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Serum concentrations of polyfluoroalkyl compounds in Faroe Islands residents

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Polyfluoroalkyl compounds (PFCs) have been used in numerous commercial applications. Several PFCs, including perfluorooctane sulfonate (PFOS) and perfluorooctanoate (PFOA), are persistent chemicals which have been found in wildlife, humans, and the environment worldwide. Some PFCs have demonstrated developmental, reproductive, genotoxic, and carcinogenic toxicity in animal studies. We measured the serum concentrations of 9 PFCs, including PFOS, PFOA, perfluorohexane sulfonate (PFHxS), and perfluorononanoate (PFNA), by on-line solid-phase extraction coupled to isotope dilution-high performance liquid chromatography-tandem mass spectrometry in two groups of Faroe Islands residents. The first group included 103 children 14 years of age, and the second was of 12 mothers and their young children. We detected PFOS in all samples analyzed. PFOA and PFNA were detected in at least 99% of the samples. In the 14 year old children, median concentrations were highest for PFOS (26.3 ng/mL) followed by PFOA (5.0 ng/mL). These concentrations were comparable to those reported in the United States and other countries. PFOS median concentrations were higher for the mothers (23.7 ng/mL) than their young children (16.3 ng/mL); both were comparable to values reported for other human populations. Interestingly, the median concentrations (in ng/mL) of PFOA, PFNA and PFHxS were higher for the children (4.5, 1.3, 0.6) than their mothers (2.4, 0.6, <0.1), respectively. These concentration data are the first ever reported for Faroese residents. The high frequency of detection of most of these PFCs suggests widespread exposure to these compounds among both the young and adult population in the Faroe Islands.