Module 4: Infection prevention and control

Title	Infection prevention and control				
Responsible/facilitators	Agency medical coordinator				
General Objective	To delay or interrupt the transmission of influenza				
Specific Objectives	Understand how to prevent infection in health facilities and in the home				
	Understand specific measures to take for patients, caregivers, health and other essential staff				
	Understand that a risk assessment must be performed to determine PPE usage				
	Practise the use and disposal of gloves and masks				
	Practise hand washing				
	Understand how to manage waste and how to handle the deceased				
Methodology	Presentation: Power point or printed in A3 (laminated).				
	THIS MODULE REQUIRES DEMONSTRATION.				
Instructions for facilitators	Included in body of module				
Messages to retain	Social distancing / Separation				
	Respiratory etiquette				
	Hand hygiene				
	PPE according to risk assessment				
Contents	See text				
Documents	Power point or printed in A3 presentation				
Bibliography	none				

• Duration = 2 hours 30 minutes

Hand washing and use of PPE cannot solely be explained, they have to be demonstrated. Prepare water, soap, alcohol rub, masks, respirators and so on. Make sure you know how to use them before and read if necessary.

Details explanation can be found in WHO documents such as the interim infection control guidelines, available at http://tinyurl.com/p7hma or http://www.wpro.who.int/NR/rdonlyres/EA6D9DF3-688D-4316-91DF-5553E7B1DBCD/0/InfectionControlAIinhumansWHOInterimGuidelinesfor2.pdf

SLIDE 1

Pandemic influenza preparedness and mitigation in refugee and displaced populations
WHO training modules for humanitarian agencies

Module 4 Infection prevention and control



SLIDE 2

Objectives

- Understand how to prevent infection in health facilities and in the home
- Understand specific measures to take for patients, caregivers, health and other essential staff
- Understand that a risk assessment must be performed to determine PPE usage
- Practise the use and disposal of gloves and masks
- Practise hand washing
- Understand how to manage waste and how to handle the deceased



Actions to prevent infection

1. Cover coughs and sneezes

(everyone, always)

2. Distancing / separation

(everyone, always)

3. Hand hygiene

(everyone, always)

 Personal protective equipment (PPE) for essential staff (according to risk assessment ie what procedures or duties you are doing)

Note: PPE = masks/gloves/goggles

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As the majority of transmission occurs when infected people come into close contact with others, the 3 main measures recommended generally are :

- Social distancing /separation of AT LEAST 1m between people/ separation of well and sick individuals
- Cough/respiratory etiquette
 - Wear masks if available.
 - Sneeze/cough into your sleeve or cover with tissue or scarf or mask.
 - If you have coughed/sneezed into your hands, wash hands immediately with soap and water.
- Hand washing
 - Before eating or feeding others, after coughing/sneezing, after touching patients or their bed sheets, clothes and utensils, before and after preparing food, after going to the toilet, after removing masks or gloves.
- In some instances, depending on the risk, PPE (personal protective equipment) such as masks or eye protection must be worn. This will be discussed later.

Risk assessment

- Remember transmission of influenza increases if there is:
 - 1. Close contact (usually proximity < 1 metre)
 - 2. Direct contact (with infected patients then self contamination)
 - 3. Indirect contact (with surfaces/objects contaminated with virus then self contamination)
 - **4. An aerosol generating procedure** (endotracheal intubation, suctioning, nasopharyngeal aspiration/swabbing)
- A risk assessment helps determine what measures should be used and when to use them



Control at the source

- The first priority is control at the source of infection the patient
- A patient should cover mouth and nose, if possible with a mask or scarf, when in close contact with other people
- During a pandemic, give a surgical or procedure mask to all patients presenting to health facilities with fever/acute respiratory symptoms (cough or shortness of breath)
 - Masks do not need to be used by patients when they are alone!
 - Wearing a mask all day long is difficult and the mask gets wet.



- The main priority is to control the infection at its source the patient. If the patient's cough/sneeze is covered, they will not transmit it to others.
- When a sick individual coughs or sneezes, they must cover their mouth and nose
 with a mask or paper tissue or cloth or cough/sneeze into their sleeves to prevent
 infectious respiratory droplets from being inhaled by others who are near them,
 thereby transmitting the infection to them.
- The next priority is to protect care givers and health care staff as they are frequently in close contact with sick patients and thus have a much higher risk of getting infected.

Distancing/separation

- In the home, distance/separate the sick person from those who are well as much as possible
 - (more details on infection prevention at home on slides 7-8)
- In health facilities, separate patients with respiratory symptoms from others
 - Ensure separate waiting areas for patients with respiratory symptoms
 - identify those with fever/acute respiratory symptoms (cough or shortness of breath) <u>before</u> they enter waiting rooms to separate them from patients with other symptoms
 - Maximise distance between beds
 - (more details on infection prevention in health facilities on slide 9-18)

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SLIDE 7

Preventing infection at home (What the ill person should do)

- The patient should:
 - Cover mouth and nose, if possible with a tightly-fitting mask or scarf, when in close contact with other people
 - distance/separate themselves from those who are well as much as possible
 - Avoid close contact with uninfected people for at least 7 days after the beginning of flu symptoms
 - Ensure proper hand hygiene





Preventing infection at home (what the caregiver should do)

- The caregiver should:
 - Cover their mouth and nose, with a mask (if possible) or tightly-fitting scarf tied at the back of the head.
 - · Dispose of masks (if available), or wash scarf or cloth, every 4 hours or when visibly wet
 - Perform hand hygiene
 - Limit close contact with people who are not sick.
 - Facilitate air circulation (open windows or tent when climate allows)
 - Wash clothes and bed linen (and scarves) that have been in contact with the patient's respiratory secretions or stools.
 - · Running water and soap should be used for washing and dry items in the sun.
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- The caregiver should also take measures to prevent disease transmission and protect themselves.
- If possible, ONE caregiver should be identified to take care of the sick person.
- The other family members should try to limit close contact with the sick person.

Preventing infection in healthcare facilities (Key principles)

- 1. Distancing / separation / restriction of movement and of visitors
- 2. PPE: gloves, gowns, masks, eye-protection (where appropriate)
- 3. Hand hygiene
- 4. Cleaning, disinfection and sterilization
- 5. Waste management
- 6. Staff health management: Exposure prophylaxis, health monitoring
- 7. Discharge of patients
- 8. Care of the deceased

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SLIDE 10

Preventing infection in healthcare facilities (1)

- Separate patients with respiratory symptoms from others
- Identify a completely separate building or structure, for use as a temporary respiratory healthcare facility (e.g. school, open tent)
 - with its own respiratory waiting room/area
 - with its own respiratory inpatient ward
- Ensure one-way flow of people
- Ensure good ventilation to encourage air flow from the facility



Preventing infection in healthcare facilities (2)

- Patients should be triaged even before they enter usual waiting rooms in health units.
 - This means identify those with fever/acute respiratory symptoms (cough or shortness of breath) to separate them from patients with other symptoms
 - Send these people to the respiratory waiting room in the separate respiratory healthcare facility
 - This can be done with signs or posters so that people with such symptoms can self-select their appropriate waiting room
 - Have a HCW monitor correct usage of waiting rooms



- People with respiratory symptoms should be identified as early as possible, BEFORE enter waiting rooms, so they will not infect other people that are ill with other diseases such as malaria or diarrhoea. Ideally these people should be directed to specific respiratory health facilities with their own respiratory waiting areas.
- This is called **first level TRIAGE**.

Preventing infection in healthcare facilities (3)

- During a pandemic, all patients coming to health facilities with fever + acute respiratory symptoms (cough or shortness of breath) must wear a tightly-fitting mask or scarf whilst in waiting areas
- Anyone in close contact with patients (1metre or less) must also wear a tightly-fitting mask or scarf.
 - Masks do not need to be worn when a person is alone!
 - Wearing a mask all day long is difficult and masks get wet!



- REMEMBER to give a surgical or procedure MASK to all patients presenting to health facilities with fever/acute respiratory symptoms (cough or shortness of breath) with explanations as to why and how to wear it.
- The mask is important not only in preventing an influenza patient from transmitting the disease but also in protecting those patients who do have respiratory symptoms from another disease and not necessarily have influenza from contracting influenza as well. The mask will help to protect these patients. It is important that all patients in the respiratory health facility or waiting area keep this mask on as long as they are in close contact with other patients and health staff.

Preventing infection in healthcare facilities (4)

- Once respiratory patients are triaged and sent to the separate respiratory waiting area
 - Then admit only the severe cases to the respiratory inpatient facility, send other cases home with homecare instructions
- Suspend elective and non-essential medical services
- Continue essential medical services



- A second level of triage should be applied in the respiratory health facility or waiting area to separate those with severe illness who will benefit from inpatient case management in order to attend to them first. Thus once the patient has been seen by the clinician, the needs of the patients should be compared with the capacity of the health unit to receive patients. Scarce beds should be reserved for those that have a reasonable chance of improving if they receive inpatient care.
- This is second level TRIAGE.
- If all beds are used by patients who are very severely ill and are likely to die, there will be no space for those that could survive if helped.
- Conversely, milder cases should be managed at home not to overwhelm the health units.
- Health systems will be overwhelmed by the amount of work.
- Activities that are life saving and essential should continue.
- Activities that are not absolutely necessary immediately and that could be performed
 at a later time, should be deferred, since this will reduce the burden on health
 systems and prevent these individuals from unnecessary risk of contracting
 influenza in the health care setting.

Preventing infection in healthcare facilities (the inpatient ward -1)

- The inpatient ward for patients with suspected influenza must be separate from other inpatient wards
- Ensure capacity for rapid expansion
 - ensure an overflow area if there is large increase in number of of patients
- Ensure as much spatial separation between patients as possible (at least 1m).
- If not possible, head-to-toe positioning to maximize separation between patients' heads

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SLIDE 15

Preventing infection in healthcare facilities (the inpatient ward - 2)

- Restrict access
- Minimize the number of entries and exits to the respiratory inpatient ward.
- Limit visitors
- 8-hour shift limit for health-care workers on duty in the respiratory inpatient ward.

World Health Organization

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WHO Training modules for humanitarian agencies.

Preventing infection in healthcare facilities (the inpatient ward - 3)

- Doors closed
- If possible, open windows to encourage air flow from room.
- Clean PPE on trolley outside room
- Used PPE, other waste and used linen inside room
- Dedicated equipment
- Keep ward free of excessive equipment or furniture

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SLIDE 17

Priority for PPE use in health care facilities

- 1. Control transmission at the **source** (the patient)
- 2. Protect care givers / care providers people in close contact with patients

World Health Organization

Protecting care givers/care providers

- Respiratory etiquette / social distancing / hand hygiene
 - Everyone, always

Masks

- patients (source) when in close contact with others (receptors)
- health care workers and care givers when in close contact with anyone with respiratory symptoms
- other essential staff when in close contact with anyone with respiratory symptoms

PPE (gloves/gowns/aprons/eye protection)

- essential staff only and when...
- performing procedures (specialised medical, cleaning, burials) where eyes, hands or clothes could get contaminated with respiratory secretions.
- use **protection items according to risk**, as shown in following tables.



- Care givers and health care staff must also be protected as they have close contact with patients.
- Some precautions are universal to everyone bullet point 1.
- Others will depend on the risk of exposure.
- Masks are used to prevent the inhalation of droplets. When droplets are very small they are called small particle aerosols and require special masks that have a capacity to filter such particles (these type of masks are called particulate respirators).
- Eye protection (goggles or face shields) are used to avoid droplet contact with the eyes. Individuals who wear glasses have some protection against droplets that are dispersed directly towards the eye.
- Gloves, gowns and aprons prevent contact between the infectious germ and the skin.

SLIDE 19 and 20

These tables are NOT to be memorized or gone through line by line in the presentation but to use as a reference.

Precautions for staff working in health care facilities

	Aerosol generating	Inpatient ward	Outpatient	Health unit	Burial and
	procedures	health worker	health worker	non-health staff	cleaning staff**
Respiratory etiquette	Yes	Yes	Yes	Yes	Yes
Social distance	Yes	Yes	Yes	Yes	Yes
Hand Hygiene	Yes	Yes	Yes	Yes	Yes
Gloves	Yes	Yes	acc. to risk	acc. to risk	heavy duty
Apron	Yes	acc. to risk*	No	acc. to risk	Yes
Gown	Yes	Yes	No	acc. to risk	Yes
Hair cover	Yes	No	No	No	No
Surgical mask	No	Yes	Yes	acc. to risk	Yes
Particulate respirator***	Yes	No	No	No	No
Eye protection	Yes	Yes	No	No	No
Surgical mask on patient	No	acc. to risk	acc. to risk	acc. to risk	No

^{*} According to risk: when transmission is possible because there is a source and a receptor. Example, when patients (the source) are alone, there is no "receptor" so they do not need to wear a mask. When non-health staff are not in close contact with patients, they do not need to wear a mask. Gloves, aprons or gowns may be necessary when performing procedures (including cleaning) where hands or clothes will get contaminated with respiratory secretions.

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Precautions for communities and essential staff working in communities

	Community	Distributor of	Home care	Patient	Family and
	health worker	essential services	giver		community
Respiratory etiquette	Yes	Yes	Yes	Yes	Yes
Social distance	Yes	Yes	Yes	Yes	Yes
Hand Hygiene	Yes	Yes	Yes	Yes	Yes
Gloves	No	No	No	No	No
Apron	No	No	No	No	No
Gown	No	No	No	No	No
Hair cover	No	No	No	No	No
Surgical mask	acc. to risk*	acc. to risk	acc. to risk	acc. to risk	acc. to risk
Particulate respirator**	No	No	No	No	No
Eye protection	No	No	No	No	No
Surgical mask on patient	acc. to risk	acc. to risk	acc. to risk	-	acc. to risk

^{*} According to risk: where transmission is possible because there is close contact between a source and a receptor. Example, When patients are alone there is no receptor so they do not need to use a mask. People should maintain distance from others or at least cover their mouth and nose with a tightly-fitting mask (surgical or made of cloth) or scarf during a pandemic when near anyone



^{**} Burial and cleaning staff should also wear impermeable heavy duty boots and gloves.

^{***} Special masks to be used according to manufacturer's specifications

with respiratory symptoms to prevent infection.

** Special masks to be used according to manufacturer's specifications

Masks (1)

- Health-care workers who have direct close contact with influenza patients should wear a particulate respirator* if available or a tightly-fitting surgical mask and eye protection
 - or a tightly-fitting scarf or a piece of cloth over the nose and mouth, if masks are unavailable

*special masks that should be used according to manufacturer's specifications

 Masks, if worn and disposed of properly, are likely to be the most effective PPE intervention (ie out of gloves, aprons, gowns, goggles)



- If masks are not available, a scarf or a tissue that covers the mouth and nose will help to retain the droplets that transmit the disease.
- Certain procedures produce very small respiratory particles, smaller than the usual droplets. Some of these procedures include: endotracheal intubation, suctioning, or taking throat or nasopharyngeal swabs.
- These very small particles are called small particle aerosols which travel further and require the use of masks that have a better fit to prevent disease transmission. These special masks are termed particulate respirators and have technical names such as N95 or EU FFP2.
- Do not perform those procedures if you can not take the adequate precautions.

- Before reading the slide you should ask two or three volunteers, health unit medical staff, to put a mask on.
- Once the mask is on, he or she must show how well the mask is fitted to his/her face.
- Ask other participants to comment on how they performed. Ask them to keep the masks on until slide 25.

Putting on a mask



Cup mask in your hand with the nosepiece at your fingertips allowing the headbands to hang freely below your hand.

Position mask under your chin with the nosepiece up. Pull top strap over your head resting it high at the top back of your head.

Pull the bottom strap over your head and position it around the neck below ears. Place fingertips of both hands at top of the metal nosepiece. Mould nosepiece to shape of your nose. Do not pinch nosepiece



Masks (2)

- Any respiratory aerosol-generating procedure (suctioning, intubation, nasopharyngeal swabbing) must NOT be performed without full PPE
 - (particulate respirator and not a surgical mask, long-sleeved gown, goggle, gloves)
- Particulate respirator masks should be used as per manufacturer's instructions. They should at least have a seal check performed (see picture)



Exhale sharply. If leakage, adjust position and/or tension straps. Retest the seal.

Inhale deeply. If no leakage, negative pressure will make respirator cling to your face.



Masks (3)

- Masks should be thrown away (or scarves removed & washed)
 - when leaving isolation wards, OR
 - every 4 hours OR
 - when wet or visibly soiled
- After disposing of/removing masks/scarves, hand hygiene must be performed
- Other essential staff (without direct patient responsibilities)
 - Should also wear masks (or scarves) but
 - change masks (or scarves) twice a day, or when wet or visibly soiled.



- Masks have to be changed when they are wet and anyone touching the mask must wash their hands afterwards.
- If a scarf is issued it should the washed twice a day with water and soap to destroy the virus that remains trapped in the cloth.
- If a tissue is used, it is must be disposed of safely and eventually incinerated.
- Hands must be washed after any contact with used masks, scarves or tissues.
- Other essential staff such as food distributors or water handlers or security personnel
 may come in close contact with large numbers of people who are potentially
 infected, and therefore should also be protected.
- They do not need to wear masks at all times but only when they are in close contact with people for example when distributing rations

Ask the volunteers with the masks on to now remove the masks one by one and again ask the participants to comment. Then show this slide.

Removing a mask

- Do NOT touch the mask itself.
- Lift the bottom elastic over your head first
- Then lift off the top elastic
- If no elastics, untie.
- Discard
- Wash hands afterwards.



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- The presenter should say that a used mask may be contaminated and should be removed without having contact with the filtering surface.
- The volunteers (who have kept their masks on since slide 22) should now remove their masks one by one following the instructions.
- If possible, provide a mask to each participant and allow them to practise the placement and removal of it.

Gowns

- A new gown should be worn for every patient contact or if resources limited, for every entry into inpatient respiratory ward
- The sleeve cuff should be tucked into the gloves
- Discard immediately if visibly contaminated.



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SLIDE 27

Removing gowns



Unfasten ties



- 2
- · Peel gown away from neck and shoulder
- Turn contaminated outside toward the inside





- Fold or roll into a bundle
- Discard





• Before reading the slide you should ask 2-3 health unit medical staff, to put gloves on and to keep them on until the next slide.

Gloves

- Gloves should be worn if contact with blood and body fluids is anticipated, but are not a substitute for hand hygiene
 - Before all patient contact
 - Before all cleaning
 - Before handling soiled linen & waste or contact with lab specimens
- Gloves must be disposed of after each use
- Dispose of gloves before exiting the inpatient ward do not keep the gloves on outside of the patient's room
- Hands should be washed after disposal of gloves



Dos and Don'ts of PPE Use

- Protect yourself, others, and the environment
- Limit opportunities for "touch contamination"
- Avoid touching:
 - your face or mask or adjusting PPE with contaminated gloves
 - environmental surfaces except as necessary during patient care









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• See if any of the participants with the gloves on have contaminated themselves.

Removing gloves



- · Grasp outside edge near wrist
- · Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand



- Slide ungloved finger under the wrist of the remaining glove
- Peel off from inside, creating a bag for both gloves



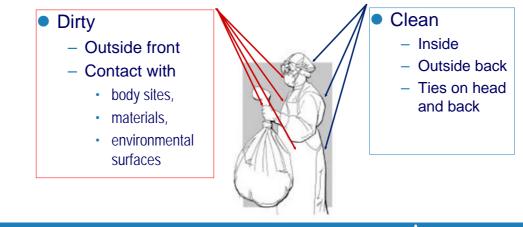
Discard



- Ask each of the participants with the gloves on to demonstrate removal of gloves as described in the slide.
- Other participants should be able to comment on who managed the procedure the best and why.
- All participants should then practise putting on and removing gloves 1-2 times.

Principles for use and removal of PPE

Outside dirty, inside clean; front dirty, back clean



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SLIDE 32

Order of removal of PPE

- Face shield / goggles
- 2. (Cap)
- 3. Apron
- 4. Gown
- 5. (Shoe Covers)
- 6. Gloves
- 7. Alcohol hand rub or wash hands
- 8. Mask, WITHOUT touching the front part
- Alcohol hand rub or wash hands



Hand hygiene

- Hand hygiene prevents the spread of many infections in a health-care facility
- Hands should be cleaned after touching people or contaminated objects or surfaces
 - Wash with soap and water or ash, rubbing for 20 seconds before rinsing
 - Rub hands with an alcohol-based preparation until hands dry



- Virus particles can be found on hands after coughing/sneezing, on sick people, their clothes, surfaces and objects that have been in contact with sick people, on used PPE such as masks, gloves, gowns.
- Hand washing after contact with any of the above is crucial. If you have been in contact with patients, wash your hands before interacting or attending to another person, be this a patient, a colleague or family..
- Soap helps to get rid of most viruses and bacteria but usually does not kill the viruses or bacteria themselves. However, soap does have a direct action on the influenza virus and helps to kill it because it destroys the lipid capsule that protects the virus.
- Wash hands with water and soap. Hot water is not necessary. Soap destroys the virus
- Alcohol-based gels are very effective but more expensive, they will be limited to health structures.

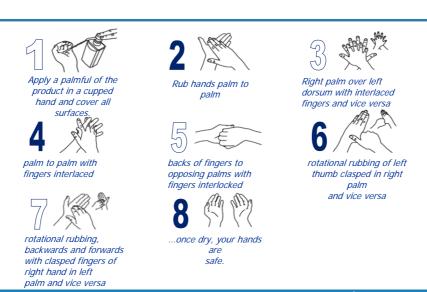
SLIDE 34 and 35

 Attention, these two slides require demonstration and practice. Two participants should be chosen to demonstrate to peers how do they follow the instructions for hand hygiene and the other participants must comment on how well they did it.

Hand hygiene with soap and water



Hand hygiene with alcohol-based rub





Environmental cleaning and disinfection

- PPE: mask (or scarf), heavy duty gloves and boots, gown, apron.
- Clean first then disinfect, 2 buckets one each for washing, rinsing
- Bleach (sodium hypochlorite) 1% for disinfection of material contaminated with body fluids
 - Several concentrations may be marketed (e.g., 2.5%, 5%)
 - If 5% solution available, mix 1 part 5% solution with 5 parts clean water.
 - If 2.5% solution available, mix 2 parts 2.5% solution with 5 parts clean water.
- Clean and disinfect patient areas daily, with particular attention to frequently touched surfaces – counter tops, door handles, medical equipment.
- Use bleaching powder (7g/1L water ie 70% available chlorine) for disinfection of toilets/bathrooms
- Clean and dry cleaning/disinfection equipment after each use. Clean and disinfect mop heads daily and dry thoroughly before re-use
- Put used linen in linen bag inside the room; place in another bag outside the room when taking to laundry area for washing – treat as soiled/contaminated

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SLIDE 37

Discharging the patient

- Ensure appropriate cleaning and disinfection of the room and bed
- Do not spray disinfectant
- Ensure appropriate cleaning, disinfection and/or sterilization of medical equipment



Contaminated waste management

- Follow routine procedures for waste management generated at health facilities
- Used PPE and other waste material from respiratory health facility should be placed in "biohazard" waste bags inside the room where waste comes from. At collection, this bag can be put inside another bag outside the room and then treated as "normal"
- Gloves must be worn when removing waste bags
- Perform hand hygiene afterwards
- Incinerate waste
- Goggles are re-usable clean prior to sterilization and re-use

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• Careful handling and cleaning of patient care equipment and soiled linen must be ensured so not to produce aerosols when handling soiled objects.

Handling the deceased

- The risk that dead bodies pose for public health is very small. The living pose a greater risk!
- Identify burial sites in advance and ensure capacity for large numbers of bodies.
- Respect culturally appropriate means of disposal of the deceased while avoiding contact with fluids from the body
- PPE: non-sterile ambidextrous gloves, waterproof gown or apron, surgical or procedure masks and boots
- If splashing of body fluids anticipated, use hair cover and face shield (preferably) or goggles
- After removing PPE, perform hand hygiene
- Family should wear gloves and gowns and perform hand hygiene
- Seal body in impermeable body bag prior to transfer to mortuary or burial site

