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# SARS-CoV-2 RNA in 39% of Hospital Air Samples Despite Ventilation

## Description

A recent study published in *Respiratory Medicine* found that COVID-19 genetic material was frequently present in hospital air during community outbreaks, even in well-ventilated areas.

Researchers from the Kirby Institute conducted air and surface sampling in the emergency department (ED) and intensive care unit (ICU) of a large Sydney hospital during two COVID-19 waves between November 2023 and July 2024. They discovered that 39% of aerosol samples tested positive for the virus.

The ED had a significantly higher detection rate than the ICU. Of the positive samples, 80% were from the ED and 20% from the ICU.

In the ED, the acute-care area, public waiting room, and a walkway were key hotspots. In the ICU, positive samples were found in a staff tearoom and near a COVID patient's room.

The researchers noted that the higher detection rate in the ED suggests it poses a greater risk than the ICU, especially in areas like the waiting room and acute-care area.

Significantly, four positive samples were taken in the ED before the hospital declared an outbreak on November 8, showing the potential of using aerosol sampling for early outbreak detection.

Surface contamination was less common, with only two of 28 samples testing positive, both from a COVID patient's room.

The study highlights that despite good ventilation, more than one-third of aerosol samples contained viral RNA, suggesting ventilation alone may not protect staff and patients during high community transmission periods.

The authors emphasise the need for high-efficiency particulate air (HEPA) filtration and respiratory protection for staff, particularly in busy areas like emergency departments. They suggest portable air purifiers and better ventilation maintenance could help reduce transmission risks.

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## Vocabulary List:

1. **Outbreak** /'aʊt.breɪk/ (noun): A sudden occurrence of a disease in a specific area.
2. **Detection** /dɪ'tekʃən/ (noun): The action or process of discovering or identifying something.
3. **Contamination** /kən,tæmɪ'neɪʃən/ (noun): The presence of an unwanted substance that affects purity or cleanliness.
4. **Transmission** /trænz'mɪʃən/ (noun): The act of passing something from one person or place to another.
5. **Ventilation** /ˌven.tɪ'leɪ.ʃən/ (noun): The provision of fresh air to a room or building.



6. **Sampling** /'sæmplɪŋ/ (noun): The process of selecting a representative group from a population for the purpose of making observations and measurements.

## Vocabulary quizzes

### Multiple Choice ( Select the Correct answer for each question. )

1. What is the primary function of ionocaloric cooling?  
Option: To heat substances  
Option: To cool substances using ions  
Option: To increase pressure  
Option: To evaporate liquids
2. Which of the following are commonly used as refrigerants?  
Option: Dichloromethane  
Option: Hydrofluorocarbons  
Option: Ethanol  
Option: Acetone
3. What does the melting point refer to?  
Option: Point where a substance starts boiling  
Option: Temperature at which a solid becomes a liquid  
Option: Temperature at which a liquid becomes a gas  
Option: Temperature at which gases condense
4. What is it called when prices for goods and services rise?  
Option: Deflation  
Option: Recession  
Option: Inflation  
Option: Stagnation
5. What type of diet emphasizes fruits vegetables and olive oil?  
Option: Ketogenic diet  
Option: Paleo diet  
Option: Mediterranean diet  
Option: Vegetarian diet
6. What is a common cause of an outbreak in a population?  
Option: Vaccination  
Option: Infection  
Option: Hygiene practices



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Option: Contamination

7. What is essential for effective disease outbreak detection?

Option: Vigilance

Option: Ambiguity

Option: Fatigue

Option: Indifference

8. What system helps reduce transmission of airborne diseases?

Option: Insulation

Option: Ventilation

Option: Heating

Option: Cooling

9. What term describes contact with harmful substances?

Option: Withdrawal

Option: Exposure

Option: Defense

Option: Immune response

10. Which hormone regulates sleep-wake cycles?

Option: Cortisol

Option: Adrenaline

Option: Melatonin

Option: Serotonin

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. The \_\_\_\_\_ effect can be used to cool materials rapidly.

12. \_\_\_\_\_ are often considered more environmentally friendly alternatives to older refrigerants.

13. The \_\_\_\_\_ diet is known for its heart-healthy benefits.

14. The \_\_\_\_\_ of ice is 0 degrees Celsius.

15. The \_\_\_\_\_ of diseases can be significantly reduced with good hygiene.

16. Adequate \_\_\_\_\_ in buildings helps improve air quality.



17. Prolonged \_\_\_\_\_ to pollutants can lead to serious health issues.
18. Food \_\_\_\_\_ can arise from improper handling and storage practices.
19. Chronic \_\_\_\_\_ can be a response to long-term exposure to irritants.
20. The \_\_\_\_\_ effects of stress can impact overall health.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. Ionocaloric cooling is an innovative technology leveraging ion movement for efficient temperature control.
22. Hydrofluorocarbons are synthetic compounds used as refrigerants that are considered less harmful to the ozone layer.
23. The Mediterranean diet emphasizes the consumption of healthy fats like olive oil and fresh produce.
24. The melting point of a substance is the specific temperature at which it changes from solid to liquid.
25. Transmission of pathogens can occur through various routes such as airborne direct contact or waterborne.
26. Good ventilation in indoor spaces helps to reduce the concentration of airborne contaminants.
27. Exposure to high levels of pollution can lead to respiratory problems over time.
28. Food contamination can lead to serious illnesses if not addressed promptly.
29. Inflammation is a natural response of the body to injury or infection helping to initiate healing.
30. Cumulative effects of exposure to toxins can lead to chronic health issues over time.

**Answer**

**Multiple Choice:** 1. To cool substances using ions 2. Hydrofluorocarbons 3. Temperature at which a solid becomes a liquid 4. Inflation 5. Mediterranean diet 6. Infection 7. Vigilance 8. Ventilation 9. Exposure 10. Melatonin

**Gap-Fill:** 11. ionocaloric 12. Hydrofluorocarbons 13. Mediterranean 14. melting point 15. transmission 16. ventilation 17. exposure 18. contamination 19. inflammation 20. cumulative

**Matching sentence:** 1. ionocaloric 2. hydrofluorocarbons 3. Mediterranean 4. melting point 5. transmission 6. ventilation



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7. exposure 8. contamination 9. inflammation 10. cumulative

## CATEGORY

1. Health - LEVEL4

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