Infection prevention and control and water, sanitation and hygiene measures in health-care settings and shelters/congregate settings in Gaza

Technical note
22 February 2024
Infection prevention and control and water, sanitation and hygiene measures in health-care settings and shelters/congregate settings in Gaza

Technical note
22 February 2024
# Table of contents

Acknowledgements iv

1: Introduction 1
   1.0 Background 2
   1.1 Objective 2
   1.2 Intended audience 2
   1.3 Contextual considerations 2

2: IPC and WASH considerations for health-care settings 5
   2.1 Key points 6
   2.2 Hand hygiene 6
   2.3 Risk assessment 7
   2.4 Screening, triage and isolation (patient placement) 9
   2.5 Rational use of personal protective equipment (PPE) and considerations during shortages 10
   2.6 Environmental cleaning 10
   2.7 Ventilation 12
   2.8 Water supply, quantity and quality 12
   2.9 Sanitation and wastewater management 13
   2.10 Waste management and sharps containment 13
   2.11 Patient health education on IPC 15
   2.12 Safe management of dead bodies 15
   2.13 IPC essential supply list 15

3: WASH and IPC considerations for shelters and congregate settings 17
   3.1 Key points 18
   3.2 Water supply, storage and quality 18
   3.3 Hygiene kits and promotion 19
   3.4 Excreta management 19
   3.5 Solid waste management 20
   3.6 Ensuring safe shelters 20
      3.6.1 Screening and isolation 20
      3.6.2 Personal protective equipment (PPE) 20

References 21

Annex 1: IPC supply list 25

Annex 2: Hygiene kits, hygiene promotion messages and food safety 29

Annex 3: Water quality and waste management 31

Annex 4: Illustrated hand hygiene, cleaning guide, food safety 35
Acknowledgements

World Health Organization (WHO) gratefully acknowledges the many individuals and organizations who contributed to this technical note, which include Ministry of Health State of Palestine, United Nations Relief and Works Agency (UNRWA), WASH Cluster State of Palestine, Health Cluster occupied Palestinian territory (oPt), Global Health Cluster, IPC Public Health Emergency Working Group, WASH in Public Health Emergency Network, UNICEF, external peer reviewers and WHO at the three levels (individual names listed below).

The development of the technical note was coordinated by April Baller, who also led the writing together with Hibak Osman Mahamed, Madison Moon and Nosheen Usman of the Department of Country Readiness Strengthening, WHO Health Emergencies Programme.

Ministry of Health State of Palestine
Rami Al-Abadla, Director of Safety, Infection Prevention and Control Unit, Gaza.

United Nations Relief and Works Agency (UNRWA)
Zoheir Elkhatib; Natalie Fischer; Hamad Khalil; Wisam Mubarak; Akihiro Seita; Julianna Smith.

WASH Cluster occupied Palestinian territory (oPt)
Drew Baldwin, ACF Spain; Isabel Cobb, ACF Spain; Jeffrey Silverman; Oxfam Vikas Goyal, WASH Cluster coordinator/UNICEF; Osama Mohammad M Al-Sheikh Ali, WASH Cluster/UNICEF.

Health Cluster oPt and Global Health Cluster
Andrea King; Eba Al-Muna Pasha; Chipo Takawira.

IPC Public Health Emergency Working Group
Colin Brown, WHO Collaborating Centre for Reference and Research on Antimicrobial Resistance and Healthcare Associated Infections, United Kingdom; Dale Fisher, Yong Loo Lin School of Medicine, National University of Singapore, Singapore; Mushtuq Husain, Institute of Epidemiology, Disease Control & Research, Bangladesh; Emilio Hornsey, UK Public Health Rapid Support Team, United Kingdom; Fernanda Lessa, International Infection Control Program, US Centers for Disease Control and Prevention (CDC), United States of America; Kalisvar Marimuthu, National Centre for Infectious Diseases, Tan Tock Seng Hospital, Singapore; Katie Wilson, International Infection Control Programme, US Centers for Disease Control and Prevention (CDC), United States of America.

WASH in Public Health Emergencies Network
Lana Abdul Samad, Oxfam, Lebanon; Mohammed Ammar, ECHO Gaza, occupied Palestinian territory; Claudio Deola, Save the Children UK, United Kingdom; Michelle Farrington, Oxfam, United Kingdom; Thomas Handzel, US Centers for Disease Control and Prevention (CDC), United States of America; Paul Hunter, University of East Anglia, United Kingdom; Daniele Lantagne, Tufts University, United States of America; Jean Lapègue, Action contre la Faim (ACF), France; Paul Patrick Onyango, ECHO Nairobi, Kenya; Maryna Peter, University of Applied Sciences and Arts Northwestern Switzerland, Switzerland; Guillaume Pierrehumbert, International Committee of the Red Cross, Switzerland; Mark Sobsey, University of North Carolina and Aquagenx, LLC, United States of America; Syed Yasir Ahmad, International Medical Corps, United Kingdom; Marij Zwart, Netherlands Red Cross, Netherlands.

UNICEF
Chris Cormency; Gemma Querol; Lindsey Denny; Omar El Hattab; Micheal Emerson Gnilo; Abdoulaye Fall; Raoul Kamadjeu; Jennifer Lamb; Pierre Yves Oger; Jerome Pfaffman; James McQuen Patterson; Jamal Shah.

WHO Country Offices, Regional Offices and Headquarters
Randa Abu Rabe; Osama Ali Maher; Benjamin Bouquet; Ana Paula Coutino Rehse; Devika Dixit; Nazik Elshiekh; Joanna Esteves Mills; Bruce Gordan; Hannah Hamilton; Iman Hewidy; Maggie Montgomery; Maria Clara Padoveze; Giovanni Satta; Victoria Willet; Teresa Zakaria.
Introduction
1: Introduction

1.0 Background

As of January 31 2024, syndromic surveillance screening in the Gaza has reported 245 858 cases of acute respiratory infections, 161 285 cases of diarrhoea, 6 625 of chickenpox, and 7 737 cases of jaundice (1). The risk of further spread of epidemic-prone diseases is high due to overcrowding, inadequate water, sanitation and waste management, lack of medical/infection prevention and control (IPC) and basic hygiene supplies, disruption of routine, vaccine-preventable disease programmes, and a dysfunctional health-care system, including staffing issues due to conflict.

Assessing IPC- and Water, sanitation and hygiene (WASH)-related risks and implementing IPC and WASH measures is pivotal to mitigating the spread of infectious diseases and ensuring a safe environment for patients, visitors, family members and health and care workers. However, given the significant infrastructural damage combined with interrupted water, sanitation, waste management and energy services and reduced access to medical and IPC supplies, this document presents a tailored approach to the implementation of core IPC and WASH measures.

This technical note is based on the guiding principles of:

- Sphere handbook (2),
- Standard precautions for the prevention and control of infections: aide-memoire (3),
- Transmission-based precautions for the prevention and control of infections: aide-memoire (4),
- Essential environmental health standards for health-care (5).

This technical note contains two sections: 1) Health-care 2) Shelters/congregate settings.

This technical note should be referenced when standard and transmission-based precautions cannot be applied. This document will be updated on a need's basis.

1.1 Objective

The objective of this document is to outline relevant IPC and WASH measures in the context of the ongoing conflict in Gaza. It also provides alternative options for implementing these measures, acknowledging contextual and capacity constraints. Users should assess their unique situations to determine the feasibility of implementing these measures.

1.2 Intended audience

This document is for infection prevention and control and water, sanitation, and hygiene focal points, national and local public health authorities, frontline health and care workers, humanitarian organizations, aid workers and responders, and partner organizations that are supporting response operations.

1.3 Contextual considerations

A plan for implementation of the IPC/WASH considerations outlined in this technical note must be underpinned by a structured situational analysis and needs assessment, as well as an examination of operational constraints and barriers to action. In scenarios where the interventions described in this technical note cannot feasibly be attempted

---

1 In this document, the term “health-care settings” denotes sites whose primary function is to offer medical care (e.g. hospitals, primary health centres, mobile medical teams, etc.), while “shelters/congregate settings” are designed primarily to house displaced individuals (e.g. in schools, tents, formal shelters, etc.). However, it is acknowledged that in Gaza, health-care settings may also serve as shelters for displaced individuals, and shelters may also provide medical care.
or implemented and no suitable alternative can be identified, health and care workers should closely examine relevant operational constraints and barriers to action and communicate them to health-care facility supervisors, relevant governmental organizations, health and WASH clusters, humanitarian partners and organizational authorities (e.g. the United Nations Relief and Works Agency for Palestine Refugees in the Near East [UNRWA]).

Results from needs assessments should be documented and communicated in cases where immediate WASH and IPC interventions are needed but cannot be carried out. The same goes for cases where planning and coordination of suitable temporary alternatives, such as those involving infrastructural remediation, are needed. This can be achieved by:

- facilitating the sharing of information by frontline workers with supervisors and/or technical leads (at health and WASH cluster/sector agencies) in cases requiring immediate attention;
- creating technical working groups with key stakeholders, including members of affected communities;
- evaluating HeRAMS (Health Resources and Services Availability Monitoring System) assessments for WASH and IPC in health-care facilities for gap analysis and planning;
- assessing water supply, sanitation, and hygiene practices; by WASH cluster partners and technical working groups.

Taking no actions on WASH and IPC would likely result in unmitigated transmission of bacterial, viral, fungal, and parasitic infections, including increased risk of development and spread of antimicrobial resistance (AMR) (6), causing severe morbidity and mortality which cannot be identified through syndromic surveillance alone.
IPC and WASH considerations for health-care setting
2: IPC and WASH considerations for health-care settings

2.1 Key points

Key IPC and WASH interventions in health-care settings to prevent infectious disease transmission:

- Ensure health and care workers, patients, family members and visitors have access to safe water, sanitation and perform hand hygiene when indicated.
- Ensure that health and care workers, patients, family members and visitors wear well-fitting medical masks when experiencing respiratory symptoms.
- Ensure workers in health-care settings adhere to proper practices related to cleaning and disinfection of the environment.

2.2 Hand hygiene

Hand hygiene is a first line of defense against the transmission of infectious diseases within a health-care setting (2, 5, 7). Hand hygiene should be performed according to the WHO’s Five Moments of Hygiene\(^2\), alternate options for hand hygiene products can be considered if preferred hand-hygiene products are not available (Table 1).

Table 1. Hand hygiene.

<table>
<thead>
<tr>
<th>Hand hygiene (WHO recommendations)</th>
<th>Alternative options when preferred hand-hygiene products are not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hand hygiene should be performed with soap and water or alcohol-based handrub according to the WHO Five moments for hand hygiene (7, 8) to protect the health of patients, family members and visitors: before touching a patient, before cleaning/aseptic procedures, after body-fluid exposure risk, after touching a patient, after touching patient surroundings (Figure 1).</td>
<td>1. If sinks are not available in-patient areas, Veronica buckets can be installed to provide water for hand hygiene close to the point of care (9). Alternatively, a handwashing basin, soap and a jug of clean water may be placed on a trolley used for ward rounds to encourage handwashing as often as needed between patient contacts (refer to Annex 4 on visual aid for handwashing and handrub technique).</td>
</tr>
<tr>
<td>• Hand hygiene should also be performed with soap and water or alcohol-based handrub after using the toilet and before handling food (refer to Annex 2 for personal hygiene messages).</td>
<td>2. When neither soap and clean water nor alcohol-based handrub is available, the following options can be considered:</td>
</tr>
<tr>
<td>• At least two handwashing stations should be provided in wards with 20 beds (5), located to maximize access across beds during patient care.</td>
<td>• Sodium hypochlorite may be added to water achieving an end formulation of 0.05% sodium hypochlorite for temporary use in dispenser containers for hand hygiene (10).</td>
</tr>
<tr>
<td></td>
<td>• Note that a sodium hypochlorite solution will inactivate when exposed to open air and organic materials. If this method is used during supply shortages, it is recommended that the solution be prepared in small batches daily and dispensed from closed containers.</td>
</tr>
<tr>
<td></td>
<td>• Note also that sodium hypochlorite added to water with a high saline content (seawater) is also an option as long as an end formulation of 0.05% sodium hypochlorite is achieved. Similarly, other sources, such as rainwater, may be considered (11).</td>
</tr>
<tr>
<td></td>
<td>• Consider using other hand hygiene products that have antimicrobial properties, such as waterless “no-rinse” hand soaps.</td>
</tr>
</tbody>
</table>

2.3 Risk assessment

Health and care workers should perform a point-of-care risk assessment to determine their risk of exposure to infectious diseases and to select the appropriate personal protective equipment (PPE) to mitigate this risk (Table 2). Health and care workers should ensure that donning and doffing of PPE is performed in designated areas.

**Table 2. Example of a risk assessment and the required personal protective equipment.**

<table>
<thead>
<tr>
<th>Risk assessment of patient</th>
<th>Required personal protective equipment (PPE)</th>
</tr>
</thead>
</table>
| Signs and symptoms of respiratory infection (cough, fever/increased body temperature, sneezing or runny nose). | Health and care worker:  
  • Perform hand hygiene before and after using PPE, following the Five moments for hand hygiene practices outlined in Section 2.2 (3, 7, 8).  
  • Wear a medical mask before entering the patient’s environment (4).  
  • Wear additional PPE if indicated based on a risk assessment (e.g. if care includes touching the patient) (4).  
  Patient:  
  • Wear a mask, if tolerated, for source control (4).  
  - No mask is to be worn by children under 5 years of age.  
  • Practice respiratory etiquette (refer to Annex 2), followed by hand hygiene after contact with respiratory secretions (blowing nose, sneezing, coughing) to reduce the spread of infection. |
| Signs and symptoms of diarrhoea, incontinence of stool and/or vomiting. | Health and care worker:  
  • Perform hand hygiene before and after using PPE, in addition to the Five moments outlined in Section 2.2 (3, 7, 8).  
  • Wear gloves and gown before entering the patient’s environment (4).  
  - Consider a medical mask and eye protection if risk of generating splashes or sprays of body fluids.  
  Patient:  
  • Ask the patient to wash hands, if feasible.  
  Note: Soap-and-water handwashing is the preferred method for hand hygiene when hands are visibly soiled, for the effective removal or deactivation of pathogens on hands.
<table>
<thead>
<tr>
<th>Risk assessment of patient</th>
<th>Required personal protective equipment (PPE)</th>
</tr>
</thead>
</table>
| Signs and symptoms of rash on face or body. | **Health and care worker:**  
- Perform hand hygiene before and after using PPE, in addition to the Five Moments outlined in Section 2.2 (Figure 1) (3, 7, 8).  
- Wear a filtering facepiece respirator before approaching the patient (4).  
- Wear additional PPE if indicated based on a risk assessment (e.g. direct contact with skin lesions) (4).  

**Patient:**  
- Wear mask for source control, if tolerated.  
  - No mask is to be worn by children under 5.  
- Practice respiratory etiquette and hand hygiene after contact with respiratory secretions (blowing nose, sneezing, coughing), to reduce the spread of infection. |
| Signs of open wound or non-intact skin, blood, or body fluid exposure risk. | **Health and care worker:**  
- Perform hand hygiene before and after using PPE, in addition to the Five moments outlined in Section 2.2 (3, 7, 8).  
- Wear gloves when caring for non-intact skin, open wound or before any anticipated exposure to blood and body fluids (4).  
- Wear additional PPE if indicated based on a risk assessment (e.g. direct contact with patients).  

- Risk of splash of blood or body fluids;  
- Handling buckets or bedpans containing watery or bloody stool or vomit;  
- Cleaning large volume of blood or body fluids in patient environment;  
- Changing/handling heavily soiled linens. | **Health and care worker:**  
- Perform hand hygiene before and after using PPE, in addition to the Five moments outlined in Section 2.2 (3, 7, 8).  
- Wear a gown or apron, gloves, medical mask and eye protection before approaching the infectious risk (4). |
2.4 Screening, triage and isolation (patient placement)

Patients should undergo screening at point of entry to the health-care setting based on clinical presentation (syndromic surveillance) and be isolated (separated) if they meet the clinical criteria for suspected infectious diseases. Screening, along with the implementation of standard and transmission-based precautions, as outlined in national and subnational infection control guidance, reduces the risk of transmission within the health-care setting.

1. The following are signs and symptoms of illness that should be screened for in a health-care setting:
   - Acute respiratory infections (cough, sneezing, sore throat, fever/increased body temperature, headaches, fatigue, body aches and pains, and runny nose)
   - Skin rash (on the face or body)
   - Acute gastrointestinal illness (diarrhoea, nausea, vomiting)

Triage should be implemented at the earliest possible opportunity to manage limited resources and provide timely support to individuals presenting with critical care needs. If neither screening alone nor screening and isolation is feasible, other risk mitigation strategies may be considered (Table 3).

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Neither screening nor isolation is feasible</th>
<th>Scenario 2</th>
<th>Screening is not feasible, but isolation is possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Due to a lack of available isolation space, patients may be able to be moved from their current placement within the health-care facility; however, to mitigate the risk of transmission, the following strategies should be employed:</td>
<td>• Establish a decision-making framework to assist in prioritizing which patients should be assigned to single-patient isolation rooms. This prioritization is to be based on factors such as the infectiousness of the disease, the mode of transmission, the potential to cause severe illness in others if exposed, and the patient’s clinical care needs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Before every interaction, health and care workers should perform a point-of-care risk assessment. If a patient shows signs and symptoms of an infectious disease, staff should put on appropriate PPE, as outlined in section 2.3 risk-assessment.</td>
<td>- Cohort patients with similar symptoms and diagnoses in one patient area/unit to prevent the spread of disease to others. Maintain a minimum distance of 1 metre between patients or beds (4).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Health and care workers should educate patients about the importance of respiratory etiquette and hand hygiene to prevent the spread of diseases.</td>
<td>- Conduct a space assessment to identify suitable areas for establishing single rooms or areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Staff should provide patients exhibiting signs and symptoms of a respiratory illness a mask, if tolerated.</td>
<td>- In situations where patients are in close proximity to one another due to a shortage of single-patient beds, arrange patients so they sleep with their heads at opposite ends to one another. Additionally, place a physical barrier, such as linens, between patients to reduce the risk of transmission via contact.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- In situations where patients are in close proximity to one another and due to a shortage of available single-patient beds, arrange the patients so they sleep with their heads at opposite ends to one another. Additionally, place a physical barrier, such as linens, between patients to reduce the risk of transmission via contact.</td>
<td>- Ensure that health and care workers conduct point-of-care risk assessments to determine whether additional PPE is required or if there is a need to relocate the patient to an appropriate isolation room.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Screening: a process in which an individual is evaluated to see whether that person meets a standardized case definition (4).
3. Screening: a process in which an individual is evaluated to see whether that person meets a standardized case definition (4).
2.5 Rational use of personal protective equipment (PPE) and considerations during shortages

In situations where there is a severe shortage of PPE or an anticipated stockout, consider using temporary stand-alone or combination measures to maximize the use of available supplies (12):

1. Extended PPE use (using PPE items for longer than normal or for multiple patient encounters):
   a. Gowns (disposable or reusable) and eye protection may be considered for extended use (wearing continuously for multiple patient encounters), prior to disposal when severe shortages are experienced. Extended-use PPE items should be removed and replaced immediately if they become soiled during use and should be discarded when they are taken off.
   b. Disposable medical masks and filtering facepiece respirators may be used continuously for multiple patient encounters; however, these items must be carefully managed as there is a high risk of self-contamination during their extended use in health-care settings. Additional advice includes:
      i. mask must be changed when wet, soiled or damaged;
      ii. mask must not be touched for adjustment or displacement from the face; if this happens, the mask should be safely removed and discarded; and hand hygiene performed.
   c. Examination gloves should not be used for multiple patient encounters (13).

2. Alternative PPE items (using non-standardized or repurposed products as PPE items):
   a. In the event of a medical masks stockout, the use of non-medical masks (such as cloth masks) may be considered\(^5\).
   b. In the instance of gowns stockout, consider using disposable or launderable aprons, lab coats and patient gowns (12).
   c. In instances of gloves stockout, consider using clean, protective gloves that are used for safety in other industries, such as those used for laboratories and those used in the handling of chemical hazards and food preparation.

3. Reprocessing PPE (using previously worn PPE after decontamination or reprocessing methods):
   a. For example, cotton gowns and eye protection may be decontaminated. To decontaminate a cotton gown, it may be laundered or washed and disinfected\(^6\). Please see Annex 4 for a visual aid on putting on and taking off PPE.

2.6 Environmental cleaning

Environmental contamination in health-care settings plays a major role in the transmission of infections\(^7\).

Ideally, individuals performing cleaning should systematically clean surfaces using the general principles of cleaning from clean to dirty and from high surfaces to low surfaces (14). For higher-risk areas (e.g. spaces where patients with epidemic-prone infections are placed), use disposable towels only and ensure the disposal of all used towels as contaminated waste before moving to another patient space. If disposable towels are not available, reusable towels can be used if they are cleaned and laundered before use.


Where there is limited stock of hospital-approved disinfectants, prioritize the disinfection of high-touch surfaces, items in proximity to patients who have higher susceptibility to infections (e.g. immunocompromised patients) and items in areas that are regularly exposed to significant amounts of blood or other body fluids (e.g. emergency rooms).

At minimum patient care areas should be cleaned and disinfection twice per day and practices adjusted as needed (e.g. depending on number of patients using the space [Table 4]) and the suggested cleaning and disinfection products that can be used to clean the patient care area (Table 5).

Environmental surfaces should be cleaned and disinfected immediately whenever they become visibly soiled or if there is a spill of body fluid (e.g. blood, stool, drainage). Please see Annex 4 for visual aid on cleaning and disinfection practices.

**Table 4. Cleaning and disinfection areas and frequency in health-care settings.**

<table>
<thead>
<tr>
<th>Patient area</th>
<th>Frequency</th>
<th>Additional guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening/triage area.</td>
<td>• At least twice daily.</td>
<td>• Focus on high-touch surfaces, then floors (last).</td>
</tr>
</tbody>
</table>
| Inpatient rooms/cohort occupied.     | • The frequency of cleaning inpatient rooms should be increased to accommodate any increased number of patients using the space.  
• Minimum: At least twice daily, preferably three times daily, in particular for high-touch surfaces. | • Focus on high-touch surfaces, starting with shared/common surfaces, then move to each patient bed; use new cloth for each bed if possible; then floors (last). |
| Patient bathrooms/toilets.          | • The frequency of cleaning inpatient rooms should be increased to accommodate any increased number of patients. Using the toilet.  
• Minimum: Private patient room toilet: at least twice daily. Shared toilets: at least three times daily. | • High-touch surfaces, including door handles, light switches, counters, faucets, then sink bowls, then toilets and finally floor (in that order).  
• Where feasible, avoid sharing toilets between staff and patients (14, 15). |

When hospital-approved disinfectants are unavailable, it is advisable, at a minimum, to use water, detergent, or sodium hypochlorite (household bleach is acceptable) to physically cleanse surfaces, using clean cloths (like microfiber or disposable towels) and manual friction (scrubbing technique) to manually eliminate microorganisms from surfaces.

**Table 5. Suggested cleaning and disinfectant products.**

<table>
<thead>
<tr>
<th>Cleaning products</th>
<th>Disinfectants</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Liquid soap.</td>
<td>• Low-level disinfection is generally adequate for environmental cleaning.</td>
</tr>
</tbody>
</table>
| • Detergents (15).                                                               | • Common low- and intermediate-level disinfectants that can be used for environmental surfaces in health-care settings include:  
• alcohol (ethyl or isopropyl 60-80%) – alcohol-based handrub solutions may also be used for surface disinfection purposes;  
• hydrogen peroxide;  
• quaternary ammonium compounds;  
• chlorine-releasing agents (e.g. bleach). |
2.7 Ventilation

Ensuring adequate ventilation in patient-care areas plays a key role in preventing transmission of infections (16).

- Natural ventilation is achieved by opening windows and/or doors to facilitate the intake of fresh air and the exhaust of stale air.

- If feasible, maintain adequate ventilation by ensuring that airflow is not obstructed by fixtures, insulation or screens. It is preferable to ensure that air flows continuously from different directions (e.g. through both open door and open window located on different sides of the room) rather than through an opening on only one side (e.g. window alone) (Figure 2).

Figure 2. Natural ventilation for IPC in health-care settings.

2.8 Water supply, quantity and quality

Water availability is critical to being able to adhere to IPC measures and maintaining a sufficient amount of water is critical (Table 6). At minimum, 2.5-3.0 litres/person/day of safe drinking-water are required for survival (2). Depending on climatic and individual needs, that quantity can go up (17). According to WHO guidelines, 40-60 L/patient/day are required for inpatients and 5 L/patient/day for outpatients (Table 6). To safeguard supplies, consider using saline water for flushing toilets, cleaning, and anal cleansing, as this is the practice typically used in the Region. Ensure provision of safe drinking-water as per national guidelines or WHO Guidelines for drinking-water quality and with minimum storage capacity of five days.

Table 6. Minimum water quality requirements in health-care settings (2,5).

<table>
<thead>
<tr>
<th>Minimum emergency water quantities for various uses in health facilities</th>
<th>Litres/patient/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking-water requirement (dependent on climatic and individual needs)</td>
<td>2.5-3.0</td>
</tr>
<tr>
<td>In-patient department/hospitalization (IPD/hospital).</td>
<td>40</td>
</tr>
<tr>
<td>Emergency Room (ER).</td>
<td>10</td>
</tr>
<tr>
<td>Outpatient Department.</td>
<td>5</td>
</tr>
<tr>
<td>Flushing toilets per user (conventional flushing toilets with sewer).</td>
<td>40</td>
</tr>
<tr>
<td>Flushing toilets per user (pour-flush toilets).</td>
<td>5</td>
</tr>
<tr>
<td>Anal washing (per person).</td>
<td>2</td>
</tr>
<tr>
<td>Basic hygiene practices (per person).</td>
<td>6</td>
</tr>
</tbody>
</table>


Since centralized water supply systems may not be functioning, localized water treatment should be undertaken employing point-of-use or point-of-entry water treatment (e.g. chlorine tablets or solutions, filters). In addition, pool testers and turbidity tubes should be made available for measuring pH, free residual chlorine (FRC) and turbidity levels in water to ensure it is properly disinfected. To ensure safe water access during a public health emergency, FRC levels of 0.5 mg/L (for water with a pH of <8 and turbidity <nephelometric turbidity units (NTUs) or 1.0 mg/L (for water with a pH >8 and turbidity >5 NTU) are recommended. The broad aim is to ensure FRC levels are 0.5 mg/L to ensure there is a residual at delivery/use and to prevent re-contamination. In contexts where there are no point-of-use supplies (for example, Aquatabs), the health setting will need to adapt and examine alternatives, such as bottled water (with appropriate solid-waste management), and/or link with a water vendor (who has reverse-osmosis equipment and chlorination supplies) for drinking-water only.\footnote{Provide water filtration or treatment units from the list of technologies evaluated by WHO (Source: Products that meet WHO performance criteria and list of all products evaluated. Geneva: World Health Organization [Website] \url{https://www.who.int/tools/international-scheme-to-evaluate-household-water-treatment-technologies/products-evaluated/})}

2.9 Sanitation and wastewater management

- Maintain gender-disaggregated toilets for 1 toilet/20 users, and separate toilets for staff with minimum twice-daily cleaning, disinfection and refilling of hygiene supplies, including those used for handwashing \cite{2, 5, 9}.

- Handwashing stations or portable/Veronica buckets (section 2.2) should be installed within five metres of the toilets for both immediate and longer-term solutions with each toilet \cite{5, 9}.

- All toilets must be equipped with safety locks that can be activated from the inside, and all fittings should be heavy-duty/vandal-proof \cite{9}.

- Regular minimum cleaning/maintenance contracts are required for all toilets \cite{9}.

- Wastewater from sinks, showers, and toilets with water discharge (sewage) must be connected to sewage systems or on-site disposal through septic tank/cesspit and soakaway pit. Lime use for stabilization of sludge in treatment units or in situ disinfection of wastewater can be considered if resources are available \cite{18}.

2.10 Waste management and sharps containment

Safe management of waste and sharps can protect both health and care workers and patients by reducing the risk of transmission from recognized and unrecognized sources \cite{3}. Health and care workers should follow standard precautions for sharps and waste management whenever feasible and consider safe alternatives when unable (Table 7).
Table 7. Waste management recommendations and alternative options.

<table>
<thead>
<tr>
<th>Medical waste management (WHO recommendations)</th>
<th>Alternative options when standard SOPs cannot be implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Waste should be segregated at point of generation; refer to waste management in Annex 3.</td>
<td>Waste management during triage and classification of patients: all waste generated during this stage, without exception, is to be stored in containers, preferably in red bags, that are properly labeled as “bio-contaminated waste.” Direct contact with such waste must be avoided.</td>
</tr>
<tr>
<td>• Take precautions when using or when working around sharp devices. Handling of sharps and disposal should follow standard precautions (sharps safety). Provide puncture-proof sharps container for safe disposal of sharps waste (19).</td>
<td>Waste management during medical activities:</td>
</tr>
<tr>
<td>• Ensure that all disposable equipment is placed in designated/labelled waste container and that waste bags are available for safe collection of waste.</td>
<td>• Well-managed, on-site burial of waste may be appropriate for small health-care centres or field hospitals.</td>
</tr>
<tr>
<td>• Designated waste storage zone should be established for the secure and effective storage away from patients and public.</td>
<td>• Consider using interim waste-disposal options for the safe disposal of waste such as De Montfort Mark 7 and drum incinerators or burning in a pit and burying in an ash pit as a temporary measure if other disposal options are not available.</td>
</tr>
<tr>
<td>• Waste disposal should be undertaken by staff wearing full PPE.</td>
<td>• To effectively burn wet waste, both solid fuel (e.g. wood) and liquid accelerant (e.g. diesel or kerosene) will be needed. The fire will need to be established before adding the wet waste and dry waste, alternating between the two to maintain a temperature high enough to kill all infective pathogens.</td>
</tr>
<tr>
<td>• Apply protocols of hazardous waste management and inform workers about safety precautions. Provide the following PPE based on the risk assessment of dealing with hazardous waste (19):</td>
<td>• Several methods can be used to burn this waste. The most common and easiest to construct is a burn pit. Simple 6-foot x 6-foot x 6-foot pits are sufficient for small amounts (e.g. waste from a six-bed unit). For larger volumes of waste, a more sophisticated burn pit will need to be built, one that gives more consideration to air supply and ventilation and offers protection from the elements during the rainy season. Sharps waste should be disposed of in a dedicated sharps pit. Bury the sharps waste in the pit or bury the drums in dedicated sharps pits. For larger pits, it may be necessary to install flues and chimneys. They can be made of corrugated iron that has been perforated to allow entry of air to the bottom of the pit; these can ensure the supply of clean air is sufficient to maintain the desired amount of heat and intensity.</td>
</tr>
<tr>
<td>a. Gloves with inner and outer layers that are chemical-resistant/gloves that protect against thermal risks.</td>
<td>• To ensure that no one falls accidentally into the pit, a barrier will need to be constructed around the top.</td>
</tr>
<tr>
<td>b. Chemical-resistant/fire-resistant boots,</td>
<td>• Consider other measures and coordinated solutions, to be agreed to by actors in the field and by authorities, such as demarcation of a space to be used in the medium term as a dumping site by all, or other options.</td>
</tr>
<tr>
<td>c. (disposable) fire-resistant/chemical-resistant suit – avoid wearing synthetic clothing, respiratory protection (respirators), goggles and face mask.</td>
<td></td>
</tr>
</tbody>
</table>
| • In larger centres, incinerators are used to properly dispose of sharps and infected waste, especially that produced by diagnostic laboratory services, radiological diagnosis and treatment facilities, pharmacies. | }
2.11 Patient health education on IPC

Where possible educate patients on IPC measures especially those who are ill or who are at high risk of infection, focus on informing patients on transmission risk and how to stop the spread of disease (Table 8). Patient education can be particularly important in cases where self-management will be required to ensure compliance with basic hygiene and prevention measures.

Table 8. Patient health education on IPC.

<table>
<thead>
<tr>
<th>Condition identified</th>
<th>Educational advice</th>
<th>Supply distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open wound/surgical wound</td>
<td>Wound care; risk of infection in exposed area; first-aid dressing technique; hand hygiene</td>
<td>• liquid antiseptic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• gauze roll/wrap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• liquid waterless soap or sanitizer</td>
</tr>
<tr>
<td>Respiratory infection, chickenpox,</td>
<td>Respiratory hygiene and etiquette; medical mask usage; hand</td>
<td>• medical mask</td>
</tr>
<tr>
<td>meningitis, suspected measles</td>
<td>hygiene; minimize contact or isolate away from others</td>
<td>• liquid waterless soap or sanitizer</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Risk of faecal-oral transmission; hand hygiene</td>
<td>• liquid waterless soap or sanitizer</td>
</tr>
</tbody>
</table>

2.12 Safe management of dead bodies

There is no evidence to suggest that the presence of dead bodies inherently leads to disease or epidemics (20). The bodies of people whose deaths were caused by traumatic events such as warfare do not pose a health hazard. They may pose a health risk only in cases where an infectious disease was the cause of the mortality (20).

Health and care workers and other persons involved in handling the deceased should follow standard precautions according to risk-assessment and existing national/subnational/local protocols for managing and handling the bodies of patients who have died of an infectious disease.

The dignity of the dead, their cultural and religious traditions and their families should be respected and protected throughout, balancing the rights of the family and the risks of exposure to infection.

2.13 IPC essential supply list

It is crucial for health-care settings to utilize IPC supplies to mitigate the risk of disease transmission. Please refer to Annex 1 for a list of IPC supplies commonly used to implement the IPC measures outlined in this document. In cases where access to supplies is challenging, users are encouraged to review and select supplies that are readily available and easy to procure.
WASH and IPC considerations for shelters and congregate settings
3: WASH and IPC considerations for shelters and congregate settings

3.1 Key points

Key WASH and IPC interventions for shelters and congregate settings in Gaza to prevent infectious disease transmission:

- Ensure residents have access to safe water.
- Ensure residents are provided with access to hygiene kits and receive key public health messages education on hygiene promotion.
- Ensure containment and safe disposal of human excreta to reduce the risk of faecal-oral transmission of disease.

During this emergency, large numbers of people have become displaced, requiring alternative accommodation in shelters, schools, hospitals, or temporary accommodations such as tents and informal shelters. New exposure to persons outside of familial structures increases the risk of infectious disease outbreaks. Even during conflicts, communities should strive to put in place conditions and best practices that mitigate the risk of disease transmission. Nonetheless, the implementation of hygiene, public health and social measures as well as IPC measures can present logistical challenges due to displacement, evacuation of residents and crowding in shelters.

3.2 Water supply, storage, and quality

- When municipal water supply is not available, use water dispensers, bottled water, water trucking, etc. as a temporary measure to access safe drinking-water. Use large plastic bottles to reduce the amount of plastic, which can be difficult to manage in this context. It is important to provide clean water storage containers with covers.
- Point-of-use water treatment: Provide approved, point-of-use water treatment as per WHO’s evaluation (21), which includes household waste treatment filters or chlorine tablets such as Aquatabs (refer to Annex 3 for use of Aquatabs).
- To mitigate consumption of non-potable water, ensure drinking-water containers are clearly labelled.
- If chlorine is available, ensure that the water in communal water tanks in shelter and congregate settings is chlorinated, and that free residual chlorine (FRC) levels measure 0.5 mg/L (for water with a pH of <8 and turbidity < NTUs) or 1.0 mg/L (for water with a pH >8 and turbidity >5 NTU). The broad aim is to ensure that FRC levels are 0.5 mg/L to ensure there is a residual at delivery/use and to prevent re-contamination (see Annex 3 for preparation of chlorine solutions).
- In cases where there is limited access to and availability of drinking-water, seawater or saline water can be used for cleaning, toilet flushing, bathing, etc. Doing so will save on supplies of drinking-water. In such cases, inspect areas where seawater is collected to ensure that it is safe to be used for these purposes. WHO has not proposed a health-based threshold for salinity in drinking-water as the contribution from drinking-water to daily sodium intake is small (22); however, it is unacceptable for drinking.
- The same principles would apply to community settings as outlined in the previous section covering water, sanitation, hygiene, and IPC measures for the protection of workers providing services in communal living facilities.
3.3 Hygiene kits and promotion

- Provide family/emergency/household hygiene kits with essential personal and environmental cleaning supplies\(^1\) to maintain personal and environmental hygiene\(^13\).
- Identify community volunteers to engage communities for hygiene promotion and to deliver key messages (see Annex 2).

3.4 Excreta management

Management of human waste is critical to reduce the risk of infectious disease in the community, when unable to follow global standards, alternative mitigation measures can be employed (Table 9).

Table 9. Sphere standards and alternative sanitation options.

<table>
<thead>
<tr>
<th>Sanitation principles as per Sphere standards</th>
<th>Alternate options</th>
</tr>
</thead>
<tbody>
<tr>
<td>The toilet/latrine-to-user ratio: 20 users/toilet and 50 users/shower (2, 5).</td>
<td>Considering the current lack of supplies and space, target 100 users/toilet.</td>
</tr>
<tr>
<td>Handwashing stations with soap and water should be accessible within 5 metres of toilet (2, 5).</td>
<td>Where there is a risk of overcrowding and limited availability of sanitation facilities, clearly mark places for safe excreta disposal or, if buckets are used, of manholes. Deliver key messages on handwashing after touching excreta.</td>
</tr>
<tr>
<td>A toilet connected to a water supply and sewer network is the ideal option; if this is not possible, the minimum would be to establish defecation sites, build communal latrines/toilets, and seek to maintain the best possible sanitation and hygiene conditions.</td>
<td>Establish deep trench latrines and locate them away from water sources. Toilets should not only be accessible, but their placement should take into consideration the safety and security of their users (i.e. children and older people should be able to use them safely and they should be equipped with safety features such as locks and lighting that would minimize the risk that users would be vulnerable to gender-based violence).</td>
</tr>
<tr>
<td>Prevent defecation near any water source, water storage and water treatment facility.</td>
<td>Pay community workers to clean and clear standing wastewater around the shelters.</td>
</tr>
</tbody>
</table>

See Annex 4 on visual aid for cleaning and disinfection of toilets.

11 For additional details see the hygiene operational file (Source: WASH Cluster [Website] https://docs.google.com/spreadsheets/d/1NUNGCV9nVAVZv_GvUtVIA.JA27a_qM/edit#gid=241115853)
3.5 Solid waste management

- Ensure proper disposal of child diapers and other diapering supplies in waste bins. Consider reuse of diapers by washing the reusable diapers if water is available.

- Provide solid waste collection bags and bins for disposal of used menstrual hygiene supplies\(^{14}\).

- If solid waste collection and disposal in landfill is not available, dig a pit for solid waste disposal (burn and bury). Provide >100-litre waste bin with waste bags per 50 people and provide small waste bags (1-5 litres) bags for disposal of sanitary pads (2, 5).

- Engage community members to collect waste on a cash-for-work basis and transport that waste on carts to disposal sites or provide support to municipalities to do so. Provide PPE (heavy-duty gloves, heavy-duty shoes, apron and mask) to community workers collecting and transporting the waste. Provide waste bags to collect waste and dig pits for disposal. Ensure that hand hygiene can be performed by making available handwashing facilities (Veronica buckets) equipped with water and soap.

- If shelters do not have access to disposal sites, establish pits at least 15 metres from the shelters and burn waste in them. Ensure that the pits are constructed so that children cannot accidentally fall into them.

3.6 Ensuring safe shelters

- Establish well-ventilated sleeping areas, ensuring a minimum of 3.5 m\(^2\) of living space per person (2), excluding areas for cooking, bathing, and sanitation, to prevent overcrowding.

- Ensure at least 1 metre of distance between beds/individual sleeping areas. If that is not possible, consider arranging sleepers to be positioned head-to-toe.

- Clean bedding and the living/sleeping spaces whenever it is possible to do so.

- When safe to do so, open windows to improve ventilation.

3.6.1 Screening and isolation

- Screen persons residing in shelters for communicable diseases using standardized screening tools (e.g. WHO’s Early Warning, Alert and Response System (EWARS) or other tools that enable case identification); frequency is dependent on feasibility.

- Shelters should have a plan in place to reduce the spread of disease among identified ill residents\(^{15}\).

3.6.2 Personal protective equipment (PPE)

- Health and care workers should perform a point-of-care risk assessment before providing care to persons residing in the shelter. If persons show signs or symptoms of infectious disease, health and care workers should put on appropriate PPE, based on a risk assessment.

---


References


Annex 1

IPC supply list
Annex 1: IPC Supply List

Supply list¹⁶

- Alcohol-based handrub (ABHR) with alcohol or ethanol, concentration range of 60-80% (v/v)
- Soap (liquid, solid, leaf or powdered form of soap - liquid soap is preferred)
- Scrubs
- Gowns meeting minimum technical standard of any of AAMI PB70, ASTM F3352, EN 13034-type PB, or equivalent
- Aprons meeting minimum technical standard of any of EN 1342, D6400, EN ISO 13688, ASTM D6400, or equivalent
- Eye protection (goggles or face shield) meeting minimum technical standard of EN 166, ANSI/ISEA Z87.1, or equivalent
- Medical masks meeting minimum technical standard of any of ASTM F2100 Level 1, EN 14683 Type IIR, or YY 0469
- Respirators (filtering facepieces) meeting minimum technical standard of any of NIOSH N95, EN 149 FFP2, or GB 19083
- Gloves (medical and surgical) meeting minimum technical standard of EN 455, or any of ASTM D6319/D3576/D5250/D6977
- Sterile surgical gloves (elbow length), which can be used during deep-cavity procedures, meeting minimum technical standard of either EN 455 or ASTM D3577; with sterility assessed using EN ISO 11607, or equivalent.
- Gloves, thick/utility: (domestic, reusable, thick rubber gloves; chemical-resistant; heat-resistant if for incineration)
- Safety footwear: (durable; reinforced toe; slip-resistant tread; safety footwear required for incineration only and rubber (gum) boots for all other environmental cleaning tasks)
- Head covering/surgical caps
- Detergent
- Disinfectant (liquid or granulated; either pre-mixed or for end-user preparation); depending on availability, any of: sodium hypochlorite, alcohol/ethanol, hydrogen peroxide, quaternary ammonium compounds OR cannisters of single-use wipes pre-impregnated with disinfectant solutions
- Buckets for use with detergent, disinfectants and rinse water
- Mixing utensils (for detergent and disinfectant preparation)
- Hand towels (disposable/reusable)
- Paper towelettes, disposables (absorbent paper, single use)
- Cloths (cotton)
- Dustpan
- Floor brush (for spot cleaning of floors, plastic or metal)
- Mop stick + mop heads

• Measuring jugs
• Chlorine test kit
• Bin + plastic bags (infectious waste and non-infectious waste). Bin should be plastic or metal with lid; preferably with step/pedal function
• Puncture-and leak-proof sharps containers for used needles and syringes
• Toilet brush
Annex 2

Hygiene kits, hygiene promotion messages and food safety
Annex 2: Hygiene kits, hygiene promotion messages and food safety

Hygiene kits

- Hand hygiene supplies
- Menstrual hygiene supplies
- Cleaning supplies for shelters

Hygiene promotion messages

Respiratory hygiene messages:

- Persons with respiratory symptoms should apply source-control measures, for example, cover their nose and mouth with a tissue or mask when coughing/sneezing; dispose of used tissues and masks and perform hand hygiene after contact with respiratory secretions.

Health-care facilities should:

- Place patients with symptoms of acute respiratory infection at least 1 metre (3 feet) away from others in common areas, if possible.
- Post visual alerts at the entrances to health-care facilities instructing persons with respiratory symptoms to practice respiratory hygiene/cough etiquette.
- Consider supplying hand hygiene materials and masks in common areas and areas used for the evaluation of patients.

Personal hygiene:

- Handwash at critical moments (after using toilet, after touching diapers or faecal matter, before eating, after cleaning households, before food preparation)
- Bathe/shower whenever possible
- Clean living spaces
- Physically distance
- Use masks/PPE where available and appropriate

Food safety

- Follow food safety practices for handling, storage and preparation.
- Where food is prepared or served in large amounts (e.g. for health-care or shelter settings), ensure that food handlers follow the practices outlined in WHO’s Five keys to safer food manual (see Annex 4).

---

17 For additional details see the hygiene operational file (Source: WASH Cluster [Website] https://docs.google.com/spreadsheets/d/1NUNGCVBrZfAVZyGNtuVJA2d4a_zM/edit#gid=24111585)
Annex 3

Water quality and waste management
Annex 3: Water quality and waste management

Water quality

- Preparation of chlorine solutions

The following chlorine solutions are required for different WASH and IPC measures in health settings:

### Table A3.1 Chlorine solutions for routine cleaning and disinfection

<table>
<thead>
<tr>
<th>Types of chlorine compounds</th>
<th>Chlorine strengths, uses and preparation of solutions for routine disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Different concentrations of chlorine use</td>
</tr>
<tr>
<td></td>
<td>0.05%</td>
</tr>
<tr>
<td>HTH (70% active chlorine)</td>
<td>0.7 grams in 1 litre of water or half tablespoon in 10 litres of water.</td>
</tr>
<tr>
<td>Sodium hypochlorite (bleach) at 5% active chlorine</td>
<td>10 ml of bleach in 1 litre of water or 1 tablespoon in 1 litre of water.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact time</th>
<th>40-60 seconds.</th>
<th>30 minutes.</th>
<th>10 minutes.</th>
<th>10 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td>Hand hygiene (if soap or ABHR not available).</td>
<td>Linen/laundry after cleaning with detergent if hot water is not available. For disinfection of utensils/plates/kitchen surfaces.</td>
<td>Surface disinfection after cleaning with soap and water.</td>
<td>Blood/body fluid spills (vomit, feces) after containing spill with cloth or paper towel. Soiled PPE (heavy duty gloves, heavy duty aprons).</td>
</tr>
</tbody>
</table>

Adapted from the following sources:
- Five keys to safer food. WHO Poster. [https://www.who.int/publications/i/item/WHO-SDE-PHE-FOS-01-1](https://www.who.int/publications/i/item/WHO-SDE-PHE-FOS-01-1)
### Table A3.2. Chlorine solutions according to use for Cholera only.

<table>
<thead>
<tr>
<th>Types of chlorine compounds</th>
<th>Different concentrations of chlorine use</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05%</td>
<td>0.2%</td>
</tr>
<tr>
<td>HTH (70% active chlorine)</td>
<td>0.7 grams in 1 litre of water or half tablespoon in 10 litres of water.</td>
</tr>
<tr>
<td>Sodium hypochlorite (bleach) at 5% active chlorine</td>
<td>10 ml of bleach in 1 litre of water or 1 tablespoon in 1 litre of water.</td>
</tr>
<tr>
<td>Use</td>
<td>Washing hands (when soap and ABHR are not available), utensils and dishes, PPE (gloves, apron, goggles, etc.).</td>
</tr>
<tr>
<td>Precautions</td>
<td>Solution must be changed every day and protected from heat and light.</td>
</tr>
</tbody>
</table>


### Different concentrations of Aquatabs for specified quantities of water

### Table A3.3. Different types of Aquatabs.

| Chart of different types of Aquatabs for disinfection of water in specified quantities |
|------------------------------------------|------------------------------------------|
| NaDCC content per tablet | Litres of water treated per tablet |
| • 8.5 mg | • 1 litre of water |
| • 33 mg | • 5 litres of water |
| • 67 mg | • 10 litres of water |
| • 167 mg | • 20 litres of water |
| • 1.67 g | • 200 litres of water |
| • 2.5 g | • 370 litres of water |
| • 8.68 g | • 1000 litres of water |
| • Aquatab granules | • 1000+ for all volumes greater |

Source: [https://www.aquatabs.com](https://www.aquatabs.com)
Messages on use of Aquatabs

1. Check package to see the strength of your Aquatabs (see table above).
2. Use the chart provided to see how much water you can treat with the strength of tablet you have. Use the tablet for specified quantities of water.
3. Water should be free from turbidity (less than 5 NTUs) or organic material. Aquatabs should be used for pretreated (filtered) water.
4. Remove tablet(s) from the strip of Aquatabs and drop into a clean container with the correct amount of water.
5. Stir the water with a clean utensil.
6. Cover the container.
7. Wait for 30 minutes before drinking or using the water.
8. Drink and use the safe water within the next 24 hours.

Waste management

Table A3.4. Waste management categorization.

<table>
<thead>
<tr>
<th>Category</th>
<th>Colour</th>
<th>Way of disposal</th>
<th>Type of container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious non-sharp waste</td>
<td>Yellow or red/labelled</td>
<td>Protected pits or incinerated</td>
<td>Washable 40-50 litre PVC containers or cardboard containers with strong, leak-proof plastic bag</td>
</tr>
<tr>
<td>Sharps</td>
<td></td>
<td>External waste treatment facilities (autoclaves / incinerators) only with safe means of transport</td>
<td>Puncture-proof containers, such as plastic bottles; encapsulation and disposal of the sharps in sharp pit</td>
</tr>
<tr>
<td>Non-infectious common waste (paper, cardboard)</td>
<td>Black/labelled</td>
<td>With general household waste, by the municipal waste collection service</td>
<td></td>
</tr>
<tr>
<td>Chemical waste (medicines, solutions)</td>
<td>Brown/labelled container</td>
<td></td>
<td>Plastic bag or container</td>
</tr>
<tr>
<td>Radioactive waste</td>
<td></td>
<td></td>
<td>Lead box with radioactive symbol</td>
</tr>
</tbody>
</table>


Annex 4

Illustrated hand hygiene, cleaning guide, food safety
How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: **20-30 seconds**

1. **1a** Apply a palmful of the product in a cupped hand, covering all surfaces;

2. **1b** Rub hands palm to palm;

3. Right palm over left dorsum with interlaced fingers and vice versa;

4. Palm to palm with fingers interlaced;

5. Backs of fingers to opposing palms with fingers interlocked;

6. Rotational rubbing of left thumb clasped in right palm and vice versa;

7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8. Once dry, your hands are safe.

Duration of the entire procedure: **20-30 seconds**

**All reasonable precautions have been taken by the World Health Organization to verify the information contained in this document. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.**

WHO recognizes the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED!

Duration of the entire procedure: 40-60 seconds

0. Wet hands with water;
1. Apply enough soap to cover all hand surfaces;
2. Rub hands palm to palm;
3. Right palm over left dorsum with interlaced fingers and vice versa;
4. Palm to palm with fingers interlaced;
5. Backs of fingers to opposing palms with fingers interlocked;
6. Rotational rubbing of left thumb clasped in right palm and vice versa;
7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
8. Rinse hands with water;
9. Dry hands thoroughly with a single use towel;
10. Use towel to turn off faucet;
11. Your hands are now safe.

**Patient zone** — The need for hand hygiene is closely connected with health care workers’ activities within the area surrounding each patient, called the patient zone, identified by the dotted area. In maternal care, it includes the woman and all inanimate surfaces that are temporarily, but exclusively dedicated to her, including items touched by or in direct physical contact with her. During and after childbirth, it includes both the woman and the newborn and their immediate surroundings.

**Hand hygiene opportunities** — defined as moments when a hand hygiene action is needed during health care activities, to interrupt germ transmission by hands. There may be multiple hand hygiene opportunities within the sequence of maternal and neonatal care (e.g. during labour and childbirth); it is extremely important to meet the requirements for hand hygiene despite the high frequency of opportunities, due to high maternal, neonatal and health care worker’s infection risk.

**Glove use and the need for hand hygiene** — When an opportunity for hand hygiene occurs while wearing gloves, these should be removed to perform hand hygiene. Gloves should always be changed between patients.

For further information please see the document:
"Hand Hygiene in Outpatient and Home-based Care and Long-term Care Facilities", World Health Organization 2012

WHO acknowledges Catherine Dunlop (University of Birmingham, Birmingham, United Kingdom [UK]), Claire Kilpatrick (NHS consultant, Glasgow, UK), and David Lissauer (University of Liverpool, Liverpool, UK) for technical input in developing this material.

WHO/UNH.NHC/2020.5 © WHO 2020. Some rights reserved. This work is available under the CC BY-NC-SA 3.0 IGO licence.

Source: Your 5 Moments for Hand Hygiene care in a maternity unit. WHO Poster.
HOW TO GUIDE – PUTTING ON PPE FOR CONTACT/DROPLET PRECAUTIONS

1 Perform hand hygiene

   Alcohol based handrub
   Rub hands for 20–30 seconds.
   or

   Water and soap
   Wash hands for 40–60 seconds.

2 Put on the gown

3 Put on the mask

   Medical mask.

4 Put on eye protection

   Put on face shield or goggles.

5 Put on gloves

   Ensure glove is placed over the cuff of the gown.

Full PPE

Source:
How to Guide – Putting on/taking off PPE for Contact/Droplet precautions. WHO Poster.
How to guide – Taking off PPE for contact/droplet precautions

1. **Remove gloves**
   - [Image of hands removing gloves]

2. **Remove the gown**
   - Ensure gown is pulled away from the body during removal and that clothing does not become contaminated and dispose of them safely.
   - [Image of person removing a gown]

3. **Perform hand hygiene**
   - **Alcohol based handrub**
     - Rub hands for 20–30 seconds.
   - **Water and soap**
     - Wash hands for 40–60 seconds.
   - [Image of hands applying alcohol and soap]

4. **Remove eye protection**
   - Remove face shield or goggles.
   - [Image of face shield being removed]

5. **Remove the mask**
   - Ensure you are taking the mask off from the straps, avoid touching the mask.
   - [Image of mask being removed]

6. **Perform hand hygiene**
   - **Alcohol based handrub**
     - Rub hands for 20–30 seconds.
   - **Water and soap**
     - Wash hands for 40–60 seconds.
   - [Image of hands applying alcohol and soap]

Order is important.

Ensure that infectious waste containers are available for safe disposal of PPE. Separate containers should be available for reusable items.

Source:
How to Guide – Putting on/taking off PPE for Contact/Droplet precautions. WHO Poster.
### ENVIRONMENTAL CLEANING AND INFECTION PREVENTION AND CONTROL IN HEALTH CARE FACILITIES IN LOW- AND MIDDLE-INCOME COUNTRIES: TRAINER’S GUIDE

**Illustrated cleaning**

<table>
<thead>
<tr>
<th>Important objects</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Bucket of water" /></td>
</tr>
<tr>
<td><img src="image" alt="Bucket of detergent solution" /></td>
</tr>
<tr>
<td><img src="image" alt="Cloth" /></td>
</tr>
<tr>
<td><img src="image" alt="Chlorine-based disinfectant solution" /></td>
</tr>
<tr>
<td><img src="image" alt="Chlorine-based disinfectant solution jug" /></td>
</tr>
<tr>
<td><img src="image" alt="Bucket of chlorine-based disinfectant solution" /></td>
</tr>
<tr>
<td><img src="image" alt="Absorbent material for cleaning blood spillage" /></td>
</tr>
<tr>
<td><img src="image" alt="Laundry container" /></td>
</tr>
<tr>
<td><img src="image" alt="Infectious waste container" /></td>
</tr>
<tr>
<td><img src="image" alt="Non-hazardous waste container" /></td>
</tr>
<tr>
<td><img src="image" alt="Warning/hazard sign" /></td>
</tr>
<tr>
<td><img src="image" alt="PPE" /></td>
</tr>
<tr>
<td><img src="image" alt="Mop" /></td>
</tr>
<tr>
<td><img src="image" alt="Alcohol hand rub" /></td>
</tr>
<tr>
<td><img src="image" alt="Concentrated detergent" /></td>
</tr>
<tr>
<td><img src="image" alt="Mixing utensil" /></td>
</tr>
<tr>
<td><img src="image" alt="Scoop" /></td>
</tr>
<tr>
<td><img src="image" alt="Toilet brush" /></td>
</tr>
</tbody>
</table>
How to prepare chlorine-based disinfectant solution from a powder

**Materials:**
- PPE, chlorine powder, scoop and mixing utensil,
- bucket for water,
- infectious waste bin/bag,
- manufacturers’ instructions

1. Prepare in a well ventilated room
2. Perform hand hygiene
3. Put on apron/gown

4. Put on face protection, that is mask/goggles/faceshield
5. Put on gloves

6. Materials: [*] litres of cold water, chlorine powder, scoop and mixing utensil

7. Add [*] scoops of chlorine powder to the water
8. Mix the powder into the water
9. Leave for [*] minutes

* as per manufacturers’ instructions or desired concentration of sodium hypochlorite solution
How to prepare chlorine-based disinfectant solution from a powder (continued...)

10. Ready for use or store securely with lid

11. Remove PPE and safely dispose of single use PPE in the waste bin/container

12. Perform hand hygiene

13. Remove eye protection and safely clean, dry and store and remove mask and dispose of it as infectious waste

14. Perform hand hygiene
How to clean a blood spillage

Materials:
Detergent solution, chlorine-based disinfectant solution, buckets for water, warning sign, PPE, infectious waste bin/bag, laundry container, mop, cloth, absorbent material, manufacturers’ instructions

1. Perform hand hygiene
2. Put on apron/gown
3. Put on gloves
4. Position warning/hazard signs appropriately
5. Cover the spillage with absorbent material*
6. Allow the spillage to be absorbed into the material
7. Gather the infectious absorbent material
8. Dispose of immediately as infectious waste
9. Dampen a cloth or mop in detergent solution and go over the area to clean it

* use absorbent granules at this point if available as per manufacturers’ instructions
How to clean a blood spillage (continued...)

10. Dispose of cloth as contaminated or soiled for laundering

11. or immediately as infectious waste

12. Dampen a cloth or mop in chlorine-based disinfectant solution and go over the area again, then rinse area with water and allow the area to dry. Dispose of cloths in infectious waste or for laundering

13. Remove warning/hazard signs

14. Remove PPE and dispose of single use PPE safely in the waste bin/container

15. Clean and dry equipment, or leave to dry

16. Store equipment appropriately in dry a store room

17. Perform hand hygiene
Damp mopping

1. Perform hand hygiene
2. Put on PPE
3. Position warning/hazard signs where appropriate
4. Remove larger items of debris from floor
5. Dispose of debris into the appropriate bin/container
6. Submerge mop in detergent solution. Squeeze out excess
7. Start at the furthest point from the exit
8. Work backwards to avoid standing on cleaned sections
9. Mop the floor edges using a straight stroke to reach corners and skirting

Materials:
- Detergent solution
- Chlorine-based disinfectant solution
- Warning sign
- PPE
- Infectious/other waste bin/bag
- Mop
- Laundry container
Continue working from side to side in backwards direction. Use figure-of-eight pattern while mopping. Turn mop frequently.

On completion of room or area, remove mop head. Place mop head in laundry container for laundering.

Remove warning/hazard signs.

Remove PPE and dispose of single use PPE safely in the waste bin/container.

Clean and dry equipment, or leave to dry.

Store equipment appropriately in dry store room.

Perform hand hygiene.
High-touch cleaning

1. Perform hand hygiene
2. Put on PPE
3. Position warning/hazard signs where appropriate
4. Remove any debris and sticky tape from the surfaces
5. Fold the cloth to create a number of clean cloth surfaces
6. Dampen the cloth in detergent solution. Do not double dip
7. Clean all high-touch surfaces with the damp cloth using one swipe
8. Work systematically from high to low surfaces (and from clean to dirty)
9. Fold a section of the cloth over to reveal a clean unused surface

Materials:
Detergent solution, PPE, cloth, warning sign, infectious waste bin/bag, laundry container
Replace the cloth and continue

Dispose of used cloths in appropriate waste or laundry bins/container. Continue replacing cloths until the task is finished

Remove warning/hazard signs

Remove PPE and dispose of single use PPE in appropriate waste bin/container

Clean and dry equipment (or leave to dry)

Store equipment appropriately in a dry store room

Perform hand hygiene
How to clean a standard (Western-style) toilet

Materials:
PPE, detergent solution, chlorine jug, chlorine-based disinfectant solution, absorbent material, water bucket, warning sign, infectious waste bin/bag, cloths, toilet brush, laundry container

1. Perform hand hygiene
2. Put on PPE
3. Position warning/hazard signs appropriately
4. Flush the toilet before cleaning
5. Pour a small amount of prepared chlorine-based disinfectant solution inside the toilet bowl. Make sure the inside and waterline are covered by the solution. Leave solution in contact. Do not allow solution to dry
6. Fold the cloth to create a number of clean cloth surfaces
7. Dampen the cloth in detergent solution
8. Clean toilet handle
9. Continue until all the clean surfaces of the cloth have been used then replace the cloth
How to clean a standard (Western-style) toilet (continued...)

10. Work systematically from clean to dirty and from outside in, clean wall tiles, ledges and pipe work.

11. Replace the cloth. Dispose of used cloths in appropriate waste or laundry bins/container. Continue replacing cloths until the task is finished.

12. Empty and clean toilet bins.

13. Clean the rim and the underside of the bowl.

14. Clean the cistern.

15. Clean the toilet seat.

16. Clean the underside and the hinges.

17. Finish with the junction with the floor.

18. Repeat the process with chlorine-based disinfectant solution.

19. Scrub the inside of the toilet with the toilet brush.

20. Keep brush in the fresh flushing water to clean.

21. Rinse surfaces with water.
How to clean a standard (Western-style) toilet (continued...)

22
Dry surfaces with a clean cloth

23
Dispose of cloths as soiled linen or infectious waste

24
Remove warning/hazard signs

25
Remove PPE and safely dispose of single use PPE as infectious waste

26
Clean and dry equipment, or leave to dry

27
Store equipment appropriately in a dry store room

28
Perform hand hygiene
How to clean a squat toilet

Materials:
- PPE, chlorine jug, detergent solution, chlorine-based disinfectant solution, water bucket, cloths, mop, warning sign, infectious waste bin/bag, laundry container

1. Perform hand hygiene
2. Put on PPE
3. Position warning/hazard signs appropriately

4. Put prepared chlorine-based disinfectant solution inside bowl. Make sure the bowl is covered and leave solution in contact without allowing it to dry
5. Fold the cloth to create a number of clean cloth surfaces
6. Dampen the cloth in a detergent solution

7. Work systematically from clean to dirty, working from outside in clean the wall tiles, ledges and pipework
8. Continue until all the clean surfaces of the cloth have been used then replace the cloth
9. Dispose of the cloths as soiled linen
10. Empty and clean the toilet bins.

11. Using the detergent solution, mop around the outside of the squat toilet.

12. Using the detergent solution, mop the inside of the squat toilet bowl.

13. Make sure to clean under the rim of the squat toilet bowl.

14. Repeat the process with chlorine-based disinfectant solution.

15. Rinse the area and squat toilet bowl with water, and then dry.

16. Dispose of cloths/mop as soiled linen or infectious waste.

17. Remove warning/hazard signs.

18. Remove PPE and safely dispose of single use PPE as infectious waste.

19. Clean and dry equipment, or leave to dry.

20. Store equipment appropriately in a dry store room.

How to clean a delivery bed

**Materials:**
PPE, detergent solution, chlorine-based disinfectant solution, warning sign, cloths, infectious waste, bag or bin, laundry container

1. **Perform hand hygiene**
2. **Put on apron and gloves**
3. **Position warning/hazard signs appropriately**
4. **Remove linen from the delivery bed, rolling contaminated area into centre**
5. **Place linen into the container for used/soiled laundry**
6. **Manage any blood/body fluid spills (as per how to clean a blood spillage)**
7. **Fold the cloth to create a number of clean cloth surfaces**
8. **Dampen or rinse folded cloth in detergent solution**
9. **Clean delivery bed mattress first and work systematically from top to bottom**
10. Clean both sides and the edges of the mattress.

11. Replace the cloth. Dispose of used cloths in appropriate waste or laundry bins/container. Continue replacing cloths until the task is finished.

12. Clean the bed base.

13. Clean the underside.

14. Clean the joints and the frame.

15. Repeat the process with chlorine-based disinfectant solution if necessary, wipe with water to remove chlorine residue and leave to dry.

16. Dispose of used cloths as soiled linen or infectious waste and/or other waste.

17. Remove warning/hazard sign.

18. Remove PPE and safely dispose of single use PPE as infectious waste.

19. Clean and dry equipment, or leave to dry.

20. Store equipment appropriately in a dry store room.
Fig. 3.25 How to clean a delivery bed (continued...)

22 Perform hand hygiene

23 Reassemble delivery bed
How to clean a ward bed

Materials:
PPE, detergent solution, chlorine-based disinfectant solution, warning sign, cloths, infectious waste, bag or bin, laundry container

1. Perform hand hygiene

2. Put on PPE

3. Position warning/hazard signs where appropriate

4. Remove linen from the delivery bed, rolling contaminated area into centre

5. Place linen into the container for used/soiled laundry

6. Manage any blood/body fluid spills (as per how to clean a blood spillage)

7. Fold a section of the cloth over to reveal a clean unused surface

8. Dampen the cloth in a chlorine-based disinfectant solution

9. Clean ward bed mattress first and work systematically from top to bottom
How to clean a ward bed (continued...)

10. Continue until all the clean surfaces of the cloth have been used then replace the cloth.

11. Replace the cloth. Dispose of used cloths in appropriate waste or laundry bins/container. Continue replacing cloths until the task is finished.

12. Clean both sides and the edges of the mattress.

13. Clean the bed base.

14. Clean the underside.

15. Clean the joints and the frame.

16. Repeat the process with chlorine-based disinfectant solution if necessary, wipe with water to remove chlorine residue and leave to dry.

17. Dispose of cloths in the appropriate laundry container.

18. Remove warning/hazard signs.

19. Remove PPE and safely dispose of single use PPE as infectious waste.

20. Clean and dry equipment, or leave to dry.

21. Store equipment appropriately in a dry store room.
How to clean a ward bed (continued...)

Perform hand hygiene

Reassemble ward bed

Source:
Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries: trainer's guide. World Health Organization. https://iris.who.int/handle/10665/366379
**Five keys to safer food**

**Keep clean**
- Wash your hands before handling food and often during food preparation
- Wash your hands after going to the toilet
- Wash and sanitize all surfaces and equipment used for food preparation
- Protect kitchen areas and food from insects, pests and other animals

**Separate raw and cooked**
- Separate raw meat, poultry and seafood from other foods
- Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- Store food in containers to avoid contact between raw and prepared foods

**Cook thoroughly**
- Cook food thoroughly, especially meat, poultry, eggs and seafood
- Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- Reheat cooked food thoroughly

**Keep food at safe temperatures**
- Do not leave cooked food at room temperature for more than 2 hours
- Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- Keep cooked food piping hot (more than 60°C) prior to serving
- Do not store food too long even in the refrigerator
- Do not thaw frozen food at room temperature

**Use safe water and raw materials**
- Use safe water or treat it to make it safe
- Select fresh and wholesome foods
- Choose foods processed for safety, such as pasteurized milk
- Wash fruits and vegetables, especially if eaten raw
- Do not use food beyond its expiry date

**Why?**
- While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.

- Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

- Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.

- Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.

- Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

Source: Five keys to safer food. WHO Poster. [https://www.who.int/publications/i/item/WHO-SDE-PHE-FOS-01.1]