Extended Abstract

Occupational heat stress among outdoor workers in Africa and Australia

The aim of this study was to use historical data collected over thirty years to evaluate the extent of environmental contamination and health risk associated with mercury (Hg) pollution attributed to Thor Chemicals in South Africa. Total Hg levels in sediment directly below the plant have reduced over time, however, levels in fish have increased significantly from 1999 to 2009 (p=0.0001). The consumption of Catfish poses a risk to local communities with median values of 1.15 µg Hg /g, which is well above the upper limit of 0.46 µg Hg /g recommended by the US Food and Drug Administration. No recent fish data were available, and it is very likely that Hg levels in fish have increased over the last decade. In 1999 all human and animal hair samples were below the level of detection of 0.5 µg/g. However, by 2009 levels had increased significantly among people living near the Inanda Dam (p=0.016) with a median of 2.46 µg/g, this finding is consistent with the increase in fish Hg data. The median hair Hg level among individuals residing close to the plant was 2.62 µg/g in 2020. The recommended limit of mercury in hair is 1 µg/g. The soils and river sediment directly below Thor Chemicals remain highly contaminated and a recent fire at the plant in 2019 has most likely introduced an additional pollution burden into the immediate environment. An issue of concern is the fact that Hg appears to be finding its way 35km downstream to the impounded waters of the Inanda dam where Hg levels in fish and humans have been increasing over time. Immediate environmental remediation and further monitoring is required. Current Hg levels in fish and livestock need to be established in order to develop fish consumption guidelines and a detailed environmental epidemiological study of the exposed community, with a focus on children and pregnant women is needed. Mercury levels in livestock needs to be established. The remaining stockpile of Hg waste needs to be disposed of as it remains a significant environmental threat.