

<sup>2</sup>Department of Molecular and Developmental Medicine, University of Siena, Siena, Italy

<sup>3</sup>Department of Medical Biotechnologies, University of Siena, Siena, Italy  
Contact: federicotaddeini@hotmail.it

### **Background:**

COVID19 outbreak highlighted air disinfection's importance. All bacteria and viruses tested to date (including various coronaviruses) respond to UV-C disinfection. This study aims to assess the effectiveness of an UVC disinfection system for air in a real working context.

### **Methods:**

This descriptive study was carried out in November 2020 in an office of the Department of Molecular and Developmental Medicine at the University of Siena. The disinfecting air system, Cleaning Air T12, produced by Italia Iso Group, has 12 lamps of 6.9 Watt of UVC/each, two inlet grills in its bottom and 2 outlet grills in the superior part. The volume of air that the system treat is of 210m<sup>3</sup>/h. The experiments were run over several days during the activities of 3-5 subjects working for several hours. Real time microbial air samplings were run during the tests switching the system ON and OFF. To verify microbial time variation, initial samplings (phase 1) had the system OFF, then ON (phase 2) and finally OFF again (phase 3). Petri dishes were incubated at 36 and 22 °C. Statistical analysis was executed with Stata 16. Significance level was set at  $p < 0.05$ .

### **Results:**

The longest test highlighted that during phase 2, after 8 minutes from the end of phase 1, the system acted significantly ( $p = 0.001$ ) on the reduction of environmental contamination up to a mean of 70 (95% C.I. 64 - 77) CFU/500 liters (about 70% at 22 °C) and 50% at 36 °C. In phase 3 the mean values became 171 (144 - 198) CFU/500 liters at 22 °C and 259 (228-291) at 36 °C.

### **Conclusions:**

The system was able to significantly reduce the environmental contamination in real time. The experimental tests show how, as soon as the device is turned OFF after at least half an hour of operation, air healthiness drops dramatically within 10 minutes, bringing the levels of microbial contamination (induced by the presence of the operators in the room) to levels even higher than 150%.

### **Key messages:**

- In order to convey a correct and truthful message about the disinfection capabilities of an air purification system, testing the device under real operating would be necessary.
- Testing the device under real operating conditions, with and without the presence of people in controlled environments, would be necessary before the final product is placed on the market.

## **Wind of change: better air for microbial environmental control**

Federico Taddeini

G Messina<sup>1,2</sup>, F Taddeini<sup>1</sup>, D Amodeo<sup>2</sup>, C Petri<sup>2</sup>, I De Palma<sup>2</sup>,  
A Puccio<sup>2</sup>, G Cevenini<sup>3</sup>

<sup>1</sup>Post Graduate School of Public Health, University of Siena, Siena, Italy