Medical Xpress

Study shows links between dust and breast milk

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Concentrations of organic compounds called brominated flame retardants in New Zealand samples of dust and breast milk are "well below" limits imposed by international authorities, researchers from the College of Health have found.

Researchers from the Centre for Public Health Research based at

Massey's Wellington campus, including PhD student Jonathan Coakley, determined that indoor dust in New Zealand is an exposure source of a potentially toxic class of fire retardant compounds called polybrominated diphenyl ethers (PBDEs). These however, were also well within accepted limits and therefore "are not likely to be associated with adverse health effects."

Mr Coakley, who undertook the research with a team led by principal investigator Andrea 't Mannetje, says PBDEs are a broad class of organic compound used to reduce fire risk in consumer goods such as foam furniture, electronic home appliances and car interiors.

"These compounds can leach out of these consumer products and then be carried with dust particles around the household."

Concentrations of 16 PBDEs, which are persistent, bioaccumulative, and may be toxic to both humans and the environment, were determined in dust samples from 33 New Zealand households and in breast milk samples from 33 mothers living in these households.

Respondents volunteered for the research as part of the recent Fourth World Health Organisation Coordinated Survey of Human Milk for Persistent Organic Pollutants. Floor and mattress dust samples were collected from study participants, while milk samples by participating mothers in second or third month after birth were held frozen in their home freezers till collected and sent for laboratory analysis by research staff.

The dust concentrations were similar to those found in the UK and Australia but " an order of magnitude lower" than concentrations in North America where many of the chemical compounds were manufactured and also used extensively.

The estimated daily intake of PBDEs from dust and breast milk for New Zealand children under two years old ranged from being eight times to 500 times beneath the limits imposed by the United States Environmental Protection Authority.

"According to the USEPA definitions, intakes below these limits are not likely to be associated with adverse health effects," Mr Coakley says.

"It confirms that breast milk is the best food of choice for infants."

While similar research has been carried out overseas, it is the first New Zealand study investigating PBDEs in matched milk and dust samples. It showed that higher dust concentrations were associated with higher breast milk concentrations of PBDEs, indicating that the indoor environment is an important source of exposure for these compounds.

New Zealand is a signatory to the Stockholm Convention that restricts the production and use of persistent organic pollutants such as PBDEs.

The Centre for Public Health researchers are currently working on a report investigating PBDE levels in blood samples as well as other persistent organic pollutants, such as organochlorine pesticides, dioxins and PCBs.

The New Zealand Ministry of Health provided funding for the dust and breast milk matching samples research.

An Australian study showed fewer concentrations of PBDEs in infant formula and cow's milk compared to breast milk too.

Provided by Massey University