

Contamination by Covid-19 patients peaks during first week of illness: Study



A simulation of a checkup inside a negative pressure room at the National Centre for Infectious Diseases. PHOTO: NATIONAL CENTRE FOR INFECTIOUS DISEASES

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Significant drop in viral shedding subsequently, NCID study shows

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A new study by the National Centre for Infectious Diseases (NCID) has found that the ability of Covid-19 patients to contaminate their environment with the coronavirus peaks during the first week of their illness, but falls significantly afterwards.

This means that there is no need to discriminate against or avoid discharged Covid-19 patients as they no longer shed the virus, and hence do not contaminate the environment, NCID said yesterday.

The study, done in collaboration with Duke-NUS Medical School and DSO National Laboratories, also found some particles of the Sars-CoV-2 virus, which causes Covid-19, that were small enough to potentially be spread like an aerosol.

But the study's principal investigator, Dr Kalisvar Marimuthu, a senior consultant at NCID, said this finding alone is insufficient to prove that Sars-CoV-2 is airborne "as the viability of the virus in the air will need to be proven".

As part of the study, which was published in scientific journal Nature Communications on May 29, researchers at NCID tested surface samples of 30 negative-pressure rooms housing Covid-19 patients at different stages of illness.

These are rooms that are designed to ensure that viral particles are contained in the room before being removed through specialised exhaust vents.

Of these rooms, 27 were in the general ward and three were in the intensive care unit (ICU).

The samples were taken from high-touch surfaces such as bed rails, lockers, chairs and toilet seats.

Researchers also took air samples from near the air exhausts of three of the 27 negative-pressure rooms in the general ward.

They found that surface contamination was significantly higher in the rooms of patients in their first week of illness, regardless of whether they showed symptoms.

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The toilet seats and flush buttons in five of the rooms were also found to be contaminated. All five rooms had patients with gastrointestinal symptoms.

The study also found that the extent of high-touch surface contamination was lower the longer someone had been infected.

There was no surface contamination found in any of the three ICU rooms. "This could be an indication that patients in ICU shed less virus as they are usually in their second week of illness," said NCID.

Meanwhile, Sars-CoV-2 particles were found in air samples of two of the three rooms. Both the patients in these rooms had been ill for five days, and had high viral loads.

But there were no such particles in the air samples taken from the room of the third patient, who had been ill for nine days and had a lower viral load.

This suggests that the presence of Sars-CoV-2 particles in the air could be the highest in the first week of illness.

NCID said it hopes the study can help minimise social discrimination against discharged patients.

"Our next step is to determine the proportion of expelled viruses that are infectious. This is what the world is waiting to know," said Dr Kristen Coleman, research fellow at Duke-NUS' emerging infectious diseases programme.

Together with Duke-NUS and DSO, NCID has also launched further investigations into the distance and duration that the virus is able to travel in the air, to find out more about its aerosolising capabilities.

The principal research scientist at DSO's biological defence programme, Dr Michelle Wong, said: "These potential findings will be a valuable piece of the puzzle in Sars-CoV-2 transmission."