

Non-Occupational Blood Lead Notifications in Queensland

Annual Report 2013

Non-occupational blood lead notifications in Queensland 2013

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Introduction

In Queensland, lead exposure resulting in a blood lead level (BLL) of 10 micrograms per decilitre ($\mu\text{g}/\text{dL}$) (0.48 micromoles per litre ($\mu\text{mol}/\text{L}$)) or greater is a notifiable condition and required to be notified by laboratories under the Queensland *Public Health Act 2005* and the *Public Health Regulation 2005*. The notifiable BLL has been revised over time based on ongoing scientific research and recommendations by the National Health and Medical Research Council (NHMRC). Prior to 2009, the notifiable level was 15 $\mu\text{g}/\text{dL}$ (0.73 $\mu\text{mol}/\text{L}$) or greater.

All notifiable conditions, including lead exposure, are held on a register known as the NOCS (Notifiable Conditions System). Once the notification is received, an investigation is undertaken by the Public Health Unit to determine the most likely lead exposure source and advice is provided to the individual to manage lead health risks and eliminate or reduce future lead exposure.

This report focuses on non-occupational blood lead notifications recorded in 2013.

Method

Data were extracted from the NOCS on 20 November 2017 for all cases of elevated blood lead notified between 1 January 2000 to 31 December 2013. Data from previous reports have been revised based on up-dated information. Descriptive analyses were performed using Stata, version 14.1 (StataCorp, College Station, TX, USA) and Microsoft Excel™. Cases were assigned to a geographic Hospital and Health Services (HHS) area based on their residential address at the time of diagnosis. This report describes elevated BLLs (notifiable level - $\geq 5\mu\text{g}/\text{dL}$) in Queensland in 2013, including the demographic profile, cause of lead exposure and location. Notifications in 2013 were compared to 2000–2012 notifications to examine trends over time. It should be noted that notifiable blood lead level was reduced during this period.

NOCS does not contain information on the total number of blood lead tests undertaken each year. An elevated BLL notification remains valid for 12 months and elevated blood lead results for the same individual within the 12-month period are not considered a new notification. An individual's highest BLL notification per individual is used in the data analysis. Children aged less than five years of age are at increased risk of lead exposure and these notifications are highlighted throughout the report. Notifications reported by interstate and overseas residents have been excluded.

Results

In 2013, the total number of non-occupational notifications reported to Queensland Health was 71. Of these there were:

- 64 non-occupational;
- seven undetermined cases.

The demographic characteristics of people with elevated BLLs in Queensland in 2013 are displayed in Table 1.

Table 1: Demographic characteristics of people with non-occupational elevated blood lead levels in Queensland 2013

Characteristic	Total	Median blood lead level µg/dL (µmol/L)	Max blood lead level µg/dL (µmol/L)
Number	64	15.3 (0.74)	52.8 (2.55)
Sex			
Male	52 (81%)	14.7 (0.71)	52.8 (2.55)
Female	12 (19%)	16.8 (0.81)	35.0 (1.69)
Age group (years)			
<5	7 (11%)	16.2 (0.78)	35.0 (1.69)
≥5	57 (89%)	14.91 (0.72)	52.81 (2.55)
Indigenous status			
Non-Indigenous	15 (23%)	14.1 (0.68)	44.3 (2.14)
Indigenous	5 (8%)	12.0 (0.58)	18.4 (0.89)
Not stated	44 (69%)	16.6 (0.80)	52.8 (2.55)

Of the non-occupational exposures, the median age was 46 years (range 1–76 years) and the proportion was higher for males (81%). The cause of the maximum BLL was attributed to the making of lead objects, for example lead sinkers and lead toy soldiers. Seven children aged less than five years were identified as having an elevated BLL in 2013.

Of the 64 notifications, 44 (69%) did not have Indigenous status stated. There were seven reported notifications where the source was undetermined¹ following investigation.

Notifiable blood lead levels by Hospital and Health Service

There are 15 HHSs in Queensland. The highest number of notifications reported were from West Moreton HHS (19%), followed by Wide Bay (17%), Sunshine Coast (14%) and Metro South (13%).

Non-occupational elevated BLL notifications by HHS are described in Table 2.

¹ An undetermined exposure (probable) is where the exact cause of the exposure is not able to be definitively determined.

Table 2: Non-occupational cases with elevated blood lead level by Hospital and Health Service 2013

Hospital and Health Service	No. (%)* notifications		
	All years (%)*	<5 years (%)	≥5 years (%)
Cairns and Hinterland	2 (3%)	-	2 (4%)
Central Queensland	-	-	-
Central West	-	-	-
Darling Downs	2 (3%)	-	2 (4%)
Gold Coast	7 (11%)	-	7 (12%)
Mackay	3 (5%)	1 (14%)	2 (4%)
Metro North	4 (6%)	-	4 (7%)
Metro South	8 (13%)	-	8 (14%)
North West	3 (5%)	2 (29%)	1 (2%)
South West	-	-	-
Sunshine Coast	9 (14%)	-	9 (16%)
Torres and Cape	-	-	-
Townsville	3 (5%)	-	3 (5%)
West Moreton	12 (19%)	2 (29%)	10 (18%)
Wide Bay	11 (17%)	2 (29%)	9 (16%)
Total	64	7	57

* Percentages may not add up to 100% because of rounding.

Notifiable blood lead levels by cause

Table 3: Non-occupational lead exposure by cause 2013

Cause	No. (%)* notifications		
	All years (%)	<5 years (%)	≥5 years (%)
Exposure at indoor/outdoor rifle range	13 (20%)	-	13 (23%)
Lead-based paint from structures (e.g. boat, bridge)	4 (6%)	1 (14%)	3 (5%)
Removal lead-based paint from domestic environment	25 (39%)	2 (29%)	23 (40%)
Making of lead sinkers, toy soldiers etc.	6 (9%)	-	6 (11%)
Mount Isa resident (general non-specific lead exposure)	3 (5%)	2 (29%)	1 (2%)
Skin penetration lead object	1 (2%)	-	1 (2%)
Lead medicines	1 (2%)	-	1 (2%)
Other	2 (3%)	-	2 (4%)
Unknown cause or source	9 (14%)	2 (29%)	7 (12%)
Total	64	7	57

* Percentages may not add up to 100% because of rounding.

Table 3 shows the causes of lead exposure for elevated BLL cases. Elevated BLLs are investigated to determine lead exposure and manage cases. For all cases, the most common causes of non-occupational exposure were associated with conducting or being present during the removal of lead-based paint from a domestic environment (39%), exposure at an indoor or outdoor rifle range (20%) and making of lead objects, for example lead sinkers or lead toy soldiers (9%). For the seven children less than five years, the highest proportion of confirmed elevated BLLs was due to the removal of lead-based paint from domestic environment (29%), Mount Isa residence (29%) and unknown cause or source (29%).

Trend analyses

There was a total of 570 cases notified associated with non-occupational lead exposure between 2000–2013. Data for years 2000–2012 are shown for comparison to the 2013 data. The number of non-occupational annual notifications varied over the time period (Figure 1). The highest number of notifications was reported in 2013 (64) and lowest in 2006 (13).

Several changes have occurred in lead surveillance which may affect trends. In 2009, the BLL notifiable level was reduced from 15 µg/dL (0.73 µmol/L) to 10 µg/dL (0.48 µmol/L). In 2006–2007 and 2010, Tropical Regional Services of Queensland Health undertook two blood lead surveys in Mount Isa of children aged one to four years; increased testing is likely to have an impact on notifications. Ongoing improvements in lead surveillance reporting and efforts to improve data quality have also occurred.

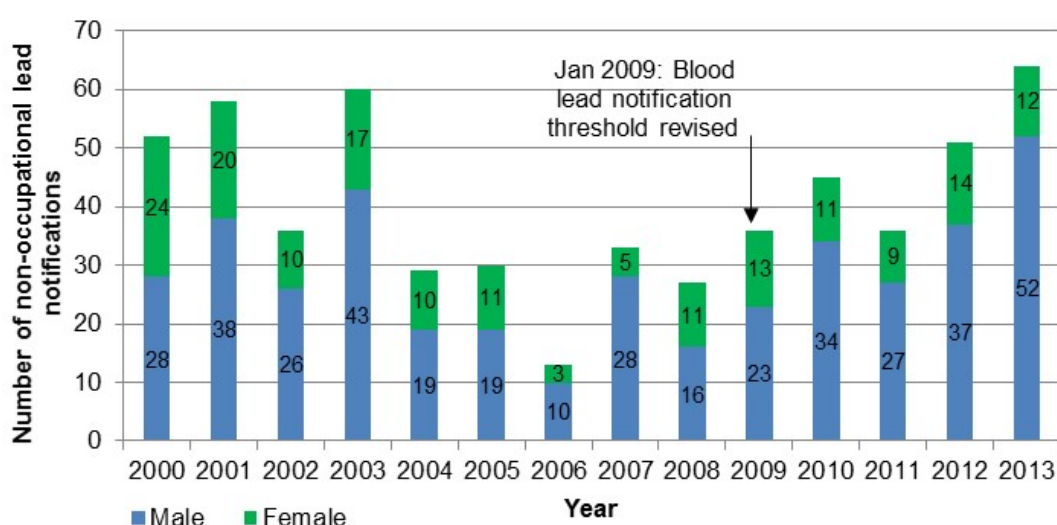


Figure 1: Number of non-occupational lead notifications by sex 2000–2013

Only slight variations are observed with the median elevated BLLs for all individuals and children aged less than 5 years were similar across the time period (Figure 2).

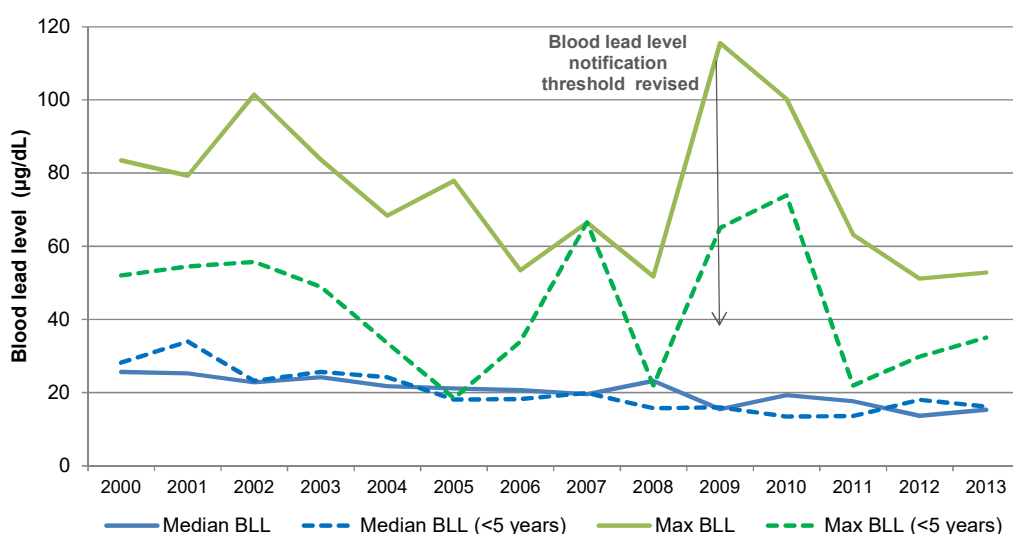


Figure 2: Median and maximum non-occupational elevated blood lead results for 2000–2013

Exposure to lead paint was a significant single cause of non-occupational elevated BLLs. This includes exposure associated with lead paint removal in domestic environments and in structures such as boats and bridges. The proportion of cases associated with lead paint ranged between 22% and 75% over the reporting period (Figure 3).

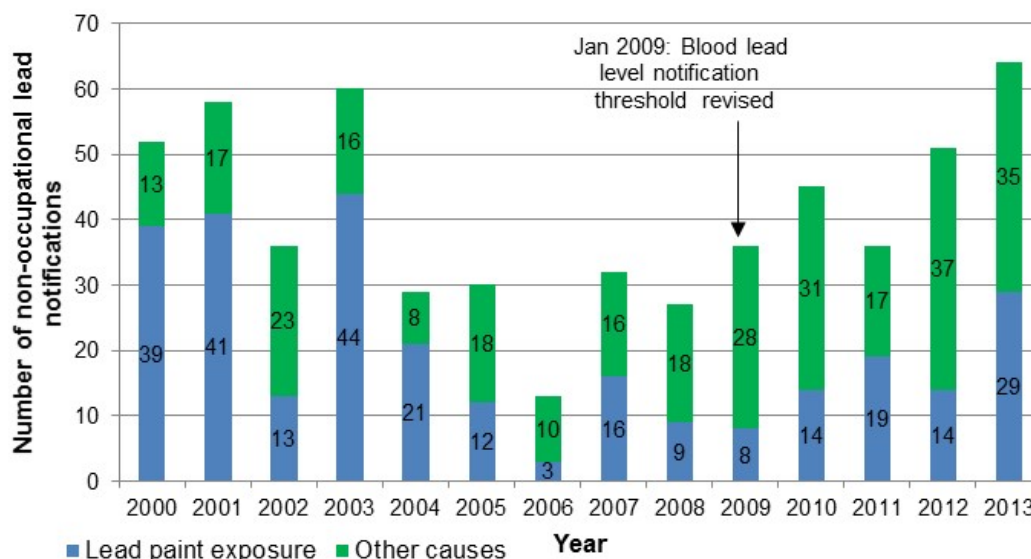


Figure 3: Number of non-occupational elevated blood lead notifications by cause 2000–2013

Figure 4 shows there is variation in the number of non-occupational notifications for each HHS in Queensland since 2000. Lead exposure may have occurred in a different location to where an individual resided at the time the elevated BLL was detected.

Table 4: Non-occupational cases with elevated blood lead levels by Hospital and Health Service 2000–2013

Hospital & Health Service	Year													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cairns and Hinterland	1	6	-	2	-	3	-	1	3	1	3	1	2	2
Central Queensland	5	6	6	8	5	6	1	1	1	6	3	-	4	-
Central West	-	1	-	-	-	-	-	-	-	-	-	1	-	-
Darling Downs	2	-	1	3	1	1	-	8	-	3	4	2	3	2
Gold Coast	3	2	2	-	2	3	2	3	4	7	5	-	5	7
Mackay	-	1	1	1	2	2	-	-	-	1	2	2	5	3
Metro North	10	11	10	6	2	2	2	2	5	3	3	8	5	4
Metro South	12	10	2	11	4	2	4	3	3	2	7	4	5	8
North West	-	-	-	1	-	1	2	8	4	7	8	4	4	3
South West	1	1	-	-	2	-	-	-	-	-	-	-	2	-
Sunshine Coast	-	9	2	3	-	3	1	1	1	2	2	2	2	9
Torres and Cape	-	1	-	1	-	-	-	-	-	-	-	-	-	-
Townsville	8	1	4	6	3	1	-	1	2	1	5	2	8	3
West Moreton	7	4	4	15	5	4	-	3	3	2	1	4	4	12
Wide Bay	3	5	4	3	3	2	1	2	1	1	2	6	2	11
Total	52	58	36	60	29	30	13	33	27	36	45	36	51	64

Summary

In 2013, there were 64 non-occupational cases of elevated BLLs notified to Queensland Health. For 2000–2013, the number of non-occupational elevated BLL notifications ranged from 13 to 64. There are many factors which may have impacted these figures. The number of notifications detected by the lead surveillance system may be influenced by the reduction to the blood lead notification level and increased awareness of the lead health risks leading to proactive BLL testing.

In 2013, the majority of non-occupational notifications were male (81%) which is consistent with trends between 2000–2012. The median age was 46 years (range 1–76 years). Seven children less than five years reported elevated BLLs. The median BLL was 15.3 µg/dL (0.74 µmol/L) and maximum 52.8 µg/dL (2.55 µmol/L).

The removal of lead-based paint from a domestic environment was the most frequent cause of non-occupational lead exposure in 2013, and ranged between 22% and 75% from 2000–2013. The Wide Bay HHS reported the highest number of notifications in 2013 (17%).

This report presents data for 2013 and summary data for the period between 2000–2013. The notifications reported to NOCS will be used to guide future research, health interventions and policy development aimed at addressing and controlling lead exposure in individuals and communities in Queensland.

Abbreviations

BLL	blood lead level
HHS	Hospital and Health Service
NHMRC	National Health and Medical Research Council
NOCS	Notifiable Conditions System
µg/dL	micrograms per decilitre
µmol/L	micromoles per litre