

## Occupational exposure and biological evaluation of lead in Iranian workers-a systematic review and meta-analysis

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### Abstract

**Introduction:** Lead exposure is considered as a global health problem. The irreparable harmful effects of this heavy metal on human have been proven in various studies. Comparing to general population, workers in related industries are more exposed to lead. Several studies have investigated lead occupational exposure and its biological evaluation in Iran; however there is no overall estimate. Thus, the present study was conducted to determine the occupational exposure to lead and its biological evaluation in Iranian workers, using systematic review and meta-analysis.

**Material and Method:** This study was carried out based on information obtained from databases including Magiran, Iranmedex, SID, Medlib, Trials Register, Scopus, Pubmed, Science Direct, Cochran, Embase, Medline, Web of Science, Springer, Online Library Wiley, and Google Scholar from 1991 to 2016, using standard key words. All of the reviewed papers which met the inclusion criteria have been evaluated. Data combination was performed according to Random Effects Model using Stata software version 11.1.

**Result:** In the 34 qualified studies, the mean blood lead level (BLL) concentration in Iranian workers was estimated 42.8µg/dl (95% CI: 35.15-50.49). The minimum and maximum BLL were belonged to west (28.348µg/dl) and center (45.928µg/dl) regions of Iran, respectively. Considering different occupations, the lowest mean value was reported in textile industry workers (12.3 µg/dl), while the highest value was for zinc-lead mine workers (72.6 µg/dl). Mean breathing air lead level of Iranian workers reported in 4 studies was estimated 0.23 mg/m<sup>3</sup> (95% CI: 0.14-0.33).

**Conclusion:** According to the high concentration of BLL and breathing air, it is recommended to increase protective measures and frequent screening. Scheduled clinical and paraclinical examination should also be performed for workers.

**Keywords:** *Biological Evaluation, Iran, Lead, Meta-Analysis, Occupational Exposure, Systematic Review, Workers*

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