REHVA
Federation of European Heating, Ventilation and Air Conditioning Associations

Guidance for Schools

Introduction

In this document we summarise advice on the operation and use of building services in schools, in order to prevent the spread of the coronavirus disease (COVID-19) virus (SARS-CoV-2). This guidance is focussing on school principals and facility managers.

Before taking preventive measures, it requires some basic understanding of transmission of infectious agents. In relation to COVID-19 four transmission routes can be distinguished:

1. In close contact of 1-2 m via droplets and microdroplets (when sneezing, coughing or talking).
2. via the air through microdroplets (droplet nuclei), which may stay airborne for hours and can be transported long distances (released when breathing, talking, sneezing or coughing).
3. via surface contact (hand-hand, hand-surface etc.).
4. via the faecal-oral route.

More backgrounds on transmission routes of SARS-CoV-2 can be found in the REHVA COVID-19 Guidance.

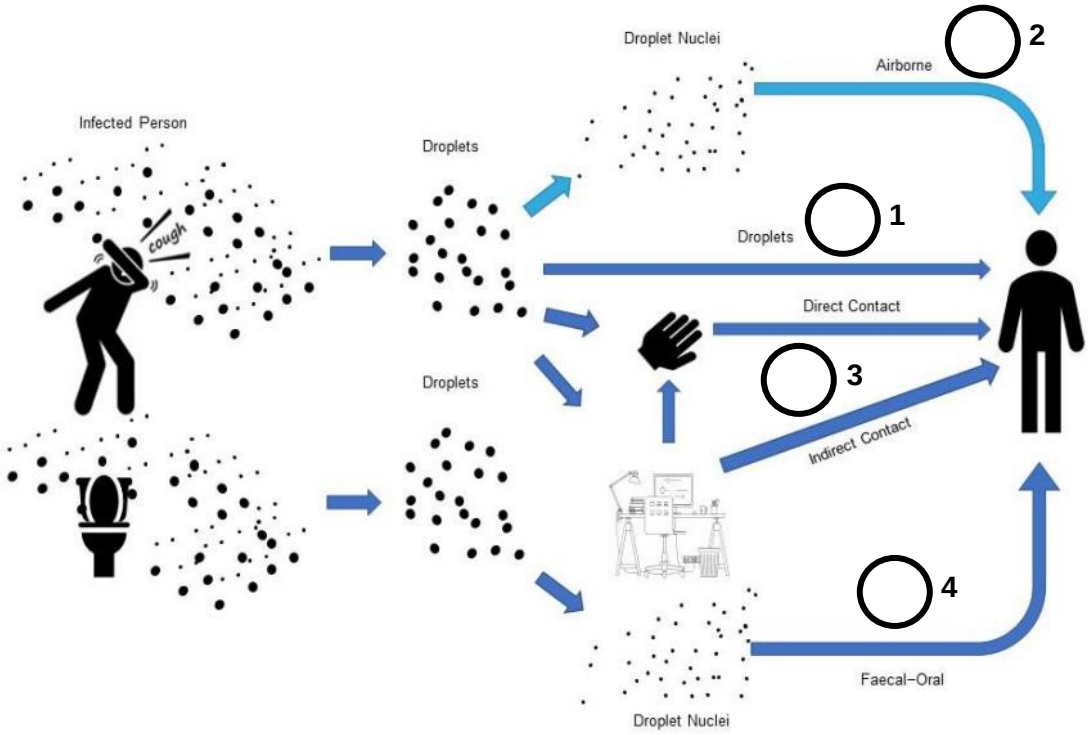

Figure 1. Exposure mechanisms of COVID-19 SARS-CoV-2 droplets. (figure: courtesy Francesco Franchimon).

General guidance for employers and building owners that is presented in e.g. the WHO document 'Guidance for COVID-19 prevention and control in schools' and national guidelines focus on monitoring

of symptoms, keeping distance and good hygiene practices (transmission routes via large droplets and via surface contact). In order to keep the risk of infection as low as reasonably achievable, we additionally recommend measures on ventilation (airborne transmission) and sanitary installations (faecal-oral transmission).

Ventilation

In many European schools sufficient ventilation is a challenge. Today, many schools in Europe are naturally ventilated (e.g. using windows). Natural ventilation significantly depends on the temperature difference between the indoor and the ambient air and the current wind situation. As a result, a sufficient natural ventilation cannot be guaranteed at all times. Mechanical ventilation systems can ensure a continuous air exchange throughout the year. Below some practical instructions are given to optimise ventilation in the short-term:

- Secure ventilation of spaces with outdoor air. Check whether the ventilation systems in classrooms, either natural or mechanical, are functioning well:
    - Check whether windows and grids can be opened.
    - Clean ventilations' grids so that the air supply is not obstructed.
    - Have mechanical ventilation systems checked for their functioning by your maintenance company.
- Install a CO_2 monitor with traffic light indication (Figure 2) at least in the classrooms in which ventilation depends on opening windows and/or grids. This visualizes the need for extra ventilation by opening windows. Make sure that the CO_2 monitor is placed at a visible position in the classroom, away from fresh air inlets (e.g. open windows). In times of the pandemic, we suggest to temporarily change the default settings of the traffic light indicator (orange light up to 800 ppm and red light up to 1000 ppm) in order to promote as much ventilation as possible.

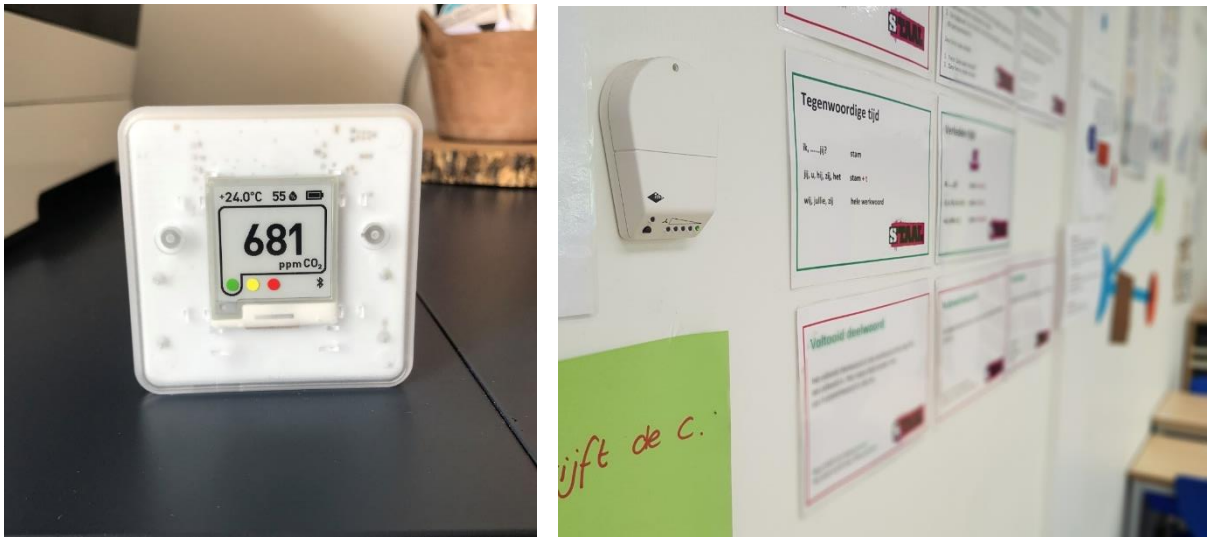

Figure 2. Examples of CO_2 monitors with traffic light indicator showing the indoor air quality.

- Check operating hours of mechanical ventilation systems. Switch ventilation to nominal speed at least 2 hours before the school starts and switch to lower speed 2 hours after occupancy. Keep toilet ventilation 24/7 in operation. This also ensures a minimum of ventilation in the entire building during night-time.
- Switch air handling units with central recirculation to 100% outdoor air.

- Adjust the setpoints of CO_2 controlled ventilation systems (if present). With these systems, the amount of air exchange is automatically reduced with lower occupancy to save energy. In order to reduce the risk of transmission of infectious diseases full ventilation is needed, even if only part of the students is present. Ask your maintenance company if there is CO_2 controlled ventilation present in your building. Generally, they are also the ones to adjust setpoints.
- Give teachers instructions on how to use the ventilation facilities:
    - Open windows and ventilations' grids as much as possible during school hours. Opening windows just underneath the ceiling reduces the draught risk. In rooms with mechanical air supply and exhaust this is usually not necessary, but extra ventilation is positive and does not disrupt the ventilation system.
    - Ensure regular airing with windows during breaks (also in mechanically ventilated buildings).
    - Make sure that ventilation facilities are not obstructed or blocked by curtains or furniture.
    - Keep an eye on any installed CO_2 monitors (ask pupils to assist). Be aware that more aerosols are released during activities such as singing or sport.
    - Use local cooling systems, like fan coils or split units, as you usually do. Though, make sure that there is ***always*** supply of fresh outdoor air by mechanical ventilation systems or operable windows.

Figure 3. Open windows as much as possible during school hours and ensure airing during breaks.

In the long-term it obviously makes sense to structurally improve the ventilation, since poor indoor air quality leads to, among others, headache, fatigue and reduced learning performance.

Some installers and maintenance companies are now offering to replace filters, but this is NOT necessary to reduce infection risks. Only replace filters when necessary or already planned. In addition, one talks about cooling and humidification of air. Adjusting the setpoints of the climate system to lower values is NOT necessary and useless in schools. The same goes for placing humidifiers

because there is NO evidence that this is effective. Focus on things that really matter, such as proper ventilation.

Sanitary

Points of attention for the sanitary facilities (taps, toilets, sewers):

- Flush all toilets, water taps and showers before the school reopens. If water taps haven't been used for several weeks, the water that is still in the pipes may be of poor quality.
- Check if water taps in all toilets are in operating condition (with soap dispensers and paper towels) or provide other facilities to disinfect hands after using the toilet.
- Replace frequently used water taps with taps with a sensor, so that they can be used without touching them.
- Make sure that floor drains do not run dry to avoid an open connection to the sewer. Fill the drains regularly with water. Add some oil to prevent the water seal from evaporating quickly.
- Give the instructions to flush toilets with closed lid and wash hands after toilet use.

More information

- https://www.rehva.eu/activities/covid-19-guidance
- https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public
- https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/guidance-for-schools-workplaces-institutions

Colophon
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