

THE FRENCH SURVEY ON BLOOD LEAD LEVEL IN CHILDREN, SATURN-INF 2008-2009

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Background and Aims: Children's exposure to lead has decreased in recent years, thanks to the ban of lead in gasoline. It remains however of public health concern because of evidence of cognitive effects even at low levels, without toxicity threshold. The last survey about lead burden was carried out in France 15 years ago. A national survey was conducted in 2008-2009 1/ to estimate the current prevalence of elevated blood lead level (BLL) among children aged 1 to 6 years, 2/ to determine the distribution of BLL by French region and 3/ to measure the contribution of various environmental sources of lead.

Methods: This cross-sectional survey included 3,255 children, recruited at hospital. A two-stage probability sample, stratified by hospital and French region was conducted. The data collected included blood samples, socio-demographic characteristics, environmental and parent's occupational exposure. We used small area estimation techniques based on empirical bayesian approach to derive specific mean on each region. Quantile regression models were used to quantify the association between BLL and environmental risk factors.

Results: The overall prevalence of elevated BLL was 0.11% (95%CI [0.02-0.21]): i.e. 5,333 children [784-9,882] in France. The BLL geometric mean was 15.1 $\mu\text{g/L}$ (95%CI [14.7-15.5]). Levels were slightly higher in males.. A difference of 9 $\mu\text{g/L}$ on geometric mean was observed between French regions. Factors significantly associated with BLL mean were leaded water supply pipes, tap water consumption, old housing with chipped paint or recent renovation, parent's occupational with lead exposure, child behaviour, passive smoking. The regression on 95th percentile of BLL (34.5 $\mu\text{g/L}$) has showed an association with chipped paint in old housing, passive smoking and child behaviour.

Conclusions: In the last 15 years, the prevalence of elevated BLL decreased from 2.1% (95%CI [1.6-2.6]) to 0.11% (95%CI [0.02-0.21]). This highlights a substantial decrease in exposure of children in France, as it occurs in adult population. The distribution of BLL was quite similar to that observed in US and in other European countries.