



Queensland Government
Queensland **Health**

Blood Lead Notifications

in

Queensland

2006

Background

Exposure to lead can be a significant population health problem. It can affect the health of children, unborn babies and adults occupationally and non-occupationally.

Children under the age of five are at greatest risk. This is because:

- the brain in young children is still maturing and appears to be more vulnerable to lead
- the exploratory hand-to-mouth activity of children places them at higher risk of ingesting lead from a contaminated environment
- children absorb a much higher proportion of ingested lead than adults (40 to 50% compared to 3 to 10% for adults).

Population-based epidemiological studies have found elevated exposure to lead in early childhood to be associated with impaired cognitive development. Symptoms of high blood lead levels may include reduced attention span, reduced spatial skills, poorer performance at school, constipation, abdominal colic and behavioural problems. However, unless levels are significantly elevated, children with high blood lead are usually asymptomatic.

Exposure to lead in pregnancy can affect the unborn baby. Complications from high levels of exposure include premature birth, low birth weight, miscarriage and stillbirth. The baby may also suffer impaired learning and cognitive development.

Symptoms in adults, if any, depend on the level of exposure. High levels can cause joint and muscle pain, muscle cramps, anaemia, nausea, constipation, colicky abdominal pain, sleep problems, reduced concentration and headaches. At very high levels, lead may cause encephalopathy (ie. a disease of the brain) and convulsions. Lengthy high level exposure to lead can be associated with chronic renal damage.

Elevated blood lead levels are notifiable in Queensland. Distinction is made between occupational and non-occupational exposure when determining whether a blood lead level is notifiable. The criteria for notification are:

- demonstration of a blood lead level of 0.73 $\mu\text{mol/L}$ (~15 $\mu\text{g/dL}$) and greater in any person not known to be occupationally exposed to lead, **or**
- demonstration of a blood lead level of 2.41 $\mu\text{mol/L}$ (~50 $\mu\text{g/dL}$) and greater in any person known to be occupationally exposed to lead.

Pathology laboratories or the employer notify Queensland Health when a blood lead level meets the notification criteria. In association with the attending medical practitioner, an attempt is then made to identify the source of exposure. Ambient air, paint, soil and dust, water, food, cosmetics, traditional medicines and occupational environments are all considered. The follow-up of children with a blood lead level of 0.73 $\mu\text{mol/L}$ (~15 $\mu\text{g/dL}$) and greater may involve an inspection of the local environment of their home. Environmental sampling may be carried out in this case. The case, parent or guardian are advised of the nature of the condition and potential or identified sources of exposure. Advice on how to reduce exposure is offered. Follow-up testing of the blood lead level is recommended to ascertain the effectiveness of implemented exposure control measures.

A blood lead surveillance program for children 0 to 4 years was commenced in late 2006 in Mt Isa and is continuing in 2007. Two Mt Isa children had a notifiable blood lead level in 2006.

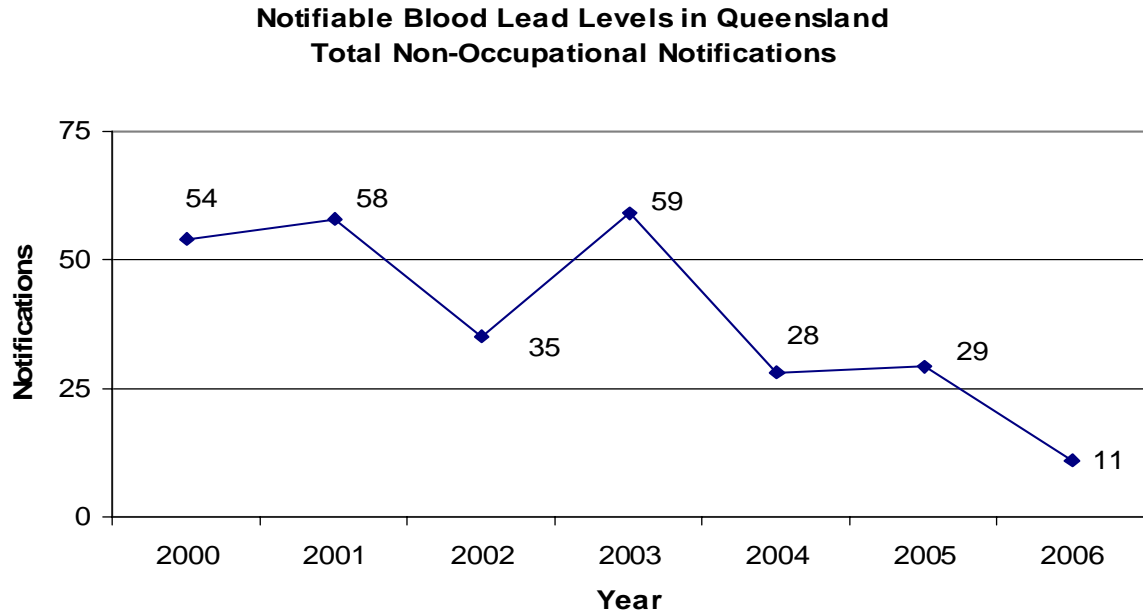
Methods

The following report is an analysis of the 2006 data on notifiable cases of blood lead levels from the Notifiable Conditions System (NOCS) that is held and maintained by Queensland Health. Microsoft Excel was used to analyse the data. Notifications where the occupational status was unknown were excluded from the analysis, of which there was one in 2006. Notifications where the occupational status was 'Former' were recoded as 'Occupational' as exposure was considered to be from an occupational setting, of which there were no valid cases in 2006.

Part A: Non-Occupational Blood Lead Notifications in 2006

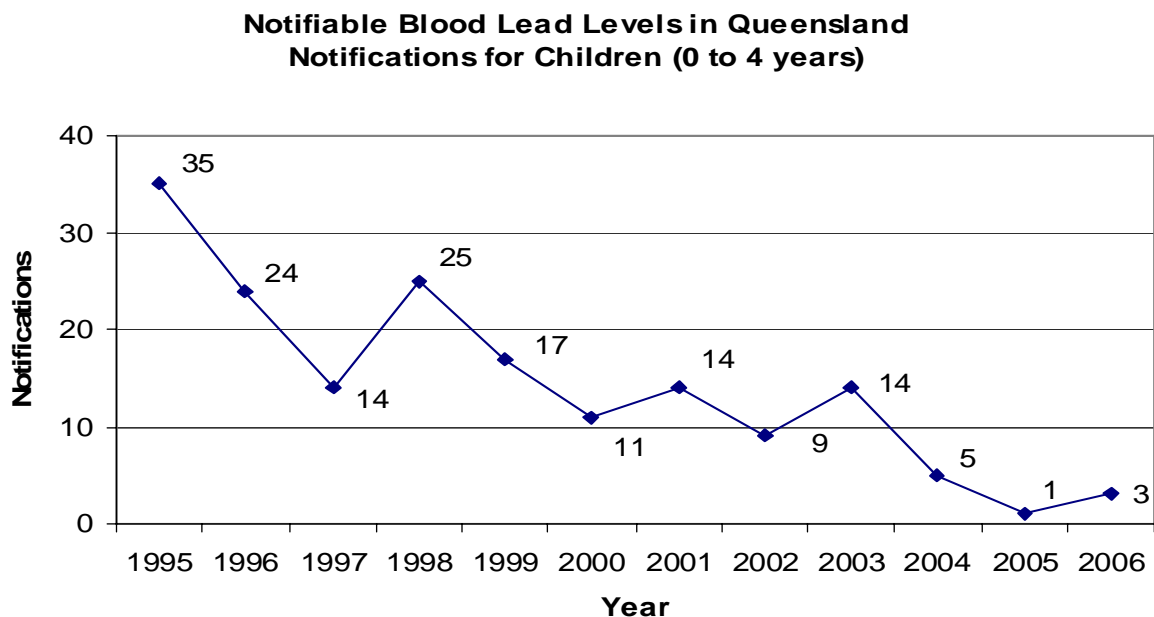
Total notifications

- Total non-occupational notifications have declined significantly since 2000.



Child notifications (0 to 4 years)

- There were three children (representing 27% of total non-occupational notifications) aged 0 to four years with a notifiable blood lead level in 2006. The number of notifications in 2006 was significantly lower than recorded in the previous ten years.

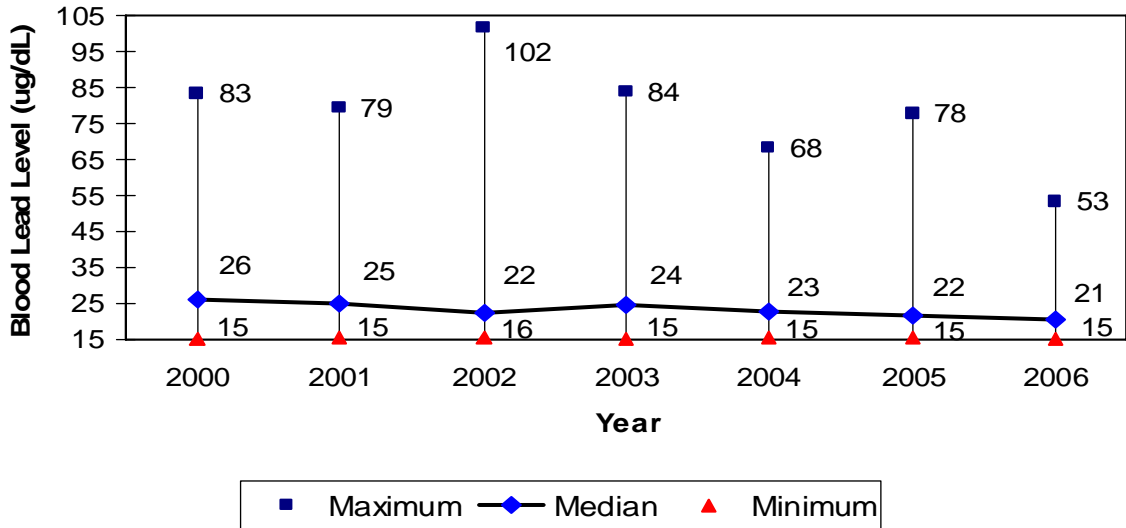


Blood lead levels

Total non-occupational notifications

- Median blood lead levels appear to have plateaued. The range of blood lead levels has reduced slightly from previous years.

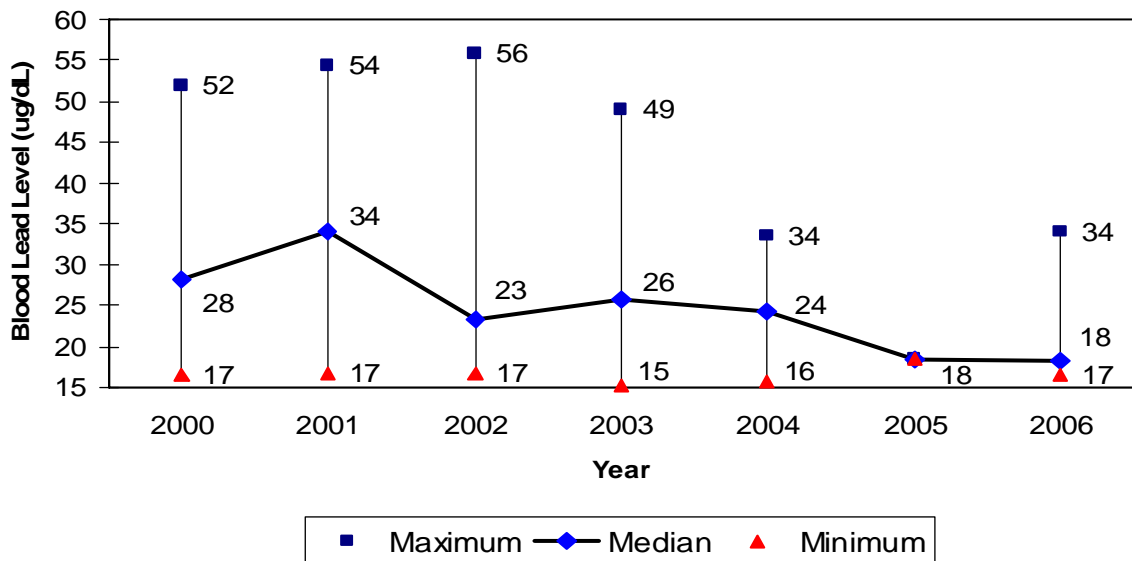
**Notifiable Blood Lead Levels in Queensland
Non-occupational Notifications (median and range)**



Child notifications (0 to 4 years)

- Median blood lead levels appear to have plateaued.

**Notifiable Blood Lead Levels in Queensland
Notifications for Children (0 to 4 years) (median and range)**



Age range

- In 2006, ages ranged from one to 74 years.

Gender

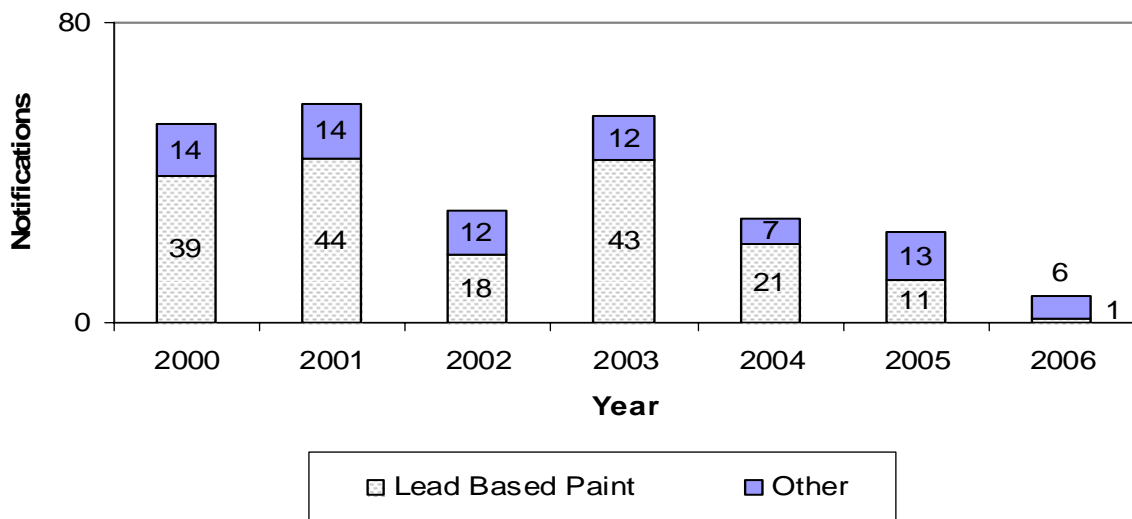
- Eight notifications (73%) were males.

Note: The blood lead level criteria for notification in Queensland is the same for males and females and does not differentiate for females of reproductive capacity or who are pregnant or breast feeding.

Causes

- The most common cause of exposure was exposure at an indoor/outdoor rifle range (four notifications or 40%).
- One notification (10%) was caused through exposure to lead paint.
- The source of exposure was unknown for four notifications (36%).

**Notifiable Blood Lead Levels in Queensland
Non-occupational Notifications by Cause**



Location

- Three notifications (30%) were from the Brisbane south region and three from the Gold Coast Population Health Unit.

Population Health Unit	2000	2001	2002	2003	2004	2005	2006
Brisbane North	10	11	10	4	2	2	1
Brisbane south region (other than Gold Coast and Darling Downs)	19	13	6	25	6	6	3
Cairns	1	7	0	3	0	3	0
Darling Downs	3	1	1	3	4	1	0
Gold Coast	3	3	3	0	3	3	3
Rockhampton	7	7	5	8	5	5	0
Sunshine Coast	0	9	1	5	0	3	1
Townsville	8	2	5	8	5	4	2
Wide Bay	3	5	4	3	3	2	1

Key Findings for Non-Occupational Notifications in 2006

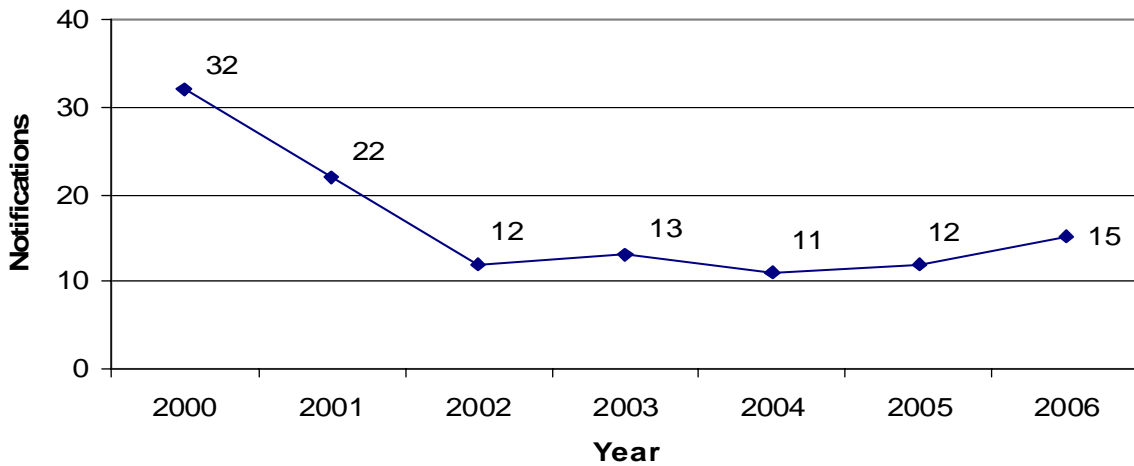
- Total notifications in 2006 have decreased significantly since 2000.
- Three children (aged 0 to 4 years) had a notifiable blood lead level in 2006.
- The median blood lead levels for total non-occupational notifications and child notifications (0 to 4 years) in 2006 appear to have plateaued.
- The most common cause (40%) of exposure for non-occupational notifications was at an indoor/outdoor rifle range.
- The most common locations (30% each) for notifications were the Brisbane south region and Gold Coast Population Health Unit.

Part B: Occupational Blood Lead Notifications in 2006

Total notifications

- Occupational notifications have declined significantly since 2000.

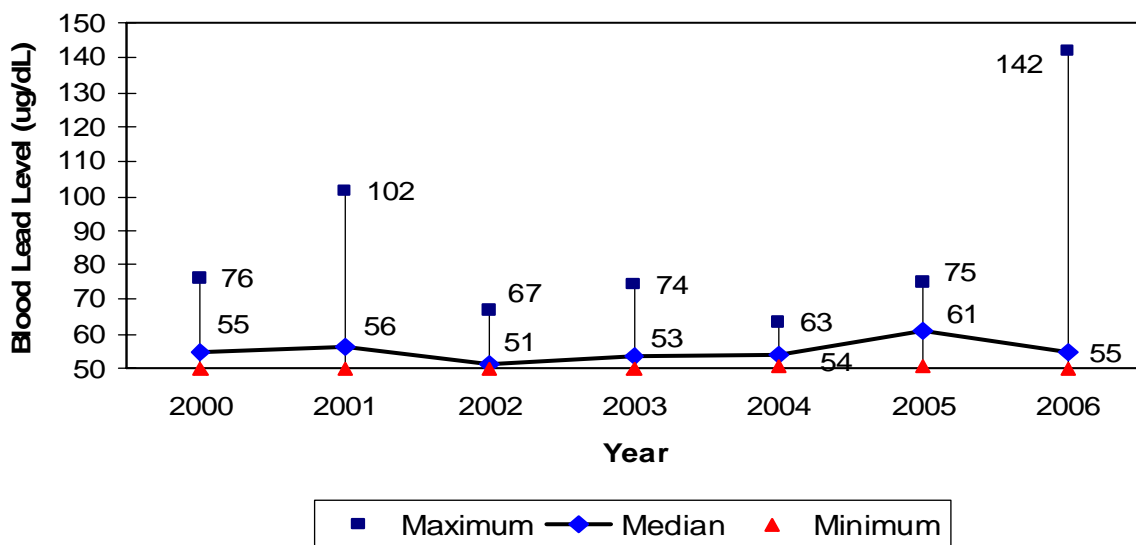
**Notifiable Blood Lead Levels in Queensland
Total Occupational Notifications**



Blood lead levels

- Median blood lead levels appear to have plateaued.
- The maximum blood lead level of 142 µg/dL is highly unusual and suspected to be an error. The individual had a follow-up test two days later with a subsequent result of 73 µg/dL and then another follow-up test four days later with a level of 39 µg/dL. The next highest maximum blood lead result was 66 µg/dL.

**Notifiable Blood Lead Levels in Queensland
Occupational Notifications (median and range)**



Blood Lead Notifications in Queensland in 2006

Age range

- Ages ranged from 21 to 61 years.

Gender

- All notifications were males. (Note: The blood lead level criteria for notification in Queensland is the same for males and females and does not differentiate for females of reproductive capacity or who are pregnant or breast feeding.)

Causes

- Battery manufacturers were the most common cause of occupational exposure in 2006.

Cause of lead exposure	2000	2001	2002	2003	2004	2005	2006
Battery manufacturers	5	3	6	3	6	6	12
Foundry	5	1	1	0	0	0	0
Indoor/ outdoor rifle range	1	5	3	0	0	0	0
Mines	11	2	1	1	3	1	2
Lead concentrate (except batteries/mines)	0	0	0	3	0	1	0
Radiator manufacture, repair or maintenance	2	2	0	2	0	0	0
Removal of paint from domestic buildings	8	7	1	2	1	2	1
Removal of paint other structures (eg. boat, bridge)	0	0	0	1	1	0	0
Maintenance or demolition work	0	0	0	0	0	2	0
Fire assay laboratory	0	1	0	0	0	0	0
Unknown source of exposure	0	1	0	1	0	0	0

Location

- Brisbane south region was the most common location for notifications.

Population Health Unit	2000	2001	2002	2003	2004	2005	2006
Brisbane North	3	3	0	0	0	0	0
Brisbane south region (other than Gold Coast and Darling Downs)	13	7	7	9	6	9	12
Cairns	0	0	1	0	0	0	0
Darling Downs	0	0	0	0	1	0	1
Gold Coast	1	5	2	2	0	0	0
Rockhampton	1	1	0	0	0	0	0
Sunshine Coast	1	2	1	1	0	1	0
Townsville	13	4	1	1	4	2	2
Wide Bay	0	0	0	0	0	0	0

Key Findings for Occupational Notifications in 2006

- Total notifications in 2006 were significantly lower than in 2000.
- Median blood lead levels appear to have plateaued.
- The most common cause of occupational exposure was from battery manufacture.
- The most common location (80%) for notifications was the Brisbane south region.