

Science for Environment Policy

Case studies from Greenland, Poland and the Ukraine on levels of banned flame retardants

Certain chemicals that were once used as flame retardants are now banned in the EU, but can remain in the environment. A new study adds to our limited knowledge regarding the presence of the chemicals polybrominated diphenyl ethers (PBDEs) and polybrominated biphenyls (PBBs) in humans. The study suggests levels in Polish and Ukrainian men are lower than in those living in the US and Greenland.

PBDEs and PBBs were used mainly as flame retardants in electronics, furniture and carpets. There are three main types of PBDEs: penta- and octa-PBDE, which were banned in the EU in 2004; and deca-BDE, which will soon be restricted. PBDEs may interfere with male reproductive and hormonal processes, and with brain development. PBBs have been linked with cancer and were phased out in the 1980s.

All of these banned and restricted [chemicals](#) can still be found in consumer products that have not yet been replaced. As they are not chemically bound to the products they are used in they can leach into the environment, for example during disposal.

The researchers measured levels of various PBDEs and one PBB in blood samples taken from men living in Greenland, Poland and the Ukraine. This was the first large scale study to measure PBDEs and PBB levels in individuals from these countries. The study group included 99 men from Greenland, 100 from Poland and 100 from the Ukraine, all of whom were between 18 and 50 and were recruited via hospitals and clinics, as the partners of women receiving antenatal care.

Samples from nearly all the men contained at least one PBDE or PBB, and 35 contained all of those that the researchers tested for. Depending on the specific chemical, levels were between 3 and 15 times lower in the European men sampled, compared to men from Greenland. However, levels in Greenlandic men are still lower by at least half than levels measured previously in US men.

Previous research indicates that Western Europe and North America may be major sources of PBDEs and PBBs for Greenland, as these chemicals are transported by [air](#) and can travel long distances. In addition, the chemicals accumulate in fish, so different diets may account for differing levels between countries – and potentially explain the higher levels in Greenland. Locally, open-air fires and incineration of waste may also be an important source.

The researchers were unable to make links between measured concentrations and factors that might influence exposure levels, such as owning items of furniture likely to contain PBDEs and PBBs. However, previous studies have identified links to smoking and living in a low income household, which are both associated with higher blood levels of these chemicals.

A limitation of this study is that it focused on a specific subset of PBDEs and one PBB; the authors say that in future research novel flame retardant chemicals should also be taken into account.



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Contact:
V.C.Lenters@uu.nl

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