

Infection prevention and control for the safe management of a dead body in the context of COVID-19

Interim guidance

4 September 2020



Background

This interim guidance is designed for individuals who tend to the bodies of persons who have died of suspected or confirmed coronavirus disease 2019 (COVID-19). Potential users include managers of health-care facilities and mortuaries, as well as religious leaders and public health authorities. Moreover, this document provides guidance for the management of the dead in the context of COVID-19 in low, middle- and high-income settings.

The following guidance is subject to revision as new evidence becomes available. Please refer to the WHO websites for [updates on the virus](#) and [technical guidance](#).

This document updates guidance issued on 24 March with the following new or modified content:

- clarification of body bag requirements;
- clarification of personal protective equipment (PPE) requirements during autopsies;
- updated ventilation requirements during autopsy;
- additional guidance for burial or cremation in the community.

COVID-19 is an acute respiratory disease caused by SARS-CoV-2 that mainly affects the lungs and is associated with mental and neurological manifestations amongst others. Most COVID-19 patients experience fever, cough, fatigue, anorexia and shortness of breath.(1) However, other non-specific symptoms may include sore throat, nasal congestion, headache, diarrhoea, nausea and vomiting. Transmission of the SARS-CoV-2 virus can occur through direct, indirect or close contact with secretions, such as saliva and respiratory secretions or respiratory droplets, expelled from an infected person.(2) Indirect contact transmission involving contact through fomites may also be possible. In health-care settings, airborne transmission of SARS-CoV-2 can occur during medical procedures that generate aerosols (“aerosol generating procedures”);(3) more information on managing aerosol generating procedures during care of the deceased can be found in the section on autopsies. Based on current knowledge of the symptoms of COVID-19 and its main modes of transmission (droplet/contact), the likelihood of transmission when handling human remains is low.(4)

Key considerations

- People may die of COVID-19 in health-care facilities, at home or in other locations.
- There is a common assumption that people who died of a communicable disease should be cremated to prevent spread of that disease; however, there is a lack of evidence to support this. Cremation is a matter of cultural choice and available resources.(5)
- The safety and well-being of those who tend to dead bodies is critical. Before attending to a dead body, people should ensure that necessary hand hygiene supplies and facilities, PPE, and cleaning and disinfection supplies are readily available (see Annex I and Annex II).(6)
- The dignity of the dead, their cultural and religious traditions, and their families should be respected and protected throughout.(5,6)
- All measures should respect the dignity of the dead including avoiding hasty disposal of the body of a person who has died of COVID-19.(6,7)
- Authorities should manage each dead body on a case by-case basis, balancing the rights of the family, the need to investigate the cause of death, and the risks of exposure to infection.(6)
- For the management of dead bodies in humanitarian settings, please refer to the Inter-Agency Standing Committee (IASC) document entitled, [COVID-19 interim guidance for the management of the dead in humanitarian settings](#).(7)

Preparing and packing the body for transfer from a patient room in a health facility to an autopsy unit, mortuary, crematorium, or burial site

Ensure that personnel who interact with the body (health-care or mortuary staff, or the team preparing the body for burial or cremation) apply infection prevention and control (IPC) standard precautions, (4,8-10) including hand hygiene before and after interaction with the body, and the patient environment; and use of the appropriate PPE (eye protection, such as a face shield or goggles, as well as medical mask, gown and gloves) depending on the level of interaction with the body.

Prepare the body for transfer including removal of all catheters and other indwelling devices. If an autopsy is to be performed, follow local guidance on the procedures for preparation of the body.

Trained medical staff should:

- ensure that any leakage of body fluids from orifices are contained;
- keep any movement or handling of the body to a minimum;
- not disinfect the body before its transfer to the mortuary area, or at any other time;
- wrap the body in cloth, and transfer it as soon as possible to the mortuary area;(7)
- do not use body bags, unless they are recommended by standard mortuary practice:
 - when there is excessive fluid leakage
 - for post-autopsy procedures
 - to facilitate the transportation and storage of bodies outside of the mortuary area and
 - for managing large numbers of dead bodies (6,7,11)
 - where indicated use solid, leakproof, non-biodegradable bags, or double bag the body if the available bag is thin and may leak when a body bag is indicated; (5-7)
- not use special transportation equipment or vehicles for body transfer.

Autopsy requirements

Safety procedures for managing the bodies of deceased persons infected with COVID-19 should be consistent with those that apply to the autopsies of people who have died of an acute respiratory illness or other infectious diseases. (7,11-13) If the person died of COVID-19 while he or she was infectious, the lungs and other organs may still contain live virus.(11). If the body of a person with suspected or confirmed COVID-19 is selected for autopsy, health-care facilities must ensure that safety measures are in place to protect those performing the autopsy including:

- appropriate PPE must be available, including a scrub suit, a long-sleeved fluid-resistant gown, gloves (either two pairs or one pair of autopsy gloves), a medical mask, eye protection (face shield or goggles), and boots/footwear protection.(7,9,10,12-14) For additional information on PPE, please refer to the [WHO Rational use of personal protective equipment guidance for COVID-19 and considerations during severe shortages: interim guidance](#);(15)
- a particulate respirator (N95 or FFP2 or its equivalent) should be used in the case of aerosol generating procedures, for example procedures that generate small-particle aerosols, such as the use of power saws or the washing of intestines; (3,10,12-14)
- perform autopsies in an adequately ventilated room, i.e. for natural ventilated spaces, a controlled airflow of at least 6 ACH (air changes per hour) for old buildings or 12 ACH for a new construction should be assured. Where a mechanical ventilation system is available, negative pressure should be created to

control the direction of airflow. For details on ventilation, refer to [WHO Infection prevention and control during health care when coronavirus disease \(COVID-19\) is suspected or confirmed: interim guidance](#); (3)

- limit the number of staff who are involved in the autopsy procedure; (10,12-14)
- lighting must be adequate. (14)

Advice for mortuary care/funeral home

- Mortuary staff or funeral home workers preparing the body, i.e. washing the body, tidying/shaving hair, or trimming nails, should wear appropriate PPE according to standard IPC precautions and risk assessment, including gloves, impermeable gown or gown with impermeable apron, medical mask, eye protection (face shield or goggles) and closed footwear or footwear protection. (5,7,11)
- Embalming is not recommended in order to avoid excessive manipulation of the body. However, if embalming is done, it should be performed by trained, experienced staff, following standard IPC precautions.(5,7,11)
- If the family wishes to view the body, allow them to do so, but instruct them not to touch or kiss the body, to maintain at least 1 meter (m) distance from one another and any staff during the viewing and to perform hand hygiene after the viewing.(6,7,16)
- Identify local alternatives to kissing and touching the dead body in settings where such contact is traditionally part of funeral procedures. (6,7,17)

In contexts where mortuary services are available, but traditional funeral rites involve bringing the body home for vigils or home viewings prior to burial or cremation, the above guidance should be followed and can be adapted as follows:

- Bodies should be prepared in the mortuary or hospital as per the relevant guidelines before being released to the family (17)
- A body bag, plastic sheeting or coffin is recommended for transportation of the dead body from the morgue to the viewing site.(17)
- To open a body bag or coffin for viewing, use gloves and medical mask, and once the body bag or coffin is opened, remove gloves and perform hand hygiene.(17)
- Do not remove the body from the body bag, coffin or shrouding,(16)
- If further manipulation than the above is required, follow the guidelines for the preparation of dead bodies at home.(1)

Environmental cleaning

Human coronaviruses can persist for up to 9 days on inanimate surfaces such as metal, glass or plastic. (18) The SARS-CoV-2 virus has been detected up to 72 hours in experimental conditions on surfaces such as plastic and stainless steel. (19) Therefore, cleaning environmental surfaces is essential.

- The mortuary must be kept clean and properly ventilated at all times. (10,12,14)
- Surfaces and instruments used for care of the dead body should be made of materials that can be easily cleaned, disinfected and maintained between autopsies.
- Instruments used during mortuary care, at the funeral home or during the autopsy should be cleaned and disinfected immediately after use, as part of routine procedure. (8,20)
- Environmental surfaces, where the body is prepared, should first be cleaned with soap and water, or a commercially prepared disinfectant solution. (20,21)
- After cleaning surfaces, a disinfectant with a minimum concentration of 0.1% (1000 ppm) sodium hypochlorite (bleach), or 70% ethanol should be placed on the surface for at least one minute. (20,21)
- Hospital grade disinfectants may also be used as long as they have a label claim against enveloped viruses, and they remain on the surface according to manufacturer's recommendations. (21)
- Personnel should use appropriate PPE, including respiratory (medical mask) and eye protection, when preparing and using disinfectants, while following the manufacturer's instructions. (21)
- Items classified as clinical waste must be handled and disposed of properly as infectious waste and according to legal requirements. (20)
- For handling bodies at the community level, cover the body with a sheet before handling, turning or rolling it, if culturally appropriate. Alternatively, place a non-medical/fabric mask on the deceased before any movement or manipulation of the body. Plastic or cloth sheeting can be used. A body bag can alternatively be used if culturally appropriate and available. (5,7,17)
- Any person (e.g. family member, religious leader) preparing the deceased (e.g. washing, cleaning or dressing body, tidying/shaving hair or trimming nails) in a community setting should wear gloves for any physical contact with the body. For any activity that may involve the splashing of bodily fluids or the production of aerosols, eye and mouth protection i.e. face shield/goggles and medical mask are recommended. Furthermore, if aerosols are generated, particulate respirators (N95 or FFP2 or its equivalent) should be worn. Clothing worn to prepare the body should be immediately removed and washed after the procedure, or an apron or long-sleeved fluid resistant gown should be worn during the procedure.(6,7,20) Those preparing the body should instruct family and friends not to kiss or touch the deceased.
- Anyone who has assisted in preparing the body should wash their hands thoroughly with soap and water when finished. (6,7)
- Apply principles of cultural sensitivity and ensure that family members reduce their exposure as much as possible.
- Family members, traditional and religious leaders and others may typically be involved in burials at the community level. All those involved in such burials should ensure individuals who are >60 years of age or with underlying conditions take the necessary precautions (i.e. wear a medical mask) to carry out safe burials.(17,22) A minimum number of people should be involved in such preparations.
- Family and friends may view the body after it has been prepared for burial, in accordance with customs, where possible.(6,7,17) However, they should not touch the body, personal belongings of the deceased or other ceremonial objects (6,7,16)and perform hand hygiene following the viewing; physical distancing measures of at least 1m between people should be strictly applied.
- People who are unwell should not participate in the viewing or funeral. If not possible, people who are unwell, should wear a medical mask, maintain at least 1m distance from others and perform frequent hand hygiene to avoid infecting others.(22)
- In areas of community transmission, anyone attending the funeral should consider wearing a mask in accordance with local guidance.(22)
- Those tasked with placing the body in the grave, on the funeral pyre, etc. should wear gloves and perform hand hygiene once the burial is complete. (6,7)
- Cleaning of reusable PPE should be conducted in accordance with the manufacturer's instructions for all cleaning and disinfection products (e.g. concentration, application method and contact time). (20)

Burial or cremation

People who have died from COVID-19 can be buried or cremated according to local standards and family preferences.

- National and local regulations may determine how the remains should be handled and disposed.
- Family and friends may view the body after it has been prepared for burials, in accordance with local customs. They should not touch or kiss the body and should perform hand hygiene after the viewing. (6,7)
- Family and friends should also follow local guidance regarding the number of people that can attend a viewing or burial, and local mask requirements. (6,7,16,22)
- Those tasked with placing the body in the grave, on the funeral pyre, et cetera, should wear gloves and wash their hands with soap and water after removal of the gloves once the burial is complete. (6,7)
- A body in a body bag or coffin can be treated in accordance with local customs and standards. (6,17)
- If a body will be buried or cremated without a casket or body bag, use surgical or waterproof rubber gloves to place the body in the grave or the funeral pyre and perform hand hygiene afterwards. (7,8)
- The number of individual conducting the burial or cremation should be kept at a minimum. (6,7,16)

Burial by family members or for deaths at home

In contexts where mortuary services are not standard or not always available, or where traditional funeral rituals are required, families and traditional burial attendants can be equipped and instructed in the preparation of bodies for burial or cremation.

- The disposal of infectious waste and disinfection of reusable PPE must be planned. (17,20)
- Single-use PPE and potential infectious waste produced should be collected safely in clearly marked lined containers. This waste should be treated, preferably on-site, and then safely disposed. If waste is moved off-site, it is critical to understand where and how it will be treated and disposed.(20)
- Although burials or cremations should take place in a timely manner and in accordance with local practices, funeral ceremonies that do not involve the disposal of the body should be postponed, if possible, until the end of the epidemic. If a ceremony is held, the number of participants should be kept to a minimum. Participants should observe physical distancing, respiratory etiquette, local mask wearing requirements, and hand hygiene at all times. (7,16,17)
- The belongings of the deceased person do not need to be burned or otherwise disposed of. However, they should be handled with gloves and cleaned with a detergent, followed by disinfection with a solution of at least 70% ethanol, hypochlorite or a bleach solution with a concentration of 0.1% (1000 ppm). (7,16,20)
- Clothing and other fabric items belonging to the deceased should be machine washed at 60–90°C (140–194°F) and laundry detergent. If machine washing is not possible, linens can be soaked in hot water and soap in a large drum, using a stick to stir while being careful to avoid splashing. The drum should then be emptied, and the linens soaked in 0.05% chlorine for about 30 minutes. Finally, the laundry should be rinsed with clean water and allowed to dry fully in sunlight.(20)

5. Leadership during a pandemic: what your municipality can do. United State aGency for Intrenational Development, 2009 (https://www.paho.org/disasters/index.php?option=com_content&view=article&id=1053:leadership-during-a-pandemic-what-your-municipality-can-do&Itemid=937&lang=en accessed 12 July 2020).
6. Finegan O, Fonseca S, Guyomarc’h P, Morcillo Mendez MD, Rodriguez Gonzalez J, Tidball-Binz M, et al. International Committee of the Red Cross (ICRC): General guidance for the management of the dead related to COVID-19. Forensic Sci Int Synerg [Internet]. 2020;2:129–37. (<https://linkinghub.elsevier.com/retrieve/pii/S2589871X20300309> accessed 18 July 2020)
7. COVID-19 Interim guidance for the management of the dead in humanitarian settings. International Federation of the Red Cross and Red Crescent Societies, International Committee of the Red Cross, World Health Organization. Geneva, 2020 (<https://interagencystandingcommittee.org/system/files/2020-07/Interagency%20COVID-19%20Guidance%20for%20the%20Management%20of%20the%20Dead%20in%20Humanitarian%20Settings%20%28July%202020%29.pdf> accessed 27 August 2020).
8. Standard precautions in health care. Geneva: World Health Organization; 2007 (<https://www.who.int/publications/i/item/standard-precautions-in-health-care> accessed 20 July 2020)
9. Centers for Disease Control. Funeral Home Workers [Internet]. 2020.(<https://www.cdc.gov/coronavirus/2019-ncov/community/funeral-faqs.html> accessed 12 July 2020)
10. Osborn M, Lucas S, Stewart R, Swift B, Youd E. Briefing on COVID-19 Autopsy practice relating to possible cases of COVID-19 (2019-nCov , novel coronavirus from China 2019 / 2020). R Coll Pathol [Internet]. 2020;19(February):1–14. <https://www.rpath.org/uploads/assets/d5e28baf-5789-4b0f-acecfe370eee6223/fe8fa85a-f004-4a0c-81ee4b2b9cd12cbf/Briefing-on-COVID-19-autopsy-Feb-2020.pdf> accessed 18 July 2020).
11. Cordner S, Conimix R, Hyo-Jeong K, van Alphen D T-BM, editor. Management of dead bodies after disasters: a field manual for first responders [Internet]. Second ed. World Health Organization Pan American Health Organization, International Committee of the Red Cross, International Federation of the Red Cross and Red Crescent Societies; 2017 (<http://www.who.int/hac/techguidance/management-of-dead-bodies/en/> accessed 12 July 2020)
12. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance. Geneva: World Health Organization; 2020.(<https://apps.who.int/iris/handle/10665/332879> accessed 20 July 2020).

References

1. Clinical management of COVID-19: interim guidance, Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/332196> accessed 27 August 2020)
2. Transmission of SARS-CoV-2: implications for infection prevention precautions: scientific brief, Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/333114> accessed 27 August 2020)
3. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected: interim guidance. Geneva: World Health Organization 2020. (<https://apps.who.int/iris/handle/10665/332879> accessed 20 July 2020).
4. European Centre for Disease Prevention and Control. Considerations related to the safe handling of bodies of deceased persons with suspected or confirmed COVID-19. Stockholm: ECDC; 2020.(<https://www.ecdc.europa.eu/en/publications-data/considerations-related-safe-handling-bodies-deceased-persons-suspected-or#no-link> accessed 27 Aug 2020)

13. Xue Y, Lai L, Liu C, Niu Y, Zhao J. Perspectives on the death investigation during the COVID-19 pandemic. *Forensic Sci Int Synerg* [Internet]. 2020;2:126–8. <https://linkinghub.elsevier.com/retrieve/pii/S2589871X20300334> accessed 20 July 2020)
14. Fineschi V, Aprile A, Aquila I, Arcangeli M, Asmundo A, Bacci M, et al. Management of the corpse with suspect, probable or confirmed COVID-19 respiratory infection – Italian interim recommendations for personnel potentially exposed to material from corpses, including body fluids, in morgue structures and during autopsy practice. *Pathologica*. 2020. (10.32074/1591-951X-13-20 accessed 27 August 2020).
15. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages: interim guidance. Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/331695> accessed 20 July 2020).
16. Centers for Disease Control. Funeral Guidance for Individuals and Families | CDC [Internet]. 2020 (<https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/funeral-guidance.html> accessed 12 July 2020).
17. International Federation of Red Cross and Red Crescent Societies, Cross IC of the R. Safe body handling and mourning ceremonies for COVID-19 affected communities: Implementation guidance for National Red Cross and Red Crescent Societies . Geneva; 2020. (https://preparecenter.org/wp-content/uploads/2020/07/COVID_MotD_IFRC-ICRC_July2020_web-1.pdf accessed 27 August 2020).
18. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect* [Internet]. 2020;104(3):246–51. (<http://www.sciencedirect.com/science/article/pii/S0195670120300463> accessed 12 July 2020).
19. van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *N Engl J Med* [Internet]. 2020 Apr 16;382(16):1564–7. (<http://www.nejm.org/doi/10.1056/NEJMc2004973> accessed 12 July 2020).
20. World Health Organization, United Nations Children's Fund. Water, sanitation, hygiene, and waste management for the COVID-19 virus: interim guidance. Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/331846> accessed 12 July 2020).
21. Cleaning and disinfection of environmental surfaces in the context of COVID-19: interim guidance. Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/332096> accessed 12 July 2020).
22. Advice on the use of masks in the context of COVID-19: interim guidance. Geneva: World Health Organization; 2020. (<https://apps.who.int/iris/handle/10665/332293> accessed 12 July 2020).

Acknowledgments

WHO wishes to acknowledge the following individuals for their contribution to the document:

Elizabeth Bancroft, Centers for Disease Control and Prevention, USA; Gwendolen Eamer, International Federation of Red Cross and Red Crescent Societies (IFRC), Switzerland; Oran Finnegan, International Committee of the Red Cross (ICRC), Switzerland; Fernanda Lessa, Centers for Disease Control and Prevention, United States of America (USA); Shaheen Mehtar, Infection Control Africa Network, South Africa; Maria Clara Padoveze, School of Nursing, University of São Paulo, Brazil; Wing Hong Seto, Hong Kong, Special Administrative Region, China; Morris Tidball-Binz, International Committee of the Red Cross (ICRC), Switzerland.

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Kamal Ait-Ikhlef, Benedetta Allegranzi, Gertrude Avortri Mekdim Ayana, April Baller, Elizabeth Barrera-Cancedda, Alessandro Cassini, Giorgio Cometto, Ana Paula Coutinho Rehse, Sophie Harriet Dennis, Luca Fontana, Jonas Gonseth-Garcia, Landry Kabego, Pierre Claver Kariyo, Ornella Lincetto, Abdi Rahman Mahamud, Madison Moon, Takeshi Nishijima, Kevin Ousman, Pillar Ramon-Pardo, Alice Simniceanu Valeska Stempliuk, Maha Talaat Ismail, Joao Paulo Toledo, Anthony Twyman, Maria Van Kerkhove, Vicky Willet, Masahiro Zakoji, Bassim Zayed.

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

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WHO reference number: [WHO/2019-nCoV/IPC_DBMgmt/2020.2](https://www.who.int/publications/iitem/WHO/2019-nCoV/IPC_DBMgmt/2020.2)

Annex I: Equipment for management of dead bodies in the context of COVID-19

Table 1. Equipment for procedures in mortuary management of COVID-19 bodies

Equipment	Details
Hand hygiene	<ul style="list-style-type: none"> • Alcohol-based hand rub • Running water • Soap • Disposable towel for hand drying (paper or tissue)
Personal protective equipment	<ul style="list-style-type: none"> • Gloves (single use, heavy duty gloves) • Boots • Waterproof plastic apron • Isolation gown • Anti-fog goggles • Face shield • Medical mask • N95 or similar level respirator (for aerosol-generating procedures only)
Waste management and environmental cleaning	<ul style="list-style-type: none"> • Disposal bag for bio-hazardous waste • Soap and water, or detergent • Disinfectant for surfaces – hypochlorite solution 0.1% (1000 ppm), 70% ethanol, or hospital-grade disinfectant.

Annex II: Summary of required personal protective equipment

Table 2. Use of personal protective equipment in the mortuary management of COVID-19 bodies

Procedure	Hand hygiene	Disposable gloves	Medical mask	Respirator (N-95 or similar)	Long-sleeved gown (isolation gown)	Face shield (preferred) or anti- fog goggles	Rubber gloves	Apron
Packing and transport of the body	Yes	Yes			Yes			
Mortuary care	Yes	Yes	Yes	Yes	Yes	Yes		
Autopsy	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Religious observation – care of body by family members	Yes	Yes			Yes, or apron		Yes, or apron	Yes, or gown

For the technical specifications for personal protective equipment, please refer to Technical specifications of medical devices for the case management of COVID-19 in healthcare settings found in the Operational support and logistics, disease commodity packages, v3: <https://apps.who.int/iris/handle/10665/332406>.