

SUMMARY REPORT – Research & Tests related to Ventilation and COVID-19 – 3rd Feb 2022

The unique tests were carried out at the Museum at the end of November 2021. However, the Media Release from the University was not put out until the third week in December (on a Friday afternoon). There was no media coverage. Hence there was a need to issue the Information Release as per below. A short video, copy attached, was also circulated. It was sent to individuals within the media and health organisations including to Dr Norman Swan (I was on ABC Radio for a brief discussion) and to well-known epidemiologist Professor Mary-Louise McClaws – UNSW, who is an advisor to WHO and who indicated that she would pass on the information to WHO. The information release was also sent to the State and Federal Health Ministers, with acknowledgement received from Hon Greg Hunt.

Successful publicity resulted through direct communication with:

- Fifth Estate (Tina Perrinotto) - an article that was also posted on LinkedIn. Copy attached.
- AIRAH (Mark Vendor) - an article in AIRAH newsletter, which generated good discussion. Copy attached

The project is now complete.

Ashak

Information Release

Australian First Research

30th December 2021

Ground-breaking outcomes offer guidance on how to minimise the spread of COVID-19 in indoor settings



Tests were carried out at the Australian National Maritime Museum by ventilation professionals from ARBS Education & Research Foundation, in association with researchers from University of Sydney. The tests simulated airborne aerosol (SARS-CoV-2) dispersion from an infectious person, namely Laura - the breathing thermal manikin (only one of a kind in Australia), who exhaled the tracer gas: nitrous oxide. Concentrations of the gas

at distances from Laura were measured accurately in real-time, under different ventilation modes, and then photo-acoustically assayed in units of parts-per-million (ppm) accuracy. This represented different concentrations of viral loading of SARS-CoV-2 at each sensor.

Outcomes are:

- The 'virus' stays aloft in indoor air for a considerable period of time, depending on the quantity of fresh air introduced, either through natural ventilation or the air conditioning system.
- The 'virus' concentrations did not vary significantly over distances ranging up to 6m from the 'infected person' within indoor environments. This indicates that the '1.5 m social distancing' rule indoors may be less effective in limiting airborne infectious aerosols emitted from an infected person simply breathing or talking. Note: the '1.5 m rule' was originally conceived to minimise infection risks posed by larger SARS-CoV-2 droplets (sneezing and coughing).
- For an indoor dining setting, application of maximum fresh air ventilation resulted in the lowest 'virus' concentrations, confirming the widespread belief that outdoor dining affords the safest conditions.
- Indoor venues with large air volumes and high ceilings, (e.g., entry foyers, places of worship, shopping malls, social halls) potentially have lower 'virus' concentrations, provided there is no interference with indoor airflows from mechanical ventilation systems or fans.
- A loose-fitting disposable mask showed noticeable leakage around the nose whilst a properly fitted N95 surgical mask showed the least amount of leakage.

Mr Nathwani, ARBS Education & Research Foundation director, who initiated this research, said: "These practical tests have enabled us to quantify what 'well' or 'adequate' ventilation means. Simply put, it relates to the quantity of fresh air introduced into an indoor space, either through natural ventilation or an air conditioning system. The outcomes provide valuable data and validation of how the 'virus' behaves in the airborne transmission context."

Mr Fairweather, also a director of the Foundation, said: "The outcomes provide plausible explanations on the likely causes of the spread of the virus in indoor venues, such as night clubs and indoor climbing gyms. It is vital that air conditioning and ventilation professionals work closely with health authorities to make indoor spaces safer, as per the latest guidelines by US Centres for Disease Control (CDC)".

Professor de Dear, University of Sydney, a key member of the study team, noted that airborne transmission is the main source of COVID-19 infections, and that this is the accepted wisdom in both scientific and policy arenas. Hence attention needs to focus on how air conditioning and mechanical ventilation systems move infectious aerosols between and through the breathing zones of multiple people inside buildings. Importantly, how indoor settings can be made safer using ventilation and air purification techniques.

Declaration: This research was funded by the ARBS Education & Research Foundation.