Non-Occupational Blood Lead Notifications in Queensland

Annual Report 2015

Queensland Government

Non-occupational blood lead notifications in Queensland 2015

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Contents

Figures

Tables

Introduction

In Queensland, lead exposure resulting in a blood lead level (BLL) of 10 micrograms per decilitre (µg/dL) (0.48 micromoles per litre (µmol/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 µg/dL (0.73 µmol/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 2015.

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 2015. 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 - ≥ 5µg/dL) in Queensland 2015, including the demographic profile, cause of lead exposure and location. Notifications in 2015 were compared to 2000–2014 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 2015, the numbers of non-occupational notifications reported to Queensland Health was 64:

- 58 non-occupational;
- six undetermined cases.

The demographic characteristics of people with elevated BLLs in Queensland in 2015 are displayed in Table 1.

Table 1: Demographic characteristics of people with non-occupational elevated blood lead levels in Queensland 2015

Characteristic	Total	Median blood lead level µg/dL (µmol/L)	Max blood lead level µg/dL (µmol/L)
Number	58	16.3 (0.79)	47.2 (2.28)
Sex			
Male	46 (79%)	15.9 (0.77)	47.2 (2.28)
Female	12 (21%)	16.6 (0.80)	28.8 (1.39)
Age group (years)			
<5	13 (22%)	16.6 (0.80)	32.7 (1.58)
≥5	45 (78%)	16.2 (0.78)	47.2 (2.28)
Indigneous status			
Non-Indigenous	15 (26%)	15.95 (0.77)	29.6 (1.43)
Indigenous	10 (17%)	19.36 (0.94)	32.7 (1.58)
Not stated	33 (57%)	16.15 (0.78)	47.2 (2.28)

Of the non-occupational exposures, the median age was 49 years (range 1–76 years) and the proportion was higher for males (79%). The cause of the maximum BLL was attributed to making lead items such as sinkers and toy soldiers. Thirteen children aged less than five years were identified as having an elevated BLL in 2015.

Of the 58 notifications, 33 (57%) did not have Indigenous status stated. There were six reported notifications where the source was undetermined[1] following investigation.

Notifiable blood lead levels by Hospital and Health Service

There are 15 Hospital and Health Services (HHS) in Queensland. The highest number of notifications reported were from North West (16%) HHS, followed by Metro North (14%), Metro South (14%) and Wide Bay (14%).

The total number of non-occupational elevated BLL notifications by HHS is shown 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 2015

Hospital and Health Service	No. (%)* notifications		
	All years (%)*	<5 years (%)	≥5 years (%)
Cairns and Hinterland	2 (3%)	-	2 (4%)
Central Queensland	2 (3%)	-	2 (4%)
Central West	-	-	-
Darling Downs	5 (9%)	-	5 (11%)
Gold Coast	6 (10%)	2 (15%)	4 (9%)
Mackay	2 (3%)	1 (7%)	1 (2%)
Metro North	8 (14%)	2 (15%)	6 (13%)
Metro South	8 (14%)	-	8 (18%)
North West	9 (16%)	5 (38%)	4 (9%)
South West	-	-	3 (7%)
Sunshine Coast	3 (5%)	-	-
Torres and Cape	-	-	-
Townsville	3 (5%)	1 (8%)	2 (4%)
West Moreton	2 (3%)	-	2 (4%)
Wide Bay	8 (14%)	2 (15%)	6 (13%)
Total	**58**	**13**	**45**

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

Notifiable blood lead levels by cause

Table 3: Non-occupational lead exposure by cause 2015

Cause	No. (%)* notifications		
	All years	<5 years	≥5 years
Exposure at indoor/outdoor rifle range	9 (16%)	-	9 (20%)
Lead-based paint from structures (e.g. boat, bridge)	1 (2%)	-	1 (2%)
Lead exposure during maintenance or demolition work	2 (3%)	-	2 (4%)
Removal lead-based paint from domestic environment	13 (22%)	2 (15%)	11 (24%)
Making of lead sinkers, toy soldiers etc.	6 (10%)	-	6 (13%)
Mount Isa resident (general non-specific lead exposure)	4 (7%)	-	4 (9%)
Weld, braze or lead solder	1 (2%)	-	1 (2%)
Pica (intentional ingestion)	8 (14%)	8 (62%)	-
Lead medicines	2 (3%)	-	2 (4%)
Other	9 (16%)	2 (15%)	7 (16%)
Unknown cause or source	3 (5%)	1 (8%)	2 (4%)
Total	**58**	**13**	**45**

* 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 causes of 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 (22%), exposure at an indoor or outdoor firing range (16%) and pica (14%). For the 13 children less than five years, the highest proportion of confirmed elevated BLLs was due to pica (62%).

Trend analyses

There was a total of 667 cases notified associated with non-occupational lead exposure between 2000 and 2015. Data for years 2000–2014 are shown for comparison to the 2015 data. The number of non-occupational annual notifications fluctuated over the time period. 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 of children in Mount Isa 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.

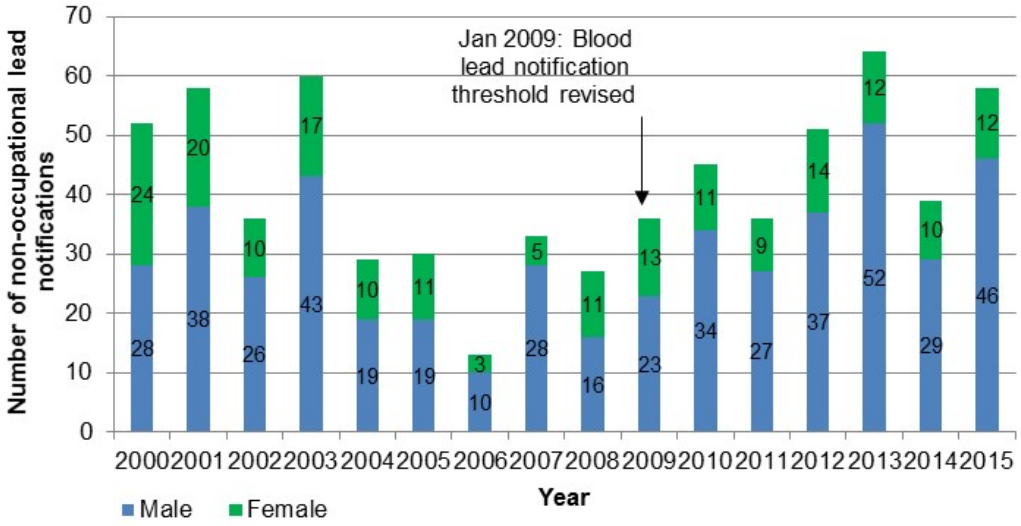

Figure 1: Number of non-occupational lead notifications by sex 2000–2015

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

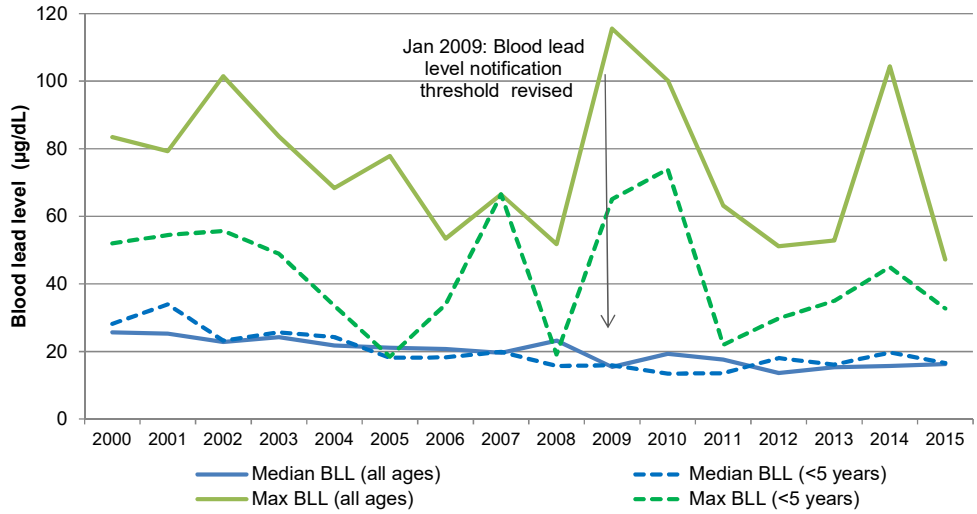

Figure 2: Median and maximum non-occupational elevated blood lead level for 2000–2015

Exposure from lead paint was a significant single cause of non-occupational elevated BLLs over time. 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).

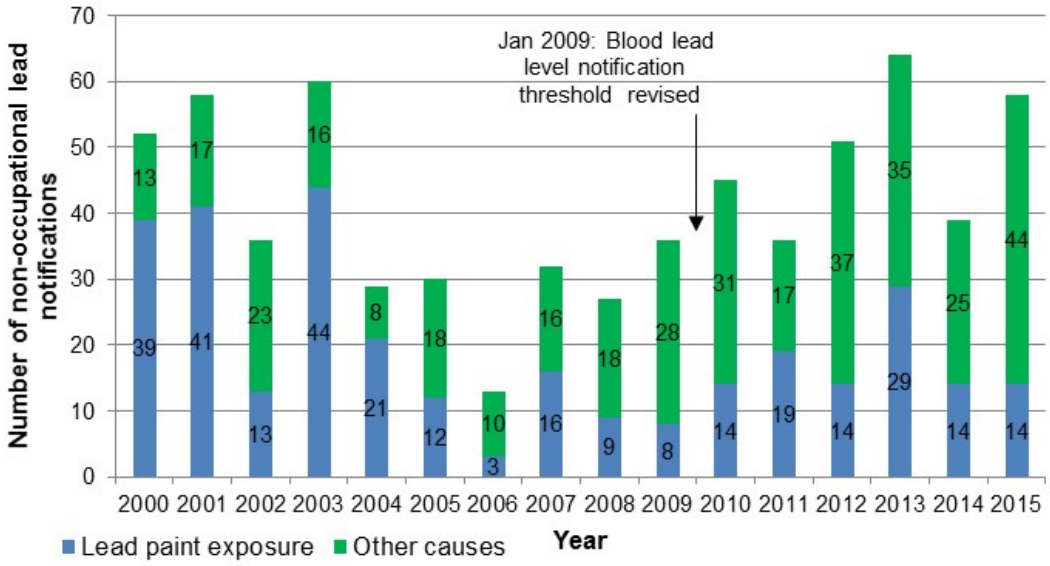

Figure 3: Number of non-occupational lead notifications by cause 2000–2015

Figure 4 shows there is variation in the number of non-occupational notifications for each HHS in Queensland since 2011. Caution is required with interpretation of results as 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 2000–2015

Hospital and Health Service	Year															
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cairns amd Hinterland	1	6	-	2	-	3	-	1	3	1	3	1	2	2	3	2
Central Queensland	5	6	6	8	5	6	1	1	1	6	3	-	4	-	6	2
Central West	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Darling Downs	2	-	1	3	1	1	-	8	-	3	4	2	3	2	3	5
Gold Coast	3	2	2	-	2	3	2	3	4	7	5	-	5	7	-	6
Mackay	-	1	1	1	2	2	-	-	-	1	2	2	5	3	1	2
Metro North	10	11	10	6	2	2	2	2	5	3	3	8	5	4	7	8
Metro South	12	10	2	11	4	2	4	3	3	2	7	4	5	8	6	8
North West	-	-	-	1	-	1	2	8	4	7	8	4	4	3	7	9
South West	1	1	-	-	2	-	-	-	-	-	-	-	2	-	1	-
Sunshine Coast	-	9	2	3	-	3	1	1	1	2	2	2	2	9	3	3
Torres and Cape	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Townsville	8	1	4	6	3	1	-	1	2	1	5	2	8	3	-	3
West Moreton	7	4	4	15	5	4	-	3	3	2	1	4	4	12	1	2
Wide Bay	3	5	4	3	3	2	1	2	1	1	2	6	2	11	1	8
Total	52	58	36	60	29	30	13	33	27	36	45	36	51	64	39	58

Summary

In 2015, there were 58 non-occupational notifications reported to Queensland Health. Between 2000 and 2015, 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 reductions to the blood lead notification level and increased awareness of the lead health risks leading to proactive BLL testing.

In 2015, the majority of non-occupational notifications were male (79%) which is consistent with trends between 2000 and 2014. The median age was 49 years (range 1–76 years). Thirteen children less than five years reported elevated BLLs, over double previous years. The median BLL was 16.3 µg/dL (0.79 µmol/L) and maximum 47.2 µg/dL (2.28 µmol/L).

The removal of lead-based paint from a domestic environment was the most frequent cause of non-occupational lead exposure in 2015, and ranged between 22% and 75% from 2000 to 2015. The North West HHS reported the highest number of notifications in 2015 (16%) with slightly lower numbers reported by Metro North, Metro South and Wide Bay.

This report presents data for 2015 and summary data for the period between 2000 and 2015. 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