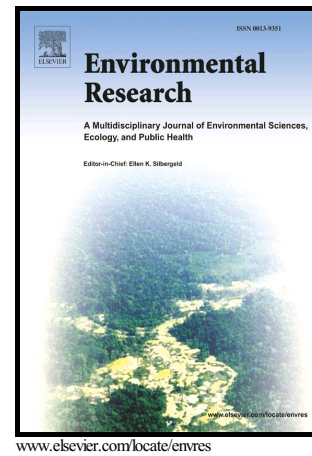


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## Environmental and take-home lead exposure in children living in the vicinity of a lead battery smelter in Serbia

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### Abstract

Blood lead levels (BLLs) have been falling steadily worldwide due to restricted use of lead (Pb) and its compounds, although they remain above preindustrial Pb levels. Elevated BLL can still be found in children living near secondary Pb smelters that represent around 50% of Pb production. There have been no studies on Pb exposure in children living in Serbia ever since the 1980s. The aim of this study was to evaluate the BLLs in children living in two villages in Serbia (Zajača, the location of a secondary lead smelter, and Paskovac, 5 km away), identify the primary determinants of children's BLLs, and investigate the impact of BLLs on children's health symptoms and school achievement.

The study was conducted in 2011 on 127 children, aged 1 to 18 years, whose BLLs were measured using inductively coupled argon plasma mass spectrometry (ICP-MS).

The median BLL in children was 12 µg/dl, with a significantly higher value of 17.5 µg/dl in Zajača, compared to 7.6 µg/dl in Paskovac. Only 1 out of 75 and 12 out of 52 children from Zajača and Paskovac, respectively, had BLLs below the CDC recommended 5 µg/dl level.

Living near the smelter resulted in 19 times, and having a father who works in the plant 4 times higher odds of elevated BLLs. No significant effects of elevated BLLs health symptoms were seen in this study.

BLLs of children living near a battery recycling plant in Serbia, an upper-middle income European country, were in the range and even higher than those of children living in developing countries. For the first time, the contribution of environmental and take-home lead exposure was quantified using mixed-effect modeling, and our results indicate a contribution of 25 to 40% of the take-home lead exposure to the BLLs of children living in the vicinity of a secondary lead smelter.

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