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Data Article

Data on the environmental exposure to lead in Iran

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ABSTRACT

The data was obtained to present the environmental and occupational exposure to lead in Iranian populations based on the published articles. To acquire the data, online resources including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct were searched and 104 articles were found out of which 70 that focused on the level of lead in blood, urine, milk, and hair of different Iranian populations were selected. Since the results of the studies were not homogenous, it was not possible to carry out a meta-analysis. The average blood lead level (BLL) among workers, ordinary people, patients with specific diseases, addicts, and pregnant women, women in labor, infants, and children are presented in this article. The average BLL was compared to the standards.

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Specifications Table

Subject area	Environmental Health
More specific subject area	Public Health
Type of data	Tables
How data was acquired	The data was collected from different databases including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct. All articles published by March 20, 2014 were included.
Data format	Raw and analyzed
Experimental factors	Based on their type and exposure intensity, the studies were classified into five groups: 1) workers and ordinary people, 2) patients with specific diseases, 3) addicts, 4) pregnant women and women in labor, and 5) infants and children.
Experimental features	Out of the 104 articles, 70 that were referable were used.
Data source location	Tehran, Tehran province, Iran.
Data accessibility	Data are included in this article

Value of the data

- The data provides information on the level of lead exposure among different Iranian groups, and is important for scientific community.
- The data clarifies protective, managerial, and policy-making measures of the risks involved with lead exposure more than before.
- The data can be useful as it collects all the available information about the blood lead level amount Iranians.

1. Data

Tables 1–5 present the data of the studies in different populations. This data is extracted from 70 articles [1–70]. As indicated in the tables, the level of the measured lead is different in different groups, with a higher level belonging to the addicts. The concentration levels of lead in blood were expressed in micromole per liter (μmol/l), which was turned into microgram per deciliter (μg/dl) by multiplying them by the constant of 20.72 (Tables 2–5).

2. Experimental design, materials and methods

The data is based on the articles that were sporadically carried out on certain groups and different cities and published in domestic and foreign journals. The articles were selected from different databases including Google Scholar, Magiran, SID, Iranmedex, PubMed, and Science Direct. While searching the articles, keywords like lead, occupational exposure to lead, lead measuring, human lead contamination, BLL, blood lead level, lead poisoning, lead toxicity, lead exposure were used and their Persian equivalents in Persian websites. All articles published by March 20, 2014 were included. First, all articles on lead exposure carried out in Iran were collected. At this stage, all articles that contained the mentioned keywords in their title or abstract were included in the primary list. Afterwards, a checklist of necessary study information, including study location, study year, sample environment, sample size, and average blood lead level (BLL), was prepared for final evaluation. Searching and extracting of the data was independently carried out by one person. A total of 104 articles that were available by March 20, 2014 were examined. Out of the 104 articles, 70 that were referable were taken used [1–70]. Due to the heterogeneity of the collected data, it was impossible to carry out a meta-analysis. Based on their type and exposure intensity, the studies were classified into five groups: 1)

Table 1
Studies related to mean blood lead concentration among adults (workers and ordinary people) in Iran.

#	Study location	Sample environment	Sample Size	Lead level	References
1	Kermanshah	Blood	150 workers of Kermanshah oil refinery	35.30 ± 6.68 μg/dl	[1]
			70 workers of a textile factory near the refinery	19.7 ± 3.91 μg/dl	
2	Tehran	Blood	497 workers of a battery recycling plant	43.31 ± 17.95 μg/dl	[2]
3	Isfahan	Blood	142 workers of battery manufacturing plant	7.59 ± 2.75 μg/dl	[3]
4	Isfahan	Blood	70 workers of battery industry with occupational exposure to lead	36.54 ± 4.34 μg/dl	[4]
			76 office workers of the same factory (control)	8.82 ± 3.96 μg/dl	
5	Tehran	Blood	60 soldering workers of an automotive company (experimental group)	36.3 ± 9.9 μg/dl	[5]
			60 office workers of the same company (control group)	13.6 ± 6.1 μg/dl	
6	Arak	Blood	67 Emarat lead and zinc mine and workers	9.64 ± 3.281 μg/dl	[6]
			67 farmers near Emarat lead and zinc mine	5.07 ± 3.061 μg/dl	
7	––	Blood	A 23-year-old worker of a lead battery recycling plant	130.53 μg/dl	[7]
8	Mashhad	Blood	105 workers of a battery manufacturing factory	32.2 ± 13.7 μg/dl	[8]
9	Zanjan	Blood	40 workers of zinc smelting factory	16.06 μg/dl	[9]
			40 healthy men in the same area (control)	10.47 μg/dl	
10	Yazd	Blood	490 workers of Koushk lead and zinc mine	48.98 ± 23.25 μg/dl	[10]
11	Tehran	Blood	32 welding workers in automotive industry	62 μg/dl	[11]
12	Yazd	Blood	70 workers of Koushk lead mine	7.06 ± 4.84 μg/dl	[12]
			70 workers of Yazd Baf textile factory	4.97 ± 1.70 μg/dl	
13	Tehran	Blood	11 welding workers in an automotive factory (control)	62.6 ± 13.4 μg/dl	[13]
			8 welding workers in an automotive factory (experimental)	67.2 ± 12.8 μg/dl	
14	Mashhad	Blood	108 workers of Mashhad traditional tile factories (2004)	52.05 ± 32.32 μg/dl	[14]
			108 workers of Mashhad traditional tile factories (2005)	36.15 ± 17.69 μg/dl	
15	Tehran	Blood	31 non-smoking workers	34.8 ± 12.9 μg/dl	[15]
16	Tehran	Blood	50 battery manufacturing workers	96.7 ± 27.9 μg/dl	[16]
17	Yazd	Blood	66 workers in different jobs (all individuals)	45.51 ± 1.71 μg/dl	[17]
			21 battery repairmen	46.77 ± 2.14 μg/dl	
			12 smoothers and painters	47.84 ± 2.64 μg/dl	
			12 radiator and exhaust welders	59.42 ± 3.87 μg/dl	
			15 workers directly involved with printing	36.14 ± 2.76 μg/dl	
			6 workers indirectly involved with printing	32.17 ± 6.84 μg/dl	
18	––	Blood	50 building painters	27.76 ± 3.31 μg/dl	[18]
			54 individuals as the control group	11.81 ± 4.35 μg/dl	
19	Hamadan	Blood	44 workers in gas stations	30.05 ± 7.01 μg/dl	[19]
			44 individuals as the control group	17.31 ± 3.46 μg/dl	
20	Zanjan	Hair	25 workers of lead ingot industry	131.7 ± 93.4 μg/dl	[20]
			25 office workers of the same industry	21.1 ± 13.2 μg/dl	
			25 citizens	27.9 ± 14.1 μg/dl	
21	Isfahan	Urine	60 workers of gas stations	6.975 ± 1.452 μg/dl	[21]
22	Naeein	Hair	25 workers of Nakhlak lead mine	43.52 ± 27.72 μg/dl	[22]

Table 1 (*continued*)

#	Study location	Sample environment	Sample Size	Lead level	References
			26 people living in surrounding villages (control)	38.17 ± 43.3 μg/dl	
23	Tehran	Blood	15 workers of battery manufacturing industry (control)	63.3 ± 3.4 μg Hb	[23]
			15 workers of battery manufacturing industry (2nd group)	57.9 ± 6.2μg Hb	
			15 workers of battery manufacturing industry (3rd group)	59.6 ± 4.9 μg Hb	
			15 workers of battery manufacturing industry (4th group)	50.9 ± 5.7 μg Hb	
24	Tehran	Blood	228 traffic policemen in Tehran	29.52 ± 7.78 μg/dl	[24]
			68 police office employees	21.74 ± 5.63 μg/dl	
25	Tehran	Urine	35 municipal workers	64.4 ± 35.4 μg/dl	[25]
			35 control participants	9.2 ± 3.2 μg/dl	
26	Tehran	Blood	40 male patients	100.32 ± 18.42 μg/dl	[26]
			62 control participants	9.33 ± 18.42 μg/dl	
27	Tehran	Blood	49 female patients	27.4 ± 3.10 μg/dl	[27]
			51 control women	12.6 ± 2.30 μg/dl	
28	Tehran	Blood	41 male patients	110.3 ± 37.5 μg/dl	[28]
29	Arak	Blood	1,142 citizens of Arak	13.42 μg/dl	[29]
30	Ravar, Feyz Abad	Blood	30 men living around a lead mine	22 μg/dl	[30]
			30 men elsewhere (control)	17 μg/dl	
31	Babol	Blood	427 infected with lead	110.2 μg/dl	[31]
			430 healthy individuals (control)	14.08 μg/dl	
32	Tehran	Blood	100 guidance male students	11.63 μg/dl	[32]
			100 guidance female students	7.21 μg/dl	

Table 2
Studies related to mean blood lead concentration in Iranian patients with specific diseases.

#	Study location	Environment sample	Sample size	Lead level	References
1	Sari	Blood	75 patients with asthma 65 healthy individuals (control)	4.98 ± 3.11 μg/dl 3.35 ± 1.64 μg/dl	[33]
2	Tehran	Blood	93 hemodialysis patient	9.7 ± 3.7 μg/dl	[34]
3	Ahwaz	Blood	33 dialysis patients 33 control participants	2.714 ± 0.64 μg/dl 1.67 ± 0.68 μg/dl	[35]
4	Sari	Blood plasma	32 esophageal cancer patients 32 control individuals	52 ± 15 μg/dl 56 ± 8 μg/dl	[36]
5	Tehran	Blood	80 patients with blood pressure 80 healthy individuals as the control group	5.1 ± 0.4 μg/dl 2.7 ± 0.3 μg/dl	[37]

Table 3
Studies related to mean blood lead concentration among drug users in Iran.

#	Study location	Environment sample	Sample size	Lead level	References
1	Mashhad	Blood	1 oral addict	196.1 μg/dl	[38]
2	Tehran	Blood	39 addicts 39 control participants	57.04 ± 46.03 μg/dl 16.7 ± 12.51 μg/dl	[39]
3	Tehran	Blood	7 lead-poisoned addicts in Loghman-e-Hakim Hospital	109 ± 37.6 μg/dl	[40]
4	Tehran	Blood	One 27-year-old addict worker One 68-year-old addict worker	154 μg/dl 180 μg/dl	[41]
5	Rafsanjan	Blood	22 addicts 22 control participants	21.9 ± 13.24 μg/dl 8.6 ± 3.5 μg/dl	[42]
6	Yazd	Blood	1 oral addict (a 46-year-old man, copper smelting worker)	90 μg/dl	[43]
7	Kerman	Blood plasma	50 opium addicts 43 non-addicts as control group	329.94 ± 14.76 μg/dl 353.27 ± 114.15 μg/dl	[44]
8	Tehran	Blood	One 25-year-old addict	350 μg/dl	[45]
9	Tehran	Blood	One 52-year-old oral addict	116 μg/dl	[46]
10	Tehran	Blood	One 41-year-old addict	118 μg/dl	[47]
11	Tehran	Blood	61 male addicts living in Tehran 40 female addicts living in Tehran All male and female addicts	13.811 ± 6.543 μg/dl 10.184 ± 5.138 μg/dl 12.375 ± 5.642 μg/dl	[48]
12	Hamadan	Blood	Lead-poisoned patient 1 (man, 43 years old) Lead-poisoned patient 2 (man, 25 years old) Lead-poisoned patient 3 (man, 23 years old)	99 μg/dl 77 μg/dl 104 μg/dl	[49]
13	Tehran	Blood	A 34-year-old addict A 57-year-old addict A 45-year-old addict	95 μg/dl 81 μg/dl 37.5 μg/dl	[50]
14	Tehran	Blood	A 40-year-old addict	Over 200 μg/dl	[51]
15	Tehran	Urine	Chronic lead poisoning in a 45-year-old male addict	244 μg/dl	[52]

workers and ordinary people, 2) patients with specific diseases, 3) addicts, 4) pregnant women and women in labor, and 5) infants and children.

workers, ordinary people, patients with specific diseases, addicts, and pregnant women, women in labor, infants, and children.

Table 4
Studies focused on mean blood lead level among pregnant women, women in labor, and infants in Iran.

#	Study location	Environment sample	Sample size	Lead level	References
1	Tehran	Blood	961 pregnant women with timely deliver 72 pregnant women with premature delivery	4.7 ± 4.9 μg/dl 4.8 ± 4.6 μg/dl	[53]
2	Tehran	Blood	75 women (mother's blood wile delivery) 75 neonates of the same mothers (umbilical cord blood)	2.73 ± 0.94 μg/dl 2.83 ± 1.31 μg/dl	[54]
3	Tehran	Blood	348 singleton pregnant women aging 16-32 (the first 3 months of pregnancy)	3.8 ± 2 μg/dl	[55]
4	Tehran	Blood	232 women in labor (total) 36 women in labor with PROM 269 women in labor with non-PROM	3.8 ± 2 μg/dl 4.61 ± 2.37 μg/dl 3.69 ± 1.85 μg/dl	[56]
5	Zarrin Shahr, Isfahan	Breast milk	27 mothers	4.6 μg/dl	[57]
6	Mashhad	Blood	40 mothers with a neonate weighing below 2500 gr 40 mothers with a neonate weighing over 2500 gr	10.49 ± 26.4 μg/dl 12.46 ± 17.5 μg/dl	[58]
7	Ardabil	Blood	65 mothers with a infants weighing below 2500 gr 65 mothers with a neonate weighing over 2500 gr	Below 1 μg/dl Below 1 μg/dl	[59]
8	Isfahan	Blood	32 mothers with intrauterine growth retard (IUGR) 32 neonates with intrauterine growth retard (IUGR) 34 mothers 34 neonates	12.465 ± 1.91 μg/dl 10.747 ± 1.675 μg/dl 13.562 ± 2.691 μg/dl 11.308 ± 1.908 μg/dl	[60]
9	Tehran-Rasht	Blood	86 mothers in a non-polluted region 86 infants in a non-polluted region 85 mothers in a polluted region 85 infants in a polluted region	7.6 ± 41 μg/dl 5.9 ± 3.2 μg/dl 9.07 ± 8.41 μg/dl 6.6 ± 5.18 μg/dl	[61]
10	Tehran	Blood	31 preeclampsia 465 control participants	5.09 ± 2.01 μg/dl 4.82 ± 2.22 μg/dl	[62]
11	Tehran	Blood	55 pregnant women with high blood pressure 55 pregnant women with normal blood pressure (control)	5.7 ± 2 μg/dl 4.8 ± 1.9 μg/dl	[63]

Table 5
Studies focusing on blood lead concentration among Iranian children.

#	Study location	Environment sample	Sample size	Lead level	References
1	Guilan	Blood plasma	90 ill children 90 healthy children	11.643 μg/dl 4.924 μg/dl	[64]
2	Birjand	Teeth	108 children aging 5-12 years (deciduous teeth)	1.96 ± 1.62 μg/dl	[65]
3	Tehran	Blood	100 children with hyperactivity and attention deficit 100 healthy children	7.2 ± 2.365 μg/dl 7.186 ± 3.186 μg/dl	[66]
4	Mashhad	Blood	32 children aging 3-7 years old	16.381 ± 5.719 μg/dl	[67]
5	Zanjan	Blood	45 children aging 7-11 living around Anguran lead mine 36 children aging 7-11 (control)	36.7 ± 24.67 μg/dl 15.57 ± 13.35 μg/dl	[68]
6	Mashhad	Blood	206 children aging 1-7 years	12.195 ± 3.359 μg/dl	[69]
7	Semnan	Blood	320 primary students aging 6-11 in Semnan's schools	21% below 10 μg/dl 74% between 10 and 20 μg/dl 5% over 20 μg/dl	[70]

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Transparency document. Supporting information

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