

**REPORT OF THE
LEAD IN SOIL AND DUST
WORKING GROUP**

**Prepared for the
NSW GOVERNMENT LEAD TASKFORCE**

January 1994

REPORT BY THE SUB-COMMITTEE ON
HEALTH RISK ASSESSMENT
LEAD IN SOIL AND DUST WORKING GROUP

Members: Ian Armstrong (Coordinator)
Bruce Markey
Peter Body
Noel Clark
Elizabeth O'Brien

INTRODUCTION

At the first meeting of the Lead in Soil and Dust Working Group, it was established that, for the determination of lead in soil and dust, there is a need to establish practical ways to assist the public to assess the risk of exposure of children under seven years of age to lead in soil and dust. Essentially, this reduces to an assessment of exposure both to the fallout from vehicle emissions emanating from leaded petrol, from deteriorating, disturbed leaded paint, and from industrial or mining sources.

Although the ultimate assessment of risk of exposure to lead involves the measurement of individual blood lead levels, this may not be necessary in many cases. To help the public to assess the need for blood lead analyses the sub-committee on Health Risk Assessment has prepared a preliminary "self risk assessment" guidance document for discussion.

It is thought that to achieve widespread use, practical guidance should not involve complex scoring systems but rather should contain relatively simple procedures covering the major risk factors for a child's exposure to lead. It was decided that complete guidance should include suggestions as to what should be done next if the risk of exposure is assessed initially to be high.

It was noted that apart from blood lead measurements there is currently no other way to assess accurately the risk to a particular child. The main reasons include:

- the complexities of a child's exposure, which would require detailed continuous monitoring beyond current monitoring capabilities;
- variability in individual toxicokinetics which cannot be simulated adequately; and
- uncertainties in current knowledge regarding the crucial role of key factors in determining the outcome of exposure to lead, e.g., the effect of particle size and speciation on bioavailability.

Mathematical modelling using the US EPA's Lead Model may be of some use in assessing the risk to children in cases where data on average concentrations of lead in soil and dust in the community are available. The model does not predict or reproduce individual blood lead levels as this is not part of its design. The model makes statistical predictions of the distribution of blood lead levels under chosen exposure scenarios.

In preparing the preliminary guidance the sub-committee has considered:

- the recommendations in Preventing Lead Poisoning in Young Children, Centres for Disease Control, U.S. Department of Health and Human Services, U.S.A., 1992;
- guidance prepared for the Boolaroo community; and
- the results of a study prepared for the Department of Planning and Development, South Australia.

The draft self risk assessment developed by the LSDWG is also consistent with the public health and individual management responses recommended by the National Health and Medical Research Council. The Working Group's goal is, however, to ensure everyday language is used and that the assessment is simple and easy to use.

The following set of questions has been formulated to help the public to make a preliminary assessment of a child's risk. The questions are based in large measure on the known dominant contributions to soil and dust lead, i.e., vehicular emissions from leaded petrol, deteriorating and disturbed leaded paint, industry and mining, and 'takehome' lead from occupation or hobby sources.

**DRAFT "SELF RISK ASSESSMENT" GUIDANCE DOCUMENT
PRELIMINARY ASSESSMENT OF CHILDHOOD RISK
OF
EXPOSURE TO LEAD IN SOIL AND DUST**

Lead enters soils and dusts mainly from exhaust from cars using leaded petrol and from deteriorating or disturbed leaded paints. Certain industries are also important sources of lead exposure. Some hobbies can be significant lead sources for some individuals.

The ultimate assessment of risk of exposure to lead involves the measurement of blood lead levels. However, this may not be necessary in many situations. The aim of the following set of questions is to try to help you to assess your child's risk of exposure to lead and, consequently, the need for a blood lead measurement. The questions are applicable to families with children under seven years of age. Each question deals with one source of lead only. To assess the risk of exposure of your child to lead you should answer all questions.

Do you live near a busy road, or do your children go to pre-school or attend daycare near a busy road?

This question is concerned with lead emitted in exhaust from cars using leaded petrol. If you have answered yes to this question then **the risk of exposure to lead emitted in exhaust from cars using leaded petrol:**

- might be **high** if the busy road is less than 50 metres away from your home or the childcare premises;
- is probably **low to moderate** if the busy road is between 50 and 200 metres away from your home or childcare premises; or
- is likely to be **low** if your home or the childcare premises are more than 200 metres from the busy road; however, you should check the remaining questions because there might be other sources of lead that affect your child.

**IF YOU ANSWER "YES" TO ANY OF THE FOLLOWING QUESTIONS YOUR
EXPOSURE TO LEAD *MIGHT* BE HIGH**

Is your child exposed (home, pre-school, daycare) to a source of lead contamination, either active or closed, such as:

Significant

- smelter;
- site of mining of metal ores; or
- battery breaking site.

Other

- steel works;
- cement works;
- refuse incinerator;
- coal-burning power station;
- crematorium; or
- pigment making plant.

Was your house, shed or outbuilding built before 1970?

Was there a structure on your property or your neighbours property before 1970?

Do you have hobbies which use lead, for example, ceramics, lead lighting, electronics, sinker and shot making, lead toy making?

Does either parent work in a job where there is lead, for example, a garage or battery manufacturing factory?

Has your house been built on an old market garden (pesticides containing lead might have been used on the garden)?

Do you and/or your child regularly visit any residence, facility or area mentioned in the above list of questions?

Are you concerned that your child might have a high blood lead level?

Your child might have a high blood lead level if you have answered yes to at least one of the above questions and your child puts its hands in its mouth often or is picky over food.

WHAT IS THE NEXT STEP?

If after answering the above questions you think that the risk of exposure to lead might be high then you should arrange for a referral from your doctor to have a blood lead test done at a recognised pathology laboratory. You should then take your doctor's advice.

HOW CAN IMPORTANT RISK FACTORS BE IDENTIFIED?

The above list of questions should help to identify sites where there *might* be a high risk of exposure to lead. If your child's blood lead is sufficiently high to require additional investigation the following questions will help you identify potential sources and behavioural factors which can contribute to elevated blood lead:

- car exhaust settling, e.g. on garden soils, pavements, window sills or other surfaces;
- old, chipped or flaking paint;
- renovations, particularly within the previous 18 months, that have disturbed lead based paints and lead containing dusts;
- home grown vegetables which might have a covering of dust containing lead or might be taking lead up from the soil;
- bare soils;
- soils tracked inside the house;
- dusts in ceilings, wall spaces, cracks in floorboards, cornices and other places where dust may accumulate; and
- rainwater from roofs which have been painted with lead based paints or might have a covering of windblown dusts.

Important child behaviour patterns which may contribute to high blood lead levels include:

- sleeping in play clothes;
- eating away from the table or eating food that has been dropped;
- playing before eating first thing in the morning - an empty stomach absorbs more lead than a full stomach;
- being picky over food may mean that certain minerals which are necessary to good health might not be quite in-balance, this might cause an increased uptake of lead from soils and dusts which children eat;
- use of a dummy which might have picked up small amounts of dust from house surfaces;
- nail biting;
- often putting hands or playthings in their mouth; and
- lack of hand washing before eating or hand to mouth activity.

A logical addition to this self risk assessment document would be a list of guidelines to advise "at risk" families of the immediate, simple and practical measures they can take to minimise the perceived potential exposure to lead in soil and dust. While some of these measures are alluded to or could be deduced from the paragraphs covering the sources and behaviour factors, a separate list would serve as a ready reference guide. Such practical advice would also assist in reducing the feeling of helplessness which often accompanies initial awareness of the risk of exposure to lead.