INDOOR AIR POLLUTION (CHLORINATED ORGANIC HYDROCARBONS) IN ELEMENTRY SCHOOL IN ISRAEL

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Background: In 1997, heavy contamination was discovered in groundwater in Tel Aviv with heavy metals and volatile organic compounds (VOC)
These VOC's were also found in soil gases in one of the neighborhoods, especially near industrial areas. As a result, the authorities began monitoring VOC's in the neighborhood elementary school.
We report the results of VOC's measurements made at the school expressing exposure of children aged 6-12 years.
Methods: Samples were taken over the years 2001 - 2011 in various methods and included indoor air samples (24-hour canister sampling, passive and active - active charcoal tubes sampling), shallow drills in the school yard, nearby buildings, and "head space" from different materials found in school.
Results: Trichloroethylene was found in all indoor-school measurements (concentrations up to 30.8mcg/m^3). Carbon Tetra-Chloride (up to 49mcg/m^3), Vinyl Chloride (up to 10.4mcg/m^3), cis1,2 Dichloroethene (up to <3.97mcg/m^3), and 1,2 Dichloroethane (up to 14.4mcg/m^3) were found only on ground and underground floors. Chloroform was found in high concentrations (up to 95mcg/m^3) in all 3 school floors. One test even showed a gradient of lower levels in higher floors.
Head-space testing for VOC's from different products found in the school showed low concentrations of chloroform from detergent (3.35mcg/m^3) and Trichloroethylene from a classroom rug (3.61mcg/m^3).
VOC's were not measured in non-ground level distant buildings (above method threshold).
Recurrent measurements were not consistent. However, this may be due to differences in tests performance (classroom ventilation, sampling location, etc.), different test methods (charcoal tubes, canisters, air flow rates, etc.) and laboratory analysis.
Conclusions: The results demonstrate significant exposure of children to carcinogens.
Assisted ventilation of classrooms and continuing measurements were recommended, as well as avoidance from learning in classrooms on the ground and underground floors. Further tests to identify the source of the pollution (indoor or outdoor) were warranted.