Living with Lead - Heritage of the past centuries

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Introduction

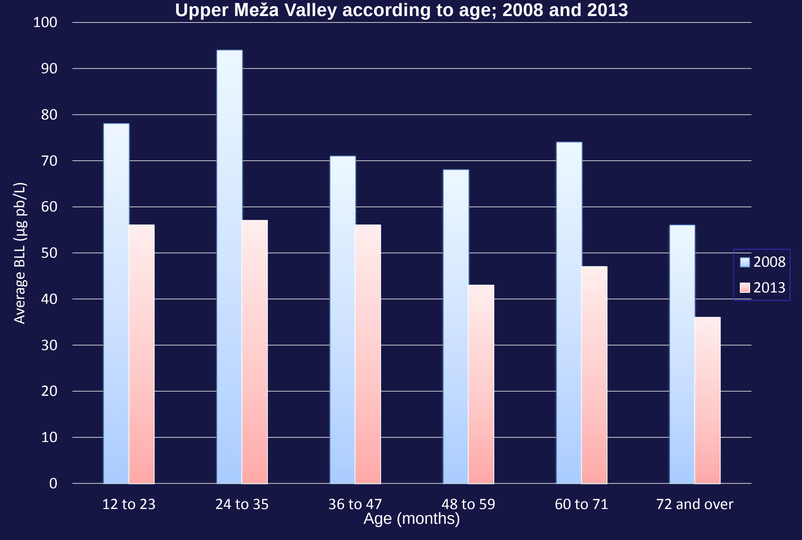
The Upper Meža Valley with 6951 inhabitants is situated in northern Slovenia. Due to long lasting lead mining and smelting the area is polluted with lead. The studies conducted in 2002 and 2004 showed high blood lead concentrations (≥100 µg/L) in children.

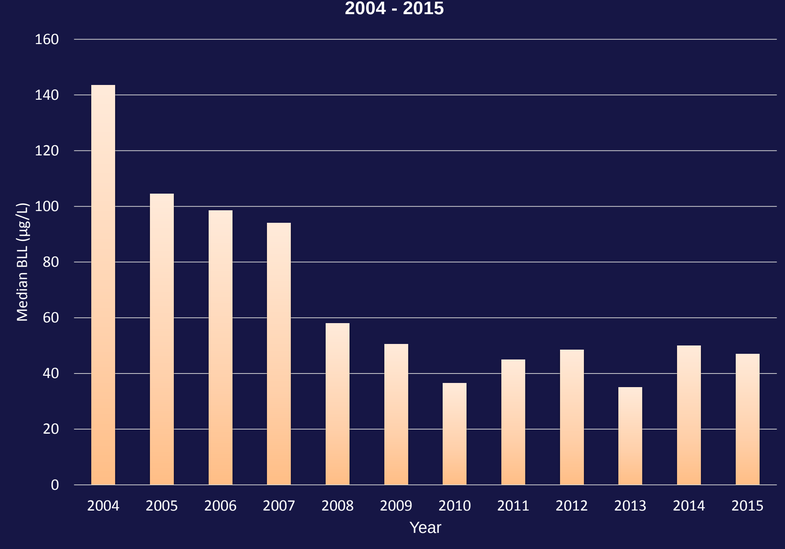
In 2007, The Upper Meža Valley was declared a degraded area and since then, several remediation measures have been taken to reduce human´s exposure to lead*.

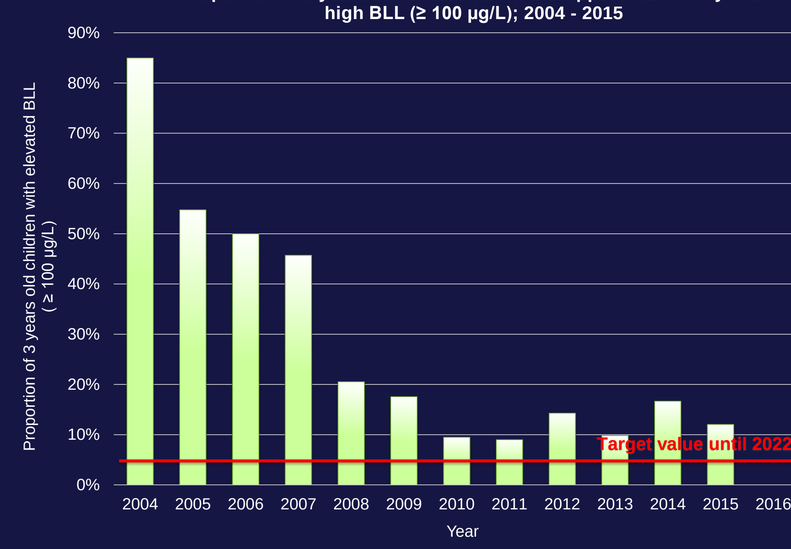
Remediation program includes: asphalting the roads, grassing surfaces, soil exchange on playgrounds, safe gardening, wet cleaning of the roads, attics and facades renewal, complementary diet, soil and air monitoring, informational and motivational activities and **blood lead monitoring.**

The results of blood lead monitoring in children are used to evaluate the efficacy of exposure reduction measures. **The goal is to reduce blood lead levels in 95% of children under 100 µg/L until 2022.**

*Ordinance on the areas of the highest environmental burden and on the program of measures for improving the quality of the environment in the Upper Meža Valley (OG RS, No. 119/2007)



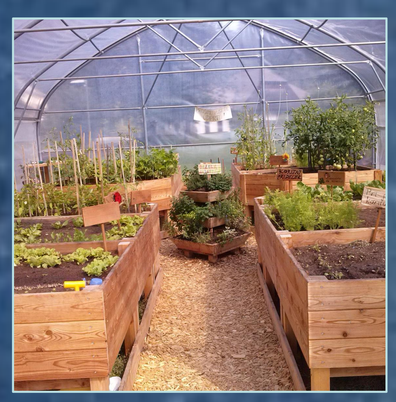




Methodology

Blood lead levels are determined annually (since 2004) in children aged 2 - 4 years from the Upper Meža Valley. In 2008 and 2013, children aged 1- 6 years and 9 years have also been included .

Blood was analysed by electro thermal atomic absorption spectrometry (2004-2013) and by inductively coupled plasma mass spectrometry (2014-2015). The surveillance was approved by the National Medical Ethics Committee.
A questionnaire about lead exposure risk assessment is fulfilled for every child. Case management protocol (child with BLL ≥ 100 µg/L) includes venous BLL measurment, residence visit and specialist consulting.



Results

Comparison of the results for 2008 and 2013 showed lower blood lead concentrations in 2013 for all age groups of children.

In total 849 blood lead samples have been analyzed. In the period from 2004 until 2010 blood lead levels gradually declined. In 2004, the levels < 100 µg/L were found in only 15%; in 2007 in 55% and in 2010 in 90% of children. The median value declined from over 100 µg/L to < 50 µg/L in the same period. From 2011 to 2015 the results stagnated. Median value varied from 45 to 50 µg/L, and the proportion of children with the levels < 100 µg/L varied from 83 to 91%.
Parental occupational exposure was the most important risk factor.

Conclusions

For further progress it is essential to work more with small groups and with children individually (individual consultations at the children's home environment).

The transfer of contaminants from the workplace into the home environment should be reduced.

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