

# Human Health Impacts Of Exposure To Metals Through Extreme Consumption Of Fish From The Colombian Caribbean Sea

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## Abstract

The health risks of metal exposure due to the high consumption of fish were assessed for a riverine population living on the Caribbean coast of Colombia. The concentrations of metals (Cd, Cr, Cu, Hg, Ni, Pb and Zn) in the edible tissues of fish were determined and used for risk assessment. The daily fish consumption of residents ( $n = 95$ ) was as high as 283, 366 and 469 g/day in children (CH), women of childbearing age (WCHA) and the remaining population groups (RP), respectively. The estimation of the potential risk (HQ) indicated that there was no health risk from most of the metals, because they did not exceed their related reference doses, with values of  $HQ < 1$ . Although the concentrations of Pb and Hg were not particularly high in fish ( $<0.2 \mu\text{g/g}$ ), their possible health effects for vulnerable groups are of great concern due to the extremely high fish intake. The Pb intake for all groups was higher than the lower confidence limit of the benchmark dose for nephrotoxicity and neurodevelopmental effects in children. The weekly intake of methylmercury was also elevated, with values approximately 3, 2 and 1.5 times the provisional tolerable weekly intake for CH, WCHA and RP, respectively. Moreover, higher Hg levels were found in top predators, whereas maximum levels for other metals were found in bottom-feeding fish. This study highlights that an accurate data of daily intake, a continuous monitoring of metals in fish and their related fish consumption advisories to protect subsistence fishing communities are recommended in a local and worldwide context.

## Keywords

Fish Intake; Marsh; Potential Risk; Provisional Tolerable Weekly Intake; Trace Metals.