World Health Organization

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Guidelines on Hand Hygiene in Community Settings

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Contents

Foreword

Hand hygiene is one of the simplest yet most powerful tools in our public health arsenal. Messages to wash hands are posted routinely in bathrooms and food preparation areas, and public health authorities consistently issue calls on the public to wash their hands when outbreaks are suspected. At the global level, promoting access to hygiene features in WHO's 2025 Pandemic Agreement and specifically for communities in its Health Emergency Preparedness and Response (HEPR) framework.

But this simplest of acts remains beyond the reach of millions of families around the world. 1.7 billion people still lack basic hygiene services. Of these, 611 million people have no handwashing facilities at all – neither soap nor water are available at home.

Without an affordable, accessible and convenient means to wash hands, in the places where people live, learn, work and gather, no amount of messaging can enable hand hygiene.

The inability to clean hands drives the spread of a range of diseases, including the biggest killers of under-fives globally: pneumonia and diarrhoea, which kills hundreds of thousands each year.

These Guidelines on Hand Hygiene in Community Settings, jointly developed by the WHO and UNICEF, emphasizethe critical responsibility of governments to enable the foundational requirements for effective practice: access to materials, information and conducive environments. They also recognize that access to hand hygiene and behaviour change require the development of a multi-faceted system comprising good governance, data, financing, capacity and innovation to support reliable water service delivery, availability of soap or alcohol-based hand rubs, and health promotion.

At their core, these guidelines recognize hand hygiene as a public good – one that requires coordinated action, inclusive design and sustained investment.

Grounded in rigorous evidence and shaped by global expertise, these Guidelines provide governments, practitioners and partners with practical recommendations that are adaptable to a variety of community or non-health care settings – from households and schools to public spaces and workplaces.

As governments consider their commitments under the new Pandemic Prevention Preparedness and Response Accord, sustained acceleration of hand hygiene as part of broader efforts is urgent. WHO and UNICEF hope these guidelines will serve not only as a technical resource but also as a catalyst for action. By embedding hand hygiene into everyday life and policy, we can reduce the burden of preventable diseases, strengthen community resilience and advance the human right to health for all.

Acknowledgements

Many practitioners and experts from diverse professional backgrounds supported the development of these Guidelines for hand hygiene in community settings. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) gratefully acknowledges all those who made this publication possible by devoting their time and expertise, including the colleagues named below.

Joanna Esteves Mills, Department of Environment, Climate Change and Health, WHO, Switzerland, was the responsible technical officer for the Guidelines. She conceptualized, coordinated and managed the development, technical editing and production of these Guidelines. Bruce Gordon, Department of Environment, Climate Change and Health, WHO, Switzerland, Ann Thomas, Water, Sanitation and Hygiene, UNICEF, United States of America and Oliver Cumming, WHO, Switzerland, provided strategic direction.

The following people guided the development of these Guidelines. Chapter 6 on methods provides information on the specific contributions of each group.

Guideline Development Group

Oluyemisi Akpa, Government of Nigeria, Nigeria; **Robert Aunger,** London School of Hygiene & Tropical Medicine, United Kingdom; **Fernando Bellissimo-Rodrigues,** University of São Paulo, Brazil; **Ana Paula Cardoso Thuzine,** Government of Mozambique, Mozambique; **Claire Chase,** Water Global Practice, World Bank, United States of America; **Kondwani Chidziwisano,** Malawi University of Business and Applied Sciences, Malawi; **Jenala Chipungu,** Centre for Infectious Disease Research in Zambia, Zambia; **Robert Dreibelbis,** London School of Hygiene & Tropical Medicine, United Kingdom; **Sophie Hickling,** WaterAid UK, United Kingdom; **Beverly Ho,** Government of the Philippines, Philippines; **Guy Howard,** University of Bristol, United Kingdom; **Khairul Islam,** WaterAid South Asia Regional Office, India; **Wanjiku Kuria,** World Vision Kenya, Kenya; **Belinda Mphela Makhafola,** Government of South Africa, South Africa; **Susan Michie,** University College London, United Kingdom; **Nga Nguyen,** United States Agency for International Development, United States; **Stephanie Ogden,** Care International, United States; **Amy Pickering,** University of California, Berkeley, United States; **Didier Pittet,** University Hospital of Geneva, Switzerland; **Hugo Sax,** Bern University Hospital, Switzerland; **Sheillah Simiyu,** African Population and Health Research Center, South Africa.

Guideline Steering Committee

Rola Al-Emam, WHO Regional Office for the Eastern Mediterranean, Jordan; **Kathryn Alberti,** Global Task Force on Cholera Control Secretariat, WHO, Switzerland; **Benedetta Allegranzi,** Infection Prevention and Control Unit, WHO, Switzerland; **Elena Altieri,** Behavioural Insights Unit, WHO, Switzerland; **April Baller,** Infection Prevention and Control in Health Emergencies Unit, WHO, Switzerland; **Wassihun Belay,** Division of Health Promotion, WHO, Switzerland; **Arnold Cole,** UNICEF East and South Africa Regional Office, Kenya; **Lindsay Marie Denny,** UNICEF New York, United States; **Edwin Edeh,** WHO Nigeria Country Office, Nigeria; **Faustina Gomez,** WHO Regional Office for South-East Asia, India; **Valentina Grossi,** WHO European Centre for Environment and Health, Germany; **Claire Kilpatrick,** WHO Infection Prevention and Control Unit, WHO, Switzerland; **Nicole Klaesener-Metzner,** WHO European Centre for Environment and Health, Germany; **Waltaji Kutane,** WHO Ethiopia Country Office, Ethiopia; **Trinette Lee,** Division of Health Promotion, WHO, Switzerland; **Bonifacio Magtibay,** WHO Philippines Country Office, Philippines; **Blerta Maliqi,** Integrated Health Services Department, WHO, Switzerland; **Guy Mbayo,** WHO Regional Office for Africa, Congo; **Nathaniel Paynter,** UNICEF New York, United States; **Nathalie Roebbel,** Urban Health Unit, WHO, Switzerland.

Systematic review team

Nick H. An, Erika Canda, Bethany A. Caruso, Kennedy Files, Matthew C. Freeman, Stephen P. Hilton, Jordan C. Honeycutt, Erin LaFon, Lilly A. O'Brien, Sridevi K. Prasad, Hannah Rogers, Dewan Muhammad Shoaib, Jedidiah S. Snyder, Marlene K. Wolfe, Emory University, United States.

Guideline methodologist

Mical Paul, Technion, Israel Institute of Technology, Israel.

Champion Country Working Group

Suzzy Abaidoo, Government of Ghana, Ghana; **Suzan Alzubaidy,** Government of Iraq, Iraq; **Marysol Balane,** UNICEF Philippines Country Office, Philippines; **Sory Ibrahima Bouare,** WHO Mali Country Office, Mali; **Doussou Doumbia,** Government of Mali, Mali; **Anthony Eshofonie,** WHO Bangladesh Country Office, Bangladesh; **Om Prasad Gautam,** WaterAid UK, United Kingdom; **Ahammadul Kabir,** WHO Bangladesh Country Office, Bangladesh; **Precious Chisale Kalubula,** WHO Zambia Country Office, Zambia; **Alemu Kejela,** Government of Ethiopia, Ethiopia; **Waltaji Kutane,** WHO Ethiopia Country Office, Ethiopia; **Akosua Takyiwa Kwakye,** WHO Ghana Country Office, Ghana; **Andrea Lee-Llacer,** Government of the Philippines, Philippines; **Alyaa Jasim Mohamed,** WHO Iraq Country Office, Iraq; **Kachusha Nkosha,** WaterAid Zambia, Zambia; Doreen Mulemba, Government of Zambia, Zambia; **Rajit Ojha,** Government of Nepal, Nepal; **Aarin Palomares,** Global Handwashing Partnership, United States; **Sudan Panthi,** WHO Nepal Country Office, Nepal; **Issaka Sangare,** WaterAid Mali, Mali; **Siddhi Shrestha,** UNICEF Nepal Country Office, Nepal; **Mahamane Toure,** WaterAid Mali, Mali; **Jon Michael Villasenor,** UNICEF Philippines Country Office, Philippines.

Product Design and Impact team

Leah Heiss and **Myra Thiessen,** Monash University, Australia; **Olga Kokshagina,** Monash University and Sydney University, Australia; **Kidist Bartolomeos** and **Elisabetta Minelli,** WHO Product Design and Impact unit, WHO, Switzerland.

External review group

Members of the Global Handwashing Partnership.

External support agencies

WHO gratefully acknowledges the financial support provided by the Foreign, Commonwealth & Development Office of the United Kingdom.

Acronyms and abbreviations

ABHR	alcohol-based hand rub
CCWG	Champion Country Working Group
EtD	evidence to decision
GDG	Guideline Development Group
GRADE	grading of recommendations, assessment, development and evaluation
GSC	Guideline Steering Committee
IHR	International Health Regulation
LRV	log reduction value
MMAT	Mixed Method Appraisal Tool
PDI	Product Design and Impact
PICOD	population–intervention–comparison–outcome–design
SDG	Sustainable Development Goal
SPIDER	sample–phenomenon of interest–design–evaluation–research
UN	United Nations
UNICEF	United Nations Children's Fund
WASH	water, sanitation and hygiene
WHO	World Health Organization

Glossary

Alcohol-based hand rub: An alcohol-containing preparation designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. Such preparations may contain one or more types of alcohol, other active ingredients with excipients and humectants.

Community settings: Settings where health care is not routinely delivered. They include three broad domains: domestic (households), public and institutional settings. Public settings include transport hubs, shopping areas, restaurants and other eating houses, marketplaces, plazas, squares and parks. Institutional settings include childcare and educational settings, social care settings, workplaces, places of worship and detention facilities.

Conducive environment: An environment that encourages consistent and sustained hand hygiene practices. A conducive physical environment achieves this by going beyond facilitating equitable access to materials to ensuring facilities are convenient, attractive and easy to use. A conducive social environment leverages social norms, interpersonal dynamics and routines to support and reinforce regular, effective hand hygiene among individuals and groups.

Consistency: Strategies to make hand hygiene habitual should include four components: cues, consistency, repetition and reward. The consistency component acknowledges that doing the behaviour in the same context or in response to the same cues helps the brain form strong associations, making it easier to perform the behaviour automatically.

Core requirement: A foundational prerequisites for changing and/or sustaining the practice of effective hand hygiene.

Cue: Signals or triggers in the environment that prompt an individual to start a behaviour. Cues can be external (e.g. time of day or location) or internal (e.g. thoughts or feelings).

Environmental hygiene: Refers to keeping the places where people spend time clean and free from hazards that can cause disease. It focuses on reducing the risk of exposure to pathogens in the immediate environment – whether at home, in public spaces or in institutional settings. Key aspects of environmental hygiene include waste management, access to safe and clean water and sanitation, surface cleaning, pest and vector control, and air quality and ventilation.

Food hygiene: Refers to the practices and conditions necessary to ensure the safety and cleanliness of food from production to consumption, to prevent foodborne illnesses. The World Health Organization (WHO) five keys to safer food are: keep clean, separate raw and cooked foods, cook thoroughly, keep food at safe temperatures, and use safe water and raw materials.

Hand hygiene (including effective hand hygiene): Any action of hand cleansing that removes or deactivates enough pathogens from hands to limit disease transmission. The exact reduction required to limit disease transmission depends on the pathogen in question and is not generally well defined. Nevertheless, hand hygiene is considered to be effective when the practice results in a log reduction in organisms on hands greater than 2 log, or 99%.

Handwashing: The act of hand cleansing with soap and water.

Handwashing facility: A fixed or mobile device designed to contain, transport or regulate the flow of water to facilitate handwashing. It includes sinks with tap water, buckets with taps, tippy-taps and jugs or basins designated for handwashing.

Health promotion: As defined by WHO, health promotion is part of broader public health efforts. It is a specific approach within public health that empowers individuals and communities to increase control over, and to improve, their health. Health promotion efforts emphasize health education, behaviour change and creating supportive environments. Social and behaviour change communication, and risk communication and community engagement, are core approaches within health promotion. Equitable and sustainable provision of accurate information on why, when and how to clean hands should be an integral part of broader health promotion efforts. Such efforts can also support the creation of a conducive physical and social environment. For example, design and placement of health promotion materials can encourage habit formation by cueing hand hygiene as part of broader routines.

Hygiene: Behaviours that can help to maintain health and prevent the spread of diseases. Hygiene behaviours in community settings can be grouped into three main types: personal hygiene, environmental hygiene and food hygiene.

Key question: These form the basis of the search for the evidence that underpin the recommendations in these Guidelines. The questions were identified in the course of exploring the scope of the Guidelines, identifying potential topics, and discussing areas of uncertainty and controversy. They are used to systematically search the evidence base for answers in the areas of uncertainty or controversy that the Guidelines seek to clarify.

Key time: A time when hand hygiene should be practised routinely in community settings to interrupt the transmission of priority diseases (faecal–oral and respiratory diseases). The five key times for practising hand hygiene in community settings are: before preparing food; before eating or feeding/breastfeeding others; after using the toilet or handling faeces; after coughing, sneezing or nose blowing; and when hands are visibly dirty.

Log reduction: A way to measure how much a cleaning or disinfecting process reduces the pathogen load. A 1-log reduction means the number of pathogens is 10 times smaller (90% reduced). A 2-log reduction means the number of pathogens is 100 times smaller (99% reduced).

Minimum material needs: The minimum materials without which people would not be able to practise hand hygiene.

Personal hygiene: The practices that individuals perform to care for their body and maintain cleanliness, which help to prevent illness and promote overall health and well-being. Key aspects of personal hygiene are regularly cleaning parts of the body and hair (including washing hands), grooming nails, facial cleanliness, oral care, covering coughs and sneezes, and menstrual hygiene.

Plain soap: A detergent that contains no added antimicrobial agents or contains these only to act as preservatives.

Recommendation: A statement that is informed by a systematic review of evidence and an assessment of the benefits and harms of alternative options, to assist decision-making in health care, public health or policy. Repetition: The repetition strategy component acknowledges that the more often the behaviour is repeated in response to the same cues, the stronger and more automatic the habit becomes.

Reward: The reward strategy component acknowledges that positive feedback or feelings that follow the behaviour will reinforce it and increase the likelihood that the behaviour will be repeated. Rewards can be intrinsic (e.g. sense of satisfaction) or extrinsic (e.g. praise and approval, or a tangible benefit).

Soap: A detergent-based product that contains esterified fatty acids and sodium or potassium hydroxide. It is available in various forms including bar soap, liquid soap, powder detergent and soapy water. Ash, soil and sand are less effective and do not count as soap.

Technique: The method used to perform effective hand hygiene effectively (see effective hand hygiene).

Executive summary

Hand hygiene is a fundamental public health measure. It is essential for infection prevention and control in health care, and also in non-health care settings – collectively referred to as "community settings" – such as households, public spaces and institutional settings. The importance of hand hygiene to human development, emergency response and health emergency preparedness is internationally recognized. Alongside water and sanitation services, hand hygiene protects community health, by reducing infectious disease transmission and contributing to community resilience.

Purpose and target audience

The purpose of these Guidelines on hand hygiene in community settings is to help governments and practitioners promote hand hygiene in community settings. This should lead to improved health outcomes such as reducing the incidence of diarrhoeal disease (including cholera), acute respiratory infections and other preventable diseases.

These Guidelines are primarily designed for use by any government ministry (or their local counterpart) with a mandate for leading hand hygiene efforts in community settings and coordinating cross-ministerial efforts. They are also relevant to ministries responsible for hand hygiene in particular community settings. Other government ministries, international organizations, funding agencies, nongovernmental organizations, civil society, academia and private sector organizations working on hand hygiene across multiple sectors may also have an interest.

Scope

These Guidelines are concerned with the practice of hand hygiene to protect community health outcomes, in particular the reduction of diarrhoeal diseases and acute respiratory infections.

The focus is on hand hygiene in non-health care settings, collectively referred to as community settings. Community settings are defined as those where health care is not routinely delivered. They include three broad domains: domestic (households), public and institutional settings.

The recommendations are relevant and implementable in any resource context. They are particularly relevant to long-term development contexts, complementing existing recommendations on hand hygiene in acute humanitarian response settings available through the Sphere standards for promotion of water, sanitation and hygiene. The Guidelines are intended for use in a routine health system context to improve population health, and also during health emergencies, as part of broader response strategies.

Guiding principles

These Guidelines present seven cross-cutting principles that are foundational to improving hand hygiene in community settings:

- prioritize meeting minimum material needs
- understand and target what drivers or hinders behaviour
- engage communities
- ensure efforts are intentionally gender responsive
- progressively improve
- strengthen systems
- monitor, evaluate and improve.

Recommendations

These Guidelines provide three recommendations. Recommendation 1 acknowledges hand hygiene as an important public health measure, recommends that governments promote the practice and defines what such promotion involves. Recommendation 2 outlines how hand hygiene should best be practised (technique), when (key times) and with what (materials) in order to be effective at removing or deactivating enough pathogens from hands to limit disease transmission. Recommendation 3 outlines the core requirements for hand hygiene, which are the foundational prerequisites for changing and/or sustaining the practice of effective hand hygiene.

The recommendations are as follows:

1. Governments should implement policy, legal, regulatory and fiscal measures to promote hand hygiene as a critical public health intervention. These actions should aim to remove barriers to the practice of hand hygiene and strengthen the factors that enable behaviour change and/or sustain practice. (*strong recommendation, moderate certainty evidence)*
2. To be effective, hand hygiene in community settings should be practised with plain soap and water for enough time to enable covering both hands entirely with soap and thoroughly rubbing at key times when disease can be transmitted via hands. Hand hygiene should be practised in community settings at the following key times: before preparing food, before eating or feeding/breastfeeding others, after using the toilet or handling faeces, after coughing, sneezing or nose blowing, and when hands are visibly dirty. Alcohol-based hand rub (ABHR) is an effective alternative to soap and water when hands are not visibly dirty. (*strong recommendation, moderate to high certainty of evidence for materials and technique; low certainty evidence for key times)*
3. The core requirements for changing and/or sustaining the practice of hand hygiene in community settings are: (a) access to the minimum material needs; (b) access to information on why, when, how and where to clean hands; and (c) a conducive physical and social environment. In particular:

   (a) The minimum material needs are hand hygiene facilities situated on premises with reliable access for all to sufficient running or poured water and soap, or ABHR, and with safe disposal of wastewater. To be reliable, hand hygiene facilities should be consistently stocked with water and soap or ABHR, providing hand hygiene materials whenever needed.

   (b) Information should include the importance of handwashing (why), the key times for practising hand hygiene (when) and the technique (how) to achieve effective hand hygiene.

   (c) A conducive environment encourages consistent and sustained hand hygiene practices. A conducive physical environment achieves this by going beyond facilitating equitable access to materials (covered under core requirement (a)) to ensuring facilities are convenient, attractive and easy to use. A conducive social environment leverages social norms, interpersonal dynamics and routines to support and reinforce regular, effective hand hygiene among individuals and groups.

   (strong recommendation, moderate to high certainty of evidence for minimum material needs, information and conducive environment)

Guidance on government measures

Overarching responsibility for promotion of hand hygiene lies with governments, through their duty to advance the individual human right to health and protect public health, and, for most governments, through global health obligations enshrined in the International Health Regulations. Promotion of hand hygiene involves taking steps to enable access to all core requirements outlined in recommendation 3. Government promotion efforts should move beyond project-based approaches and short-term service delivery, towards government-led strengthening of national and local systems for hand hygiene.

To achieve this, governments should provide oversight and coordination to ensure the complementary components of a system function effectively together. Local government is responsible for ensuring equitable and sustained access to services related to hand hygiene within the defined administrative area. The role of national government is to develop policy, normative and legal frameworks, and institutional arrangements that set a common vision, priorities and targets, and to ensure appropriate financing of hand hygiene services.

1. Introduction

1.1 Background

Hand hygiene is a fundamental public health measure. It is essential for infection prevention and control in health care, and also in non-health care settings – collectively referred to as "community settings" – such as households, public spaces and institutional settings. Alongside water and sanitation services, hand hygiene protects community health, by reducing infectious disease transmission and contributing to community resilience. Hand hygiene is one aspect of broader hygiene practices. Hygiene refers to behaviours that can help to maintain health and prevent the spread of diseases. Hygiene behaviours in community settings can be grouped into three main types: personal hygiene, environmental hygiene and food hygiene. These Guidelines focus on hand hygiene.

The importance of hand hygiene to human development, emergency response and health emergency preparedness is internationally recognized. It has direct links to Sustainable Development Goal (SDG) 3 on good health and well-being and SDG 6 on clean water and sanitation, and indirect links to SDGs 1, 2 and 4 on poverty reduction, hunger and malnutrition, and education *(1)*. The International Health Regulations (IHRs) *(2)* and the Pandemic Prevention, Preparedness and Response Accord *(3)* – two legally binding frameworks designed to curb the spread of disease globally – require countries to bolster water, sanitation and hygiene (WASH) services and adopt infection prevention and control measures such as handwashing.

Despite the benefits of hand hygiene, 1.7 billion people lacked basic hand hygiene services at home in 2024, and 611 million had no handwashing facility at all. Achieving the internationally agreed target of universal access by 2030 would require current rates of progress to double, rising to 11-fold in least developed countries and eightfold in fragile contexts *(4)*.

Strong leadership from policy-makers is essential to drive the necessary investment in hand hygiene. As an effective preventive and health-promoting intervention, hand hygiene is a public good, not just a private action. The savings and health improvements from practising hand hygiene in community settings are well documented, and merit government investment and prioritization. However, short political and funding timelines, low public and media attention outside emergencies, and competing priorities can mean that hand hygiene – and other preventive measures – is overlooked until there is an emergency. Strong leadership from policy-makers can change this pattern, driving sustainable change. This includes setting out an inspirational vision for promoting hand hygiene and a financed plan for achieving it, and providing ongoing coordination and support to the implementation agenda. This includes the creation of course-correction mechanisms that enable rapid identification and remediation of identified implementation obstacles.

In addition to strong political leadership, a single ministerial lead is advantageous to coordinate implementation of the recommendations in these Guidelines. Hand hygiene is cross-cutting in nature, with a diversity of actors across numerous sectors playing a role. Without a single ministerial lead, roles and responsibilities for delivering, regulating and supporting services can be fragmented and lines of accountability weak.

These **Guidelines on hand hygiene in community settings** have been developed to provide normative guidance to governments leading improvements in hand hygiene in community settings, facilitating progress towards a universal, sustained practice and improved health outcomes. These Guidelines are different but complementary to the **WHO guidelines on hand hygiene in health care** *(5)* (see **Box 1**).

Box 1. Differences across health care and community settings

Differences in population groups and their exposures across health care and community settings affect guidance on how to improve hand hygiene. Table 1 summarizes these differences.

Table 1. Hand hygiene in health care and community settings

	Health care settings	Community settings
Population	**Health care workers:** Regular touching of patients and body fluid whether gloves are worn or not. Hand hygiene is a professional responsibility for health care workers and often a legal and institutional requirement. **Patients:** Patients are often immunocompromised, elderly or critically ill. High risk of opportunistic infections. **Visitors:** Visitors to health care settings may introduce infectious agents from the community, posing a risk to patients, health care workers and others within the facility.	**General population:** Mixed age, health status and immunity levels. Often more mobile and less monitored. Includes high-risk subgroups (e.g. elderly people, children and homeless people). Although individual hand hygiene has implications for public health, it is a private behaviour.
Common types of exposure	Direct and indirect contact transmission due to touching patients including vulnerable sites and their environment, and device-associated transmission (e.g. touching central lines, catheters and ventilators). Respiratory, faecal–oral and other modes can occur.	Lower frequency of direct pathogen exposure. Direct exposure through respiratory spread, faecal–oral transmission or direct person-to-person contact. Indirect exposures in public spaces.
Recommendation on when to practise hand hygiene	The concept of "my five moments for hand hygiene" focuses on the point of care: 1) before touching a patient 2) before a clean/aseptic procedure 3) after body fluid exposure risk 4) after touching a patient 5) after touching patient surroundings. The five moments approach simplifies when to do hand hygiene in a range of health care settings, integrates hand hygiene action into the workflow of busy health workers where they interact with patients and the health care environment, is easy to remember, and encourages a consistent approach across practice, policy, education and training, monitoring and reminders.	Five critical times for practising hand hygiene: 1) before preparing food 2) before eating or feeding/breastfeeding others 3) after using the toilet or handling faeces 4) after coughing, sneezing and nose blowing 5) when hands are visibly dirty.
Recommendation on hand hygiene materials	Using alcohol-based hand rub (ABHR) is recommended as the most effective method to clean hands in most patient-care situations, unless exposure to potential spore-forming pathogens is strongly suspected or proven, hands are visibly soiled or ABHR is not available. Handwashing with soap and water is also recommended.	Using water and soap is recommended as the most effective method to clean hands in most situations in community settings, with ABHR as an effective alternative when hands are not visibly dirty.

1.2 Purpose, target audience and scope

1.2.1 Purpose

The purpose of these Guidelines is to help governments and practitioners promote hand hygiene in community settings. This should lead to improved health outcomes such as reducing the incidence of diarrhoeal disease (including cholera), acute respiratory infections and other preventable diseases.

1.2.2 Target audience

These Guidelines are primarily designed for use by any government ministry (or their local counterpart) with a mandate for leading hand hygiene efforts in community settings and coordinating cross-ministerial efforts. In the absence of an existing clearly established lead, health ministries hold the mandate for this role. Health ministries are tasked with protecting and improving the health of people and their communities. Hand hygiene in the community is central to this, and is a foundational element of health programmes in most countries, particularly for maternal and child health, vertical disease programmes, school-based health, community-led health promotion, and pandemic and epidemic response.

These Guidelines are also relevant to ministries responsible for hand hygiene in particular community settings. For example, in schools, education ministries are responsible for ensuring hand hygiene is accessible and practised, as part of a healthy school environment. For some settings, the ministerial lead will be clear. For other settings, such as marketplaces or social care settings, this might require interministerial and/or intersectoral discussion and agreement.

Other government ministries, international organizations, funding agencies, nongovernmental organizations, civil society, academia and private sector organizations working on hand hygiene across multiple sectors may also have an interest in these Guidelines, when developing and contextualizing strategies, programmes and tools for hand hygiene measures to ensure they protect public health. At their broadest application, the Guidelines are a general reference on hand hygiene and health, together with the **WHO guidelines on hand hygiene in health care** *(5)*.

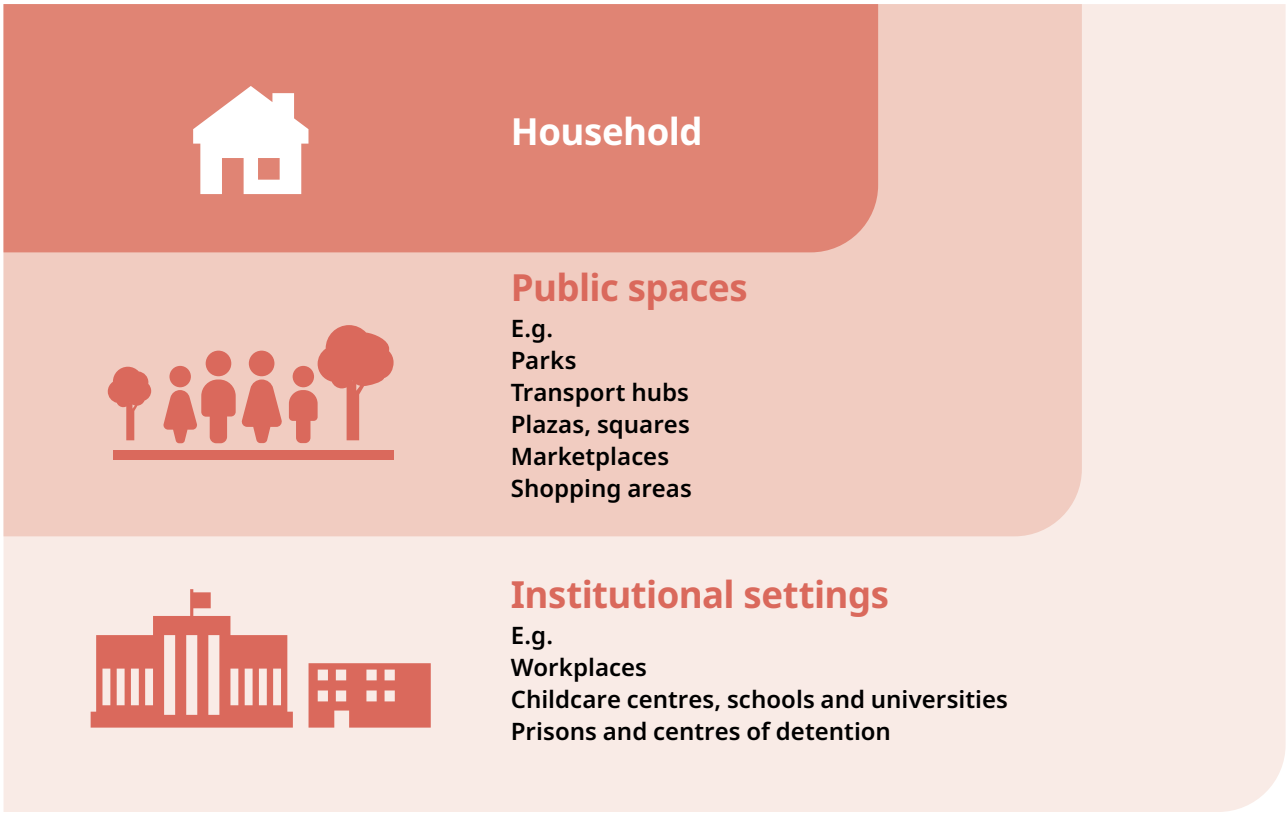
1.2.3 Scope

These Guidelines are concerned with the practice of hand hygiene to protect community health outcomes, in particular the reduction of diarrhoeal diseases and acute respiratory infections.

Community settings: The focus in these Guidelines is on hand hygiene in non-health care settings, collectively referred to as community settings. Using the definition set out in the 1986 Ottawa Charter for Health Promotion, settings are considered to be where "health is created and lived by people within the settings of their everyday life; where they learn, work, play and love" *(6)*. Community settings are defined as those where health care is not routinely delivered. They include three broad domains: domestic (households), public and institutional settings (**Figure. 1**).

Public settings include transport hubs, shopping areas, restaurants and other eating houses, marketplaces, plazas, squares and parks. Institutional settings include childcare and educational settings, social care settings, workplaces, places of worship and detention facilities. These Guidelines do not cover nursing homes, long-term care facilities, non-acute care facilities and home care, as these are places where health care is routinely provided and are therefore covered within the **WHO guidelines on hand hygiene in health care** *(5)*.

Figure 1. Community settings



Community settings are diverse, and guidance may differ across them in some cases. For example, from the perspective of infrastructure, public use and higher traffic in institutional or public settings demand multiple hand hygiene facilities and adaptations to reduce points of contamination (e.g. foot pumps or touchless dispensers), and may require theft prevention measures, none of which are likely to be applicable in households.

Low, middle and high resource contexts: The recommendations in these Guidelines are relevant and implementable in any resource context. Given the greater burden of disease associated with poor hand hygiene in low and middle resource contexts, implementation of the recommendations is most pressing in such contexts. However, hand hygiene is also critical to public health in high-income contexts. In those contexts, the focus is likely to be on ensuring inclusivity and/or promoting sustained adoption of the practice.

Long-term development contexts: The recommendations in these Guidelines are relevant to long-term development contexts (where efforts are proactive and focused on sustainable improvements), complementing existing recommendations on hand hygiene in acute humanitarian response s0ettings (where efforts are short term and reactive) available through the Sphere standards for WASH promotion *(7)*. Acknowledging the transition between humanitarian and long-term development contexts, the recommendations are relevant along a continuum between stable and fragile states pursuing long-term development plans.

Routine public health and public health emergency contexts: These Guidelines are intended for use in a routine health system context to improve population health, reduce endemic disease, and build resilience to and preparedness for future disease outbreaks. They are also intended for use during health emergencies, as part of broader response strategies.

Specific guidance relevant to health emergencies is shaded in blue throughout this report, for ease of reference.

1.3 Guiding principles

The following principles underpin these Guidelines:

Prioritize meeting minimum material needs: Despite numerous influences on hand hygiene, there are certain minimum material needs, without which it cannot be practised. These minimum material needs are water and soap, or ABHR. Given their foundational nature, strategies to improve hand hygiene should prioritize access to these basic needs above all else. This is a simple but important point, as interventions often promote hand hygiene through information, education and marketing but without ensuring access to soap and water *(8, 9)*.

Understand and target what drives or hinders behaviour: Hand hygiene is influenced by many interconnected factors, including cognitive, psychological, environmental and sociocultural factors *(10)*. These can act as either barriers or enablers to hand hygiene, and are highly context specific in nature. Understanding what drives or hinders hand hygiene, and the nature of those influences, is important for developing strategies that can change and/or sustain the behaviour.

Engage communities in planning, designing and implementing hand hygiene policies and programmes: It is important to use a participatory approach to define barriers and enablers to hand hygiene and design tailored strategies and interventions with the communities who will be engaged. Involving relevant stakeholders in communities (e.g. citizens, policy-makers and health care providers) from an early stage of the design process ensures interventions take into account population needs and abilities. Such engagement also builds trust in communities, which is an important element in enabling healthy behaviours and more equitable health and well-being outcomes. Community outreach should include representatives of the local demographic and prioritize people from marginalized populations.

Ensure efforts to improve hand hygiene are intentionally gender responsive: In many societies, hygiene and domestic care roles are highly gendered; women carry a disproportionate burden of responsibility for the hygiene of the household, their families and within institutions *(11)*. Identifying and understanding gender-related roles and barriers throughout the hand hygiene system will allow deliberate steps to be taken to address inequalities by developing policies and approaches that are responsive to the needs of women and girls who perform most hygiene-related tasks, and which do not reinforce gender stereotypes (e.g. by targeting women and girls).

Progressively improve: An incremental approach can be taken to improve hand hygiene, recognizing that it may take time to overcome challenges and achieve universal, equitable and sustained practice. The core requirements for changing and/or sustaining hand hygiene are identified throughout these Guidelines, and guidance is provided on progressive improvements that can be made from that baseline.

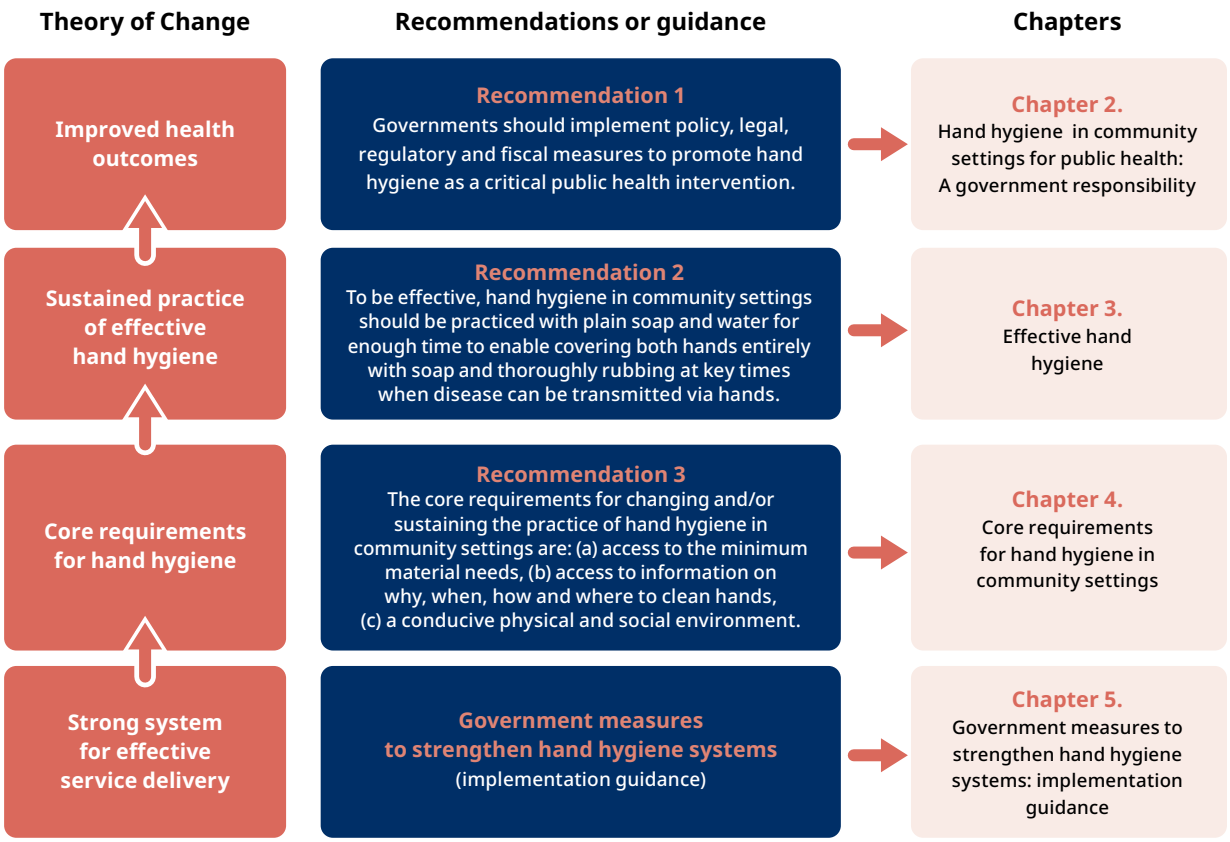
Strengthen systems that can deliver effective, sustainable and equitable services: Efforts to improve hand hygiene should move beyond project-based approaches and short-term service delivery, towards government-led strengthening of national and local systems for hand hygiene. A hand hygiene system comprises whatever elements enable or hinder the delivery of effective, equitable and sustainable services for hand hygiene and their often complex interlinkages. Effective, equitable and sustainable delivery of hand hygiene services means reliable, accessible and affordable provision, operation and maintenance of hand hygiene facilities for all, with water and soap or ABHR and ongoing behaviour change strategies for sustained practice.

Monitor, evaluate and improve: Finding out what works best to facilitate the sustained practice of hand hygiene requires proportionate time and resources to test, learn from and adapt approaches. Whenever possible, strategies and programmes should be evaluated to determine what works and what does not work, and why (the mechanisms underlying change). Given the influences of social, cultural and other environmental factors on behaviour, it is important to empirically evaluate strategies and interventions in specific contexts. Evaluation at a smaller scale (e.g. pilot projects and proof of concepts) can generate useful data and insights to refine and contextualize a strategy or intervention for greater health impact before scaling up. Evaluation should be documented and shared to build the evidence base.

1.4 Structure

The structure of these Guidelines is in line with their theory of change (**Figure 2**), and starts with the outcome of interest. **Chapter 2** acknowledges hand hygiene as an important public health measure, recommends that governments promote its practice and defines what such promotion involves (**Recommendation 1**). **Chapter 3** outlines how hand hygiene should be practised (technique), when (key times) and with what (materials) to be effective at removing or deactivating enough pathogens from hands to limit disease transmission (**Recommendation 2**). **Chapter 4** outlines the core requirements for changing and/or sustaining the practice of hand hygiene, and which need to be implemented as a package as part of any hand hygiene promotion strategy (**Recommendation 3**). **Chapter 5** provides guidance on a system-strengthening approach to implementing the recommendations, with an emphasis on government roles and responsibilities. **Chapter 6** describes the methods used in the development of these Guidelines. **Annex 1** lists the key questions underpinning the recommendations. **Annex 2** lists the systematic reviews synthesizing the evidence on these key questions. **Annex 3** documents a summary of the Guideline Development Group (GDG) evidence-to-decision (EtD) process, with full details provided in **Web Annex 1**. **Annex 4** summarizes the direction, strength and quality of evidence of the recommendations.

Figure 2. Structure of these Guidelines



2. Hand hygiene in community settings for public health: a government responsibility

This chapter outlines why hand hygiene is important for public health, makes a case for government leadership to promote hand hygiene and defines what hand hygiene promotion involves. The core requirements for changing and/or sustaining the practice of hand hygiene, which should underpin any promotion strategy, are outlined in recommendation 3 (Chapter 4).

2.1 Recommendation 1

Governments should implement policy, legal, regulatory and fiscal measures to promote hand hygiene as a critical public health intervention. These actions should aim to remove barriers to the practice of hand hygiene and strengthen the factors that enable behaviour change and/or sustain practice (see core requirements for promotion under recommendation 3).

Strength of recommendation: Strong
Quality of the evidence: Moderate certainty evidence

2.2 Remarks

2.2.1 An important public health measure

The role of hand hygiene as an important public health measure has long been recognized. In 1795, Alexander Gordon (1752–1799) asserted that deaths from puerperal fever could be prevented with greater cleanliness and that "nurses and physicians ought carefully to wash themselves" after contact with an infected patient *(12)*. Ignaz Semmelweis (1819–1865) later achieved a dramatic reduction in maternal deaths by requiring doctors to wash their hands in chlorine solution before examining women in labour *(13)*.

People who practise poor hand hygiene are at increased risk, primarily of acute respiratory infections and diarrhoeal diseases. Diarrhoeal diseases are a leading cause of death in children under the age of 5 years *(14)*. The diarrhoeal disease burden includes acute and epidemic cases, caused by diseases such as cholera, but also a large endemic burden resulting in morbidity and mortality. Acute respiratory infections are a leading cause of global morbidity and mortality *(15)*. Pneumonia is the single largest infectious cause of death among children under the age of 5 years in low- and middle-income countries *(14)*. Handwashing with soap and water can reduce the risk of diarrhoea and acute respiratory infections by 30% *(16)*. and 17% *(17)*, respectively, preventing 740 000 deaths each year *(18)*.

Additional benefits of hand hygiene include reducing skin and eye infections such as trachoma and intestinal worm infections such as hookworm and ascaris, which together contribute significantly to the disease burden in low- and middle-income countries.

Domestic hand hygiene promotion is a cost-effective intervention for child health, on a par with oral rehydration therapy and most routine childhood vaccinations *(19)*. By reducing the spread of infectious diseases, hand hygiene also has indirect health impacts and socioeconomic benefits. It can reduce pressure on health systems, freeing up resources to address other health priorities. It can also reduce the transmission of resistant pathogens and the need for antibiotic treatments, helping to reduce the spread of antimicrobial resistance and associated deaths and health costs *(20)*. Significant financial costs related to infectious diseases are borne by the patient and their family or household and the health system. They include direct costs, such as the costs of medical treatment borne by households and/or governments, and nonmedical costs, including travel costs for households seeking health care. Indirect costs include income loss, school absence and lost productivity associated with sickness.

2.2.2 Government responsibility

Although many actors have roles to play in ensuring the delivery of services that provide the core requirements for hand hygiene, the overarching responsibility lies with governments. This is through their duty to advance the individual human right to health and to protect public health, and, for most governments, through global health obligations enshrined in the IHRs.

Individual health: Governments bear a duty to advance the human right to health of each individual in their population. All World Health Organization (WHO) Member States have ratified at least one international human rights treaty that includes the right to the highest attainable standard of health *(21-25)*. This legally commits each country to develop rights-compliant health systems and to implement other public health measures that improve the underlying determinants of health.

Public health and public finances: Most governments bear a duty to protect and improve the health of people and their communities. The Ministry of Health generally has the mandate for this. In addition, as custodians of public finances, governments have a duty to ensure resources are used efficiently and effectively. Public health investments and early prevention of infectious disease can prevent often-costly curative treatments in the future, and increase school attendance and productivity.

Global health: The IHRs provide an overarching legal framework that defines the rights and obligations of countries in handling public health events and emergencies that have the potential to cross borders.[2] The IHRs are a legally binding instrument of international law. Under the IHRs, countries must act to limit and address public health threats, including limiting the spread of health risks.

This overarching responsibility does not signify that governments are responsible for direct service delivery. Rather, governments should create a policy, legal, regulatory and fiscal environment that enables relevant actors to deliver effective, accessible and sustainable hand hygiene services. **Chapter 5** on implementation provides further details.

2.2.3 Promotion

Promoting hand hygiene in community settings is an integral part of broader public health efforts. Most public health challenges – such as hand hygiene – have a behavioural component. Numerous factors can influence behaviours, broadly falling within three dimensions: cognitive and psychological, environmental and sociocultural. Strategies to promote public health, and promote hand hygiene as part of this, should address factors across these three dimensions.

The factors that influence hand hygiene behaviour are highly context specific. Therefore, initiatives (e.g. research) that identify influencing factors in the local context and design interventions to specifically target these factors are likely to be most effective. However, there are certain universally applicable drivers of hand hygiene behaviour that should form the basis of any hand hygiene promotion strategy (outlined in the core requirements in **Chapter 4**). Together, these core requirements enable health literacy and a conducive physical and social environment.

2.3 Rationale

The GDG made a recommendation in favour of government promotion of hand hygiene as an important public health measure, because there is evidence that the promotion of hand hygiene can reduce disease transmission, and because of a strong normative basis for assigning government responsibility for enabling it (as outlined in **Sections 2.2.1**. and **2.2.2**). Despite the moderate quality of the evidence synthesised in the two latest systematic reviews of the effect of handwashing promotion on diarrhoeal disease and respiratory infections *(16, 17)*, the GDG issued a strong recommendation. This is because the GDG acknowledged that although there are methodological challenges associated with quantifying the risk associated with poor hand hygiene, the importance of hand hygiene is a well-established principle in public health. A strong recommendation indicates that the GDG is highly confident that the desirable effects of practising hand hygiene in community settings outweigh any undesirable consequences of practising it.

3. Effective hand hygiene

This chapter provides guidance on the effective materials, technique and key times for practising hand hygiene in community settings.

3.1 Recommendation 2

To be effective, hand hygiene in community settings should be practised with plain soap and water for enough time to enable covering both hands entirely with soap and thoroughly rubbing at key times when disease can be transmitted via hands.

Hand hygiene should be practised in community settings at the following key times: before preparing food, before eating or feeding/breastfeeding others, after using the toilet or handling faeces, after coughing, sneezing or nose blowing, and when hands are visibly dirty.

Alcohol-based hand rub (ABHR) is an effective alternative to soap and water when hands are not visibly dirty.

Strength of recommendation: Strong
Quality of the evidence: Materials - Moderate to high certainty evidence;
Technique – Moderate to high certainty evidence; Key times - Low certainty evidence

3.2 Remarks

Effective hand hygiene is any action of hand cleansing that removes or deactivates enough pathogens from hands to limit disease transmission *(5)*. The exact reduction required to limit disease transmission depends on the pathogen in question and is not generally well defined. Nevertheless, hand hygiene is considered to be effective when the practice results in a log reduction in organisms on hands greater than 2 log, or 99% *(26)*. Log reduction is a way to measure how much a cleaning or disinfecting process reduces the pathogen load. A 1-log reduction means the number of pathogens is 10 times smaller (90% reduced). A 2-log reduction means the number of pathogens is 100 times smaller (99% reduced) *(27)*.

Recommended hand hygiene materials, technique and key times for effective hand hygiene are outlined below.

3.2.1 Hand hygiene materials

Soap: Soap is recommended because it is effective at removing pathogens from hands, and it is generally acceptable, cheap and easy to find in most community settings. Plain soap is recommended, defined as a detergent that contains no added antimicrobial agents or contains these only to act as preservatives *(5)*. Liquid, bar or powdered forms of soap can be used. Soapy water solutions made by mixing detergent with water can also be used. The ratio of detergent to water will depend on types and strengths of locally available products, but a useful guide is 5 g of powdered soap or 5 mL of liquid soap (1 teaspoon) for every litre of water *(28)*. Antimicrobial soap is not recommended, because certain active ingredients in antimicrobial soap (triclosan and triclocarban) may be harmful to health and the environment *(26, 29-36)*. However, handwashing should still be practised with antimicrobial soap if plain soap is not available.

Water: Efforts should be made to use and source water from an improved source where possible. Improved drinking-water sources are those that have the potential to deliver water that is free from contamination, by nature of their design and construction *(4)*. If microbial water quality is poor or unknown, handwashing is still recommended, provided it is with soap, and the water source should be clearly labelled as non-potable, especially in public and institutional settings. Hands should not be rinsed in standing water within a communal basin, as this may increase contamination. Running or poured water is required. The core requirements in **Chapter 4** provide guidance on the water quantity.

ABHR: ABHR can inactivate pathogens on hands and is an effective alternative to soap and water. When hands are visibly dirty or soiled, soap and water may be the more effective option for cleaning hands, but ABHR can still be effective *(37)*. ABHR is a good option for hand hygiene in situations where water and soap are unavailable or insufficient, or difficult to access. In households and most institutional settings, soap and water should be available, and they are the preferred option for hand hygiene. However, ABHR can be preferrable to water and soap in public settings with a high population density and/or transient population, because it is quick and convenient to use relative to water and soap and can be more accessible, with dispensers situated anywhere. ABHR should contain at least 60% alcohol to ensure disinfectant efficacy *(5)*. Such products should be certified, and, where supplies are limited or prohibitively expensive, can be produced locally according to WHO recommended formulations *(38)*.

If soap is unavailable: Water alone can achieve some log reduction, but not above the threshold required for effectiveness. The use of water alone to wash hands is preferable to no handwashing at all.

Non-alcohol-based antiseptics, antimicrobial wipes, sand, soil or ash are not recommended as alternatives to soap and water: Although they can be effective at removing or deactivating pathogens from hands, they may present risks to the user. Non-alcohol-based antiseptics such as chlorine may cause skin irritation and damage, and are subject to degradation when exposed to sunlight or heat *(39)*; sand, soil or ash can be contaminated; and disposable antimicrobial wipes have a negative environmental impact *(40, 41)*.

Although these alternatives are not recommended under standard conditions, they may be used as a last resort during health emergency situations where there is heightened risk of infectious disease transmission and no access to soap and water or ABHR.

Hand drying: The ability to dry hands after washing is important for effective hand hygiene, because the level of residual moisture left on hands after washing can be an important determinant of pathogens being transmitted from hands to surfaces and vice versa *(42)*. Appropriate hand-drying methods that do not lead to recontamination of hands should be chosen. Clean, single-use paper towels are recommended, with consideration for how these can be recycled to minimize their environmental impact. Alternatively, manual air drying by shaking is effective. Hand drying using one's own clothes can lead to recontamination of hands and is not recommended *(43)*.

3.2.2 Technique

The recommended technique for effective hand hygiene is to wet hands with water and apply a sufficient amount of soap to cover all hand surfaces (**Figure 3**). Rub vigorously for enough time to fully cover hands with soap. Rinse hands with water and dry thoroughly with a single-use towel. Use the towel to turn off the tap. When using ABHR, apply a palmful of product (the amount needed to cover all surfaces of both hands) and cover all surfaces of the hands. Rub hands until dry.

Figure 3. Technique for effective hand hygiene in community settings

3.2.3 Key times

Hand hygiene in community settings should be practised when it is plausible that this practice can interrupt transmission of disease via hands. There are many circumstances in community settings when hands should be cleaned. The following represent key times when hand hygiene should routinely be practised in community settings to interrupt transmission of priority diseases (faecal–oral and respiratory infectious diseases).

Five key times have been identified for practising hand hygiene in community settings (**Figure 4**):

Figure 4. Key times for practising hand hygiene in community settings

During health emergencies, additional times for practising hand hygiene may be considered, to prevent the spread of infectious diseases. In addition, in more contaminated environments or more densely populated settings, a higher frequency of hand hygiene may be required. Additional times for practising hand hygiene in these contacts may include: upon entering private or public buildings (including the home) and after caring for people who are sick.

There are specific occupations or activities that warrant greater frequency of handwashing. These are covered in relevant occupational health guidance, for example, on food handling *(44)*. or handling of chemicals *(45)*.

3.3 Rationale

3.3.1 Hand hygiene materials

The recommendation on materials was formulated by the GDG based on the best available evidence on efficacy and effectiveness of practices used in community settings related to hand hygiene, as well as consideration of the relative acceptability, availability, cost and socioeconomic impacts of the different materials. A description of how these considerations weighed in the decision-making process can be found below. In sum, the GDG provided a recommendation in favour of water and soap for hand hygiene, with alcohol-based handrub as an alternative because these materials were demonstrated to be effective at removing pathogens from hands, and the GDG considered them to be widely acceptable and available at no significant financial, societal or environmental cost.

Balance of health benefits and harms

Effectiveness: A systematic review commissioned by WHO for these Guidelines and published in 2025 synthesized the evidence on efficacy effectiveness of different hand hygiene materials *(46)*.

Plain and antimicrobial soap, ABHR, non-alcohol-based antiseptics (e.g. chlorhexidine, chlorine and iodine) and antiseptic/antimicrobial towels were found to be efficacious for hand hygiene in a laboratory setting, with summary log reduction values (LRVs) ranging from 3.12 for ABHR to 2.13 for antiseptic/antimicrobial towels. However, in general, study results were highly heterogeneous and there was a lack of data on the efficacy of different materials on viruses, particularly non-enveloped viruses *(46)*. Furthermore, it is well established that ABHR and non-alcohol-based antiseptics are not effective at removing pathogens from visibly dirty or soiled hands, which is common in many community settings or contexts *(46)*.

Ash and sand were found to be efficacious for handwashing in some conditions, but this was based on only two studies of limited quality *(47, 48)*. A review concluded that more research on sand and ash may be particularly useful to inform whether these are effective against organisms in resource-constrained areas. These findings are consistent with a systematic review carried out in 2020 *(49)*.

On water quality, the literature is insufficient to uphold a recommendation on the particular level of water quality required for effective handwashing, but supported a recommendation for handwashing when microbial water quality is unknown. A 2019 study modelled the hypothesized mechanism of infection due to contaminated handwashing water and concluded that even water with moderate faecal contamination when used with soap and the correct technique can be effective at removing pathogens from hands *(50)*. The systematic review commissioned by WHO and published in 2025 identified two studies assessing microbial water quality for handwashing, but neither investigated use of soap, and findings were inconclusive *(51, 52)*. On hand drying, there were 12 studies investigating paper towels, cloth towels, evaporation, hot-air dryers and jet-air dryers, but meta-analysis was not possible. Although no method was consistently identified as showing the greatest reduction across studies, those that tested paper towels generally reported reductions in contamination *(46)*.

On washing hands with water alone without soap, the commissioned review identified 10 studies, six of which could be summarized for bacteria, revealing a summary LRV of 1.16 *(46)*. Although this does not meet the threshold of >2 LRV to constitute effective hand hygiene, the GDG unanimously agreed this would be better than not washing hands at all.

Potential harms: Concerns about the potential risks posed by certain hand hygiene materials also played a part in the GDG deliberations and formulation of recommendations.

Use of antimicrobial soap containing active ingredients like triclosan and triclocarban has been widely discussed in scientific literature and regulatory reviews *(29-36)*. These concerns include endocrine disruption, skin irritation, antibiotic resistance and long-term systemic effects. Concerns about the potential risks posed by use of non-alcohol-based antiseptic for hand hygiene have also been well documented *(39)*. These concerns, together with concerns around environmental impact of these products, led the GDG to unanimously agree not to recommend these materials for hand hygiene.

With regard to sand and ash, it is possible that these could be contaminated. Ash resulting from freshly burned wood should be sterile. However, ash can be produced through the burning of various materials, especially in low-resource settings where wood for burning is scarce or expensive. These include coal, wood fibre, dry leaves, fodder, cow dung cakes, waste crops and various kinds of solid waste matters discarded from rural households. In addition, even if ash is sterile, from freshly burned wood, and then stored in or around the home, it can become contaminated. Although there are no epidemiological data quantifying the magnitude of the risk of contamination, the GDG unanimously agreed that the potential for harm, together with concerns around acceptability, was sufficient to warrant not recommending ash or sand as alternatives to soap. aterials for hand hygiene.

Acceptability, availability and cost

Beyond its effectiveness at cleaning hands, the GDG unanimously agreed on plain soap as the recommended hand hygiene material in community settings because it is highly accepted and widely available at low cost compared to alternatives.

Societal and environmental implications

The GDG did not raise any societal or environmental implications of concern for plain soap or ABHR. For antimicrobial soap, concerns were raised about the environmental persistence of antimicrobials like triclosan and triclocarban, bioaccumulation and toxicity in aquatic ecosystems. Emergence of antimicrobial resistance has also been well documented *(29-31)*. There are environmental concerns associated with the use of antimicrobial wipes *(40-41)*.

3.3.2 Technique

The recommended technique was mostly adapted from the **WHO guidelines on hand hygiene in health care** *(5)*, except for the question of duration. The systematic review commissioned by WHO for the present Guidelines was inconclusive on the relative effectiveness of washing hands for 10, 20 or more seconds *(46)*. Given this, the GDG could not make a recommendation for a specific duration of handwashing. Instead, the GDG recommendation is for handwashing for a sufficient duration to enable the objective of the handwashing event to be achieved – to fully cover hands with soap, rub and rinse. Given the focus on the objective of the handwashing event rather than a specific duration, this is a strong recommendation, because the GDG was confident in the balance between the desirable and undesirable consequences of implementing it.

3.3.3 Key times

Studying the health impacts of practising hand hygiene at specific times is methodologically complex, so WHO did not commission a systematic review of the literature on this question. Still, the GDG considered it important to include key times in the recommendation. These key times were informed by a scoping review of existing global guidance and biological plausibility. The review found that certain clusters of times for hand hygiene are consistently recommended across sources *(75)*. The GDG reviewed this list of consistently recommended times and selected those where it is biologically plausible that hands can interrupt transmission of priority diseases (faecal–oral and respiratory infectious diseases).

The GDG also considered additional key times that prevent hands from being contaminated with pathogens and/or that prevent hands from contaminating other surfaces. For example, after touching public surfaces and when arriving home. However, the majority of GDG members found these to be unnecessary in non-epidemic, non-pandemic or other scenarios that are not high risk. Most pathogens are not able to penetrate intact skin, so the focus for key times is on moments when disease can be transmitted during activities where hands contact food, water, hands or eyes, or are particularly likely to become contaminated (e.g. after using the toilet).

4. Core requirements for hand hygiene in community settings

This chapter defines the core requirements for practising hand hygiene in community settings. These represent the foundational prerequisites for changing and/or sustaining the practice of hand hygiene. Guidance may differ across community settings (see **Section 1.2.3**).

4.1 Recommendation 3

The core requirements for changing and/or sustaining the practice of hand hygiene in community settings are: (a) access to the minimum material needs; (b) access to information on why, when, how and where to clean hands; and (c) a conducive physical and social environment. In particular:

(a) The minimum material needs are hand hygiene facilities situated on premises with reliable access for all to sufficient running water and soap, or ABHR, and with safe disposal of wastewater. To be reliable, hand hygiene facilities should be consistently stocked with water and soap or ABHR, providing hand hygiene materials whenever needed.

(b) Information should include the importance of handwashing (why), the key times for practising hand hygiene (when) and the technique (how) to achieve effective hand hygiene.

(c) A conducive environment encourages consistent and sustained hand hygiene practices. A conducive physical environment achieves this by going beyond facilitating access to materials (covered under core requirement (a)) to ensuring facilities are convenient, attractive and easy to use. A conducive social environment leverages social norms, interpersonal dynamics and routines to support and reinforce regular, effective hand hygiene among individuals and groups.

Strength of recommendation: Strong
Quality of the evidence: Minimum material needs – Moderate to high certainty evidence
Information - Moderate to high certainty evidence; Conducive environment – Moderate to high certainty evidence

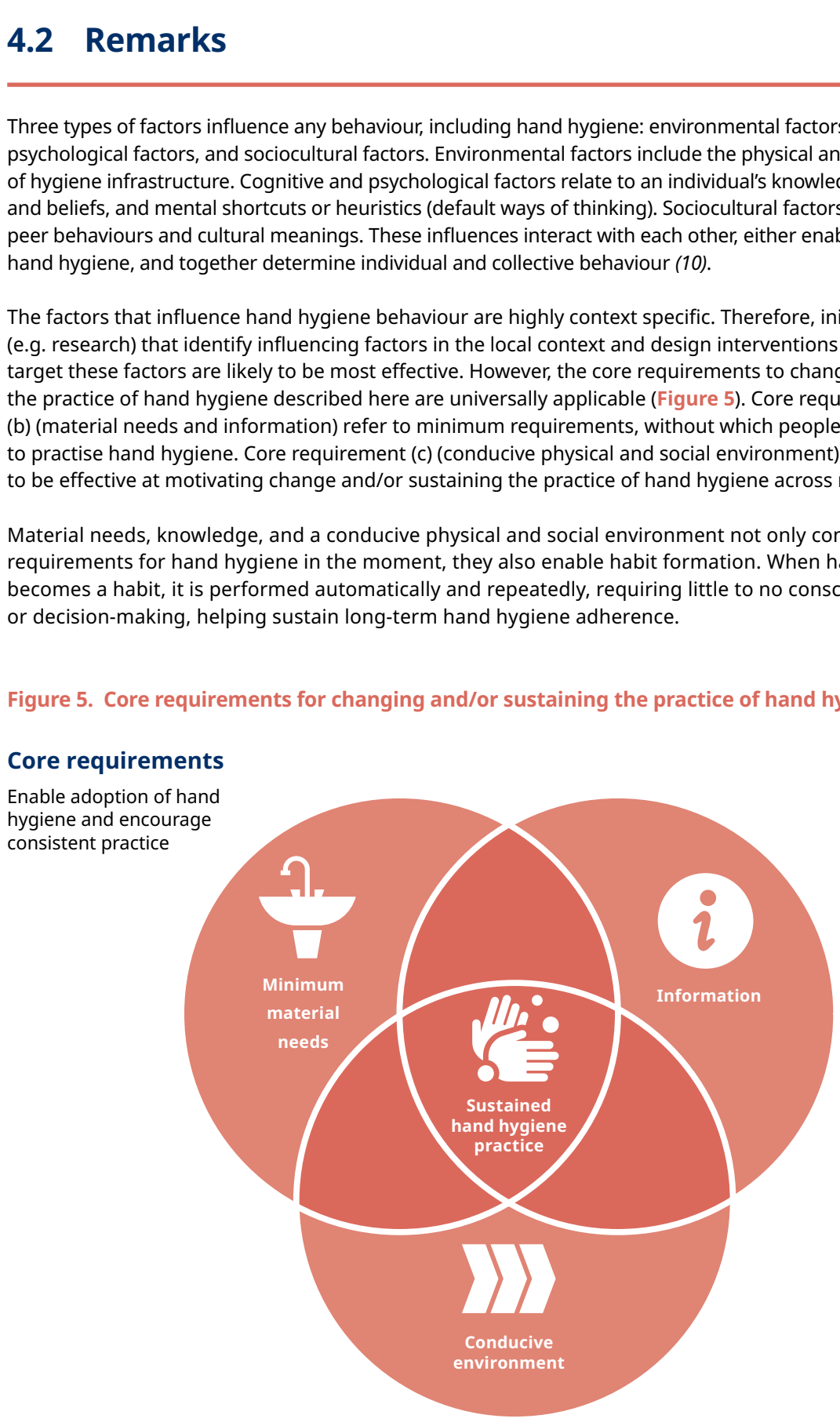
4.2 Remarks

Three types of factors influence any behaviour, including hand hygiene: environmental factors, cognitive and psychological factors, and sociocultural factors. Environmental factors include the physical and logistic setup of hygiene infrastructure. Cognitive and psychological factors relate to an individual's knowledge, attitudes and beliefs, and mental shortcuts or heuristics (default ways of thinking). Sociocultural factors include norms, peer behaviours and cultural meanings. These influences interact with each other, either enabling or hindering hand hygiene, and together determine individual and collective behaviour *(10)*.

The factors that influence hand hygiene behaviour are highly context specific. Therefore, initiatives (e.g. research) that identify influencing factors in the local context and design interventions to specifically target these factors are likely to be most effective. However, the core requirements to change and/or sustain the practice of hand hygiene described here are universally applicable (**Figure 5**). Core requirements (a) and (b) (material needs and information) refer to minimum requirements, without which people would not be able to practise hand hygiene. Core requirement (c) (conducive physical and social environment) has been shown to be effective at motivating change and/or sustaining the practice of hand hygiene across multiple settings.

Material needs, knowledge, and a conducive physical and social environment not only constitute core requirements for hand hygiene in the moment, they also enable habit formation. When hand hygiene becomes a habit, it is performed automatically and repeatedly, requiring little to no conscious thought or decision-making, helping sustain long-term hand hygiene adherence.

Figure 5. Core requirements for changing and/or sustaining the practice of hand hygiene



4.2.1 Core requirement (a): Minimum material needs

The materials recommended for effective hand hygiene are outlined in recommendation 2 (**Chapter 3**). These are plain soap and water, with ABHR as an alternative. Ensuring people have access to the necessary materials to practise hand hygiene when needed should be a core requirement of any promotion strategy. The guidance below supports planning to ensure access to at least the minimum material needs for effective hand hygiene. It includes guidance on the quantities of materials required per hand hygiene event as well as guidance on hand hygiene facility design to ensure sustainable access to materials.

Per hand hygiene event

Sufficient running water and soap, or ABHR, at locations that enable hand hygiene at key times are the minimum materials needed for practising effective hand hygiene.

Water quantities: Water is sufficient for a handwashing event when it enables the entire hand surfaces to be wetted before rubbing with soap, and to thoroughly rinse off the soap after rubbing. When insufficient water is used, hands may not be effectively cleaned. Reported quantities of water used for handwashing that have enabled reduction of faecal contamination range from 0.5 to 2.0 L per person, per handwashing session *(54)*. Where water is limited, or where touchless features remove the need to touch the tap, the water can be turned off after wetting hands and while covering with soap and rubbing, and then turned on again to rinse.

Soap quantities: Soap is sufficient for a handwashing event when it covers the entire surface of the hand. The specific quantity of soap required depends on the type of soap used (liquid, bar or soapy water). Reported quantities of soap used for handwashing that have enabled reduction of faecal contamination range from 1 to 3 mL (about 1–3 g) for liquid soap, 0.5–1 g for bar soap and 200 mL of soapy water.

ABHR quantities: ABHR is sufficient for a hand hygiene event when it enables covering all surfaces of both hands thoroughly. A palmful of product containing at least 60% alcohol is recommended, equivalent to approximately 3–5 mL per hand hygiene event *(5)*.

For hand hygiene facilities

Hand hygiene facilities should provide equitable and sustained access to the materials outlined above. When planning the design of effective hand hygiene facilities, programme managers should consider the following minimum needs for a hand hygiene facility.

Reliable water supply: Water supply to a handwashing facility should be available when needed and come from an improved source. If water quality is unknown, handwashing is still recommended (see **Section 3.2.1**), but when designing hand hygiene facilities, every effort should be made to ensure a water supply that is free from contamination. Improved water sources include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water *(4)*. A piped water connection providing running water when needed is the ideal supply option. Alternatively, a local water storage container can be used, either built into the handwashing facility with a tap or located nearby. The container should be covered to avoid contamination, large enough to avoid frequent refilling, and designed to enable water levels to be checked and for easy refill.

Available soap or ABHR: Liquid, bar or powdered forms of plain soap can be used, as well as soapy water solutions (see **Section 3.2.1** for more specific information on soap products). When bar soap is used, small bars of soap in racks that facilitate drainage should be used to allow the bars to dry and reduce risk of contamination. When liquid soap is used, the container should be covered. To ensure soap is available whenever needed, regular checks should be performed throughout the day. When ABHR is used, pump bottles should have easy-to-use nozzles. ABHR can be flammable, so supplies should be placed away from open flames or heat sources.

To estimate the quantity of water and soap required per handwashing facility, the following formulae can be used. In particular, institutional and public settings may find this useful for planning purposes. An estimate for the number of handwashing events per day can be arrived at through estimation of the frequency of key times occurring in a given setting.

Quantity of water per handwashing facility	=	number of people × number of handwashing events per day × litres of water
Quantity of soap per handwashing facility	=	number of people × number of handwashing events per day × grammes of soap per event

Accessible: The facilities should be accessible to all users, including children and those with limited mobility. In particular, the height and design of the water supply and soap tray or dispenser need to be adjusted for the intended users, and the location and surrounding area should be flat, with a non-slip surface. Accessibility and safety audits can be used to guide this process.

Drainage and greywater disposal: Water should always be allowed to flow freely to a drainage area or receptacle. Handwashing produces a small amount of greywater (sometimes called sullage), and this should be disposed of properly. Where a tap is connected to a basin and there is a connection to a sewer or on-site sanitation system using water, the drain for greywater should be connected to the sewer or pipework connecting the toilet to containment. For other forms of handwashing facilities, a soak pit can be constructed to take greywater. This should be located away from the house or other buildings. It is not recommended that greywater is discharged into stormwater drains (even if they have a sullage channel).

Affordable, durable and repairable: Facility materials and water supply should be affordable to users and durable. Repair/replacement parts should be available to be sourced locally. Affordability is context specific and should be determined locally.

Adaptations to reduce points of contamination: Adapting hand hygiene facilities to reduce points of contamination or recontamination is advised, especially during times or in settings where the risk of disease transmission is high. Water dispensers or taps may be adapted to reduce the use of hands during operation. For example, handwashing stations can be fitted with foot pumps or pedals, large handles for operation with the arm or elbow or a touch-free sensor. Such adaptations have the added benefit of enabling the tap to be turned off during rubbing without risk of recontamination, thereby reducing water use.

In addition, hand hygiene facilities may need to be adapted during health emergencies to enable physical distancing between users of at least 1 m. This will require ensuring enough facilities to prevent the build-up of crowds, and ensuring sufficient distance between facilities.

Theft-resilient design: In public spaces, facilities should be resilient to theft of soap in particular. Soap should be secured so that it cannot be stolen, but remains accessible to users whenever needed (e.g. through wall-mounted liquid soap or soapy water dispensers). Regular maintenance: Hand hygiene facilities should be regularly maintained and cleaned to ensure materials are available at all times, and to ensure they are not a source of contamination.

Number of hand hygiene facilities

Any community setting should have enough hand hygiene facilities to enable ready access at the key times without significant delay (see **Section 3.3.3** for information on key times).

To estimate the number of hand hygiene facilities needed in institutional and public settings, the following factors should be considered:

- expected number utilizing the space or setting
- event layout and crowd flow
- number of toilets and/or food preparation or eating areas
- cultural practices or health regulations (e.g. COVID-19)
- type of hygiene facilities (soap and water versus ABHR)

4.2.2 Core requirement (b): Information on why, when and how to clean hands

Getting the basics right: enabling hand hygiene

Effective communication of vital information on hand hygiene is a necessary precondition. If people do not know why, when or how to practise hand hygiene, they may not prioritize it, may miss key times, or may use materials or techniques that do not sufficiently remove pathogens from hands.

However, it is important to note that, when provided alone, information that builds knowledge about hand hygiene is not likely to be sufficient to motivate adoption and sustained practice of hand hygiene. The discrepancy between knowledge and behaviour has been well documented *(55-57)*. Information on hand hygiene should be part of a holistic behaviour change approach that takes into account sociocultural and environmental factors.

Information on **when and how** to practise hand hygiene should cover the key times for practising hand hygiene and the hand hygiene technique. Information on **why** hand hygiene is important should focus on the direct health benefits (individual level) and the public health benefits (community/population level), but can also cover indirect health and socioeconomic benefits (see **Section 2.2.1** for more information).

The WHO Strategic Communications Framework outlines six core principles for designing health promotion materials to ensure health communications are impactful and drive positive health outcomes *(58)*. Specifically, health promotion materials should be:

- **Accessible:** Ensure that information reaches all intended audiences, including those with disabilities, low literacy levels or limited internet access. This involves using multiple channels and providing materials in various formats and languages.

- **Actionable:** Design messages that clearly convey the desired health behaviours or actions. Communications should address potential barriers, highlight benefits and provide practical steps for individuals to follow.
- **Credible and trusted:** Maintain trust by providing accurate, consistent and evidence-based information. Credibility is enhanced when messages are delivered by trusted sources and align with the audience's values and beliefs.
- **Relevant:** Tailor content to the specific needs, age, concerns and cultural contexts of the target audience. Relevance increases engagement and the likelihood of behaviour change.
- **Timely:** Disseminate information promptly, especially during health emergencies, to enable individuals and communities to make informed decisions quickly.
- **Understandable:** Use clear, simple language and incorporate visuals like infographics, videos and illustrations to make complex health information comprehensible.

Examples of such materials include:

- posters placed in critical locations such as toilets, and cooking, food serving and feeding areas, as well as where the public gathers
- local radio broadcasts
- brochures placed in community spaces.

From enabling to encouraging and motivating

In addition to providing the minimum required information on why, when and how to practise hand hygiene to enable the behaviour, health promotion also holds the potential to encourage and motivate people to practise hand hygiene. Health promotion materials that are informed by behavioural data and evidence, community engagement, an understanding of the audience, and address barriers and enablers to hand hygiene behaviour can move beyond knowledge transfer, addressing motivation, emotional drivers, social influences and behavioural barriers.

Examples include:

- holding community meetings to understand, define, describe and deate on how to address public health behaviours
- social media question and answer sessions to combat misinformation
- engaging local leaders to tailor messages about hand hygiene.

Providing clear, accurate and timely information on hand hygiene is particularly critical during emergencies (e.g. pandemics, outbreaks and disasters) when risk communication and community engagement is used to inform and involve communities in managing health risks.

4.2.3 Core requirement (c): A conducive environment

Key characteristics of a conducive physical environment

Access to the minimum material needs for hand hygiene is covered in core requirement (a), and is an important part of what makes a physical environment conducive to hand hygiene. However, beyond basic access to material needs, making these convenient, attractive and easy to use can render the physical environment more conducive to behaviour change and sustained practice. Convenience, attractiveness and ease of use can be achieved through the following:

- **Convenience:**
  - **Provide fixed hand hygiene facilities,** in a designated, permanent place, to improve consistency of access.
  - **Situate hand hygiene facilities at locations linked to key times for practising hand hygiene,** ensuring availability when needed (for a list of key times, see **Section 3.2.3**). Key locations are close to and within view of toilets, and near areas where food is prepared, cooked and eaten.
  - **Ensure a sufficient number of hand hygiene facilities** for the population size, to eliminate or limit the waiting time. The maximum number of users during peak demand should be taken into account when deciding how many facilities are needed.
  - **In institutional and public settings, ensure facility locations are accessible, safe and convenient** for various people's needs, paying special attention to the needs of women and girls, who may require privacy during menstruation.

During higher-risk scenarios, additional locations for hand hygiene facilities include at the entrances to public buildings and in public spaces to enable hand hygiene upon entering private or public buildings (including the home) and when having come from public places.

- **Attractiveness:**
  - **Ensure hand hygiene facilities are clean, well lit and well ventilated,** rendering them more attractive to users. Facilities should be regularly maintained to achieve these standards and to ensure a favourable experience for the user.
  - **Situate hand hygiene facilities so they are highly visible** and cannot easily be overlooked.
  - **Provide visual cues and reminders** around the hand hygiene facility about when and how to practise hand hygiene.
  - **Consider integrating aesthetic design features** to render the hand hygiene facility more aspirational to use. For example, placing mirrors behind or above facilities, using bright or calming colours to draw attention, and making the station feel clean and modern to encourage use of the facilities.

- **Ease of use:**
  - **Ensure hand hygiene facility designs are simple, rendering them easy to use.** Reduction in the use of facilities may be observed if it is unclear how to use or operate a design feature (e.g. touch-free dispensers).
  - **Ensure materials are easy to access.** If using liquid soap or ABHR, dispensers should provide sufficient soap or ABHR with one pump for each hand hygiene event. In some contexts with high population density and/or a transient population, ABHR may be a more convenient material for hand hygiene. For example, in marketplaces or eateries where food is consumed in public spaces and toilets and their associated handwashing facilities are not available in close proximity.

- Consider touchless features (e.g. sensor taps and dispensers). These can reduce contamination and increase ease of use. If touch-free taps are in use, these should be engineered to minimize the stagnation of water in the system, regularly flushed and disinfected, and monitored for microbial contamination *(59-60)*. Not observing these measures could lead to biofilm formation within the internal components *(61)*. In addition, clear information on how to turn them on is important.

Key characteristics of a conducive social environment

Establishing a supportive social environment is essential for promoting hand hygiene because social dynamics strongly influence human behaviour. In particular, social norms – shared understandings of what is typical and appropriate – serve as powerful drivers of behaviour change. When handwashing is perceived as an expected and valued practice, individuals are far more likely to adopt and sustain the behaviour *(62-63)*. In addition, in settings where handwashing facilities are publicly visible, hand hygiene becomes a public act. Social strategies to promote handwashing include:

- **Visibility and role modelling:** When respected figures – like teachers, parents and community leaders – consistently wash their hands in public, it reinforces hand hygiene as a social norm. Placing handwashing facilities in visible spots such as school entrances, markets and places of worship strengthens this message *(62, 64)*.
- **Positive reinforcement:** Publicly recognizing individuals or groups who regularly practise hand hygiene – through awards, praise or storytelling – can encourage others to do the same *(62, 63, 65)*.
- **Collective routines:** Making handwashing part of shared routines – such as before meals or during school schedules – helps turn it into a group habit rather than a personal choice *(62, 65)*. Schools, institutions and public places can and should help build and reinforce hand hygiene habits.
- **Community engagement:** Involving communities in designing and promoting hygiene initiatives increases their relevance, ownership and sustainability. Participatory efforts like school clubs or community meetings foster shared responsibility.
- **Communication and social marketing:** Positive messaging through trusted channels – including local leaders, media and religious events – can shift norms *(62, 63)*.
- **Addressing misconceptions:** Tackling harmful beliefs through culturally relevant education and dialogue helps overcome resistance and stigma *(63)*.
- **Inclusivity and equity:** Efforts must ensure everyone – regardless of age, gender, ability or status – has the opportunity and encouragement to practise hand hygiene *(63)*.

Strategies to make hand hygiene habitual should include four components: cues, consistency, repetition and reward *(63)*. Cues are signals or triggers in the environment that prompt an individual to start a behaviour. Cues can be external (e.g. time of day or location) or internal (e.g. thoughts or feelings). The consistency component acknowledges that doing the behaviour in the same context or in response to the same cues helps the brain form strong associations, making it easier to perform the behaviour automatically. Repetition acknowledges that the more often the behaviour is repeated in response to the same cues, the stronger and more automatic the habit becomes. Reward acknowledges that positive feedback or feelings that follow the behaviour will reinforce it and increase the likelihood that the behaviour will be repeated. Rewards can be intrinsic (e.g. sense of satisfaction) or extrinsic (e.g. praise and approval, or a tangible benefit).

Table 2. Linkages between core requirements and four components for habit formation strategies

Component	Core requirement (a): material needs	Core requirement (b): information	Core requirement (b): information
Cues: Signals or triggers in the environment that prompt an individual to start a behaviour. Cues can be external (e.g. time of day or location) or internal (e.g. thoughts and feelings).	The physical presence of well-placed, visible handwashing facilities acts as a powerful cue, reminding people to wash hands at key moments.	Information campaigns (e.g. posters, jingles, announcements and stickers) when placed where the hygiene behaviour occurs serve as cognitive cues, prompting use of handwashing (facilities) at key times.	Attractive, conveniently located facilities, visual reminders, enhancing features and environmental nudges (e.g. footprints to the water facility), leading to prompt handwashing.
Consistency: Repeating the behaviour in the same context or in response to the same cues helps the brain form strong associations, making it easier to perform the behaviour automatically and creating habits.	When materials are reliably available at all necessary locations (e.g. near toilets, kitchens and entrances), this enables consistent and automatic practice in the same context.	Clear messaging about when and how to wash hands helps people form stable routines and consolidate new skills.	Standardized placement across settings (e.g. a sink right outside a toilet) enables people to anticipate and act on the habit in multiple locations.
Repetition: The more often the behaviour is repeated in response to the same cues, the stronger and more automatic the habit becomes.	Easy access to materials allows for frequent handwashing, which is critical for repetition and habit development.	Repeated exposure to information reinforces the behaviour, making it more likely to be remembered and practised.	Physical ease of use with the smallest possible level of friction, cost and frustration for the user encourages repeated practice.
Reward: Positive outcomes, feedback or feelings that follow the behaviour will reinforce it and increase the likelihood that the behaviour will be repeated. Rewards can be intrinsic (internal sense of satisfaction) or extrinsic (external praise or a tangible benefit).	Clean hands, pleasant-smelling soap or the satisfaction of using a well-designed facility provide immediate positive feedback.	Information that invites people to reflect on health benefits, pleasant associations and experience and social approval related to clean hands reinforces motivation and intentions, which are key for behaviour change and the value of handwashing.	Positive sensory experiences triggered by handwashing (e.g. pleasant-smelling soap, easy-to-use taps, and a satisfactory water temperature and pressure) reinforce the behaviour.

The core requirements for hand hygiene promotion strategies are applicable in all community settings. **Box 2** provides examples of how the requirements could apply in schools.

Box 2. Implementing the core requirements in schools

There is a specific focus in schools on group handwashing, where multiple students wash their hands at the same time in a designated, structured and often purpose-built area. This approach builds social norms, promotes hygiene at scale and supports regular, supervised handwashing as part of the school day.

- **Core requirement (a): Minimum material needs**

  Handwashing within schools requires sufficient running water and soap to adequately support students and teachers throughout the school day. If the water in the handwashing facilities is not piped, someone should be tasked with refilling the facilities throughout the school day to ensure there is enough water for key handwashing moments. Handwashing facilities should be accessible to children of varying heights and should be made from durable materials that can withstand frequent use.

- **Core requirement (b): Information**

  Teaching children why, when and how to wash their hands is central to hygiene education in schools. This information can be delivered during group handwashing, such as before eating, but should also emphasize the importance of washing hands after using the toilet. Teachers and school administrators should provide specific hygiene routines, and hygiene messages that are simple, fun and age appropriate, and may use songs or games to engage students. Furthermore, schools may promote handwashing among students by celebrating Global Handwashing Day (15 October every year).

- **Core requirement (c): Conducive physical and social environment**

  The visibility and accessibility of handwashing infrastructure play a key role in reinforcing positive norms. In schools, facilities should be installed near toilets and eating areas, with larger units (10–15 taps) supporting group handwashing, thus limiting the waiting time. Colourful designs enhance the appeal for students, while signage with step-by-step instructions provides helpful visual reminders.

  A conducive social environment helps make handwashing a lasting habit. In schools, face-to-face facilities and daily group routines – like group routine handwashing before meals – promote peer learning and normalize the behaviour. Visible role models, community involvement and public recognition reinforce hand hygiene as a shared and valued practice *(62, 63, 65)*.

4.3 Rationale

This recommendation is graded as strong because the GDG tasked with formulating the recommendations is confident that the balance between health benefits and harms favours each of the core requirements of the recommendation.

4.3.1 Identifying the core requirements for hand hygiene in community settings

The GDG identified the first two core requirements due to their foundational nature. Without minimum material needs and basic information, people would not be able to practise hand hygiene, and might not know why or how best to practise it. The third core requirement was identified due to the ability of a conducive environment to motivate and encourage the consistent and sustained practice of hand hygiene. Evidence and expert opinion informed the selection of each core requirement.

Minimum material needs: The evidence supports identification of access to minimum material needs as a core requirement. Inadequate access to the material needs (soap and water availability) was found to be one of the most commonly reported barriers to the practice of hand hygiene in the commissioned systematic review of behavioural factors influencing hand hygiene practices across domestic, institutional and public community settings *(8)*. This is consistent with previous systematic reviews in this area *(63, 66)*.

Information: The evidence supports identification of access to information on why, when and how to practise hand hygiene as a core requirement. The provision of information on health consequences and instruction on how to perform hand hygiene were found to be effective behaviour change techniques in a commissioned systematic review of interventions to improve hand hygiene in community settings *(9)*. The review investigated the theories underpinning the interventions reviewed and found that 83% of interventions used a theory. The second most commonly used theory (18% of studies) was the Health Belief Model (which is advocated for messaging primarily around health). Most interventions were effective, and there was no difference in effectiveness among interventions using a theory (including the Health Belief Model) and those that did not. The review also investigated the effectiveness of different behaviour change techniques. Although it was not possible to identify which specific behaviour change techniques are most effective at improving hand hygiene in community settings (because the interventions reviewed used a range of behaviour change techniques across multiple package types and settings), the package that comprised the two information-based behaviour change techniques ("Instruction on how to perform hand hygiene" and "Information on health consequence"), representing 24% of the packages evaluated, was found to be 86.7% effective overall *(9)*. This suggests that health- and instruction-based messaging can be effective, and is consistent with previous systematic reviews on this topic *(66)*. Two sister equivalence trials published after the systematic review team carried out their searches substantiate this *(67-68)*. The trials compare an intervention that targeted play and curiosity as key motives for handwashing among children with an intervention that provided health-based messaging, and include an active control arm with the same inputs (contact with promoters and provision of soap). Both studies found that handwashing with soap events after key events increased after baseline observations in the intervention and control arm, and remained high throughout the 16-week follow-up *(67-68)*.

Conducive physical and social environment: The evidence supports the identification of a conducive physical and social environment as a core requirement.

A conducive physical environment was identified through the commissioned systematic review of behavioural factors influencing hand hygiene practices *(8)*. One of the most frequently reported barriers to hand hygiene practice was reflective motivation (time prioritization). Time prioritization refers to an individual's assessment that the time cost of hand hygiene outweighs the perceived benefits, in a context of competing priorities. This points to the importance of a conducive environment, where materials are easy and convenient to use. Efforts to promote hand hygiene therefore need to make the behaviour as easy, convenient and attractive as possible. This is consistent with broader public health literature, which emphasizes that, for health education to be effective, people must also be equipped with an environment that enables them to act on what they have learned *(69)*.

A conducive social environment did not come out strongly in the commissioned systematic review of behavioural factors influencing hand hygiene practices *(8)*. However, the importance of social factors to health behaviours is well established *(10, 62, 63, 65, 66)* and was identified by the GDG as an important requirement for hand hygiene.

4.3.2 Defining the core requirements

Minimum material needs: The commissioned systematic review of the minimum material requirements for hand hygiene in community settings *(70)* returned insufficient data on the minimum quantities of water and soap required for practising effective hand hygiene. Although there are no clear data on the specific water quantity required for effective hand hygiene from the literature, the relationship between water availability and handwashing is well established *(71, 72)*, and water quantity has been associated with lower viral loads on hands *(73)*. The GDG made a recommendation for "sufficient" water to achieve the objective of handwashing – enabling the entire hand surface to become wet before covering with soap, and to thoroughly rinse off the soap after rubbing.

Information: Guidance for effective communication of vital information on hand hygiene was drawn from the WHO Strategic Communications Framework, which outlines six core principles for designing effective health promotion materials to ensure health communications are impactful and drive positive health outcomes *(58)*.

Conducive physical environment: Guidance on the key characteristics of a conducive physical environment was based on the expert opinion and experience of the GDG.

Conducive social environment: Guidance on the key characteristics of a conducive social environment was based on published literature, complemented by expert opinion and experience of the GDG.

5. Government measures to strengthen hand hygiene systems: implementation guidance

Overarching responsibility for promotion of hand hygiene lies with governments, through their duty to advance the individual human right to health and protect public health, and, for most governments, through global health obligations enshrined in the IHRs. Recommendation 1 (**Chapter 2**) outlines this.

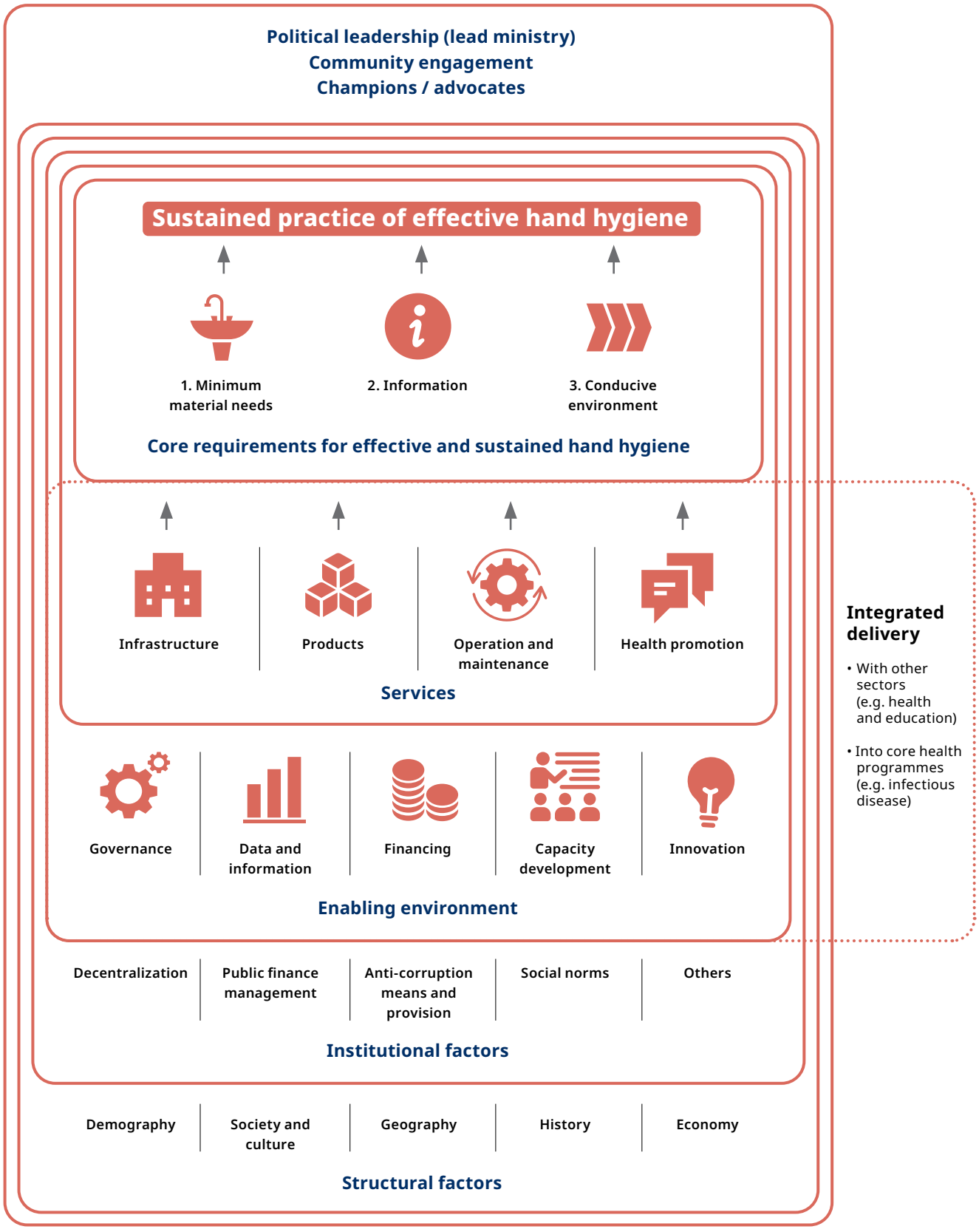
Promotion of hand hygiene involves taking concrete steps to enable access to the core requirements outlined in **Chapter 4** Government efforts to promote hand hygiene should move beyond project-based approaches and short-term service delivery, towards government-led strengthening of national and local systems for hand hygiene.

This chapter provides guidance on government measures to strengthen hand hygiene systems. It first presents a framework for understanding a hand hygiene system, then describes the actors in the system and their roles and responsibilities, including those of governments, and finally discusses the importance of integration of hand hygiene within relevant areas of work and provides guidance on achieving this integration.

5.1 Framework for a system to deliver core requirements for hand hygiene

A hand hygiene system comprises the hand hygiene services that deliver the core requirements detailed in **Chapter 4** and the factors and functions that enable their effective, sustainable and equitable delivery. A system-strengthening approach recognizes the complexity of such a system and acknowledges that hygiene services do not exist in isolation. To simplify this network of variables, the framework presented in **Figure. 6** breaks them down into blocks – services, enabling environment, institutional and structural factors – which are described in the sections below.

Figure 6. Framework for understanding a hand hygiene system



5.1.1 Services

A range of services provide the core requirements for hand hygiene in community settings. These services function to deliver water supply infrastructure, hand hygiene products, operation and maintenance of infrastructure and products, and health promotion.

Water supply infrastructure: Services delivering water supply infrastructure should function to ensure equitable and sustainable access to the necessary water for health, including for handwashing. These services provide connections and operation and maintenance to existing water supply networks, and supply network extensions where needed to serve the entire population. Network extensions require major investment and may involve recourse to national, state or regional authorities, or external financing. Where piped infrastructure is not yet available, non-piped supplies, protected springs or wells and self-supply, as well as community systems, can supply water for handwashing. Such systems may require additional infrastructure such as water containers to maintain an uninterrupted water supply.

Hand hygiene products: Services delivering hand hygiene products should provide equitable and sustainable access to the material needs for hand hygiene: mobile or permanent hand hygiene facilities or replacement parts, soap products and ABHR. Such services can also support the creation of a conducive physical environment, through market-based research and development that make products easier and more desirable to use. Operation and maintenance of hand hygiene facilities: The operation and maintenance of hand hygiene facilities should involve all the activities necessary to ensure hand hygiene facilities function reliably, safely and efficiently over time. Operation refers to routine tasks to ensure the functionality and usability of the facility. Tasks comprise ensuring water supply, stocking consumables, cleaning and emptying waste disposal. Maintenance refers to regular and corrective activities to keep the facility safe and in good working order. Tasks comprise repairing damage or replacing parts and drainage management to ensure wastewater is drained or collected hygienically.

Health promotion: Health promotion, as defined by WHO, is part of broader public health efforts. It is a specific approach within public health that empowers individuals and communities to increase control over, and to improve, their health. Health promotion efforts emphasize health education, behaviour change and creating supportive environments. Social and behaviour change communication, and risk communication and community engagement are core approaches within health promotion. Equitable and sustainable provision of accurate information on why, when and how to clean hands should be an integral part of broader health promotion efforts. Such services can also support the creation of a conducive physical and social environment. For example, design and placement of health promotion materials can encourage habit formation by cueing hand hygiene as part of broader routines.

5.1.2 Enabling environment

The conditions, policies and resources in which services operate are often referred to as the enabling environment. A strong enabling environment functions to provide policy and legal frameworks, regulation and monitoring that support planning and actions, and the coordination of these processes by national institutions with a clear delineation of mandates and sufficient human and financial resources. The blocks that make up the enabling environment for the hand hygiene system include governance, data and information, financing, capacity and innovation.

Governance

An enabling governance environment is one where policy, normative and legal frameworks, and institutional arrangements set a common vision, priorities and targets, and provide procedures, rules and accountability mechanisms for service and programme delivery. Key indicators of an enabling governance environment include the following.

Policy framework: Comprises policies setting a vision and direction, with measurable targets, strategies outlining pathways and costed implementation plans. A policy framework should give direction to sector actors and investments. Hand hygiene is a cross-cutting issue most likely to be embedded within a number of relevant policies and strategies across sectors and departments. For example, hand hygiene should be embedded within policy frameworks for health emergency preparedness, response and resilience, health promotion, specific diseases, occupational health, food safety, education, sanitation and others.

Norms and standards: Define requirements for water supply and handwashing product standards, location of hand hygiene facilities, and ratios for institutional and public settings.

Legal and regulatory frameworks: Cover equitable access to the minimum material needs and accountability mechanisms.

Institutional arrangements and a coordination mechanism: Clearly define roles and responsibilitie across national, regional and local governments and partners and identify a coordination mechanism between health, water and sanitation, occupational health and other sectors as appropriate.

Data and information (monitoring)

An enabling monitoring environment is one where data collection, management and analysis systems provide reliable, up-to-date, actionable and accessible data that are used to support decision-making on hand hygiene. Key indicators of an environment that enables effective monitoring of hand hygiene include:

- a government-led national monitoring system is in place and being used;
- a common set of indicators for hand hygiene services and enabling environments that are adhered to by all stakeholders and monitored over time;
- established monitoring feedback systems and learning processes are in place and being used, including sector reviews; and
- data transparency and public access to information, promoting accountability and community engagement.

Financing

An enabling financial environment is one where there is adequate and sustainable financing for water supply and public health information campaigns to all community settings. Key indicators of an environment that enables effective financing for hand hygiene include:

- robust financial plans to fund strategies, including long-term plans for water infrastructure development and maintenance;
- sufficient budget allocation to financial plans;
- diversified funding sources to fund budget allocation, combining public funds, tariffs and, where needed, transfers; and
- strong financial management and accountability, through transparent budgeting, tracking and reporting of hand hygiene expenditures

Capacity

An enabling capacity environment is one where people, organizations and institutions have the ability to carry out their roles and responsibilities for effective and sustainable hand hygiene service delivery. Human resource capacity (people) can be strengthened through training and education of professionals (e.g. engineers, public health officers and community workers) and by building local expertise in hand hygiene promotion.

Strengthening organizational capacity involves supporting service providers to improve management, service delivery and accountability. Strengthening institutional capacity involves strengthening the ability of local governments, utilities and ministries to plan, finance, monitor and regulate services, and to improve coordination across sectors. Key indicators of an environment that enables capacity development include:

- a capacity development plan based on needs assessment;
- different institutional stakeholders/providers have their own capacity development plans; and
- implementation/progress is measured against all capacity development plans.

5.1.3 Institutional and structural factors

Beyond the immediate enabling environment, institutional and structural factors are important contextual influences. These are factors that are not (or only partially) subject to influence by the sectors involved in hand hygiene, but might affect service delivery and should therefore be accounted for during planning:

- Structural factors are natural, physical and contextual characteristics inherent to a country that are changeable over decades. These characteristics include demography, society and culture, geography, history and economy. For example, water scarcity is a structural factor that could affect hand hygiene service delivery. Mitigating actions include water-efficient hand hygiene technologies and promotion interventions that educate communities on water-saving techniques.

- Institutional factors are norms, regulations and information rules that shape the relationship between the actors and in a given context and sector. These characteristics include decentralization, public finance management and social norms. For example, a decentralized governance structure in a country is an institutional factor that might affect hand hygiene service delivery. Decentralized governance structures distribute decision-making, management and resource allocation for services like hand hygiene across multiple levels of government from the national level down to regional, and local authorities. This can present benefits, empowering local decision-makers to deliver or support services tailored to their community. However, it can also present challenges if local resources are scarce and coordination across levels of governance is inadequate. Mitigating actions include placing greater emphasis on clarity of roles and responsibilities across levels of government and strong coordination mechanisms.

5.2 System actors and their roles and responsibilities

Many actors have a role to play in effective hand hygiene services. This includes through direct service delivery, and also through the enabling environment for services. For example, water utilities deliver services directly, but also have a responsibility for training staff to ensure strong technical capacity for service delivery.

Governments are responsible for ensuring a strong enabling environment, and effective, equitable and sustainable service delivery. To achieve this, governments should provide oversight and coordination to ensure the complementary components of a system function effectively together.

This section describes key actor categories in the system and outlines their roles and responsibilities (see **Figure. 7** for a summary).

5.2.1 Local administration

The local administration is the governing body responsible for the day-to-day management of a given community setting at the facility level. In institutional settings, each institution typically has a management structure that oversees daily operations. For example, in educational institutions, detention centres or workplace settings, a senior management team typically covers these responsibilities. In public settings, this might fall under the local government or municipal authorities, private management entities of agencies in the case of semi-autonomous or public–private settings, or third sector organizations or groups.

This concept of local administration is not relevant to the household setting. Nonetheless, one or more people in a household will inevitably manage the day-to-day running of the household. As part of their role, the local administration/household head is responsible for ensuring availability of the core requirements by:

- Paying for water tariffs for the facilities under their purview and purchasing hand hygiene products (facilities and soap), proactively maintaining hand hygiene facilities and liaising with service providers for upkeep as needed (core requirement (a)). In private settings, these purchases are financed through private sources. In public settings, they are financed by local government, but in some cases, may be financed by community groups or third sector bodies.
- When procuring hand hygiene products, the local administration is also responsible for considering what type, number and location of facilities would create a conducive environment for hand hygiene practice (component 3).
- Providing user access to information, education and communication materials and activities, procuring these through local public health authorities or soap suppliers (component 2).
- Providing visual cues and reminders and embedding hand hygiene within existing setting routines (component 3).

5.2.2 Service providers

Service providers can be public or private, and include water utilities, soap suppliers and marketeers, and local health promotion authorities, or a combination of these. They are broadly divided into local administration, customer services (private sector), public services and infrastructure development.

Customer services

Customer services provide direct benefits to users as well as improving public health at the community level. They are typically suitable for provision by small businesses and may be commercially viable. Customer services are often responsible for:

- Sale of the material needs for hand hygiene: mobile or permanent hand hygiene facilities or replacement parts, soap products and alcohol-based handrub, as well as vendor-provided water supplies in households or other settings not connected to the water network.
- Provision of information, education and promotion on the benefits of hand hygiene, and how and when to practise it as part of their own marketing efforts.
- Market-based research and development to produce hand hygiene products that meet customer needs in order to grow the market, which can support creation of a conducive environment for the practice of hand hygiene. This type of research and development might be commercially viable or require some subsidy from governments.

Public services

Public services are delivered upstream of users, producing public health benefits to the community. It may not be possible or fair to finance them entirely through direct user fees. They are usually delivered by local authorities or utility companies, but may also be subcontracted to the private sector. Public services are often responsible for:

- Provision of water network connections and operation and maintenance of water supplies. These services are typically delivered by local authorities or utility companies, but may also be subcontracted to the private sector. They are usually funded through user payments (tariffs), although acquiring a connection may be subsidized from government resources.
- Provision of information on hand hygiene as part of public health education and promotion and habit formation. These can include routine public awareness campaigns around disease prevention and control, school health programmes, workplace wellness initiatives, and emergency response and preparedness communication.

Infrastructure development

Infrastructure development also provides public health benefits to the community, but requires major investments, which may require recourse to high-level authorities of external financing. For example, the extension of water supply networks that deliver piped water to homes and institutional and public settings. These require major investment and may require recourse to national, state or regional authorities, or external financing.

Local government

Local government is responsible for ensuring equitable and sustained access to services related to hand hygiene within the defined administrative area. Some of this is achieved through direct service provision (see public services above), including providing water network connections and operation and maintenance of water supplies, providing information on hand hygiene as part of public health education and promotion, and habit formation. Where local governments do not directly deliver services, they may be responsible for enforcing compliance of service providers and the governing bodies of private settings with national policy and normative standards, legislation and regulation, although this might also be provided by a national regulator.

National government

The role of national government is to develop policy, normative and legal frameworks, and institutional arrangements that set a common vision, priorities and targets. It should provide procedures, rules and accountability mechanisms for service and programme delivery, and empower local authorities and other agencies to deliver and oversee hand hygiene services. It is also responsible for ensuring equality in access to services, in line with human rights and the SDGs. Coordination, accountability and regulatory mechanisms are also needed, so that the interdependent services required for hand hygiene function without interruption, and according to prescribed standards.

National government functions are likely to be spread across numerous ministries. These should be documented through clear delineation of roles and responsibilities. The following should be taken into account:

- **Oversight:** Oversight of hand hygiene services is likely to be spread across ministries. Water infrastructure network connections and operation and maintenance will likely be overseen by ministries of water supply and sanitation or public works; information, education and communication will likely be public health departments within health ministries; soap manufacturing and distribution might be overseen by health, trade or environment ministries. Roles and responsibilities for oversight of services should be clearly defined and delineated.
- **Practice:** Different ministries will likely be responsible for promoting the practice of hand hygiene across community settings. For example, in schools, education ministries are usually responsible for hand hygiene as part of broader concerns for student well-being; in prisons, justice ministries are often responsible for hand hygiene as part of broader responsibility for prisoner well-being; and trade and business ministries or departments might be responsible for well-being of workers and customers. A ministerial lead for each community setting should be identified to lead on hand hygiene.
- **Coordination:** A strong ministerial lead is required to coordinate the efforts of these various national bodies and sustain progress. This could be any ministry with a national mandate for leading hand hygiene. Without an existing clear lead, the mandate of the Ministry of Health – to protect and improve the health of people and their communities – empowers it to coordinate and monitor progress.

Figure 7. System actors and their responsibilities

National government functions

Accountable for equitable and sustained access to the minimum material requirements as well as up-to-date, evidence-based guidance for the practice of effective hand hygiene by all in the community setting(s) within their remit

- Policy and coordination
- Legislation, regulation, standards and guidelines
- Planning
- Capacity building and technical assistance

Local government functions

Responsible for ensuring equitable and sustained access to services related to hand hygiene within a defined administrative area

- Finance, install and manage operation and maintenance of hand hygiene facilities in public settings
- Enforce compliance of hand hygiene product and service providers with national policy and normative standards, legislation and regulation
- Enforce compliance of private setting administrations with norms and standards (e.g. through inspections)
- Support compliance of public setting administrations with norms and standards (e.g. through technical and financial assistance)

Local administration functions

Governing body responsible for day-to-day management of a given community setting (e.g.: in a school setting, this is the school's senior management)

- Paying water tariffs and purchasing hand hygiene products (facilities and soap)
- Facilitating a conducive environment for hand hygiene practice
- Providing access to IEC materials
- Encouraging habit formation (through provision of visual cues and embedding hand hygiene in existing routines

Customer services

- Sale of hand hygiene products (handwashing stations, soap, alcohol-based hand rub, vendor-provided water supplies), including user-centred product development
- Produce and/or disseminate health promotion materials

Public services

- Water network connections and operation and maintenance of water supplies
- Produce and promote IEC materials

Infrastructure

- Extension of water networks

5.3 Integration of hand hygiene within related policy areas

The system framework presented above enables a detailed inspection of all the components underpinning the core requirements for sustained hand hygiene practice: notably hand hygiene services and their enabling environment. In reality, these components do not typically fall within one sector, but are dispersed across different sectors. Water supply is typically led by the water sector. Enabling and regulating the market for hand hygiene products falls under the purview of various government ministries or regulatory bodies, depending on the country and the type of product (whether the soap is classified as a cosmetic, household product or medical product). Health promotion activities are typically part of broader programmes within the health sector: the sanitation sector (when related to faecal–oral disease), the education sector (when related to schools), the occupational health sector (when related to workplace), the transport sector (when related to transport hubs) and others.

A strong system for hand hygiene relies on integration of hand hygiene as a policy goal within these broader policy areas. Ensuring a sufficient running water supply for hand hygiene should be part of broader water sector policies and strategies. Effective hand hygiene should be promoted as part of broader health, education, occupational health and other related programmes, most notably: health emergency preparedness, response and resilience; health promotion; specific disease programmes; occupational health; food safety; education; and sanitation. Tangible indicators of strong leadership for hand hygiene within other sectors include costing and financing of hand hygiene components within sector budgets, and alignment of hand hygiene indicators of interest with existing monitoring frameworks.

Integration of hand hygiene within broader areas is essential given its cross-cutting nature. However, it requires oversight, coordination and financing to be effective. This is a simple but important point, as without oversight and coordination, integrating hand hygiene within broader programmes of work can dilute accountability and make roles and responsibilities for core requirements unclear. Local governments responsible for ensuring equitable and sustained access to services related to hand hygiene within their defined administrative area should coordinate these different actors to ensure all the complementary components for hand hygiene function effectively together.

6. Methods used for developing these Guidelines

These Guidelines on hand hygiene in community settings were developed according to the procedures and methods described in the WHO handbook for guideline development *(74)*. The development process is characterized by three phases: (1) scoping, (2) evidence retrieval and (3) formulation of recommendations.

6.1 Contributors and management of conflicts of interest

Groups and individuals (including end users and technical experts from a range of disciplines) contributed to the development process. The groups are outlined below, and the **Acknowledgements** section lists the group members.

6.1.1 Guideline Steering Committee

These Guidelines are co-published by WHO and the United Nations Children's Fund (UNICEF). Therefore, the Guideline Steering Committee (GSC) comprised representatives from both of these United Nations (UN) agencies. GSC members represented three organizational levels: global, regional and national.

Members from WHO headquarters comprised representatives from WHO units providing nor mative guidance on hand hygiene as an effective preventive measure. WHO regional members comprised environmental health focal points from four WHO regions (Africa, Eastern Mediterranean, Europe and South-East Asia). Country members comprised environmental health country focal points from three countries particularly active on hand hygiene at the time (Ethiopia, Nigeria and the Philippines).

UNICEF headquarters members comprised representatives from the Sanitation and Hygiene Team. Regional members comprised WASH focal points from UNICEF Eastern and Southern Africa and UNICEF South Asia. Country members represented UNICEF Indonesia.

6.1.2 Guideline Development Group

The GDG comprised external experts whose central task was to formulate evidence-based recommendations. As per WHO protocol *(74)*, the members were not commissioned and did not receive any financial compensation. Members of the GDG participated in the development process of the Guidelines as individuals and not as representatives of the institutions or organizations with which they were affiliated.

The GDG included 23 members with expertise across various relevant content areas. The group was consulted at critical points during the development process, including formulating recommendations and supporting the drafting and reviewing of different chapters of the Guidelines. The group was balanced in terms of gender and geography, and included technical experts as well as end users. The GDG also included a methodologist with experience in systematic reviews, the grading of recommendations, assessment, development and evaluation (GRADE) approach and EtD processes.

6.1.3 Systematic review team

Experts with extensive experience in carrying out systematic reviews on public health interventions conducted the commissioned systematic reviews, using Cochrane-style and broader qualitative, quantitative and mixed method systematic review methods (e.g. GRADE-CERQual, Mixed Method Appraisal Tool (MMAT) and laboratory quality score) for assessing the quality of the evidence.

6.1.4 Guideline methodologist

The Guideline methodologist, contracted by WHO, oversaw the process of developing recommendations based on evidence. Their main functions were to review GRADE evidence profiles developed by the systematic review team, attend GDG meetings and assist the group in developing recommendations using the EtD framework (see **Section 6.2.4**).

6.1.5 Champion Country Working Group

The Champion Country Working Group (CCWG) was set up by WHO and UNICEF to support the development of these Guidelines. The CCWG co-designed the implementation guidance (**Chapter 5**), grounding this guidance in the experiences of countries showing effective leadership in this space. The CCWG comprised 10 country governments from across five WHO regions, with experience in the development and implementation of strategic plans for hand hygiene improvement in their country. For each country, there was representation from the government ministry leading on improvements in hand hygiene across multiple community settings, the WHO Country Office, the UNICEF Country Office and where possible the WaterAid Country Office. WHO, UNICEF and WaterAid regional and global focal points for these Guidelines were also part of this working group.

6.1.6 Product Design and Impact team

The WHO Product Design and Impact (PDI) unit of the Department of Quality Assurance, Norms and Standards prioritizes product design for impact by focusing on the usability and effectiveness of WHO guidelines and normative products. This involves understanding end-user needs, optimizing document structure and format, and ensuring recommendations are relevant and actionable at the country level. The PDI unit, in collaboration with Monash University's Design Health Collab, supported the design and roll-out of the process for co-developing the implementation guidance of these Guidelines with the CCWG.

6.1.7 External review group

The external peer review group provided a review of the draft guidelines. This group consisted of individuals representing key disciplines (epidemiology, behavioural science and microbiology), end users (e.g. Ministry of Health representatives) of these Guidelines, and individuals with expertise in design and implementation of government-led hand hygiene improvement initiatives.

6.1.8 Management of conflicts of interest

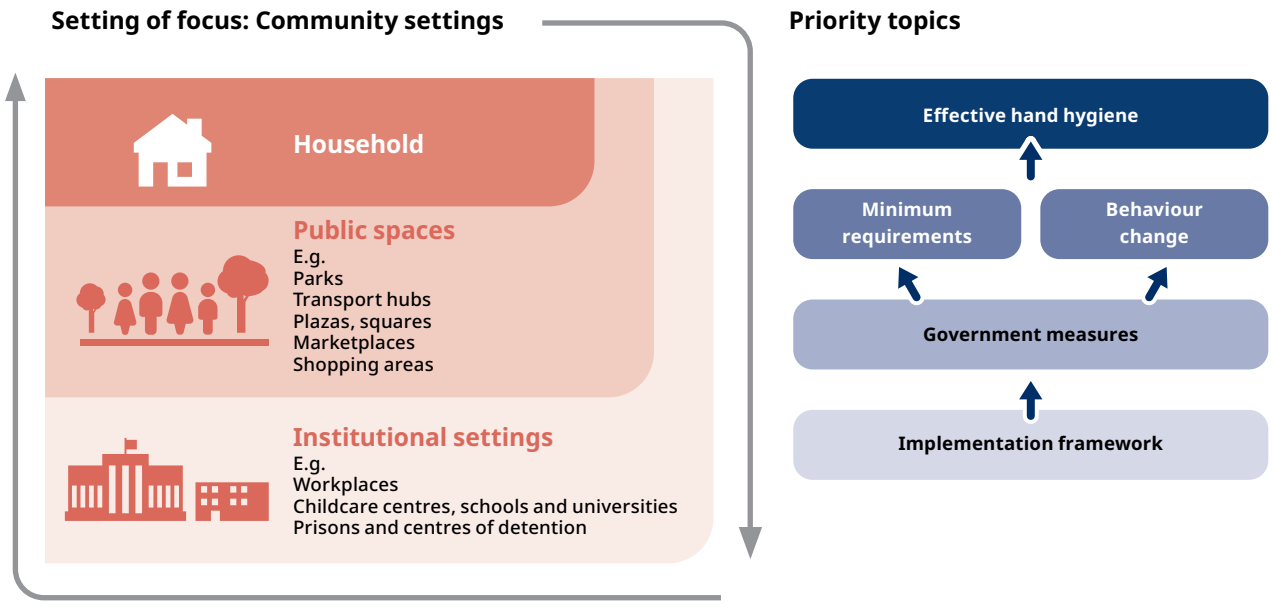
All members of the GDG and the external peer review group completed WHO declaration of interest forms. These were then reviewed for potential conflicts of interest. One conflict of interest was declared, but it did not require the member of the GDG to be excluded.

6.2 Recommendation development process

6.2.1 Scoping and question formulation

The process of scoping a guideline establishes the focus for the recommendations, as well as the key questions that will govern the search for evidence to form the recommendations. It is a highly consultative process, involving a series of steps. First, a list of potential focus topics are identified where areas of uncertainty or controversy exist. Second, key questions to be answered by the Guidelines are formulated and prioritized under each topic. Third, the type of evidence needed to answer the key questions is identified, as well as existing evidence gaps (through a rapid assessment of pre-existing systematic reviews, see Section 6.2.2). Finally, an evidence retrieval strategy is proposed to fill the gaps identified.

Figure 8. Scope of these Guidelines



The priority topics for the Guidelines were identified in November 2021 in the first meeting of the GSC, based on the conceptual framework depicted in Figure 8. Priority topics were: (1) effective hand hygiene, (2) minimum requirements, (3) behaviour change and (4) government measures. As noted in the introduction, the settings of focus were community settings (Figure 1).

A long list of 37 questions was developed collaboratively with the GSC during the scoping phase. The responsible technical officer drafted the initial list of questions under each of these priority topics where there was uncertainty or controversy, based on findings of a WHO-commissioned scoping review of existing global recommendations on hand hygiene, which identified areas where global guidance is discordant, lacking or not supported by evidence *(75)*. The GSC reviewed this initial list in December 2021, and written inputs were compiled and addressed, resulting in a list of 37 questions. These were further consulted upon through external networks and groups throughout May 2022.

The 37 questions went through a series of prioritization assessments, guided by the methodologist, to arrive at the final list of 25 questions (**Table 3**). The question prioritization process had three steps: (1) question prioritization based on independent ranking by two independent reviewers following the established methodology for question prioritization *(76)*; (2) prioritized questions grouped based on areas of overlap; and (3) revised prioritized questions assessed for answerability. The 25 questions were then refined following consultation with and feedback from the GSC.

The key questions were subsequently reformulated according to the PICOD (population–intervention–comparison–outcome–design) or SPIDER (sample–phenomenon of interest–design–evaluation–research) type format as appropriate. SPIDER was selected for questions that required qualitative and mixed method research and where PICOD, used for intervention studies, was not relevant. These can be found in the published protocol *(77)*.

6.2.2 Evidence retrieval, assessment and synthesis

With the scope defined and key questions identified, the next phase was to identify and synthesize the available evidence for each question. As a first step, a rapid assessment was carried out to map pre-existing systematic reviews and other types of evidence syntheses to each key question. The following databases were searched for published evidence syntheses: Google Scholar, PubMed, Medline and Embase. The Cochrane Library was searched for existing reviews, as well as for protocols of reviews under development. The PROSPERO registry was also searched for ongoing reviews. Once retrieved, the systematic reviews were assessed for relevance, quality and timeliness. For three of the 25 questions, existing evidence was found to be sufficient. These are in bold in **Table 3**. For the remaining 22 questions, WHO commissioned new systematic reviews.

Table 3. Key questions underpinning these Guidelines[a]

1. Should effective hand hygiene be practised in community settings as an important public health measure?	1a. What is the effect of hand hygiene in community settings on diarrheal disease? 1b. What is the effect of hand hygiene in community settings on acute respiratory infections?
2. Which hand hygiene methods are effective at removing or deactivating pathogens associated with disease transmission by hands in community settings?	2a. How effective are soap products at removing or deactivating key pathogens[b] (or organisms intended as their surrogates) and how does duration impact effectiveness? 2b. Where soap and/or water are not available, what are appropriate alternatives for hand hygiene? 2c. Which hand-drying methods are effective at reducing risk of recontamination of washed hands? 2d. What microbial water quality is required for effective handwashing with soap? 2e. What are the key moments for hand hygiene in the context of community settings?
3. What are the minimum requirements (material needs) for the sustained practice of effective hand hygiene in community settings?	3a. What quantity of water is required to enable handwashing with soap and water at key moments? 3b. What quantity of soap is required to enable handwashing with soap and water at key moments? 3c. Where should soap and water or alternatives be located in community settings to enable hand hygiene at key moments? 3d. What are the optimal spacing and number of users per hand hygiene facility[c] in household settings and public places to enable hand hygiene with soap and water at key moments? 3e. What are the main considerations for ensuring equitable[d] access to minimum material requirements and preventing discrimination in community settings?
4.1 What are key behavioural barriers and enablers to practising effective hand hygiene in community settings?	
4.2 Among interventions to improve hand hygiene in community settings, what theories, barriers and enablers, intervention functions and behaviour change techniques, and design features have been leveraged effectively to improve and sustain hand hygiene in community settings?	4a. Among interventions to improve hand hygiene in community settings, which have been designed using behaviour change theories? 4b. Among interventions to improve hand hygiene in community settings, which have effectively leveraged identified barriers and enablers of hand hygiene in community settings? 4c. Among interventions to improve hand hygiene in community settings, what behaviour change techniques have been implemented to effectively improve and sustain handwashing practices? 4d. Among interventions to improve hand hygiene in community settings, what hand hygiene facility designs have been effective at improving and sustaining hand hygiene? 4e. Among interventions to improve hand hygiene in community settings, what hand hygiene facility design adaptations (e.g. placement, nudges and cues) have been effective at improving and sustaining hand hygiene? 4f. Among interventions to improve hand hygiene in community settings, what level of frequency and intensity of behaviour change interventions are necessary to effectively improve hand hygiene? 4g. Among interventions to improve hand hygiene in community settings, how do hand hygiene practices vary by population group, risk scenario or over time?
5. What government measurese have been implemented to support minimum requirements – water and soap – for equitable and sustained practice of hand hygiene.	5a. What government measures have increased access to soap for hand hygiene? Was it sustained? Was it equitable? 5b. What government measures have increased access to water for hand hygiene? Was it sustained? Was it equitable? 5c. What government measures have resulted in changes to end-user hand hygiene practices? Was it sustained? Was it equitable? 5d. Where have governments intervened to address equality and/or affordability? What government measures specifically targeted equity and affordability of handwashing 5e. Where have governments intervened to address other intermediate outcomes that could impact end-user access or practices (i.e. related to enabling conditions related to questions 5a, b, c), but that did not measure soap access, water access or end-user practices?

[a] Bold type denotes questions where existing evidence was found to be sufficient. For the other questions, WHO commissioned new systematic reviews.
[b] Key pathogens are those causing infectious disease, diarrheal disease or respiratory infections.
[c] Key factors to consider include total number of users over a given time period, operation and maintenance requirements, security and distancing requirements (e.g. COVID-19 response).
[d] Applying the key elements of the UN human rights to water and sanitation: availability, accessibility, affordability, quality and safety, and acceptability *(78).*
[e] Evaluated using the Sanitation and Water for All building blocks: sector policy and strategy; institutional arrangements; sector financing; planning, monitoring and review; and capacity development *(79).*

Three calls for research proposals were issued in August 2022, combining questions 2 and 3, and 4.1 and 4.2, with question 5 separate. Through a competitive bidding process, one systematic team was awarded all three terms of reference. The commissioned reviews were all conducted in accordance with Cochrane standards. A protocol was registered in PROSPERO (CRD42023429145) and a full protocol was published in BMJ Open *(77)*.

The systematic review team used a two-phased approach to identify relevant studies because the multiple reviews were related. Phase 1 involved a broad search to capture all studies on hand hygiene in community settings. Databases, trial registries, expert consultations and hand searches of reference lists were used to ensure an exhaustive search. A comprehensive, electronic search strategy was used to identify studies indexed in PubMed, Web of Science, Embase, CINAHL, Global Health, Cochrane Library, Global Index Medicus, Scopus, PAIS Index, WHO Institutional Repository for Information Sharing, UN Digital Library and World Bank eLibrary published in English from January 1980 to March 2023. The outcome of phase 1 was a reduced sample of studies from which screening, specific to the five key questions (2, 3, 4.1, 4.2 and 5), could be performed. Two reviewers independently assessed each study for inclusion, and disagreements were resolved by a third reviewer. The systematic reviews developed and applied clearly defined inclusion and exclusion criteria, usually through two independent assessors, extracted data onto prespecified data extraction forms and assessed the quality of the data. Heterogeneity across included studies was explored and described. Depending on the nature of the systematic review, evidence synthesis was undertaken using meta-analysis, tabular or narrative synthesis, or a form of qualitative evidence synthesis.

Five systematic reviews were delivered, in accordance with Cochrane standards, and published as a package in BMJ Global Health journal on 16 September 2025.

6.2.3 Evidence grading

MMAT was used to assess the quality of the reviewed evidence. MMAT is designed for systematic reviews that include qualitative, quantitative and mixed methods studies. It is designed to assess the methodological quality of various study designs *(80, 81)*.

6.2.4 EtD framework

Health decision-making at local, national, regional and global levels is complex and can be influenced by a broad range of factors. The relative importance of these factors varies depending on the type of health decision and the decision-making context. EtD frameworks intend to ensure all criteria of relevance to a health decision are considered in a systematic and transparent way. They provide a structured approach for GDGs to consider the available evidence and to make informed judgements about the advantages and drawbacks of a given health decision.

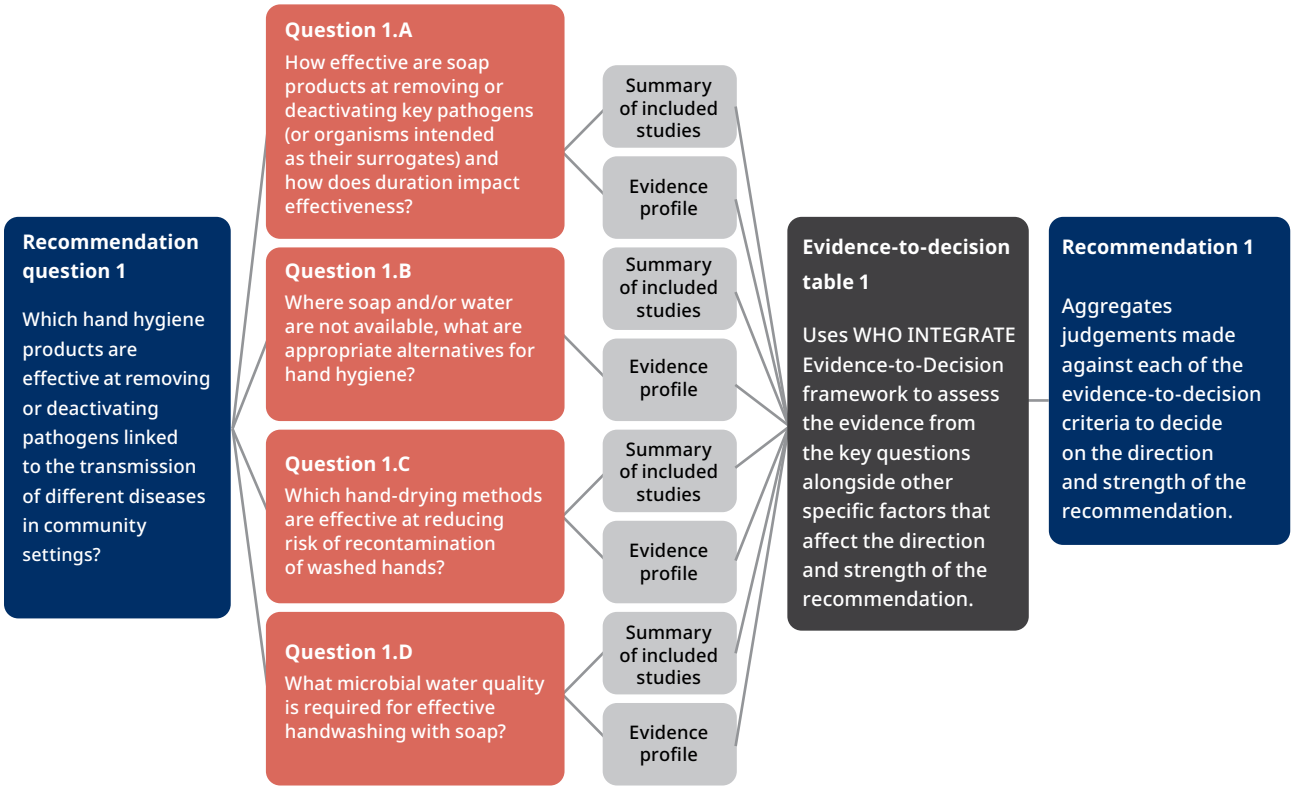
These Guidelines applied the WHO-INTEGRATE framework *(82)*. This EtD framework is rooted in the norms and values of WHO, as agreed upon by Member States, and is particularly suitable for complex, multisectoral population- and system-level interventions *(83)*. It comprises six criteria: (1) balance of health benefits and harms; (2) human rights and sociocultural acceptability; (3) health equity, equality and non-discrimination; (4) societal implications (including environmental); (5) financial and economic considerations; and (6) feasibility and health system considerations Across these six criteria is the meta-criterion, Quality of evidence.

For these Guidelines, an EtD table was produced for each of the five recommendation areas covered by each of the five systematic reviews. Not every criterion, or subcriterion, was relevant to each recommendation. In consultation with the systematic review team and the GDG, the technical officer identified relevant criteria for each recommendation (see **Web Annex 1** for the EtD tables). Where the commissioned systematic reviews could not provide evidence-based information or guidance for a given criteria, the WHO team sought additional sources of evidence or information, and the expert opinion of the GDG members.

6.2.5 GDG meetings

The GDG had the critical task of formulating recommendations based on the evidence. It achieved this through interpretation of the available evidence and EtD tables, technical discussions and consensus building. **Figure 9** illustrates the process of developing a recommendation, with a worked example using key question 2.

Figure 9. Simplified process for GDG formulation of recommendations



The following steps were followed:

1. **Review evidence (April 2024):** The GDG received a short evidence summary for each of the 25 key questions and was given an opportunity through online meetings and email exchanges to raise queries. The evidence summaries included a summary of included studies, and a short evidence profile (see **Annex 2** for a list of the systematic reviews underpinning the evidence summaries).

2. **Review EtD tables and judge the relative importance of each criteria (May 2024):** GDG members received the five draft EtD tables and provided inputs via an online survey. The inputs involved comments or feedback on the EtD content and, where possible, to add to the existing content with evidence or opinion-based information on one or more of the EtD criteria for any of the key questions of interest. Once the EtD tables had been finalized with GDG input, the GDG provided individual judgement on each criteria for each of the five tables, via an online survey. These judgements enabled the project team to assess beforehand where there was disagreement on specific issues, and to craft the agenda for the GDG meeting to focus discussion time on these areas of disagreement.

3. **Meet online as a group to discuss possible areas of discordance and strive for consensus (May 2024):** WHO and UNICEF convened a 2-day online meeting of the GDG. During this meeting, each recommendation and the specific questions under it were discussed, and areas where GDG members provided differing judgements to the INTEGRATE criteria were unpacked with a view to arriving at consensus. The consensus decision-making process was led by the GDG Chair (Stephanie Ogden). Consensus decision-making has the aim of unanimity, and, failing this, a focus on establishing the agreement of a supermajority. The GSC determined a protocol for making group decisions during GDG meetings. The GDG Chair would use informal voting at key junctures throughout the meeting to assess agreement. Where opinion was divided, the GDG Chair would facilitate discussion among GDG members. If unanimity could still not be achieved, the GDG Chair would call a formal vote, whereby a two-thirds majority would determine decisions. In the event that a two-thirds supermajority through formal voting could not be found, the GDG Chair would facilitate continued discussion and a further vote. If this did not yield a two-thirds supermajority, the GDG Chair would move to a simple majority. In the event of a split decision, the GDG Chair would have a casting vote. This protocol was communicated to the GDG at the start of the meeting.

   All votes and decisions were recorded during the meeting. A total of 18 subquestions were discussed. For 10 of these subquestions (55%), a supermajority of at least two thirds was reached among the GDG on the strength and direction of the subrecommendation. Of these 10, GDG members voted 100% unanimously on eight subquestions and with at least 90% consensus on two subquestions.

   For eight of these subquestions, the GDG members did not arrive at a decision, or there was insufficient time to discuss them during the meeting. The project team gathered inputs from the GDG for these remotely (see next point).

4. **Remote inputs and judgements on the remaining eight questions online (September 2024):** Following the GDG meeting in May 2024, the responsible technical officer summarized discussions and the split of informal votes on outstanding questions with the GDG, and identified areas of discord or contention. For these, where possible, an expanded summary of the evidence was provided. The GDG provided written inputs into a shared document and a final vote. A supermajority vote was achieved on these eight questions through these means.

6.3 Implementation guidance development process

6.3.1 Scoping

To identify the scope of implementation guidance for these Guidelines, WHO and UNICEF consulted prospective end users. In May 2023, WHO and UNICEF convened a meeting including representatives from government, UN agencies, international financial institutions, development partners, civil society and the private sector from 18 low-, middle- and high-income countries. The group published five key points of consensus to guide the development of implementation guidance *(84)*: (1) the recommendations are necessary and feasible to implement; (2) progress requires moving beyond emergency-led responses, through sustainable and resilient national systems; (3) hand hygiene system-strengthening plans should be underpinned by a comprehensive situational analysis and needs assessment, and monitored on an ongoing basis for course correction where necessary; (4) execution of system-strengthening plans should be integrated with existing programmes; and (5) strong political leadership is required to drive this agenda.

6.3.2 Evidence retrieval and synthesis

The implementation guidance was shaped from the existing literature and primary data collection. The systematic review team carried out a rigorous synthesis of implementation literature through a systematic review of "Effectiveness of measures taken by governments to support hand hygiene in community settings" *(86)*. Primary data were collected through the work of the CCWG (see **Section 6.1.5**), with 10 national workshops in 10 countries.

Framework for understanding a hand hygiene system

The framework was developed through the following steps:

- **Drafting:** A draft implementation framework was developed using existing WASH and health sector system literature and tools. The global CCWG did this collaboratively *(87-92)*.

- **Testing:** The global CCWG team tested the draft framework through 10 workshops in 10 countries. Between March and May 2024, each champion country held a national workshop with key stakeholders to discuss and map the components of a system for hand hygiene in community settings. These national workshops brought together representatives from relevant government ministries and departments, UN agencies and third sector organizations with a stake in hand hygiene in community settings. Using the draft framework as a starting point for discussions, the stakeholders broke into small groups to discuss specific community settings. Materials co-developed with the WHO PDI unit (see **Section 6.1.6**), including visual aids, activity sheets and discussion prompts, supported targeted and effective discussions. Each breakout group collected data on the key functions, actors, and roles and responsibilities in their national system for hand hygiene in different community settings. Ten national workshops were held, comprising 32 breakout group discussions with an estimated 300 participants in total.

- **Improving:** The global CCWG team aggregated, analysed and synthesized the national data from the 10 champion countries to identify commonalities of functions, actors, and roles and responsibilities across countries. Across the 10 workshops, 1 531 data points were collected. These data were cleaned, classified, grouped and cross-checked. The national data were then used by the CCWG team to revise the draft global framework for a system for hand hygiene in community settings.

- **Validating:** The improvement process and improved system framework were reported back to the CCWG at a global workshop for final input and/or validation (June 2024). The framework was further consulted upon remotely with the CCWG during September and October 2024, before being finalized.

7. Research needs

Although the recommendations included in these Guidelines are supported by evidence, there is need for further research. Specific areas for future research outlines in the commissioned systematic reviews are summarized in Table 4.

Table 4. Research needs

Priority topic	Further evidence needed
1. **Efficacy and effectiveness of hand hygiene-related practices used in community settings**	• Relative effectiveness of soap and water, and ABHR, on non-enveloped viruses • Relative effectiveness of different hand-drying methods and soap alternatives • Effect of microbial water quality on hand hygiene outcomes.
2. **Minimum material requirements for hand hygiene in community settings**	• Access to and specific quantities and locations of minimum material requirements • Relationship between material requirements and hygiene practices
3. **Behavioural factors influencing hand hygiene practices in community setting**	• From regions outside of Africa and South East Asia Specific to ABHR or soap alternatives • Public and institutional setting
4. **Interventions to improve hand hygiene in community settings**	• From regions outside of Africa/ SEA • Specific to ABHR or soap alternatives • In public settings, non-school institutional settings • Among those with disabilities (only 4 studies) • Improved evaluation methods to enable greater specificity on outcomes • Improved design and write-up of interventions to provide greater detail on what interventions did and why
5. **Effectiveness of measures taken by governments to support hand hygiene in community settings**	• For public spaces • Across regions • Related to sustainability

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Annex 1. Key questions and outcomes for the recommendations

This annex comprises Tables A1.1–A1.5. Each table presents a key question and the subquestions associated with it. For each subquestion, the tables outline detailed eligibility criteria in PICOD or SPIDER format.

Table A1.1. Detailed PICO(D) questions for key question 1 on health impact

Key question		Participants	Interventions	Comparison	Outcome	Study design
1. Should effective hand hygiene be practised in community settings as an important public health measure?	1a. What is the effect of hand hygiene in community settings on diarrhoeal disease?	General population in community settings.	Promotion of handwashing with soap alone or in combination with broader hygiene promotion, or improving access to handwashing facilities and materials.	No handwashing.	Diarrhoeal disease mortality and morbidity.	Randomized studies, involving individual and cluster-randomized controlled trials, and non-randomized and quasi-randomized studies, including those with cohort, before-and-after and interrupted time-series designs.
	1b. What is the effect of hand hygiene in community settings on acute respiratory infections?	General population in community settings.	Promotion of handwashing with soap.	No handwashing.	Acute respiratory infection morbidity arising from any pathogen for any age group.	Randomized and non-randomized controlled studies of interventions conducted in domestic, school or childcare settings.

Table A1.2. Detailed eligibility criteria in PICO(D) format for key question 2 on effective hand hygiene

Key question		Participants	Interventions	Comparison	Outcome	Study design
2. Which hand hygiene methods are effective at removing or deactivating pathogens associated with disease transmission by hands in community settings?	2a. How effective are soap products at removing or deactivating key pathogens[a] (or organisms intended as their surrogates) and how does duration impact effectiveness?	General population in community settings or laboratory-based studies on interventions used in community settings.	Handwashing with soap and water methods for varying durations.	Handwashing with water alone for varying duration.	Microbial load reduction in key pathogens and their surrogates on human hands or fingers from before to after washing.	Laboratory and field efficacy studies in which hands are either experimentally inoculated or naturally contaminated.
	2b. Where soap and/or water are not available, what are appropriate alternatives for hand hygiene?	General population in community settings or laboratory-based studies on interventions used in community settings.	Other handwashing materials including antiseptics, friction-generating materials and water alone for varying durations.	Handwashing with soap and water. Air drying without assistance.	Microbial load reduction in key pathogens and their surrogates on human hands or fingers from before to after washing.	Laboratory and field efficacy studies in which hands are either experimentally inoculated or naturally contaminated.
	2c. Which hand-drying methods are effective at reducing risk of recontamination of washed hands?	General population in community settings or laboratory-based studies on interventions used in community settings.	Any hand-drying method after handwashing with water or soap and water.		Microbial load increase in key pathogens and their surrogates on human hands or fingers after washing but before drying and after drying.	Laboratory and field efficacy studies in which hands are either experimentally inoculated or naturally contaminated.

[a] Key pathogens are those causing infectious disease, diarrheal disease or respiratory infections.

Table A1.3. Detailed eligibility criteria in SPIDER format for key question 3 on minimum requirements

Key question		Sample	Phenomenon of interest	Design	Evaluation	Research type
3. What are the minimum requirements (material needs) for the sustained practice of effective hand hygiene in community settings?	3a. What quantity of water is required to enable handwashing with soap and water at key moments?	General population in community settings.	Quantity of water required for handwashing with soap at key moments as recommended and as commonly practised.	Observational study.	Hand hygiene practice (i.e. any action of hand cleansing for the purpose of removing or deactivating pathogens from hands).	Quantitative and mixed methods.
	3b. What quantity of soap is required to enable handwashing with soap and water at key moments?	General population in community settings.	Quantity of soap required for handwashing with soap at key moments as recommended and as commonly practised.	Observational study.	Hand hygiene practice (i.e. any action of hand cleansing for the purpose of removing or deactivating pathogens from hands).	Quantitative and mixed methods.
	3c. Where should soap and water or alternatives be located in community settings to enable hand hygiene at key moments?	General population in community settings.	Location of soap and water required for handwashing with soap at key moments.	Observational study.	Hand hygiene practice (i.e. any action of hand cleansing for the purpose of removing or deactivating pathogens from hands).	Qualitative, quantitative and mixed methods.
	3d. What are the optimal spacing and number of users per hand hygiene facility[a] in household settings and public places to enable hand hygiene with soap and water at key moments?	General population in community settings.	Spacing and number of users per hand hygiene facility required for handwashing with soap at key moments.	Observational study.	Hand hygiene practice (i.e. any action of hand cleansing for the purpose of removing or deactivating pathogens from hands).	Qualitative, quantitative and mixed methods.
	3e. What are the main considerations for ensuring equitable[b] access to minimum material requirements and preventing discrimination in community settings?	General population in community settings.	Considerations (including location and design) leading to harm or inequitable access to handwashing with soap at key moments or discrimination.	Observational study.	Hand hygiene practice (i.e. any action of hand cleansing for the purpose of removing or deactivating pathogens from hands).	Qualitative, quantitative and mixed methods.

[a] Key factors to consider include total number of users over a given time period, operation and maintenance requirements, security and distancing requirements (e.g. COVID-19 response).

[b] Applying the key elements of the UN human rights to water and sanitation: availability, accessibility, affordability, quality and safety, and acceptability *(1)*.

Table A1.4. Detailed eligibility criteria in SPIDER and PICO(D) format for key question 4 on behaviour change

Key question		Sample	Phenomenon of interest	Design	Evaluation	Research type
4.1 What are key behavioural barriers and enablers to practising effective hand hygiene in community settings?		General population in community settings.	Behavioural barriers and enablers for practising hand hygiene.	Phenomenology, barrier analysis, grounded theory, thematic analyses and cross-sectional/ observational.	Effective hand hygiene (i.e. any practice that removes or deactivates pathogens from hands and thereby limits diseases transmission).	Qualitative, quantitative and mixed methods. Mixed methods (includes protocols or formative research referenced in the evaluation studies themselves).
4.2 Among interventions to improve hand hygiene in community settings, what theories, barriers and enablers, intervention functions and behaviour change techniques, and design features have been leveraged effectively to improve and sustain hand hygiene in community settings?	4.2a. Among interventions to improve hand hygiene in community settings, which have been designed using behaviour change theories?	General population in community settings.	Behaviour change theories among interventions to improve hand hygiene in community settings.	Experimental or quasi-experimental designs, randomized and non-randomized controlled trials, and before–after studies.	Effective hand hygiene (i.e. any practice that removes or deactivates pathogens from hands and thereby limits diseases transmission).	Mixed methods (includes protocols or formative research referenced in the evaluation studies themselves).
	4.2b. Among interventions to improve hand hygiene in community settings, which have effectively leveraged identified barriers and enablers of hand hygiene in community settings?	General population in community settings.	Effective leveraging of identified barriers and enablers of hand hygiene among interventions to improve hand hygiene in community settings.	Experimental or quasi-experimental designs, randomized and non-randomized controlled trials, and before–after studies.	Effective hand hygiene (i.e. any practice that removes or deactivates pathogens from hands and thereby limits diseases transmission).	Mixed methods (focus on quantitative evaluation and will include any papers linked to the evaluation that may be relevant, e.g. protocols, follow-up studies (qualitative or quantitative) to assess sustainability).
	4.2c. Among interventions to improve hand hygiene in community settings, what behaviour change techniques have been implemented to effectively improve and sustain handwashing practices?	General population in community settings.	Behaviour change techniques to promote handwashing among interventions to improve hand hygiene in community settings.	Experimental or quasi-experimental designs, randomized and non-randomized controlled trials, and before–after studies.	Effective and sustained hand hygiene (i.e. consistent hand hygiene practices).	Mixed methods (focus on quantitative evaluation and will include any papers linked to the evaluation that may be relevant, e.g. protocols, follow-up studies (qualitative or quantitative) to assess sustainability).
	4.2d. Among interventions to improve hand hygiene in community settings, what hand hygiene station designs have been effective at improving and sustaining hand hygiene?	General population in community settings.	Hand hygiene station design among interventions to improve hand hygiene in community settings.	Experimental or quasi-experimental designs, randomized and non-randomized controlled trials, and before–after studies.	Effective and sustained hand hygiene.	Mixed methods (focus on quantitative evaluation and will include any papers linked to the evaluation that may be relevant, e.g. protocols, follow-up studies (qualitative or quantitative) to assess sustainability).

Key question		Sample	Phenomenon of interest	Design	Evaluation	Research type
	4.2e. Among interventions to improve hand hygiene in community settings, what hand hygiene station design adaptations (e.g. placement, nudges and cues) have been effective at improving and sustaining hand hygiene?	General population in community settings.	Design adaptations (e.g. placement, nudges and cues) of hand hygiene stations.	No hand hygiene station design adaptation or a different type of adaptation among interventions to improve hand hygiene in community settings.	Effective and sustained hand hygiene (i.e. consistent hand hygiene practices).	Randomized and non-randomized controlled trials, and before–after studies (will include any papers linked to the evaluation that may be relevant, e.g. protocols, follow-up studies (qualitative or quantitative) to assess sustainability).
	4.2f. Among interventions to improve hand hygiene in community settings, what level of frequency and intensity of behaviour change interventions are necessary to effectively improve hand hygiene?	General population in community settings.	Varying frequencies and intensities of behaviour change interventions to promote effective hand hygiene. Phenomenon of interest	Standard frequency and intensity of behaviour change interventions among interventions to improve hand hygiene in community settings. Design	Effective and sustained hand hygiene (i.e. consistent hand hygiene practices).	Mixed methods (focus on quantitative evaluation and will include any papers linked to the evaluation that may be relevant, e.g. protocols, follow-up studies (qualitative or quantitative) to assess variability, subgroups).
	4.2g. Among interventions to improve hand hygiene in community settings, how do hand ygiene practices vary by population group, risk scenario or over time?	General population in community settings	Hand hygiene practices among key population groups and risk scenarios in community settings.	Experimental or quasi-experimental mental design randomized and non-randomized controlled trials, and before–after studies.	Variations in hand hygiene practices.	

Table A1.5. Detailed eligibility criteria in SPIDER format for key question 5 on government measures

Key question		Sample	Phenomenon of interest	Design	Evaluation	Research type
5 What government measures[a] have been implemented to support minimum requirements – water and soap – for equitable and sustained practice of hand hygiene?	5a. What government measures have increased access to soap for hand hygiene? Was it sustained? Was it equitable?	General population in community settings.	Government measures for increasing access to soap for handwashing with soap.	Policy documents and grey literature reports.	Access to minimum quantity of soap for effective hand hygiene.	Qualitative, quantitative and mixed methods.
	5b. What government measures have increased access to water for hand hygiene? Was it sustained? Was it equitable?	General population in community settings.	Government measures for ensuring access to water for handwashing.	Policy documents and grey literature reports.	Access to minimum quantity of water for effective hand hygiene.	Qualitative, quantitative and mixed methods.
	5c. What government measures have resulted in changes to end-user hand hygiene practices? Was it sustained? Was it equitable?	General population in community settings.	Government measures for delivering behaviour change interventions for promoting handwashing with soap at key moments.	Policy documents and grey literature reports.	Delivery of interventions for effective hand hygiene.	Qualitative, quantitative and mixed methods.
	5d. Where have governments intervened to address equality and/or affordability? What government measures specifically targeted equity and affordability of handwashing?	General population in community settings.	Government measures for affordable and equal access to minimum requirements for handwashing with soap at key moment.	Policy documents and grey literature reports.	Affordable and equal minimum requirements for effective hand hygiene.	Qualitative, quantitative and mixed methods.
	5e. Where have governments intervened to address other intermediate outcomes that could impact end-user access or practices (i.e. related to enabling conditions related to questions 5a, b, c), but that did not measure soap access, water access or end-user practices?	General population in community settings.	Government measures for delivering behaviour change interventions for promoting handwashing with soap at key moments.	Policy documents and grey literature reports.	Delivery of interventions for effective hand hygiene.	Qualitative, quantitative ad mixed methods.

[a] Evaluated using the Sanitation and Water for All building blocks: sector policy strategy; institutional arrangements; sector financing; planning, monitoring and review; and capacity development *(2)*.

Annex 1 References

1. The human right to water and sanitation. New York: United Nations General Assembly; 2010 (A/RES/64/292; https://undocs.org/A/RES/64/292).
2. Building blocks [website]. Sanitation and Water for All; 2025 (https://www.sanitationandwaterforall.org/about/our-work/priority-areas/building-blocks).

Annex 2. Systematic reviews

This annex comprises two tables. **Table A2.1** lists the systematic reviews commissioned by WHO for the purpose of these Guidelines and **Table A2.2** lists the pre-existing systematic reviews that also informed the formulation of recommendation by the GDG.

Table A2.1. Commissioned systematic reviews, published in a special supplement of *BMJ Global Health* on the evidence to establish global guidelines on hand hygiene in community settings

Title of manuscript	Authors
Efficacy and effectiveness of hand hygiene-related practices used community settings for removal of organisms from hands: a systematic review. doi: https://doi.org/10.1101/2025.03.12.25323775	Stephen P Hilton, Nick An, Lilly O'Brien, Kennedy Files, Jedidiah S Snyder, Hannah Rogers, Oliver Cumming, Joanna Esteves Mills, Bruce Gordon, Matthew C Freeman, Bethany A Caruso, Marlene K Wolfe
Minimum material requirements for hand hygiene in community settings: a systematic review. doi: https://doi.org/10.1101/2025.03.12.25323858	Lilly O'Brien, Kennedy Files, Jedidiah S Snyder, Hannah Rogers, Oliver Cumming, Joanna Esteves Mills, Bruce Gordon, Matthew C Freeman, Bethany, A Caruso, Marlene K Wolfe
Behavioural factors influencing hand hygiene practices across domestic, institutional, and public community settings: a systematic review. doi: https://doi.org/10.1101/2025.03.11.25323561	Bethany A Caruso, Jedidiah S Snyder, Lilly O'Brien, Dewan M Shoaib, Erin LaFon, Kennedy Files, Hannah Rogers, Oliver Cumming, Joanna Esteves Mills, Bruce Gordon, Marlene K Wolfe, Matthew C Freeman
Interventions to improve hand hygiene in community settings: a systematic review of theories, barriers and enablers, behavior change techniques, and hand hygiene facility design features. doi: https://doi.org/10.1101/2025.03.11.25323730	Sridevi K Prasad, Jedidiah S Snyder, Erin LaFon, Lilly O'Brien, Hannah Rogers, Oliver Cumming, Joanna Esteves Mills, Bruce Gordon, Matthew C. Freeman, Marlene K Wolfe, Bethany A Caruso
Effectiveness of measures taken by governments to support hand hygiene in community settings: a systematic review. doi: https://doi.org/10.1101/2025.03.11.25323746	Jedidiah S Snyder, Erika Canda, Jordan C Honeycutt, Lilly O'Brien, Hannah Roger, Oliver Cumming, Joanna Esteves Mills, Bruce Gordon, Marlene K Wolfe, Bethany A Caruso, Matthew C Freeman

Table A2.2. Pre-existing systematic reviews

Title of manuscript	Date	Authors
Effectiveness of handwashing with soap for preventing acute respiratory infections in low-income and middle-income countries: a systematic review and meta-analysis. doi: https://doi.org/10.1016/S0140-6736(23)00021-1	2023	Ian Ross, Sarah Bick, Philip Ayieko, Robert Dreibelbis, Jennyfer Wolf, Matthew C Freeman, Elizabeth Allen, Michael Brauer, Oliver Cumming
A systematic review of nudges on hand hygiene against the spread of COVID-19 doi: https://doi.org/10.1016/j.socec.2023.102046	2023	Alexandros Tzikas, George Koulierakis
What did we learn about changing behaviour during the COVID-19 pandemic? A systematic review of interventions to change hand hygiene and mask use behaviour doi: https://doi.org/10.1016/j.ijheh.2023.114309	2023	India Hotopf, Fiona Majorin, Sian White
What are the barriers and facilitators to community handwashing with water and soap? A systematic review doi: https://doi.org/10.1371/journal.pgph.0001720	2023	Obidimma Ezezika, Jennifer Heng, Kishif Fatima, Ayman Mohamed, Kathryn Barrett
Hand hygiene practices among primary and secondary school students in sub-Saharan Africa: a systematic review doi: https://doi.org/10.2166/washdev.2023.222	2023	Obadia Kyetuza Bishoge, Mwanaidi Omary, Edwin Liheluka, Jonathan Mcharo Mshana, Maryyusta Nguyamu, Yolanda Joseph Mbatia, Robert Mussa Njee, Mwanaidi Kafuye
Effectiveness of interventions to improve drinking water, sanitation, and handwashing with soap on risk of diarrhoeal disease in children in low-income and middle-income settings: a systematic review and meta-analysis doi: https://doi.org/10.1016/S0140-6736(22)00937-0	2022	Jennyfer Wolf, Sydney Hubbard, Michael Brauer, Argaw Ambelu, Benjamin F Arnold, Robert Bain, Valerie Bauza, Joe Brown, Bethany A Caruso, Thomas Clasen, John M Colford Jr, Matthew C Freeman, Bruce Gordon, Richard B Johnston, Andrew Mertens, Annette Prüss-Ustün, Ian Ross, Jeffrey Stanaway, Jeff T Zhao, Oliver Cumming, Sophie Boisson
Effectiveness of behaviour change techniques used in hand hygiene interventions targeting older children – A systematic review doi: https://doi.org/10.1016/j.socscimed.2021.114090	2021	Julie Watson, Oliver Cumming, Amy MacDougall, Alexandra Czerniewska, Robert Dreibelbis
The determinants of handwashing behaviour in domestic settings: An integrative systematic review doi: https://doi.org/10.1016/j.ijheh.202.113512	2020	Sian White, Astrid Hasund Thorseth, Robert Dreibelbis, Val Curtis
Approaches to promote handwashing and sanitation behaviour change in low- and middle-income countries: a mixed method systematic review doi: https://doi.org/10.4073/csr.2017.7	2017	Emmy De Buck, Hans Van Remoortel, Karin Hannes, Thashlin Govender, Selvan Naidoo, Bert Avau, Axel Vande veegaete, Alfred Musekiwa, Vittoria Lutje, Margaret Cargo, Hans-Joachim Mosler, Philippe Vandekerckhove, Taryn Young

Annex 3. GDG judgements related to the recommendations

This annex summarizes in **Table A3.1** the judgements made by the GDG for key questions 1–4. See **Chapter 6** for a full description of the methods for formulating recommendations. See **Web Annex 1** for a full description of the EtD process.

Table A3.1. GDG judgements for key questions 1–4

Interventions	1. Balance of health and harms	2. Human rights and sociocultural acceptability	3. Health equity, equality and non-discrimination	4 .Societal and environmental acceptability	5. Financial and economic acceptability
Key Question 1					
Hand hygiene versus no hand hygiene	Favours the intervention	Yes	Positive	Favours the intervention	Favours the intervention
Key Question 2					
Soap (any) versus no hand hygiene	Favours the intervention	Yes	Positive	Positive	Favours the intervention
Plain soap versus no hand hygiene	Favours the intervention	Yes	Positive	Positive	Favours the intervention
Antimicrobial soap versus no hand hygiene	Probably favour the intervention	Probably yes	Positive	Probably positive	Favours the Intervention
Handwashing for at least 20 s versus other duration	Don't know	Yes	Don't know	Don't know	Don't know
ABHR versus no hand hygiene	Favours the Intervention	Yes	Probably positive	Probably positive	Favours the Intervention
Non-ABHR versus no hand hygiene	Don't know	Don't know	Don't know	Don't know	Don't know
Antimicrobial wipes versus no hand hygiene	Don't know	Don't know	Don't know	Don't know	Don't know
Sand or soil versus no hand hygiene	Favours the comparison	No	Negative	Negative	Favours the comparison
Ash versus no hand hygiene	Favours the comparison	No	Negative	Negative	Favours the comparison
Paper towels versus air drying without assistance	Probably intervention	Probably yes	Don't know	Probably negative	Don't know
Cloth towels versus air drying without assistance	Probably comparison	Uncertain	Probably positive	Probably positive	Don't know
Hot-air dryer versus air drying without assistance	Probably intervention	Probably yes	Don't know	Don't know	Don't know
Hot-air dryer versus air drying without assistance	Probably intervention	Probably yes	Don't know	Don't know	Don't know
Jet-air dryer versus air drying without assistance	Probably intervention	Probably yes	Don't know	Don't know	Don't know
Key Question 3					
Water quantity: 0.5 L or 1 L or 1.5 L or 2 L per person per event	Don't know	Don't know	Don't know	Don't know	Don't know
Soap quantity: 120–250 g or 250–500 g per person per event	Don't know	Don't know	Don't know	Don't know	Don't know
Key Question 4					
Theory-based intervention design versus non-theory-based intervention design	Don't know	Yes	Neither positive nor negative	Varies	Don't know
Recommend a set of generalizable barriers and/or enablers versus not	Probably favours intervention	Probably yes	Probably positive	Probably favours intervention	Probably favours intervention
Recommend a set of generalizable behaviour change techniques versus not	Favours the comparison	Don't know	Don't know	Don't know	Don't know

Annex 4. Recommendation strength and quality of evidence

This annex provides a summary of the recommendations formulated by the GDG. For each recommendation (1–3), Table A4.1 lists the key questions that the GDG considered in their deliberations, and the strength and the quality of the evidence.

Table A4.1. Recommendation strength and quality of evidence

Recommendation	Relevant key question(s)	Strength of recommendation	Certainty of evidence
1. Hand hygiene is an important public health measure, and governments should fulfil their responsibility for promoting it. Promotion involves taking steps to remove barriers to the practice of hand hygiene and strengthen the factors that enable behaviour change and/or sustained practice.	1	Strong	Moderate to high
2. To be effective, hand hygiene in community settings should be practised with plain soap and water for enough time to enable covering both hands entirely with soap and thoroughly rubbing at key times when disease can be transmitted via hands. Hand hygiene should be practised in community settings at the following key times: before preparing food, before eating or feeding/breastfeeding others, after using the toilet or handling faeces, after coughing, sneezing or nose blowing, and when hands are visibly dirty. Alcohol-based hand rub (ABHR) is an effective alternative to soap and water when hands are not visibly dirty.	2	Strong	Moderate to high
3. The core requirements for changing and/or sustaining the practice of hand hygiene in community settings are: (a) access to the minimum material needs; (b) access to information on why, when, how and where to clean hands; and (c) a conducive physical and social environment. In particular (a) The minimum material needs are hand hygiene facilities situated on premises with reliable access for all to sufficient running water and soap, or ABHR, and with safe disposal of wastewater. To be reliable, hand hygiene facilities should be consistently stocked with water and soap or ABHR, providing hand hygiene materials whenever needed. (b) Information should include the importance of handwashing (why), the key times for hand hygiene (when) and the technique (how) to achieve effective hand hygiene. (c) A conducive environment encourages consistent and sustained hand hygiene practices. A conducive physical environment achieves this by going beyond facilitating equitable access to materials (covered under core requirement (a)) to ensuring facilities are convenient, attractive and easy to use. A conducive social environment leverages social norms, interpersonal dynamics and routines to support and reinforce regular, effective hand hygiene among individuals and groups.	3, 4.1 and 4.2	Strong	Moderate to high

Contact info

Water, Sanitation, Hygiene and Health Unit
Department of Public Health, Environmental
and Social Determinants of Health

World Health Organization
20 Avenue Appia
1211-Geneva 27
Switzerland
www.who.int/water_sanitation_health/en/

UNICEF
Programme Group
Water, Sanitation, and Hygiene Section
United Nations Children's Fund (UNICEF)
3 United Nations Plaza
New York, NY 10017
USA
www.unicef.org/wash