INDOOR AIR QUALITY MANAGEMENT IN CHILDCARES & ELCS

Presented By Air-Met Scientific

- Why monitor Indoor Air Quality?
- COVID-19 Considerations for Childcare and ELCs
- Benefits of Indoor Air Quality Monitoring
- How Indoor Air Quality Monitoring Works
- Q & A

ABOUT AIR-MET SCIENTIFIC

Established since 1984, Air-Met Scientific is Australia's market leader in the supply, service, rental and engineering of reliable measurement and monitoring solutions to OHS and environmental professionals.

- **Local support:** 6 offices nationally
- **Committed to quality:**
  - ISO 9001 Certified
- **National Association of Testing Authorities (NATA) Accreditations:**
  - Iso/IEC 17025 – NATA accredited on Calibration of gas detectors including on-site
  - ISO/IEC 17020 – NATA accredited on Overhaul inspections association with explosion protected equipment (Ex i)
  - ISO/IEC 17025 – NATA accredited on calibration and testing of air sampling pumps and flow meters

CHALLENGES FACED BY CHILDCARES AND EARLY LEARNING CENTRES

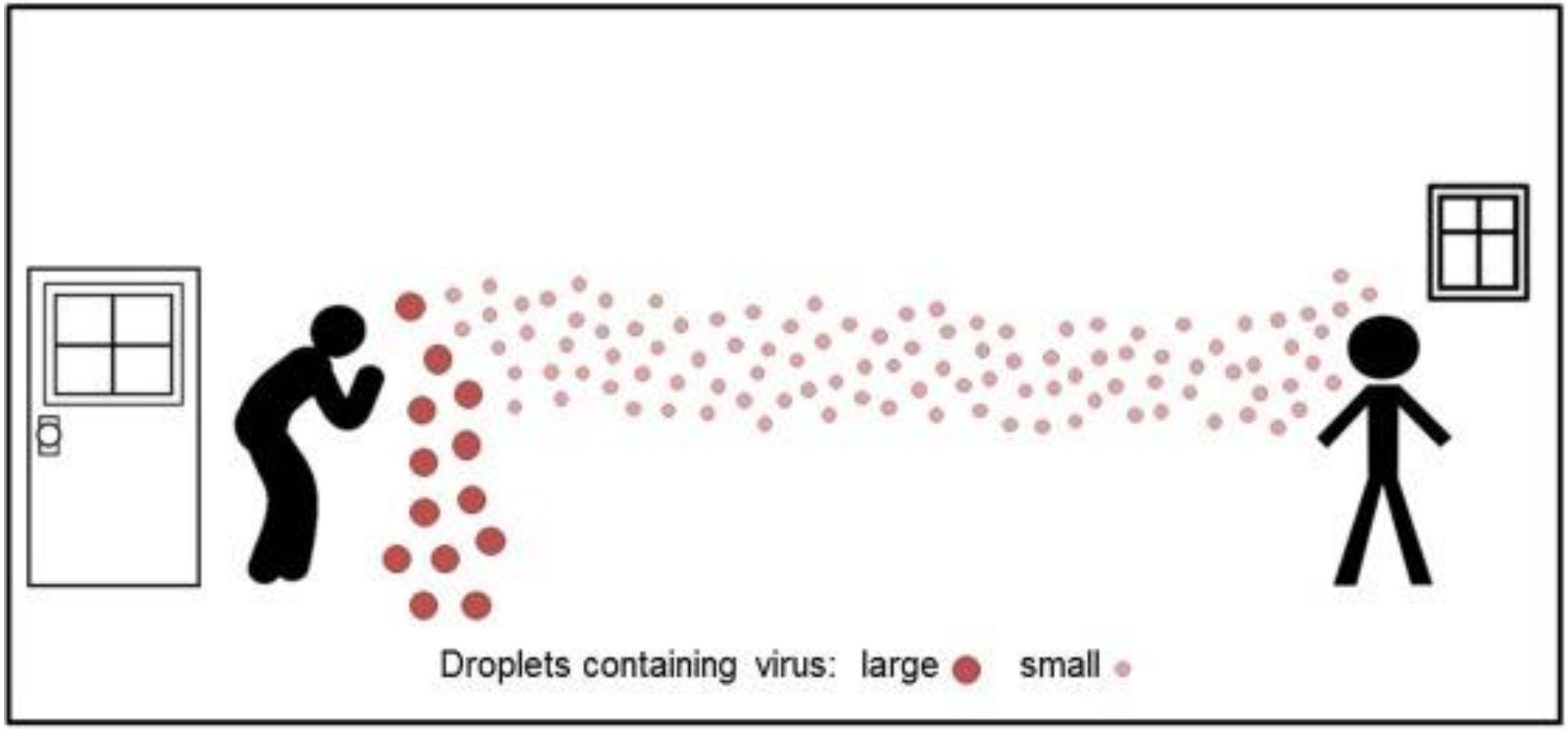
- Social distancing is not really feasible or practical among educators and children
- Mask wearing in young children is also not feasible or if under 2, advised
- Children under 5 are currently ineligible to get vaccinated in Australia

INDOOR AIR QUALITY MONITORING BENEFITS

- Improving illness-related absenteeism in children and educators
- Minimises additional cost and time to replace sick educators
- Reduces the potential need to close the centre due to COVID-19 exposure
- Alleviates stress on children
- Better learning outcomes

WHY MONITOR INDOOR AIR QUALITY

"Even if you're physically distancing and washing hands, COVID transmits in the air, so we need to make sure we have good indoor air quality," Kate Cole – Occupational Hygienist and president-elect of the Australian Institute of Occupational Hygienists.



Credit: Airborne transmission of SARS-CoV-2 By Lidia Morawska

IAQ & VENTILATION

"Buildings including restaurants, schools, homes, apartment buildings and offices continue to be the highest-risk locations for disease spread, and many Victorian classrooms – the site for several recent outbreaks **– have air quality 2½ times worse than recommended."**

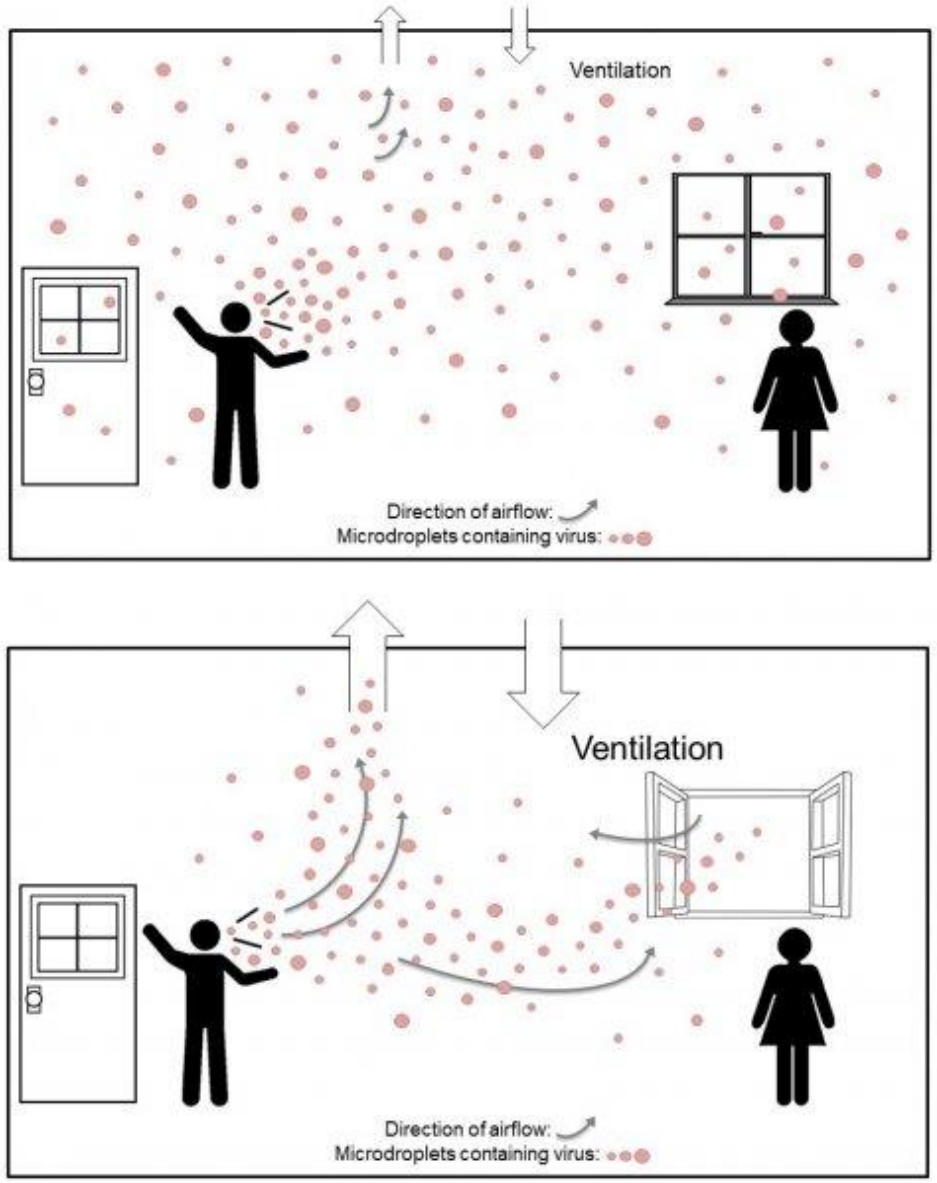
Ventilation 'revolution' needed to speed up Australia's path out of lockdown, The Age, August 22, 2021

IAQ & VENTILATION

> The principal aim of good ventilation is to control the risk of airborne transmission when in the same indoor space as an infected person.

> Good ventilation can reduce transmission risk via the airborne route in an indoor environment by diluting the concentration of airborne particles with a supply of fresh or clean air.

> The aim here is to bring in clean fresh air and **NOT** recirculating the air that is already inside the room.



Credit: Morawska et al.; Clinical Infectious Diseases 2020 (CC BY NC ND 4.0)

WHAT AFFECTS INDOOR AIR QUALITY

- Size of the room
- Number of children and educators in a room
- Social distancing – as mentioned, not always feasible in the childcare setting
- Area natural ventilation – what types of window and door ventilation have you got
- Vents: have you got wall vents and trickle vents you can use
- Mechanical ventilation:
  - No mechanical ventilation
  - HVAC or similar on recirculation
  - Toilet and change room exhaust fans
  - HVAC or similar on full fresh air
  - HVAC on recirculation with HEPA or other suitable virus arresting technology
- The activity of the occupants within the room

WHAT AFFECTS INDOOR AIR QUALITY

- Stale air areas may also exist where there is very little airflow and the air remains still and unaffected by ventilation.

- **Effects/symptoms of stale air:**
  - Makes a room feel stuffy
  - Causes occupants to be further exposed to harmful particles, toxins and hazardous chemicals that are in circulation
  - Linked to headaches, skin irritation and fatigue at high levels

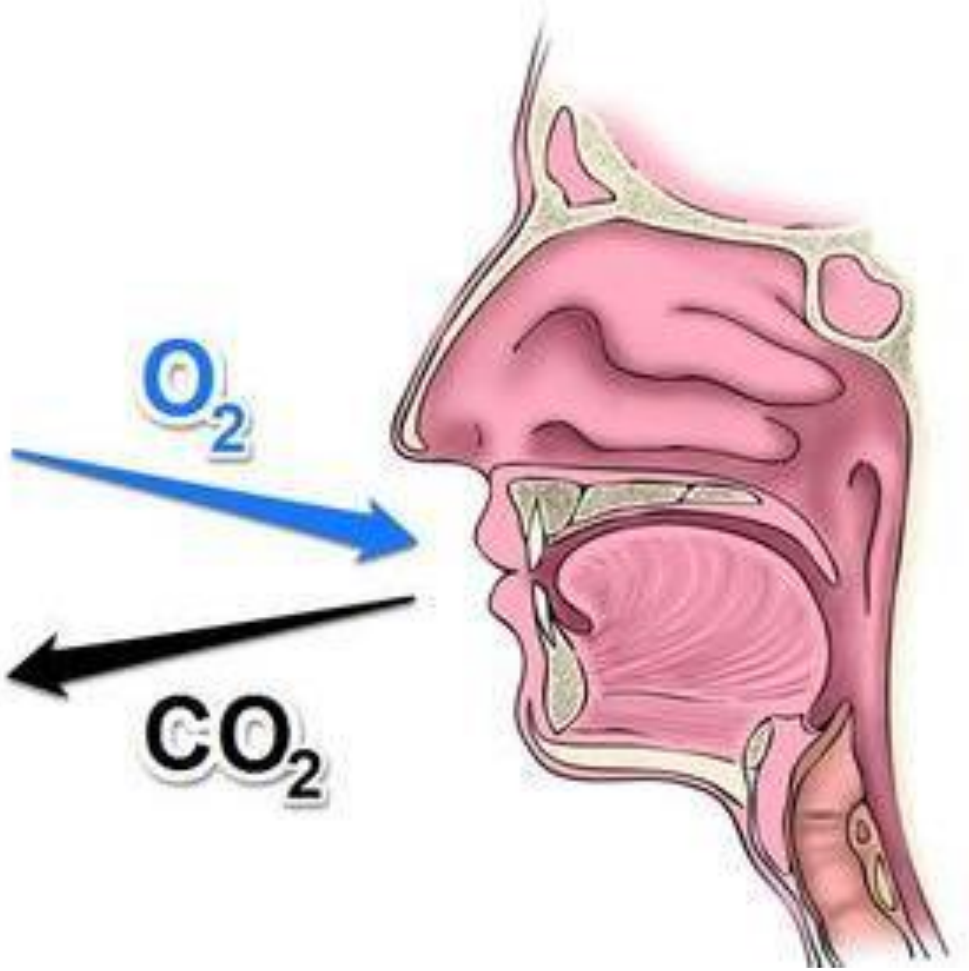
Credit: Daikin

HOW DO YOU MONITOR IAQ?

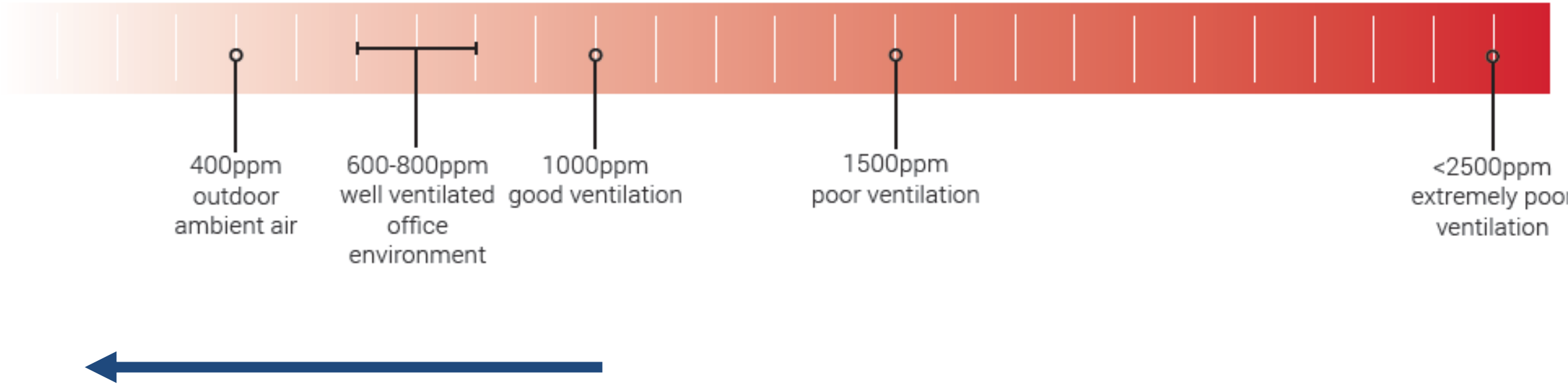
- CO_2 is a colourless, odourless and non flammable gas that is present naturally in the earth's atmosphere and is also a by product in the air exhaled from our lungs.

- Measuring CO_2 can tell you how much fresh air exchanges are occurring in a room and if adequate ventilation and dilution of the air is occurring to reduce possible COVID-19 transmission between people.

- **IMPORTANT**:
  Air-cleaning devices such as HEPA Filters or UV can also help reduce the risk of transmission but **it does not** reduce the CO_2 levels in a room.



LEVELS OF CO2 CONCENTRATION



IMPORTANT NOTES

- > CO_2 monitors do not directly measure COVID-19. They are an indication of how effective the ventilation is in that room
- > CO_2 levels will vary according to what people are doing and other factors. A perfectly healthy person breathes our CO_2 so CO_2 levels can be high and no actual COVID-19 is being spread
- > But if everyone in the space is infected, there could be a high risk even if the CO_2 readings are low.

TYPES OF MONITORING UNITS

- There are different types of monitoring systems that exist
  - Real-Time Spot Measurements
  - Real-Time Single Sensor Instruments
  - Multi-level real-time data logging sensors with online portals and alarm triggers.

- The **Elsys ERS CO_2 Sensor** is a plug and play sensor with datalogging capabilities and trigger notifications to alert educators when action is required to improve the quality of air within the room.
  - No expensive infrastructure upgrades
  - Wireless and powered by two 3.6V AA Lithium (10 year battery life)
  - Equipped with NFC for easy configuration

CREATING A WIRELESS NETWORK OF SENSORS TO IMPROVE INDOOR AIR QUALITY

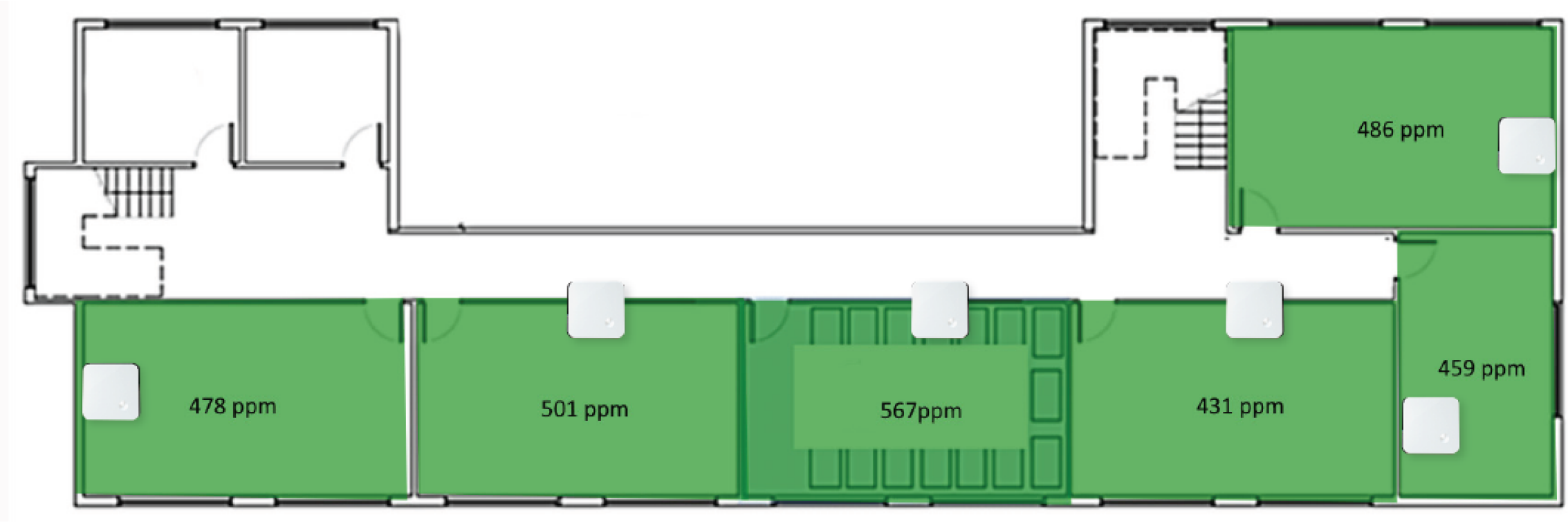
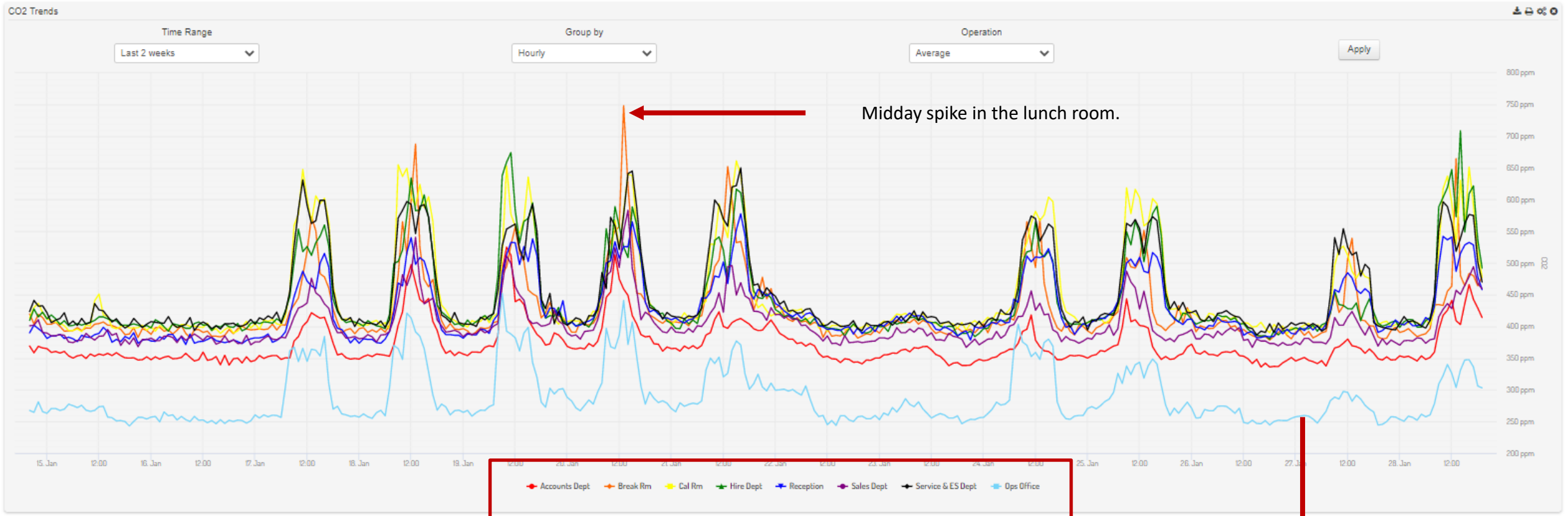


Figure 1. Typical placement of CO_2 Sensors in rooms which require IAQ monitoring

REAL-TIME INSIGHTS



Indicates the different rooms where the sensors are placed

Low CO2 reading. 1 person occupancy office

KEY MESSAGES

- Good ventilation is a proven mitigation strategy to reduce the spread of respiratory illnesses and also lowers the risk of exposure to COVID-19 in the built environment
- Good ventilation is for the general health and safety of children and educators in your centres.
- COVID-19 mitigation strategies don’t have to be costly and small changes to existing tools, systems and practises can have a big impact on reducing risks
- Without monitoring, there is no way to determine the quality of air in each of the rooms

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WWW.AIRMET.COM.AU P: 1800 000 744