

## 1.101 Health risk assessment of toxic heavy metals in fine particles of road dusts in Dhaka city, Bangladesh.

Early Career Scientist

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Abstract:

Street dusts were collected from different road sides (22 locations) in Dhaka city, Bangladesh. Dusts samples were sieved below 90  $\mu\text{m}$  and analyzed with EDXRF for fifteen toxic heavy metals. Concentrations of all elements are above on the safe limit of WHO. Pollution assessment is present by studding enrichment factor(EF),pollution index(PI), pollution load index(PLI), and Geo-accumulation index(Igeo).Spatial distribution of the elements has been shown by ArcGIS software.Correlation, cluster and principal component analyses identifiedprobable natural and anthropogenic sources of contaminants. Enrichment factors of Cu, Pb, Cd and Zn showed that the dust is extremely enriched in these metals. Multivariate statistical analyses revealed that Cu, Pb, Zn, Fe and, to a lesser extent, Cr and Ni have common anthropogenic sources. While Mn and Li were identified to have natural sources, Cd may have different anthropogenic origins. The health risk assessment has studied by USEPA model.Elemental health risk was assessed through dose calculations for carcinogenic andnon-carcinogenic metals; and by the determination of LADD (lifetime average daily dose). The carcinogenic metals studied showedthe following variation in their LADD values;  $\text{Cr} > \text{As} > \text{Co} > \text{Cd} > \text{Ni}$ . Dose calculations for non-cancerous elementsshowed that hazard index (HI) of  $\text{Cr} > 1$  and Cd, V also near to 1. So these elements are on non-carcinogenic risk. Dose calculations for cancerous elementsshowed that Cr and Aslie within the threshold of  $10^{-3}$ - $10^{-6} \text{ mgkg}^{-1}\text{day}^{-1}$ . So these two elements are on cancerous risk.In Dhaka, it appears that the highest levels of risk for children than adults by the three exposure pathway(ingestion, inhalation and dermal contact) and that two elements—As and Cr—are of most concern regarding the potential occurrence of health effects.