

Lead Contamination in Drinking Water: Vulnerability and Risk

Assessment in Southern Khyber Pakhtunkhwa

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Exposure to lead (Pb) through drinking water has adverse health impacts that are particularly severe in children. The main objective of this study was to determine lead contamination levels in drinking water in the southern parts of Khyber Pakhtunkhwa and to conduct vulnerability analysis and risk assessment of the exposed population. Lead concentration in drinking water samples using the atomic absorption spectrophotometric technique (AA) ranges between 0.02 mg/l and 1.572 mg/l. Data analysis shows that the lead concentration level in 44 samples is more or less within the permissible limit of WHO (0.05 mg/l), 2002. While 99 drinking water samples out of 145 had a higher value of Pb than the permissible exposure level of 0.05 mg/l set by the WHO in 2002, The hot spot areas include district Kohat, Hangu, D.I. Khan, Bannu, and district Karak. The range of 0.581 mg/l to 1.572 mg/l. The overall interpretation indicates the lead concentration level is many folds higher in 99 samples collected from the above-mentioned locations as compared with the permissible exposure limits (0.05 mg/l) set by the WHO for drinking water. On the basis of observed data in the study area, different types of care strategies were suggested to control the effects of Pb in the vulnerable sites of the study area to protect humans and the environment from exposure to lead toxicity.

Keywords: vulnerable; Risk; prediction; hotspot area; Karak; Bannu; Hangu