Yearly measurements of blood lead in Swedish children since 1978: an update showing that the falling trend continues

U Strömberg, T Lundh, S Skerfving

Department of Occupational and Environmental Medicine, University Hospital,
SE-221 85 Lund, Sweden

Correspondence to:
Ulf Strömberg
(address as above)
e-mail: ulf.stromberg@med.lu.se
phone: +46 46 173979
fax: +46 46 173669

Keywords: blood lead; environmental lead exposure

Word count of the text (excluding Acknowledgements): 300 words
Letter to the Editor:

Yearly since 1978 we have measured blood lead concentrations (B-Pb) in children living in the municipalities of Landskrona and Trelleborg, in southern Sweden. A substantial decrease of B-Pb was found for the period 1978-2001, as an effect of gradual reduction of petrol lead.\cite{1,2} We here present results up to 2006. Altogether, 3646 children, aged 7-12 years, have been studied (different children across all years).

Figure 1 shows the substantial decrease of B-Pb over the years. A lowering the community intervention from 100 to 50 µg/l,\cite{3} or even down to 20 µg/l,\cite{4} is discussed in the USA. In the period 2002-2006, 0.6% and 29.9% of our investigated children had B-Pb above 50 and 20 µg/l, respectively.

Analysis of variance analyses focusing on the petrol-lead-free period revealed consistently and significantly (p<0.05) decreasing B-Pb time trends during the period 2000-2006 in Landskrona and during the period 2001-2005 in Trelleborg.

In each of the three periods 1978-94, 1995-99, and 2000-06, the proportional decrease of the average B-Pb per year seemed to be fairly constant. Linear regression analyses of sample year on ln(B-Pb) yielded B-Pb reduction estimates of 5%/year in 1978-94, 0%/year in 1995-99, and 7%/year in 2000-2006. Adjustments for other influential factors\cite{1,2} gave similar results.

In Sweden, petrol lead was banned 12 years ago; nevertheless, B-Pb levels in Swedish children continue to fall markedly. There has not been any significant lead exposure from other important sources, such as contaminated drinking water and lead-based paint. Petrol lead seems to yield a long-lasting environmental exposure effect. Lead in vegetables is mainly due to direct deposition on the plant; however, lead deposited on the ground can be recycled into the air. The
recent B-Pb decrease can also have been influenced by a weakened global exposure from
surrounding countries, where petrol lead has been phased out later.⁵

ACKNOWLEDGEMENTS

This work was supported by the EU through its 6th Framework Programme (contract no FOOD-
CT-2006-016253; see www.PHIME.org). This publication reflects only the authors’ views; the
Community is not liable for any use that may be made of the information therein.
Moreover, the Swedish Environmental Protection Agency, the Medical Faculty, Lund University,
and the county councils of Southern Sweden have supported the studies. Anita Ohlsson gave
valuable assistance.
REFERENCES


4 Gilbert SG, Weiss B. A rationale for lowering the blood lead action level from 10 to 2 microg/dL. *Neurotoxicology* 2006;27:693-791.

FIGURE LEGEND

Blood lead concentrations (B-Pb) found in Swedish children from the municipalities Landskrona (geometric means represented by squares) and Trelleborg (triangles) during the period 1978-2006. Notice that, in 1991, children from both municipalities were measured. For the sample years with maximum B-Pb above 100 µg/l, the range of B-Pb is truncated; we present the maximum B-Pb value and the proportion of measured children with B-Pb above 100 µg/l.
B-Pb (µg/l; geometric mean and range)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>250</td>
<td>5.3%</td>
</tr>
<tr>
<td>1979</td>
<td>104</td>
<td>1.3%</td>
</tr>
<tr>
<td>1980</td>
<td>134</td>
<td>2.5%</td>
</tr>
<tr>
<td>1981</td>
<td>116</td>
<td>0.9%</td>
</tr>
<tr>
<td>1982</td>
<td>129</td>
<td>0.6%</td>
</tr>
<tr>
<td>1983</td>
<td>162</td>
<td>0.5%</td>
</tr>
<tr>
<td>1984</td>
<td>115</td>
<td>1.3%</td>
</tr>
<tr>
<td>1985</td>
<td>122</td>
<td>0.7%</td>
</tr>
</tbody>
</table>