

# THYROID FUNCTION, PFOA AND PFOS IN CHILDREN LIVING NEAR A CHEMICAL PLANT

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**Background and Aims:** Altered thyroid hormone levels following exposure to perfluorocarbons (PFCs) have been found in some animal studies. Published epidemiological findings are not consistent and most prior studies have focused on adults. We investigated if concentrations of two PFCs, perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS), were associated with thyroid function among 10,725 children (aged 1-18 years) living near a Teflon manufacturing facility in the Mid-Ohio Valley, USA.

**Methods:** Serum levels of thyroid-stimulating hormone (TSH), total thyroxine (TT4), and T3 uptake were measured and free thyroxine index (FTI) was calculated as biomarkers of thyroid function during 2005-2006, at the same time as serum levels of PFCs were measured. We estimated modeled in utero PFOA concentrations. Child-mother pairing allowed maternal serum concentrations of PFOA estimated at pregnancy to be used as a proxy for in utero exposure to PFOA for 52% of children. We performed multivariate regression analyses between thyroid disease status or thyroid hormone levels and PFOA/PFOS concentrations.

**Results:** At survey, median serum PFOA and PFOS concentrations were 29.3 and 20 ng/mL, respectively, and modeled in utero PFOA concentration was 17.1 ng/mL. The prevalence of reported thyroid disease was 0.5%, and the prevalence of subclinical hypothyroidism and hyperthyroidism based on thyroid hormone levels was 2.6 and 1.0%, respectively. We found a positive association between serum TT4 or FTI and LnPFOS in children (TT4:  $\beta=0.19$ , 95% CI=0.12, 0.26; FTI:  $\beta=0.04$ , 95% CI=0.02, 0.06). Findings for PFOA will also be presented in the conference but must first be shown to the local community.

**Conclusions:** Our results demonstrate a possible association between altered thyroid hormone levels and PFOS concentrations. This study comprises by far the largest population to date of children studied with such levels of PFOA, in relation to markers of thyroid function.