

Environmental pollutant has sex-skewing effect

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Women exposed to high levels of PCBs (polychlorinated biphenyls – a group of banned environmental pollutants) are less likely to give birth to male children. A study published today in BioMed Central's open access journal *Environmental Health* found that among women from the San Francisco Bay Area, those exposed to higher levels of PCBs during the 50s and 60s, were significantly more likely to give birth to female children.

Similar exposure is thought to have occurred in Wales, after a quarry on the edge of Groesfaen village near Cardiff was used as a toxic dumping ground from 1965 to 1972.

PCBs are persistent organic pollutants identified worldwide as human blood and breast milk contaminants. They were widely used in industry as cooling and insulating fluids for electrical equipment, as well as in construction and domestic products such as varnishes and caulks. PCBs were banned in the 1970s because of their general toxicity and persistence. They are associated with effects on immune, reproductive, nervous, and endocrine systems. Given the high quality measurements, this research provides the strongest evidence to date that PCBs affect sex ratio in human children.

Irva Hertz-Picciotto, the lead author of the study, explains how marked the effect was, "The women most exposed to PCBs were 33% less likely to give birth to male children than the women least exposed". The researchers measured the levels of PCBs in blood taken from pregnant women during a Bay Area study in the 1960s. When they compared these levels to the children's sex, they found that for every one microgram of PCBs per litre of serum, the chance of having a male child fell by 7%.

As Hertz-Picciotto states, "These findings suggest that high maternal PCB concentrations may either

favour fertilization by female sperm or result in greater male embryonic or fetal losses. The association could be due to contaminants, PCB metabolites or the PCBs themselves".

This investigation will be useful for assessing problems likely to be faced by populations currently exposed to high levels of PCBs, such as those that rely on fish from contaminated lakes or who live near former manufacturing facilities. Furthermore, other chemicals with a similar structure to PCBs, such as the flame-retardants PBDEs (polybrominated diphenyl ethers), are currently widely used in plastic casings and foam products. According to the authors, "PBDEs share many of the biochemical and toxicologic properties of PCBs. As levels of these substances rise in wildlife and human populations, studies like ours provide an indication of the potential effects of these newer compounds".

Source: BioMed Central

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