COVID-19

&

Safety and Hygiene Guidelines for Water and Sanitation Workers

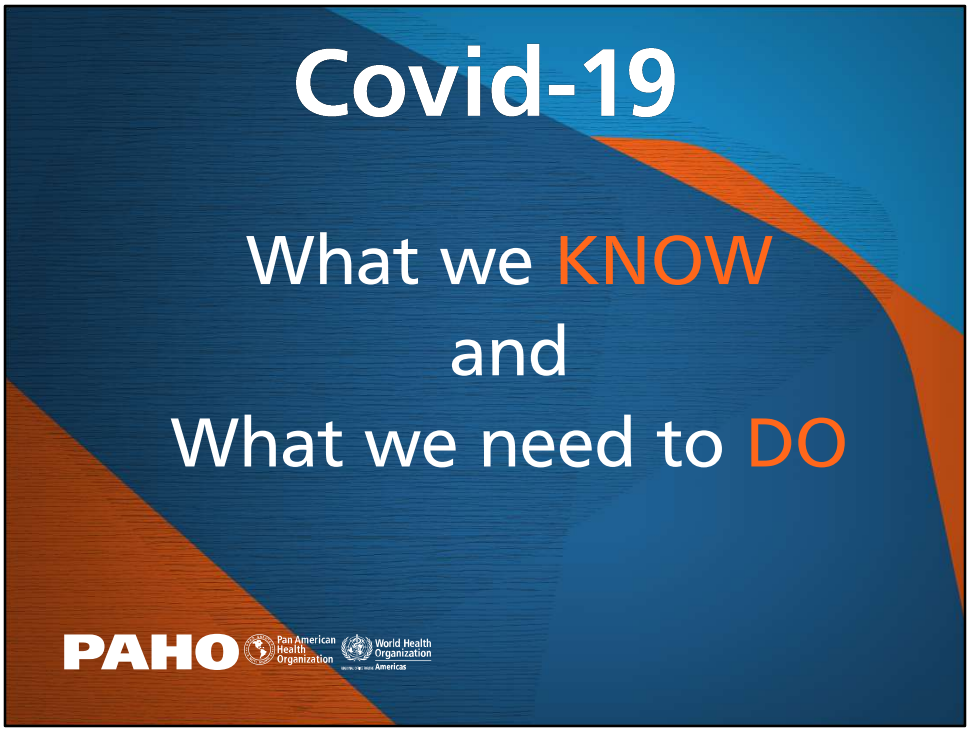
Watersupply, wastewater, municipal waste, recyclers and waste from health care facilities

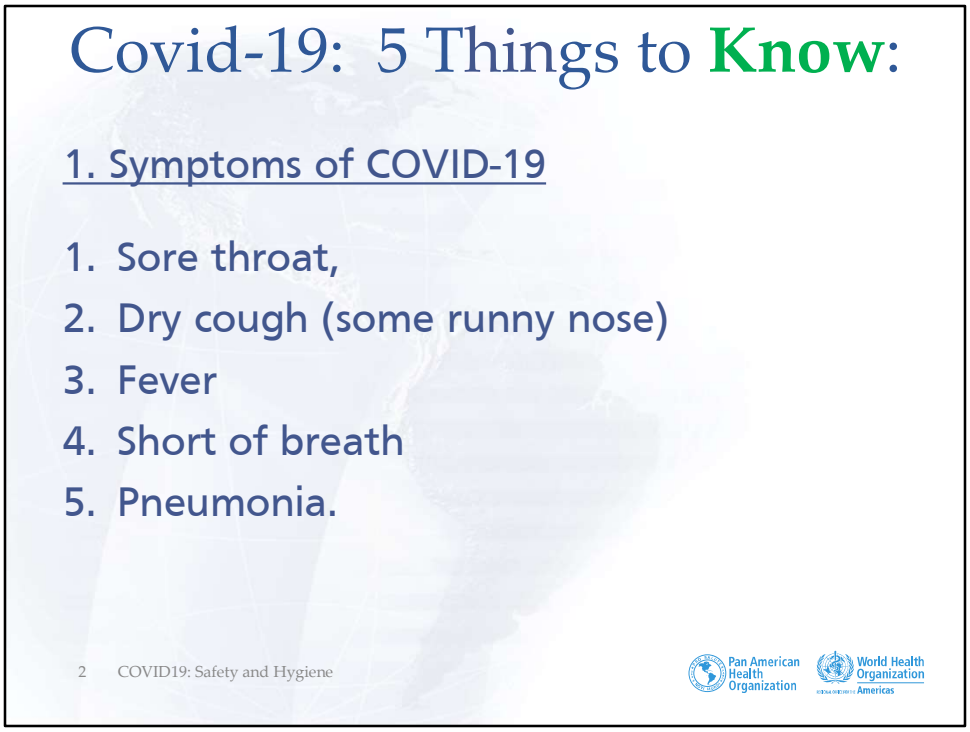
Adrianus (Ton) Vlugman
Senior Advisor, Water, Sanitation and Environmental Health for the Caribbean Sub-Region
PAHO/WHO

Online Discussion on Water Utility Preparedness For COVID-19
CWWA, 3 April 2020

PAHO Pan American Health Organization World Health Organization Americas

0


Covid-19
What we KNOW
and
What we need to DO
PAHO
Pan American Health Organization
World Health Organization
Americas



In most cases, COVID-19 causes mild symptoms including sore throat, dry cough, sometimes a runny nose, fever and shortness of breath

It can become more severe for some people and can lead to pneumonia and breathing difficulties.

In some cases, infection can lead to death

There are two main routes of transmission of the SARS-CoV-2 virus:

1. respiratory;
2. contact.

Available evidence indicates that COVID-19 virus is transmitted during close contact through respiratory droplets (such as coughing) and by contaminated surfaces.

The virus can spread directly from person to person through coughing or exhaling droplets that reach the nose, mouth or eyes of another person.

In addition, droplets are too heavy to be airborne, and land on objects and surfaces surrounding the person.

Other people become infected with COVID-19 by touching these contaminated objects or surfaces, then touching their eyes, nose or mouth.

According to the currently available evidence, transmission through smaller droplet nuclei (airborne transmission) that propagate through air at distances longer than 1 meter is limited to aerosol generating procedures during clinical care of COVID-19 patients.

No evidence of airborne transmission as of date, the clustered cases are typical for close contact transmission.

https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200326-sitrep-66-covid-19.pdf?sfvrsn=81b94e61_2

Coughing and Sneezing

Pan American Health Organization

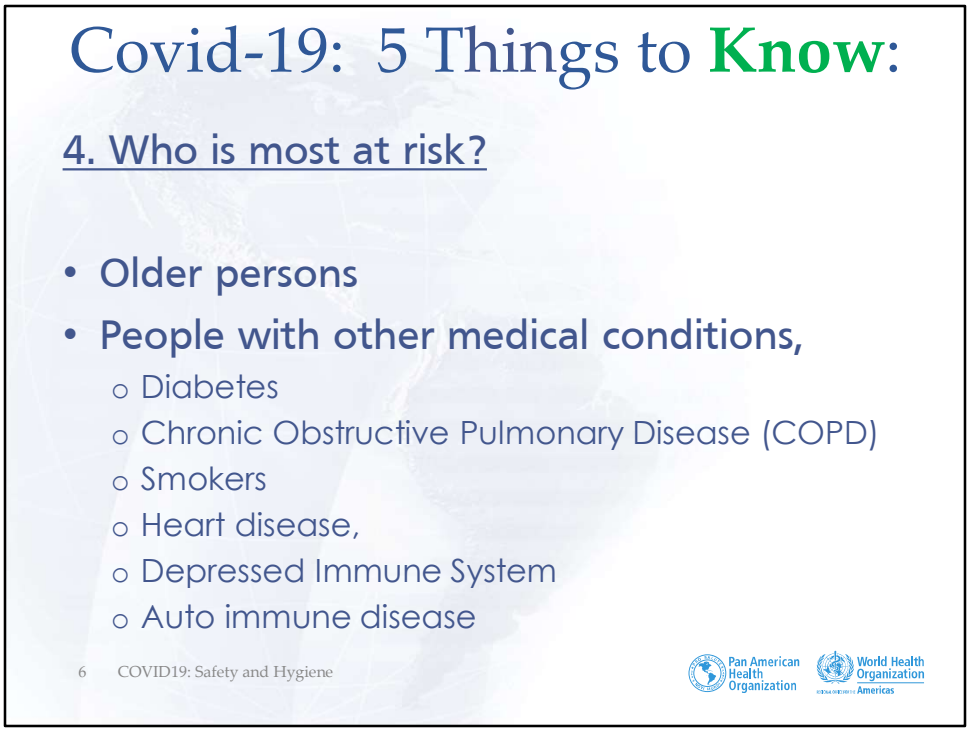
World Health Organization Americas

Covid-19: 5 Things to **Know**:

3. How does COVID-19 spread?

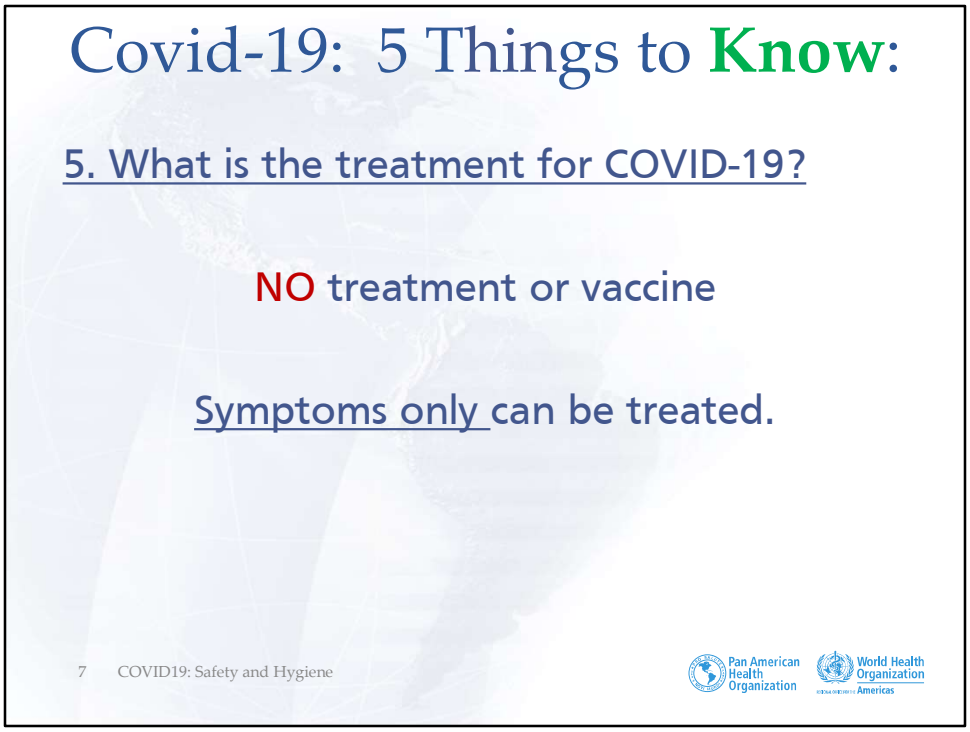
1. Close contact with an infected person.
2. Coughs and sneezes
3. Touching eyes, nose, mouth

Pan American Health Organization | World Health Organization Americas



We still need to learn more about how COVID-19 affects people.
Older people, and people with other medical conditions, such as diabetes and heart disease, smokers and persons suffering from Chronic Obstructive Pulmonary Disease (COPD) appear to be more at risk of developing severe disease.

Also at higher risk are persons with depressed immune system as well as persons with auto-immune disease (AID)



There is currently NO available treatment or vaccine for COVID-19, but the world is working hard on developing a vaccine,

However, many of the symptoms can be treated.

Wash your hands with soap and water
Only use alcohol-based hand sanitizers when hands are not visibly dirty.
These measures will remove the virus from your hands.

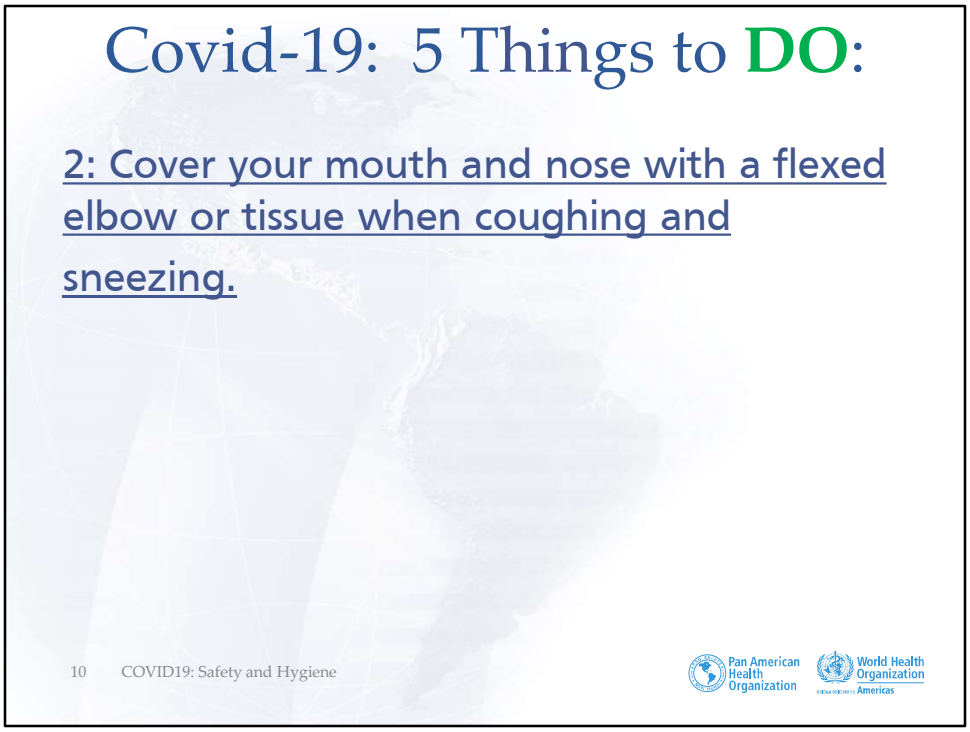
How to wash your hands:
https://www.youtube.com/watch?v=3PmVJQUCm4E

But don't waste water!
Most videos show running tap while lathering hands, wasting 2/3 – 3/4 of the water!

https://www.who.int/gpsc/clean_hands_protection/en/

Pan American Health Organization

World Health Organization Americas



Throw away the used tissue immediately and wash your hands with soap and water or use an alcohol-based hand rub.

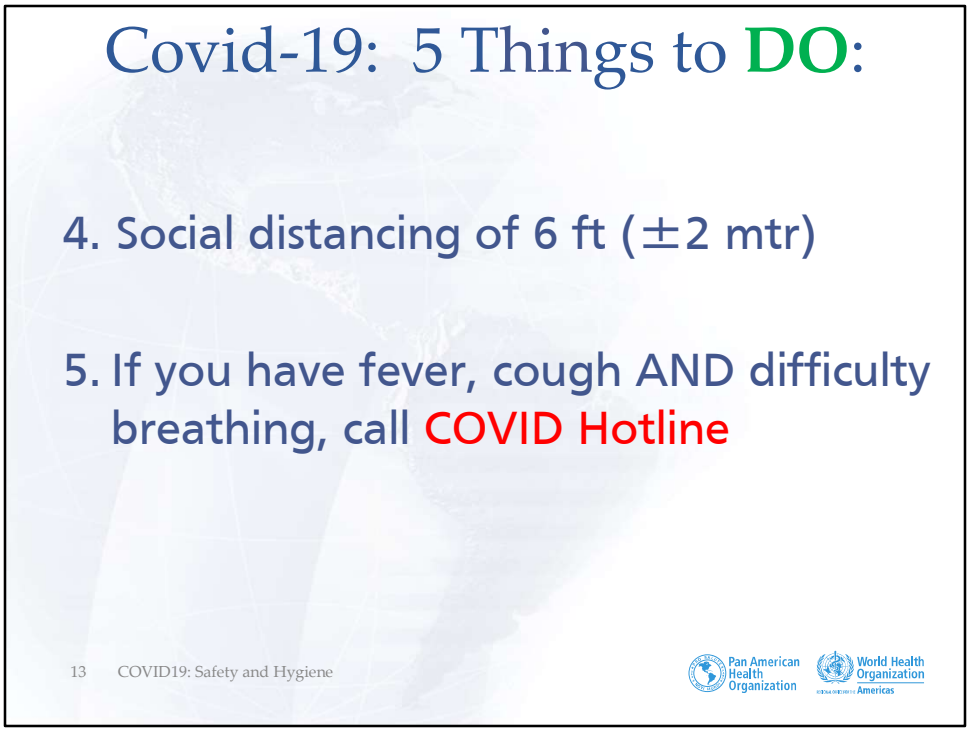
This way you protect others from any virus released through coughs and sneezes.

Couching and Sneezing

Back to Basics

Hands touch many surfaces which can be contaminated with the virus.
If you touch your eyes, nose or mouth with your unclean hands (or gloved hands), you can transfer the virus from that surface to yourself.
Use less dominant hand to open doors, etc

Do not touch nose, mouth, eyes, or ears anyway, unless you have just washed your hands .

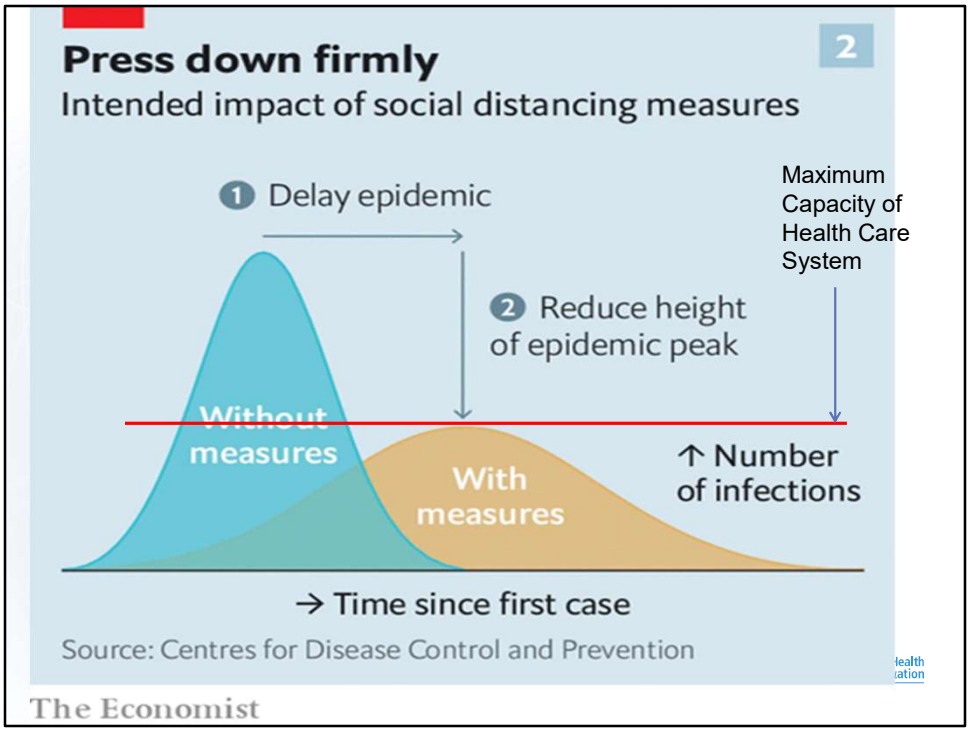


COVID-19 appears to spread most easily through close contact with an infected person.

1. Keep your distance
2. Avoid sharing cups, utensils, personal items and clean commonly touched surfaces: door handles, faucets, switches, etc.
3. Use less dominant hand to open doors, etc

In Barbados COVID Hotline tel # = 536 5000 for instructions.

Always follow the guidance of your health care professional or national health advisories.



Flattening the Curve has two important benefits.

First, it is easier for health-care systems to deal with the disease if the people infected do not all turn up at the same time.
Better treatment means fewer deaths; more time allows treatments to be improved.

Second, the total number of infections throughout the course of the epidemic can be lower.

To flatten the curve you must slow the spread. The virus appears to be transmitted primarily through virus-filled droplets that infected people cough or sneeze into the air. This means transmission can be reduced through physical barriers, good hygiene and reducing various forms of mingle, *(s.a. partying, liming, congregations, ATV)*—a strategy known as "social distancing".

Such measures are already routinely used to control the spread of the influenza virus, which spreads in a similar way and is responsible for hundreds of thousands of deaths a year.

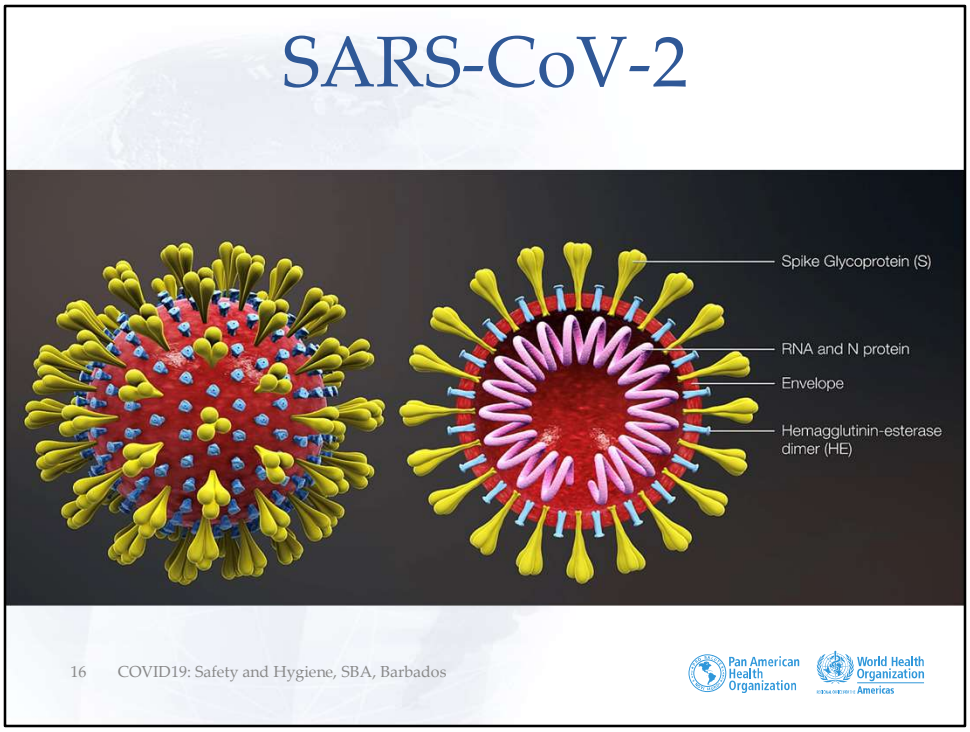
The Economist: https://www.economist.com/briefing/2020/02/29/covid-19-is-now-in-50-countries-and-things-will-get-worse

Water and Sanitation are paramount in primary (preventative) health and for economic and social development.

The word sanitation is derived from the Latin word SANITAS, which means HEALTH

People working in the water and sanitation sector are primary health care workers in preventing communicable diseases!!

Sanitation saves more lives than vaccination!

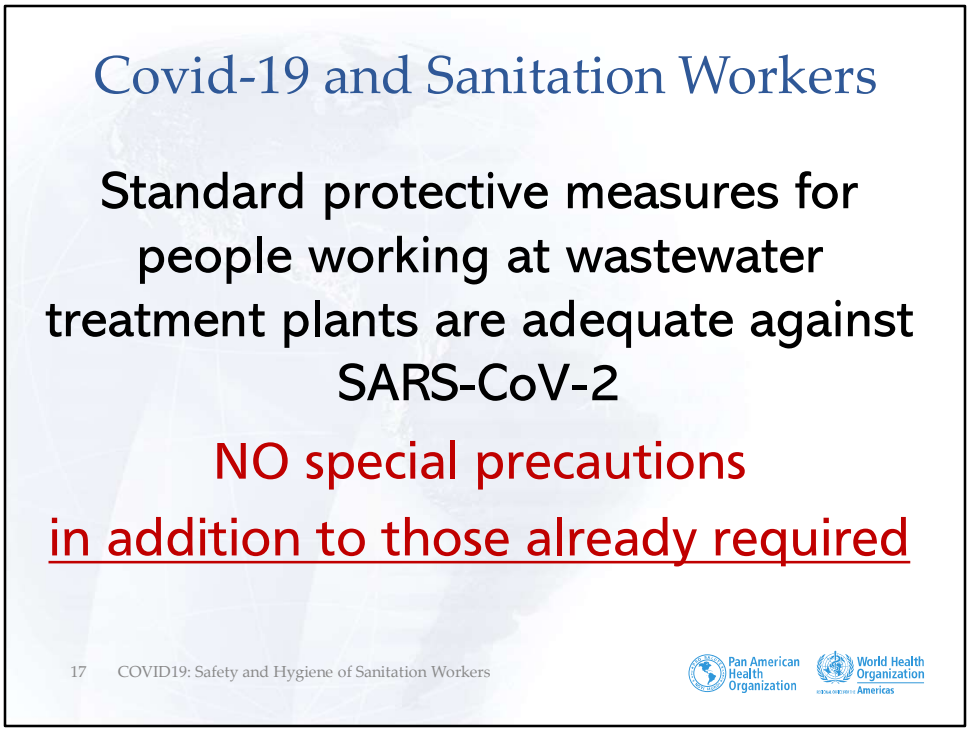


The COVID-19 virus is an enveloped virus, with a fatty fragile outer membrane (red) sheltering the RNA to be injected in healthy cells using the Spikes and Hemagglutinin

This fatty layer is not very stable in the environment and is susceptible to surfactants (soap, detergents), alcohol and oxidants, such as chlorine.

Once the envelop dissolves the virus falls apart, becomes inactive and the RNA cannot penetrate a healthy cell.

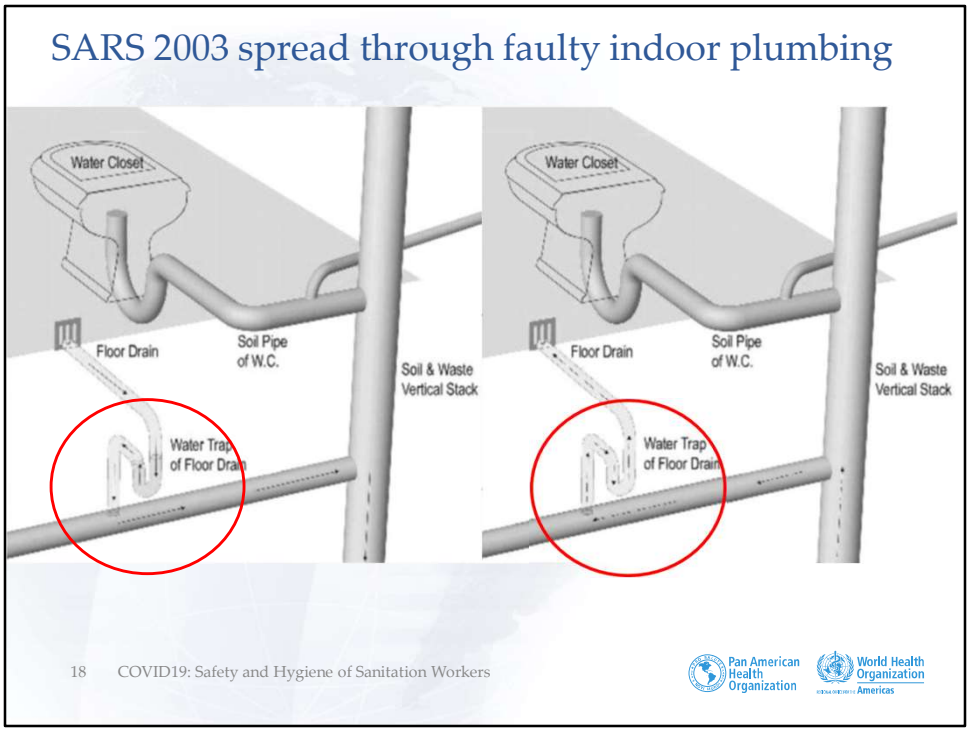
Based on our knowledge of viruses and water, studies have shown that chlorinated drinking water is very well protected against all viruses, including the new coronavirus. Ref. 8



Wastewater and Solid Waste contain dangerous substances. Wastewater IS infectious, (from hospital or not) and contains disease causing organisms, (pathogens): incl: bacteria, viruses, protozoa, and parasitic worms.

Studies have found SARS-CoV-2 in wastewater, and this virus is likely to becomes quickly inactivated compared to non-enveloped human enteric viruses with known waterborne transmission (such as adenoviruses, norovirus, rotavirus and hepatitis A) 99.9% die off in two days (Ref. 1) Sanitation workers are potentially exposed to many diseases: Gastrointestinal, respiratory, skin disorders, occupational hepatitis A, the existing protocols and protective measures to protect workers from occupational hazards encountered during routine job tasks in wastewater and solid waste management are sufficient to prevent COVID-19. Ref 7.

Management of wastes does not require special precautions for COVID-19 in addition to the establish protocols and protective measures.



As many as two/thirds of the patients in the Amoy Gardens, Hong Kong, during the 2003 SARS outbreak had diarrhea, so a very substantial virus load would have been discharged into the sewerage in Block E.

Probably the index patient infected only a small group of Block E residents, with the remainder acquiring the disease via sewage, person-to-person contact and shared communal facilities such as lifts and staircases.

These residents subsequently transmitted the disease to others both within and outside Block E through person-to-person contact and environmental contamination.

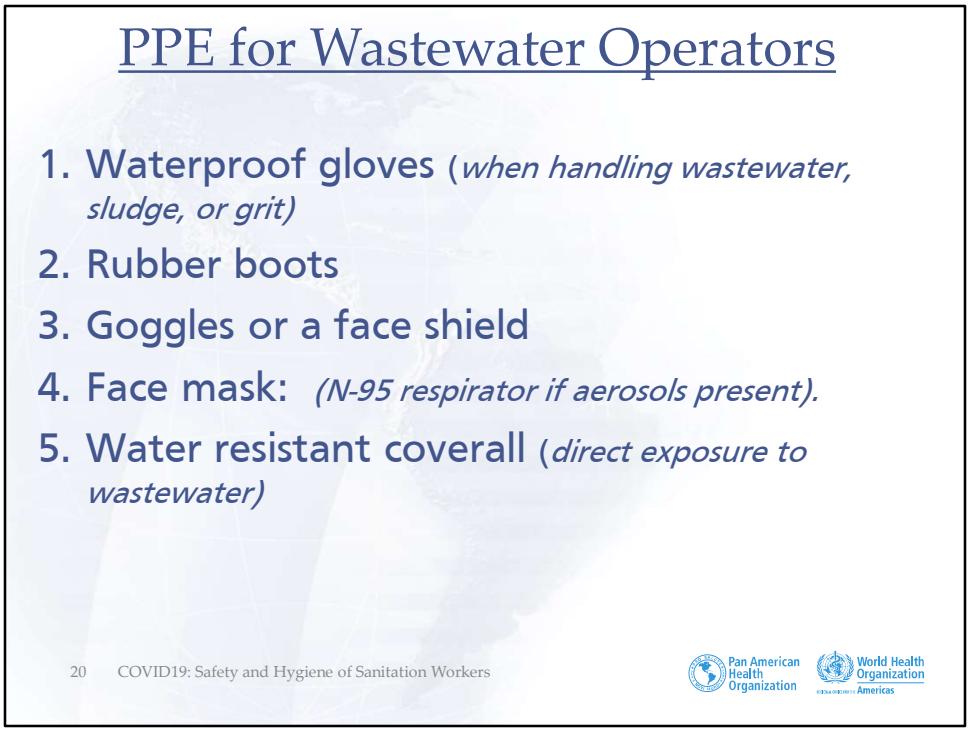
The bathroom floor drains with dried-up U-traps provided a pathway through which residents came into contact with small droplets containing viruses from the flushed sewage. These droplets entered the bathroom floor drain through negative pressure generated by exhaust fans when the bathroom was being used with the door closed. Water vapour generated during a shower, and the moist conditions of the bathroom, could also have facilitated the formation of water droplets. The likelihood of exposure was enhanced by the small dimensions of the bathroom units (about 3.5 square metres). Virus- contaminated droplets could readily have been deposited on floor mats, towels, toiletries and other bathroom equipment.

The possibility of disease transmission by other routes—airborne, water-borne, infected dust aerosols—has been examined but there is neither epidemiological nor laboratory support for such mechanisms. (Ref 3)

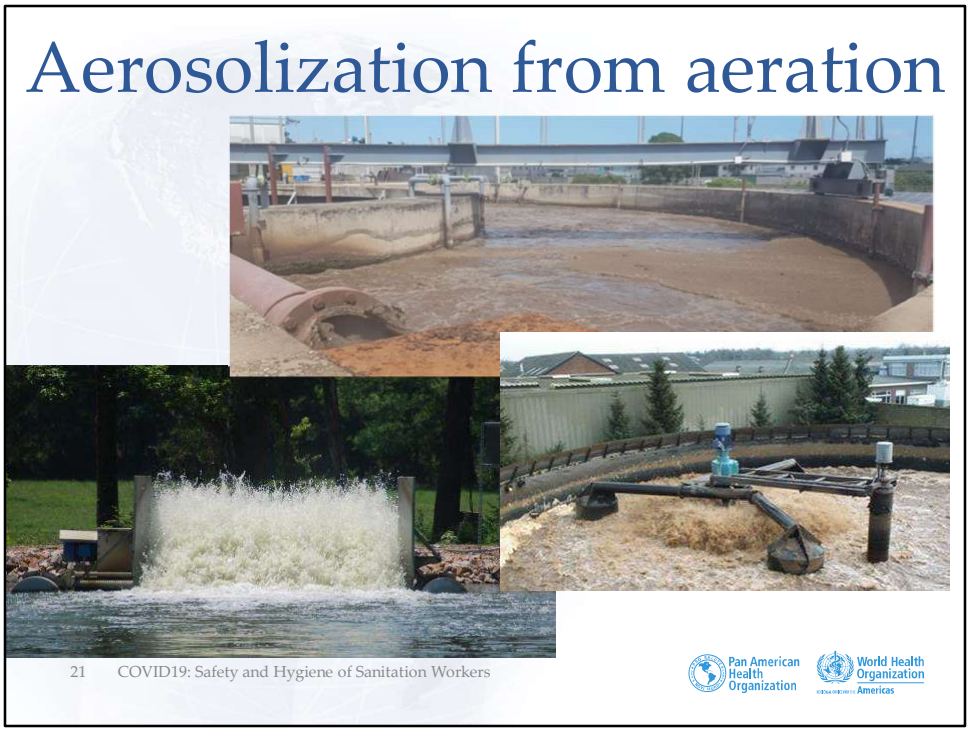
Best practices for protecting the health of sanitation workers include:

1. Adjust personal/professional behavior reducing or avoiding possible contact with wastewater, solid waste, droplets, splashes, aerosols and

2. Use appropriate PPE specially to protect broken skin (wounds), and mucous membranes (eyes, nose, mouth).



Waterproof gloves when cleaning pumps or screens and when handling wastewater, sludge, or grit.
Rubber boots,
Goggles or a face shield
Face mask;
If undertaking cleaning processes that generate aerosols, use an approved N-95 respirator.
In case of aerosolization at aeration chambers, especially surface aerators, rotors, brushes, etc
Water resistant coverall in case of direct exposure to wastewater in wet wells, sewer mains, etc. etc.

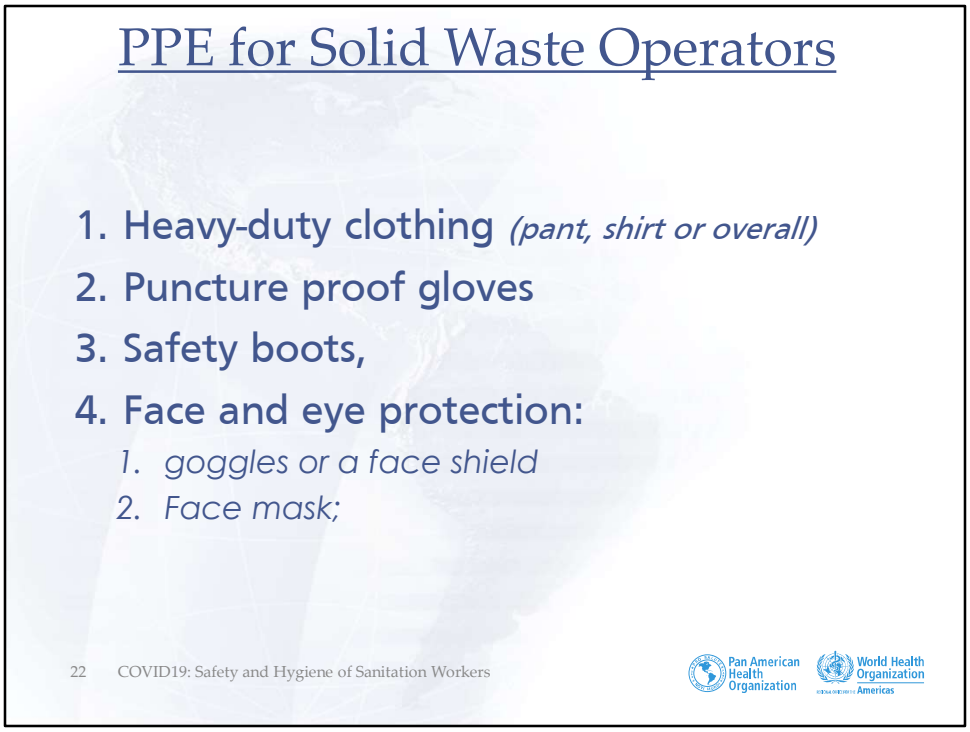


Aeration of wastewater will cause aerosols especially surface aerators, like rotors and brushes.

This creates an occupational risk as well as a public health risks to nearby communities
Design aspects must reduce these risks.

Precautions must be taken to reduce spread of these aerosol to nearby communities, like closed fencing, hedges

Although the risk of COVID-19 is very small, due to dilution, and die-off of SARS-CoV-19



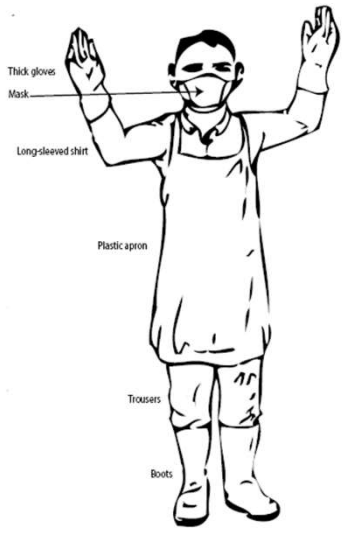
Solid waste workers require several sets of

1. Heavy-duty clothing (pant, shirt or overall, preferably with company logo and employee name and reflectors)
2. Puncture proof gloves (there are many sharp object in waste offered, including sharps from insulin injection)
3. Safety boots,
4. Face and eye protection:
    - goggles or a face shield
    - Face mask;

Request public to use double plastic bags, the first tied-up in a second tied bag, before offering for collection during community transmission phase of COVID-19

PPE for Handlers of Health Care Waste

1. Heavy Duty Gloves
2. Face mask
3. Long-Sleeved Shirt
4. Plastic Apron
5. Durable Trousers
6. Rubber Boots
7. Goggle/Face Shield
   (if splashes possible)



23 COVID19: Safety and Hygiene of Sanitation Workers

Pan American Health Organization | World Health Organization Americas

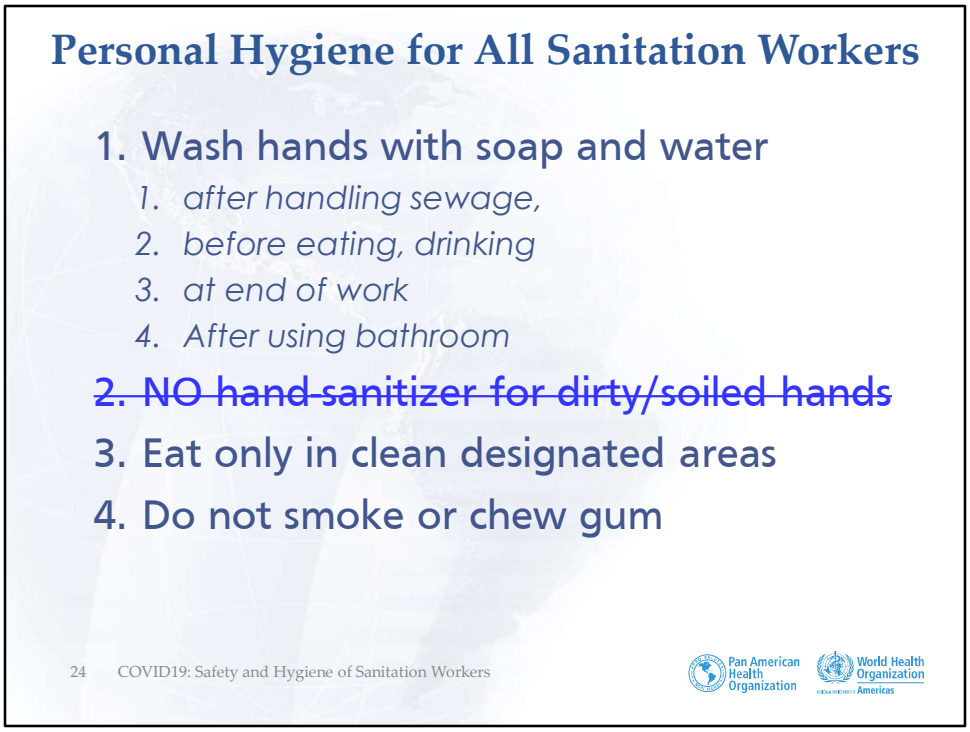
All those who handle health care waste should wear appropriate PPE (that is, boots, long-sleeved gown, heavy-duty gloves, mask, and goggles or a face shield (if splashes are possible, eg mopping up excreta) and perform hand hygiene after removing it.

Infectious waste volume during the COVID 19 outbreak will increase, especially with used PPE.

It is important to increase capacity to manage this extra health care waste.

Additional waste treatment/destruction capacity like autoclaving or through high temperature burn incinerators, may need to be put into operation.

For more information refer to the WHO guidance, *Safe management of wastes from health-care activities:* https://www.who.int/water_sanitation_health/publications/wastemanag/en/



Wash hands and skin that have been exposed to waste with soap and water immediately after handling sewage, or any materials that have been in contact with sewage.

Wash hands well with clean water and soap before eating, drinking and at end of work.

Do not use hand-sanitizer for dirty/soiled hands)

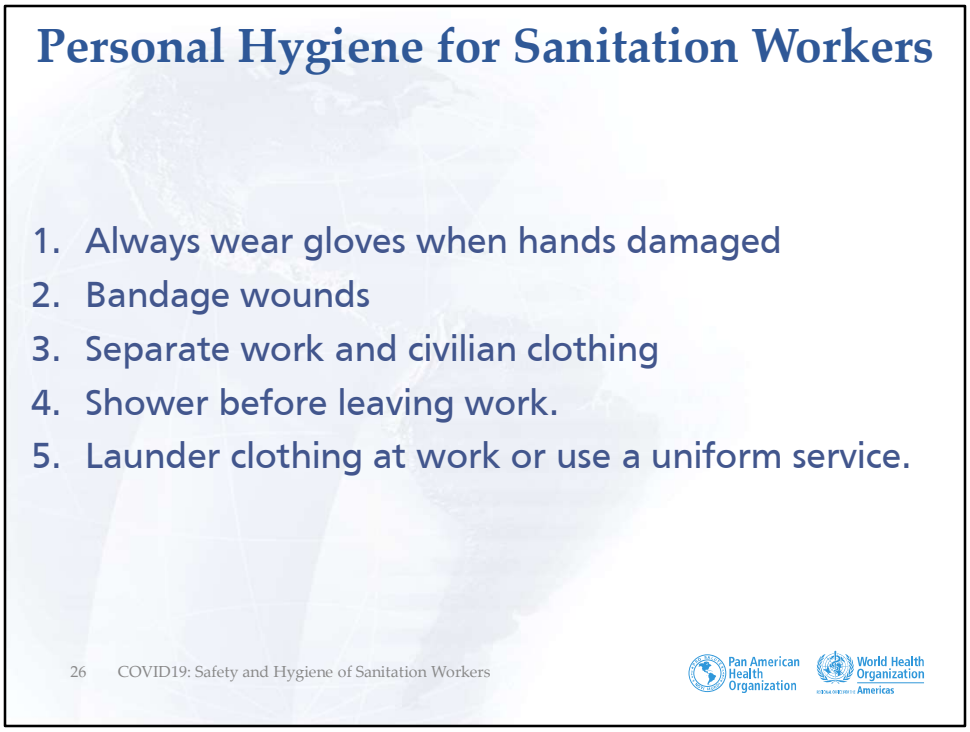
Eat only in clean designated areas away from wastes, aerosols, foul air.

Do not smoke or chew gum while handling wastes or any materials that have been in contact with human wastes.

Avoid touching face, mouth, eyes, nose, or open sores and cuts while at work, handling wastes, or any materials that have been in contact with wastes.

Do not touch nose, mouth, eyes, or ears anyway, unless you have just washed your hands .

Keep your fingernails short; use a stiff soapy brush to clean under nails.



Always wear gloves when hands are chapped or burned or having a rash or a cut.
Importantly, the use of gloves does not replace the need for appropriate hand hygiene, which should be performed frequently;
Also don't touch eyes, nose and mouth with gloves on.;

Cover open sores, cuts, and wounds with clean, dry bandages

Shower and change out of work clothes before leaving work in designated area whit separation of civilian cloth and work clothing

Keep soiled work clothes separate from civilian clothes. Launder clothing at work or contract a uniform service.

Report any injury or illness you think you got from work right away.

Inform your doctor if you think you got sick during work at wastewater treatment plant, it will give important information for potential diagnosis.

Regular (annual, preferably twice annual) medical check-ups, including stool testing.

Vaccination recommendations (in consultation with local health authorities.):
Tetanus, diphtheria, Hepatitis A & B, typhoid fever

Janitorial services at home, office, hotels

environments without COVID patients

Clean frequently touched objects and surfaces with a recognized cleaning spray or wipe (surfactant (soap) + disinfectant (e.g. Chlorine))

1. All door handles and push plates (incl. bathrooms)
2. staircase and stairwell railing
3. taps, faucets, water dispensers
4. Toilet Flush Buttons
5. office desktop surfaces
6. light switches, telephones, dial pads and speaker horn, computer keypads, mouse (rubbing alcohol or glass cleaner)
7. cleaning shared electronic equipment, office printers, light switches (rubbing alcohol or glass cleaner)

Pan American Health Organization | World Health Organization Americas

Spray cleaning agent onto the cloth, not directly onto the electrical appliance as moisture or excess liquid can damage and short-circuit electronics inside.

Using a small amount of rubbing alcohol or glass cleaner on a lint-free cloth.

When cleaning toilet, flush toilet with lid down.

No need for PPE, except if chemical being used have occupational risk (e.g. a chlorin solution will affect skin, thus wear gloves)

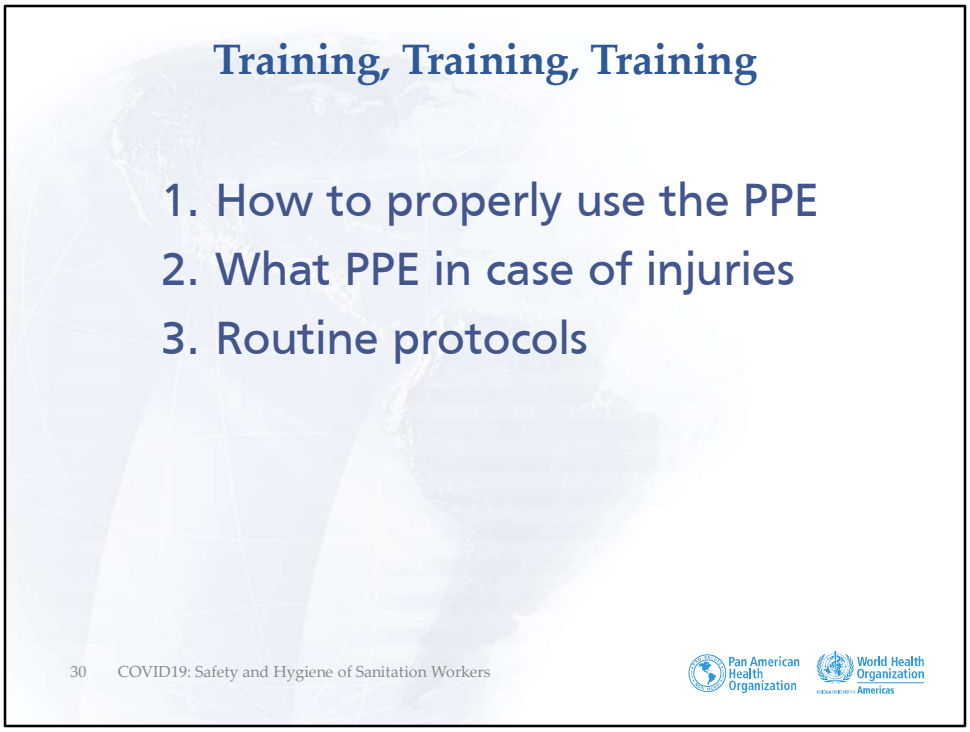
After cleaning with detergent and water, a disinfectant solution should be used: of either 0.1% Chlorine or 62-70% alcohol Solution (2 parts alcohol(100%) – 1 part water)

Adopt a healthy lifestyle increasing the natural immunity and strengthening the body to fight a disease and thus the extent and severity of the symptoms.

Healthy food, regular physical exercise, no smoking, moderate alcohol use, safe driving, etc.

Positive thinking: anxieties will reduce resistance and immunity;

Be selective in your social media messaging, conduct fear avoidance

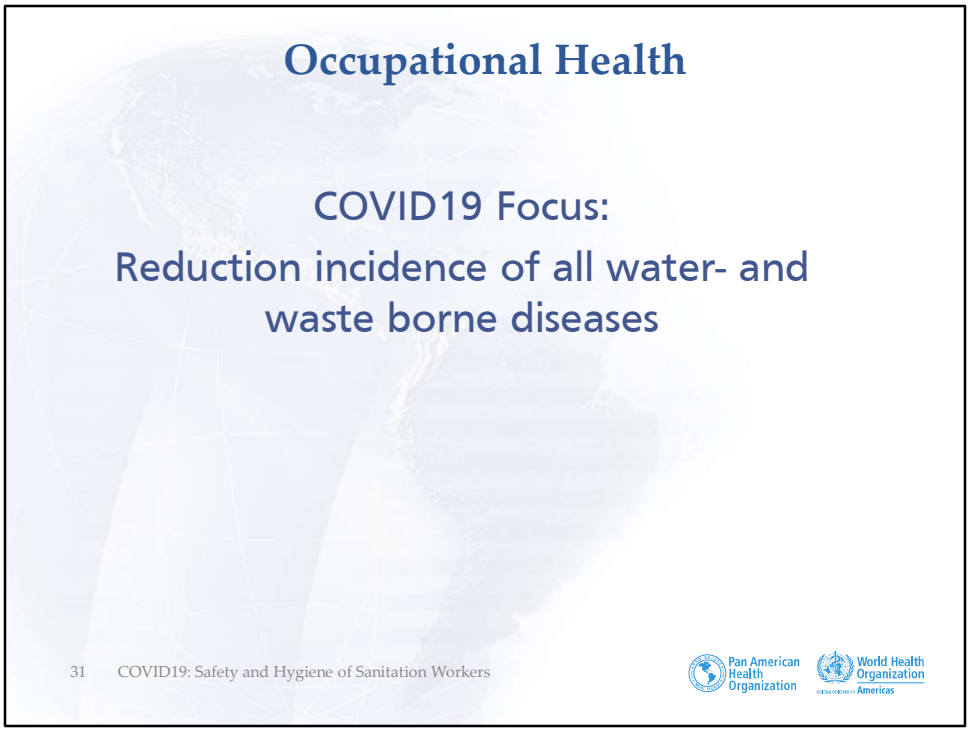


Ensure that workers are educated and trained in:

What PPE to use to protect broken skin and mucous membranes and

How to properly use the PPE, including how to put it on and take it off (donning and doffing)

Develop and fully implement routine protocols that ensure workers are protected against potential exposures (i.e., prevent contact with broken skin, eyes, nose or mouth) when handling untreated sewage.



Applying these preventive and protective measures will significantly reduce the incidence of all water- and waste borne diseases to which sanitation workers are exposed and reduce the occupational health risk to anybody who works with wastewater.

References

Ref 1: Water, sanitation, hygiene and waste management for the COVID-19 virus, WHO, Technical Brief, 19 March 2020;
https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19

Ref 2: The COVID-19 Risk Communication Package For Healthcare Facilities, WHO 10 march 2020
https://iris.wpro.who.int/bitstream/handle/10665.1/14482/COVID-19-022020.pdf

Ref 3: The SARS epidemic in Hong Kong: what lessons have we learned? Lee Shiu Hung
J R Soc Med 2003;96:374–378
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC539564/

Ref 4: Biological Hazards in Sewage and Wastewater Treatment Plants, CPWR;
https://www.cpwr.com/sites/default/files/publications/hazsludge.pdf

Ref 5: Safe Management of Wastes from Health-care Activities, WHO, 2014
https://apps.who.int/medicinedocs/documents/s21552en/s21552en.pdf

Ref 6: OSHA Control and Prevention:
https://www.osha.gov/SLTC/covid-19/controlprevention.html

Ref 7: Novel coronavirus found in wastewater https://www.rivm.nl/en/news/novel-coronavirus-found-in-wastewater

Ref 8: What we learn about the Corona virus through waste water research
https://www.kwrwater.nl/en/actueel/what-can-we-learn-about-the-corona-virus-through-waste-water-research/

Pan American Health Organization | World Health Organization Americas