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Fetal development and exposure to PCB and DDE

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Background: Epidemiological findings regarding associations of persistent organic pollutants (POPs) and human fetal development are inconsistent.

Methodology: In the present study, we included women who gave birth to a singleton liveborn child and had a blood sample analyzed for exposure to 2,2',4,4',5,5'-hexachlorobiphenyl (CB-153) and 1,1-dichloro-2,2-bis (p-chlorophenyl)-ethylene (p,p'-DDE) during pregnancy. We included 551 mother-child pairs from Greenland, 198 from Warsaw, Poland and 583 from Kharkiv, Ukraine. All women were recruited using a uniform recruitment procedure and they all answered a standard questionnaire translated to their native language to enable control for potential confounders. Information on birth weight, gestational age and sex of the newborn child was obtained from the medical records at the health centres participating in the project.

Results: Birth weight was decreasing with increasing exposure to PCB or DDE in all countries. However, the decrease in birth weight was only significantly associated to PCB in the high exposed population of Greenland with an adjusted decrease of 79 grams per log unit increase of PCB, whereas DDE was significantly associated to birth weight in Greenland and Poland (-80 and -131 grams per log unit increase of DDE, respectively). Also gestational age was reduced among the children exposed to higher PCB or DDE in utero, but the effect on birth weight persisted after controlling for gestational age, indicating growth retarding effects of organochlorines independent of the effects on gestational age.