

# 2014 DON Pediatric Lead Screening Report

## Introduction

The Centers for Disease Control and Prevention (CDC) reports that nearly 500,000 American children between the ages of one and five are thought to have high blood lead levels, defined as  $>5$  micrograms of lead per deciliter of blood ( $\mu\text{g}/\text{dL}$ ).<sup>1</sup> Pediatric lead poisoning is of national concern due to the potential negative health impact and because measures are available to prevent exposure. The Department of the Navy (DON) has adopted Environmental Protection Agency (EPA) guidelines in the sampling and testing for lead in drinking water in the priority areas program. Highlights of this program may be found at:

<http://www.med.navy.mil/sites/nmcphc/environmental-programs/Pages/Lead-in-Drinking-Water.aspx>

Instructions for the Pediatric Lead Poisoning Prevention (PLPP) Program (BUMEDINST 6200.14C) (21 July 2014), state that all Medical Treatment Facilities (MTFs) must operate a formal pediatric lead screening program. Lead poisoning surveillance is focused on children aged 6 months to 72 months due to their increased susceptibility of high blood lead levels. Children older than 72 months of age may be screened if there is a clinical indication of lead poisoning. Healthcare practitioners are required to treat and monitor all children with a confirmed BLL of  $\geq 5 \mu\text{g}/\text{dL}$ .<sup>2</sup>

## Purpose

This report covers pediatric lead poisoning surveillance of records from the Composite Health Care System (CHCS) database for DON dependents from January 1, 2014 through December 31, 2014. For the purposes of this report, and based on DON guidelines, a child is considered to have high lead levels if the concentration of lead in their blood is  $\geq 5 \mu\text{g}/\text{dL}$  for any lead screening test done within the report timeframe.

## Methodology

Lead poisoning surveillance was based on records with a test collection date of January 1, 2014 through December 31, 2014 from the Health Level 7 (HL7) chemistry data system, obtained from the CHCS database. Records that had a lead (Lead/Pb) test in the test result field for beneficiary children younger than 18 years were extracted for analysis. Records were excluded from the final analysis if they were true duplicates; had a service code other than N (Navy) or M (Marine Corps); if body site for sample collection was not blood or whole blood (e.g. serum); or if the unit of measure or result could not be determined. The highest annual test result per child was used in the final analysis. Children were divided into age groups of less than two years, two to three years, four to five years and six years of age and older. Based on Congressional Lead Measurement Standards and the format of previous lead reports from the EpiData Center



Department (EDC), Navy and Marine Corps Public Health Center (NMCPHC) test results categorized as an estimated value (*i.e.* <5) were classified as <5. During the 2014 reporting period, no estimated test result values were greater than 5µg/dL.

Thirteen test results specified a unit of measurement of micrograms per milliliter (µg/mL) rather than µg/dL. After conversion to µg/dL these results were above the DON guidelines. However, Armed Forces Health Longitudinal Technology Application (AHLTA) records indicated that these results were within normal guidelines. AHLTA test result values were used in the analysis of these records.

Previous NMCPHC annual pediatric lead reports cited high BLL test results as ≥10 µg/dL. Based on BUMEDINST 6200.14C recommendations, this level has been reduced to ≥5 µg/dL. Therefore, comparisons of BLL test results from previous years are not discussed in this report.

## Results

There were 6,220 unique records of DON military dependents included in this analysis. Table 1 shows that 6,152 (98.9%) records had acceptable blood lead levels (<5µg/dL) and 68 (1.1%) had high blood lead levels (≥5 µg/dL). Three of these results were ≥20µg/dL. There were 1,432 blood lead levels reported with an actual value and 4,788 with an estimate value, reported as <5 µg/dL. All high test results were reported with an actual value.

**Table 1.** Blood Lead Levels by Age Group, DON Dependents, CY 2014

Age Group (Years)	Blood Lead Levels (µg/dL)				Total
	<5	5-9	10-19	>=20	
< 2	3,592	33	6	1	3,632
2-3	1,204	12	0	1	1,217
4-5	1,103	9	1	1	1,114
6-17	253	4	0	0	257
Total	6,152	58	7	3	6,220

Prepared using HL7 Chemistry data  
 Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center on 29 January 2015



Most children with reported BLL test results were tested at one year of age (3,321, 53.4%) (Table 2). This age group also had the highest number of children with test results  $\geq 5$   $\mu\text{g}/\text{dL}$  (37, 54.4%).

**Table 2. Blood Lead Levels by Age, DON Dependents, CY 2014**

Blood Lead Levels ( $\mu\text{g}/\text{dL}$ )					
Age (Years)	<5	5-9	10-19	$\geq 20$	Total
0	308	1	2	0	311
1	3,284	32	4	1	3,321
2	638	7	0	1	646
3	566	5	0	0	571
4	722	5	0	1	728
5	381	4	1	0	386
6	96	2	0	0	98
7	46	1	0	0	47
8	30	0	0	0	30
9	17	0	0	0	17
10	12	0	0	0	12
11	10	0	0	0	10
12	13	0	0	0	13
13	6	0	0	0	6
14	7	0	0	0	7
15	7	1	0	0	8
16	4	0	0	0	4
17	5	0	0	0	5
Total	6,152	58	7	3	6,220

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As seen in Table 3, 68 test results indicated a high BLL ( $\geq 5$   $\mu\text{g}/\text{dL}$ ); three results were  $\geq 20$   $\mu\text{g}/\text{dL}$ . Naval Branch Health Clinic (NBHC) New England reported the highest number of BLL test results  $\geq 5$   $\mu\text{g}/\text{dL}$  (15 of 68, 22.1%) followed by NBHC Charleston and Naval Medical Center (NMC) San Diego, both with 7 results  $\geq 5$   $\mu\text{g}/\text{dL}$  (10.3% each). All of the tests which reported a range of values had a BLL test result  $< 5$   $\mu\text{g}/\text{dL}$ . This report reflects the highest BLL



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test result per child in the reporting period. Retesting may have occurred resulting in a lower BLL.

<b>Table 3. Medical Treatment Facilities with Reported High Blood Lead Levels, DON Dependents, CY 2014</b>					
		Blood Lead Levels ( $\mu\text{g}/\text{dL}$ )			
DMIS ID	Military Treatment Facility	5-9	10-19	$\geq 20$	Total
0100	NBHC New England	13	1	1	15
0103	NBHC Charleston	7	0	0	7
0029	NMC San Diego	6	0	1	7
0121	McDonald Army Health Center	3	1	0	4
0051	78th Medical Group	3	0	0	3
0035	NBHC Groton	1	2	0	3
0385	NHC Quantico	3	0	0	3
0120	633rd Medical Group	2	0	0	2
0045	6th Medical Group	2	0	0	2
0378	NBHC Little Creek	3	0	0	2
0091	NH Camp Lejeune	1	1	0	2
0039	NH Jacksonville	2	0	0	2
0067	WRNMMC Bethesda, MD	2	0	0	2
0356	628th Med Group - Charleston	1	0	0	1
0377	BMC Naval Station Norfolk	0	0	1	1
0075	CBPCC Ft Leonard Wood	1	0	0	1
0061	Ireland ACH Ft Knox, KY	1	0	0	1
0073	Keesler Medical Center	1	0	0	1
0028	NH Lemoore	0	1	0	1
0058	Munson ACH Ft Leavenworth	1	0	0	1
0262	NBHC NATTC Pensacola	1	0	0	1
0092	NBHC Cherry Point	1	0	0	1
0321	NBHC Portsmouth, NH	1	0	0	1
0124	NMC Portsmouth	0	1	0	1
0387	NBHC Oceana	1	0	0	1
6214	VA Beach Tricare OP Clinic	1	0	0	1
	<b>Total</b>	<b>58</b>	<b>7</b>	<b>3</b>	<b>68</b>

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Table 4 illustrates the number of BLL tests performed, the number of tests with high BLL results ( $\geq 5\mu\text{g/dL}$ ), and the percentage of tests with high results by medical treatment facility.

**Table 4.** Fixed Military Treatment Facilities Reporting Blood Lead Level Tests, DON Dependents, CY 2014

DMIS ID	Medical Treatment Facility	Tests Performed (Frequency)	Tests with High BLL <sup>1</sup>	Percent with High BLL <sup>2</sup>
0001	FOX AHC REDSTONE ARSENAL	3	0	0.0
0004	42 MED GP MAXWELL AFB	11	0	0.0
0005	BASSETT ARMY COMMUNITY HOSP	1	0	0.0
0008	BLISS AHC	2	0	0.0
0009	56 MED GP LUKE AFB	2	0	0.0
0010	355th MEDICAL GROUP	5	0	0.0
0013	19TH MEDICAL GROUP	3	0	0.0
0014	DAVID GRANT MEDICAL CENTER	9	0	0.0
0018	30TH MEDICAL GROUP	3	0	0.0
0019	412TH MEDICAL GROUP	2	0	0.0
0024	NH CAMP PENDLETON	36	0	0.0
0026	NACC PORT HUENEME	39	0	0.0
0028	LEMOORE NAVAL HOSPITAL	228	1	0.4
0029	NMC SAN DIEGO	293	7	2.4
0030	NH TWENTYNINE PALMS	89	0	0.0
0033	AIR FORCE ACADEMY CLINIC	1	0	0.0
0035	NAVAL BRANCH HEALTH CL GROTON	527	3	0.6
0036	436 MED GP DOVER AFB	9	0	0.0
0037	WALTER REED AMC	1	0	0.0
0038	NH PENSACOLA	11	0	0.0
0039	NAVAL HOSPITAL JACKSONVILLE	45	2	4.4
0042	96TH MEDICAL GROUP	3	0	0.0
0043	TYNDALL AFB	9	0	0.0
0045	6TH MEDICAL GROUP	25	2	8.0
0046	45 MEDICAL GP HOSPITAL	6	0	0.0
0047	EISENHOWER ARMY MED CTR	19	0	0.0
0048	MARTIN ARMY COMMUNITY HOSPITAL	2	0	0.0
0050	23 MED GP MOODY AFB	2	0	0.0



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DMIS ID	Medical Treatment Facility	Tests Performed (Frequency)	Tests with High BLL <sup>1</sup>	Percent with High BLL <sup>2</sup>
0051	78TH MEDICAL GROUP	12	3	25.0
0052	TRIPLER ARMY MEDICAL CENTER	25	0	0.0
0055	375 MED GP SCOTT AFB	1	0	0.0
0056	NH GREAT LAKES	40	0	0.0
0058	MUNSON ACH FT LEAVENWORTH	9	1	11.1
0059	22 MED GP MCCONNELL AFB	1	0	0.0
0060	BLANCHFIELD ACH FT CAMPBELL	1	0	0.0
0061	IRELAND ACH Ft Knox	10	1	10.0
0062	2 MED GP BARKSDALE AFB	4	0	0.0
0066	MALCOLM GROW	4	0	0.0
0067	WRNMMC BETHESDA, MD	25	2	8.0
0068	PAX	4	0	0.0
0069	KIMBROUGH ACC	9	0	0.0
0073	KEESLER MEDICAL CENTER	15	1	6.7
0075	GEN LEONARDWOOD ACH	22	1	4.5
0078	EHLING BERGQUIST CLINIC	19	0	0.0
0079	NELLIS FEDERAL HOSPITAL	13	0	0.0
0084	HOLLOMAN AFB	1	0	0.0
0086	KELLER ACH WEST POINT NY	21	0	0.0
0091	CAMP LEJEUNE NAVAL HOSPITAL	241	2	0.8
0092	NAVAL HEALTH CLINIC CHERRY PT	150	1	0.7
0095	WRIGHT-PATTERSON MED CENTER	19	0	0.0
0097	USAF CLINIC ALTUS	2	0	0.0
0098	REYNOLDS ACH FT SILL	2	0	0.0
0100	NAVAL HEALTH CL NEW ENGLAND	249	15	6.0
0103	NAVAL HEALTH CLINIC CHARLESTON	64	7	10.9
0104	BEAUFORT NAVAL HOSPITAL	2	0	0.0
0105	MONCRIEF ARMY COMMUNITY HOSP	5	0	0.0
0106	28TH MED GP	1	0	0.0
0107	NSA MID SOUTH NBHC TENNESSEE	1	0	0.0
0108	CONSOLIDATED TROOP MEDICAL CLN	6	0	0.0
0109	BROOKE ARMY MEDICAL CENTER	48	0	0.0
0112	DYESS MEDICAL DIVISION	1	0	0.0



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DMIS ID	Medical Treatment Facility	Tests Performed (Frequency)	Tests with High BLL <sup>1</sup>	Percent with High BLL <sup>2</sup>
0114	LAUGHLIN AFB	2	0	0.0
0117	WILFORD HALL AMB SURGICAL CTR	31	0	0.0
0118	CORPUS CHRISTI	3	0	0.0
0119	75TH MED GP HILL AFB	3	0	0.0
0120	633RD MEDICAL GROUP	92	2	2.2
0121	MCDONALD ARMY HEALTH CENTER	111	4	3.6
0122	KENNER ARMY HEALTH CLINIC	4	0	0.0
0123	FT BELVOIR COMMUNITY HOSPITAL	1	0	0.0
0124	NAVAL MEDICAL CENTER PORTSMOUTH	705	1	0.1
0125	MADIGAN AMC	4	0	0.0
0126	BREMERTON NH	24	0	0.0
0127	OAK HARBOR NH	1	0	0.0
0128	92 MED GP FAFB	1	0	0.0
0203	354 MEDICAL GROUP	1	0	0.0
0231	NI-NORTH ISLAND NAS BRNCH CLNC	16	0	0.0
0232	MIRAMAR MCAS BRNCH MED CLINIC	56	0	0.0
0248	61st MEDICAL SQ	11	0	0.0
0252	PETERSON AFB CLINIC	5	0	0.0
0261	NAS WHITING FIELD NBHC	3	0	0.0
0262	NATTC NAS PENSACOLA NBHC	1	1	100.0
0272	TUTTLE ARMY HEALTH CLINIC	4	0	0.0
0275	ALBANY BRANCH CLINIC	7	0	0.0
0280	NAVAL HEALTH CLINIC HAWAII	118	0	0.0
0285	KANEOHE BAY MCBH BMC	71	0	0.0
0287	HICKAM AFB	4	0	0.0
0290	ROCK ISLAND ARSENAL AHC	4	0	0.0
0306	ANNAPOLIS	18	0	0.0
0308	ABERDEEN	6	0	0.0
0309	DETRICK	1	0	0.0
0310	66 MED GP HANSCOM 11307-01	46	0	0.0
0316	GULFPORT NBHC	7	0	0.0
0317	NAS MERIDIAN NBHC	7	0	0.0
0321	NAVAL HEALTH CLINIC PORTSMOUTH	1	1	100.0



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DMIS ID	Medical Treatment Facility	Tests Performed (Frequency)	Tests with High BLL <sup>1</sup>	Percent with High BLL <sup>2</sup>
0326	87TH MED GP	10	0	0.0
0333	MCAS NEW RIVER, BR MED CLN	10	0	0.0
0335	POPE HEALTH CLINIC	1	0	0.0
0337	KINGS BAY BRANCH CLINIC	12	0	0.0
0338	VANCE AFB, OK	1	0	0.0
0352	DUNHAM USAHC	3	0	0.0
0356	AIR FORCE BASE CLINIC	1	1	100.0
0364	MEDICAL DIVISION	12	0	0.0
0366	359TH MEDICAL GROUP,RANDOLPH	30	0	0.0
0377	BMC NAVAL STATION NORFOLK	42	1	2.4
0378	NBHC NAVPHIBASE LITTLE CREEK	713	3	0.4
0379	NBHC NAVAL STATION NORFOLK	18	0	0.0
0380	BMC NORFOLK NAVAL SHIPYARD	1	0	0.0
0381	NBHC WEAPONS STA YORKTOWN	7	0	0.0
0382	NBHC FLTCLANT DAMNECK	18	0	0.0
0385	NAVAL HEALTH CLINIC QUANTICO	169	3	1.8
0387	BMC NAVAL AIR STATION OCEANA	387	1	0.3
0390	RADER USAHC	12	0	0.0
0405	MAYPORT BRANCH CLINIC	15	0	0.0
0406	NBHC RANCHO BERNARDO	1	0	0.0
0407	NTC BRANCH MEDICAL CLINIC	159	0	0.0
0409	EAST COUNTY PRIMARY CARE DIV	6	0	0.0
0410	NBHC EASTLAKE	2	0	0.0
0413	JOINT BASE ANACOSTIA_BOLLING	11	0	0.0
0436	NAS BELLE CHASSE NBHC	5	0	0.0
0437	SCHOFIELD BARRACKS USAHC	10	0	0.0
0508	NBHC NAVAL STATION NORFOLK	36	0	0.0
0517	KEY WEST BRANCH CLINIC	3	0	0.0
0519	TPC NORTHWEST	31	0	0.0
0612	121ST GENERAL HOSPITAL	8	0	0.0
0615	USNH GUANTANAMO BAY CU	4	0	0.0
0618	USNH ROTA, SPAIN	1	0	0.0
0620	USNH GUAM MI	6	0	0.0



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0621	US NAVAL HOSPITAL OKINAWA	3	0	0.0
0622	USNH YOKOSUKA JA	15	0	0.0
0625	IWAKUNI BRANCH MEDICAL CLINIC	2	0	0.0
0639	35TH MDG MISAWA AB JA	5	0	0.0
0701	NAVSTA 32ND ST BRNCH MED CLNC	1	0	0.0
0852	SASEBO BRANCH MEDICAL CLINIC	1	0	0.0
0853	NBHC NAF ATSUGI	19	0	0.0
1147	WIESBADEN	1	0	0.0
1233	PATCH STUTTGART	3	0	0.0
1269	KINSER BRANCH MEDICAL CLINIC	3	0	0.0
1481	BIGGS FIELD MEDICAL CLINIC	2	0	0.0
1946	BRANDON COMMUNITY CLINIC	5	0	0.0
6006	CBPCC 1-FT. SHAFTER	3	0	0.0
6014	WEST FORT HOOD DIVISION	1	0	0.0
6106	AMH HOPE MILLS	2	0	0.0
6114	MONCRIEF MEDICAL HOME	2	0	0.0
6115	CBPCC FT LEONARD WOOD	4	0	0.0
6120	CBPCC 1-FT. SHAFTER	7	0	0.0
6122	RICHMOND HILL AMH	1	0	0.0
6123	MOUNTAIN POST MEDICAL HOME	1	0	0.0
6124	NORTH COLUMBUS PCC	1	0	0.0
6200	FAIRFAX FHC	1	0	0.0
6201	DUMFRIES HEALTH CENTER	3	0	0.0
6207	TOC PRIMARY CARE CLMT MESA	52	0	0.0
6214	VA BEACH TRICARE OP CLINIC	161	1	0.6
6215	TOC PRIMARY CARE CHULA VISTA	16	0	0.0
6216	TRICARE OUTPATIENT CLN 6216-N	5	0	0.0
6221	CHESAPEAKE TRICARE OP CLINIC	292	0	0.0
7032	BUSH BRANCH MEDICAL CLINIC	2	0	0.0
7138	EVERETT	19	0	0.0
7139	HURLBURT CLINIC	1	0	0.0
7143	ROBINSON HEALTH CLINIC	1	0	0.0
7200	BUCKLEY AFB	2	0	0.0



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7236	BENNETT FAMILY CARE DIV	1	0	0.0
7286	JOEL AHC - FT. BRAGG	1	0	0.0
7906	WILFORD HALL AMB SURGICAL CTR	29	0	0.0
8006	PORTSMOUTH MCSC NETWORK	2	0	0.0
8011	87TH MED GP	17	0	0.0
9999	87TH MED GP	6	0	0.0

<sup>1</sup> BLL ≥5 µg/dL  
<sup>2</sup> Percentage of results with BLL ≥5 µg/dL per Medical Treatment Facility  
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## Discussion

This report was created in support of BUMEDINST 6200.14C and is limited to DON beneficiaries. Pediatric blood lead results were tracked independent of location using HL7 data; this ensured the report included all eligible beneficiaries who received care through the military health system. Because it is unknown why a blood sample was taken for a particular child, a risk assessment could not be conducted. The highest blood lead value was selected for children with more than one test result, leading to an overestimation of the true prevalence of elevated blood lead levels in the sampled population. It is strongly recommended that individual medical treatment facilities review their respective results to ensure all elevated results have the proper clinical follow-up.

## Limitations

HL7 data maintained at the EDC are routinely generated within the CHCS at fixed MTFs. These data do not include records from shipboard facilities, battalion aid stations, purchased care, or in-theater facilities. The chemistry database consists of non-culture laboratory test results (e.g., polymerase chain reaction (PCR) and antigen testing). Providers may order a group of tests, called panels, when patients present with non-specific symptoms. If the test name or test results within a panel are not disease-specific, these results may not be captured in search terms used to query the chemistry data. Classifying chemistry tests involves extensive searching of free-text test result fields. It is possible that some test results were misclassified, though validation steps were included to reduce error.



## References

1. Center for Disease Control and Prevention (CDC). Lead. <http://www.cdc.gov/nceh/lead/> Updated 19 June 2014. Accessed 27 January 2015.
2. United States navy Bureau of Medicine and Surgery (BUMED). Instruction 6200.14C, Childhood Lead Poisoning Prevention. <http://www.med.navy.mil/directives/ExternalDirectives/6200.14C.pdf>. Published 21 July 2014. Accessed 28 January 2015.

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