



Shifting Global Exposures to Poly- and Perfluoroalkyl Substances (PFASs) Evident in Longitudinal Birth Cohorts from a Seafood-Consuming Population.

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Abstract: Rapid declines in legacy poly- and perfluoroalkyl substances (PFASs) have been reported in human populations globally following changes in production since 2000. However, changes in exposure sources are not well understood. Here, we report serum concentrations of 19 PFASs (19PFAS) measured in children between 1993 and 2012 from a North Atlantic fishing community (Faroe Islands). Median 19PFAS concentrations in children (ages 5-13 years) peaked in 2000 (47.7 ng mL⁻¹) and declined significantly by 14.4% year⁻¹ until 2012. Principal component analysis (PCA) identified two groups of PFASs that likely reflect exposures from diverse consumer products and a third group that consisted of perfluorocarboxylic acids (PFCAs) with nine or more carbons (C = 9). These C = 9 PFASs are strongly associated with mercury in children's hair, a well-established proxy for seafood consumption, especially perfluoroundecanoic acid (PFUnDA, $r = 0.72$). Toxicokinetic modeling shows PFAS exposures from seafood have become increasingly important (53% of perfluorooctanesulfonate, PFOS, in 2012), despite a decline in whale consumption in recent years. We infer that even in a major seafood-consuming population, declines in legacy PFAS exposure after 2000 were achieved by the rapid phase out of PFOS and its precursors in consumer products. These results emphasize the importance of better understanding exposures to replacement PFASs in these sources.

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