

Science for Environment Policy

Building materials used between 1950 and 1980 in Europe may contribute to PCB air pollution

European buildings built in the 1950s, 60s and 70s may contribute towards levels of toxins in the body, a new study suggests. Polychlorinated biphenyls (PCBs) were found at elevated levels in children that lived in houses and studied in schools built during this period, before PCBs were more thoroughly regulated in the construction industry. Although food is generally a more concentrated source of these toxins, the authors say exposure through these environments should be minimised wherever possible.

In the past, PCBs were used in the manufacture of paints, sealants and plastics due to their capacity for heat resistance and chemical stability. However, these compounds are semi-volatile, meaning that over time they are slowly released into the [air](#). High exposure to PCBs is now considered to be carcinogenic, and carries a risk of inducing inflammatory and reproductive problems.

Research into the [health](#) implications of these air-bound PCBs led many European countries — such as Denmark, where this study was conducted — to limit their use in building materials in the 1970s. By 1985, their use was heavily restricted throughout the European Community. Approximately one third of buildings in Denmark were built during the 1950–1977 period of PCB use in that country.

The measurement of concentrations in blood samples was a specific Danish supplement to [DEMOCOPHES](#)¹, a Europe-wide initiative to coordinate the methodologies used in human biomonitoring. The study gathered data on the levels of a specific type of PCB, called PCB 28, which was detected in the blood of 116 pairs of mothers and children (aged 6–11 years) selected from the regions of Gentofte and Viby Sjælland. Toxicity levels were combined with data indicating the year in which their homes were built, and the year in which the children's schools were built.

Of all children in the study, 24% lived in homes that were constructed between 1950 and 1977. Of these children, 85% went to a school that was built during the same era.

Analysis of the blood samples revealed that mothers and children who lived in PCB-era housing had 40% higher PCB 28 concentrations than those who lived in housing built outside this time period. Furthermore, children who attended schools that were built or refurbished in the PCB era had 46% higher PCB concentrations than those who went to schools built before or after this period.

Children are generally considered to be at higher risk than adults of exposure to toxic chemicals in buildings, due to their greater interaction with and proximity to dust and surfaces. Previous research has shown that toddlers have a PCB exposure risk up to three times higher than adults; in this particular study it constituted up to 11% of non-dietary PCBs for adults, and up to 35% for young children.

The authors note that the small sample sizes and non-random sampling of participants used in the study mean it cannot represent the general population. However, it still makes a valuable contribution to understanding exposure risk. As the levels of PCBs in food decrease, the proportion coming from the built environment will become more noteworthy, and the researchers recommend monitoring of such sources and minimisation of exposure where feasible.



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Contact: liek@sund.ku.dk

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