

## **Association between living near to a non-sanitary landfill, fingernail cadmium level and health symptoms among children in Nilai**

### **ABSTRACT**

**Background:** Living in proximity to landfill could expose children to heavy metals such as Cadmium that can reduce immune system function and lead to an increased risk of infections. Study was aimed to determine the accumulation of Cd in fingernails and the associated health symptoms among school children living in a proximity to non-sanitary landfill sites.

**Materials and Methods:** A cross-sectional study was performed from November 2013 to February 2014 in Pajam-Nilai, Malaysia. Study involved 70 children aged 7 to 11 years old who reside within 2 to 4 km radius from a non-sanitary landfill. A standard questionnaire was used to determine the socio-demographic background of the respondent, the Cd exposure and the health symptoms. Fingernail samples were collected from the children to indicate metal body burden and the airborne dust was monitored using air sampling pump. Cd in all samples was analyzed using Inductive Coupled Plasma Mass Spectrometry.

**Result:** The mean (SD) of Cd in fingernails of children who lives < 2km from landfill was slightly higher (0.20 (0.17)  $\mu\text{g/g}$ ) than children living 2km (0.10 (0.07)  $\mu\text{g/g}$ ). The mean (SD) of Cd in airborne dust of children residing near to landfill (< 2 km) was significantly higher (3.85 (0.52)  $\mu\text{g/m}^3$ ) than children who reside > 2km from landfill (3.19 (0.47)  $\mu\text{g/m}^3$ ). No association was found between Cd in fingernails and Cd in the airborne dust. Reside close to landfill and the levels of Cd in fingernails were not associated with the health symptoms in this study.

**Conclusion:** Although Cd level in fingernail of children living in proximity to landfill was higher than those who lives beyond that, health symptoms had no association with the exposure level.

**Keyword:** Non-sanitary landfill; Cadmium; Fingernails; Dust; Children's health