

COVID-19 Air Transmission and Precautions**UMESH CHANDRA KULSHRESTHA**

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Dear Readers

Hope you are safe and doing well.

I am pleased to present before you this issue of Current World Environment. In spite of tremendous pressure due to second wave of COVID-19, the authors, editors and the staff of journal office have shown their great cooperation to bring out this issue in time. I thank all the contributors for their dedication for making the successful release of this issue.


The COVID-19 shutdown has been a major challenge for mankind. This pandemic period has witnessed relatively clean environment especially very significant reduction in air pollution and haze levels due to closure of fossil fuel driven industries, automobiles and aviation. According to a study the South Asian region experienced around 50% reduction in NO_2 concentrations.¹ The major sources of NO_2 include combustion of coal, petrol and diesel. The pandemic lockdown has taught us a lesson of 'new normals'.² The shutdown period air pollution levels have verified the IPCC findings confirming that the present era climate change is due to anthropogenic activities.³ The reduction in pollution during shutdown has open a new path for sustainable development using clean energy alternates.⁴

The COVID-19 origin and spread pathways had a number of theories. In the beginning of lockdown last year, the public was on crossroads having huge confusion what to do what not to do? Slowly, the situation became clear and directional with help of World Health Organization (WHO) and other organizations. The World Health Organisation (WHO) declared the COVID-19 as a pandemic. There were doubts whether the COVID-19 is spreading through air? Soon, the researchers established its airborne presence and

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transmission routes.⁵⁻⁶ A number of quick studies on COVID-19 strengthened our understanding about its spread.⁶⁻¹⁰ According to studies, possibility of airborne transmission of COVID-19 are high in the dry air (below 40% RH).^{5,8} Based on an indoor experiment from Chinese cities during Jan-March 2020, it was found that less than 40% RH activates the evaporation of water in the cough droplets, leading to droplet shrinkage and prolonged suspension in air whereas high RH at 95% will increase the droplet size due to hygroscopic growth with higher deposition fractions both on humans and on ground.

Exposure to aerosol virus is equally possible as via larger respiratory droplets or direct contact with infected people or contaminated surfaces.¹¹ The transmission of SARS-CoV-2 is much higher indoors than outdoors.¹² However, more comparative studies are needed to estimate the indoor impact vis-e-vis modular buildings and Indian style ventilated houses. The in-situ study on risk assessment due to airborne transmission of COVID-19 viruses generated by asymptomatic individuals in a confined space under ventilation has shown 10% increase in risk.¹³ In an apartment building in Seoul, South Korea, an epidemiological relationship study involving COVID-19 infected cases demonstrated the spread of virus to upstairs and downstairs through the air duct.¹⁴

In a nutshell, though in the beginning of pandemic, spread of COVID-19 was widely recognized via larger respiratory droplets or direct contact with infected objects. But recent research confirms that it can be transmitted through inhalation of airborne viruses. However, more epidemiological studies are needed to understand the impact of air pollution on COVID-19. Similarly, more comprehensive *In vitro* and *in vivo* studies are needed to understand air particle–virus interactions.¹⁰ Since, at present it is established that the COVID-19 spread is possible through inhalation, there is a need to avoid crowdedness at various places such as market, offices, hospitals and other common places. Isolation of infected person will further help in controlling the spread of viruses. Bearing mask will also reduce the possibility of infection through inhalation. Of course, everyone needs to vaccination too. In addition, there is a need to establish a global network for monitoring of infectious aerosols.

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