Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

COVID 19 can spread through breathing, talking, study estimates

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Microdroplets

Dear Editor,

The COVID 19 pandemic has become a major threat to humankind infecting millions world-wide. So far, we considered two main routes of infection: 1) direct contact with object that has virus on it, and 2) indirect contact-by inhaling droplets emitted through sneezes and cough.

Sima Asadi and team,[1] explained the role of aerosols in transmission of COVID 19 published in Aerosol Science and Technology journal. They described two possible mode of COVID 19 aerosols transmission; a) during a sneeze or a cough, "droplet sprays" of virus-laden respiratory tract fluid, typically greater than 5 μm in diameter, impact directly on a susceptible individual and b) alternatively, a susceptible person can inhale microscopic aerosol particles consisting of the residual solid components of evaporated respiratory droplets, which are tiny enough (<5 μm) to remain airborne for hours.

However, World Health Organization says the evidence is not compelling. Some virologist still claimed that virus spreads only when the patient cough or sneeze, releasing respiratory droplets that carry the virus. Therefore, I agree with Sima Asadi and co-author idea, that, it is time for the aerosols scientists to step in and provide the technology and hard data to either corroborate or reject that hypothesis.

In a recent study by United State National Academy of Sciences, Engineering & Medicine, revealed a new way through which the virus spreads quickly along with the evidence of asymptomatic spread of the disease.[2]

The study reported that even breathing or talking could possibly release tiny particles (Bioaerosols) carrying the SARS-CoV-2 virus which causes COVID 19. The team explained that the virus can stay suspended in the air in the ultrafine mist that is produced when infected people exhale. They recommended wearing masks while going out in public places.

Another experimental study was also conducted at Toho University in Japan by the Japanese Association for Infectious Disease to find out the third mechanism of transmission of COVID -19 using laser beams and high sensitivity camera to trap droplets particle in the air during sneezing, loud conversation, and breathing.[3]

They reported about micro-droplets infection as the third route of transmission in COVID 19. The mechanism of micro droplets infection is shown in Fig. 1. The micrometer particles which carries many viruses are very small particles (10 μm) releases during sneezing, loud conversation and heavy breathing drift in the air which might causes infection. However, the larger droplets (about 1mm) in diameter quickly falls after sneezing.

To conclude, the limitations of their experiment is that it is not yet known what volume of micro droplets leads to infection. The study recommends wearing mask to prevent from micro droplets infection, however, they do not highlight what type of mask one's should wear since the micro droplets are very tiny. Therefore, there is a need for in depth research to identify aerosols covid-19 transmission.

If it is found to be airborne then it poses a greater threat to mankind and the world as a whole. Physical distance, regular hand wash, lockdown and wearing a mask is a temporary solution. Therefore, there is an urgency for the need to develop a vaccine to battle this pandemic. Until then, this virus will continue to stalk the human race.

Secondly, until a complete cure is discovered people at large must be encourage to continue wearing mask. Production of mask must be increased.

There is also an urgent need to deploy rapid testing kits to speed up identifying both symptomatic and asymptomatic persons at large to avoid from further spreading of virus.

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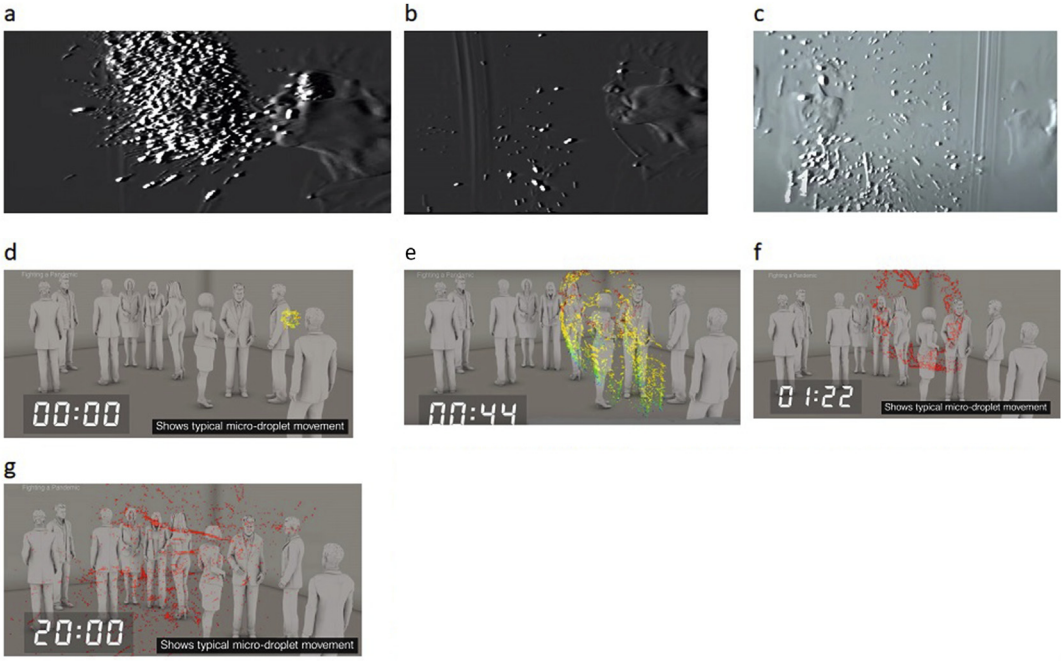

Fig. 1. Experiment 1(a & b): Sneezing releases micro droplets drifting in the air which might carry virus. Experiment 2(c): Micro droplets during loud conversation and heavy breathing. Experiment 3(d, e, f, g): a person cough once and spread about 1000 macro droplets (green and blue) which falls down after 30 seconds and micro droplets (red) drift inside the closed room even after 20 mins.

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Declaration of competing interest

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