

Virus in the air: preventive measures

COVID-19: Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The most common symptoms of COVID-19 are fever, tiredness and dry cough. Apart from these common symptoms, patients have also reported other symptoms like breathlessness, diarrhea, sore throat, body pains, headache, loss of taste and smell, etc. Many of the COVID-19 positive individuals are even asymptomatic. Though most of the symptomatic patients experience mild to moderate symptoms, in some cases COVID-19 can be fatal. The group of people who are at greater risk of developing COVID-19 related health complications are older people above 60 years of age and those who have pre-existing medical issues like respiratory disorders, cardiovascular disorders, cancers, diabetes, obesity, etc.

How is SARS-CoV-2 transmitted? SARS-CoV-2 can get transmitted through contact, droplets or fomite. It can get transmitted through direct or indirect contact of a healthy individual with a COVID-19 infected individual through his secretions like saliva or through respiratory droplets released during coughing, sneezing or talking. The size of respiratory droplets is usually larger than 5 μm and thus, they tend to settle down after travelling a short distance of 1 - 2 meters in a short time. Such studies suggested that the spread of SARS-CoV-2 has largely been because of respiratory droplets or surface contact and that air borne transmission was unlikely.

Is SARS-CoV-2 airborne, and if so for how long and how far? Researchers are now able to find the virus in infectious aerosols measuring the size of less than 5 μm . The smaller sized aerosols could get formed due to evaporation of water from larger respiratory droplets. These smaller sized aerosols can stay suspended in air for longer durations and also travel longer distances. Thus the question arises whether the distance of 1 or 2 meters is safe or not. There are some emerging evidences which indicate the possibility of air borne transmission of SARS-CoV-2. Though the statistics of air borne transmission of SARS-CoV-2 is not clear yet, the virus is detected in the air for prolonged durations in certain circumstances.

Observations from our study of air surveillance of SARS-CoV-2: To understand SARS-CoV-2 transmission in a clearer manner, we collected air samples from various locations in hospitals and closed rooms occupied by one or more COVID-19 positive individuals from different spots in the homes of the COVID-19 positive individuals and tested them for the presence of the virus. Factors like the distance from the individuals, ventilation in the area of sample collection, fumigation conditions, number of individuals in the room, etc., were also taken into consideration while sampling.

The major findings from our study:

- The virus could be detected in a few hospital samples from COVID care areas but not from non-COVID areas, suggesting that demarcation of hospital areas in these zones is a successful strategy to prevent cross infections.
- The chances of picking up SARS-CoV-2 in air is directly related to number of COVID positive cases in the room, their symptomatic status and the duration of exposure.
- In neutral environmental conditions, the virus does not seem to spread far away from the patients, especially if they are asymptomatic, providing an objective evidence for the effectiveness of physical distancing in curbing the spread of epidemic.
- Early detection and isolation of positive individuals works in preventing infection of other family members in a home setting as well.
- In certain situations, especially in closed rooms where COVID positive individuals spent longer periods, viral particles could be detected in air even after 2 hours of their exit from the room and at distances greater than 2 meters as well.

Advisory for prevention of spread of COVID-19

After easing of restrictions, there has been a significant increase in public mobility and interactions. On the one hand, a sense of disbelief/ disregard for the advocated preventive measures has set in among the people of our country, as the cases continued to spike despite such strict lockdown. On the other hand, there is a large section of the population that has not returned back to their jobs due to the fear of contracting the disease. A right amount of caution with courage backed up by sound scientific principles is the need of the hour.

Based on recent studies, including our observations, we present the following advisory to limit the spread of COVID-19:

Etiquette in Public/ Office spaces

- Wearing mask in public or crowded places should be mandatory. The spread of the pandemic, to a large extent, can be attributed to people having unprotected verbal interaction in close quarters with asymptomatic COVID positive individuals. Using masks significantly decreases the viral load released by a COVID positive individual. And if both the affected person and unaffected person wear masks the risk of transmission of the virus becomes very low.

- Nonverbal communication by texting/ emailing should be encouraged among office staff even if they are sitting next to each other in the same room. Further they should be encouraged to have indirect forms of verbal communication through personal mobiles/ telephones instead of direct face to face interactions.
- Social distancing is a must. A distance of 3 feet at least, if not 6 feet, should be maintained.
- The virus can stay longer in the air in closed rooms which are not properly ventilated. Spending more time in closed spaces can therefore be risky even if social distancing is maintained.
- Open well-ventilated spaces carry less risk of infection. It is, therefore, advisable to conduct larger gatherings in such places. Adequate measures should be taken in offices/ schools to facilitate cross ventilation.
- Exposure to a COVID positive individual for a short duration (< 30 mins) when adequate precautions are being taken does not significantly increase the risk of contracting the disease. Taking this in to consideration, short duration of travel in metros/ local trains or buses is likely to be safe. If one needs to travel longer, the journey may be broken in to sub parts to mitigate the risk. For example, if the journey from point A to B is for an hour, it can be broken down in to two journeys of half hour each.
- Caution should be exercised while using public toilets. Flushing has the potential to generate aerosols which can stay longer in air and virus is known to be excreted in stool. Masks should be always on while using these and if possible, the same toilet should be reused only after half hour or more of last usage. Pictorial instructions should be stuck in the toilets regarding cleaning them after utility. This should be followed by adequate hand hygiene.

Home quarantine, visits and hospitals

- In a family, if a person is detected COVID-19 positive and advised by the doctor to be home quarantined, to prevent the spread of infection to other family members, he/ she should be isolated in a separate room. Toilet should be separate from others. All members in the house should preferably always wear masks. It is advised to keep the utility things of the infected person separately. The rooms and the space occupied by the un-infected individuals in the house should have proper ventilation.
- It is better to avoid going to others homes. The risk of contracting the disease in home environments is likely to be higher.
- Demarcation of hospital areas into COVID and non-COVID areas is a successful approach to prevent cross infections. ICMR guidelines regarding practices that need to be implemented in such COVID care centres should be strictly followed.

Brief technical tips:

Which mask?

N-95, if close proximity to COVID-19 positive individuals is expected else surgical mask is appropriate for most situations and even a multi-layered cloth mask is helpful in normal scenarios.

How to wear and handle mask?

Both mouth and nose should be covered with mask all the time if there is any other individual around. While wearing the mask, one should not touch its inner side. While removing the mask, the outer surface should not be touched back to the mouth or nose and hands should be washed with soap after removing it. If using a multi-layered cloth mask, it should be washed regularly, preferably after every use, with detergent or soap.

Eye protection

To prevent the entry of the virus through eyes, one can wear eyeglasses or use face shield. It is, however, not necessary in normal routines and only desirable where interactions with multiple individuals is necessary, for example, security personnel, etc.

Hand wash – when, how often, with what?

Maintaining hand and general hygiene is necessary. If a COVID-19 positive individual touches his/ her eyes, mouth or nose and then touches an object, the virus can get transferred to that object. If a healthy individual touches the object which already has the virus on it, and then in turn touches his own mouth, nose or eyes, the virus can potentially infect him/her. Thus, maintaining hygiene by both COVID-19 positive and negative individuals is very important. Considering these possibilities, one should wash their hands with soap or use a sanitizer after touching surfaces in public places and also at regular intervals of time.

Sanitizer use

Whenever it is not possible to wash hands with soap, sanitizer should be used to sanitize the hands. Care should be taken that sanitizer should not be used near fire or electrical circuits.

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