

Mitigating Indoor Risk of Airborne Infections: the MIRAI project

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Background and aim

The risk of infection from SARS-CoV-2 and other airborne diseases is known to be higher in indoor environment, also depending on personal (e.g. individual susceptibility, modality of exposure, viral load) and environmental (e.g. airflow, temperature, humidity) factors. Measurements of CO₂ indoors are often used as a proxy for air quality and recent evidence suggests that its monitoring can be helpful to identify poorly ventilated multi-occupancy spaces like offices and classrooms, thus possibly evaluating the risk of exposure to indoor airborne contaminants, including infectious agents. In addition, the recent availability of portable low-cost sensors has been suggested to be effective in the prevention of SARS-CoV-2 infection and other airborne diseases.



Figure 1. Setup of OPC unit and CO₂ sensor-

Methods

In this project, we will use low-cost sensors for the evaluation of CO₂ levels using Non-Dispersive InfraRed method. We will assess CO₂ levels in high school and university in Modena, Northern Italy from March 2022 up to end of the year. Information factsheets will be placed along with the sensors with detailed information about the project aim and purpose, guidelines for adequate CO₂ monitoring and alert thresholds (800 and 1400 ppm) indicating the need to increase the ventilation (e.g. opening doors and windows). Calibration and quality control of the low-cost monitors will be also performed to ensure the reliability of the measurements.

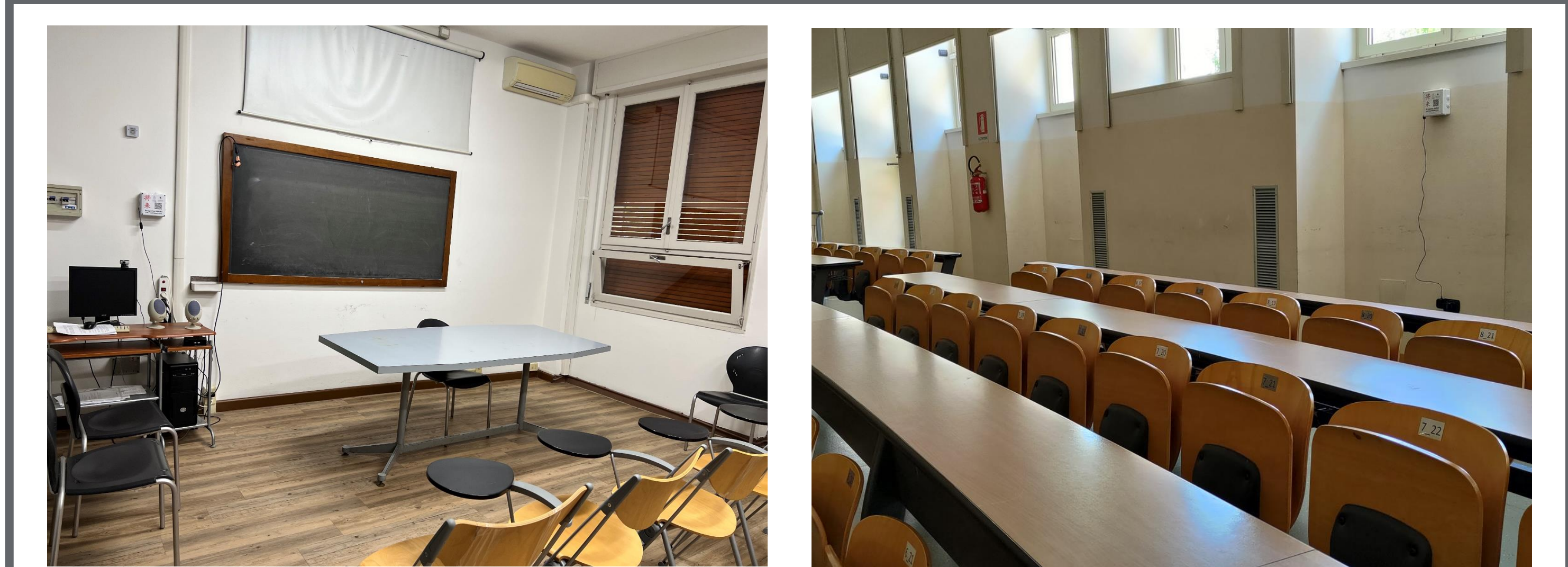


Figure 2. Set up of the monitoring unit in the classrooms of Public Health and Engineering Departments.

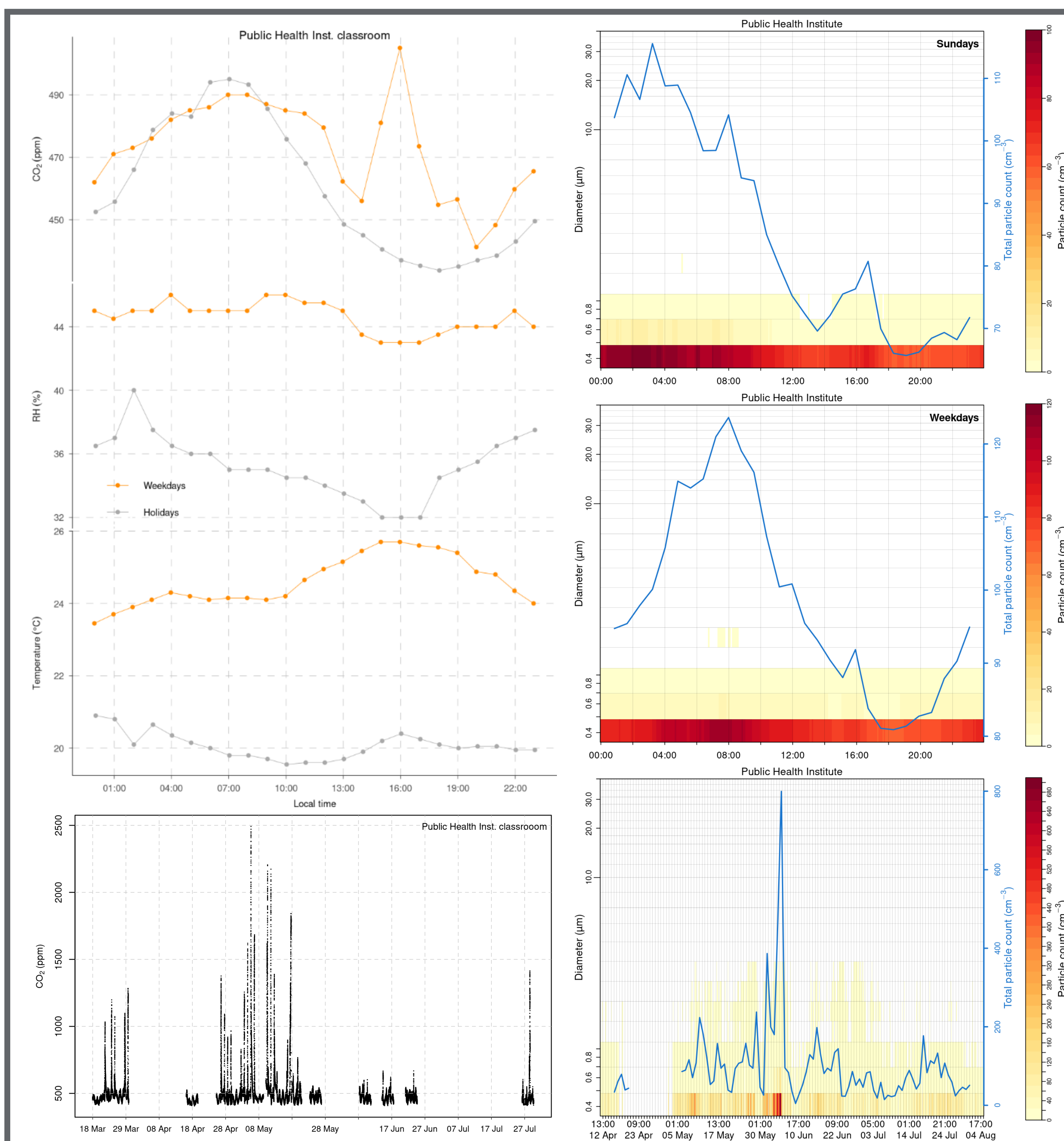


Figure 3. Overview of the dataset collected at the Public Health Department.

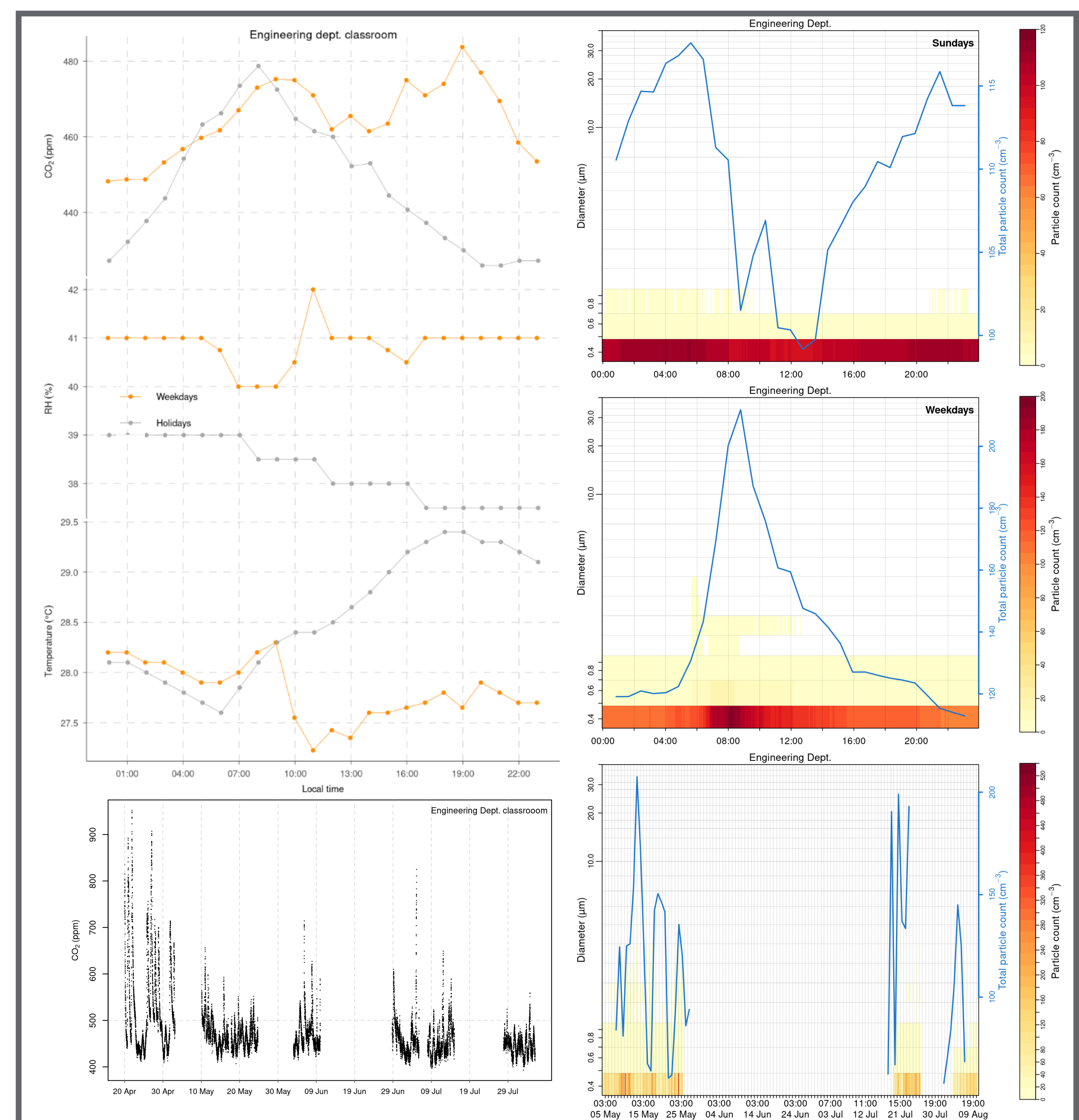


Figure 4. Overview of the dataset collected at the Engineering Department.

Results and Conclusions

The monitoring campaign has started as planned and the environmental and health data collection is ongoing. Considering the recommendations to prevent SARS-CoV-2 in Italy still indicate to wear masks for both students and personnel as well as the lowering of pandemic spread, no positive cases have been identified within the monitored classrooms. Preliminary results of monitoring campaign and project outputs will be presented during the conference.



Go to project webpage



This study was supported by the grant 'UNIMORE FAR 2021 Mission Oriented' by Fondazione di Modena



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