DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH

Guidance Note for Ventilation and Indoor Air Quality (IAQ) during Pandemic COVID-19

11TH AUGUST 2021

SCOPE OF PRESENTATION

- Background
- Types of settings
- Scope of guidance
- Roles of employers, building management & home owners
- Expectation
- Conclusion

Background

- Current evidence suggest that airborne transmission could play a role in the spread of Covid-19. WHO also acknowledged that aerosols carrying the virus can “remain suspended in the air” or travel farther than 1 metre (long range).

- The COVID-19 virus can spread in **poorly ventilated or crowded indoor** settings such as office buildings, healthcare facilities, and workplace where people tend to spend longer periods of time. Virus also spreads mainly between people who are in close contact with each other .i.e. within 1 metre (short range)

- Since PKP 1.0, weekly SOP by DOSH was made compulsory for all workplaces since April 2020. One important element in the SOP is **ventilation.** Compliance was found to be above 95%.

- A Technical Committee was formed on **9th June 2021** appointed by Dato’ KSU Ministry of Human Resource upon instructions from PMO

- Ministry of Human Resource through **DOSH and MOH** have collaborated to come up with an interim guidance on ventilation to enhance ventilation and indoor air quality during this pandemic.

TECHNICAL COMMITTEE ON VENTILATION AND INDOOR AIR QUALITY 2021

- The committee consists of: 17 Officers

1. DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH
   6 OFFICERS
2. MINISTRY OF HEALTH
   5 OFFICERS
3. PUBLIC WORKS DEPARTMENT (JKR)
   2 OFFICERS
4. MEMBER OF THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (MASHRAE) MALAYSIA CHAPTER
   2 OFFICERS
5. NEHAP REPRESENTATIVE FROM MOH
   1 OFFICER
6. UNIVERSITI TUN HUSSEIN ONN MALAYSIA
   1 OFFICER

- Approved by MOH
- Guidance approved by Technical Committee YB Defence Minister then subsequently Sidang Khas MKN on 8th July 2021

LEGISLATIONS IN MALAYSIA: INDUSTRY CODE OF PRACTICE ON INDOOR AIR QUALITY 2010

a. **Purpose**:

i. Provide guidance on improving IAQ;

ii. Set minimum standard for selected parameters to avoid discomfort and/or adverse health effect among employees and other occupants

APPLICATION OF ICOP 2010

Domestic building

Used or intended to be used for domestic/ industrial purposes

Building or any part of building/ totally enclosed areas , served by MVAC/split unit, where there are persons at work,

EXCEPT

Removal and disposal of asbestos containing materials

Where any chemical hazardous to health are used for analytical, research or prevention purposes

Guidance Notes are developed based on ICOP 2010 & WHO & other established docs international bodies

LIMITATIONS OF ICOP

Applies to all buildings or any part of the building or totally enclosed areas served by a mechanical ventilating and air conditioning (MVAC) system including air-cooled split unit, where **there are persons at work,** except-

i. **domestic buildings**;
ii. any area or any part of the **building which is constructed,** used or intended to be used for **domestic or industrial purposes;**
iii. any area or part of building where any **chemicals hazardous to health are used** for analytical, research or preservation purposes; or
iv. **removal and disposal of asbestos** containing materials.

GUIDANCE OF 4 TYPES OF SETTINGS

1

NON RESIDENTIAL

2

RESIDENTIAL

3

PUBLIC SPACES

4

HEALTHCARE FACILITIES

TYPES OF SETTINGS

1

NON RESIDENTIAL

2

RESIDENTIAL

3

PUBLIC SPACES

4

HEALTHCARE FACILITIES

GUIDANCE NOTES IN TEXT @ WEBSITE, SCAN QR CODE IN INFOGRAPHIC

BOTH LANGUAGES : BAHASA INGGERIS DAN BAHASA MALAYSIA

Scope of Guidance

- ONLY APPLICABLE DURING PANDEMIC COVID 19

TYPES OF VENTILATION:

AIR-CONDITIONED FACILITIES WITH MECHANICAL VENTILATION

AIR-CONDITIONED FACILITIES WITHOUT FRESH AIR SUPPY

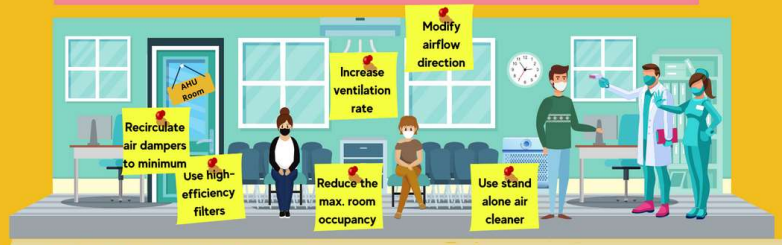
NATURAL VENTILATION FACILITIES

Infographic produced

HEALTHCARE FACILTIES

GUIDANCE NOTE TO BUILDING OWNERS AND MANAGEMENTS ON IMPROVING VENTILATION AND INDOOR AIR QUALITY (IAQ) FOR HEALTHCARE FACILITIES SETTING DURING COVID-19 PANDEMIC

AIR-CONDITIONED FACILITIES WITH MECHANICAL VENTILATION



- Reduce the maximum room occupancy
- Modify airflow direction by relocating supply and return air devices
- Set recirculation air dampers to a minimum according to system capabilities
- Increase the ventilation rate according to system capabilities
- Use high-efficiency filters in AHUs. Filter should be properly installed, regularly inspected, maintained and cleaned
- Use air-cleaning technologies that be able to kill microbe in AHUs or ducting to augment MERV14 filters
- Use a stand-alone air cleaner with appropriate filters if no other (short-term) strategy can be adopted

AIR-CONDITIONED FACILITIES WITHOUT FRESH AIR SUPPLY

- Open operable windows and doors as frequently as possible, unless outdoor/outside air quality is poor
- Position extractor/mounted exhaust fans at windows to blow air outwards and increase air exchange
- Add a dedicated outdoor air supply and/or exhaust
- Modify the position of the split unit or FCUs to direct the airflow to the less clean zone or install an extractor to control the airflow where AGP is performed
- Use a stand-alone air cleaner with appropriate filters if no other (short-term) strategy can be adopted

MINISTRY OF HEALTH MALAYSIA · MINISTRY OF HUMAN RESOURCES

For further information please go to the website www.dosh.gov.my or scan this QR code.

GUIDANCE NOTE TO BUILDING OWNERS AND MANAGEMENTS ON IMPROVING VENTILATION AND INDOOR AIR QUALITY (IAQ) FOR HEALTHCARE FACILITIES SETTING DURING COVID-19 PANDEMIC

NATURAL VENTILATION FACILITIES

- Assess the opening locations and opening surfaces considering potential new openings
- Enable cross-ventilation rather than single-sided ventilation
- Reduce the maximum room occupancy
- The airflow direction should be from a clean to less clean area
- Increase natural ventilation with enhancement by fans
- Use a stand-alone air cleaner with appropriate filters if no other (short-term) strategy can be adopted

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NATURAL VENTILATION FACILITIES

- a) Assess the opening locations and opening surfaces considering potential new openings.
- b) Consider enabling cross ventilation rather than single-sided ventilation. However, this approach should not be implemented in a room or ward for COVID-19 suspected cases where AGP may take place and when the exhaust air is not properly managed and when the airflow is moving from a less clean to a clean area.
- c) Consider reducing the maximum room occupancy.
- d) The airflow direction should be from clean to less clean area.
- e) Increase natural ventilation with enhancement by fans.
- f) Consider to use a stand-alone air cleaner with appropriate filters if no other (short-term) strategy can be adopted. The stand-alone air cleaners do not replace ventilation in any circumstance.

AIR-CONDITIONED FACILITIES WITHOUT FRESH AIR SUPPY

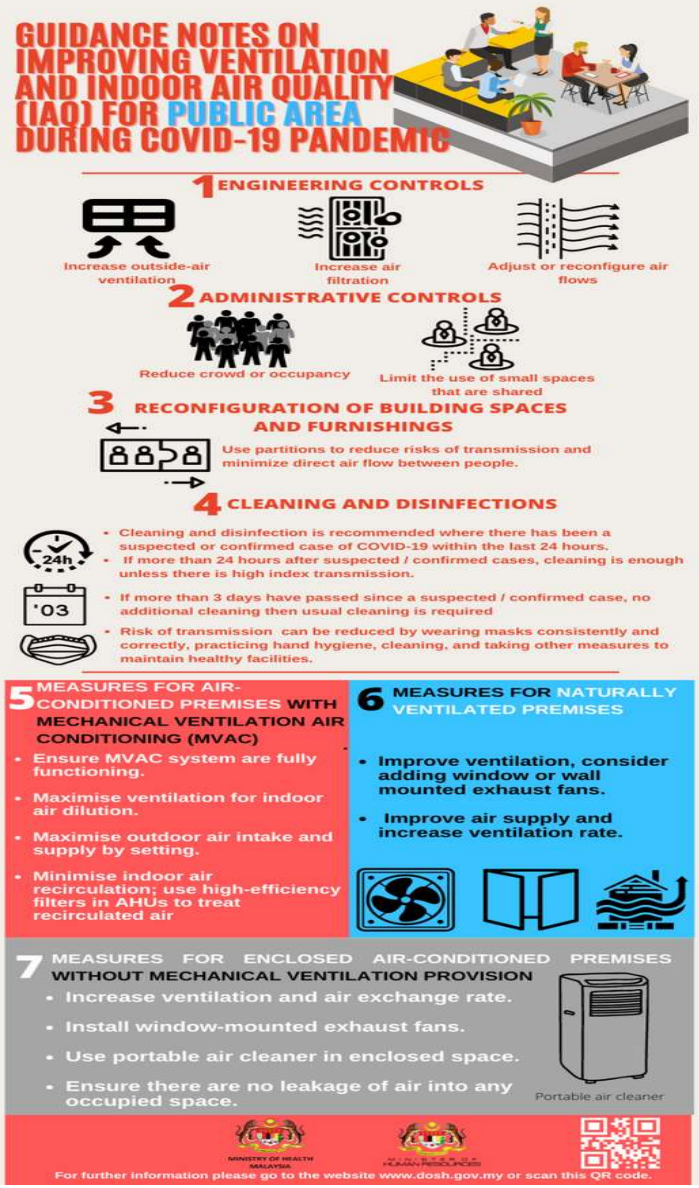
- a) Open operable windows and doors as frequently as possible, unless outdoor/outside air quality is poor. Air-conditioning should be reduced or turned off when doors and/or windows are opened.
- b) Consider positioning extractor/mounted exhaust fans at windows to blow air outwards and increase air exchange.
- c) Consider adding dedicated outdoor air supply and/or exhaust. The outdoor air system can be designed such that high-efficiency (MERV14 or F8) filters when necessary.
- d) Modifying the position of the split unit or FCUs to direct the airflow to the less clean zone or install an extractor to control the airflow where AGP are performed.
- e) Consider to use a stand-alone air cleaner with appropriate filters if no other (shortterm) strategy can be adopted. The stand-alone air cleaners do not replace ventilation in any circumstance.

AIR-CONDITIONED FACILITIES WITH MECHANICAL VENTILATION

- a) To increase the ventilation rate according to system capabilities. Disable demand-control ventilation such as those with CO2 sensors, to avoid automatic reduction of outdoor air supply.
- b) Consider reducing the maximum room occupancy.
- c) Modify airflow direction by relocating supply and return air devices if necessary.
- d) Set recirculation air dampers to a minimum according to system capabilities if possible.
- e) Use high-efficiency filters (at least MERV14 or F8 is recommended) in AHUs. Filters should be properly installed regularly inspected, maintained and cleaned according to manufacturers' recommendation.
- f) Consider to use air-cleaning technologies that be able to kill microbe in AHUs or ducting to augment MERV14 filters. Efficacy and safety of all air-cleaning devices under the operating conditions must be considered.
- g) Consider to use a stand-alone air cleaner with appropriate filters if no other (shortterm) strategy can be adopted. The stand-alone air cleaners do not replace ventilation in any circumstance.

Infographic produced

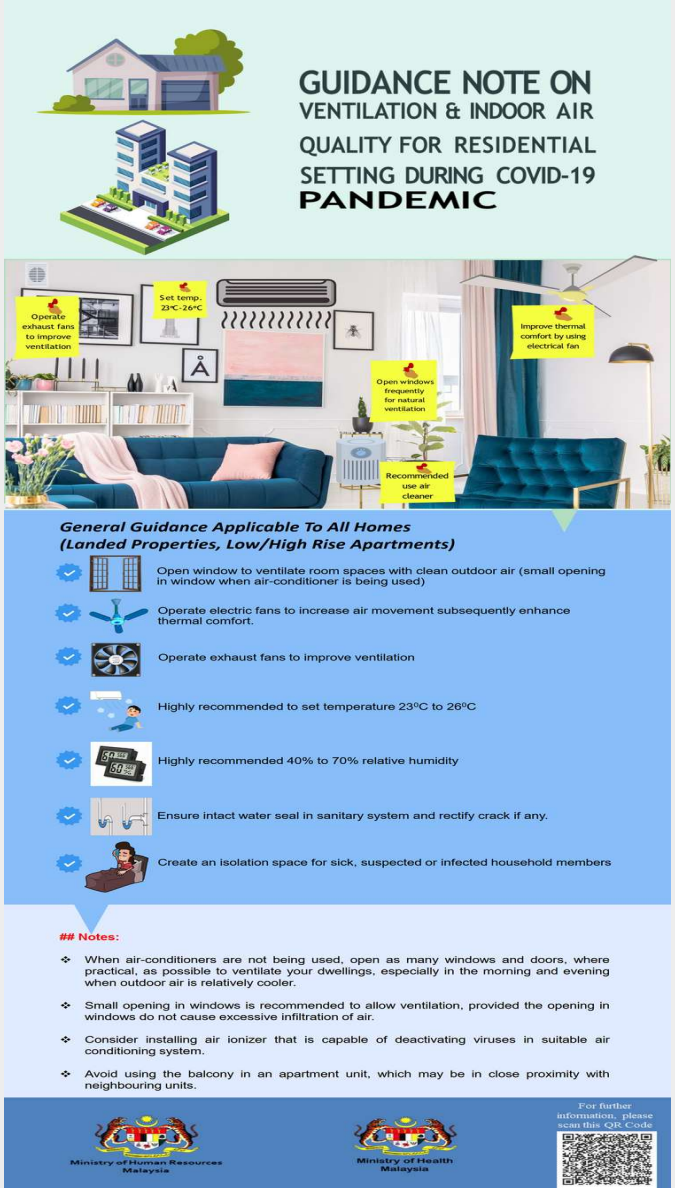
PUBLIC SETTING



- **Method to control**
  - Engineering Controls
  - Administrative Controls
  - Reconfiguration of Building Spaces and Furnishings
  - Cleaning and Disinfection
- **Measures for air-conditioned premises with mechanical ventilation air conditioning (MVAC)**
  - Ensure MVAC system are fully functioning.
  - Maximise ventilation for indoor air dilution: Maximise outdoor air intake and supply by setting.
  - Minimise indoor air recirculation; use high-efficiency filters in AHUs to treat recirculated air.
- **Measures for naturally ventilated premises.**
- **Measures for enclosed air-conditioned premises without mechanical ventilation provision (e.g. split-unit air-conditioners or FCUs without fresh air supply)**

Infographic produced

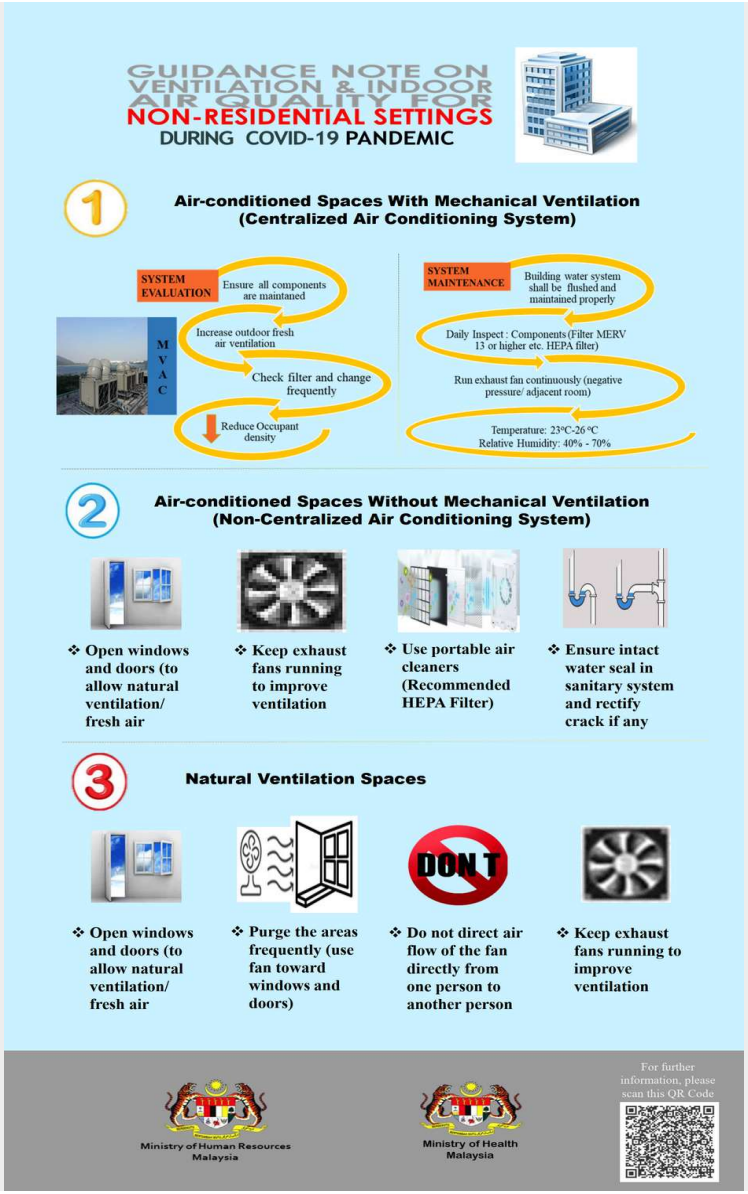
RESIDENTIAL SETTINGS



- **There are two types of residential settings that can be distinguished as follows:**
  - Houses (landed properties)
  - Other residential settings
- **Both residential settings can be divided into two (2) types of ventilation as follows:**
  - **Enclosed air conditioned residential settings without mechanical ventilation provision.**
  - **Naturally ventilated residential settings**
- **Carrying out a Risk Assessment: It is of importance that a risk assessment be carried out to facilitate the implementation of relevant countermeasures and to assess the minimum ventilation rate per person.**

Infographic produced

NON-RESIDENTIAL SETTINGS



- **Carrying out a Risk Assessment:** It is of importance that a risk assessment be carried out to facilitate the implementation of relevant countermeasures and to assess the minimum ventilation rate per person.
- **Non-residential setting can be divided into three (3) types of ventilation as follows:**
  - Air-Conditioned Spaces with Mechanical Ventilation (Centralized Air Conditioning System)
  - Air-Conditioned Spaces without Mechanical Ventilation (NonCentralized Air Conditioning System)
  - Natural Ventilated Spaces

Recommendations

Few common method:

1	2	3	4	5
Increase ventilation rate	Reducing the maximum room occupancy	Open operable windows and doors frequently	Portable Air cleaner with appropriate filters	Increase outdoor air supply

Few specific method:

	RESIDENTIAL	NON RESIDENTIAL	HEALTHCARE FACILITIES	PUBLIC AREA
AIR CHANGE	Use stand / ceiling fan	Minimize air recirculation	Increase outdoor air supply	Use stand / ceiling fan
AIR CLEANER/ FILTER	Use Air cleaner with appropriate filters	Min filter type MERV 13	Min filter type MERV 14	Use Air cleaner with appropriate filters

ROLES OF BUILDING MANAGEMENT, EMPLOYERS, HOMEOWNERS

- COMPLY TO STRATEGIES AND MINIMUM REQUIREMENTS LISTED IN EACH SETTINGS AND RECOMMENDATIONS SUCH AS
  - ANALYSE BUILDING MVAC SYSTEMS
  - PROPER OPERATIONS AND MAINTENANCE OF MVAC
  - MONITOR AND MAINTAIN RELATIVE HUMIDITY AS IN THE ICOP 2010
  - AVOID RECIRCULATION OF AIR
  - OPENING WINDOWS
  - EXTEND OPERATING TIMES OF MVAC
  - LIMIT NO OF OCCUPANCY
- WEAR MASK, PHYSICAL DISTANCING
- INCREASE VENTILATION RATE: 10L/S

EXPECTATION

- TO PROMOTE AND IMPLEMENT THESE GUIDANCES FOR THESE 4 SETTINGS
- THESE GUIDANCES MAY REDUCE THE RISK OF VIRUS TRANSMISSION THROUGH AIRBORNE.
- TO BE READ TOGETHER WITH SOP ESTABLISHED BY MKN AND MOH
- COMPLY TO SOPS AT ALL PUBLIC PLACES TO PREVENT BUILD UP OF CO2
  - –INITIAL VENTILATION PERFORMANCE INDICATOR

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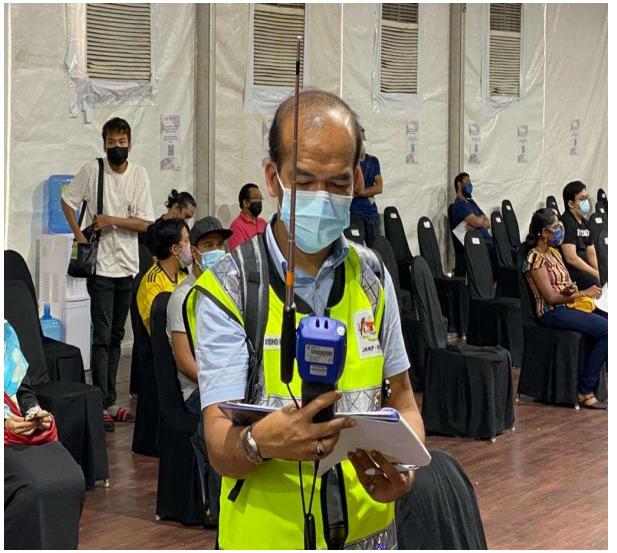
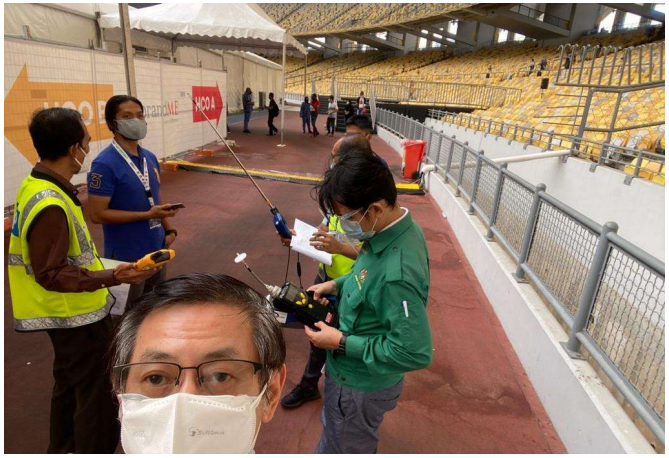
MEASUREMENTS OF VENTILATION AT PPVS BY DOSH





Thank you!

hazlina@mohr.gov.my
Technical Committee on Ventilation and Indoor Air Quality (IAQ) During Pandemic COVID-19