

## MATERIAL SUPPLEMENTARY

### Effects of indoor endocrine disrupting chemicals on childhood rhinitis

#### Supplementary methodology

From the 53 public primary schools of Porto Municipality, 20 schools with the highest number of students were selected. In each school, four classrooms of 3rd and/or 4th grades were selected among those with similar conditions and representative of the school building. All schools were naturally ventilated through windows and doors, and were mainly open during breaks [1]. Classrooms were selected based on ISAAC Phase II criteria, where children of this age group were more likely to understand the procedures than 6-7-year-old children and to be more compliant than 13-14 year old adolescents[2], highest density of occupation, full-week occupation time by the same class, and, if possible, on the location of classrooms on different floors[3].

Data from a cross-sectional analysis of 845 participants from 20 schools in Porto, Portugal, were analyzed. The evaluation included a self-administered ISAAC-based questionnaire [4] filled out by the parents, covering information on respiratory/allergic health of the children. A physical and clinical assessment, including height, weight, spirometry with bronchodilation, exhaled nitric oxide levels, skin-prick-tests (SPTs) and pupillometry were also performed by trained health professionals. The detailed participant assessment has previously been described [5]. SPTs were performed on children forearm using a QuickTest™ applicator containing house dust mite, mix of weeds, mix of grasses, cat dander, dog dander and *Alternaria alternata*, negative control, and a positive control consisting of histamine at 10mg/mL (Hall Allergy, Netherlands). Asthma was defined based on reported asthma medical diagnosis with symptoms (wheezing, dyspnoea or dry cough) in the past 12 months symptoms, and lung function [6]. Pupillometry was performed with a portable infrared PLR-200 pupillometer (Neuroptics PLR-200™ Pupillometer, Neuroptics Inc., CA). Pupillometry is a simple noninvasive technique that can provide valuable data concerning the functioning of both branches of the autonomic nervous system. Parasympathetic nervous system plays a dominant role during the pupil constriction phase (diameter of the pupil before (baseline) and at constriction peak (minimal), constriction amplitude and maximum and average constriction), while sympathetic nervous system is associated with pupil dilation phase (dilation velocities and the total time taken by the pupil to recover to 75% of the initial resting pupil size after reaching peak of constriction). The detailed assessment has previously been described[7].

Among the 845 children included (49.2% girls), the prevalence of AR and CAR was 13.4%, 10.4%, respectively. Additionally, the prevalence of children with asthma and atopy was 9.5% and

35.4%, respectively. Among children with rhinitis, the prevalence of asthma was approximately 20% (21.8% for AR and 23.6% for CAR).

Principal component analysis (PCA) was used to identify major EDCs patterns based on the 15 individual compounds. The PCA divided the EDCs into two principal components (PC1 and PC2). Of the two factors, PC1 had a higher absolute correlation with toluene, o-xylene, m/p-xylene, ethylbenzene, styrene and benzene, while PC2 had a higher absolute correlation with cyclohexanone, BHT, benzene, benzaldehyde, formaldehyde and acetaldehyde.

## References

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