Expert Group on the Role of Ventilation in Reducing Transmission of COVID-19

First Report

Suppression of COVID-19 requires a scientific understanding of how the virus (SARS-CoV-2) is transmitted and a risk-based approach that maximises all strategies for infection prevention and control.

Since the emergence of COVID-19 there has been considerable research on the modes of transmission and the evidence base is still evolving. Close-range transmission has appeared to be the dominant pathway for spreading the virus, with some evidence indicating that long-range (airborne) transmission can also be important in certain indoor environments. The indirect surface contact route can also occur and while the relative contribution of the three possible transmission pathways to overall infection risk remains unknown, it is likely context specific. The emergence of SARS-CoV-2 variants with increased transmissibility, such as B.1.1.7, invites the re-evaluation of all routes of transmission and the associated control measures.

Reducing infection risk and slowing the spread of the virus can be achieved by mitigating all possible transmission modes. However, public health guidance in Ireland has focused on reducing the risk of infection through the close-range and indirect surface contact routes. Mitigation against long-range (airborne) transmission has received less attention, despite scientific evidence indicating that it can contribute to the spread of the virus, especially in enclosed spaces with inadequate ventilation and high occupancy levels. The weight of scientific evidence indicates opportunities for mitigation of long-range (airborne) transmission following the precautionary principle and the hierarchy of controls approach.

The purpose of this Expert Group is to provide scientific advice on the role of ventilation in mitigating against the risk of long-range (airborne) transmission of SARS-CoV-2. The Group has a wide range of multi-disciplinary expertise in indoor air quality and related areas including, aerosol science, architecture, engineering, regulation, occupational hygiene, exposure science, virology, microbiology and public health medicine.

Terms of Reference

1. Provide scientific advice on ventilation and other control measures to reduce the risk of airborne transmission of SARS-CoV-2.
2. Evaluate the available research and guidance published on mitigating the risk of airborne transmission and consider how this could be best utilised in Ireland.
3. Provide advice and support for the development of public information campaigns on how to reduce spread of the virus in enclosed spaces.
4. Provide general and sector-specific guidance on immediate strategies for delivering enhanced ventilation (natural and mechanical), air cleaning and indoor air quality monitoring.

5. Review public health information on COVID-19 and, where appropriate, advise in relation to ventilation and other control measures.
6. Review existing guidance, standards and regulations for the management and operation of ventilation for public, private and commercial buildings in order to identify additional measures which can readily be implemented to support the re-opening and operation of buildings based on reduced risk of transmission.
7. Review technical guidance and standards provided in other countries and by professional bodies and make recommendations for ventilation systems and strategies that help build resilience against airborne diseases and future pandemics in the context of climate change.

Plan of Work

The group propose the following work as an immediate priority:

- A general document on ventilation and related measures written at public information level, to support public health advice and information campaigns.
- A review of the HPSC guidance documents on ventilation in buildings and facilities with recommendations for changes as required. Use this guidance as a basis for informing sector specific guidance documents.
- Research and consultation in priority areas, including relevant Government departments and bodies.

The initial priority areas are considered to be: healthcare environments (including residential care facilities); educational settings; residential accommodation (private and institutional); transport; workplaces with particular environmental risks.

Opening Statement

The report published by The Health Information and Quality Authority (HIQA) has already provided an excellent evidence summary on activities or settings associated with a higher risk of SARS-CoV-2 transmission. Among the main findings were that:

- a small proportion of cases potentially cause the majority of local transmission
- inadequately ventilated indoor spaces present a risk for SARS-CoV-2 transmission and have superspreading potential
- until further research can fully elucidate the contribution of the various pathways to total transmission risk, the precautionary principle should be applied.

In relation to engineering controls, the ECDC and WHO have recognised that well-maintained heating, ventilation and air-conditioning (HVAC) systems have the potential to play a significant role in reducing airborne transmission of SARS-CoV-2 and slowing the spread of the virus. The ECDC recommends that ventilation is considered as part of the bundle of non-pharmaceutical interventions used to reduce transmission risk in closed spaces.

The Expert Group is therefore confident that there already is a strong evidence base to support the following recommendation:

The Government should act swiftly to update public health advice and communications on COVID-19 to include ventilation, alongside distancing, mask-wearing and hygiene as part of a layered approach to protection against spread of the virus. The public information on how the virus is spread should also be updated in order to be consistent with this message.

The Group is ready to provide advice and support for delivering these actions as required.

Membership

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