

# Do You Have A Spare PLANet?

## Description of the project including the project's goal

Scientific literature has underlined the role of indoor air pollution in affecting health, because people generally spend a major part of their time indoors (European Commission's HESE study).

Air quality assessment is frequently driven by the need to determine whether the standard guideline has been exceeded ("Monitoring ambient air quality for health impact assessment", WHO Regional Publications, European Series No. 85.). This overshadows another objective of air quality assessment which is to provide information needed to estimate students' exposure to air pollution and effects on health and work performance.

It is very important to assess pollutant levels in different facilities where students spend most of their time. Preventing risks caused by indoor air pollution is very effective if the pattern of exposure is recognized and monitored simultaneously with the implementation of action to prevent or reduce pollution.

Given the importance of these facts for air quality management, in this study we tried to provide some information on ambient air quality in Belgrade's School of Dentistry. Our main goal was to initiate the long term optimization of working conditions through renovation of the school's facilities which would significantly lower the exposure risks to the indoor air pollution.

## Project's objectives, activities and achievements

The objective of this study was to examine the correlation between temperature, O<sub>2</sub> and CO<sub>2</sub> concentrations (IAQ) and subjective symptoms experienced by students, who took part in a survey during lectures in the amphitheatres with the artificial and low-rate ventilation.

The experimental protocol was focused on measuring the indoor air quality parameters while the participating students answered a questionnaire comprised of 13 questions with answers provided (closed type questionnaire assembled in accordance to the European Commission's HESE Study questionnaire).

Temperature, O<sub>2</sub> and CO<sub>2</sub> concentration levels were measured simultaneously using the multigas analyzer (MULTI RAE IR- manufacturer RAE systems) with an electrochemical sensor within the amphitheatres A and B.

Using questionnaires we were able to show that the perception of air quality is broadly related to objective measurements, but it is not sufficiently precise to characterize the environment. The majority of the people perceived air quality as poor or very poor while a less number of people were satisfied with the quality of air.

Recent research, where air pollution source strength and ventilation rate were altered in a series of linked experiments (Wargocki et al. 1999, 2000 a,b,c), has demonstrated that work performance could be increased by 5-10% by improving indoor air quality. The negative economic consequences of effects on health and productivity due to inadequate indoor air quality greatly exceed the total investment and running costs of heating, cooling and ventilation (Djukanovic et al. 2002).

Having reviewed the results of this study, the Management of the Belgrade's School of Dentistry financed the renovation of the Amphitheatres A and B in order to improve the microclimatic conditions and thus protect health and optimize working conditions for our students.

## **How young people were involved**

This project was launched following students' complaints about the ambient air quality during their lectures. It was organized and implemented by a student research group professionally supported and guided by the mentoring Professor. In total, 217 healthy second-year-students from the Belgrade's School of Dentistry volunteered to participate giving the written informed consent. Students were not recruited with regard to exercise habits and were therefore of varying activity levels.

Participants gave an overview on their perception of the indoor air quality during lecture using a pre-assembled questionnaire; at the same time the objective parameters' measurement was taken.

After concluding this project, our student presented her results along with a more detailed monitoring project proposal at an international dental students' meeting. We hope to inspire other students in Europe to conduct similar research and help improve working conditions for them as well.

After the renovation of amphitheatres no more complaints were reported.

## **Project funding**

The project was financially supported by Belgrade Dental School, University of Belgrade. All of the relevant measurements were made by the Institute for Public Health, Republic of Serbia, which provided us with their standardized cost list for these kinds of measurements. After submitting the financial and activity report to the school's administrations, the costs were granted. The overall costs did not exceed 200 Euros.

## **Project's connections to national or international environment processes**

The Indoor air monitoring project was conducted following the adaptation of WHO Parma Declaration on Environment and Health in 2010. Taking into consideration the Regional Priority Goal 3, Preventing disease through improved outdoor and indoor air quality, we tried to give our contribution to the monitoring process of the commitments taken by the Serbian government.

## **Project's connections to national or international health processes**

Our project's objectives in the early recognition and prevention of health hazards correlates with the Serbian health strategies and programmes of early diseases detection and prevention set by the Ministry of Health. We followed the standardized WHO Air Quality Guidelines to assess whether the recommended pollutant concentrations have been exceeded. We have also used a number of European indoor air quality studies to modify the methodology in order to compare the results.

## **Follow up, outcomes and future plans**

The first phase of this project was completed after the renovation of the amphitheatres and the improvement of the microclimatic working conditions.

The second phase will consider conducting a long-term ambient air monitoring programme that would help keep the working conditions optimal at all times.

We are planning to publish the results of this monitoring process in relevant publications thus hoping to inspire a number of schools to consider implementing the same or similar monitoring activities in order to improve the working conditions for their students.