

# HEALTH RISK ASSESSMENT OF VILLAGERS WHO LIVE NEAR A LEAD MINING AREA: A CASE STUDY OF KLITY VILLAGE, KANCHANABURI PROVINCE, THAILAND

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**Abstract.** This was a cross-sectional study aimed at assessing environmental lead exposure and its association with blood lead levels, teeth lead levels and IQ of the inhabitants who live near lead mining in Kanchanaburi Province, Thailand. Two hundred fifteen villagers from 6 villages participated in this study. Exposed and non-exposed villagers were asked to perform IQ tests based on Raven's Standard Progressive Matrices. Environmental, blood and tooth samples were collected and analyzed to determine an association with the IQ level. The results showed that soil, vegetables (mint, bitter gourd, Chinese watercress, basil and turmeric) and meat (fish and shellfish) had lead concentrations above the recommended standard. Each person in the exposed group had blood and tooth lead levels higher than 10 µg/dl and 10 µg/g, respectively. The mean IQ of the exposed group was 82.70 ( $p < 0.05$ ). The blood and tooth levels in the non-exposed group were lower than 10 µg/dl and 10 µg/g, respectively. The mean IQ scores in the non-exposed group was 96.14 ( $p < 0.05$ ). The health risk in the low IQ score exposed group was 5.6 times more than the non-exposed group ( $p < 0.05$ ). The IQ scores of the exposed group were significantly inversely associated with the blood lead and tooth lead levels ( $r = 0.397$  and  $0.129$ , respectively,  $p < 0.05$ ). The children in this study who were exposed to environmental lead had an accumulation of lead in their bodies. This resulted in a great impact on intellectual development. The results reveal that blood lead levels are the best predictor of lead exposure, and the tooth lead levels may provide epidemiological evidence for chronic toxicity. Populations with blood lead or tooth lead levels higher than normal limit should be treated with chelation therapy and health education.