



## COVID-19 sampling field station deployment.

**Created:** Feb 09, 2021; **Last modified:** Feb 19, 2021 **Version:** 1.0

This document describes the layout and procedures involved in the collection of respiratory specimens from COVID-19 suspected subjects in field stations. These procedures are based on those recommended for work with suspected cases of influenza-like illness (ILI) as set out by both the Centers for Disease Control & Prevention (CDC) as well as based in part on the interim guidance on laboratory testing for Middle East Respiratory Syndrome (MERS) coronavirus set forth by the World Health Organization (WHO).

### Personal protective equipment (PPE)

CDC interim guidelines for the work with risk group 3 agents should be followed for the recollection of nasopharyngeal swab samples (or other respiratory samples) from COVID-19 suspected patients or general population in the case of community sampling.

COVID-19 field stations should make use of three different types of healthcare workers: a **sampler**, a **helper** and a **data-collector**.

The **sampler** is involved in direct contact with the subject to be sampled (less than 2-meter distance) for the collection of respiratory specimens. The sampler is equipped with Personal Protective Equipment (PPE) offering the highest biological protection. The PPE employed by samplers should include surgical scrubs, Tyvek™ (or other gas-permeable/liquid-impermeable hooded coverall), neoprene boots, full face-piece Respirator (FFPR) or a Powered Air Purifying Respirator (PAPR's) if available. Gloves should be worn and taped to coverall (to facilitate decontamination after sampling).

Both the **helpers** and **data-collectors** not involved in direct contact with COVID-19 or ILI suspected patients, those working at more than 2 meters from suspected cases and those **ONLY** involved in handling respiratory specimen vials after being collected by sampler should use BSL2 PPE including, disposable gown (or coverall if available), N95 respirators, eye protection (goggles or face shield), gloves, and shoe covers (if neoprene boots not available).

Once CDC or WHO lowers the biological risk group of SARS-CoV2 to BSL2, the sampler may also make use of less stringent PPE such as that described above for the helpers and data-collectors.

Healthcare workers using N95 respirators must previously have had to be certified in their correct donning and use, preferably according to the "*N95 respirator fit test and assessment form*" protocol available from [www.genomica.uaslp.mx/Protocolos/Biosaf\\_N95\\_Fit\\_Test.pdf](http://www.genomica.uaslp.mx/Protocolos/Biosaf_N95_Fit_Test.pdf).



BSL2 Personal Protective Equipment being worn by COVID-19 station helpers



BSL3 Personal Protective Equipment being worn by COVID-19 station samplers

### Donning of BSL2 PPE (sampler)

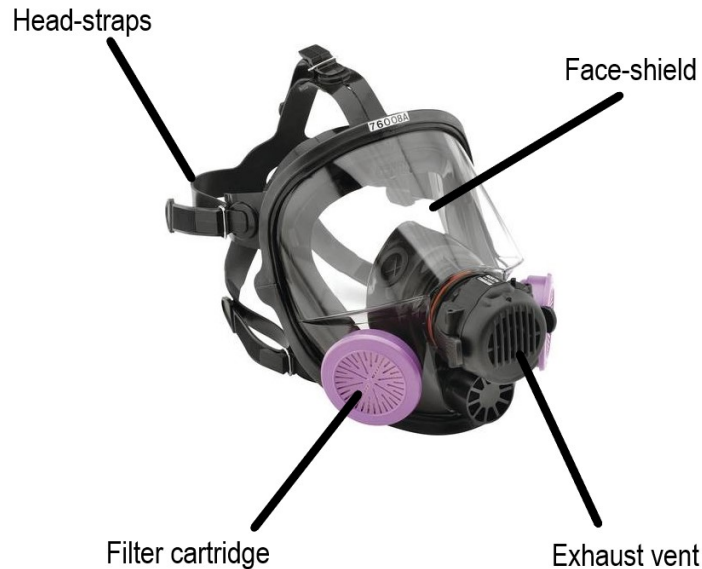
1. Change normal clothing for surgical scrubs.
2. Lay corresponding Tyvek coverall over large table and inspect for wear and tear.
3. Open de the coverall zipper and lay it over chair that is to be used for donning gear.
4. Place neoprene or rubber boots nearby the donning chair.
5. Remove normal shoes.
6. Sit over open coverall and VERY CAREFULLY insert legs.
7. Place rubber boots on and cover with coverall leg sleeve OVER BOOTS.
8. Stand-up and place arms inside coverall sleeves, place hood over the head and close the zipper.
9. Wear nitrile or latex gloves as indicated.
10. Ask for help in placing gloves over folded cuff and for taping them off to coverall.
11. Place plastic apron on (if indicated).
12. Place corresponding respiratory and eye protection (see below for either PAPR or FFPR).

## Donning of Power Air Purifying Respirator (PAPR)



1. Remove PAPR hood, blower, battery and corrugated hose from box.
2. Inspect for integrity and clean with 70% ethanol, especially inside of face-shield.
3. Check battery level and place battery pack on motor blower.
4. Place motor blower belt and adjust fit.
5. Connect corrugated hose to motor blower and turn blower on, check for air-flow.
6. Place PAPR hood on and adjust head belt.
7. Adjust collar elastic and extend breast and back flaps of hood.
8. Connect the corrugated hose to PAPR hood and ensure air-flow.
9. Ask for help in checking placement and integrity of PAPR hood.

## Donning of filter-cartridge Full Face-Piece Respirator (FFPR).



1. Remove FFPR from 3M bag and box.
2. Inspect for integrity and clean with 70% ethanol, especially inside of face-shield.
3. Fully extend FFPR head-straps and move clear out of the way of face seal.
4. Place FFPR against face taking caution to cover the forehead part of coverall hood.
5. Have a helper pull back on the straps to tighten fit.
6. FFPR should provide a snug fit and perfect seal around face but not pain.
7. Remove cartridge filters, place gloved hands above filter ports and verify seal by asking wearer to breath in. If properly fitted the wearer should encounter resistance to air flow.
8. Verify exhaust valve function by asking wearer to exhale.
9. Replace filter cartridges.

## Field station layout

The field station where nasopharyngeal swabs or any other type of respiratory specimen is to be collected in a community setting must be located as far away from other sampling stations as possible and closed off from surrounding traffic and/or free access by the community.

One way transit routes leading into and out of this area should be clearly defined maintained separate from each other.

Field station should be equipped with a plastic washable table large enough to place sample collection material, decontamination gear and laptop for data collection (**general work area**).

Two patient sampling chairs should be made available, each fitted with tissue wipes for patient use after sampling. These chairs should not be used by healthcare workers for rest.

Additional chairs for healthcare workers should also be made available, these are not to be used for patients.



The **general work-area** should be equipped with a chair for the person involved in sample tracking, an icebox for the transport of viral transport media tubes or samples, all the necessary decontamination material (tissue paper and spray bottles) as well as all specimen recollection material (sterile swabs, gloves and tube-racks).

A plastic biological waste bag should be placed near the sampling station, preferably in the vicinity of the patient chairs. All material coming into contact with the patient should be placed in this bag.



The field station is divided into 1) a **patient sampling area** (two foldable camping chairs shown on the left of the picture above, and 2) **general work-area** (foldable plastic table shown on the right).



The **patient sampling area** should be provided with two chairs, a pair of tissue wipes made available for each patient to be sampled as well as a biological waste bin liner.

## Respiratory specimen collection

The proper collection of respiratory specimens is the most crucial step towards achieving a correct laboratory diagnosis of COVID-19. A specimen collected incorrectly can lead to false negative or aberrant test results. CDC specimen collection guidelines applicable to respiratory viruses in general have been taken as the basis for these recommendations.

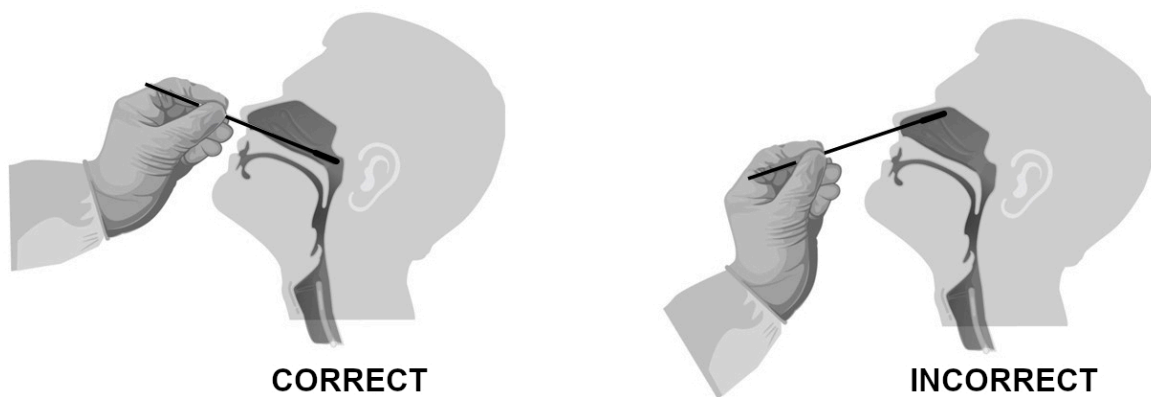
For SARS-CoV-2 diagnostic testing the CDC recommends collecting an upper respiratory specimen. A small amount (1 to 2 mL) of saliva (not sputum) is first collected by the suspected patient without intervention from healthcare worker into the 15 mL conical tube containing 2 mL of viral transport medium (VTM). **THE PATIENT SHOULD BE CLEARLY INSTRUCTED NOT TO DRINK THE VTM!**

After collecting the saliva sample, the trained sampler is to employ a sterile synthetic swab to collect nasopharyngeal (NP) specimens.

Nasopharyngeal swab specimens should be immediately placed in the same conical tube holding the saliva sample.

VTM is prepared using RPMI-1640 + 16% Glycerol or Amies transport medium, phosphate buffered saline, or sterile saline for transport.

Nasopharyngeal swab specimens are collected by tilting the patients head back as far as comfortable for patient. Slowly, gently and talking to the patient during the procedure, insert the swab through the nostril following the floor of the nose.



Slight resistance may be felt halfway through the nose while passing the swab tip through the inferior turbinate, a gentle rotation of the swab normally allows further travel until the swab is fully introduced (typically measured as the distance from the nostril to the ear).



Once fully introduced, the swab should be rotated 4 times to absorb secretions. After this, remove the swab slowly while rotating it to facilitate passage through inferior turbinate on the way out.

Due note that in some persons nasal septum deviations can create difficulty in introducing the swab, it is recommended to try the other nostril with the same swab if this is the case.

Store respiratory specimens at 2-8°C for up to 72 hours after collection (although WHO suggest time spans of up to 5 days), preferably refer to diagnostic laboratory within the first 6 hours for optimal performance.

If a delay in testing or shipping is expected (greater than 72 hours according to CDC or greater than 5 days according to WHO recommendations), store specimens at -70°C (dry ice or ultra-low freezers).







## COVID-19 Sampling Material Checklists

All specified quantities relate to a four-member crew (sampler, data logger, helper and patient liaison)

### PPE checklist

Quantity	Item	Check
4	Tyvek coveralls, with hood.	<input type="checkbox"/>
4	Surgical scrubs.	<input type="checkbox"/>
2	Plastic aprons (only sampler + extra).	<input type="checkbox"/>
4	Boots, neoprene pairs.	<input type="checkbox"/>
2	PAPR hoods, air-hose, blower motor and battery (only sampler + extra).	<input type="checkbox"/>
2	Whole-face respirators with 2 P100 filter cartridges each (optional to PAPRs).	<input type="checkbox"/>
1	Box of large sized nitrile gloves.	<input type="checkbox"/>
1	Box of medium sized nitrile gloves	<input type="checkbox"/>
1	Box of small sized nitrile gloves	<input type="checkbox"/>
1	Roll of 2" wide adhesive duct-tape	<input type="checkbox"/>
1	Blunt scissors for cutting adhesive tape	<input type="checkbox"/>
4	N95 respirators (2 for each, data-logger and patient liaison).	<input type="checkbox"/>
4	Pair of shoe covers (only if necessary or if boots not available).	<input type="checkbox"/>
4	Health worker name tags	<input type="checkbox"/>
4	Plastic zip-Lok bags for mobile phones.	

### Biological safety, clean-up and decontamination checklist

Quantity	Item	Check
1	Police-line "Caution" tape	<input type="checkbox"/>
10	Wind-direction flags	<input type="checkbox"/>
2	Pack of tissue wipes	<input type="checkbox"/>
1	Cleaning cloth	<input type="checkbox"/>
2	70% Ethanol spray bottles	<input type="checkbox"/>
1	0.1% NaOCl decontamination spray bottle or spray back-pack	<input type="checkbox"/>
1	Biological waste bag or bin liner	<input type="checkbox"/>
1	Germicidal alcohol-rub bottle	<input type="checkbox"/>





## Specimen collection checklist

Quantities may vary according to the number of samples to be collected.

Quantity	Item	Check
Variable	15 mL conical tubes with 2 ml of Viral Transport Media (RPMI-1640+16% Glycerol)	<input type="checkbox"/>
Variable	Plastic/cotton nasal swabs, pack of 3, sterile, 15 cm long	<input type="checkbox"/>
3	Polystyrene 15 mL conical tube racks, for 40 tubes each.	<input type="checkbox"/>
Variable	Polystyrene ice box with cover	<input type="checkbox"/>
Variable	Cold packs	<input type="checkbox"/>
1	Pack of tissue wipes	<input type="checkbox"/>
4	Foldable field-station camping chairs	<input type="checkbox"/>
1	Foldable 75 cm x 200 cm plastic camping table	<input type="checkbox"/>
3	Permanent felt-tip marker (fine and normal tip)	<input type="checkbox"/>
1	Field notebook or block of recycled paper for field notes	<input type="checkbox"/>
1	Plastic clipboard (compatible with decontamination solution)	<input type="checkbox"/>
3	Sheets of sample ID stickers or blank pre-cut stickers for vial labelling	<input type="checkbox"/>
1	Sample list form	<input type="checkbox"/>
1	Informed consent forms	<input type="checkbox"/>

## Notes

Space left intentionally for field notes, debriefing, etc.





## References

1. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens for COVID-19. Updated Jan. 6, 2021. Centers for Disease Control and Prevention.  
<https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html#collecting>
2. Nasopharyngeal (NP) Specimen Collection Steps infographic, Centers for Disease Control and Prevention.  
[https://www.cdc.gov/coronavirus/2019-ncov/downloads/lab/NP\\_Specimen\\_Collection\\_Infographic\\_FINAL\\_508.pdf](https://www.cdc.gov/coronavirus/2019-ncov/downloads/lab/NP_Specimen_Collection_Infographic_FINAL_508.pdf)
3. Laboratory testing for coronavirus disease (COVID-19) in suspected human cases. Interim guidance 19 March 2020. World Health Organization 2020.  
<https://apps.who.int/iris/rest/bitstreams/1272454/retrieve>

## Revision history

- 1.0 Original document.

