



Our testing services to fight  
against the spread of  
COVID-19

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[www.ET.eurofinsca.com](http://www.ET.eurofinsca.com)

 eurofins

EnvironeX

# Launch of Eurofins COVID-19 Sentinel™

As the world moves toward the “new normal,” proactive solutions to protect the safety of employees, customers, and their families is undoubtedly a top priority.



The Eurofins SAFER@WORK program is designed to support in implementing the appropriate risk management protocols to help keep your business free of COVID-19.

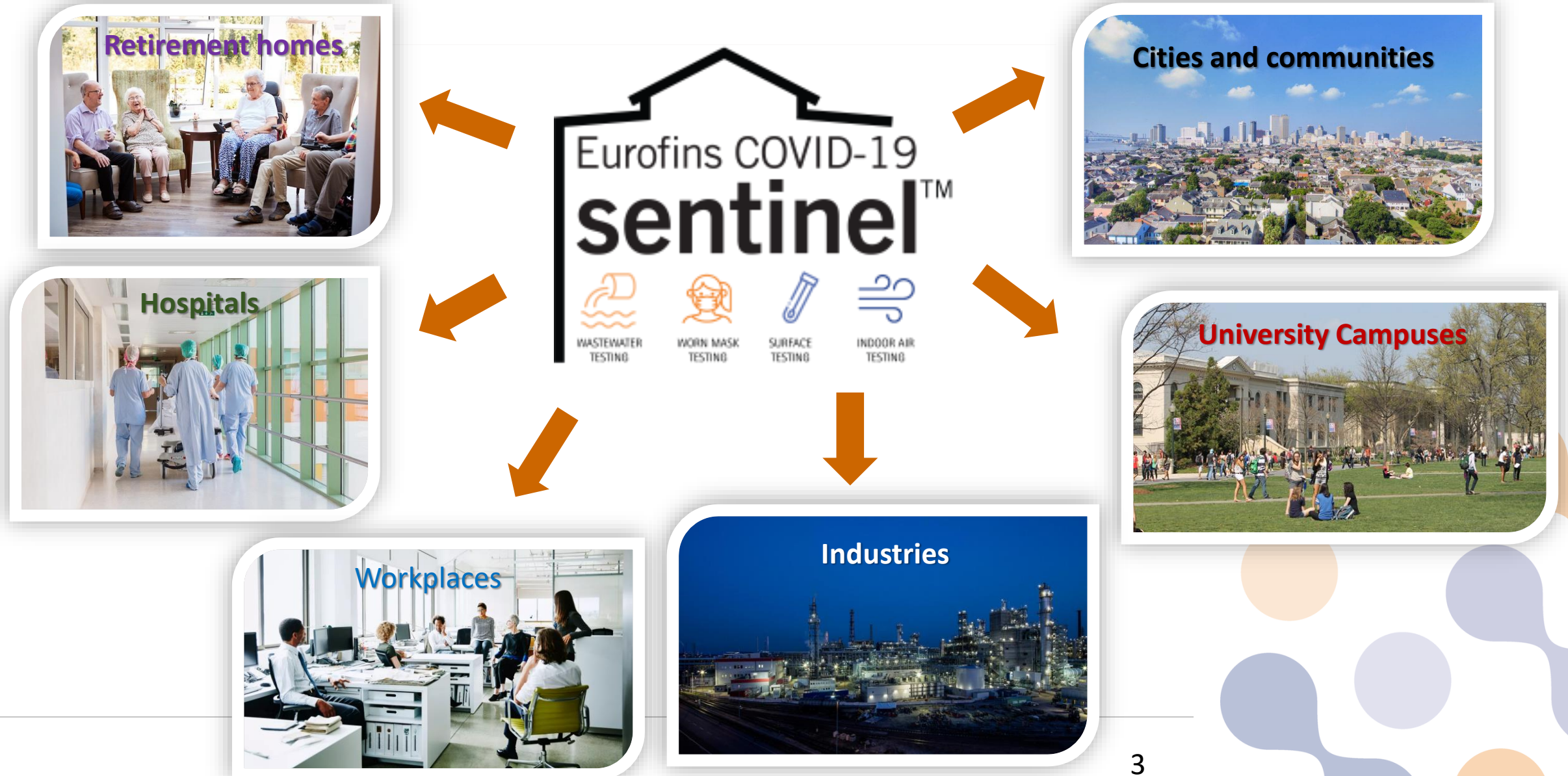
As part of this program, Eurofins is launching the Eurofins COVID-19 Sentinel™ offer. This offering includes a full range of analysis solutions, including:

- ✓ Workplace surface testing
- ✓ Wastewater testing
- ✓ Worn mask testing
- ✓ Air testing
- ✓ Test on humans
- ✓ Consulting services

Our customers must consider us as their trusted partner in protecting their employees during this time of a global pandemic.

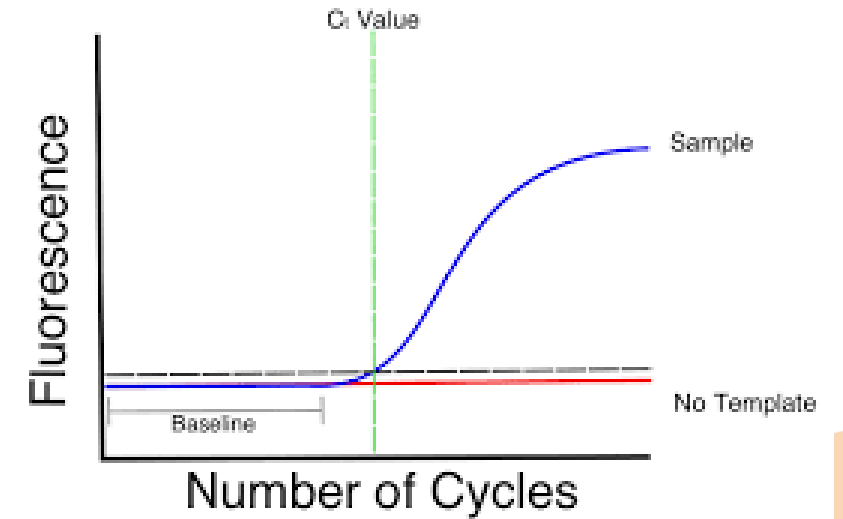
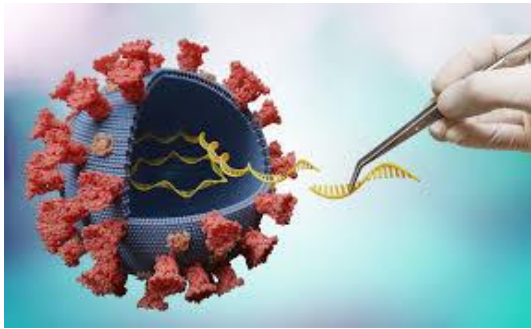


# Targets



# Method of analysis

## Virus Detection: Real-Time RT PCR



RNA<sub>sb</sub> → DNA → Amplification → Fluorescent signal → Results

# Method of analysis

## SARS-CoV-2 – VIRSeek Modular Approach

- Surface sampling similar to surface
- Use of a process control virus (MNV) to evaluate RNA extraction efficiency
- RNA-isolation using silica-based technology
- Subsequent analysis of the target virus using Real-Time RT-PCR technology



# Method of analysis

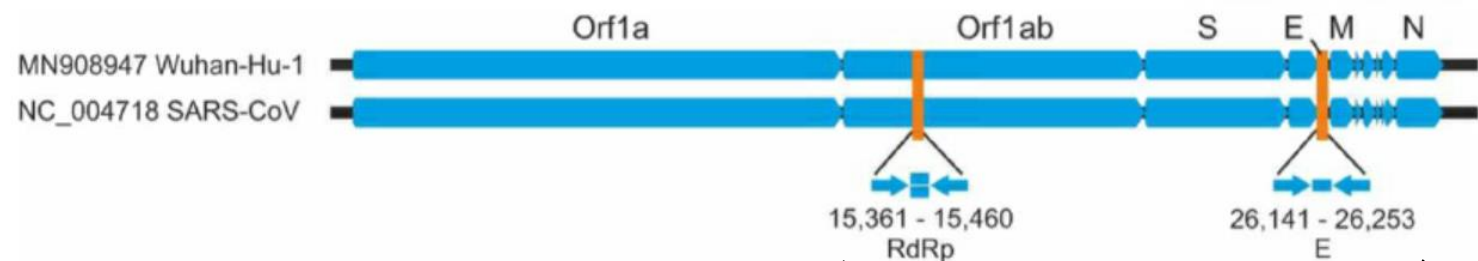
## Global Coronavirus / SARS-CoV-2 Testing

### Recommendations to test for two target gene on the SARS-Co-2 virus genome

- So far assay published mainly targeting
  - ORF1ab region (coding for RNA-dependent RNA polymerase, RdRP)
  - E-gene (coding for the envelope)
  - Or the N-genes (coding for the nucleocapsid)

#### VIRSeek SARS CoV-2 Ident

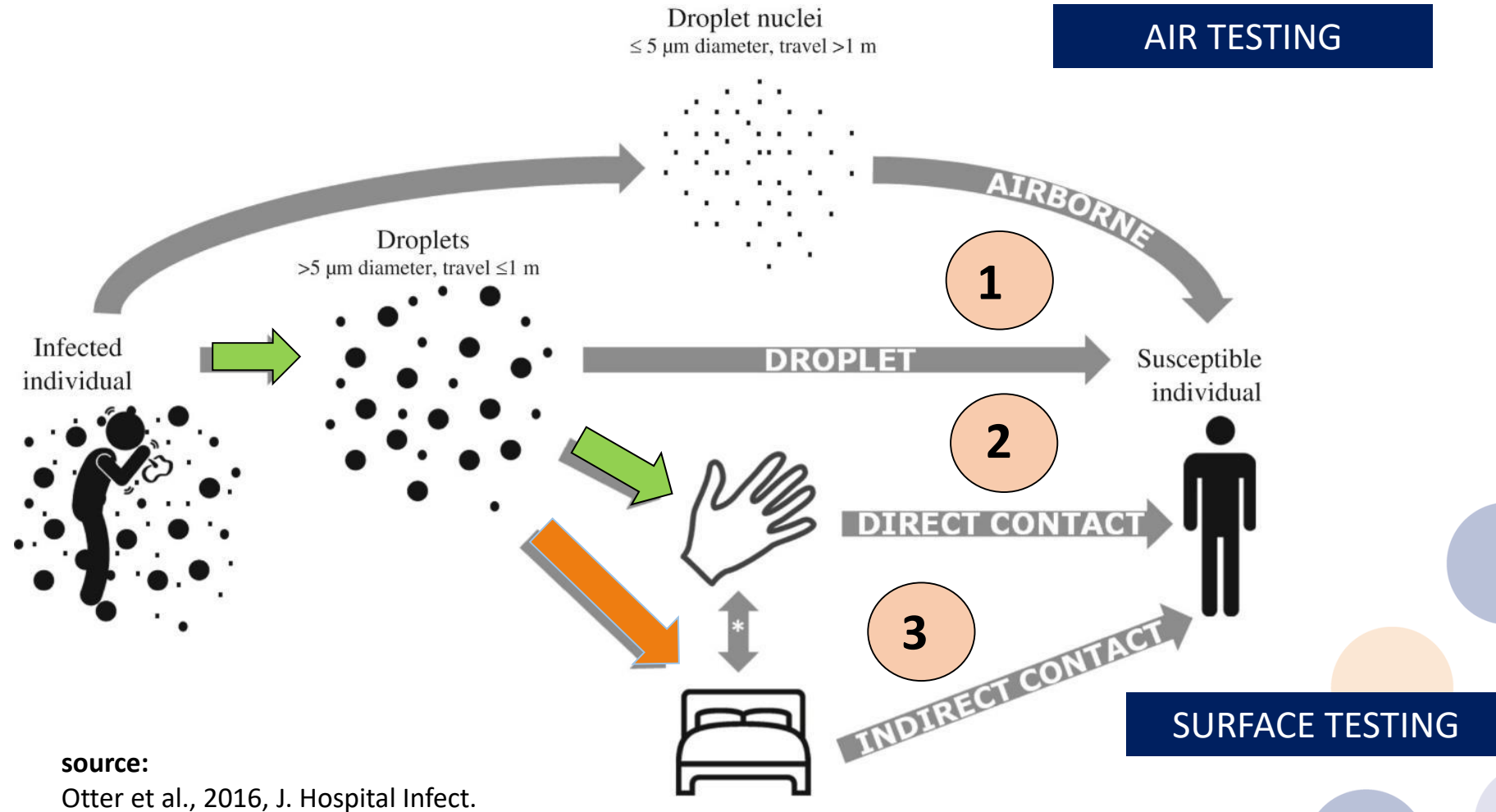
18.51 copies / reaction  
(13,71 – 23.32 copies / reaction)



Specific for SARS-CoV-2

Fully conserved SARS-related Coronaviruses (Screen test)

# SARS-CoV-2 transmission





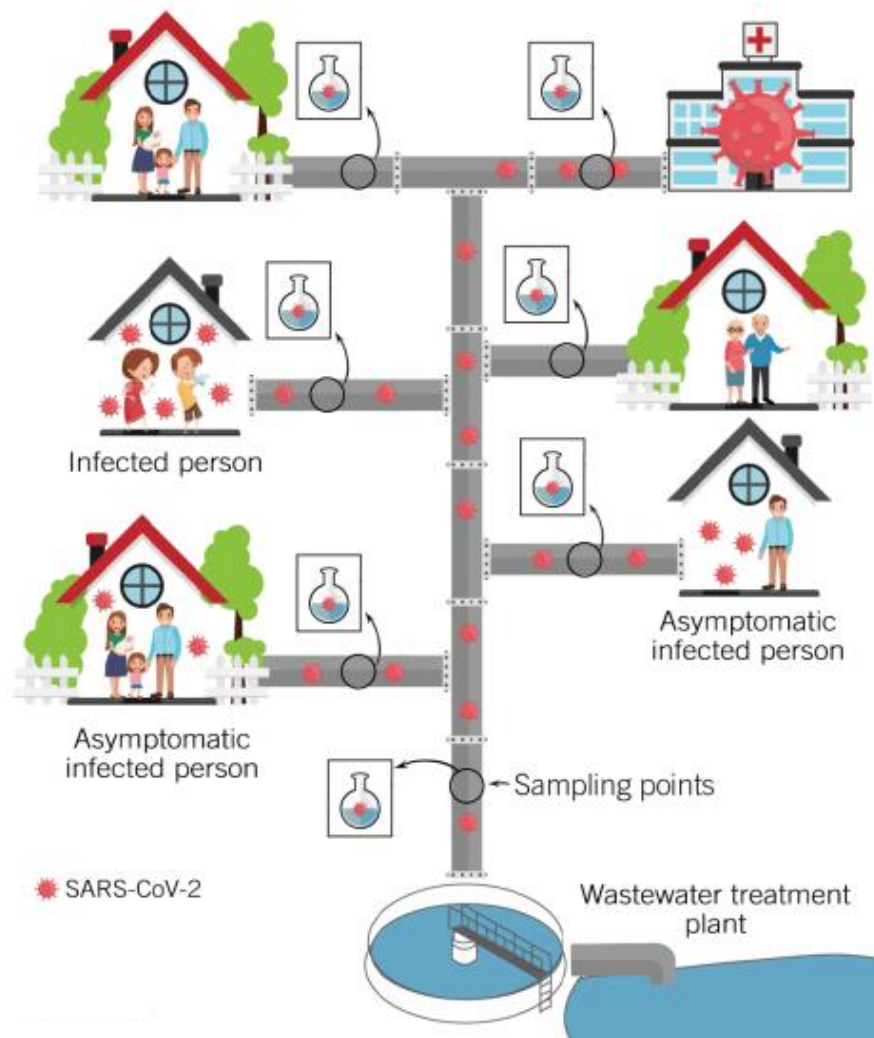


# Wastewater Testing

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# What is wastewater testing for SARS-CoV-2 ?



- The application of RT-PCR technology on prepared samples of wastewater streams to identify the absence/presence of SARS-CoV-2 along with semi-quantitative information that can provide relative viral load over time.
- Is highly sensitive – Studies have shown that 1 infected person out of a community of over 1000 persons is detectable.

# Why wastewater testing ?

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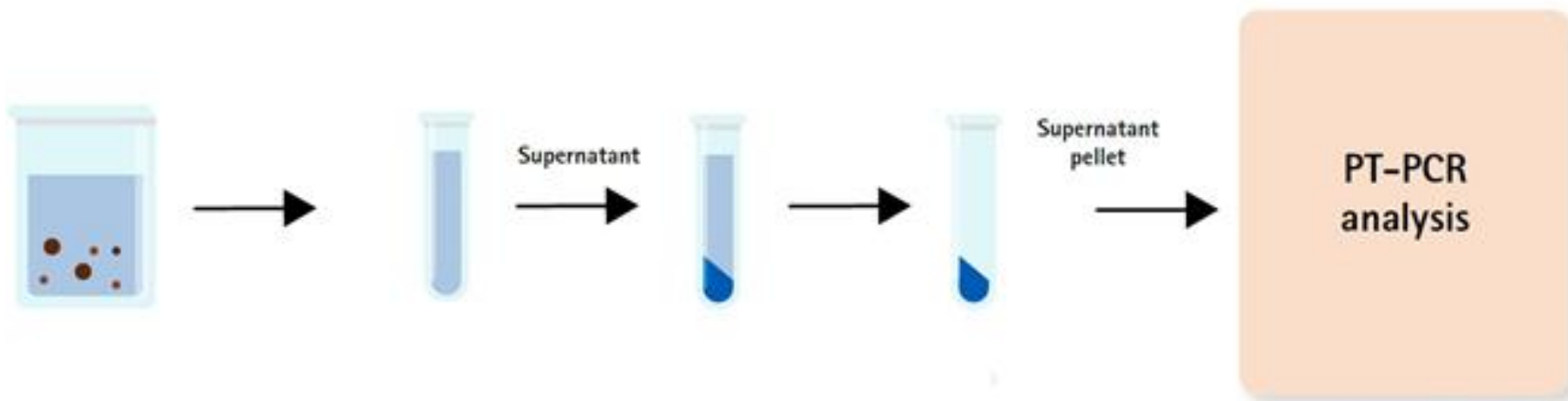
## **GROUP TESTING => WASTEWATER TESTING**

- Low cost alert system to quickly identify new outbreaks
- Full view of testing population
- Determine trends in current outbreaks and prevalence of infection
- Can identify infected population prior to symptoms

# Pretreatment

## Steps of pretreatment

- a) Sample split by centrifugation
- b) Virus precipitated from the supernatant by flocculation and centrifugation
- c) Fragments of the RNA extracted from pellets and analyzed by RT-PCR



# Results

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## **How are results reported?**

Detect/Not Detect and Ct Value (Semi-quantitative measurement).  
Quantitative results can also be provided in genomic unit/mL.

## **How soon will the results be available?**

Results will be reported within 2 working days from the samples arriving at the laboratory.

## **Are there requirements to inform the Government in the case of a positive?**

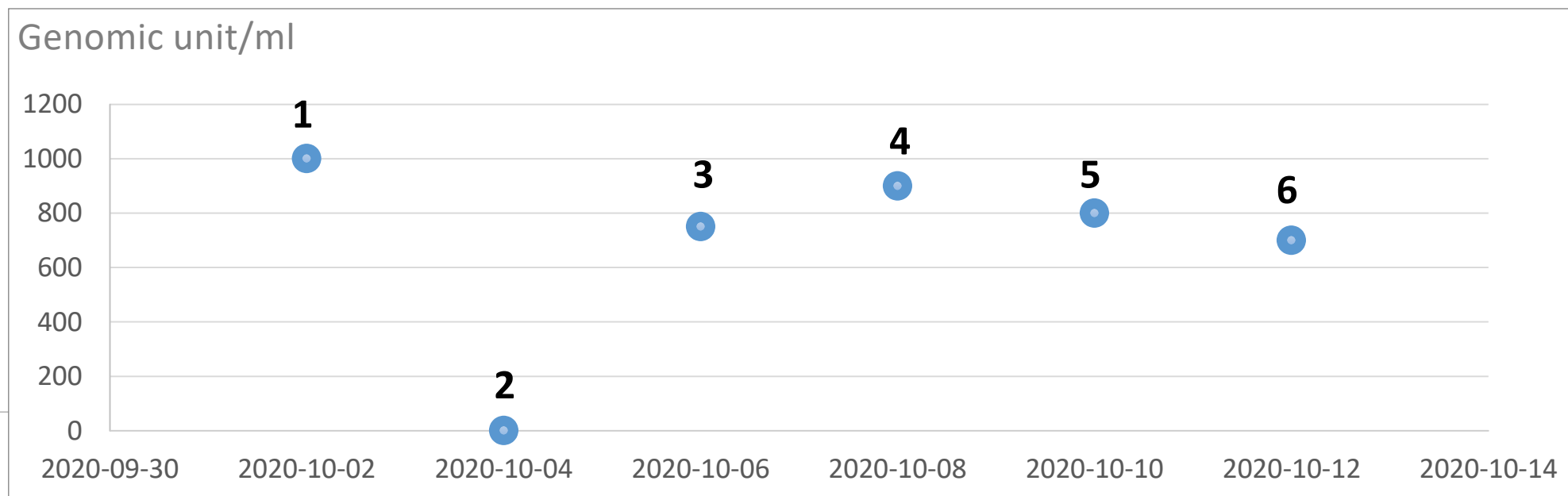
In the case of a positive result, our experts should support the client in defining the appropriate measures described under Eurofins SAFER@WORK™.



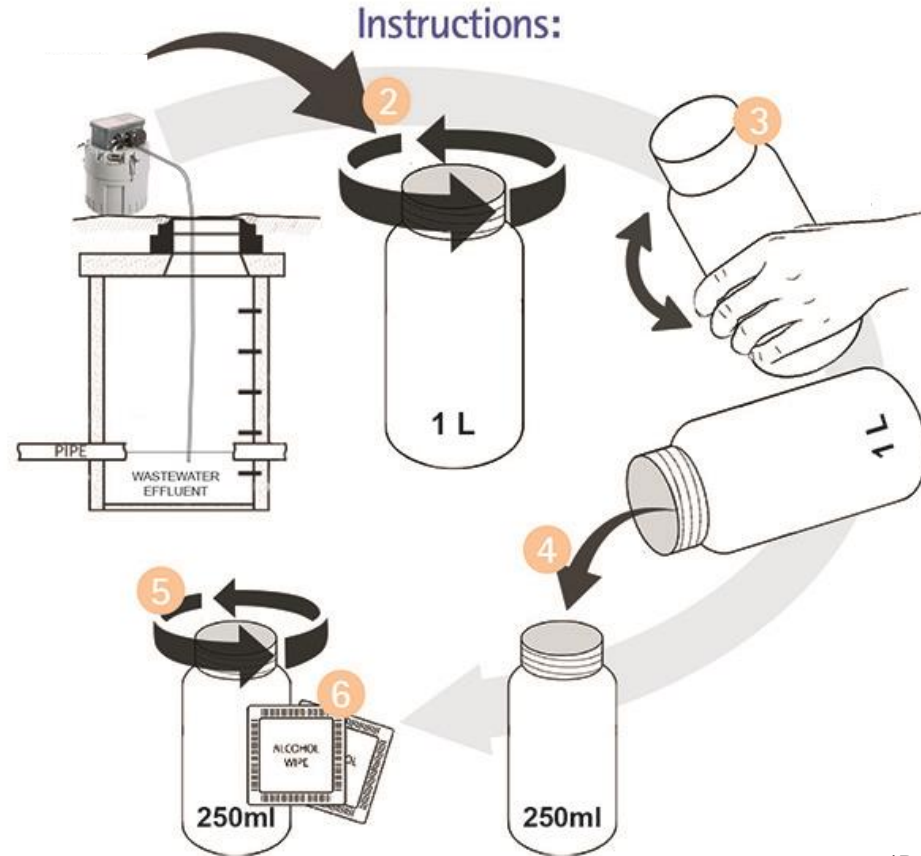


## Example of results interpretation

Example	Phase	Parameter	Results
1	water	genomic unit/mL SARS-Cov-2	1000
2	water	genomic unit/mL SARS-Cov-2	Non-detected
3	water	genomic unit/mL SARS-Cov-2	750
4	water	genomic unit/mL SARS-Cov-2	900
5	water	genomic unit/mL SARS-Cov-2	800
6	water	genomic unit/mL SARS-Cov-2	700



# Sampling protocol

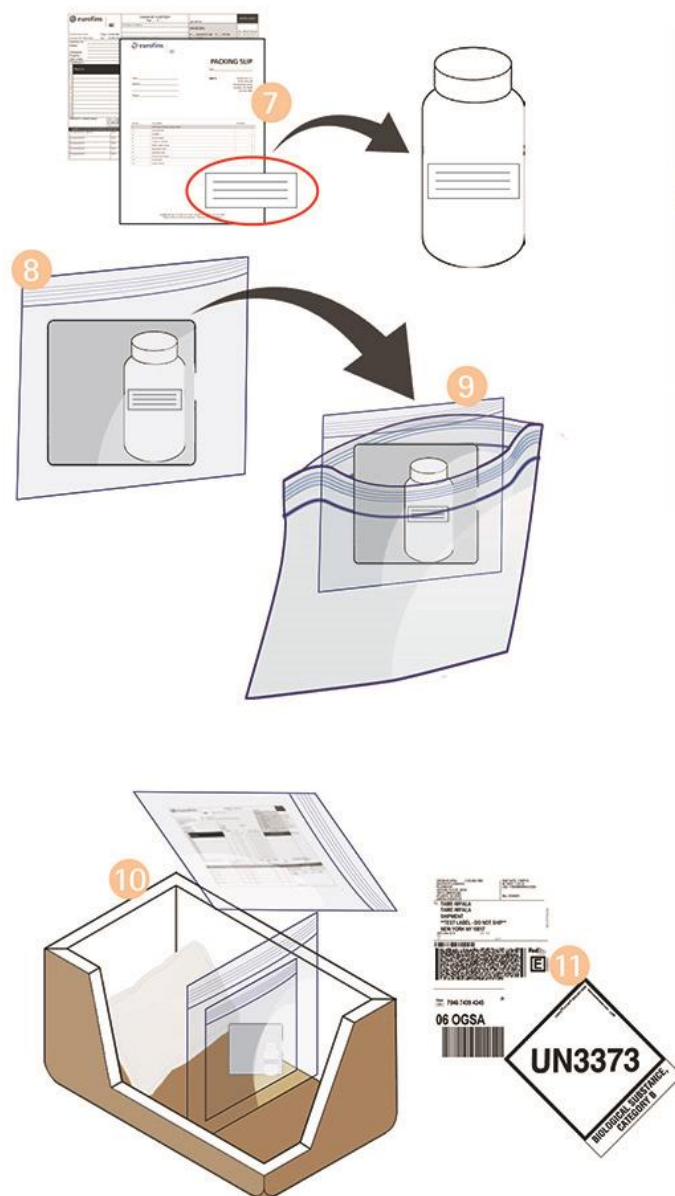


- 1 Upon receipt of the sampling kit, store the gel ice pack in freezer (if applicable.)
- 2 Collect a minimum 1 Liter composite sample of untreated wastewater over a recommended 24 hour period\*
- 3 Tightly close the container and shake well to mix.
- 4 Fill the supplied 250 ml sample container to the fill line. *Do not overfill container.*
- 5 Screw the bottle cap on tightly. Wrap parafilm around the cap and press tightly to secure.
- 6 Use an alcohol wipe to clean the outside of the 250 ml sample container.

\*Durée de l'échantillonnage dépendamment des caractéristiques du site et de la population.

**Warning : The maximum samples retention period is 25 days before analysis, stored at -2 ° C to 6 ° C**

# Sampling protocol



7 Fill out the chain of custody, sample label (s), and packing slip. Attach sample label to the 250 ml sample container(s).

8 & 9 After securely closing the first bag, place each bag in a second plastic zipper bag.

10 Place each individually wrapped container in the cooler or insulated bag. Fill cooler with ice or provided ice packs and place chain(s) of custody in zipper bag on top of samples. Seal cooler/box.

11 Close everything and put the return label on the box.

Ship to :  
**Eurofins Environex**  
2350, Chemin du Lac  
Longueuil (QC) Canada J4N 1G8

Warning : The maximum samples retention period is 25 days before analysis, stored at -2 ° C to 6 ° C



# Worn mask Testing

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# Why worn mask testing ?

## Opportunities :

- Wearing a mask is compulsory in public places and workplaces where distancing cannot be respected
- Clinical test: saturated, difficult to access and the results can be long
- ⚠ Worn mask testing not replace clinical test



**Additional strategy**  
to ensure the safety of the  
workplace or any environment



**Detect an infected person**  
(even asymptomatic)



**Non-invasive method**



**Fast results :**  
Tests results are provided  
within 2 business days of  
sample receipt



**Easy sampling :**  
Worn mask testing requires no  
health care professional for  
sampling



**Cost-effective**

## Conditions

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- The mask must have been **used / worn for a minimum period of 4 hours.**
- Masks can be analyzed individually or in composites (pool) of 2 to 5 masks. If pool analysis is being considered, **the masks of employees working in the same group should be analyzed.**
- It is recommended to carry out **sampling campaigns twice a week.**
- In case of a positive result, a daily sampling campaign is recommended to ensure that there is no spread of COVID-19 in the workplace.



# Sampling method

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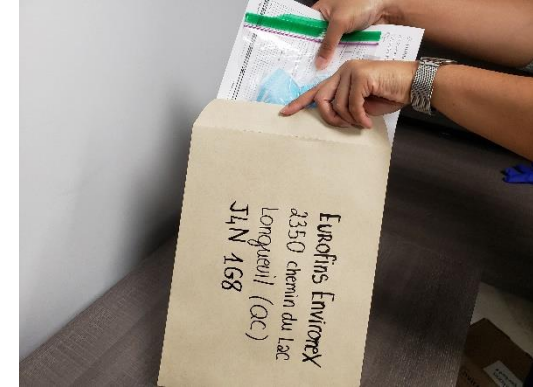
Wear gloves before identifying and handling the worn masks



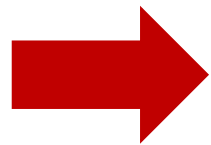
Identify and put the masks in a plastic bag (Ziploc)



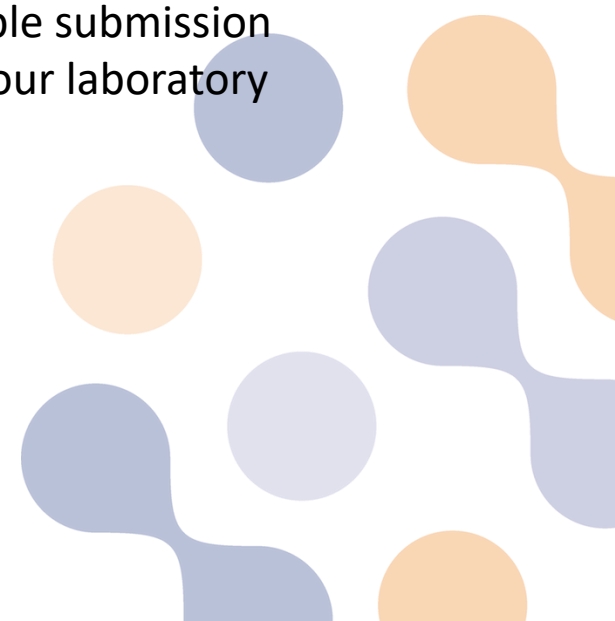
Fill in the sample submission form



Ship the sample(s) and the sample submission form to our laboratory



**The results are delivered within 48 hours (working days)**







# Air ambient Testing

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# Why air testing ?

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- We are dealing with a respiratory virus.
- Reports on the 2003 SARS outbreak indicated that air transmission played a significant role.
- SARS-CoV-2 has been detected in air samples since the beginning of the COVID-19 outbreak.
- Environmental testing is less constraining and financially more interesting for companies; it is the right tool for COVID monitoring initiatives.

# Applications

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Potential high risk environments:

Risks	Examples
Medical procedures that aerosolize virus	hospitals, emergency COVID triage centers, dental office
Enclosed space, prolonged exposure, inadequate ventilation	airplanes, trains, other public transportation  offices, theaters, convention halls, hotels, cruise ships, schools, work places indoors (production lines), shopping etc.

# Applications

...any indoor environment where SARS-CoV-2 is expected



# Droplets and aerosols

## Droplets ( $> 5\mu\text{M}$ )

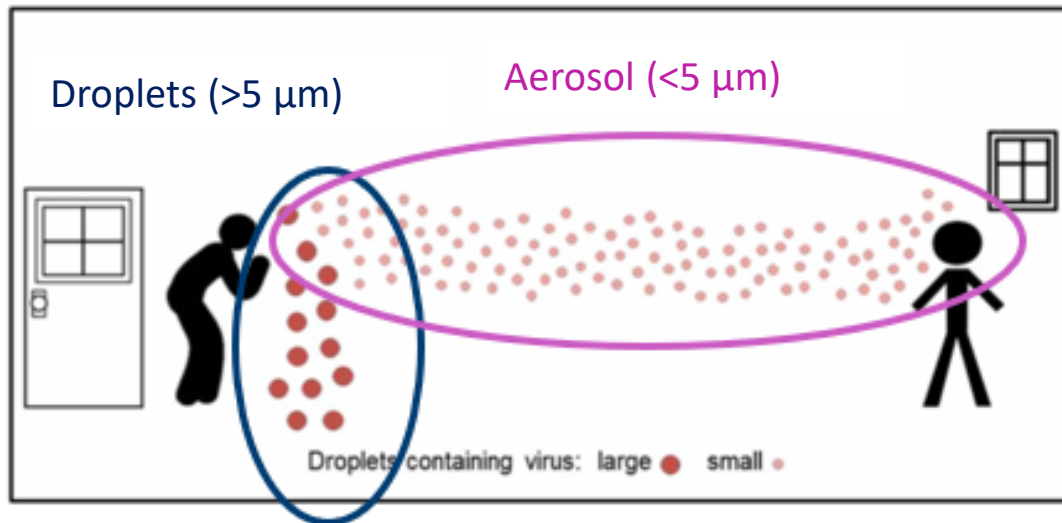
Coughing, Sneezing, Talking  
Settle quickly

**Close contact and/or fomite spread**

## Aerosol ( $< 5\mu\text{M}$ )

Coughing, Sneezing, Talking,  
Breathing

Stay in the air longer, travel further  
**Air transmission**





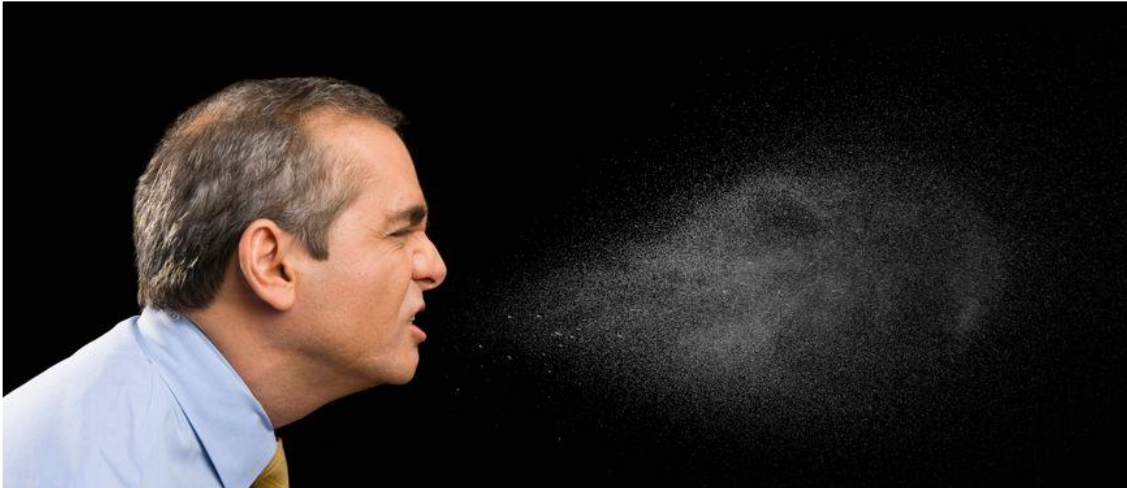
# Considerations



Coughing produces approx. 3,000 droplets  
Sneezing produces approx. 40,000 droplets

50  $\mu\text{m}$  droplet – 37% probability to contain virus (7 x 10<sup>6</sup> copies/ml concentration of infected person)

10  $\mu\text{m}$  droplet – 0.37% probability to contain virus



1 min of loud speaking could produce thousands of oral droplets per second, at least 1000 virus-containing droplet nuclei could remain airborne for more than 8 min.

## Comments on airborne transmission :

- Most infections are spread through close contact, not airborne transmission
- Airborne transmission of SARS-CoV-2 can occur under special circumstances including
  - **Enclosed spaces** with infectious and susceptible individuals at the same time or in shortly after the infected individual left the space.
  - **Prolonged exposure** to respiratory particles, often generated with expiratory exertion (e.g., shouting, singing, exercising).
  - **Inadequate ventilation** or air handling that allowed a build-up of suspended small respiratory droplets and particles.

# Air testing method



## Sample volume:

- > 1000 liters (better 3,000 – 4,000 liters)

## Sampling media:

- PTFE filters (available)
- Gelatin filter membrane

## Testing:

- RT-PCR technology, same as other Sentinel tests

## Reporting:

- Qualitative, LOD < 500 pc/filter
- Quantitative



# Air testing method

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## 1) MD8 (Satorius)

Sampling onto gelatine filters  
High flow rate (30 lpm)



## 2) Low flow sampling with PTFE filters

Sampling onto Teflon (PTFE) filters  
Low flow rate (3-6 lpm)  
Inexpensive set up, disposable cassettes





# Sampling

## Step 1: Pump pre-calibration

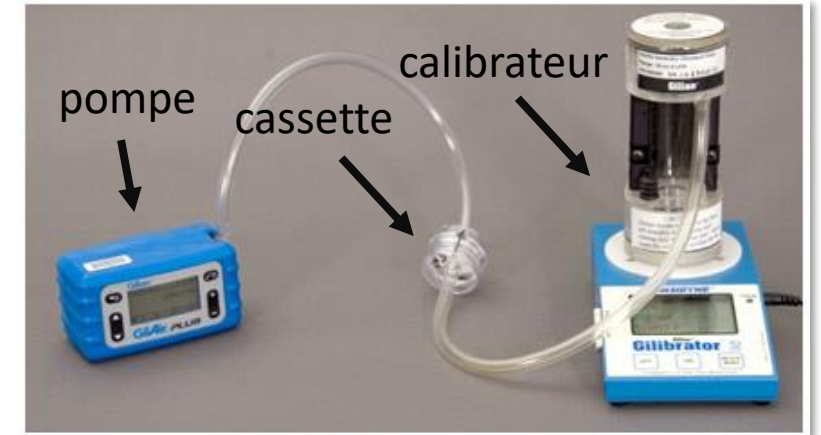
- Attach separate filter cassette for calibration.
- Perform calibration before sampling.
- Replace cassette with sampling cassette

## Step 2 : Sampling

- Take air sample (>1000 liters) via “open face” sampling technique (3 -5 lpm)
- Sampling can be performed on the sampler or set up stationary

## Step 3: Pump post-calibration

- Re-calibrate instrument to confirm flow rate





# Surface Testing

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# Why test environmental surfaces ?

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- Reduce liability, create confidence in safety of the workplace
- Proactive monitoring
- Post exposure disinfection efficacy verification
- Verify that returned quarantined employees are not shedding virus in work environment
- Satisfy a customer expectation



# High Risk Touch Points

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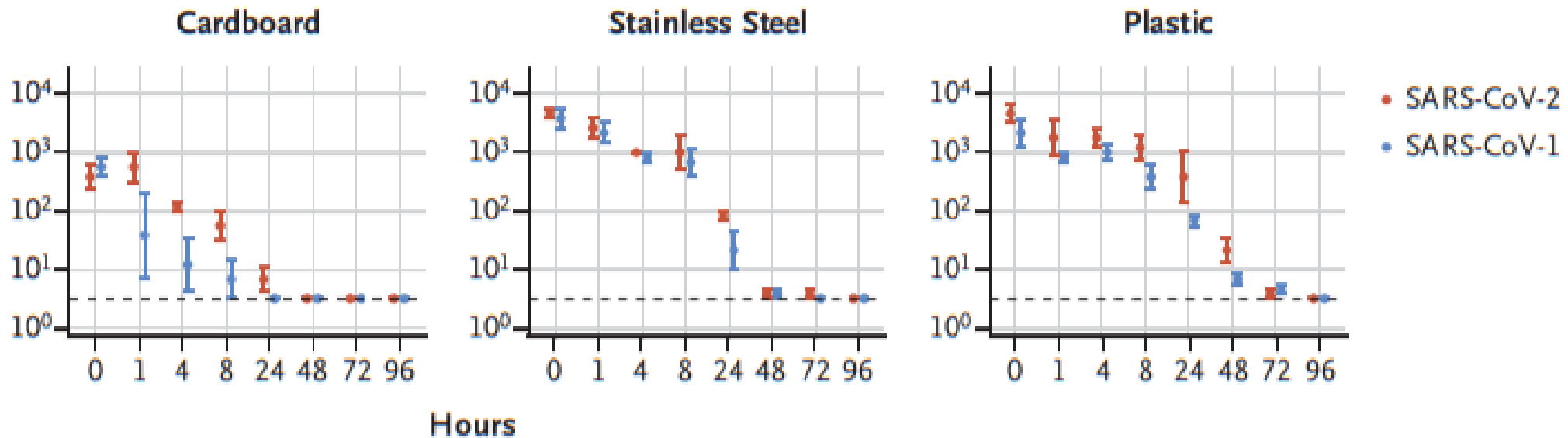
- Floors, chairs, tables, counters
- Door handles, knobs, railings
- Copier, appliances
- Sinks, toilets, trash bins
- Soap, sanitizer, & towel dispensers
- PPE storage bins
- Employee lockers, vending machines
- Control panels, keyboards, log books





# SARS Virus Surface Stability

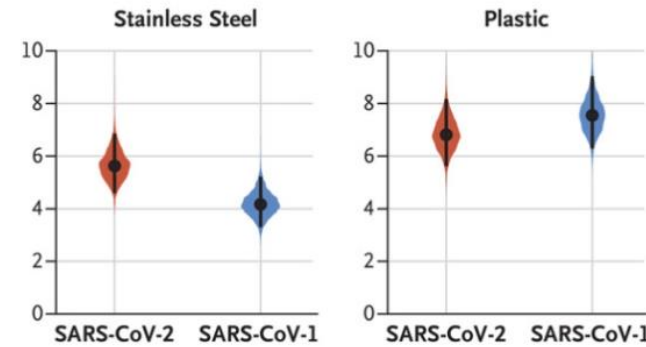
In laboratory experiments:



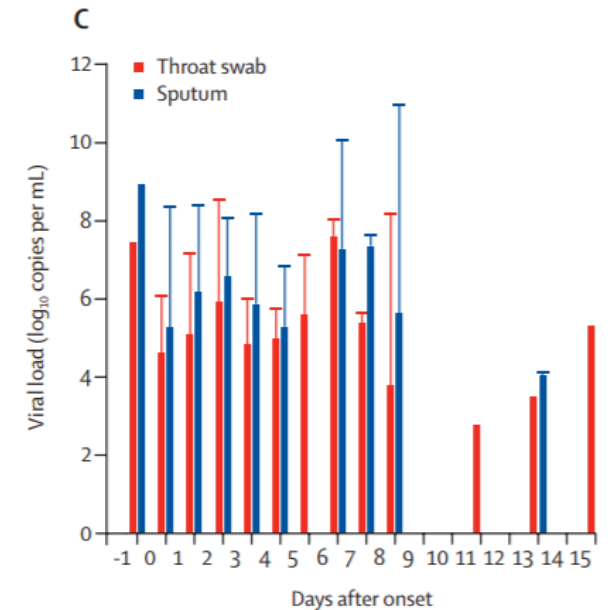
Source: Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med. 2020 Apr 16.

# Viral Load and Infectious Dose

- Virus half life (lab experiments)
  - Air: 1.2 hours
  - Stainless steel: 5.6 hours
  - Plastic: 6.8 hours
- Viral load
  - Throat :  $7.99 \times 10^4$  copies par ml
- Infectious dose
  - Currently unknown



**Source:** N Engl J Med.  
2020 16 avril.



**Source:** Pan et coll. Charge virale de SRAS-CoV-2 dans des échantillons cliniques. Lancet Infect Dis. 2020.

# Contact us

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