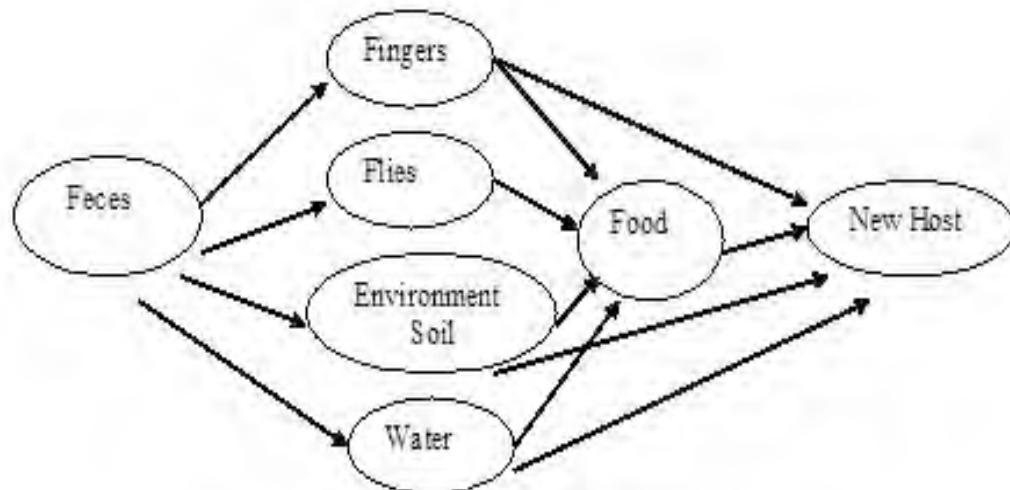
Be aware that dirty computer keyboards, door handles, and etc. might contain more microorganisms than a toilet ring of a well-maintained toilet.

Faecal-oral transmission occurs when diseases causing microorganisms found in the stool of one person or animal are swallowed by another person. This is especially common in group-day-care settings, where faecal organisms are commonly found on surfaces and on the hands of providers. See also Module 7. Usually, the contamination is invisible. Concerning some infections, such as by rotavirus, only a few viral particles (<100) are needed to cause an infection. Other infections, such as caused by salmonella, require a larger number of organisms ($>100\ 000$) to create an infection. In the absence of visible stool contamination, these infections often travel through contaminated food or beverages.

1 gramme of faeces can contain
10 million viruses
1 million bacteria
1,000 parasitic cysts
100 parasitic eggs

Box 1: Microorganisms in faeces

Source: *New Internationalist* Issue 414, 2008,



Fecal-Oral Transmission route of Pathogens

Graphic 1: Faecal-oral transmission route of pathogens

Source: *New Internationalist* Issue 414, 2008, <http://www.newint.org/features/2008/08/01/toilets-facts/>

Many common infections spread by faecal-oral transmission including: diarrhoeal diseases, Cholera, Typhoid fever, Coxsackievirus (hand-foot-mouth disease) and helminth infections. Pathogens that can be found to cause these diseases are (exemplary): Adenovirus, Campylobacter, Enteroviruses, E. coli, Giardia lamblia, Hepatitis A, Pinworms, Poliovirus, Rotavirus, Salmonella, Shigella, Tapeworms, Toxoplasma.

Well-known epidemics are, for example, E. coli in Germany (2011), Hepatitis A (Stara Zagora, 2010), the Plague in Europe in the Middle Ages.

2. Importance of eating clean food, drinking clean water and using clean water for bathing

Swimming pools and water parks can also be places where faecal-oral transmission of diseases occur. If the water is not visibly contaminated and is adequately chlorinated, getting water in the mouth is usually not enough to cause an infection; the risk is greatly increased by swallowing. Never swallow water in sea/rivers/pools and water-play areas or from irrigation pumps.

EVERYBODY'S DOIN' IT

**WASH
YOUR
HANDS**



How

- Use soap and running water
- Rub your hands vigorously for 20 seconds
- Wash all surfaces, including the back of hands, wrists, fingernails, and between fingers
- Rinse Well
- Dry hands with paper towels
- Turn off water using a paper towel instead of bare hands

When

- After coughing or sneezing
- After using the bathroom
- Before and after eating or cooking
- Before and after treating wounds
- Before and after handling shared equipment

**your health
is in your hands**

UNIVERSITY OF WINDSOR
Student Health Services

Figure 2: Instructions and suggestions about washing your hands.

Source: Students Health Services, Windsor

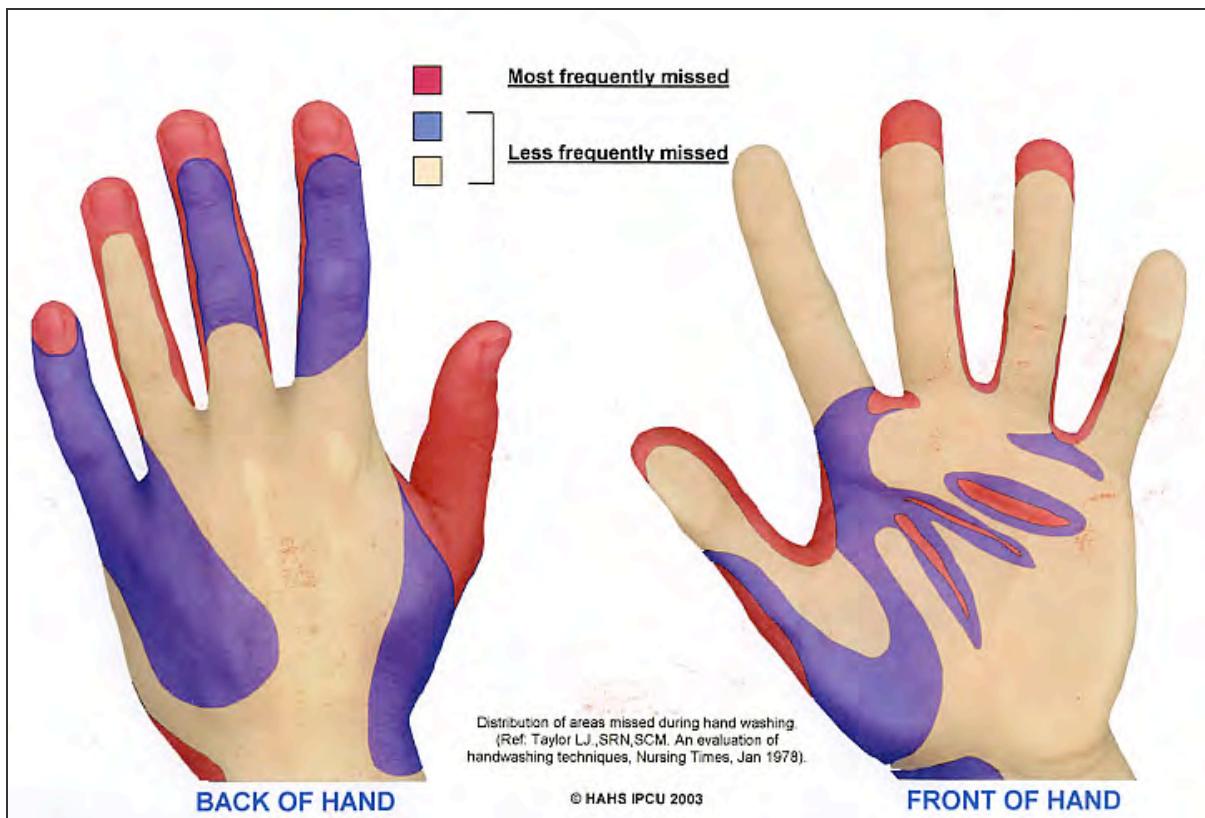


Figure 3: Illustration of areas that are most frequently and less frequently missed during handwashing.
Source: HAHS IPCU 2003

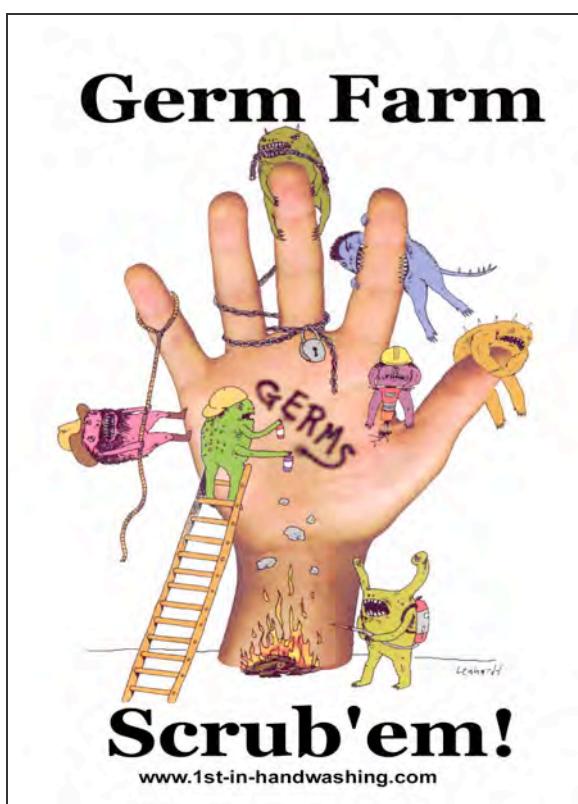


Figure 4: Comic on germs on not properly washed hands.
Source: www.1st-in-handwashing.com

3. Exercises and Questions

- Take the children to the handwashing facility in the school and show them all steps of correct hand washing. Pictures above (Figure2, 3, 4) can be copied and hung up in the class and used as a basis for further discussions.
- Meet an experienced person from the community who will demonstrate how to prepare homemade soap.
- What does the abbreviation WASH stand for?
- When are the first built toilets dated back to?
- Discuss the importance of safe water for human health. In which situations is safe water essential, and why is handwashing so important?
- Explain what is meant by the faecal-oral transmission of pathogens.
- How many bacteria, viruses, pathogenic cysts and eggs can be found approximately in 1 grammme of faeces?
- A questionnaire could be prepared together with the pupils, including the following questions:
When is handwashing day?
Why is handwashing important?
Describe the correct handwashing technique.
Which diseases are prevented by handwashing?
How many pathogens may be found on hands after using toilet?
What does the faecal-oral mechanism explain? Make a drawing of it.
What is the most important practice to prevent hepatitis A?
How many children approximately die of diarrhoea each year in the world?
What is the importance of soap?
When is it critical to wash hands?
How important is it to use clean bathing water?
Parents and other persons from the community could be invited to the presentation of the results where acquired knowledge is also demonstrated. By this, the pupils contribute to awareness raising on this topic.

WSP related activities

- Discuss if schools and other public institutions provide appropriate facilities for handwashing.
- Discuss where in the local environment pathogens are more likely to spread. What are the reasons for this and how could the situation be improved?
- Which actions could the participants take in order to raise awareness about the importance of handwashing?

4. Reference and Further reading

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