

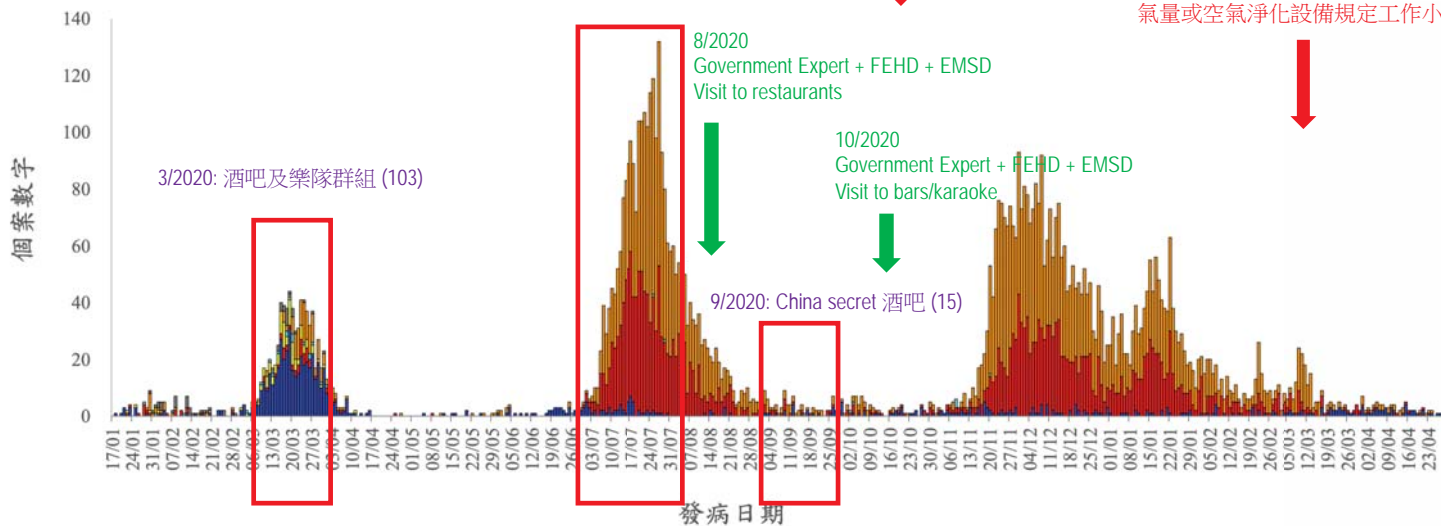
## Ventilation in restaurants scientific basis

### Sequence of event

7/2020:  
 彬記/新發/建榮 (46)  
 慈雲山中心翠河 (38)  
 雅蘭中心稻香 (42)  
 屯門中央廣場富臨酒家 (44)  
 新都會廣場潮庭 (20)  
 慈雲山中心百匯軒 (32)  
 旺角維景酒店海港酒家 (15)

16/10/2020  
 「每小時6次換氣量或裝置空氣淨化設備」自願申報制度

16/3/2021  
 第599F章下在提供堂食食肆實施換氣量或空氣淨化設備規定工作小組



# Transmission of respiratory pathogens

	Airborne transmission (空氣傳播)	Opportunistic airborne 機會性 空氣傳播	Droplet transmission 飛沫傳播
Examples	TB Measles Chickenpox	Respiratory viruses: - Influenza - SARS-Coronavirus	Respiratory viruses
Description	Droplet nuclei remain suspended in air over long distance and time	Transmission of droplet nuclei in special circumstances	Droplets propelled at a short distance
Circumstances	Short-range airborne (<2m)  Long-range airborne (rest of the room)	Aerosol generating procedures  Poor ventilation: <3L/s/person → long range airborne	Usually <1m

WHO 2009: Natural Ventilation for Infection Control in Health-care settings

## International recommendations on ventilation (engineering control) to deal with COVID

### Guidance for Building Operations During the COVID-19 Pandemic

BY SHANNON J. ZHANG, PH, FELLOW LEED AP GREEN ACCREDITED  
The HVAC systems in most non-medical buildings play only a small role in infectious disease transmission, including COVID-19.<sup>8</sup> Knowledge is emerging about COVID-19, the virus that causes it (SARS-CoV-2), and how the disease spreads. Reasonable, but not certain, inferences about spread can be drawn from the SARS outbreak in 2003 (a virus genetically similar to SARS-CoV-2) and, to a lesser extent, from transmission of other viruses. Preliminary research has been recently released, due to the urgent need for information, but it is likely to take years to reach scientific consensus.

**SUPPLEMENT to Reducing the Risk of COVID-19 Using Engineering Controls**

**Heating, ventilation and air-conditioning systems in the context of COVID-19: first update**  
10 November 2020

### Ventilation in Buildings

Updated Mar. 23, 2021 Languages Print



### Summary of Recent Changes

Updates as of March 23, 2021

- Simplified language in the overall list of tools to improve ventilation.
- Added three new Frequently Asked Questions (FAQs) on the usefulness of carbon dioxide monitors to inform ventilation decisions, the useful of temperature and relative humidity to control the spread of COVID-19, and the use of fans indoors.
- Expanded the FAQ on emerging technologies to include more products available on the market.
- Added additional information with simple calculations to the FAQ on portable HEPA air cleaners to help consumers choose appropriate units for their spaces.

Guidance  
**Ventilation of indoor spaces to stop the spread of coronavirus (COVID-19)**  
Updated 23 April 2021

#### Contents

**What ventilation is and why it is important**  
Reduce the amount of time you spend indoors with people you do not live with.

#### What ventilation is and why it is important

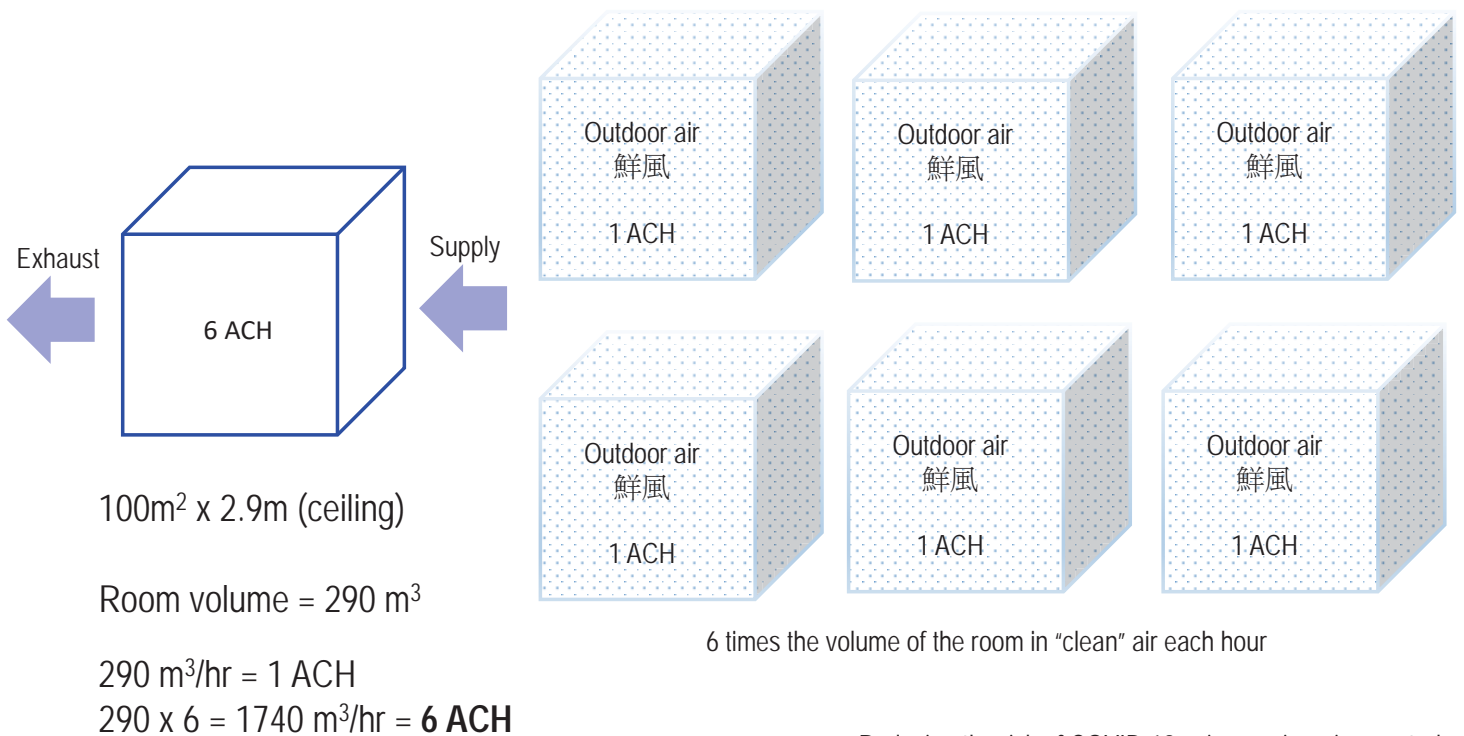
Ventilation is the process of introducing fresh air into indoor spaces while removing stale air. Letting fresh air into indoor space can help remove air that contains virus particles and prevent the spread of coronavirus (COVID-19).



**Roadmap to improve and ensure good indoor ventilation in the context of COVID-19**

## Dealing with airborne pathogen

Principle	Mechanism	Chinese
Dilution	Ventilation → mixing with fresh air	稀釋
Filtration	Physical removal of particles from air stream by high grade filters: <ul style="list-style-type: none"> <li>- Interception</li> <li>- Impaction</li> <li>- Diffusion</li> <li>- Electrostatic force</li> </ul>	過濾
Germicidal	UV damage of genetic materials of microorganisms	消毒



## Local and international recommendation on ventilation requirement in various premises

Standards/Regulations	Year	m <sup>3</sup> /hr/person	L/s/person	ACH at 3m height Ceiling @1.5m <sup>2</sup> /person	ACH at 2.3m height Ceiling @1.5m <sup>2</sup> /person
<b>Section 93(1) of and Second Schedule to the Public Health and Municipal Services Ordinance (Cap. 132) (for Restaurants)</b>		<b>17.0</b>	<b>4.7</b>	<b>3.8</b>	<b>4.9</b>
Chartered Institution of Building Services Engineer (CIBSE) Guide A (for Restaurants)	2015 edition (May 2019 reprint)	36	10	8.0	10.4
ASHRAE Standard 62.1 The Standards for Ventilation and Indoor Air Quality (for Restaurants)	2019	18.7	5.1	4.2	5.4
國家市場監督管理總局、中國國家標準化管理委員會(國家標準)GB37488-2019 Hygiene indicators and limits for public places (for Public leisure places)	4 April 2019	30	8.3	6.7	8.7
Coronavirus (COVID-19): ventilation guidance Scottish Government	18 Dec 2020	28.8 - 36	8-10	6.4 - 8	8.3 - 10.4
WHO Roadmap to improve and ensure good indoor ventilation in the context of COVID-19 (non-residential settings)	1 March 2021	36	10	8	10.4
Buildings Department Practice Note ADM2 (for Offices)	May 2011	36	10	8.0	10.4
Voluntary declaration scheme on air changes in licensed catering premises	Oct 2020	27	7.5	6	6

Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency

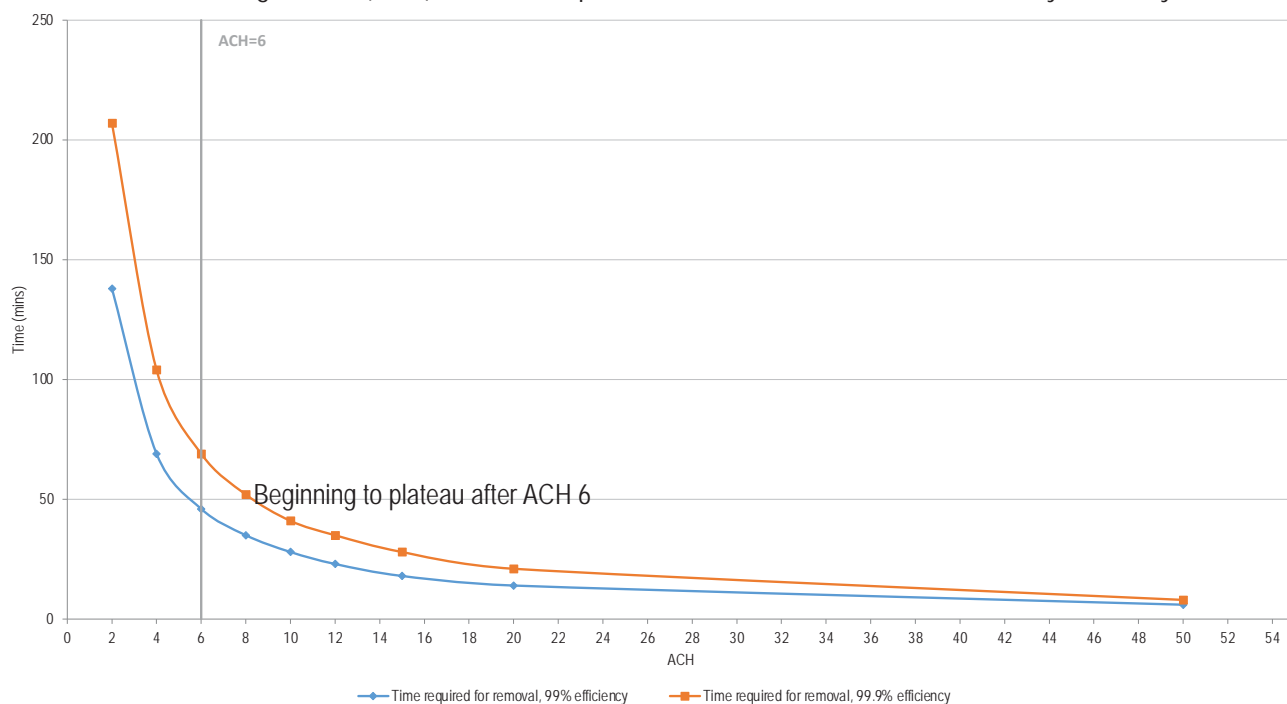
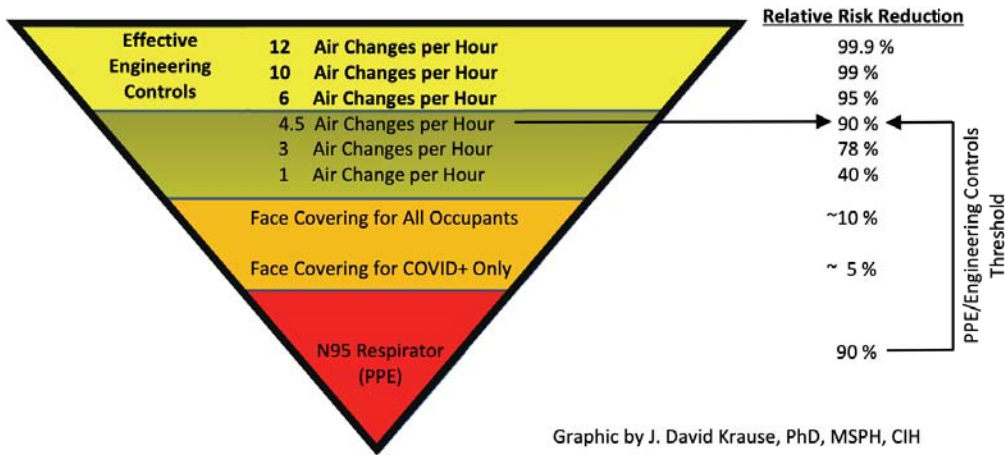


Table B1: Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency  
<https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#>

**SUPPLEMENT to Reducing the Risk of COVID-19 Using Engineering Controls**



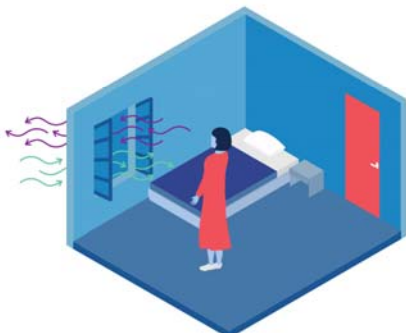
Risk reduction by ventilation

Graphic by J. David Krause, PhD, MSPH, CIH

AIHA August 2020



**Roadmap to improve and ensure good indoor ventilation in the context of COVID-19**



mechanical ventilation		
Minimum requirements	Steps – key questions	Strategies
<p>Minimum recommended ventilation rate:</p> <ul style="list-style-type: none"> <li>• 10 L/s/person (EN 16798-1) (42, 43)</li> </ul>	<p>Does the ventilation rate meet the minimum requirement? To assess the ventilation rate consult point 1.</p>	<p>In consultation with a HVAC professional, assess the opportunity to increase the ventilator rate according to system capabilities. Disable demand-control ventilation controls that reduce air supply based on temperature or occupancy.</p> <p>If the ventilation rate cannot be increased mechanically, consider maximizing ventilation by using natural ventilation through opening windows (37) (see natural ventilation section for more strategies).</p> <p>If the system does not allow increasing the ventilation up to the recommended minimum per person requirement, consider reducing the maximum room occupancy to meet the L/s/person standard.</p> <p>If no other strategy can be adopted, consider using a stand-alone air cleaner with MERV 14 / ISO ePM1 70-80% filter. The air cleaner should be positioned in the areas used by people and close to people. Stand-alone air cleaners should be operated continuously. Air cleaner capacity should at least cover the gap between the minimum requirement and the measured ventilation rate (44) – compare the device clean air delivery rate (CADR) (m<sup>3</sup>/hr) with the room ventilation rate.</p> <p>Note: Consider that filtered recirculated air does not replace ventilation in any circumstance.</p>
	<p>NO</p>	
	<p>YES</p>	