

Detecting viruses on MRT with portable device

Duke-NUS team's method in study can potentially detect viruses in a population much faster than clinic screenings

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Researchers at Duke-NUS Medical School have successfully detected common airborne viruses on board MRT trains, including influenza, adenovirus and respiratory syncytial virus (RSV), which cause flu and flu-like symptoms.

For a year, researchers carrying backpacks with sampling devices attached to air pumps rode East-West and North-East line trains during morning and evening peak hours.

This was to simulate commuters' regular exposure to potential viruses, they said. The devices can also be used at fixed locations.

A total of 89 air samples were collected between January last year and this January. Laboratory analysis found one or more common respiratory viruses in 14 of the samples.

The first of its kind to study infectious respiratory diseases on board MRT trains, the study was led by Dr Kristen Coleman, a research fellow at the Emerging Infectious Diseases (EID) programme at Duke-NUS.

The method can potentially detect viruses in a population much faster than screening patients seeking medical care at clinics or hospitals, which can take several days.

If similar samplers are deployed at airport checkpoints or other high-risk crowded places, potential biological threats such as Sars and the H7N9 strain of bird flu could be detected in eight hours or less, Dr Coleman told media yesterday.

"A lot of the time, once we know that a pandemic is present, it is often too late and it can spiral out of control. If we can detect it earlier, we can start controlling it right away," she added.

Viruses can be spread when a person carrying them coughs or sneezes. Depending on the size, droplets containing the viruses can travel up to 90cm before settling.

Viruses can also become attached to dust particles when the droplets dry, and be recirculated. Free-floating viruses can travel much farther and persist for longer, up to 48 hours, Dr Coleman said.

The sampling device is able to sep-



Dr Kristen Coleman, the lead author of the study, wearing the backpack and apparatus used to collect air samples on MRT trains. Researchers carried the devices (above) for a year on trains and successfully detected common airborne viruses which cause flu. ST PHOTOS: REI KUROHI

arate larger and smaller particles.

Larger particles, measuring more than 4 micrometres, are referred to as "inhalable" particles and usually affect the upper respiratory tract.

Smaller particles are referred to as "respirable" and can be absorbed deeper into the lungs, causing more serious respiratory problems.

Before the technique can be applied practically to safeguard public health, more research is needed to determine the optimal conditions for monitoring specific types of viruses, said Dr Coleman.

Dr Gregory Gray, a professor of the EID research programme and a senior author of the study, said: "Usually, transit network studies focus on mapping surface-borne bacteria and neglect to target aerosolised or respiratory-borne viruses."

He added: "MRT riders may be at a higher risk of exposure to respiratory viruses. We hope this study will motivate scientists around the globe to collaborate on similar field studies to unveil the true risk of exposure while using public transportation."

The team hopes to continue its research on the topic.

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