CADMIUM AND ARSENIC EXPOSURE FACTORS IN A POPULATION LIVING ON POLLUTED SOILS, CASSIOPÉE STUDY, AVEYRON, FRANCE, 2008

Cécile DURAND, Regional office of the French institute for public health surveillance (Cire) Midi-Pyrénées, Toulouse, France
Nicolas SAUTHIER, Cire Midi-Pyrénées, Toulouse, France
Valérie SCHWOEBEL'Cire Midi-Pyrénées, Toulouse, France
Frédéric DOR, French institute for public health surveillance (InVS), Saint-Maurice, France

Background and Aims:
The town of Viviez (south-west of France) experienced 150 years of industrial activity generating atmospheric emissions until 1987 and substantial soil pollution, in particular by cadmium and arsenic. A public health assessment was carried out in order to estimate the health impact of this pollution and to formulate recommendations. This assessment included an exposure study with the objective of identifying exposure factors that increase the cadmium and arsenic body burden.

Methods:
Adult residents of Viviez and Montbazens (an unexposed town) who did not have occupational exposure to pollutants were included. Urinary cadmium and arsenic were analyzed by multivariate regression taking into account individual factors (age, smoking…) and environmental factors. Statistical methods for analysis of censored data were used in order to take into account concentrations below detection limit.

Results:
In Viviez, 21.6% of adults exceeded 1 µg of cadmium/g.creatinine and 5% exceeded 2 µg/g.creatinine against 4% and 0% in Montbazens. After adjustment for individual factors, the geometric means of urinary cadmium and arsenic were higher in Viviez than in Montbazens. Contrary to Montbazens, some environmental factors in Viviez were associated with urinary cadmium (length of residence, consumption of local fruit and vegetables and animal products), and with urinary arsenic (recent consumption of local poultry, consumption of local well and spring water, low frequency of mopping the floor, frequency of gardening).

Conclusions:
Differences in mean concentrations between the exposed and the unexposed town and exposure factors associated with cadmium and arsenic body burden suggest an environmental exposure of Viviez population. Residents could be presently exposed by local food ingestion and by inhalation or ingestion of polluted dust and soils. They could also have been exposed in the past by inhalation of atmospheric emissions. Recommendations based on these results will be made to limit further exposure.