



## **Lead Poisoning and Blood Lead Level in Mitrovica Region, Republic of Kosova**

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**Abstract:** Lead poisoning is a result of exposure to lead in the environment. Lead is toxic to many of human tissues and enzymes. Children are more susceptible to lead poisoning because lead can accumulate in their nervous system as they grow and develop. The purpose of this work is estimation of the lead poisoning in Mitrovica region as a result of the continued lead pollution caused by Trepca mine smelter that have started work as of 1939 until 1999. Measurement of lead in the body is the blood lead level (BLL), measured in micrograms of lead per deciliter of blood ( $\mu\text{g/dL}$ ). Nearly everyone has a measurable BLL. Research was focused mostly in most affected areas in Mitrovica, Republic of Kosova, such as "2 Korriku" Street, "Artim Jashari" Street, Centre town, *etc.* Based on the blood test results most affected area is "2 Korriku" Street, which is situated next to the Trepca battery factory, in which most of the 240 examined persons showed high BLL (Blood Lead level). Determination of the BLL is done using the blood test results conducted in Main Centre for Domestic Medicine, Health and heavy metals unit in Mitrovica, Republic of Kosova.

**Keywords:** *Mitrovica, Blood, blood lead level, Lead, Pollution, contamination, Poisoning, Korriku, Trepca mine smelter, Kosova, WHO.*

### **Introduction**

Lead poisoning (also known as saturnism, plumbism, or painter's colic) is a medical condition caused by increased levels of the metal lead in the blood. Lead may cause irreversible neurological damage as well as renal disease, cardiovascular effects, and reproductive toxicity. Some regions in the Republic of Kosova have high level of the lead pollution, mostly because of the industrial activities, like Trepca mine complex that included a lead smelter factory too. Lead pollution is of long term status even when a source of the pollution is closed; lead is still present in the environment and has impact on human health. This work will give us a general knowledge on lead poisoning expose with the specific focus in Mitrovica region.

Children are the most vulnerable to environmental threats as they are in a dynamic state of growth with their cells multiplying quickly and their organ systems developing at a rapid rate. With the blood laboratory test we can determine lead level in the blood. World Health Organization (WHO) recommends that children aged up to 6 years old, pregnant women and women of childbearing age be screened for lead poisoning and that initial screening, even if negative, should be repeated after six months to help to ensure that factors that may have affected the exposure pathways are not giving a misrepresentation of exposure. World Health Organization (WTO) has set the maximum values of the BLL (Blood Lead Level) and recommends the maximum of 10  $\mu\text{g/dL}$  (micrograms per deciliter).

### **Materials and Methods**

When we have lead pollution, lead spreads all around in environment; in soil, in water, in air, in food, in dust etc. There are four ways that a human might get exposed to lead:

1. Breathing in contaminated air and dust;

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2. Eating contaminated food, water, soil or dust;
3. Through the skin, generally only from lead petrol exhaust;
4. Blood with lead traveling through the mother's placenta to the fetus

Although the blood generally carries only a small fraction of the total lead body burden, it serves as the initial receptacle of absorbed lead and distributes lead throughout the body, making it available to other tissues (or for excretion).

Blood lead is also important because the blood lead level is the most widely used measure of lead exposure. Typically the blood lead level shows only recent exposure during the last 60-70 days approximately.

Doctors use a blood test to detect lead poisoning. A small blood sample is taken from a finger prick or from a vein. Lead levels in the blood are measured in micrograms per deciliter (mcg/dL). An unsafe level is 10 mcg/dL or higher (WHO).

Exposure to even low levels of lead can cause damage over time, especially in children. The greatest risk is to brain development, where irreversible damage may occur. Very high lead levels may cause seizures, unconsciousness and possibly death. Death by lead poisoning is rare, but it can happen.

Health problems in children caused by elevated blood lead levels may include:

- Nervous system and kidney damage
- Learning disabilities
- Speech, language and behavior problems
- Poor muscle coordination
- Decreased muscle and bone growth
- Hearing damage

Lead levels in the blood are categorized into Classes I through V. Class V is the most severe and constitutes a medical emergency. The classes are as follows:

- **Class I:** less than 10 micrograms per deciliter (mcg/dL)
- **Class II-A:** 10 to 14 mcg/dL
- **Class II-B:** 15 to 19 mcg/dL
- **Class III:** 20 to 44 mcg/dL
- **Class IV:** 45 to 69 mcg/dL
- **Class V:** 70 or greater mcg/dL

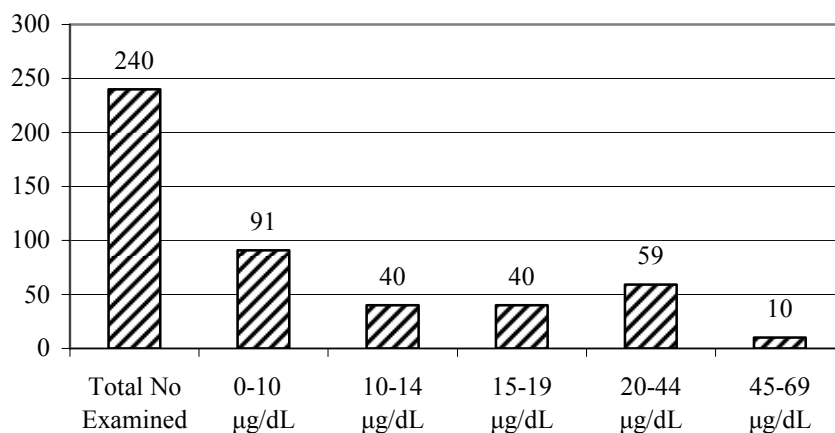
The method used to test blood is called a "finger stick" method that is widely used to provide a quick accurate assessment of a child or adult blood lead levels, while test results are called "screening". Blood samples are taken by pricking the finger, which can be done in a doctor's office or clinic and will give results while you are there (i.e. in minutes). Blood samples taken from the vein can also be taken if your child's level using the finger stick method is higher than 10µg/dL. These samples are sent to a laboratory in Main Centre for Domestic Medicine, Health and heavy metals unit in Mitrovica (2007) for analysis.

139 out of 240 or around 58% of examined patients during 2007 in Mitrovica town resulted over 10µg/dL of BLL:

**Table No.1.**

Total No Examined	0-10 µg/dL	10-14 µg/dL	15-19 µg/dL	20-44 µg/dL	45-69 µg/dL
240	91	40	40	59	10

This table represents total number of examined persons in Mitrovica town during the 2007, and shows that more than 58% of examined persons resulted over limit of BLL.



**Figure 1.** Chart representation of the values shown in table number 1.

### Discussion of the results

Based on the results we can conclude that from 240 tested people 91, or 38% are within the limited BLL (0-10 µg/dL), 40 or 16,5% has between 10-14 µg/dL, 40 or 16.5% between 15-19 µg/dL, 59 or 24.5% between 20-44 µg/dL and 10 or 4.5% has between 44-69 µg/dL BLL.

Most of the affected people are aged between 0 and 6 years, and most of them are coming from the neighborhood of the Trepca battery factory, which used to work until 1999, the “2 Korriku” Street.

But, also the town centre of Mitrovica is widely affected by lead pollution caused from heavy traffic by vehicles that use leaded gasoline.

Lead is widely present in the environment, but in Mitrovica town this presence was dramatically increased with the opening of the Trepca mine in 1927 and Trepca smelter in Zvečan in 1939 that operated until 1999. Even when an industry actually stops working, lead remains in the environment and continues to damage people's health. This is what is happening in Mitrovica town, but has also impact on other areas in Kosova.

Based on these results we can conclude that treatment against the Lead poisoning in Mitrovica region is of urgent and important matter, especially in the most affected areas.

### References

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