

Children's health and the environment
WHO training package for the health sector

SANITATION AND HYGIENE

TRAINING FOR HEALTH CARE PROVIDERS
THIRD EDITION



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Notes:

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- **Sanitation and hygiene** is one module from a larger training package focused on children's environmental health. Consult these other modules where relevant. Throughout **Sanitation and hygiene**, a number of different modules are suggested that contain additional relevant information. To see the full package visit: <https://www.who.int/teams/environment-climate-change-and-health/settings-populations/children/capacity-building/training-modules>;
- **Sanitation and hygiene** has a companion module titled **Water**, which covers many overlapping and relevant topics. Consult this module for relevant additions;
- the World Health Organization (WHO) reference number for the module **Sanitation and hygiene: training for health care providers, third edition** is WHO/HEP/ECH/CHE/23.11;
- for more information on WHO's work on children's environmental health, please visit: <https://www.who.int/health-topics/children-environmental-health>.

Learning objectives

- Understand the global context of sanitation and hygiene
- Describe children's special vulnerabilities to inadequate sanitation and hygiene
- Understand the consequences of poor sanitation and hygiene on children's health and development
- Recognize options for improving access to sanitation and hygiene



SANITATION AND HYGIENE

This presentation deals with the global context of sanitation and hygiene, and the effects that poor or inadequate access to sanitation and hygiene services and facilities can have on children's health and development. The learning objectives for this module are to:

- have an understanding the global context of sanitation and hygiene;
- be able to describe children's special vulnerabilities to inadequate access to sanitation and hygiene facilities;
- understand the consequences of poor access to sanitation and hygiene facilities on children's health and development;
- recognize options for improving access to sanitation and hygiene facilities.

Outline

- Magnitude of the problem
- Children's special vulnerability and exposure
- Health effects
- Interventions
- Case studies



SANITATION AND HYGIENE

Note:

When selecting the slides to include in your presentation, please choose only those of relevance to the region and/or interests of your audience.

This training module includes the following sections:

- magnitude of the problem
- children's special vulnerability and exposure
- health effects associated with poor or inadequate access to sanitation and hygiene facilities and services
- interventions at international, national and local levels for improving access to sanitation and hygiene facilities
- case studies on sanitation, hygiene and children's health.

Photo:

- © WHO / Valerie Fernandez. Deworming programme with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Outline

- Magnitude of the problem
- Children's unique vulnerability and exposure
- Health effects
- Interventions
- Case studies



SANITATION AND HYGIENE

This module begins with the global magnitude of the problem of access to adequate sanitation and hygiene services and facilities. It also discusses definitions that are relevant to this module and that are used widely across the literature.

Photo:

- © WHO / Valerie Fernandez. Deworming programme with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Definitions

SANITATION IN HOUSEHOLDS

Access to, and use of, facilities and services for the safe disposal of human urine and faeces

SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated off-site
BASIC	Use of improved facilities that are not shared with other households
LIMITED	Use of improved facilities that are shared with other households
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open places, or with solid waste

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This module uses data and definitions from the World Health Organization (WHO) and United Nations Children's Fund's (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). The definitions of sanitation, hygiene and menstrual health are relevant to this module as the service levels are referred to throughout. It is important to have an understanding of what each level means. These service levels are used as national indicators for the Sustainable Development Goals (SDGs). The SDGs will be discussed in a later slide.

The WHO defines **sanitation in households** as:

- **access to, and use of, facilities and services for the safe disposal of human urine and faeces (1).**

This slide shows the definitions of the different levels of **sanitation services**. The JMP has defined five levels of sanitation service levels:

- **Safely managed:** the use of improved facilities that are not shared with other households and where excreta are safely disposed of on-site (for example in septic tanks) or removed and treated off-site;
- **Basic:** the use of improved facilities that are not shared with other households;
- **Limited:** the use of improved facilities that are shared with other households;
- **Unimproved:** the use of pit latrines without a slab or platform, hanging latrines or bucket latrines;
- **Open defecation:** the disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open places, or with solid waste (1).

The JMP uses a similar ladder to monitor and assess the progress of sanitation in **schools**. In schools, the sanitation ladder includes three tiers:

- **Basic service:** improved sanitation facilities at the school that are single-sex and usable at the time of the survey. **Usable** refers to facilities that are available, functional and private;
- **Limited service:** improved sanitation facilities at the school that are either not single-sex or not usable at the time of the survey;
- **No service:** is unimproved or no sanitation facilities at the school premises (3).

In **health care facilities**, the JMP also uses an adjusted ladder to monitor and assess the progress of sanitation facilities. In health care facilities, the sanitation service ladder includes:

- **Higher levels of service:** which are defined at national levels;
- **Basic service:** improved sanitation facilities, with at least one toilet for staff, at least one sex-separated toilet with menstrual hygiene facilities and at least one accessible toilet for people with limited mobility;
- **Limited service:** where there is at least one improved sanitation facility available;

- **No service:** toilet services are unimproved or no services are available at all (4).

Sanitation in schools and health care facilities will be discussed in greater detail later in this section.

References:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).
2. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
3. Progress on drinking water, sanitation and hygiene in schools: 2000-2021 data update. New York: United Nations Children’s Fund and World Health Organization; 2022 (<https://apps.who.int/iris/handle/10665/360841>, accessed 22 November 2022).
4. Progress on WASH in health care facilities: 2000–2021. Geneva: World Health Organization; 2022 ([https://www.who.int/publications/i/item/progress-on-wash-in-health-care-facilities-2000-2021--special-focus-on-wash-and-infection-prevention-and-control-\(ipc\)](https://www.who.int/publications/i/item/progress-on-wash-in-health-care-facilities-2000-2021--special-focus-on-wash-and-infection-prevention-and-control-(ipc)), accessed 22 November 2022).

Figure:

- © WHO/ UNICEF. Progress on household drinking water, sanitation and hygiene 2000-2020: five years in to the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Definitions

HAND HYGIENE IN HOUSEHOLDS

Hygiene is a broad term and there is no internationally agreed-upon definition

SERVICE LEVEL	DEFINITION
BASIC	Availability of a handwashing facility with soap and water at home
LIMITED	Availability of a handwashing facility lacking soap and/or water at home
NO FACILITY	No handwashing facility at home

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There is no international-agreed upon definition of hygiene. Hygiene is a broad term that encompasses many activities. This module will discuss hand hygiene in households, schools and health care facilities, and menstrual hygiene (1).

This slide shows the definitions of the different levels of **hand hygiene** services. The Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) has defined three levels of hygiene service levels:

- **Basic:** the availability of facility at home for washing hands that has both soap and clean water available;
- **Limited:** refers to households that have a handwashing facility but lack clean water and/or soap. In some settings, sand, ash or soil are used as handwashing agents. However these are less effective than soap and are counted as limited services;
- **No facility:** refers to households that have no handwashing facility (2).

The JMP uses the same ladders to monitor and assess the progress of hygiene in **schools** (3).

In **health care facilities**, the JMP uses an adjusted ladder to monitor and assess the progress of hygiene facilities. In health care facilities, the sanitation service ladder includes:

- **Higher levels of service:** which are defined at the national level;
- **Basic service:** hand washing facilities with clean water and soap and/or alcohol-based hand rub available at all points of care and within 5 metres of all toilets;
- **Limited service:** handwashing facilities available either at points of care or toilets, but not both;
- **No service:** no handwashing facilities available at either points of care or toilets (4).

Hand hygiene in schools and health care facilities will be discussed in greater detail later in this section.

References:

1. State of the world's hand hygiene: a global call to action to make hand hygiene a priority in policy and practice. New York: United Nations Children's Fund, World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/350184>, accessed 22 November 2022).
2. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children's Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
3. Progress on drinking water, sanitation and hygiene in schools: 2000-2021 data update. New York: United Nations

Children's Fund and World Health Organization; 2022

(<https://apps.who.int/iris/handle/10665/360841>, accessed 22 November 2022).

4. Progress on WASH in health care facilities: 2000–2021. Geneva: World Health Organization; 2022 ([https://www.who.int/publications/i/item/progress-on-wash-in-health-care-facilities-2000-2021--special-focus-on-wash-and-infection-prevention-and-control-\(ipc\)](https://www.who.int/publications/i/item/progress-on-wash-in-health-care-facilities-2000-2021--special-focus-on-wash-and-infection-prevention-and-control-(ipc)), accessed 22 November 2022).

Figure:

- © WHO/ UNICEF. Progress on household drinking water, sanitation and hygiene 2000-2020: five years in to the SDGs. Geneva: World Health Organization and the United Nations Children's Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Definitions

MENSTRUAL HEALTH

Menstrual health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in relation to the menstrual cycle

Four key indicators:

1. **Awareness** of menstruation before menarche
2. **Use** of menstrual materials
3. **Access** to a private place to wash and change
4. **Participation** in activities during menstruation

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Note: menstrual health is a sensitive topic in many regions, areas and countries. Please adapt the information and language on this slide so that it is suitable, acceptable and relevant for your audience and context.

Menstrual health is a highly sensitive topic and is considered taboo in many places. However, the importance of menstrual health is increasingly being recognized and advances have been made in monitoring. A global definition of menstrual health was published in 2021 and defines menstrual health as: “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in relation to the menstrual cycle (1)”.

This definition of menstrual health was used to create four key indicators that are now used in the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). The progress report published in 2021 is the first update of the JMP to include a dedicated section on menstrual health.

The four indicators on menstrual health are:

- **awareness** of menstruation before menarche (the first occurrence of menstruation);
- **use of menstrual materials** to capture and contain menstrual blood. This can include sanitary pads, cloth, tampons or cups;
- **access to a private place** to wash and change at home;
- **participation in activities during menstruation**, including school, work and social activities (2).

Sanitation and hygiene facilities and services are essential to ensuring that girls and women can effectively and safely manage their menstruation without embarrassment or stigma. Safely managed and basic sanitation facilities can ensure that girls and women have a private place to wash and change during menstruation, and dispose of used products. Basic hygiene services and clean water allow girls and women to safely wash during menstruation, reducing the risk of some infectious diseases (3).

The JMP does not currently use a service ladder for menstrual health, as the standards and norms relating to menstrual health around the world are diverse and associated sanitation and hygiene needs are evolving (2).

Note: this training module recognizes that not everyone who menstruates identifies as a woman and that not all women menstruate.

References:

1. Hennegan J, Winkler IT, Bobel C, Keiser D, Hampton J, Larsson G et al. Menstrual health: A definition for policy,

- practice and research. *Sex Reprod Health Matters*. 2021;29 (1):31-8.
2. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
 3. Phillips-Howard PA, Caruso B, Torondel B, Zulaika G, Sahin M, Sommer M. Menstrual hygiene management among adolescent schoolgirls in low-and middle-income countries: research priorities. *Glob Health Action*. 2016;9(1):33032.

Sanitation – the global situation in 2020



Source: (3).

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In 2007, the British Medical Journal undertook a survey of more than 11 000 readers, asking them what they considered the most important medical milestone since 1840 (the year of the first edition of the British Medical Journal). Readers chose “the sanitary revolution – the introduction of clean water and sewage disposal (1)”. While many advances have been made to improve the sanitation situation worldwide, significant gaps remain and global sanitation needs are still enormous.

The Sustainable Development Goals (SDGs) were developed in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. SGD 6 measures progress towards ensuring available and sustainable management of water and sanitation for all (2).

In 2020 (five years into the SDGs), 3.6 billion people globally still lacked safely managed sanitation services. In that same year, 115 million people globally gained access to basic sanitation services at home. Progress towards achieving universally available sanitation services has not been achieved equally. The poorest countries continue to have the least access to sanitation services and facilities (3).

Despite significant developments in access to safely managed sanitation services, progress is still too slow. By 2030, at the current rate of progress, 2.8 billion people globally will still lack safely managed sanitation services at home. A significant reason for this is due to faster growth in the global population than the growth in access to safely managed sanitation services. Access to safely managed sanitation services needs to increase globally by four times the current growth rate to achieve universal access by 2020 (3).

The next slide shows the global distribution of universal access to safely managed sanitation services.

Note: for more information on child health and water please see the **Water** module.

References:

1. Ferriman A. BMJ readers choose the “sanitary revolution” as greatest medical advance since 1840. *BMJ*. 2007;334:111.
2. SDG 6: ensure availability and sustainable management of water and sanitation for all [website]. New York: United Nations (<https://sdgs.un.org/goals/goal6>, access 22 November 2022).
3. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Figure:

- © WHO/ UNICEF.

Sanitation – reporting countries



In 2020, 120 countries had estimates for safely managed sanitation services. This map shows the proportion of the population in reporting countries using safely managed sanitation services in 2020. In 2020, 54% of the global population used safely managed sanitation services and 62 countries had achieved universal access (more than 99% of the national population) to **at least basic sanitation services** (1).

We can see on this map that progress towards universal access to safely managed sanitation services has not been achieved equally. The majority of countries that have achieved universal access to safely managed sanitation services are high-income countries (HICs) and are concentrated in North America, Western Europe and Australia and New Zealand, with a few exceptions, for example Tunisia and Chile. Only eight countries are on track to achieve universal access to safely managed sanitation by 2030, all of which are HICs (1). Low- and middle-income countries (LMICs) face significant challenges in achieving universal access to at least basic sanitation services due to many factors including (2,3):

- high initial costs
- lack of resources
- infrastructure and funding issues
- geographically-diverse populations.

Significant inequalities exist between people living in **rural areas** in comparison to people living in **urban areas**. In 2020, safely managed sanitation coverage was significantly higher globally in urban areas when compared to rural areas (62% versus 44%). People living in urban slum areas often have reduced access to sanitation services (4).

In 2020, the majority of people without access to even basic sanitation services lived in **rural areas** and almost half of all these people lived in sub-Saharan Africa. However, rates of progress towards access to basic sanitation services are higher in rural areas than urban ones (1).

In some urban areas, access to safely managed sanitation services is actually decreasing as the growth of the population outpaces access to services (1).

Five broad features have been identified to ensure universal access to sanitation services (5):

1. **availability:** sufficient number of sanitation and hygiene facilities;
2. **physical accessibility:** facilities that are accessible to *everyone* on a continuous basis;
3. **quality and safety:** facilities that function and are safe for everyone to use with a particular focus on the safety of women and girls;

4. **affordability:** access to services must not undermine the ability of vulnerable and marginalized groups to pay for other essential necessities;
5. **acceptability:** sanitation and hygiene services must be culturally acceptable.

Note: find the progress towards access to safely managed sanitation services in 2020 in your country at: <https://washdata.org/>.

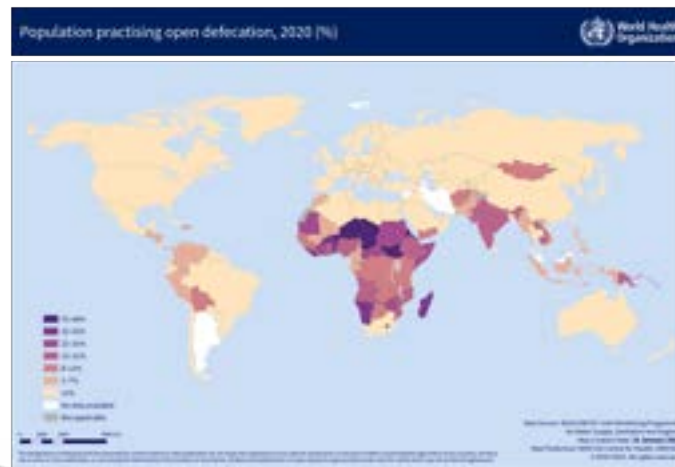
References:

1. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
2. State of the world’s sanitation: an urgent call to transform sanitation for better health, environments, economies and societies. New York: United Nations Children’s Fund and the World Health Organization; 2020 (<https://apps.who.int/iris/handle/10665/336688>, accessed 22 November 2022).
3. Hutton G, Chase C. Water supply, sanitation, and hygiene. In: Mock CN, Nugent R, Kobusingye O, Smith KR, editors. Injury Prevention and Environmental Health. 3rd ed. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017:171-198.
4. Inheriting a sustainable world? Atlas on children’s health and the environment. Geneva: World Health Organization; 2017 (<https://apps.who.int/iris/handle/10665/254677/>, accessed 22 November 2022).
5. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).

Map:

- © WHO.

Open defecation – reporting countries



In 2020, the world was on track to eliminate open defecation by 2030

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In 2020, 198 countries had data on national open defecation rates. In 2020, an estimated 494 million people globally had no access to any form of toilet and practised open defecation.

In 55 countries, more than 5% of the population practised open defecation in 2020 (1). Women and girls who practice open defecation face increased risks of sexual and physical violence. Women and girls who do not have access to a toilet, may travel long distances from their homes, increasing their vulnerability to various types of violence. Pregnant women exposed to open defecation, and who practice open defecation themselves, are at increased risk of infectious diseases that may affect maternal health, as well as the health of their unborn child (2,3).

As seen in this map, open defecation is most widespread in sub-Saharan Africa with high proportions also seen in central and southern Asia and parts of the Western Pacific Region. However, variation exists between countries in these regions, as well as between high- and low-income communities and between urban and rural contexts. **92% of people practising open defecation in 2020 lived in rural areas. In 2020, the world was on track to eliminate open defecation by 2030 (1).**

Human faeces can contain millions of pathogenic bacteria and viruses and thousands of parasite cysts or worm eggs (4). Open defecation is a major obstacle to reducing childhood mortality and morbidity from diarrhoeal diseases and soil-transmitted helminth infections (such as hookworm). Diarrhoeal diseases and soil-transmitted helminth infections will be discussed in greater detail later in this module.

Note: find the progress towards eliminating open defecation in your country at: <https://washdata.org/>.

References:

1. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
2. State of the world’s sanitation: an urgent call to transform sanitation for better health, environments, economies and societies. New York: United Nations Children’s Fund and the World Health Organization; 2020 (<https://apps.who.int/iris/handle/10665/336688>, accessed 22 November 2022).
3. Saleem M, Burdett T, Heaslip V. Health and social impacts of open defecation on women: a systematic review. BMC Pub Health. 2019;19(1):158.
4. Inheriting a sustainable world? Atlas on children’s health and the environment. Geneva: World Health Organization; 2017 (<https://apps.who.int/iris/handle/10665/254677/>, accessed 22 November 2022).

Map:

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Hygiene - the global situation in 2020



Source: (2).

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Sustainable Development Goal (SDG) 6 has eight targets. Target 6.2 aims to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030 (1).

In the five years since the adoption of the SDGs, 547 million people globally gained access to basic hygiene services at home. In 2020, an estimated 71% of the global population was covered by basic hygiene facilities. However, in 2020, 2.3 billion people globally still lacked access to basic hygiene services at home, including 670 million people globally that had no access to handwashing facilities at all (2).

Significant progress is needed to achieve universal access (more than 99%) to hygiene facilities at home by 2030. At the current rate, 1.9 billion people globally will still lack basic access to hygiene services at home in 2030 (2).

References:

1. SDG 6: ensure availability and sustainable management of water and sanitation for all [website]. New York: United Nations (<https://sdgs.un.org/goals/goal6>, access 22 November 2022).
2. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Figure:

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Hygiene – reporting countries



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In 2020, only 79 countries had available estimates for the proportion of the population with access to basic hygiene services in households. Interestingly, the majority of high-income countries (HICs), do not keep data on the availability of hygiene services at home (as is illustrated by many of the white areas shown on the map). In general, urban areas have higher rates of access to basic hygiene facilities when compared to rural areas. However, access to basic hygiene facilities is increasing faster in rural areas than urban areas (1).

At the current rate, the world is not on track to achieve universal access to basic hygiene services by 2030, and significant improvements are needed. Due to the lack of data on the availability of basic hygiene services in households, these rates of progress should be taken with caution.

Note: find progress towards achieving universal access to basic hygiene services in households in your country at: <https://washdata.org/> (please note, not all countries have available data on hygiene services in households).

Reference:

1. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Map:

- © WHO.

Menstrual health – reporting countries

- **2021: first year menstrual health data included in JMP**
- 42 countries collected nationally representative data on at least one indicator:
 - All low-and middle-income countries
 - Almost half in sub-Saharan Africa
- Only two countries collected data on knowledge of menstruation prior to menarche:
 - Cross-cutting issue
- Menstrual health is important to women and girl's:
 - General health and safety
 - Education equality
 - Economic equality

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Note: menstrual health is a sensitive topic in many regions, areas and countries. Please adapt the information and language on this slide so that it is suitable, acceptable and relevant for your audience and context.

In 2021, the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) extended its database to incorporate internationally-harmonized menstrual health indicators for the first time.

Menstrual health indicators were collected using household surveys of girls and women aged 15–49 years. These surveys were conducted by women. In 2020, there was approximately 1.9 billion people globally who fell into this group. In 2020, 42 countries collected nationally representative data on at least one menstrual health indicator (please see Slide 7 for more details on the four menstrual health indicators included in the JMP). All countries that collected data on menstrual health in 2020 were low- and middle-income countries (LMICs) and almost half were in sub-Saharan Africa (1).

Only two countries – Egypt and Bangladesh – collected girl's and women's knowledge on menstruation prior to menarche (an individual's first menstruation). Findings from these two countries suggest that a significant proportion of girls and women are unaware of menstruation prior to their first menstruation. Awareness of menstruation is considered a cross-cutting issue as it has long-term implications for sexual and reproductive health, family planning, education, and psychosocial wellbeing (1).

Menstrual health has significant impacts on women and girl's physical and psychological health and safety. Menstrual health and access to private sanitation and hygiene services, including a private place to wash and change, can also impact women and girl's ability to attend school and work, affecting educational and economical equality (2,3). This will be discussed in greater detail in a later slide.

Note: this training module recognizes that not everyone who menstruates identifies as a woman and that not all women menstruate.

References:

1. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children's Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
2. State of the world's sanitation: an urgent call to transform sanitation for better health, environments, economies and societies. New York: United Nations Children's Fund and the World Health Organization; 2020

- (<https://apps.who.int/iris/handle/10665/336688>, accessed 22 November 2022).
3. Saleem M, Burdett T, Heaslip V. Health and social impacts of open defecation on women: a systematic review. *BMC Pub Health*. 2019;19(1):158.

Health care facilities – reporting countries

SANITATION IN HEALTH CARE FACILITIES

41 reporting countries in 2021

- **780 million people** globally had no sanitation service at their health care facility
- In LDCs, only 21% of health care facilities had basic sanitation service

HYGIENE IN HEALTH CARE FACILITIES

40 reporting countries in 2021

- **Globally, half (51%)** of health care facilities had basic hand hygiene facilities
- In LDCs, only one third (32%) of health care facilities had a basic hygiene service

Sanitation and hygiene services are vital for **maternal and newborn health** and survival:

- Unclean births
- Infections
- More than 1 million maternal and neonatal deaths globally

Estimated 1 billion people in LMICs serviced by health care facilities lacking electricity

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In 2018, the United Nations (UN) Secretary-General issued a Global Call to Action to elevate the importance of and prioritize action on water, sanitation and hygiene (WASH) in all health care facilities. Health care facilities are essential tools in reducing disease, but without basic WASH, health care facilities can instead contribute to more infections, prolonged hospital stays and preventable deaths, including in mothers and newborns (1).

A systematic review published in 2011 found that in low- and middle-income countries (LMICs) an estimated 15% of patients acquired one or more infections during a typical hospital stay (2).

Access to adequate sanitation and hygiene facilities at health care facilities is vital **for maternal and newborn health**. Every year infections linked to unclean births are responsible for an estimated 26% of neonatal deaths and 11% of maternal mortalities globally. These account for more than 1 million deaths globally every year (3–5). Women who have caesarean sections are at particular risk of infection in health care facilities that do not have sanitation or hygiene services (5). **Access to at least basic levels of sanitation and hygiene services at health-care facilities is vital to reducing maternal and newborn mortality and ensuring that pregnant women and newborns receive adequate health care.**

In 2021, **780 million people** globally attended health care facilities that had no sanitation service, meaning that they had unimproved toilets or no toilet at all. In the **least-developed countries (LDC), only 21% of health care facilities in 2021** had basic sanitation services. Only **41 countries** had collected sufficient data on sanitation services in health care facilities in 2021 (6).

Regarding access to hygiene services in health care facilities in 2021 (6):

- **40 countries** had sufficient data to estimate national coverage of basic hygiene services in health care facilities;
- **half (51%) of health care facilities** globally had hand hygiene facilities at points of care, meaning functioning hand hygiene facilities available at both points of care and toilets;
- **in LDCs, only one third of health care facilities** had basic hand hygiene facilities.

Unfortunately, there is currently insufficient data available to generate global estimates for the proportion of health care facilities with basic sanitation and hand hygiene services.

Data is also collected at health care facilities on waste management and environmental cleaning. Only 65 countries and 21 countries, respectively, collected data on these two indicators in 2021 and global coverage cannot be estimated (6). Additionally, an estimated 1 billion people in LMICs in 2019 were serviced by health care facilities that

lacked electricity (7). Electricity is essential for health care facilities and is required for many basic surgical and diagnostic equipment as well as clean water supply that is essential for sanitation and hygiene services (5,8).

Sanitation and hygiene in health care facilities relates directly to Sustainable Development Goal (SDG) 6. Sanitation and hygiene in health care facilities is essential to reaching this goal as well as interdependent SDGs, including reducing maternal, newborn and child mortality rates.

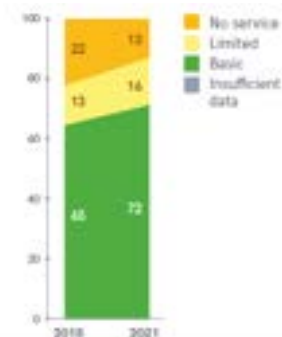
Note: least-developed countries (LDCs) are low-income countries confronting severe structural impediments to sustainable development. As of October 2022, there are 46 countries on this list (9).

References:

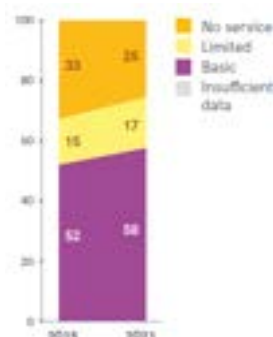
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Sanitation and hygiene in schools

Global coverage of sanitation in schools 2015–2021 (%)



Global coverage of hygiene in schools, 2015–2021 (%)



MAGNITUDE OF THE PROBLEM

SANITATION AND HYGIENE

In 2021, the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) specifically surveyed sanitation and hygiene coverage in schools. Results are shown on the slide comparing progress between 2015 and 2021 (shown on the x axis). The y axis of the graph shows the percentage of reporting schools with sanitation or hygiene coverage.

Children spend a large proportion of their time at school; ensuring adequate sanitation and hygiene in these environments is critical to their health and safety. Appropriate sanitation and hygiene facilities at schools is also essential to ensuring that girls and adolescents who are menstruating can attend school in a safe, respectful and dignified manner. Ensuring appropriate sanitation and hygiene facilities for girls and young women may ensure their attendance at school increases (1).

Global school sanitation coverage:

In 2021, **123 countries, covering 60% of the global school-age population**, had data covering accessibility to sanitation services at school. **72% of schools** had basic sanitation services at school, meaning they had an improved single-sex services. In 2021, **539 million children globally** still lacked access to basic sanitation services at school, **including 240 million children globally at schools with no sanitation service at all**. Coverage of sanitation at schools varied widely between the different regions and countries. For example in 2021 estimates found that (2) :

- **more than 99% of schools in Australia and New Zealand, Europe and North America** had basic sanitation services;
- **only 44% of schools in sub-Saharan Africa and 48% of schools in Oceania** had basic sanitation services. These numbers remain unchanged since 2015.

Global school hygiene coverage:

In 2021, **121 countries, covering 57% of the global school-age population**, had data covering accessibility to hygiene services at school. **58% of schools** had basic hygiene services at school, meaning handwashing facilities with soap and water. In 2021, **802 million children globally** still lacked a basic hygiene service at their school, including **480 million children globally at schools with no hygiene service at all**. Coverage of hygiene services at schools varied widely between the different regions and countries. For example in 2021 estimates found that (2):

- **100% of schools in Australia and New Zealand** had basic hygiene services;
- **only 18% of schools in Oceania** had basic hygiene services. This number remains unchanged since 2015.

References:

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Inequities within high-income countries

Vulnerable and marginalized groups have consistently lower access to adequate sanitation and hygiene services:

- Indigenous populations
- Rural communities
- Low-income communities
- Refugee and migrant groups
- People experiencing homelessness
- People with disabilities
- Ethnic minority groups



Children within these groups are especially vulnerable

MAGNITUDE
OF THE PROBLEM

SANITATION AND HYGIENE

While access to at least basic sanitation and hygiene services is generally high across high-income countries (HICs), inequities still remain. In particular, vulnerable and marginalized groups in HICs have consistently lower access to adequate sanitation and hygiene services (1).

These groups, their specific needs and the barriers to accessing adequate sanitation and hygiene services differ within and between HICs. Vulnerable and marginalized groups may include:

- **indigenous populations:** for example, children living in some remote indigenous communities in Australia have significantly higher rates of some infectious and parasitic diseases associated with inadequate access to adequate water, sanitation and hygiene services, when compared to non-indigenous communities (2,3);
- **rural communities:** may have reduced access to adequate sanitation and hygiene services compared to urban communities, which may be associated with small and geographically dispersed populations, and the high initial costs of providing sufficient and adequate service. A study conducted in the Republic of Korea found that rural areas have a lower rate of sewerage connection than urban areas (4);
- **low-income communities:** may have reduced or no access to safely managed sanitation and hygiene due to lack of economic means to pay for and maintain services. Research conducted in urban areas of the United States of America has found that functioning water and sanitation facilities are not universal in low-income housing units (5);
- **refugee and migrant groups:** may experience reduced access to adequate sanitation and hygiene facilities as institutions that they rely on, for example camps or centres for displaced persons, may have inadequate, insufficient or inappropriate services, resources and funding. Undocumented migrants and refugees may experience additional difficulties accessing adequate sanitation and hygiene services (6);
- **people experiencing homelessness:** may have limited or no access to safe sanitation and hygiene facilities. For example, in the United States of America during the period 2017–2018, a nationwide outbreak of hepatitis A was linked to inadequate access to safe sanitation services for people experiencing homelessness (5);
- **people with disabilities:** may experience decreased access to adequate sanitation and hygiene facilities as services are often not designed to meet their physical needs (1);
- **ethnic minority groups:** may face historic and continued social exclusion that is associated with poorer access to sanitation and hygiene services. For example, in Europe, Roma communities, the region's largest ethnic minority, face more challenges than the majority population in accessing adequate water, sanitation and hygiene services. These challenges are linked to social exclusion, poverty, geography and distinct health beliefs. In some countries in the European Region, poor sanitation and hygiene living conditions have been used as grounds to evict Roma communities from housing (7).

Children within these groups are especially vulnerable to diseases spread through inadequate sanitation and hygiene and services.

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Photo:

- © WHO/ Malin Bring. Rural village scene showing a small house in poor condition next to a trash dumpster with much trash littering the landscape and stream and people in the background, Romania.

Outline

- Magnitude of the problem
- Children's unique vulnerability and exposure
- Health effects
- Interventions
- Case studies



SANITATION AND HYGIENE

The next second of the module discusses children's unique vulnerabilities and routes of exposure to contaminants associated with poor or inadequate access to sanitation and hygiene facilities.

Photo:

- © WHO / Valerie Fernandez. Deworming program with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Children's unique vulnerabilities

- Different and unique exposures:
 - Maternal exposure during pregnancy
 - Stature and outdoor play
 - Hand-to-mouth and object-to-mouth behaviours
- Developmental physiology:
 - Anabolic, rapidly growing
 - Developmental physiology
 - Windows of vulnerability
 - Cognitive immaturity
- Longer life expectancy
- Dependent upon adults



CHILDREN'S UNIQUE
VULNERABILITY & EXPOSURE

SANITATION AND HYGIENE

As with many environmental hazards, children are often at increased risk from poor or inadequate access to sanitation and hygiene services and facilities.

Children have **different and unique exposures** to sanitation and hygiene risks. Research has found that poor or inadequate access to sanitation facilities and practices during pregnancy may be linked to adverse birth outcomes. Pregnant women with poor or inadequate access to sanitation and hygiene facilities are more likely to be exposed to infectious diseases that can cause complications to maternal health, as well as to the health of the fetus (1,2). Health care facilities without safe sanitation or hand hygiene facilities increase the risk of maternal and newborn sepsis and mortality (3,4).

Children are closer to the ground, putting them in closer proximity to contaminated soil and water, and faeces from open defecation or poorly managed toilets. For instance, small children spend more time on the ground, and thus may be forced to crawl or play around contaminated soil and water. Children tend to spend more time outdoors than adults, engaging in sport and play. If a sports ground, school, community or play areas are close to contaminated water, inadequate toilet facilities or open defecation, children may be exposed to high levels of biological or chemical contaminants. Young children are also likely to put their hands, toys or other items in their mouths – increasing their risk of ingesting infectious contaminants in the soil, water or transferred from their own hands or surfaces. Children with pica are at even higher risk (5).

Due to their **developmental physiology** children are often subjected to higher exposures of contaminants from poor sanitation and hygiene practices. Poor access to sanitation and hygiene facilities is strongly linked to contaminated water, soil and foods, as well as body parts such as hands and faces. Because they are anabolic and rapidly growing, children ingest more food and water relative to their size than adults. Consequently, children have higher intakes of biological or chemical contaminants relative to their size than adults. In terms of developmental physiology, children have immature immune and respiratory systems, which may be less equipped to handle foreign contaminants and may lead to more serious illness. Children are going through windows of vulnerability that, if disrupted, may cause irreversible and lifelong harm. For example, children who have episodes of persistent diarrhoea are more likely to suffer from undernutrition, deficiencies in essential nutrients, stunting and wasting, which may affect a child for the rest of its life (5,6).

Children are cognitively immature and may not be able to recognize the dangers of poor or inadequate sanitation and hygiene facilities. Children may not be able to recognize areas that are contaminated with biological or chemical contaminants, for example land or water that have been used for open defecation. Children often put their hands in

their mouths or touch their faces without washing them first, including after using the toilet, without understanding that the contaminants that may be found on them can cause the onset and spread of illness (5,6).

Children have **longer life expectancies** than adults and have longer to live with damage and disease associated with sanitation and hygiene hazards, which may manifest in childhood or later in life. Some illnesses associated with poor or inadequate access to sanitation and hygiene facilities, such as trachoma and diarrhoeal diseases, may be linked to lifelong health consequences and decreased quality of life (3,5).

Children are **dependent upon adults** to keep them safe from sanitation and hygiene hazards. Children rely on the adults in their lives to provide them with access to safe sanitation and hygiene facilities at home, in schools and in the community. The youngest children are unable to appropriately wash themselves and rely on adults to do so for them. Children also rely upon adults to remove unsafe sanitation and hygiene hazards, or remove them from dangerous situations. Children have little political voice or advocacy and rely upon adults to ensure that their sanitation and hygiene needs are provided for, and their environments are protected, through local and national government action and policies (5).

Note: for more information on children’s vulnerabilities please see the ***Children are not little adults*** and ***Why children*** modules.

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Photo:

- © WHO. WHO staff disseminating messages on healthy practices and hygiene measures to control the cholera outbreak and curb the spread of the disease, Syrian Arab Republic.

Children's exposure scenarios

- **Poor or inadequate access to sanitation and hygiene facilities**

leads to contamination of:

- Water
- Soil
- Food
- Objects and surfaces (cooking utensils, toys, clothes)
- Hands, feet, face
- Some insects



CHILDREN'S UNIQUE
VULNERABILITY & EXPOSURE

SANITATION AND HYGIENE

Poor or inadequate access to sanitation and hygiene facilities leads to the contamination of the **environment** which children rely upon to lead happy and healthy lives.

Poor or inadequate access to sanitation and hygiene facilities can cause pathogens from human excreta (both faeces and urine) and chemical agents, such as antimicrobial residues, to contaminate (1,2):

- **Water:** including drinking water and water sources used for bathing, washing, irrigation and playing. Children may be exposed to contaminated water at home, school or during play;
- **Soil:** found in backyards, community and school areas, and used for growing food and grazing animals. Children may be exposed to contaminated soil during many daily activities including playing, washing, contributing to household chores or agricultural activities. Children who do not wear shoes and preambulatory, crawling children are at particularly high risk;
- **Food:** that is grown or washed in contaminated soil or water may expose children to pathogens or chemicals. Additionally, if there is inadequate hygiene facilities, contamination from unclean hands can be passed onto food items;
- **Objects and surfaces:** including cooking utensils, toys and clothes may be contaminated if they come into contact with unclean hands or faces, water, soil or by direct contact with human excreta;
- **Hands, feet and face:** can all carry pathogens via direct contact with excreta, lack of access to hygiene services or through contact with the above detailed environmental media and items. Children who do not wear shoes, preambulatory, crawling children and toddlers who are going through normal hand-to-mouth exploratory behaviours are at particularly high risk to exposure from contaminated hands, feet or face;
- **Some insects:** such as flies, cockroaches and mosquitos that feed on, or breed in, human excreta can carry pathogens on their bodies or in their gut.

Note: for more information on children's exposure to contaminated water, please see the **Water** module.

References:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).
2. Etzel RA, editor. Pediatric environmental health, 4th edition. Itasca: American Academy of Pediatrics; 2019.

Photo:

- © WHO/ Diego Rodriguez. A kid pours over his feet the remaining water of his jar after defecating behind the bushes, Mahim, Mumbai, India.

Children's routes of exposure

- Primary route of exposure is **ingestion**
- **Direct transmission**
 - Contaminated food and water
- **Indirect transmission:**
 - Contaminated hands, feet, objects
- Exposure can also occur through **inhalation and dermal contact:**
 - Contaminated water and soil



CHILDREN'S UNIQUE
VULNERABILITY & EXPOSURE

SANITATION AND HYGIENE

Children's primary route of exposure to excreta-related pathogens or chemicals from poor or inadequate access to sanitation and hygiene facilities is via **ingestion**.

Ingestion of pathogens or chemicals can occur through (1):

- **direct transmission** by drinking contaminated water and eating contaminated foods; or
- **indirect transmission** via mouthing hands, feet or objects, such as toys, that have contaminated soil or dust or that have been directly contaminated with pathogens or chemicals. Children may also be exposed to contaminants on the hands of parents or carers who may not be able to wash their hands.

Children can also be exposed to pathogens via **inhalation**. Faeces-contaminated water may become aerosolized through spraying, flushing or washdown activities. Contaminants present may then be inhaled through the nose or mouth (2).

Dermal contact with contaminated soil and water sources is another concern for children. Some parasitic organisms, such as soil-transmitted helminths, that are present in the faeces or urine of infected humans can penetrate the skin, thereby infecting a new host (2).

Note: for more information on children's routes of exposure to contaminated water please see the **Water** module.

References:

1. Children are exposed to fecal contamination via multiple interconnected pathways: a network module for exposure assessment. Risk Anal. 2018;38(11):2478-96.
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Photo:

- © WHO/Anna Kari. Children playing and swimming in the sea surrounding a slum area, Manila, the Philippines.

Transmission of excreta-related pathogens



This figure shows the transmission pathways of excreta-related infections from left to right. The purpose of this figure is to highlight the role of safe sanitation as a primary barrier to disease transmission. It shows the way in which unsafe management at each step of the sanitation chain can spread human excreta into the environment. The figure also illustrates transmission routes other than ingestion and shows the complex ways in which different sanitation and hygiene hazards are interrelated (1).

From left to right (1):

1. an **infected human host can excrete** pathogens, such as bacteria and parasites, via faeces and urine;
2. **sanitation hazards** can cause pathogens present in faeces or urine to spread widely into the environment. Sanitation hazards include:
 - a. **unsafe, non-existent or unused toilets and open defecation practices;**
 - b. **unsafe containment**, including storage and treatment, of sewerage and human excreta;
 - c. **unsafe transportation** of sewerage and human excreta;
 - d. **unsafe off-site treatment** of sewerage and human excreta;
 - e. **unsafe disposal** of sewerage and human excreta;
3. Sanitation hazards can lead to **hazardous events** when the environment is contaminated with sewerage and human excreta. Hazardous events include:
 - a. **flies and other insects**, which can spread contamination **to food, humans, objects and surfaces;**
 - b. **animals**, which may spread contamination around **fields, soil and onto humans;**
 - c. **water bodies**, contaminating water sources used for **drinking, washing and playing;**
 - d. **fields**, which may contaminate **crops and humans;**
 - e. **ground water**, which may contaminate **soil, crops and some drinking water sources;**
4. Sanitation hazards and hazardous events in the environment lead to **human exposure** via ingestion, inhalation or dermal routes and cause **the spread of disease**.

Note: the figure on this slide may be read both horizontally and vertically, taking into account the potential interaction between different hazardous events to form complex or indirect pathways. For more detail on this figure visit reference (1).

Note: for more information on water contamination and child health outcomes please see the **Water** module.

Reference:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018

(<https://apps.who.int/iris/handle/10665/274939/>, accessed 22 November 2022).

Figure:

- © WHO. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939/>, accessed 22 November 2022).

Examples of common excreta-related pathogens

BACTERIAL	VIRAL	PARASITIC
<i>Chlamydia trachomatis</i>	Astroviruses	<i>Cryptosporidium</i>
<i>Escherichia coli</i>	Enteroviruses	<i>Giardia intestinalis</i>
<i>Salmonella</i>	Hepatitis A virus	Hookworm
<i>Salmonella typhi</i>	Noroviruses	Roundworm
<i>Shigella</i>	Poliovirus	Whipworm
<i>Vibrio cholerae</i>	Rotaviruses	<i>Schistosoma</i>

- There are many pathogens that pose health threats to children globally
- Importance of individual pathogens differs from context-to-context

CHILDREN'S UNIQUE
VULNERABILITY & EXPOSURE

SANITATION AND HYGIENE

Human excreta, both faeces and urine, can contain many different pathogens. These fall into three groups: bacterial, viral and parasitic.

This slide gives some examples of common bacterial, viral and parasitic pathogens that cause diseases in children and which are spread through poor or inadequate access to sanitation and hygiene. The relevance and importance of individual pathogens differs from context-to-context.

Bacterial examples include (1,2):

- *Chlamydia trachomatis* – causing trachoma, a bacterial infection in the eye;
- *Escherichia coli* (*E. coli*) – are common bacteria, naturally found in the human gut. Some strains of *E. coli* can cause disease in humans and are significant causes of diarrhoea globally;
- *Salmonella* – causing salmonellosis, which presents with a range of symptoms varying in severity;
- *Salmonella typhi* – causing typhoid fever;
- *Shigella* – are common bacteria and can cause a variety of diarrhoea diseases varying in severity;
- *Vibrio cholerae* – causing cholera, often in community-wide outbreaks.

Viral examples include (1,2):

- Astroviruses – some of the most common causes of childhood diarrhoea;
- Enteroviruses – which covers a large number of viruses with an array of clinical symptoms;
- Hepatitis A virus – causing acute, self-limiting hepatitis;
- Noroviruses – major causes of gastroenteritis outbreaks in all age groups;
- Poliovirus – a type of enterovirus causing poliomyelitis (polio);
- Rotaviruses – major causes of acute gastroenteritis in infants globally.

Parasitic examples include both **protozoa** (large, complex and single-cell organisms which cannot replicate outside the human body) and **helminths** (complex, multi-cellular organisms and often known as parasitic worms) (1,2):

- *Cryptosporidium* (protozoa) – one of the most common global causes of childhood diarrhoea;
- *Giardia intestinalis* (protozoa) - the most common protozoan, a gastrointestinal pathogen and a common cause of diarrhoea;
- Hookworm (helminth) – largely asymptomatic but can cause chronic health conditions;
- Roundworm (helminth) – one of the most common helminth infections in humans and can lead to chronic health conditions;
- Whipworm (helminth) – often asymptomatic but can lead to a variety of health issues, especially with heavy

infection;

- Schistosoma (helminth) – can lead to a number of acute and chronic illness, varying in severity.

References:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).
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Outline

- Magnitude of the problem
- Children's special vulnerability and exposure
- **Health effects**
- Interventions
- Case studies



SANITATION AND HYGIENE

The next section of the module discusses health effects in children associated with poor or inadequate access to sanitation and hygiene facilities.

Photo:

- © WHO / Valerie Fernandez. Deworming program with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Sanitation, hygiene and health effects

Diarrhoeal diseases

Neglected tropical diseases

Menstrual health and hygiene

Other serious health conditions



HEALTH EFFECTS

SANITATION AND HYGIENE

Children cannot be healthy without access to adequate sanitation and hygiene facilities. One gram of human faeces can contain millions of pathogenic bacteria and viruses, and thousands of parasite cysts or worm eggs. Inadequate sanitation, including open defecation, may contaminate water sources and environments where children live, play and learn, and cause repeated infections which can hamper their nutritional status, growth and development (1).

Lack of sanitation is a critical determinant in the contamination of drinking-water with pathogens. Excreta-related contamination of drinking-water can lead to bacteria, viral and parasitic transmission causing a number of **diarrhoeal diseases** (2).

Several **neglected tropical diseases** are also spread by poor sanitation and hygiene. Intestinal worms and schistosomiasis are spread through faeces from an infected person that have contaminated soil and water. Trachoma is spread through personal contact with discharge from the eyes or nose of those infected (2).

Poor or inadequate sanitation and hygiene also affects **menstrual health** (3).

Finally, poor sanitation and hygiene can lead to other serious conditions including hepatitis A and polio (4). These diseases will be discussed in greater detail in the next slides.

References:

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Photo:

- © WHO / Diego Rodriguez. Women washing clothes in a canal, India.

Diarrhoeal diseases

- Significant progress has been made on reducing global childhood mortality due to diarrhoeal diseases
- **In children under 5 years in 2019:**
 - Estimated 484 000 deaths globally
 - Highest burden in the African Region

Poor access to sanitation and hygiene facilities contributes significantly to incidence of diarrhoeal diseases

HEALTH EFFECTS

SANITATION AND HYGIENE

Significant progress has been made in reducing mortality linked to diarrhoeal disease in recent years. Global deaths associated with diarrhoeal disease have fallen dramatically in children under the age of 5 years, decreasing from approximately 1.2 million in 2000 to an estimated 484 000 in 2019, due to improvements in water, sanitation and hygiene, along with better case management and treatment (1,2). The African Region accounts for the highest burden of under 5 mortality due to diarrhoea, accounting for 68.8% of global deaths in this age group in 2019 (2).

In 2016, diarrhoeal diseases attributable to the environment caused about 5% of deaths in children under the age of 5 years globally, making them the second leading environmental cause of death in that age group in that year (3). Many cases of diarrhoea are caused by faecal-oral pathogens, meaning that much of this burden can be prevented through environmental modifications. In children under 5 years, 62% of the global disease burden due to diarrhoeal diseases was attributable to the environment in 2016 (3). The World Health Organization (WHO) estimated that in 2016, children under 5 lost almost 28 million disability-adjusted life years (DALYs) globally due to preventable diarrhoeal diseases. In that same year, an estimated 297 000 children under the age of 5 globally lost their lives due to diarrhoeal diseases that could have been avoided with safe water, sanitation and hygiene facilities (3,4).

Research has found that interventions that improve access to sanitation and hygiene facilities can effectively reduce diarrhoeal morbidity in children (5). There is strong evidence that handwashing at two key moments – after defecation and before preparing food – is key to reducing prevalence of diarrhoeal diseases (5). Implementing safely managed sanitation and hygiene facilities will significantly reduce the burden of disease from diarrhoea.

The following two slides will discuss in greater detail some of the most common diarrhoeal diseases and some of the short- and long-term health effects they can have on children.

Note: for more information on child health, diarrhoea and water please see the **Water** module.

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Diarrhoeal diseases

Diarrhoea is the passage of three or more loose or liquid stools per day

Three clinical types of diarrhoea:

1. Acute watery
2. Acute bloody (dysentery)
3. Persistent (14 days)

Common diarrhoeal diseases:

- Cholera
- Salmonellosis
- Typhoid

Diarrhoeal diseases are caused by many bacterial, viral and parasitic organisms

HEALTH EFFECTS

SANITATION AND HYGIENE

Diarrhoea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual) (1).

Diarrhoea is usually a symptom of an infection of the intestinal tract and may be caused a variety of bacterial, viral and parasitic pathogens (see Slide 22 for some common examples). These pathogens are usually spread through excreta-contaminated food, water, soil, body parts such as hands, some insects or person-to-person due to poor access to hygiene and sanitation facilities. Children, especially those who are malnourished or with impaired immunity, are at high risk of diarrhoeal diseases (1).

There are three clinical types of diarrhoea:

1. acute watery diarrhoea
2. acute bloody diarrhoea, also known as dysentery
3. persist diarrhoea, lasting for 14 days or more (1).

Some common diarrhoeal diseases include the following:

- **Cholera** is a bacterial, diarrhoeal disease that is spread widely across the world. It is spread through contaminated food and water and passed through the faeces of infected people. It can quickly spread through communities with poor access to sanitation and hygiene facilities, resulting in cholera outbreaks. In many people it may present with few, mild symptoms. However, those who have severe cholera may develop acute diarrhoea that can quickly lead to death within hours due to rapid dehydration if left untreated (2). In 2022, 30 countries report cholera cases of outbreaks, mainly in the World Health Organization (WHO) Regions of Africa and the Eastern Mediterranean. The global burden of cholera is largely unknown as the majority of cases are not reported. Studies have estimated that 2.9 million cases and 95 000 deaths occur annually (3). Incidences of cholera are highest in children under the age of 5 years. Some estimates have suggested that half of all global cases and deaths from cholera occur in children under 5 years of age (4).
- **Salmonellosis** is caused by non-Typhoidal *Salmonella* bacteria. *Salmonella* is a hardy bacteria that can survive in water for months and is ubiquitous in the environment. It is widely spread through the food chain and is commonly found in food animals (for example, chickens). The primary route of human exposure to *Salmonella* is through consumption of contaminated food from animals. However, other routes of exposure may include consumption of contaminated water or vegetables and contact with infected animals or faeces. Salmonellosis is characterized by fever, abdominal pain, diarrhoea and sometimes vomiting. While the majority of *Salmonella* cases are mild and do not require treatment, some cases can be severe and life-threatening, requiring antimicrobial therapy and intravenous rehydration. Severe cases are most likely to affect young children and the

elderly (5).

- **Typhoid** is a severe and life-threatening infection caused by a specific *Salmonella* bacteria (*Salmonella Typhi*) that lives only in human intestines and bloodstreams. It is passed through food and water contaminated with infected faeces. Outbreaks of typhoid are strongly linked to inadequate sanitation and hygiene facilities and a lack of safe drinking water. Symptoms of typhoid include high fever, headache, abdominal pain and diarrhoea. Even after recovering from typhoid, people can continue to carry the bacteria and infect others (6). In 2019, approximately 110 000 people globally died from typhoid, including more than 18 000 children under the age of 5 (7). Typhoid outbreaks occur predominantly in low- and middle-income countries (LMICs) and especially in areas where sanitation and hygiene facilities are inadequate (8).

These are only three of the most common diarrhoeal diseases. Many other bacteria, viruses and parasites can cause diarrhoeal diseases that can lead to serious, life-threatening illness in children.

Note: if a particular diarrhoeal disease is common in your community, country or region, use this slide to discuss this disease in greater detail.

Note: WHO has developed several resources that are useful for the management of childhood diarrhoeal including:

- The treatment of diarrhoea: a manual for physicians and other senior health workers (9)
 - First steps for managing an outbreak of acute diarrhoea (10)
 - Acute diarrhoeal diseases in complex emergencies: critical steps (11).
- Additionally, Integrated Management of Childhood Illness (ICMI) has created a set of distance learning modules, including one dedicated to managing, treating and preventing diarrhoea (12).

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Diarrhoeal diseases – health effects

- Dehydration
- Malnutrition
- Stunting
- Wasting
- Anaemia



HEALTH EFFECTS

SANITATION AND HYGIENE

In low-income countries, children may experience on average three episodes of diarrhoea every year during the first three years of life (1). This regularly deprives children of nutrients that are essential for healthy growth and development. Acute and persistent diarrhoea can have significant effects on child health, which may have lifelong impacts.

Some health effects in children due to diarrhoea diseases include:

- **Dehydration** is the most direct and common effect of diarrhoea. It is a significant cause of child death due to diarrhoea. Children who develop persistent diarrhoea (diarrhoeal episodes of more than 14 days duration) have an increased risk of dehydration and death (2).
- **Malnutrition:** diarrhoea is harmful to the nutritional status of children and may lead to childhood malnutrition. Malnutrition affects immune function and impairs gut structure and function. This leads children to be more susceptible to infectious diseases (3). Childhood nutritional status may be affected by the length, severity and number of diarrhoeal episodes (4). Additionally, children who are malnourished are more likely to experience more frequent and severe incidences of diarrhoea. This can lead to a cycle of repeated diarrhoeal disease and malnutrition (5). Early childhood malnutrition, especially during the first two years of life, can affect a child's normal growth and development, causing stunting, wasting and anaemia, and impacting them for the rest of their lives. The African and South-East Asia Regions carry the greatest burden of stunting and wasting in children under the age of 5 (6).
- **Stunting:** in 2020, stunting affected an estimated 149.2 million children under the age of 5 globally, or 22% of the world's under 5 population. Stunting is the result of poor nutrition *in utero* and/ or during early childhood, especially during the first 2 years of life (6). Stunting that occurs **after** the first 2 years of life is generally considered to be irreversible (3). Children who suffer from stunting may never reach their full possible height and may have impaired cognitive development, perform poorly in school, are more likely to develop noncommunicable diseases (NCDs) later in life and are more likely to have poor economic outcomes. In 2011, an estimated 13.5% of global stunting in children under the age of 5 was attributed to diarrhoeal diseases (7).
- **Wasting:** in 2020, wasting affected 45.2 million children under the age of 5 globally, or 6.7% of the world's under 5 population (6). Wasting in children is due to a combination of poor maternal and childhood nutrition, access to safe water, sanitation and hygiene facilities, infectious diseases including diarrhoea, and poverty. Diarrhoea contributes to wasting in children by triggering muscle and weight loss due to inadequate intake and retention of essential nutrients. Children who suffer from wasting may experience weakened immunity and developmental delays. Weakened immune systems place wasted children at higher risk of contracting infectious diarrhoeal diseases (8). Childhood wasting is a leading risk factor in childhood mortality and morbidity due to diarrhoea (9).
- **Anaemia:** a condition in which the number of red blood cells, or the haemoglobin concentration within them, is

lower than normal. In 2019, 39.8% of children globally aged 6–59 months were affected by anaemia. The African Region has the highest burden of anaemia – 60.2% of children aged 6–59 months in the Region were affected in 2019. Anaemia causes dizziness, weakness, fatigue, shortness of breath and is linked to poor educational outcomes in children (10,11). Studies completed in sub-Saharan Africa have found that diarrhoeal diseases are a significant risk factor in childhood anaemia (12).

Note: find the prevalence of stunting and wasting in your country or region at:

<https://www.who.int/data/gho/data/themes/topics/joint-child-malnutrition-estimates-unicef-who-wb>.

Note: find the prevalence of anaemia in your country or region at:

https://www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children.

Note on terminology: stunting is defined as a child whose length/height is low for their age by 2 or more standard deviations below the population standard average. **Severe stunting** is 3 or more standard deviations below the population standard average. **Wasting** is defined as a child whose weight is low for their length/height by 2 or more standard deviations below the population standard average. **Severe wasting** is children whose weight is low for their height by 3 or more standard deviations below the population standard average (13).

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Photo:

- © WHO/ Ala Kheir. A child has her upper mid-upper arm circumference measured to identify whether she is at risk of malnutrition, Sudan.

Neglected tropical diseases – soil-transmitted helminth

- Caused by parasitic worms
- More than 900 million children globally at risk in 2021
- Pregnant women, children are at high risk
- **Linked to:**
 - Adverse birth outcomes
 - Diarrhoea
 - Anaemia
 - Malnutrition
 - Poor weight gain
 - Impaired development

Effective, preventative treatment is available

HEALTH EFFECTS

SANITATION AND HYGIENE

Soil-transmitted helminth (STH) infections are caused by different species of parasitic worms that live in the intestinal track of infected humans. They are transmitted by eggs, which are present in the faeces of infected humans, through open defecation and poor or inadequate sanitary services. Parasitic worms can produce thousands of eggs per day, which are then released in faeces. The most common types of parasitic worms are (1):

- roundworm
- whipworm
- hookworm.

In situations where open defecation occurs or there is poor or inadequate sanitation services, eggs can contaminate parts of the body, especially hands and nails, food, water and soil. Susceptible people are then infected through ingestion or penetration of the skin (1). STH infections are widely distributed across tropical and subtropical regions of the world, are endemic in some countries and are a cause of substantial morbidity. The majority of cases occur in the African and South-East Asia Regions (2).

Pregnant women, pre-school and school-aged children are at high risk of infection. In 2021, preventative chemotherapy was required for STH infections in 91 countries (1). In 2021, more than 900 million pre-school and school-aged children globally required preventative chemotherapy for STH infections. However, only 56% of children globally requiring treatment were estimated to have received it in 2021 (1). In 2021, pre-school and school-aged children in India made up a significant proportion of the estimated global population requiring preventative chemotherapy for STH infections (more than 330 million) (1,3).

While mortality rates due to STH are low, morbidity is substantial (1). STH infections are linked to a number of health effects in children including (4,5):

- diarrhoea
- anaemia
- malnutrition
- slow weight gain
- impaired development.

In pregnant women, STH infections may cause anaemia and adverse birth outcomes. A study conducted in Benin found that STH infections during pregnancy were associated with pre-term birth and low birth weight. These adverse birth outcomes were also linked to poor emotional development in children (6).

Effective treatments for STH infections are available. Effective and preventative chemotherapies are available and are recommended in pre- and school-aged children in high-risk countries (1,2).

Note: find the estimated number of pre-school and school-aged children requiring preventative STH chemotherapies in your country or region here:

https://apps.who.int/neglected_diseases/ntddata/sth/sth.html.

References:

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Neglected tropical diseases - schistosomiasis

- 253.1 million people globally at risk in 2021:
 - 137 million children
 - 91% in the African Region
- Treatment required in 51 countries in 2021

Acute effects in children:

- Anaemia
- Diarrhoea
- Malnutrition
- Impaired growth

Chronic effects:

- Bladder cancer
- Organ failure
- Reproductive problems

Effective, preventative treatment is available

HEALTH EFFECTS

SANITATION AND HYGIENE

Schistosomiasis is an acute and chronic disease caused by infection with blood flukes, a type of parasitic worm. *Schistosoma* parasites live in the veins of the intestines or the urinary tract. Transmission occurs when people carrying *schistosoma* contaminate freshwater sources with their excreta containing parasitic eggs, which then hatch in water. People become infected when larval forms of the parasite – released by freshwater snails – penetrate the skin during contact with contaminated water sources (1).

Schistosoma transmission is associated with several environmental factors particularly (2):

- inadequate access to clean water
- inadequate sanitation services
- dumping or agricultural use of human excreta, including both urine and faeces
- open defecation.

People can be infected with *schistosoma* through many activities that expose them to contaminated water (1):

- work, including agricultural activities
- household labour, such as laundry and washing
- bathing
- playing.

School-aged children, pregnant women and women of childbearing age are at high risk of schistosomiasis infection.

There are two types of schistosomiasis (1):

1. intestinal
2. urogenital

Schistosomiasis transmission has been reported in 78 countries (3). In 2021, schistosomiasis was endemic in 51 countries where preventative chemotherapy was required (4). More than 253 million people globally required treatment in 2021, including 137 million school-aged children. Less than half of these school-aged children (58.9 million) received it in 2021 (4). 91% of the global burden of schistosomiasis is in the African Region (4).

The burden of disease and mortality rate due to schistosomiasis is difficult to estimate due to hidden illnesses that may be associated with infection (1).

Acute health effects in children infected with schistosomiasis may include (1,3):

- anaemia
- diarrhoea

- malnutrition
- impaired growth and development.

Acute health effects in children linked to schistosomiasis infection can also lead to learning difficulties and may compromise cognitive development. However, effective treatment for schistosomiasis infection is available and evidence suggests that many acute health effects may be reversed following treatment (5,6).

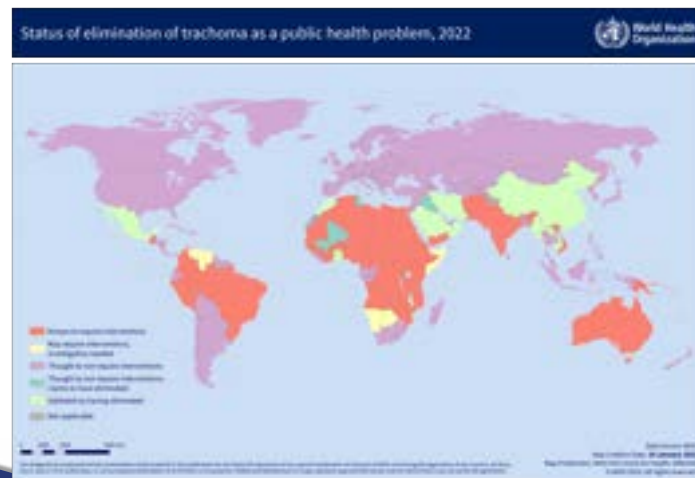
Chronic health effects associated with schistosomiasis include (3):

- bladder cancer
- organ failure, in particular of the liver and kidney
- reproductive health issues, primarily in women who have experienced chronic urogenital schistosomiasis infection.

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Neglected tropical diseases - trachoma



HEALTH EFFECTS

SANITATION AND HYGIENE

Trachoma is an infectious bacterial disease of the eye and the global leading cause of preventable blindness. Trachoma is spread via contact with discharge from the eyes or nose of infected people, through contact with contaminated hands, towels, bedding or through flies that have contacted infectious discharge (1). Trachoma is largely a childhood disease, particularly affecting young children. **It is characterized by inflammation of the upper eyelid, eye redness and irritation and mucus discharge. However, many people with trachoma may have few or no symptoms (2).**

Repeated episodes of trachoma can lead to scarring on the eyelids and “trachomatous trichiasis” – a condition in which one or more eyelashes on the upper eyelid touch the eye. This condition is painful and over time leads to scratching of the cornea, resulting in visual impairment and blindness (2). At least 150 trachoma infections are required to cause this condition in an individual (2). This provides significant opportunity for effective interventions through improved access to hygiene services. In 2020, trachoma was estimated to be responsible for blindness or visual impairment in approximately 1.9 million people globally (3).

Trachoma is endemic in 44 countries, more than half of which are found in the African Region, and is associated with environmental risk factors including (2,3):

- inadequate access to clean water and soap for laundry and washing, especially of the hands and face;
- inadequate access to sanitation services, especially the appropriate disposal of faeces;
- overcrowding in housing, especially in sleeping areas.

Trachoma is largely a public health problem in low-income countries, in particular in conditions of poverty. Australia remains the only high-income country (HIC) where trachoma remains endemic, where it primarily affects remote Aboriginal and Torres Strait Islander communities (see Case Study 1 for more on trachoma in Australia) (2).

World Health Organization (WHO) recommends interventions that are implemented at national level to work towards the elimination of trachoma as a public health problem. These interventions are grouped under the **SAFE strategy** and were adopted by WHO in 1993 (3,4):

- **S = surgical intervention** for trachomatous trichiasis
- **A = antibiotics** to treat trachoma infections
- **F = facial cleanliness** to prevent infection and reinfection
- **E = environmental improvement**, in particular improving access to clean water and sanitation services.

As of 2022, 15 countries have been validated by WHO as successfully eliminating trachoma as a public health problem

(see the top right of the map) (1). The map on this slide shows the status of elimination of trachoma as a public health problem in 2022. Countries coloured in red require intervention, while countries in pale green have been validated as eliminating trachoma as a public health problem.

Note: if relevant, find the prevalence of trachoma in your country or region at: <https://atlas.trachomadata.org/>.

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Map:

- © WHO.

Other serious health conditions

Poor or inadequate sanitation and hygiene can lead to many other diseases in children:

- **Poliomyelitis (polio):**
 - Irreversible paralysis
 - Vaccination available
- **Hepatitis A:**
 - Liver inflammation
 - Vaccination available
- **Respiratory infections**



These diseases can have life-long health outcomes in children

HEALTH EFFECTS

SANITATION AND HYGIENE

Poor or inadequate access to sanitation and hygiene facilities can lead to many other infectious diseases in children. Many of these can have lifelong health impacts on children. Some examples of these are:

- **Poliomyelitis (polio):** mainly affecting children under 5 years of age. Polio is a highly infectious, viral disease that is primarily spread through faecal contamination due to inadequate sanitation and hygiene facilities (1). It attacks the central nervous system and symptoms include: fever, fatigue, headache, vomiting, stiffness of the neck and pain in the limbs. It can lead to paralysis and 1 in 200 cases leads to irreversible paralysis. 5–10% of those who experience paralysis will suffer from immobilized breathing muscles, causing death (1). Almost every country has eradicated polio due to the availability of highly effective preventative vaccination. Polio has significantly decreased due to successful vaccination campaigns; from an estimated 350 000 cases globally in 1988 to only 6 reported cases in 2021 (2). As of 2022, polio remains endemic in two countries (1).
- **Hepatitis A:** is closely associated with inadequate access to safe water and sanitation and hygiene facilities, among other factors such as contaminated food, crowded housing and socioeconomic status. Hepatitis A is characterized by inflammation of the liver and may cause many clinical symptoms including fever, diarrhoea and jaundice. Adults tend to be more affected than children and the vast majority of patients make a full recovery (3,4). In 2019, the World Health Organization (WHO) reported more than 5000 deaths in children under the age of 5 globally were due to acute hepatitis A infection (5). Hepatitis A vaccinations are widely available and are highly effective at preventing infection and transmission of the disease (6).
- **Respiratory infections:** including acute lower respiratory infections, are major causes of under 5 mortality and morbidity. In 2019, an estimated 744 000 children under the age of 5 died globally due to respiratory infections (5). Poor hand hygiene and inadequate access to hygiene and sanitation facilities are strongly associated with increased risk of development and spread of respiratory infections (7).

References:

1. Poliomyelitis [website]. Geneva: World Health Organization; 2022 (<https://www.who.int/news-room/fact-sheets/detail/poliomyelitis>, accessed 22 November 2022).
2. Global polio eradication initiative: annual report 2021. Geneva: World Health Organization; 2021 (<https://polioeradication.org/tools-and-library/policy-reports/annual-reports/>, accessed 22 November 2022).
3. Jacobsen KH. The global prevalence of hepatitis A virus infection and susceptibility: a systematic review. Geneva: World Health Organization; 2010 (<https://apps.who.int/iris/handle/10665/70180>, accessed 22 November 2022).
4. Hepatitis A [website]. Geneva: World Health Organization; 2022
5. Global health estimates 2019: deaths by cause, age, sex, by country and by region, 2000-2019. Geneva: World Health Organization; 2020 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health->

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6. WHO position paper on hepatitis A vaccines – June 2012. Geneva: World Health Organization; 2012 (<https://apps.who.int/iris/handle/10665/241938>, accessed 22 November 2022).
 7. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009 (<https://apps.who.int/iris/handle/10665/44102>, accessed 22 November 2022).

Photo:

- © WHO/ Ilyas Ahmed. A 2-year old girl has her finger marked after she received double doses of the oral polio vaccine during an immunization campaign, Somalia.

Menstrual health

Poor access to sanitation and hygiene facilities affects menstrual health

- Maternal morbidity
- Infections – urinary, reproductive
- Mental health:
 - Shame, stress and anxiety
- Safety:
 - Physical and sexual violence
- Educational, economic outcomes



HEALTH EFFECTS

SANITATION AND HYGIENE

Note: menstrual health is a sensitive topic in many regions, areas and countries. Please adapt the information and language on this slide so that it is suitable, acceptable and relevant for your audience and context.

Women and girls face particular challenges regarding access to sanitation and hygiene facilities. Menstruation in the context of health has garnered a significant increase in attention from public health programmes over the past two decades (1). Women and girl's ability to manage menstruation safely, hygienically and without embarrassment is now considered a central issue to ensuring sustainable and meaningful improvements in sexual and reproductive health, women and girl's overall health and future outcomes.

Many factors have been identified which can impact women and girl's ability to manage menstruation. The extent to which these factors impact individuals differs greatly from context-to-context. These factors include **education and awareness, stigma, norms and cultural practices**, access to **menstrual products**, access to **private sanitation and hygiene facilities** and access to **disposal and waste management systems** (2,3). This presentation focusses on access to private water, sanitation and hygiene facilities, menstrual health and outcomes, however recognizes that these factors are cross-cutting and need to be addressed collectively.

Poor or inadequate access to sanitation and hygiene facilities affects women and girl's ability to manage menstruation and is associated with negative health outcomes including:

- **Maternal morbidity** has been linked to poor access to sanitation and hygiene facilities, especially in health care facilities. The World Health Organization (WHO) estimates that 11% of global maternal mortality is linked to infections due to unclean births every year. This is most significant in low- and middle-income countries (LMICs) (4).
- **Some infections**, such as urinary and reproductive tract infections are associated with inadequate sanitation and hygiene facilities. A study of 358 rural schoolgirls in the Gambia found that access to private sanitary facilities in school was associated with a decrease in likelihood of developing urinary tract infections, while access to soap in school was associated with a decrease in likelihood of developing reproductive tract infections (5). Infections associated with inadequate access to sanitation and hygiene facilities during menstruation are strongly suspected, but research has been inconsistent (6). Studies have found that women may engage in transaction sex in order to obtain menstrual management products. This places them at risk of contracting sexually-transmitted diseases or infections (7).
- **Mental health** of menstruating girls and women can be significantly affected if they do not have adequate access to sanitation facilities at home, school or workplaces. A study conducted in rural Odisha, India found that women expressed shame, embarrassment and worry about needing to urinate or defecate while menstruating and

without access to adequate and private sanitation facilities. These anxieties were particularly linked to concerns of “filth” that may cause infection, infertility or harm unborn children. While these concerns applied generally, the women in this study were particularly concerned during menstruation and perceived their risk of contracting infection or illness without sanitation and hygiene facilities as heightened during this time. The study participants also expressed greater shame and worry at being seen by others while menstruating, changing or washing clothes or menstrual products. This led them to walk further from home to find privacy. This in turn led to increased anxiety due to time away from home and neglect of responsibilities. Fear for personal safety while managing menstruation at night was a considerable concern (8).

- **Safety** is a significant concern for women and girls who do not have adequate access to sanitation and hygiene facilities. Some women and girls need to travel significant distances to use adequate facilities or practice open defecation in public areas, placing themselves at heightened risk of physical and sexual violence especially at night. In some cultures, menstrual management is deeply private and women and girls may choose to only visit sanitation facilities or practice open defecation and washing after dark when they are less likely to be seen. This places them at increased risk of physical and sexual violence (6).
- Girls’, women’s and menstrual health and access to adequate sanitation and hygiene facilities has been strongly associated with **education and economic outcomes**. Girls and women are less likely to be absent or leave school if they have clean and safe sanitation and hygiene facilities in which to privately manage menstruation. Research also suggests that the longer a girl stays in school the more opportunities she will have later in life, leading to better overall health and economic outcomes (3,6).

Note: this training module recognizes that not everyone who menstruates identifies as a woman and that not all women menstruate.

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1. Sommer M, Hirsch JS, Nathanson C, Parker RG. Comfortably, safely, and without shame: defining menstrual hygiene management as a public health issue. *Am J Public Health*. 2015;105(7):1302-11.
2. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
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4. WASH in health care facilities: practical steps to achieve universal access to quality care. Geneva: World Health Organization and the United Nation’s Children’s Fund; 2019 (<https://apps.who.int/iris/handle/10665/311618>, accessed 22 November 2022).
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8. Caruso BA, Clasen TF, Hadley C, Yount K, Haardörfer R, Rout M et al. Understanding and definition

sanitation insecurity: women's gendered experiences of urination, defecation and menstruation in rural Odisha, India. *BMJ Glob Health*. 2017;2:e000414.

Photo:

- © WHO/ NOOR/ Sebastian Liste. Two kids wait to use the village toilet, Kenya.

Outline

- Magnitude of the problem
- Children's special vulnerability and exposure
- Health effects
- **Interventions**
- Case studies



SANITATION AND HYGIENE

The fourth section of this module discusses management and prevention. This includes the role of health professionals and actions that can be taken at local, national and international levels.

Photo:

- © WHO / Valerie Fernandez. Deworming program with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Critical role of health & environment professionals

The health sector should fulfil core functions to ensure safe, accessible sanitation and hygiene practices and facilities:

- Diagnose and treat
- Inform and teach:
 - Patients and families
 - Colleagues and students
- Advocate:
 - Adequate sanitation and hygiene facilities at governmental levels
- Role model:
 - Appropriate actions



INTERVENTIONS

SANITATION AND HYGIENE

Health care professionals have a critical role to play in maintaining and stimulating change that will protect children's health from diseases spread through poor access to sanitation and hygiene facilities.

At the one-to-one patient level, health professionals can take a paediatric environmental history at each visit, include environmental etiologies in differential diagnoses, and add sanitation and hygiene considerations to preventative advice. Health care workers can stay informed about the specific sanitation and hygiene conditions and risks of individual patients and local and regional areas to help prioritize activities.

Health care workers can educate patients and their families by including sanitation and hygiene protections in anticipatory guidance during each visit. Health care workers can:

- conduct presentations on sanitation and hygiene risks and child health;
- continue educational programs;
- develop case studies on child health and sanitation and hygiene.

Health care workers are trusted and respected members of the community and can be powerful advocates for change. Health care workers can advocate for policies at government level that will ensure adequate sanitation and hygiene facilities for example:

- appropriate public sewerage;
- adequate sanitation and hygiene facilities in public spaces;
- adequate sanitation and hygiene facilities in schools and public health care facilities;
- incorporation of sanitation and hygiene education into schools, community programs, medical school curricula.

Health care professions are powerful role models. Health care professionals and facilities must display good examples of sanitation and hygiene practices by:

- ensuring available hand washing facilities at all health care facility points of care and toilets;
- ensuring adequate sanitation facilities are available at health care facilities;
- following guidance on hand hygiene before, during and after treating patients;
- incorporating educational materials into clinic waiting rooms.

Photo:

- © WHO/ Rolex dela Pena. Dr Jacqueline Kitong, WHO Philippines technical officer, demonstrates hand disinfection for health care facility workers.

Key questions: That health professionals can ask

- Do you have handwashing facilities at your home, including water and soap?
- What kind of toilet do you have at your home? Is it private? Do you share it with other homes or neighbours?
- Does your child use a toilet/latrine/potty/nappies?
- Are you aware of any sewage problems in your neighbourhood?
- Has your child experienced episodes of diarrhoea? If so, how frequently and how long did an episode last?
- Are you aware of any infectious disease outbreaks in your community?

INTERVENTIONS

SANITATION AND HYGIENE

Health professionals can ask their patients, parents and other family members key questions that can help in detecting and identifying diseases associated with inadequate access to sanitation and hygiene facilities. Examples of questions that can be asked include:

- Do you have handwashing facilities at your home, including water and soap?
- What kind of toilet do you have at your home? Is it private with a door that shuts or locks? Do you share it with other households, neighbours or people?
- Does your child use a toilet/latrine/potty/nappies?
- Are you aware of any sewage problems in your neighbourhood?
- Has your child experienced episodes of diarrhoea? If so, how frequently and how long did an episode last?
- Are you aware of any infectious disease outbreaks in your community?

Detecting exposures to inadequate sanitation and hygiene facilities and associated pathogens in children's homes, neighbourhoods and schools may support diagnosis and treatment of disease, as well as helping families prevent their children from developing diseases in the future. Adapt these questions to the specific context of each patient and include the answers in an environmental history (1).

Note: if you have examples of questions that have been useful in your context or region they can be used here.

Note: for more information on questions that can be asked please see *The paediatric environmental health* module.

Reference:

1. Children's environmental record: green page. Geneva: World Health Organization; 2017 (<https://www.who.int/publications/m/item/children-s-environmental-record--green-page>, accessed 22 November 2022).

Management and prevention: national

- Share information and advocate for improved access to sanitation and hygiene facilities
- Strengthen intra-governmental, multisectoral collaborations
- Ensure adequate finance and resources
 - GLAAS
- Establish priority areas and targets
- Develop, implement national standards and targets
- Establish effective surveillance systems
- Ensure adequate facilities in schools and health care facilities



INTERVENTIONS

SANITATION AND HYGIENE

At the national level, governmental action is vital to ensuring universal access to adequate sanitation and hygiene facilities. National governments can take many actions to help protect children from sanitation and hygiene hazards. Governments can:

- **share information and advocate for improved national access to sanitation and hygiene, and the health benefits it can bring (1);**
- **strengthen multisectoral collaborations** to engage a greater number of communities and target multiple sanitation and hygiene issues. For example, some national governments have partnered with producers of menstrual products to ensure that girls from rural and low-income communities have adequate access to menstrual products at school (2);
- increase access to sanitation and hygiene facilities through **strong intra-governmental department collaboration**, including environment, health, water, land and planning agencies;
- **ensure adequate financing and resources** to achieve sustainable and effective change. Use the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) data portal to track possible funding solutions for national water, sanitation and hygiene programmes (1,3);
- **establish priority areas and targets**, for example open defecation and behavioural change (1);
- develop and implement **national sanitation and hygiene standards and targets**;
- **establish effective surveillance systems** to measure and prevent outbreaks of infectious diseases associated with inadequate sanitation and hygiene (1,4);
- ensure that **schools and health care facilities** have access to adequate sanitation and hygiene services (5).

Note: if you have examples of national sanitation and hygiene policies, regulations or measures that have been developed or used in your country they can be mentioned here.

References:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).
2. Plesons M, Patkar A, Babb J, Balapitiya A, Cason F, Caruso BA et al. The state of adolescent menstrual health in low-and middle-income countries and suggestions for future actions and research. *Reprod Health*. 2021;18(31):1-13.
3. UN-Water global analysis and assessment of sanitation and drinking-water: data portal. Geneva: World Health Organization; 2022 (<https://glaas.who.int/>, accessed 22 November 2022).
4. WHO, NNN. WASH and health working together: a 'how-to' guide for Neglected Tropical Disease programmes. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/279913>, accessed 22

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5. WASH in health care facilities: practical steps to achieve universal access to quality care. Geneva: World Health Organization and the United Nation's Children's Fund; 2019 (<https://apps.who.int/iris/handle/10665/311618>, accessed 22 November 2022).

Photo:

- © WHO/ Tom Vierus. The Health Promoting Schools program is a joint governmental initiative between the education and health ministries in Fiji and involves three strategic intervention areas in schools, including water, sanitation and hygiene.

WHO Guidelines: sanitation and health

Aim to ensure safe sanitation systems and protect human health

Four key recommendations for national and local authorities:

1. Universal access and use of safe toilets
2. Universal access to safe sanitation systems
3. Sanitation services included as part of local services
4. Health sector should fulfil core functions to ensure safe sanitation services and practices are protecting public health

Includes guides and key criteria for 11 different types of toilets that protect public health

INTERVENTIONS

SANITATION AND HYGIENE

The World Health Organization (WHO) develops and publishes global guidelines containing recommendations for clinical practice or public health policy. Recommendations are statements designed to help users make informed decisions on if, when and how to undertake specific actions such as clinical interventions, diagnostic tests or public health measures, with the aim of achieving the best possible individual or collective health outcomes.

In 2018, WHO published *Guidelines on sanitation and health (1)*. These guidelines are aimed at national and local authorities. They summarize the evidence on the links between sanitation and health, provide evidence-based recommendations, and offer guidance for international, national and local sanitation policies and programme actions.

The guidelines include **four key recommendations** that national and local authorities should implement:

1. ensuring universal access and use of toilets and sanitary services that safely contain excreta;
2. ensuring universal access to safe systems along the entire sanitation service chain;
3. addressing sanitation as part of locally delivered services, development programmes and policies;
4. empowering the health sector to fulfill core functions ensuring safe sanitation that protects public health.

Guidelines on sanitation and health has 11 factsheets that include guides and key criteria for 11 different types of acceptable toilets that protect public health and prevent the spread of disease. These include:

- on-site sanitation systems;
- on-site systems with faecal sludge management and off-site treatment;
- on-site systems with faecal sludge management, sewerage and off-site treatment;
- off-site systems with sewerage and off-site treatment (1).

Note: if you have examples of acceptable toilets that have been built, accepted and improved sanitation in your community or region, they can be discussed here.

Reference:

1. Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/274939>, accessed 22 November 2022).

WHO Guidelines: hand hygiene and health care



INTERVENTIONS

SANITATION AND HYGIENE

The World Health Organization (WHO)'s *Guidelines on hand hygiene in health care* provide health-care workers, hospital administrators and health authorities with a thorough review of evidence on hand hygiene in health care settings. The guidelines give specific recommendations to improve practices and reduce transmission of pathogenic microorganisms in patients and health-care workers. They have a global perspective, with the aim of improving patient outcomes across all countries and encourage the adaptation of recommendations to individual contexts according to locally available resources.

The guidelines detail:

- the success of hand hygiene interventions in health care settings that have been implemented in different countries;
- indicators for best practice hand hygiene;
- hand hygiene techniques, including the use of both soap and water (see the illustration above) and alcohol-based formulation;
- recommendations for hand hygiene prior to surgery;
- criteria to select appropriate hand hygiene agents;
- skin care information;
- best practice when using gloves;
- educational programmes on hand hygiene for health care workers;
- the responsibilities of national governments and health care institutions.

The guidelines also include detailed illustrations on best practice hand hygiene in health care settings. An example of this is included on this slide. **This illustration shows hand hygiene technique using soap and water for 40–60 seconds (1).**

Note: if appropriate, demonstrate with the learners the 11 steps in the illustration included in the slide.

Reference:

1. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009 (<https://apps.who.int/iris/handle/10665/44102>, accessed 22 November 2022).

Figure:

- © WHO.

Neglected tropical diseases (NTDs): toolkit

Step-by-step guidance to:

- Build partnerships
- Shape NTD programme structure
- Sustainable programming
- Build local capacity
- Support clinical interventions
- Complement public health interventions



INTERVENTIONS

SANITATION AND HYGIENE

WASH and health working together is a toolkit to help shape and integrate water, sanitation and hygiene (WASH) into public health programmes and prevent neglected tropical diseases (NTDs). The toolkit is aimed at NTD programme managers and provides step-by-step guidance to:

- build multisectoral partnerships with key stakeholders, including ministries, national and local WASH agencies and community groups;
- develop and shape NTD programme structure according to local resources and needs;
- create programmes that focus on building local capacities across every level and ensure programme sustainability;
- support clinical interventions;
- complement existing public health intervention for NTD control (1).

The toolkit also provides a range of useful templates, planning tools, budget checklists and ideas for public health messaging. The toolkit is free and can be accessed online or downloaded (1).

Note: access the interactive toolkit online here: <https://apps.who.int/wash-health-toolkit/>.

Note: only present this slide if NTDs are relevant to your context.

Reference:

1. WHO, NNN. *WASH and health working together: a 'how-to' guide for Neglected Tropical Disease programmes*. Geneva: World Health Organization; 2018 (<https://apps.who.int/iris/handle/10665/279913>, accessed 22 November 2022).

Management and prevention: international

International actions and tools:

- Hand Hygiene for All Initiative
- World Hand Hygiene Day
- World Toilet Day
- World Water Day
- Menstrual Hygiene Day
- World Neglected Tropical Diseases Day
- Global Task Force on Cholera Control
- GLAAS

Relevant World Health Assembly (WHA) resolutions:

- WHA64.24
- WHA66.12
- WHA72.7



INTERVENTIONS

SANITATION AND HYGIENE

This slide displays some of the international initiatives and tools for action that aim to increase awareness of the importance of universal access to safely managed sanitation and hygiene services and facilities.

Hand Hygiene for All Initiative: a joint United Nations Children’s Fund (UNICEF) and World Health Organization (WHO) initiative launched in 2020 that aims to implement WHO’s global recommendations on hand hygiene to prevent and control COVID-19 transmission. It also works to ensure lasting hygiene infrastructure and behaviours. The Initiative is designed around three stages: **Responding** to the COVID-19 pandemic, **rebuilding** infrastructure and services and **reimagining** hand hygiene in society. The Initiative is working with a number of partners to further hand hygiene progress in specific settings, such as health care facilities, schools and child-care centres, workplaces, transport hubs, households, institutions and places of worship (1).

World Hand Hygiene Day: celebrated every year on 5 May since 2009 and a major global effort led by WHO to support health care workers in improving hand hygiene and thus support the prevention of life threatening healthcare-associated infections. In 2022, the theme focused on recognizing that health care workers can add to a health facility’s climate or culture of safety and quality through good hand hygiene. It also highlighted that health care facilities with a strong hygiene culture will encourage people to clean hands at the right times and with the right products. The campaign provides videos, tools and materials to help support and promote good hand hygiene in health care facilities (2).

World Toilet Day: established in 2001 by the World Toilet Organization and has been an annual United Nations (UN) observance on November 19 since 2013. It is now coordinated by UN-Water, the UN agency responsible for water and sanitation, which sets a different theme every year. In 2022, the World Toilet Day theme was safe sanitation to protect groundwater resources. World Toilet Day aims to celebrate toilets and raise awareness of the billions of people who live without access to safely managed sanitation. It also aims to contribute towards achieving Sustainable Development Goal (SDG) 6 – access to clean water and sanitation for all by 2030 (3).

World Water Day: an annual UN Day of Observance and is on 22 March. It aims to celebrate and raise awareness of those who do not have access to clean water. Each year a different water-related theme is chosen. In 2022, the theme of World Water Day was *Groundwater: making the invisible visible* (4).

Menstrual Hygiene Day: started in 2013, a coordinated by WASH United and held annually on 28 May. Menstrual Hygiene Day aims to ensure that no one is held back by menstruation, women and girls have access to affordable menstrual products, period stigma is eliminated and everyone has access to menstrual hygiene education,

information and menstrual friendly-water, sanitation and hygiene services (5).

World Neglected Tropical Diseases (NTD) Day: began in 2019 and is an official WHO campaign. It is commemorated every year on 30 January. World NTD Day aims to translate awareness into action, secure resources and facilitate leadership of programmes that will help eliminate NTD in affected countries (6,7).

Global Task Force on Cholera Control: a global collaboration of more than 50 organizations across multiple sectors aiming to support countries in the implementation of the Global Roadmap to 2030. The Roadmap aims to reduce cholera by 90% in 20 different countries by 2030. The Task Force offers a range of support to affected countries to assist them in developing and implementing national cholera plans (8,9).

Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS): a UN-Water initiative implemented by WHO. It aims to provide policy-makers at all levels with reliable, easily accessible and comprehensive analysis of WASH systems to make informed decisions for sanitation, drinking-water and hygiene. GLAAS also evaluates financial aspects of water, sanitation and hygiene programmes and services, including how well funds are absorbed, who funds services, the amount and sufficiency of funding, and the types of services funded (10).

World Health Assembly (WHA) Resolution 64.24 on drinking water, sanitation and health: calls on WHO to continue to highlight the importance of drinking water and sanitation to human health and prevention of diseases. The Resolution requires member states to develop and strengthen, with all stakeholders, national public health strategies, so that they highlight the importance of safe drinking water, sanitation and hygiene as the basis for primary prevention (11).

WHA Resolution 66.12 on neglected tropical diseases (NTDs): calls on member states to strengthen programmes on NTDs with the aim of preventing, controlling and eliminating them. It also calls upon WHO to continue its leadership and support of member states to eradicate NTDs (12).

WHA Resolution 72.7 on water, sanitation and hygiene in health care facilities: requires member states to integrate water, sanitation and hygiene (WASH) into key national health programs and policies, include WASH in health care budgets and establish and implement minimum national standards. The Resolution aims to ensure that all members states have health care facilities that can provide quality essential health services for everyone (13).

References:

1. Hand hygiene for all global initiative. New York, Geneva: United Nations Children's Fund, World Health Organization; 2020 (<https://www.who.int/publications/m/item/hand-hygiene-for-all-global-initiative>, accessed 22 November 2022).
2. World Hand Hygiene Day [website]. Geneva: World Health Organization; 2022 (<https://www.who.int/campaigns/world-hand-hygiene-day>, 22 November 2022).
3. World Toilet Day [website]. Geneva: United Nations Water; 2022 (<https://www.worldtoiletday.info/>, accessed 22 November 2022).
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7. World NTD Day [website]. London: United to Combat Neglect Tropical Diseases; 2022 (<https://worldntdday.org/>, accessed 22 November 2022).
8. GTFCC. Global task force on cholera control. Lyon: Mérieux Foundation; 2022 (<https://www.gtfcc.org/>, accessed 22 November 2022).
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10. UN-Water global analysis and assessment of sanitation and drinking-water: data portal. Geneva: World Health Organization; 2022 (<https://glaas.who.int/>, accessed 22 November 2022).
11. Resolution WHA64.24. Drinking-water, sanitation and health. In: Sixty-fourth World Health Assembly, Geneva, 16-24 May 2011. Geneva: World Health Organization; 2011 (<https://apps.who.int/iris/handle/10665/3587>, accessed 22 November 2022).
12. Resolution WHA66.12. Neglected tropical diseases. In: Sixty-sixth World Health Assembly, Geneva, 20 – 28 May 2013. Geneva: World Health Organization; 2013 (<https://www.who.int/publications/i/item/WHA66.12>, accessed 22 November 2022).
13. Resolution WHA72.2. Water, sanitation and hygiene in health care facilities. In: Seventy-second World Health Assembly, Geneva, 20 - 28 May 2019. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/handle/10665/329290>, accessed 22 November 2022).

Photo:

- © WHO.

Sustainable Development Goals (SDGs)

SDG 6: Ensure access to clean water and sanitation for all

Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations



INTERVENTIONS

SANITATION AND HYGIENE

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, a blueprint for economic, social and environmental development, including 17 Sustainable Development Goals (SDGs). SDG 6 specifically focuses on achieving access to adequate and equitable clean water and sanitation for all and explicitly references targeting vulnerable populations, including women and girls, and ending open defecation (1).

SDG 6 has eight targets aiming to make this goal achievable, with several targets specifically addressing sanitation and hygiene needs. Target 6.2 aims to:

- by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations (1).

SDG 6's eight targets are measured by three indicators :

- proportion of the population using safely managed drinking water services;
- proportion of population using safely managed sanitation services;
- proportion of population with handwashing facilities with soap and water at home (2).

The World Health Organization (WHO) and United Nations Children's Fund (UNICEF)'s Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), is responsible for these eight targets and collating the data used to measure these indicators (2). Please see the next slide for more information on the JMP.

References:

1. Sustainable Development Goals [website]. New York: United Nations; 2022 (<http://www.un.org/sustainabledevelopment/sustainable-development-goals>, accessed 22 November 2022).
2. Wash data [website]. New York; Geneva: United Nations Children's Fund; World Health Organization; 2022 (<https://washdata.org/>, accessed 22 November 2022).

Figure:

- © UN.

WHO/ UNICEF Joint Monitoring Program

- Publishing global updates on WASH progress since 1990
- Data covering more than 200 countries, areas and territories
- Custodian of WASH SDG targets
- Recently expanded to include:
 - WASH in schools
 - WASH in health care facilities
 - Menstrual health



INTERVENTIONS

SANITATION AND HYGIENE

Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) is jointly managed by the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF). It also collaborates with partners at country, regional and global levels to collect data. The JMP has been publishing global updates and reports on the progress of water, sanitation and hygiene (WASH) since 1990.

The JMP database has more than 5000 data sets that have enabled the production of estimates for more than 200 countries, areas and territories. The JMP is the custodian for measuring the three indicators within the Sustainable Development Goals (SDGs) that focus on WASH (as discussed on the previous slide) (1).

The JMP has also recently expanded to include global estimates on:

- WASH in schools (established in 2018)
- WASH in health care facilities (established in 2019 and also includes waste management and environmental cleaning in facilities)
- menstrual health (established in 2021) (2).

References:

1. Wash data [website]. New York; Geneva: United Nations Children’s Fund; World Health Organization; 2022 (<https://washdata.org/>, accessed 22 November 2022).
2. Progress on household drinking water, sanitation and hygiene 2000-2020: five years in to the SDGs. Geneva: World Health Organization, United Nations Children’s Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).

Figure:

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Outline

- Magnitude of the problem
- Children's special vulnerability and exposure
- Health effects
- Interventions
- Case studies



SANITATION AND HYGIENE

The final section of this module discusses case studies on sanitation and hygiene interventions.

Note: if you have case studies that detail local, regional or national sanitation and hygiene interventions targeting the improvement of public health, they can be used here.

Photo:

- © WHO / Valerie Fernandez. Deworming program with emphasis on hygiene and hand washing implemented through schools in rural areas, Vanuatu.

Case study 1: Trachoma in Australia

- Affecting some rural and remote Aboriginal and Torres Strait Islander communities
- Eliminated from other populations in 20th century
- Locally associated with:
 - Remoteness
 - Inequities
 - Poor living conditions, crowded housing, poor hygiene
 - Lack of clean water and sanitation facilities, drought
 - Movement between communities

CASE STUDIES

SANITATION AND HYGIENE

Australia is the only high-income country (HIC) where trachoma is still endemic. In 2022, it exclusively affected some rural and remote Aboriginal and Torres Strait Islander communities in four states and territories – the Northern Territory, Queensland, South Australia and Western Australia (1). In all other populations in Australia, trachoma was eliminated as a public health risk in the early 20th century (2).

The long-term prevalence rate of trachoma in remote and rural Aboriginal and Torres Strait Islander communities since the implementation of national surveillance and screening programs in 2006 is declining across communities. However, declines in trachoma prevalence are not always straightforward. Surveillance and monitoring programs have found, for example, that during the period between 2018 and 2019 the overall prevalence of trachoma had *increased* in 5–9 year old children from 3.9% to 4.5%. During that same period, the *number* of communities with endemic trachoma (equal to or greater than 5% prevalence) had *decreased*, but the number of communities with hyperendemic trachoma (greater than 20% prevalence) had *increased* (1). Additionally, declines have not been equal across the four affected states and territories (2).

Localized increases of trachoma in Australia are likely due to a range of factors. These include (1,3):

- remoteness of affected communities;
- significant inequities faced by affected communities, including access to health care facilities, education and hygiene services and facilities;
- poor living conditions, in particular crowded housing conditions and poor personal and community hygiene;
- lack of access to clean water and sanitation facilities, including drought-related water scarcity in some communities;
- population movement between communities for cultural and other events.

Trachoma in Aboriginal and Torres Strait Islander communities is rarely associated with only one of these factors. Research has found that communities with endemic trachoma are affected by multiple factors that require interventions at many levels to effectively and sustainably eliminate trachoma (3).

References:

1. Australian trachoma surveillance report 2019. Sydney: Kirby Institute; 2020 (<https://kirby.unsw.edu.au/report/australian-trachoma-surveillance-report-2019>, accessed 22 November 2022).
2. Warren JM, Birrell AL. Trachoma in remote Indigenous Australia: a review and public health perspective. *Aus NZ J Public Health*. 2015;40(1):S48–52.
3. Barksby R. Trachoma elimination targets missing in Australia. *Lancet Microbe*. 2022;3(12);e903.

Case study 1: Trachoma in Australia

- Collaborative, multi-agency, culturally-informed interventions
- Interventions:
 - Screening
 - School visits
 - Child-friendly media
 - Provision of soap
 - Pest control
 - Bathroom assessments
 - Plumbing works
 - Waste site clean-up
 - Provision of individual face towels



CASE STUDIES

SANITATION AND HYGIENE

Australia is signatory to the World Health Organization's (WHO) resolution to eliminate global trachoma by 2030 and follows WHO's guidelines on trachoma control with alterations for the local conditions (1,2). For example, Australia focuses screening activities on children 5–9 years of age, rather than 1–9 years of age as suggested by WHO. This is due to access to this age group through schools, feasibility of eye exams and evidence that prevalence of trachoma is similar between these age groups (3). Australia launched a National Trachoma Surveillance and Reporting Unit in 2006, which is responsible for providing a national mechanism for monitoring and evaluating trachoma elimination. The Unit is guided by the *National guidelines for the public health management of trachoma in Australia*, published in 2014. The *National guidelines* were developed in the context of WHO's SAFE strategy and make recommendations for control strategies, data collection, reporting and analysis (3).

Significant progress towards eliminating trachoma in Australia has been made. The national trachoma prevalence rate has declined from 14% in 2009 to 3.3% 2021 and Australia has consistently reported treating 100% of children with active trachoma (3,4).

Successes thus far have been achieved by:

- **Collaborative, multi-agency and culturally-informed interventions** involving government ministries, such as education and health, at national and state levels, local Aboriginal and Torres Strait Islander health and community services, nongovernment organizations (NGOs) and other program partners such as universities and researchers. Additionally, recently the Australian Government has recognized that successful trachoma elimination strategies and interventions must involve community participation to ensure sustainability, ownership and culturally-informed interventions.
- A range of interventions that target **health promotion and environmental improvements** such as (3,5):
 - annual, community-wide screening, including screening for facial cleanliness, active trachoma and adults with trichiasis;
 - school visits;
 - child-friendly health promotional media including books, videos, games and posters with a focus on hygiene and facial cleanliness, such as the image shown on this slide showing Milpa's (a lizard mascot) Six Steps to Stop Germs;
 - provision of soap for washing hands and faces;
 - pest control, especially flies;
 - bathroom assessments in communities;
 - plumbing works to improve sewerage;
 - cleaning up waste sites;

- providing school children with individual face towels for washing and facial cleanliness.

Interventions, screening and health promotional activities differ between state and territories, depending upon the appropriateness of each activity within individual communities. While Australia has made significant progress in decreasing the prevalence of trachoma in remote and rural Aboriginal and Torres Strait Island communities, more action is required to eliminate the disease from the most neglected communities. Elimination will require interventions that recognize the social determinants of trachoma and target behavioural change in conjunction with improved access to sanitation and hygiene facilities and treatment of active trachoma cases (5).

Note: to view the trachoma resources featured on the slide visit:

<https://mbspgh.unimelb.edu.au/centres-institutes/onemda/research-group/ieh/trachoma/six-steps#resources>.

References:

1. Trachoma control: a guide for programme managers. Geneva: World Health Organization; 2006 (<https://apps.who.int/iris/handle/10665/43405>, accessed 22 November 2022).
2. Ending the neglect to attain the Sustainable Development Goals: a road map for neglected tropical diseases 2021–2030. Geneva: World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/338565>, accessed 22 November 2022).
3. Australian trachoma surveillance report 2019. Sydney: Kirby Institute; 2020 (<https://kirby.unsw.edu.au/report/australian-trachoma-surveillance-report-2019>, accessed 22 November 2022).
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5. Warren JM, Birrell AL. Trachoma in remote Indigenous Australia: a review and public health perspective. *Aus NZ J Public Health*. 2015;40(1):S48–52.

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Case study 2: Swachh Bharat Mission, India

- Significant childhood mortality and DALYs due to sanitation- and hygiene-related diseases:

- Diarrhoea
- Neonatal conditions
- Soil-transmitted helminths
- Stunting
- Wasting



Challenges:

- Open defecation
- Infrastructure and initial cost
- Poor construction
- Access to water
- Behaviours

CASE STUDIES

SANITATION AND HYGIENE

India has a significant burden of childhood mortality and morbidity due to sanitation-related diseases. In 2019 in India (1,2):

- **diarrhoeal diseases** were the number one cause of death and disability-life adjusted-years (DALYs) in children 1–4 years of age;
- **neonatal conditions**, including infections associated with poor hygiene, were the number one cause of death and DALYs in newborns and infants 0–12 months of age.

India also carries a substantial proportion of the global burden of **soil-transmitted helminths**. Soil-transmitted helminth infections are strongly associated with poor access to sanitation and hygiene facilities, and children are among the most vulnerable. In 2021, more than 330 million pre-school and school-aged children were estimated to require preventative chemotherapies for soil-transmitted helminths in India (3). Finally, India has a high level of childhood stunting, wasting and malnutrition. In 2020, estimates suggested that more than 30% of children under 5 years of age were stunted in India, while in 2017 estimates suggested that 17% of children under the age of 5 years were wasted (4).

India faces a variety of sanitation- and hygiene-related public health challenges that need to be addressed in order to reduce the burden of related diseases. These public health challenges include (5,6):

- **open defecation**, which varies from state-to-state, and between urban and rural areas;
- lack of **sanitation and hygiene infrastructure** and the initial **cost** of building and maintaining this infrastructure;
- **poorly constructed toilets** that do not safely deal with excreta, or are not culturally acceptable or do not adequately account for local environmental conditions;
- access to safe water supply, especially in rural areas;
- **behaviours** and **misconceptions** about toilet use, for example some people may see open defecation as a healthier or cleaner option than using a toilet.

Swachh Bharat Mission, or the Clean India Mission, is country-wide programme initiated in 2014 by the Government of India to tackle open defecation and waste management issues and ensure universal sanitation coverage (7). It is widely believed to be the world's largest behavioural change and sanitation programme (5). The next slide will discuss some of the aims, successes and challenges of the programme so far.

References:

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 6. Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs. Geneva: World Health Organization and the United Nations Children's Fund; 2021 (<https://apps.who.int/iris/handle/10665/345081>, accessed 22 November 2022).
 7. Swachh Bharat Mission – Grameen [website]. New Delhi: Government of India; 2022 (<https://swachhbharatmission.gov.in/sbmcms/index.htm>, accessed 22 November 2022).

Photo:

- © WHO/ Diego Rodriguez. Bath in the sacred lake, Pushkar, India.

Case study 2: Swachh Bharat Mission, India

- 2014–2019: 100 million toilets built in rural India
 - Significant decrease in national open defecation prevalence:
 - 2015: 29%
 - 2020: 15%
 - Some health outcomes may be associated
- **Interventions:**
 - Financial incentives
 - Local government engagement
 - Community toilet construction
 - Behavioural change campaigns, trainings
 - Monitoring
 - Awards

CASE STUDIES

SANITATION AND HYGIENE

Under the Swachh Bharat Mission programme, the Government of India estimates that between 2014 and 2019, 100 million toilets were constructed in rural areas (1). India has also made considerable progress in reducing the prevalence of open defecation across the country. According to the World Health Organization (WHO) and United Nations Children’s Fund’s (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), India’s prevalence of open defecation among the population has decreased from **29% in 2015** to **15% in 2020** (2). Progress, however, has not been equal and prevalence of open defecation varies greatly between states, and rural and urban areas.

Some health outcomes, such as reduced stunting in children under 5 years (3) and changes to the number of diarrhoeal disease outbreaks (4), *may* be associated with improved sanitation due to Swachh Bharat Mission interventions, however more research is required to confirm these findings.

Interventions under the Swachh Bharat Mission programme have contributed to India’s successes in reducing open defecation. These interventions have included (3,5):

- **financial incentives** to rural households for constructing toilets;
- **engaging local government** in community mobilization and messaging;
- **constructing community toilets**;
- **behavioural change campaigns**, particularly focused on public health messaging about sanitation, handwashing and hygiene on social media, in cinemas and in community spaces, and through mass training programmes;
- **monitoring, evaluation and reporting activities using technologies** to assess the success of the interventions, a feature that was neglected or inadequate in previous sanitation campaigns in India;
- **awards**, given out to districts, officials and individuals for achievements in toilet construction and reducing or eliminating open defecation.

While the Swachh Bharat Mission has made considerable progress towards ensuring universal access to sanitation facilities in India, significant challenges remain. In particular (5,6):

- public misconceptions about toilet use;
- sustainable behavioural change regarding the use of sanitation facilities;
- poor or inappropriate toilet construction;
- access to water, especially in rural and drought-prone areas;
- neglected communities, especially rural and remote households, the urban poor and migratory groups.

References:

1. UNICEF, BMGF, Sambodhi. Access to toilets and the safety, convenience and self-respect of women in rural India. Noida: Sambodhi; 2020 (<https://swachhbharatmission.gov.in/sbmcms/study-survey.htm>, accessed 22 November 2022).
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5. Curtis V. Explaining the outcomes of the Clean India campaign. *BMJ Glob Health.* 2019;4:e001892.
6. Prakash S, Kumar P, Dhillon P, Unisa S. Correlates of access to sanitation facilities and benefits received from the Swachh Bharat Mission in India: analysis of cross-sectional data from the 2018 Nation Sample Survey. *BMJ Glob Health.* 2022;12:e060118.



In July 2010, the United Nations General Assembly recognized access to safe drinking-water and sanitation as a human right, “essential for the full enjoyment of life and all human rights” (1).

Sanitation is vital for health and the prevention of illness. It contributes to social development, as more children, particularly girls, are able to attend school and learn; safe sanitation reduces the vulnerability of women and children. Moreover, improved sanitation is a good economic investment, reducing the cost of illness and lost productivity, and it protects water bodies from human waste and pollution (2).

Finally, access to safely managed sanitation and hygiene services is achievable. Successful interventions, programme models and people-centred approaches can be rolled out where there is will to do so.

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1. The human right to water and sanitation: resolution adopted by the General Assembly on 28 July 2010. New York: United Nations; 2010 (A/RES/64/292; https://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/64/292, accessed 22 November 2022).
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Photo:

- © WHO / Karen Reidy. Kids bath in the river at Cemetery Beach, Timor-Leste.



SANITATION AND HYGIENE

To end this presentation, a beautiful reminder from a child who has drawn a happy illustration, where a clean environment brings happiness and health.

Illustration:

- © WHO SEARO.

More information and recommended reading

For more information on sanitation, hygiene and child health see the WHO training modules:

- Children are not little adults
- The paediatric environmental history
- Water
- Why children

Recommended reading on sanitation, hygiene and child health:

- Inheriting a sustainable world? Atlas on children's health and the environment
- Guidelines on sanitation and health
- Progress on household drinking water, sanitation and hygiene
- WHO guidelines on hand hygiene in health care

SANITATION AND HYGIENE

For more information on sanitation, hygiene and child health see the World Health Organization (WHO) training package on children's environmental health for the health care sector (1). The following modules may be of particular interest:

- ***Children are not little adults***
- ***The paediatric environmental history***
- ***Water***
- ***Why children.***

To read more on sanitation, hygiene and child health see the below references:

- ***Inheriting a sustainable world? Atlas on children's health and the environment*** (2)
- ***Guidelines on sanitation and health*** (3)
- ***Progress on household drinking water, sanitation and hygiene 2000–2020: five years into the SDGs*** (4)
- ***WHO guidelines on hand hygiene in health care*** (5).

References:

1. Training modules and instructions for health care providers [website]. Geneva: World Health Organization; 2022 (<https://www.who.int/teams/environment-climate-change-and-health/settings-populations/children/capacity-building/training-modules>, accessed 22 November 2022).
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5. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009 (<https://apps.who.int/iris/handle/10665/44102>, accessed 22 November 2022).

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SANITATION AND HYGIENE

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SANITATION AND HYGIENE

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