

## عنوان مقاله:

The effect of industrial development on health hazard risk posed by drinking water containing heavy metals with HRAEPA index, Case study; Semnan province

## محل انتشار:

مجله بین المللی مطالعات سلامت, دوره 2, شماره 1 (سال: 1395)

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## خلاصه مقاله:

Background: Developmental activities especially the establishment of more than ۲۰ industrial units in Semnan province caused the officers worries about increased concentration of heavy metals in drinking water supplies and probably increasing of health risk at consumers. The aim of the study was to investigate the effect of Semnan province industrial development on the health risk level caused by drinking waters heavy metals with HRAEPA index. Methods: For this descriptive-analytical study, sampling from ۱۷ wells was perfumed at first. Then the heavy metals concentrations were measured at laboratory with Standard methods (Arsenic, Cadmium and Mercury with Atomic Absorption GTA-۹۵ - Lead and Chromium with Atomic Absorption Spectrophotometry). Meantime, HRAEPA index was calculated with three step process of health risk assessment. Statistical analysis was performed by Repeated Measure. One sample T-test and One-Way ANNOVA methods. Finally, zoning map of heavy metals in Semnan province has been prepared with GIS. Results: Results showed that the levels of all heavy metals are at national, WHO and EU standard ranges. HRAEPA indexes was ۴.۴۸۱۰-۴, ۴.۳۶۱۰-۴ and ۴.۴۶۱۰-۴ for ۲۰۰۱-۲۰۱۱, ۲۰۱۲-۲۰۱۵ and ۲۰۱۵ period, respectively. Also, the highest and lowest HRAEPA index was for ۲۰۰۱-۲۰۱۱ and ۲۰۱۵, respectively. Conclusions: The study showed that the heavy metals concentrations in groundwater resources were lower than threshold toxic level. However with the industrial development started at Semnan province, water resources quality must be protected by law enforcement and tight supervision on industrial and mining-excavation activities.

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## کلمات کلیدی:

Heavy Metals, Health Risk, Semnan, Industrial Development

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