Sources of Exposure to Lead in Children

French researchers have recently demonstrated that the main cause of exposure to lead in children is food consumption. Lead exposure may have significant health impacts even at low levels and hence this study helps to identify sources of lead exposure in children.

Following the ban on lead as a gasoline additive, concentrations of this pollutant in the air have decreased significantly. However, certain industrial sites still release lead into the environment, which accumulates in soils and can move up the food chain. In children, even at low concentration in the blood, lead can cause significant health impacts such as a decrease in neural capacity and intellectual ability.

In this context, French researchers have recently modelled the environmental exposure of children to lead. To this end, they considered three media that can contain lead, namely food, tap water and soil and dust. Air was not considered in this study and researchers verified that its contribution to the total dose of lead ingested is minimal. For each of these potential lead contamination paths, they collected contamination and consumption data for France. Further, they used published data about the average quantity of soil and dust unintentionally ingested by children. They then estimated the weekly exposure dose (WED) for children aged from 0.5 to 6 years in terms of lead weight per body weight (in µg/kg).

Their results are as follows:

- The median WED is 7.5µg/kg and 4.7µg/kg for children aged from 0.5 to 3 and from 3 to 6 years respectively.
- The median weekly lead dose attributable to food for children is 6.3µg/kg and 3.9µg/kg for children aged from 0.5 to 3 and from 3 to 6 years respectively.
- The median weekly lead dose attributable to tap water for children is not significant.
- The median weekly lead dose attributable to soil and dust ingestion for children is 0.8µg/kg and 0.4µg/kg for children aged from 0.5 to 3 and from 3 to 6 years respectively.

The authors highlight that, for children, lead exposure comes mainly from food consumption. They further note that the foods contributing most to lead intake are soup, milk and fruit.

Their results are consistent with blood lead levels measurements recently performed in France. Thus, the researchers suggest that the results of their investigation could serve as a relevant basis for a cost-utility analysis in the field of lead exposure reduction from various exposure sources.

Overall, the researchers stress the need for periodic updating of lead exposure levels in order to assess the effectiveness of lead exposure prevention measures.

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