Lead absorption in New Zealand: Position statement

WasteMINZ Residential Lead Working Group

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Thirty-eight cases of childhood lead absorption were reported in New Zealand between 2013 and 2017. A group of contaminated land experts are concerned that they are the tip of the iceberg. They want to ensure there are adequate tools to assess and manage this nationally significant risk.

The Residential Lead Working Group comprises representatives of WasteMINZ members – in practice, environmental consultants and councils – who are contaminated land specialists with an interest in assessing and managing lead contamination at residential properties.

The working group was formed in December 2018, following a series of conference presentations and webinars that suggested there could be significant issues around residential lead. It has since confirmed that between 2013 and 2017, 38 cases of childhood lead absorption were reported to the Ministry of Health. In New Zealand, lead absorption is currently defined as a blood lead level of more than 10 µg/dL (the Ministry of Health is currently consulting on plans to lower it to 5 µg/dL). Most of these cases were associated with exposure to lead-based paint, but in several cases no source was identified.

Medical practitioners are concerned about lead absorption because it has a range of subtle neurotoxic effects, including behavioural disorders and learning difficulties. Most notoriously, elevated blood lead in early childhood is statistically associated with a lower adult IQ – roughly three IQ points for every 10 µg/dL.

One of the big questions in contaminated land practice is whether these cases are the tip of an iceberg – whether there are many more cases of lead absorption from soil that go undetected. It is difficult to be sure because moderate lead absorption usually has no visible effects; clinical symptoms only occur following severe lead poisoning, and there is no systematic blood lead testing programme in New Zealand.

Some contaminated land specialists think there could be a big iceberg out there, on the basis that:

- More than 320,000 houses built before 1945 were originally painted with lead-based paints, containing up to 50 per cent lead by weight. While lead was progressively phased out in favour of titanium, lead exterior paints were not banned until 1965, by which time there were more than 450,000 wooden houses. Metal primers containing lead are still available.
- Since older enamels are not compatible with modern paints, usually either the original paint has been removed or it is in a deteriorated condition.
- Unless precautions are taken to contain paint dust during removal it simply falls on soil around the house, which can result in soil that is more than 1 per cent lead by dry weight. The national Soil Contaminant Standard (SCS) for lead at ordinary residential properties is just 0.021 per cent. There are similar standards in other jurisdictions.
- One group member has compiled data for 44 rural Canterbury properties with pre-1940s dwellings. Soil lead exceeded the SCS at 42 of them, often over areas of 500m² or more.
- People who live in the house can be exposed to lead when they handle the soil, eat vegetables grown in it, or track dirt and dust into the house.
- Exposure is most likely greatest in 2-year-olds, who live close to the ground, put a lot of things into their mouths, have digestive systems that readily absorb lead, and brains that should be developing rapidly.

Moreover, this line of reasoning only considers lead from paint. While the group believes this is the main source of residential soil lead, there are several other potentially significant sources. Up until 1996, petrol contained lead-based additives; properties on major pre-1990s traffic routes will also have elevated soil lead. Other known sources include pre-1960s orchard sprays, lead smelters and lead shot.

Overall, tens of thousands of children must live in homes surrounded by soil exceeding the standard. Many preschools also appear to occupy older houses and other painted buildings.

We know lead absorption was much worse in the past. In 1970s Christchurch, children *averaged* over 10 µg/dL blood lead. Population blood lead levels steadily reduced from the early 1980s as lead was progressively eliminated from canned food, painted toys, industry, and petrol. In contrast, a recent study showed that typical blood lead levels in school-age children are now below 1 µg/dL. This is great news. But it does not tell us much about the critical group who are at the greatest risk; pre-schoolers living on lead-contaminated soils, a source that has never been addressed.

The working group is acutely aware that, although we probably know more about lead than any other soil contaminant, there are significant gaps in our understanding. Given how often we find elevated lead levels in soil, and the numbers of potential properties involved, our current soil standards indicate we would expect a significant health impact. Nonetheless, we do not have a comprehensive picture of which properties are contaminated or to what extent. We do not know what proportion of children are affected or how badly. It is possible there is something wrong with our standard risk assessment models.

Our aim is to engage stakeholders in answering these questions. If there is a nationally significant issue, then we want to ensure there are adequate tools to assess and manage affected sites.