

# **CHIMICA AMBIENTALE**

CdL triennale in  
Scienze e Tecnologie per l'Ambiente e la Natura

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***Indoor and Outdoor Air Quality is the main issue in Atmospheric Chemistry.*** In particular, indoor air quality has been considered a fundamental aspect of an integrated approach to air quality evaluation, especially in large urban areas and/or megacities. In 2000, the World Health Organization published the document, “The Right to Healthy Indoor Air,” where the indoor air is recognized as fundamental human right. People spend a lot of time in indoor, e.g., in offices, laboratories, buildings, etc. Consequently, indoor pollution can cause side effects ranging from discomfort to severe sensory consequences on health....

[https://www.mdpi.com/journal/atmosphere/special\\_issues/indoor-outdoor-air-quality?view=abstract&listby=type](https://www.mdpi.com/journal/atmosphere/special_issues/indoor-outdoor-air-quality?view=abstract&listby=type)

<https://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/pre2009/the-right-to-healthy-indoor-air> (-> Diritto)



## COVID-19



WEAR A MASK



STAY 6 FEET APART



AVOID CROWDS



GET A VACCINE



Your Health

Vaccines

Cases & Data

Work & School

Healthcare Workers

Health Depts

Science

More

### Science & Research

Science Agenda: Building  
the Evidence Base for  
Ongoing COVID-19  
Response, 2020-2023

# Science Brief: SARS-CoV-2 and Surface (Fomite) Transmission for Indoor Community Environments

Updated Apr. 5, 2021 [Languages](#) [Print](#)

5 aprile 2021

The principal mode by which people are infected with SARS-CoV-2 (the virus that causes COVID-19) is through exposure to *respiratory droplets carrying infectious virus*. It is possible for people to be infected through contact with contaminated surfaces or objects (fomites), but the risk is generally considered to be low.

# Approfondimento sul bioaerosol

vedere

Linsey Marr

[https://drive.google.com/file/d/12qyN2i90NlreWwMROz7\\_5ACuygsVZRoT/view](https://drive.google.com/file/d/12qyN2i90NlreWwMROz7_5ACuygsVZRoT/view)

Zhi Ning

<https://www.biorxiv.org/content/10.1101/2020.03.08.982637v1>

Leonardo Setti

[http://www.simaonlus.it/wpsima/wp-content/uploads/2020/03/COVID19\\_Position-Paper\\_Relazione-circa-l%E2%80%99effetto-dell%E2%80%99inquinamento-da-particolato-atmosferico-e-la-diffusione-di-virus-nella-popolazione.pdf](http://www.simaonlus.it/wpsima/wp-content/uploads/2020/03/COVID19_Position-Paper_Relazione-circa-l%E2%80%99effetto-dell%E2%80%99inquinamento-da-particolato-atmosferico-e-la-diffusione-di-virus-nella-popolazione.pdf)

<https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html>

# Aerodynamic analysis of SARS-CoV-2 in two Wuhan hospitals

<https://doi.org/10.1038/s41586-020-2271-3>

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The ongoing outbreak of coronavirus disease 2019 (COVID-19) has spread rapidly on a global scale. Although it is clear that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is transmitted through human respiratory droplets and direct contact, the potential for aerosol transmission is poorly understood<sup>1–3</sup>. Here we investigated the aerodynamic nature of SARS-CoV-2 by measuring viral RNA in aerosols in different areas of two Wuhan hospitals during the outbreak of COVID-19 in February and March 2020. The concentration of SARS-CoV-2 RNA in aerosols that was detected in isolation wards and ventilated patient rooms was very low, but it was higher in the toilet areas used by the patients. Levels of airborne SARS-CoV-2 RNA in the most public areas was undetectable, except in two areas that were prone to crowding; this increase was possibly due to individuals infected with SARS-CoV-2 in the crowd. We found that some medical staff areas initially had high concentrations of viral RNA with aerosol size distributions that showed peaks in the submicrometre and/or supermicrometre regions; however, these levels were reduced to undetectable levels after implementation of rigorous sanitization procedures. Although we have not established the infectivity of the virus detected in these hospital areas, we propose that SARS-CoV-2 may have the potential to be transmitted through aerosols. Our results indicate that room ventilation, open space, sanitization of protective apparel, and proper use and disinfection of toilet areas can effectively limit the concentration of SARS-CoV-2 RNA in aerosols. Future work should explore the infectivity of aerosolized virus.



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Environmental Research

journal homepage: [www.elsevier.com/locate/envres](http://www.elsevier.com/locate/envres)



## SARS-Cov-2RNA found on particulate matter of Bergamo in Northern Italy: First evidence



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### Highlights

- COVID-19 burden seems more severe in areas with high concentrations of PM.
- Particulate matter is already known to have negative effects on human health.
- This is the first evidence that SARS-CoV-2RNA can be found on particulate matter.



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International Journal of Infectious Diseases

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INTERNATIONAL  
SOCIETY  
FOR INFECTIOUS  
DISEASES

## Viable SARS-CoV-2 in the air of a hospital room with COVID-19 patients



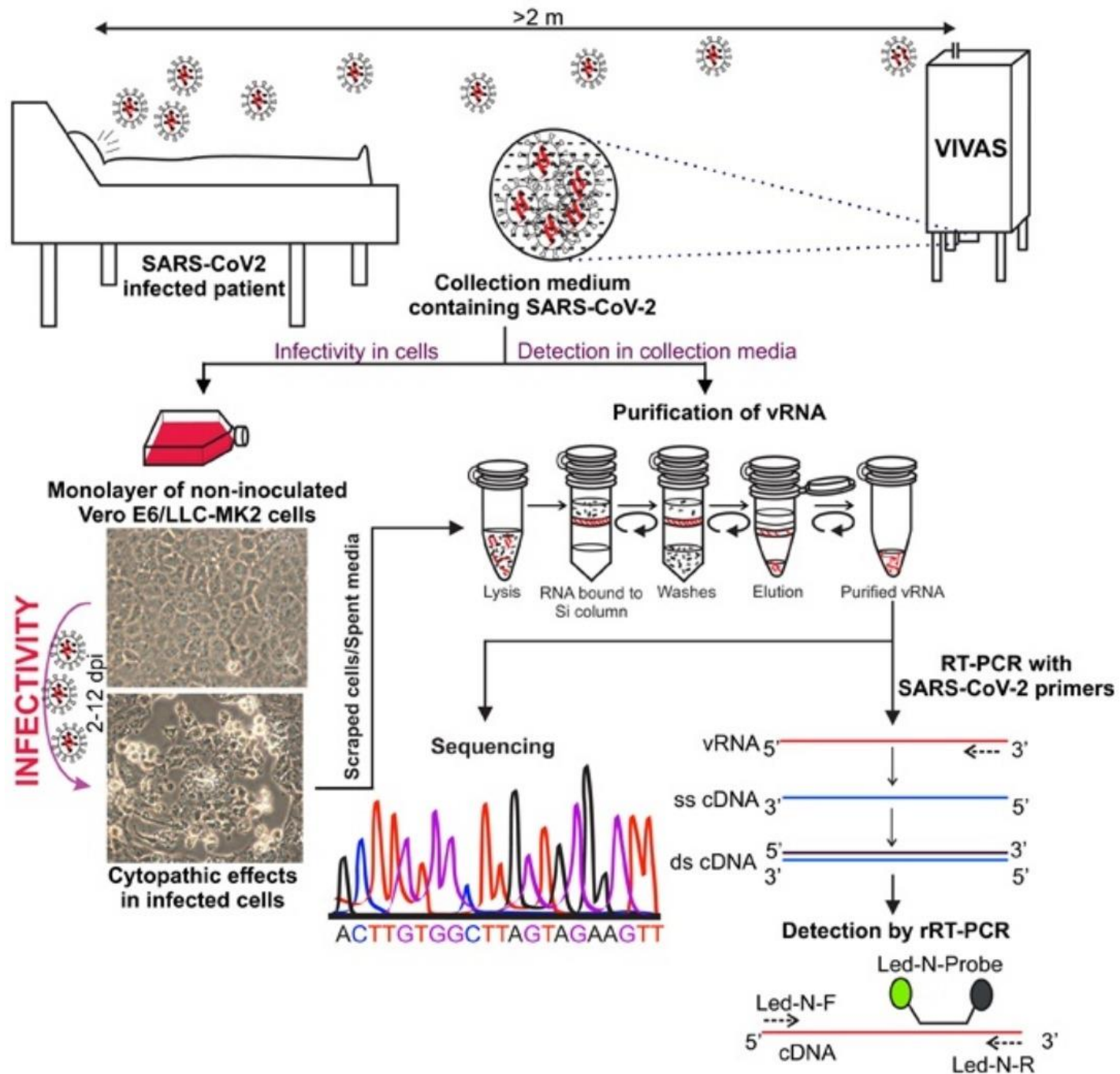
John A. Lednicky<sup>a,b,\*</sup>, Michael Lauzardo<sup>b,c</sup>, Z. Hugh Fan<sup>d,e</sup>, Antarpreet Jutla<sup>f</sup>, Trevor B. Tilly<sup>f</sup>, Mayank Gangwar<sup>f</sup>, Moiz Usmani<sup>f</sup>, Sripriya Nannu Shankar<sup>f</sup>, Karim Mohamed<sup>e</sup>, Arantza Eiguren-Fernandez<sup>g</sup>, Caroline J. Stephenson<sup>a,b</sup>, Md. Mahbulul Alam<sup>a,b</sup>, Maha A. Elbadry<sup>a,b</sup>, Julia C. Loeb<sup>a,b</sup>, Kuttichantran Subramaniam<sup>b,h</sup>, Thomas B. Waltzek<sup>b,h</sup>, Kartikeya Cherabuddi<sup>c</sup>, J. Glenn Morris Jr.<sup>b,c</sup>, Chang-Yu Wu<sup>f</sup>

### **Objectives**

Because the detection of SARS-CoV-2 RNA in aerosols but failure to isolate viable (infectious) virus are commonly reported, there is substantial controversy whether severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can be transmitted through aerosols. This conundrum occurs because common air samplers can inactivate virions through their harsh collection processes. We sought to resolve the question whether viable SARS-CoV-2 can occur in aerosols using **VIVAS air samplers that operate on a gentle water vapor condensation principle.**



# CAN SARS-CoV-2 BE TRANSMITTED BY AEROSOL ?





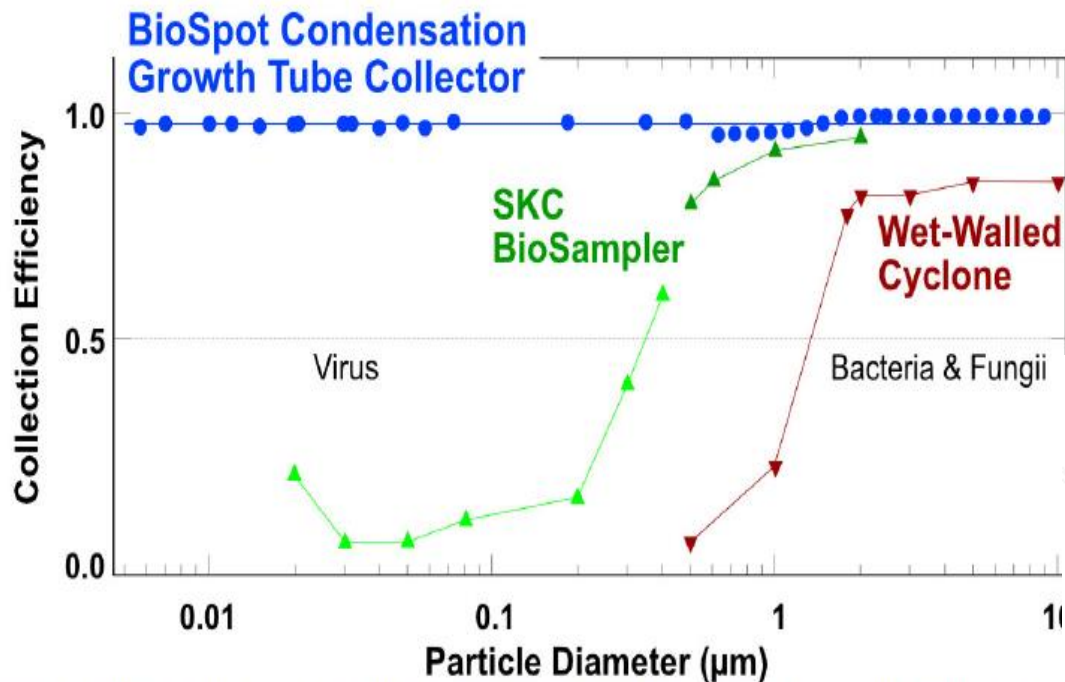


Figure 1. Collection efficiency as a function of particle size for various bioaerosol sampler techn (Hogan et al. 2005, Willeke et al. 1998, McFarland et al. 2010, and Lednicky et al. 2016).

Growth tube collector

<https://sfamjournals.onlinelibrary.wiley.com/doi/full/10.1111/jam.13051>

