**WASH in health care facilities & COVID-19 webinar series: Questions and answers**

The following document provides answers and sources of further information from questions raised during the WHO/UNICEF webinar series on WASH in HCF in the context of COVID-19 in April 2020. Presentations from each of the episodes are available at [www.washinhcf.org/resources](http://www.washinhcf.org/resources), or can be downloaded directly here:

* [Water](https://washinhcf.us7.list-manage.com/track/click?u=40c522edc754647c0af621de2&id=743e1185e4&e=1d42ead44b)
* [Health care waste management](https://washinhcf.us7.list-manage.com/track/click?u=40c522edc754647c0af621de2&id=77203264b2&e=1d42ead44b)
* [Hand hygiene](https://washinhcf.us7.list-manage.com/track/click?u=40c522edc754647c0af621de2&id=5336d4e7c1&e=1d42ead44b)
* [Environmental cleaning](https://www.washinhcf.org/resource/covid-19-webinar-series-environmental-cleaning/)
* [Sanitation](https://www.washinhcf.org/resource/covid-19-webinar-series-sanitation/)

Recordings are available [here](https://washinhcf.us7.list-manage.com/track/click?u=40c522edc754647c0af621de2&id=948e5615a5&e=1d42ead44b).

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# Water

## Water quantity & scarcity

**How much water is needed for handwashing? How can hand washing be done in countries where there are water shortages and a lack of soap?**

The amount of water needed for handwashing is not well studied. If a tap was kept open for 20-40 seconds, about 2.5-5 litres per handwashing event would be needed (assuming a flow of 7.5 litres per minute). In resource-limited settings use of 0.5-2 litres per wash has been shown to reduce faecal contamination of hands. WHO considers up to 20 litres per person per day to be sufficient for drinking, cooking and food hygiene, and handwashing, though laundry and other hygiene needs may not be met. Sphere standards call for a minimum of 15 litres per person per day to meet drinking and domestic hygiene (including handwashing) needs.

The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response: <https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf>

**Is the minimum water quantity guidelines for health care facilities valid for all countries?**

The WHO 2008 Environmental health standards are designed for use in low- and middle-income countries but can be applied in all settings.

<https://www.who.int/water_sanitation_health/publications/ehs_hc/en/>

## Water quality

**Is chlorinated water needed for hand washing to protect from COVID 19 ?**

WHO does not recommend washing hands with chlorinated water. If alcohol-based hand rubs or soap and water are not available or feasible, then using chlorinated water (0.05%) for handwashing is an option as a short-term measure.

**Can handwashing water be reused for handwashing if it is chlorinated?**

Handwashing water should not be reused for handwashing. Water should always be allowed to flow to a drainage area or receptacle, and hands should not be rinsed in a communal basin, as this may increase contamination.

## Human right to water

**What information is available on the rights to water, sanitation and hygiene and minimum standards in Humanitarian responses?**

No one should be denied access to safe drinking water, sanitation and hygiene, especially during COVID-19 crisis. Information can be found in The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response at <https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf> and the Manual on the Right to Water and Sanitation: A tool to assist policy makers and practitioners develop strategies for implementing the human right to water and sanitation published by UN HABITAT (pages 88-110) <https://unhabitat.org/sites/default/files/download-manager-files/Manual%20on%20the%20right%20to%20water%20and%20sanitation.pdf>

# Health care waste management

## Infectious waste from COVID-19 settings

**Can COVID-19 spread through waste?**

There is no evidence that direct, unprotected human contact during the handling of health care waste has resulted in the transmission of the COVID-19 virus. However, all health care waste produced during the care of all patients, including confirmed COVID-19 patients, is considered as infectious and should be collected safely in clearly marked lined containers and sharp boxes. This waste should be treated, preferably on-site, and then safely disposed.

There have been no reports of transmission outside health care facilities from waste. Masks and gloves used by people in the community should be deposited in a lined bin which is then collected and hand hygiene should be done after depositing such items. The SARS-CoV-2 virus is enveloped and less robust than non-enveloped viruses in the environment. Higher temperatures (above 20°C) facilitate quicker die-off. Due to an increase in demand for masks, there is a likelihood of scavengers illegally collecting throwaway face masks, cleaning them, and re-selling to unsuspecting members of the community. Effective education and communication is critical. Used PPE can also be swept away by wind and floods into waterways if not covered by a layer of soil. Local government authorities should monitor disposal operations due to the higher generation of PPE.

**In COVID hospitals, should we consider all waste to be infectious waste?**

No, most waste, even in hospitals with COVID-19 patients, is not infectious. Waste from treating COVID-19 patients should be classified as potentially infectious, but other waste still needs to be segregated. There will be likely more waste generated through disposal of masks and PPE, and maintaining segregation can help prevent waste management systems becoming overwhelmed. Increasing capacity to handle (e.g. more frequent emptying of bins/staffing) and treat (incinerator capacity) are important. More details are available in the WHO/UNICEF WASH and waste technical note: <https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-the-covid-19-virus-interim-guidance>.

**How should treat mixed infectious and non-infectious waste be treated?**

Any waste that has been mixed with potentially infectious waste has to be classified as infectious waste and has to be handled, treated and disposed as such.

**How should COVID-19 waste be transported?**

COVID-19 waste is considered as infectious and must be transported as such (UN 3291). It should be ensured that transport meets national or international requirements is available and any necessary permissions have been obtained. Available guidance: <https://www.washinhcf.org/wp-content/uploads/2019/03/Guidelines-Transport-of-infectious-waste-UN3291.pdf>

**How can you ensure that waste is segregated correctly by hospital staff?**

Segregation rules should be reinforced and waste managers can do spot checks. Reinforcement can be achieved by additional training, awareness raising and ongoing onsite monitoring and mentoring. The importance of continued segregation in emergency situations should be part of routine training. Waste collection staff should be tasked to provide feedback on the quality of segregation performed in each shift and continuously keep the record for counterchecking purposes by the hospital management teams, IPC committee or any other interested parties.

**If infectious waste is kept within sealed plastic bags and chemical disinfectant like sodium hypochlorite or hydrogen peroxide added, how long can COVID-19 survive inside?**

Manual chemical disinfection is not a reliable method for the treatment of waste. It is potentially problematic due to the variability of chemical efficacy based upon load characteristics and the generation of toxic liquid waste. The speed and efficiency of chemical decontamination depends on operational conditions, including the type of chemical disinfectant used, its concentration, the contact time between the disinfectant and the waste, the extent of contact, the organic load of the waste, operating temperature, and factors that may affect the efficacy of the disinfectant such as humidity and pH. It is estimated that the COVID-19 virus can survive up to three days on surfaces like plastics but only around 24 hours on tissues and similar absorbent surfaces[[1]](#footnote-1).

## Disposal of PPE

**Is there is a risk associated with waste (face-masks, hand gloves, etc) from people in the community? Is there guidance on disposal of masks being worn in the community for the COVID-19 outbreak?**

Single use masks, like surgical masks, should be disposed as normal general waste, in a lined bin and disposed of to a municipal landfill. Cloth masks can be reused and should be washed at 60°C. Staff should be trained in how to take off PPE safely. Always practice hand hygiene after taking off PPE.

ECDC (2020) Guidance for wearing and removing personal protective equipment in healthcare settings for the care of patients with suspected or confirmed COVID-19. <https://www.ecdc.europa.eu/en/publications-data/guidance-wearing-and-removing-personal-protective-equipment-healthcare-settings>.

## Treatment technologies

**Available guidance for further information:**

WHO (2019) *Overview of technologies for treatment of infectious and sharp waste* <https://www.who.int/water_sanitation_health/publications/technologies-for-the-treatment-of-infectious-and-sharp-waste/en/>. (Also [available in French](https://www.who.int/water_sanitation_health/publications/technologies-for-the-treatment-of-infectious-and-sharp-waste/fr/), Spanish coming soon).

UNEP (2012) *Compendium of waste treatment technologies,* includes discussion of environmental aspects. <http://wedocs.unep.org/handle/20.500.11822/8628?show=full>

* Health Care Without Harm: Database of waste treatment technology suppliers. <http://medwastetech.info/>

**What innovative measures are in place to avoid waste burning through incineration which pose a great risks of pollutions to the environment, going green?**

Non-incineration waste treatment technologies like autoclaving or microwaving should always be implemented wherever possible. WHO calls on all stakeholders to uphold the [Stockholm Convention](http://www.pops.int/) and work towards incrementally improving safe health care waste management practices to protect health and reduce harm to the environment.

**Are mobile incinerators recommended?**

Mobile waste treatment of any type is more difficult and costly than transporting waste, so the cost effectiveness needs to be assessed. Mobile incinerators, although easy to install and use, lack flue gas treatment devices. Non-incineration waste treatment technologies like autoclaving or microwaving should always be implemented wherever possible. WHO calls on all stakeholders to uphold the Stockholm Convention and work towards incrementally improving safe health care waste management practices to protect health and reduce harm to the environment. There should be a coordination mechanism within each country to ensure that the incinerators to be purchased by governments or WASH partners are meeting the Best Available Techniques (BAT) requirements of the Stockholm Convention:

*In accordance with the Stockholm Convention, the Best Available Technology (BAT) should be used. BAT, with a suitable combination of primary and secondary measures results in dioxin and furan air emissions no higher than 0.1 ng I-TEQ3 /Nm10 (at 11% O2) and less than 0.1ng I-TEQ/l for wastewaters discharged from the facility (UNEP 2007). Primary measures for high-heat thermal incinerators include two burning chambers (850 °C/1100 °C), an auxiliary burner, sufficient resident time of air in the second chamber, sufficient oxygen content and high turbulence of exhaust gases. Additional flue gas treatment systems are needed as secondary measures.*

**How should ash from incinerators be disposed of?**

Ash from the incineration of hazardous health-care waste may continue to pose a risk. Burnt-out needles and glass may have been disinfected but can still cause physical injury. Fly ash and bottom ash from incineration is generally considered to be hazardous, because of the possibility of heavy metal content and dioxins and furans. It should preferably be disposed in sites designed for hazardous wastes, e.g. designated cells at engineered landfills, encapsulated and placed in specialized monofill sites, or disposed in the ground in an ash pit.

**Are there any criteria for burning pits in terms of how far it should be from community?**

In general burning in a pit should ONLY be used in emergency situations. A burning pit should be located as far as possible away from the community and the prevailing wind direction should be considered. Efforts should be made to incrementally improve health care waste management and engage in multi-sectoral efforts to strengthen systems change. Low temperature burning and smouldering typical of open burning promotes the formation of a range of toxic and potentially harmful chemicals, including dioxins and furans. These compounds form during open burning regardless of the composition of the material being burnt. The compounds produced from sources of open burning can travel long distances and be deposited on soil, plants, and in water. The remaining ash in the burn pile also contains pollutants, which can spread into soil and water.

**Until new treatment equipment is installed, is it okay to proceed in burning the waste in an open pit or dump it in deep cells within the central dump sites?**

Infectious waste should be treated in a safe and environmentally sound way. Burning waste at landfills should be avoided. Dumping waste in open or deep pits should only be used in the short term in emergencies and if other options are not available.

**Is it okay to locate and operate “small size 50kg/cycle ” medical waste incinerators within the central solid waste dump sites or within a solid waste transfer station?**

The incinerator should comply with the requirements of the Stockholm convention (Best Available Techniques). It can be located within the central waste dump or transfer station, considering the standard safety measures for infrastructure and equipment for infectious waste (prevention of unauthorized access, safe storage area etc.).

**Does WHO have any guidance on how to assess waste treatment capacities?**

Refer to the 2019 [WHO technology document](https://www.who.int/water_sanitation_health/publications/technologies-for-the-treatment-of-infectious-and-sharp-waste/en/) for how to calculate waste treatment capacities. To assess the existing waste treatment capacity, the available treatment technology and its treatment capacity (kg/hour or kg/day) should be assessed and compared to the amount of generated waste which needs to be treated. The set-up of the logistic system (collection, transport) also needs to be considered.

**Are there costing estimates of the different types of health waste disposal systems?**

* WHO has done a draft/rough costing for WASH in different types of health care facilities that has some estimates for health care waste costs based on evidence from 7 countries. <https://www.washinhcf.org/resource/costing-of-wash-in-health-care-facilities-working-document/>
* The 2019 [WHO technology document](https://www.who.int/water_sanitation_health/publications/technologies-for-the-treatment-of-infectious-and-sharp-waste/en/) has a comparison of costs of different technologies:

## Health care waste personnel

**How to ensure sufficient there are sufficient personnel for waste management, particularly in resource-limited settings?**

Waste management is closely linked to WASH and it may be possible to have staff deal with both issues, but it is more common to link with infection prevention professionals. One person should be designated as responsible for the handling of healthcare waste (Healthcare Waste Officer - HWO), including coordination of actions, reporting to managers and regulators, and liaising with emergency services. In most countries this person is also a part of the Infection Control Committee (ICC), e.g. the head nurse or the infection control nurse. Biomedical engineers can also assist in making sure that onsite healthcare waste management technologies remain operational.

Healthcare waste segregation at the generation point, which is fundamental pillar in successful healthcare waste management is the responsibility of everyone at the hospital. Healthcare waste management should be a mandatory subject for all healthcare students followed by regular on-the-job training. Investment in waste management pays off in terms of sustainability, better health and a cleaner environment.

## Personal Protective Equipment (PPE) for waste handlers

**If there is a limited supply of PPE in HCF, are there any SOPs for disinfecting one-time-use PPE to be used again?**

WHO does not recommend re-using PPE and masks yet acknowledge this is a reality for many. Only PPE which are designed to be reused should be disinfected in accordance with manufacturer’s procedures. Boots & heavy-duty gloves for waste handlers can be cleaned with soap and water.

* There is a recent update of WHO guidance on the rational use of PPE in the context of COVID-19: <https://apps.who.int/iris/bitstream/handle/10665/331695/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf>.
* Ongoing research on disinfecting masks can be found at: <https://www.n95decon.org/>.

**Should waste handlers follow the same procedure for wearing and removing PPE like health care workers e.g. doctor/nurse?**

Waste workers should use the same procedures for taking off PPE as health care workers. Face shields are important for waste workers; they protect the face and eyes from splashes and can be cleaned with soap and water.

* European Centre for Disease Control. Guidelines on how to put on and take off PPE:<https://www.ecdc.europa.eu/en/publications-data/guidance-wearing-and-removing-personal-protective-equipment-healthcare-settings>

**In Somalia, we are working at health facility and there are no PPE supplies. What do you recommend?**

Make the availability of PPE a priority for the hospital. Masks which can be reused should be disinfected in accordance with manufacturers’ manual. For an interim time also self-made face shields and cloth masks can help to prevent splashes which can transmit COVID-19 and also prevent workers touching their eyes, another potential method of infection. Face shields and cloth masks can be reused. Face shields can be cleaned with soap and water and cloth masks should be washed at 60°C. Always practice hand hygiene after taking off PPE.

## Monitoring health care waste management

**What are the best motivational ways to make sure SOPs are followed by health workers especially in public health facilities?**

* Training, awareness raising, monitoring, competitions between wards (choosing of champions), motivating winners by giving award certificates, etc.
* South-to-South collaboration in which staff working in SOP compliant wards or hospitals will be allowed to visit other facilities for the practical demonstration on safe waste segregation, minimization, etc.
* Safe working environments are likely to motivate healthcare workers to do better. Therefore, user-friendly waste management containers should be available at waste generation points. These containers should be emptied and cleaned as required. Safety boxes for sharps waste should always be located within arm’s reach. Make waste management compliance/IPC SOPs part of the performance appraisal for healthcare workers.

**What are the ways to monitor health care waste management?**

Health-care waste-management policies or plans should include arrangement for the continuous monitoring of workers’ health and safety. This is to ensure that correct handling, treatment, storage and disposal procedures are being followed. Sensible occupational health and safety measures need to be established and monitored. These include the following:

* develop a standardized set of management rules and operating procedures for health-care waste;
* inform and train waste workers so that they perform their duties properly and safely;
* involve waste workers in the identification of hazards and recommendations for prevention and control;
* provide equipment and clothing for personal protection;
* establish an occupational health programme that includes information, training and medical measures when necessary, such as immunization, post-exposure prophylactic treatment and regular medical surveillance;
* train operators of waste treatment equipment in maintenance and repair activities;
* include the necessary spare parts, warranty on the equipment, spare parts, and installation service after commissioning purchasing new waste treatment equipment (the supplier should provide a replacement in case of the breakdown associated with manufacture’s defect within the first 24 months of operation);

Regular monitoring includes the annual planning of monitoring activities which includes onsite monitoring tours using checklists, monitoring of health staff, waste workers, cleaners etc. as well as monitoring of correct documentation of e.g. weighing of waste, treatment efficiency testing of autoclaves, maintenance activities, physical compliance of treatment equipment and disposal infrastructure etc. Bar coding and tracking systems are available to provide digital monitoring of waste collection and delivery to waste disposal site.

## Waste (other)

**How should waste generated at home in the context of COVID-19 be managed?**

Waste generated at home is classified as non-hazardous waste and can be disposed with the other general waste for disposal. No disinfection or other precautionary measures are necessary. The use of re-usable masks should be encouraged to reduce the rate of waste generation.

**Should hygienic towels, menstrual hygiene materials and diapers be handled as infectious waste?**

WHO and UNICEF do not advocate setting up separate waste streams. If diapers or towels are generated in waiting areas in health care facilities, in homes or other community areas they should be put in a lined bin, the bag closed when 3/4 full and emptied in the normal waste stream for general municipal waste.

**Could you provide guidance on zero waste and circular economy in the context of COVID?**

COVID-19 waste is considered as infectious waste and need to be handled as such. There are some possibilities to reduce waste, such as providing workers with reusable face shields, and segregation and recycling systems should be maintained as far as possible. However, changes to waste systems, including moves toward zero waste, should not be attempted during times of crisis.

# Hand hygiene

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| General information | | |
| **How important are clean hands in health care?** | Hand hygiene contributes significantly to keeping all patients safe. It is a low-cost action to prevent the spread of all microbes that cause health care-associated infection (HAI) and other infectious diseases. While hand hygiene is not the only infection prevention measure, compliance to it alone can dramatically enhance patient and health worker safety, because there is much scientific evidence showing that microbes causing HAI are most frequently spread between patients on the hands of health-care workers.  Remember, 1 in 10 patients get an avoidable infection while receiving care. On average, in acute care hospitals in low and middle-income countries, 15 in every 100 patients will acquire at least one infection. | |
| **Why is hand hygiene compliance still low?** | In recent years, many parts of the world have seen major improvements in hand hygiene. However, there is still not enough access to clean water, not enough sinks or towels (as noted in the WASH in HCFs reports), limited or no access to effective alcohol based handrubs, not enough awareness of the central role played by hand hygiene, and not enough investment in a multifaceted approach to tackle the unsafe low levels of compliance.  There are many evidence-based factors which contribute to low compliance and the best place to find all of these is within the WHO Guidelines on Hand Hygiene in Health Care (2009), Part I, Chapter 16.  Whatever the reasons, even in resource-rich settings, compliance can be as low as 0%, with compliance levels most frequently well below 40%. | |
| **What types of microbes can spread due to defective hand hygiene?** | The following are examples of the types of microbes that can be spread on the hands of health-care workers:   * *Staphylococcus aureus* (including MRSA) * *Streptococcus pyogenes* (Group A Strep) * Vancomycin-resistant *Enterococcus* (VRE) * *Klebsiella* (including ESBL-producing *Klebsiella*) * *E. coli* (including ESBL-producing *E. coli*) * *Enterobacter* spp * *Pseudomonas* spp (including multidrug-resistant *Pseudomonas* spp) * *Clostridium difficile* * *Candida* spp * Rotavirus * Adenovirus * Hepatitis A virus * Norovirus * Coronaviruses | |
| **What activities in health care can lead to the spread of microbes between patients (and health workers)?** | It isn’t always easy to understand that the hands of health care workers can become contaminated even after seemingly ‘clean’ procedures such as:   * Taking a pulse * Taking blood pressure readings * Taking a temperature * Touching a patient’s hand, shoulder or groin   But this is the case, even though the microbes are invisible. Additionally, any task that exposes the health workers hands to blood or body fluids or contaminated equipment and surfaces including those dedicated to patients while in hospital, means microbes can then be spread if hand hygiene is not performed at the right times.  Remember, different studies have presented evidence that different microbes have the ability to survive on the hands, sometimes for hours, if hands are not cleaned. All of the studies clearly demonstrate that contaminated hands can be vehicles for the spread of microbes to patient (and health workers). | |
| The approach to improving hand hygiene – the multimodal strategy | | |
| **How can I improve hand hygiene?** | Hand hygiene is a behavior that is influenced by many factors and as such needs a multimodal approach in order for improvements in compliance to occur. The likelihood of hand hygiene occurring at the right time and in the right way is influenced by:  1.The infrastructure & resources available to perform hand hygiene  2.People trained in the why, when and how of hand hygiene  3.Having checks in place to monitor whether it is being performed at the right time and in the right way and timely feedback so that corrective action can be addressed  4.Reminding people to perform hand hygiene at the right time and in the right way  5.Senior managers showing they value hand hygiene  This is what the WHO multimodal improvement strategy is all about. Hand hygiene improvers should address all of these five elements commonly referred to as: 1) system change; 2) training and education; 3) monitoring and feedback; 4) reminders and communications; and 5) a culture of safety. In other words, the strategy involves “building” the right system, “teaching” the right things, “checking” the right things, “selling” the right messages, and ultimately ”living” IPC throughout the entire health system. Lessons from the field of implementation science suggest that targeting only one of these five elements (that is, using a “unimodal” strategy) is more likely to result in improvements that are short-lived and not sustainable.  This approach is applicable to all settings, and has been tested in a range of high, middle and low-income countries.  <https://www.who.int/infection-prevention/publications/ipc-cc-mis.pdf?ua=1> | |
| **What WHO evidence is available to support me to convince colleagues of the importance of hand hygiene?** | Besides the evidence in the WHO Guidelines on Hand Hygiene in Health Care (2009), Part I, Chapter 16, which can support your conversations for improved hand hygiene, a more recent document outlines the evidence of hand hygiene action as the building block for infection prevention <https://www.who.int/infection-prevention/tools/core-components/evidence.pdf?ua=1>  The evidence also exists for hand hygiene action when dealing with multidrug resistant organisms <https://www.who.int/infection-prevention/campaigns/clean-hands/MDRO_literature-review.pdf?ua=1>  And COVID-19  <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/health-workers> | |
| **What improvement tools/ resources are available for me to use?** | An ideal place to start, as there are many tools and many steps to take, is using the WHO hand hygiene self-assessment framework (HHSAFS) <https://www.who.int/gpsc/country_work/hhsa_framework_October_2010.pdf?ua=1> This diagnostic tool is focused on hand hygiene in detail but will also help you meet WASH FIT.  In addition WHO’s Guide to Implementation is a very useful implementation resource to consult before using the series of tools to support your action plan to establish good hand hygiene practices and reduce HAI.  The range of evidence-based tools available for hand hygiene improvement are practical and applicable to all settings – try using these! <https://www.who.int/infection-prevention/tools/hand-hygiene/en/>  The tools are categorized according to the five components of the WHO Multimodal Hand Hygiene Improvement Strategy that all health care facilities should address in order to improve hand hygiene:   1. System change – see below Q&A on resources for hand hygiene 2. Training / Education   Note: a number of WHO materials already exist. You can find them here:  <https://www.who.int/infection-prevention/tools/hand-hygiene/training_education/en/>  <https://ipc.ghelearning.org/>  [https://openwho.org](https://openwho.org/)  <https://www.washinhcf.org/resources/>   1. Evaluation and feedback   Note: Direct observation of health care workers while delivering routine care is one of the methods to evaluate hand hygiene practices against the 5 Moments for Hand Hygiene – this is called hand hygiene compliance. Hand hygiene product usage can also be monitored to give an indication of compliance. A tool and full instructions are available here [**https://www.who.int/infection-prevention/tools/hand-hygiene/evaluation\_feedback/en/**](https://www.who.int/infection-prevention/tools/hand-hygiene/evaluation_feedback/en/)   1. Reminders in the workplace   A range of hand hygiene promotion and educational materials should be clearly visible and understandable, at key places, e.g. point of care (and should be replaced on a scheduled basis). It is also useful to participate in hand hygiene campaigns. Find resources here:  <https://www.who.int/infection-prevention/tools/hand-hygiene/workplace_reminders/en/>  <https://www.who.int/infection-prevention/campaigns/clean-hands/en/>  Hand hygiene technique is just one part of hand hygiene improvement. The web links include the access to hand hygiene technique images. The process of drying hands is also important in the technique of handwashing; a clean, preferably disposal, towel is gold standard. For information on hand driers and their limitations, read the WHO Guidelines on Hand Hygiene in Health Care. Care of skin is also important, including using personal hand creams. It should be noted that effective alcohol handrubs contain emollients to prevent drying of hands.   1. Institutional safety climate (culture)   Examples of how to address culture can be found on WHO web pages and through use of the HHSAF, but will vary from setting to setting.  Acknowledging the vastly different levels of awareness and barriers to implementing good hand hygiene from country to country, the tools are designed to support health care workers to improve hand hygiene at their facilities, regardless of their starting point. | |
| **Should targets be set for hand hygiene compliance? If so, what level of increase would be good?** | Year on year improvements in compliance and infrastructures to support compliance with the "My 5 Moments for Hand Hygiene" approach should be the goal. All local targets should first be realistic and attainable, e.g. an increase of 10% each year, in view of the long-term efforts required to bring about improvements in hand hygiene behaviour. Aiming for very high levels of compliance in the short-term would obviously be difficult to achieve in facilities where the initial compliance rate may be less than 10%. | |
| **The 5 Moments for Hand Hygiene and the importance of the point of care** | | |
| **What is the "My 5 Moments for Hand Hygiene" approach?** | The reasons for hand hygiene (the indication) depend on the risk of germ transmission and are closely connected with the activities of health care workers within the geographical area surrounding each patient (patient zone) and with tasks they perform. Health care activities are made up of a succession of tasks during which health care workers’ hands touch different types of surfaces (patients, objects and surfaces, body fluids, etc). Depending on the order in which these things are touched by hands, germ transmission from one surface/person to another must be interrupted, as each touch is a potential source of hand contamination. It is during the interval between two touches that the indication or indications for hand hygiene occur.    The “before” moments are present when there is a risk of microbial transmission to the patient; the hand hygiene actions that correspond to these indications protect the patient. They are ‘before touching a patient’ and ‘before clean/aseptic procedure’    The “after” moments are present when there is a risk of germ transmission to the health care worker and/or to the health care environment (and to any other person present); the hand hygiene actions that correspond to these indications protect health care workers and the health care environment and ultimately other patients. These are ‘after body fluid exposure risk’, ‘after touching a patient’ and ‘after touching patient surroundings’.    The correct hand hygiene action at the right moment will contribute significantly to the maintenance of clean and safe care in the context of germs transmitted by hands. | |
| **How do we define the point of care?** | The point of care is the place where three elements occur together ; the health worker, the patient, and care or treatment involving touching the patient.  Understanding the point of care facilitates understanding of when hand hygiene should occur. Hand hygiene infrastructures including products (e.g. alcohol handrub if available, water, soap, sinks) should be in place and easily accessible at the point of care, to ensure safe hands, safe patients and safe health workers. | |
| **How do we define the patient zone ?** | The ‘patient zone’ (i.e. everything inside the dotted line featured in 5 Moments posters) concept refers to the patient’s surroundings, irrespective of whether the patient is in a single room, a multiple-occupancy room or in a cohort. It includes all inanimate surfaces that are temporarily, but exclusively designated for that patient, as well as items touched by or in direct physical contact with the patient, such as the bed rails, bedside table, bed linen, infusion tubing, bedpans, urinals and other medical equipment. It also contains surfaces frequently touched by health care workers during patient care, such as keyboards, monitors, knobs and buttons and other ‘high frequency’ touch surfaces in the patient’s immediate geographic area. S  Such items can be considered an ‘extension’ of the patient as these high touch surfaces near the patient are likely to be contaminated with the patients’ own germs. | |
| **How do we apply the "My 5 Moments for Hand Hygiene" approach in situations where there is multiple bed-occupancy?** | Unfortunately, circumstances can occur where more than one patient is sharing a patient environment / patient zone: either the same bed or the space around the bed. The resulting shared environment becomes a place where germ transmission may occur irrespective of hand hygiene. In these circumstances, the patients are likely to become colonized by the same microbes, irrespective of the frequency of hand hygiene.    In these situations, conceptually there is one set of shared microbes within the patient environment. Is hand hygiene compliance important in these situations? The answer is a resounding "yes". The emphasis, however, shifts to Moments 2 and 3 for each individual patient, since compliance here is critical. When entering the "shared patient zone", compliance with Moment 1 applies. In a similar way, after touching either or both of the patients, or leaving their environment, provides an indication for hand hygiene (Moments 4 and 5). However, logic dictates that when undertaking tasks within the patient environment, the indications “before” and “after” touching a patient, when moving from one patient to the other (in the same bed), may lose their importance. This is similar to the situation encountered when caring for a mother and baby. | |
| **How do you apply the "My 5 Moments for Hand Hygiene" approach in situations where bed spacing is sub-optimal?** | Adequate spacing of > 1 meter between patient beds should be in place. In instances where this is not the case, the principles of the My Five moments should still be applied, each bed having its own 'zone' around it, within which the "My 5 Moments for Hand Hygiene" approach applies. The size of the patient zone will “shrink” in these instances. | |
| Resources for hand hygiene | | |
| **What resources are needed for achieving hand hygiene improvement according to the WHO Multimodal Hand Hygiene Improvement Strategy?** | Improving hand hygiene in health care is a relatively low cost intervention. Resources required will depend on the existing infrastructures and strategies in a country or health-care facility and on the sophistication of the chosen approach. In a situation where hand hygiene improvement has never before been addressed, and based on the minimum criteria for implementation contained within the Guide to Implementation, likely costs are as follows:   1. Human Resource: 2. A responsible person to coordinate activity. This person should have a clinical background at a senior level and this can be incorporated within an existing role incurring no up-front cost; however, a dedicated person is preferable 3. Start-up costs: 4. Alcohol-based handrub:    * 1. Point-of-care handrub varies in cost and availability      2. If a commercial product is available, after giving the priority to the selection criteria of efficacy (according to international standards) and of demonstrated tolerability and acceptability by health-care workers, the cheapest product should be sourced. The product should be well tolerated and accepted by health-care workers. It may be worthwhile to assess whether the product can be sourced at a discount price.      3. If there is no commercial product available, consider local production using the WHO-recommended formulation. Costs for local production vary greatly as they are influenced by the local costs of raw materials and the quantities produced.      4. The toolkit contains a tool to assist in estimating required quantities and likely costs 5. Sink to bed ratio: facilities should aim for at least one sink to every 10 beds/and be at all points of care (also in areas where PPE is put on/taken off and waste is handled) 6. Soap and fresh towels at each sink 7. Training and education: 8. Training is a key component of the strategy. Costs associated with training include capacity to deliver training and geographical area to deliver training 9. Evaluation and feedback:   Two periods of observational monitoring are required (baseline and follow-up) and depending on the extent of the implementation, at least one person must be available to undertake the observations. Observers require a minimum of 2 hours of training in observation techniques   1. Reminders in the workplace (posters): 2. As a minimum, the "How To" (technique) posters and the "Your 5 Moments for Hand Hygiene" poster should be displayed in all clinical areas. Costs associated with translation, adaptation, and printing need to be factored in 3. Recurrent costs: 4. The main on-going costs relate to human resource (i.e. a person who has responsibility, not necessarily full-time) for coordinating activity over at least a 5-year period 5. Alcohol-based handrub usage is likely to increase and will form the main ongoing cost 6. Training: refresher training is required on an annual basis   Reminders: posters should change and evolve and ideally fit with the local culture and context. The WHO designed posters are useful at start-up, but consideration should be given to local development, using local artists/designers and marketers if available, and reflect local context. Some facilities have used local artists or volunteers with expertise in this area, at no cost and with excellent results. | |
| **What has WHO recently said about hand hygiene stations in the context of COVID-19?** | WHO recommend one or several hand hygiene stations (either for handwashing with soap and water or for hand rubbing with an alcohol-based hand rub) should be placed in front of the entrance of every public (including schools and healthcare facilities) or private commercial building, to allow everyone to practice hand hygiene before entering and when leaving it. Chlorine hand washing solutions are not recommended because of potential harm to users and those making the solutions, as  well as degradation of chlorine exposed to sunlight or heat. Soap is generally cheap and easy to find, and liquid soap solutions  can also be used. | |
| **What is recommended for installation and placement of sinks or handwashing stations?** | Overall placement, is a local decision based on workflow and should include discussions with frontline staff to understand their actions and to ensure resources can be accessed at the point of care.  Remember, available ABHR facility-wide with continuous supply at each point of care (with efficacy and tolerability proven) is the gold standard.  Additionally, from an IPC perspective regarding standards and installation:   * The dimension of a handwash basin should be large enough to contain most splashes during hand washing procedures. * Handwash basins should be fitted ideally with liquid soap dispensers and good quality paper towels. When liquid soap is unavailable and bar soap is used, small bars of soap in racks that facilitate drainage should be used to allow the bars to dry. Handwash basins should be wall mounted using concealed brackets and fixings that should also be sealed to a waterproof splashback to allow effective cleaning of all surfaces. The surrounding area should be made of non-porous material to resist fungal growth * Taps should be fitted with a hands-free control (for example, elbow-operated) to avoid contamination. If a handwash basin with conventional tap handles is used, the water should be turned off using a paper towel rather than bare fingers or hands to avoid recontamination of hands. * Taps should not be aligned to run directly into the drain aperture as contamination from the waste outlet could be mobilized and generate aerosols responsible for cross-infection, especially with Gram-negative bacteria (Pseudomonas spp., multidrug-resistant Enterobacteriaceae, etc.) that colonize ‘U bends’, and then dispersed by splashing if disturbed by a stream of water. * Swan-neck tap outlets are not recommended as they do not empty after use. Similarly, strainers, aerators and flow restrictors should not be used as they become colonized with bacteria. * Plugs – handwash basins should not have a plug or a recess capable of taking a plug as hands must be washed in running water. Provision of a plug allows the basin to be used to soak and clean items and equipment and this must not be done. Overflow – handwash basins should not have an overflow as this is not amenable to cleaning. | |
| **What are the commodities required to implement the WHO Guidelines on Hand Hygiene in Health Care?** | **Consumables:**   1. Alcohol-based handrubs (either locally produced or a commercial product compliant with WHO recommendations) 2. 100 ml alcohol-compatible plastic bottles for the handrub (pocket carriage by health-care workers) 3. Non-medicated liquid soap. Alternatively, non-medicated bar soap (small bars) with soap racks to facilitate drainage   4. Dispensers for liquid soap  5. Antimicrobial soap for surgical hand scrub   1. Single-use hand towels 2. Creams or lotions for skin care (they should not interfere with the antimicrobial action of handrub) 3. Medical gloves - single use examination gloves for routine patient care 4. Medical gloves - sterile surgical gloves   **Other items:**  1. Sinks  2. Clean running water  3. 500 ml wall-mounted dispensers for alcohol-based handrub  4. Printed material  Reminders in the workplace - e.g. posters  Educational tools (leaflets, brochures, handouts of hand hygiene training slides, etc)  Advocacy documents for senior managers  Evaluation tools (e.g. ward infrastructure survey, hand hygiene observation, etc)  Notes: There is not much in the peer reviewed literature on minimum water requirements – key is to make sure the proper hand hygiene technique is performed for the right amount of time. This could be done with 500 ml of water, especially if turned off while hand rubbing. Bar or liquid soap. Bar soap and liquid soap are both effective for handwashing (bar soap should be drained). Soap doesn't need to be antimicrobial. "Soapy water" can be made cheaply by mixing powder detergent with water. Handwashing with soap is still effective with hard water. It may be harder to get a good lather going but it can still be effective. | |
| **COVID-19 hand hygiene indications** | | |
| **What are the hand hygiene indications during COVID-19?** | “My 5 moments for hand hygiene” are recommended. To reinforce times due to COVID-19 fear and pressure, in particular, before putting on PPE and after removing it, when changing gloves, after any contact with a patient with suspected or confirmed COVID-19 virus, their waste, or the environment in the patients’ immediate surroundings, after contact with any respiratory secretions are emphasized. Additionally, important times, as normal, are before food preparation and eating, and after using the toilet.  Even with the enveloped nature of COVID-19, it is important to note that soap and alcohol based handrub both work when cleaning hands. | |
| **Alcohol based handrubs** | | |
| **Why is WHO placing great emphasis on alcohol-based handrubs at the point of care, and promoting them as the international standard for hand hygiene?** | | The availability of a product which renders the hands safe in terms of transmission of microbes, and which can be used at the very place where microbes are transmitted, has revolutionized hand hygiene improvement strategies in the modern age. For this reason, alcohol-based handrubs are considered to fulfil the highest standards of safety in relation to the prevention of cross-transmission*.*    At the present time, the most efficacious, well-tolerated and well-researched product that can be placed ergonomically and safely at the point of care is an alcohol-based handrub. This ‘System Change’ facilitates the right action to occur at the right time and in the right way. It is unlikely, although not impossible, that running water, soap and towels will be installed right next to each patient’s bed, or be available at the point of care in an affordable and practical way. Soap and water is also more time-consuming, and less well tolerated by skin than alcohol-based handrubbing.  In countries where access to sinks is limited or non-existent, alcohol-based handrubs offer a method of preventing cross-transmission which can be implemented in the short term alongside a longer-term strategy of sink installation. |
| **When using pocket bottles of alcohol-based handrubs, can bottles (or health-care workers' gowns) become contaminated? Does this affect hand hygiene action?** | | The potential contamination of pocket bottles and health-care workers' gowns can occur. However, this does not pose a problem for hand hygiene action as hands are always rubbed after touching the bottles. Affixed or wall-mounted dispensers can also get contaminated but as stated this is not a problem due to the resulting hand hygiene action. |
| **Does WHO make any recommendation on the use of non-alcohol-based handrubs when soap is limited?** | | In this COVID-19 situation, WHO has stated that the ideal hand hygiene materials for communities and homes in order of effectiveness are:  • Water and soap or alcohol-based hand rub  • Ash or mud  • Water alone.  When soap or alcohol-based hand rub are not available, the use of ash or soil can be considered and has shown to be effective in some cases.  Ash, in particular, may inactivate pathogens by raising the pH.  However, in communities with limited sanitation services, soil may be  faecally contaminated, and thus it is important to weigh the benefits against the risk of contaminating hands.  Finally, washing with water alone, although the least effective of the four options, this can result in reductions in faecal contamination on hands and in diarrhoea.  Regardless of the type of material, the washing and rubbing of hands, and  the amount of rinsing water in particular, are important determinants in the reduction of pathogen contamination on hands.  Chlorine hand washing solutions are not recommended because of potential harm to users and those making the solutions, as  well as degradation of chlorine exposed to sunlight or heat. Soap is generally cheap and easy to find, and liquid soap solutions  can also be used. |
| **What are the WHO-recommended formulations for alcohol-based handrub production?** | | There are two formulations that are on the WHO list of essential medicines - <https://www.who.int/infection-prevention/tools/hand-hygiene/system_change/en/> |
| **It is suggested that the WHO-recommended alcohol-based handrub should be produced in quantities not exceeding 50 L. Is it possible to exceed this volume?** | | If the alcohol-based handrub is being produced in a small hospital facility or in central pharmacies lacking specialized air conditioning and ventilation, it must not be produced in quantities exceeding 50 L. However, if the formulation is being produced on behalf of a health-care facility, by a commercial company with good laboratory and safety facilities, then it can be produced in larger quantities exceeding 50 L. The reason for limiting production to no more than 50 L at a time is to minimize fire hazards. |
| **If distilled water is not available, what would be an appropriate substitute for the preparation of WHO-recommended formulations?** | | Although sterile distilled water is preferred for making the formulations, boiled and cooled tap water or deionized sterile water may also be used as long as it is free of visible particles. |
| **Why is H202 included in the ABHR recipe (and what are the implications of taking it out)?** | | The H202 is there as the quality of the receptacle could not be guaranteed and there is a risk of spore formation in the bottles meaning the product isn’t able to be of quality and do its job. |
| How long does the alcohol-based **handrub** remain active? | | The 'shelf life' of WHO-recommended formulations, produced according to the Guide to Local Production: WHO-recommended Handrub Formulations, is at least 2 years after production. There may be some variability depending on local storage temperatures. However, the WHO formulation tested for quality control in Mali up to 19 months after production, met the optimal quality parameters.  The key to producing a high-quality product is adherence to general rules of good manufacturing practices. Longevity is also dependent upon the alcohol being stored as recommended in the Guide to Local Production: WHO-recommended Handrub Formulations document. |
| **How many times can health-care workers use the alcohol-based handrubs?** | | There is a common misconception that hands should be washed after every four or five applications of alcohol-based handrub. There is no reason to do this, other than personal preference in some cases (i.e. if hands feel like they need washing or in hot and highly humid climates), while taking into account, though, that alcohol-based handrubs and soap should not be used concomitantly. |
| **How should used bottles be disposed?** | | Used containers and dispensers will contain handrub residues and flammable vapours.  Rinsing out used containers with copious amounts of cold water will reduce the risk of fire and the containers may then be recycled or disposed of according to local waste policies. |
| **Can Muslim health-care workers use alcohol-based handrubs?** | | In some religions, alcohol use is prohibited or considered an offence requiring a penance (Sikhism), or is considered to cause mental impairment (Hinduism, Islam). Nonetheless, in theory, those religions with an alcohol prohibition in everyday life demonstrate a pragmatic vision which is followed by the acceptance of the most valuable approach in the perspective of optimal patient-care delivery. Indeed, any substance that man can manufacture or develop in order to alleviate illness or contribute to better health is permitted by the Qur'an and this includes alcohol used as a medical agent. No serious obstacles to the promotion of the use of alcohol-based handrubs have been reported to WHO. As an example, to understand Muslim health-care workers’ attitudes to alcohol-based hand cleansers in an Islamic country, no difficulties or reluctance were encountered in the adoption of alcohol-based handrubs at the King Abdul Aziz Medical City (KAAMC) in Riyadh, Kingdom of Saudi Arabia (Ahmed et al, *Lancet* 2006). At the KAAMC, the policy of using alcohol handrub is not only permitted, but has been actively encouraged in the interest of infection control since 2003. No state policy or permission or *fatwa* (Islamic religious edict) were sought for approval of the use of alcohol-containing handrubs, given that alcohol has long been a component present in household cleaning agents and other materials for public use, including perfume, without legislated restriction within the Kingdom. In all these instances, the alcohol content is permitted because it is not for ingestion. |
| **Can alcohol be used on gloved hands?** | | It is not recommended that health-care workers use the alcohol-based handrub whilst gloves are on their hands.  It is very important that health-care workers allow the alcohol to dry properly before donning gloves, and that they clean their hands again after removing them, if indicated. |
| **Other info on effective hand hygiene (gloves and jewellery)** | | |
| **Should hand hygiene be performed prior to donning non-sterile gloves?** | Hand hygiene should be performed regardless of the use of gloves (whether non-sterile or sterile) when an indication for hand hygiene applies. That means: hand hygiene must be performed before donning gloves, if the following care activity implies an indication for both hand hygiene, such as “before touching a patient” or “before a clean/aseptic procedure”, and using gloves.  The fact of donning gloves by itself does not constitute an indication for hand hygiene (for example, you may put on gloves just to handle contaminated material for your own protection, without touching the patient or undertaking an aseptic procedure).  It is important to clarify also that glove use should be limited only to real indications. Gloves are often overused and consequently a "false" sense of security might induce the health-care worker to omit hand hygiene when indicated. Glove use indications were reviewed by WHO and summarized in the Glove Use Information Leaflet. | |
| **What are the recommendations in relation to jewellery and fingernails?** | Several studies have shown that skin underneath rings is more heavily colonized than comparable areas of skin on fingers without rings. The consensus recommendation is to strongly discourage the wearing of rings or other jewellery during health care. If religious or cultural influences strongly condition the health-care worker’s attitude, the wearing of a simple wedding ring (band) during routine care may be acceptable, but in high-risk settings, such as the operating theatre, all rings or other jewellery should be removed.  Consensus recommendations regarding fingernails are that health-care workers do not wear artificial fingernails or extenders when having direct contact with patients and natural nails should be kept short (≤0.5 cm long or approximately ¼ inch long). | |

* Information adapted from: WHO Frequently Asked Questions (revised May 2010) <https://www.who.int/infection-prevention/tools/hand-hygiene/training_education/en/> and COVID-19 guidance (2020).
* This Q&A adds to the slide set on HH for WASH FIT and COVID-19, therefore does not replicate many other key HH points within those slides (e.g. the 5 Moments for hand hygiene and the multimodal improvement strategy for HH improvement).

# Environmental cleaning

## Cleaning guidance & documentation

**There are two versions of the Best practices in environmental cleaning. What are the differences between version 1 and 2?**

Version 2 is primarily formatting changes to improve usability of the document. There have been small technical edits made to tables in Appendix B1 and B2.

**Is the guidance available in French?**

At present, there is not a French version of the CDC/ICAN Best Practices, but there may be translations to languages other than English in the future.

**Is there an ISO standard on Environmental cleaning for health facilities ?**

Not presently. National level policy and guidelines should be used where available, and where these do not exist, you can consult the [Best Practices for Environmental Cleaning in Healthcare Facilities in RLS](https://www.cdc.gov/hai/prevent/resource-limited/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fprevent%2Fresource-limited%2Fenvironmental-cleaning.html)

**We need detailed waste management and environmental cleaning details for: 1) Quarantine centres, 2) Home quarantine and 2) community settings for patients 4) waste from non-quarantined households, such as masks and gloves etc. - especially in rural contexts.**

Please see this website for this guidance: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>

**Many documents for cleaning (e.g. CDC and ICAN guidance) specify that they are for LMICs. What, if anything, should be done differently so they are also applicable for high-income countries?**

The CDC and ICAN best practices are derived from a variety of best practices and cleaning standard documents from several English-speaking high-income countries, most notably, the United States of America, Canada, the United Kingdom, and Australia. Therefore these best practices are also applicable for high-income countries. The CDC and ICAN best practices were developed by a committee of experts in environmental cleaning in resource-limited settings. Using a consensus-driven process, the best practices most relevant and achievable for the target context are included. For example, the best practices in ICUs in this document include more frequent environmental cleaning than recommended in several of the referenced documents because of the increased HAI risk and burden in ICUs in resource-limited settings. Alternatively, the use of no-touch and novel disinfection devices, which are increasingly common in high-income countries, were excluded from this document because of their prohibitive cost and limited evidence on their effectiveness in reducing HAIs in resource-limited settings.

**Is there any costing data available on cleaning and disinfection?**

Not that we are aware, as this would likely have to be generated at a national or sub-national level, depending on wage levels, supplies and equipment cost. However, WHO and UNICEF are working on some estimates of costing for WASH in health care facilities more generally. A draft paper is available at: <https://www.washinhcf.org/resource/costing-of-wash-in-health-care-facilities-working-document/>

## Cleaning equipment

**How should mops or cleaning cloths be cleaned after cleaning a COVID patient room?**

Reusable cleaning equipment such as mop heads, cleaning cloths and buckets should be cleaned and disinfected after use in a COVID-19 patient room using standard procedures as described in the [Best Practices for Environmental Cleaning in Healthcare Facilities in RLS](https://www.cdc.gov/hai/prevent/resource-limited/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fprevent%2Fresource-limited%2Fenvironmental-cleaning.html)

## Cleaning frequency

**What is the recommended frequency for cleaning and disinfection of toilets in suspected cases area, especially when more than one suspected patient might be sharing the same toilet?**

The recommended frequency for cleaning and disinfecting of shared toilets that may be used by suspected or confirmed COVID-19 patients is at least three times daily. If resources allow, more frequent cleaning and disinfection can be considered. Please continue to check here for the environmental cleaning and disinfection guidance document for COVID-19: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>

**For cleaning purposes, areas in health facilities are usually categorized into risk zones and colours. Are COVID-19 patient rooms different to a standard patient room? If yes, what would be the differences (PPE, detergents, colour etc.)?**

Cleaning schedules, including the frequency, products and process/technique of environmental cleaning are determined based on transmission-risk level. A simple way to determine transmission risk-level in general for any patient care area can be found [here](https://www.cdc.gov/hai/prevent/resource-limited/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fprevent%2Fresource-limited%2Fenvironmental-cleaning.html) (Appendix A). A patient room with a COVID-19 patient is under droplet and contact precautions and therefore is higher risk than a general inpatient room. As such, the recommended cleaning schedule is different than for a general inpatient room. The recommended cleaning frequency for a COVID-19 inpatient room is at least twice daily and high-touch surfaces and the floor should be cleaned and disinfected using an approved disinfectant product. Please continue to check here for the environmental cleaning and disinfection guidance document for COVID-19: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>.

## Chlorine solutions

**What concertation chlorine solution should be used to disinfect surfaces in HCFs with COVID-19 patients?**

The concentration of chlorine solution to be used as a disinfectant in health care facilities in areas with suspected or confirmed COVID-19 patients is 0.1% (1,000ppm). This change from 0.5% was made based on new evidence that this concentration can achieve a >3 log10 reduction of human coronavirus(Kampf, 2020), and it is also proven to be effective against the majority of other clinically relevant pathogens in the healthcare settings. The use of 0.5% is significantly in excess of what is needed and may unnecessarily damage equipment, pose health risks to those preparing and using this solution, and more quickly deplete limited resources of chlorine, given that it is 5 times the concentration needed. The cases where 0.5% are needed are for disinfecting after cleaning of spills of blood and body fluids (except urine) and in cases where there has been confirmed presence of pathogens which are highly resistant to disinfectants such as *C. difficile* and *C. auris*.

|  |  |
| --- | --- |
| **Recommended sodium hypochlorite concentrations** | **Intended use in health care facilities** |
| 0.05% (500ppm) | Disinfecting linens and laundry items  Disinfecting food utensils such as plates and spoons |
| 0.1% (1,000ppm) | Disinfecting environmental surfaces |
| 0.5% (5,000ppm) | Disinfecting blood and body fluid spills (except urine) |

**For diluting solutions, how many parts of sodium hypochlorite to water are needed to disinfect blood and surfaces?**

The recommended concentration for sodium hypochlorite to disinfect blood and body fluids (except urine) is 0.5% (5,000ppm). Therefore, if the starting concentration of sodium hypochlorite is 5%, then the dilution would be 1 part sodium hypochlorite to 9 parts water (1:10 dilution). For environmental surfaces, the recommended concentration is 0.1% (1,000ppm), so this would be a 1:50 dilution of a 5% sodium hypochlorite product; meaning 1 parts sodium hypochlorite to 49 parts water. Please see these graphics for instructions on how to prepare 0.1% (1,000ppm) chlorine solutions from various formulation - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/non-us-settings/emergency-considerations-ppe.html#chlorine-solution>.

## Cleaning products

**How effective are silver nanoparticles (silver water) for cleaning the environment? Some countries are using it to fight COVID-19.**

Many standard cleaning and disinfection products are effective for removing COVID-19 virus from the environment, including chlorine-based products, alcohols and hydrogen peroxides, as well as many other active ingredients – see this list which is actively updated with new products approved for use for COVID-19 virus, <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>.

**Can we use thick bleach solutions as disinfectant for surfaces against COVID-19?**

See section above on Chlorine Solutions.

**What are the parameters to ensure that the cleaning products are of sufficient quality and not pirated in low income countries?**

Product label claims need to be evaluated, including the active ingredient, spectrum of activity and test organisms. National level guidance from regulatory bodies should be referenced. If these are not available, European or North American standards can be referenced.

## Use of UV

**Can UV light be used for disinfecting health care facilities?**

Devices using ultraviolet radiation have been specifically designed for healthcare settings. Several parameters may affect the efficacy of UV irradiation such as distance from the UV device, irradiation dose, wavelength, exposure time, lamp placement, direct or indirect line of sight from the device, room size and shape, intensity, reflection1. Notably, **these technologies for use in health care settings are performed during terminal cleaning** (cleaning a room after a patient has been discharged or transferred)**, when rooms are unoccupied for the safety of staff and patients.** These technologies supplement, but do not replace the need for, manual cleaning procedures[[2]](#endnote-1). In all cases of no-touch disinfection methods, manual surface cleaning with applied friction (e.g. brushing, scrubbing) to the environmental surfaces must be performed first, to ensure physical removal of organic materials followed by disinfection.[[3]](#endnote-2).

## Spraying

**Some countries have developed disinfection cubicles or tunnels for people entering hospitals. How effective and safe are these? What is the impact of spraying health facilities and public places? What is the recommendations in terms of products and procedures?**

There is no evidence that clothes are an important vector for transmission, therefore there is no need to decontaminate the exterior clothing, shoes, and skin of the general public. Hand hygiene remains the most effective intervention against COVID-19. The hazards associated with spraying practice will vary depending on the virucidal agent, the concentration of the disinfectant, the time of exposure, and the vulnerability of the person entering the tunnel, including age, pre-existing conditions, pregnancy status, etc. There is a possibility of respiratory irritation, depending on these factors. That is a concern because the virus takes advantage of weakened lungs. For more information refer to Health Care Without Harm factsheet: <https://noharm-global.org/articles/news/global/coronavirus-update-disinfection-tunnels-factsheet>. Also, please refer to this PAHO statement - [https://iris.paho.org/handle/10665.2/52066](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Firis.paho.org%2Fhandle%2F10665.2%2F52066&data=02%7C01%7C%7C15c484c5d2544ac02d9208d7f05f5f9e%7Ca6fa3b030a3c42588433a120dffcd348%7C0%7C0%7C637242164776485802&sdata=KPyMjeW9Ggdk4MHMjX3pj63HKjg2yoemriTKYkqTPfE%3D&reserved=0).

**Is use of sprayers and spraying of the patient care environment using 0.5% chlorine solution effective?**

In indoor spaces, routine application of disinfectants to environmental surfaces via spraying or fogging (also known as fumigation or misting) is generally not recommended due to the risks of eye, respiratory or skin irritation and resulting health effects . In particular, recommendations against spraying or fogging of certain chemicals (e.g., formaldehyde, chlorine-based agents, or quaternary ammonium compounds) are made due to adverse effects on workers in facilities where these methods were utilized. Furthermore, spraying as a primary disinfection strategy has been shown in a medical device study to be ineffective at removing contaminants outside of direct spray zones . Spraying environmental surfaces in both healthcare and non-healthcare settings with disinfectants may not effectively remove organic material and may miss surfaces shielded by objects, folded fabrics, or surfaces with intricate designs that inhibit the direct application of disinfectants.

## Monitoring

**Though the infrastructure, supplies and other equipment are provided and secured in HCF, Human behaviour is the key component in the implementation of preventive measures. Are there any real-time tools for monitoring staff behaviour? For example, real-time monitoring of hand hygiene practice in HCF?**

For more details on monitoring of cleaning practice, including links to existing monitoring checklists, please see the [Best Practices for Environmental Cleaning in Healthcare Facilities in RLS](https://www.cdc.gov/hai/prevent/resource-limited/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fprevent%2Fresource-limited%2Fenvironmental-cleaning.html).

For monitoring of hand hygiene, please refer to the section Hand Hygiene in this document.

## PPE for cleaning staff

**Are PPE requirements for cleaning staff different compared to other health care workers who are dealing more directly with clients/patients?**

For recommended PPE for cleaning staff, as well as clinical staff, please see: <https://apps.who.int/iris/bitstream/handle/10665/331695/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf>.

**What should be done with disposable and reusable PPE after cleaning a COVID patient room?**

Refer to the health care waste section.

**Are there any specifications (e.g. type of materials, thickness) of Personal Protective Equipment vs. chemical contact requirements?**

No, both nitrile gloves and reusable rubber gloves are adequate for personal protection during cleaning activities as well as for preparing cleaning chemicals. There are not other differences among other PPE required for cleaning staff, both will protect against chemical exposure as well as protect against infectious agents during cleaning activities. For more guidance on PPE, please see <https://apps.who.int/iris/bitstream/handle/10665/331695/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf> as well as the [Best Practices for Environmental Cleaning in Healthcare Facilities in RLS](https://www.cdc.gov/hai/prevent/resource-limited/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fprevent%2Fresource-limited%2Fenvironmental-cleaning.html).

# Sanitation

## Greywater and wastewater

**What is the latest evidence on transmission of Covid-19 through wastewater?**

Please see this interim guidance and the associated references for the latest evidence as of the date of publishing on risks from wastewater - <https://apps.who.int/iris/bitstream/handle/10665/331846/WHO-2019-nCoV-IPC_WASH-2020.3-eng.pdf>

**Are there any specific recommendations for grey wastewater management for LMICs? SARI centers require a lot of water for washing and cleaning, all this waste water needs to be treated before disposing it into the environment (i.e. drainage channels, soak away pits...).**

Please see the interim guidance and the associated references for guidance on greywater management from cleaning: <https://apps.who.int/iris/bitstream/handle/10665/331846/WHO-2019-nCoV-IPC_WASH-2020.3-eng.pdf>. In circumstances where greywater (from showers, drains and sinks) volumes are high and pose a risk of overloading wastewater treatment systems priority should be given to treatment of blackwater (from toilets) which carries a lot higher load of nutrients and pathogens. Greywater can be directed to the infiltration leach fields or covered drains. Separating black and greywater requires changing the plumbing within buildings.

**In a context where there is limited space and it's difficult to make grease traps, soak away pits etc. Can we consider that this water, being soapy or mixed with disinfectant or bleach, is already considered "safe" in terms of COVID?**

If greywater includes disinfectant used in prior cleaning, it does not need to be chlorinated or treated again. However, it is important that such water is disposed of in drains that does not lead to localized ponding that would cause a new risk from mosquitoes and vector borne disease. Ideally greywater should be connected to a septic system, a sewer or in a soak-away pit. If greywater is disposed of in a soakaway pit, the pit should be fenced off within the health facility grounds to prevent tampering and to avoid possible exposure in the case of overflow.

**How should wastewater from environmental cleaning (i.e. full of disinfectants) be dealt with in treatment facilities?**

The concentration of disinfectant solutions from cleaning of surfaces and mopping of floors will decrease over time as these solutions quickly become contaminated during use. Relative to the addition of greywater from other sources (e.g., showers, laundry operations), the amount of greywater from used disinfectant solutions is fairly low, which should help dilute any remaining disinfectant and minimize any impact on the biological degradation process of on-site wastewater treatment systems. If greywater is input into centralized sewer systems, this dilution factor is even greater and therefore would have minimal impact on the performance of treatment facilities.

# Other settings

**What PPE should be used at the household level and how to make them cost effective and sustainable?**

Wearing PPE at home is not necessary. Wearing cloth mask in situations where you interact with other people – like in a supermarket – can protect yourself against splashes and droplets, and may also help to prevent people from touching their face. Always follow safe procedures for taking off face masks and perform hand hygiene afterwards. Wash cloth masks in hot soapy water (60 °C) and allow them to dry before re-use. WHO guidance on use of masks in the community and HCF: <https://www.who.int/publications-detail/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak>

**In the context of COVID-19, should these WASH principles also be applied to old age homes?**

Yes, the principles apply. There is specific guidance for long-term care centres (largely for elderly). <https://apps.who.int/iris/bitstream/handle/10665/331508/WHO-2019-nCoV-IPC_long_term_care-2020.1-eng.pdf>

1. van Doremalen et al (2020) Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. <https://www.nejm.org/doi/pdf/10.1056/NEJMc2004973> [↑](#footnote-ref-1)
2. Marra, A. R., Schweizer, M. L., & Edmond, M. B. (2018). No-touch disinfection methods to decrease multidrug-resistant organism infections: a systematic review and meta-analysis. Infection Control & Hospital Epidemiology, 39(1), 20-31. <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/notouch-disinfection-methods-to-decrease-multidrugresistant-organism-infections-a-systematic-review-and-metaanalysis/9A1C020089F6418D083FE42CFC0F304B> [↑](#endnote-ref-1)
3. Rutala, W. A., & Weber, D. J. (2013). Disinfectants used for environmental disinfection and new room decontamination technology. American journal of infection control, 41(5), S36-S41. <https://www.sciencedirect.com/science/article/pii/S0196655313000102> [↑](#endnote-ref-2)