



DCPH-A

# Army Annual Pediatric Lead Report Calendar Year 2024 (CY2024)

## ANNUAL HIGHLIGHT

Between 1 January and 31 December 2024,

7,954 Army child dependents received a blood lead test; 0.8% of those tests exceeded the CDC blood lead reference value (eBLL  $\geq 3.5$   $\mu\text{g}/\text{dL}$ ). Among child dependents tested within the Military Health System, the rate of BLLs above the CDC blood lead reference value was 8.5 per 1,000 children in CY2024.

## INTRODUCTION

Lead is a naturally occurring heavy metal but can present an environmental and health hazard if it contaminates water, air, soil, or dust. In the U.S., the most common ways that people are exposed to lead are the inhalation or accidental ingestion of contaminated dust and soil as a result of aging or chipping lead-based paint.<sup>1,2</sup> Lead-based paint was banned from use in the U.S. in 1978, but many homes built prior to the ban still exist in communities across the country. Other potential sources of lead exposure are contaminated water, ammunition, soldering equipment, as well as some foreign-made toys, ceramics, make-up, and packaged foods.

Lead is neurotoxic and can cause cognitive and behavioral issues, as well as gastrointestinal and hematological problems.<sup>2,3</sup> Children are at higher risk of lead exposure because of their more frequent hand-to-mouth behavior. They are also more susceptible to the harmful effects of lead since the brain is in a period of rapid development during childhood.

Because children are at higher risk of poor health outcomes if exposed to lead, the American Academy of Pediatrics recommends that all children aged 6 months to 6 years, inclusive, be screened for increased risk of lead exposure via a parental questionnaire administered at routine well-child visits.<sup>3</sup> Children who screen positive for an increased exposure risk should be tested to determine if their blood lead level (BLL) exceeds the Centers for Disease Control and Prevention (CDC) blood lead reference value (BLRV).<sup>4</sup> Laws regarding lead exposure screening, testing, and reporting are established at the State level, and Army regulation directs installations to comply with State law.<sup>3</sup>

In 2021, the CDC lowered the BLRV from 5 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) to 3.5  $\mu\text{g}/\text{dL}$ .<sup>4</sup> This updated reference value was derived from the 97.5<sup>th</sup> percentile of the blood lead values among U.S. children aged 1 to 5 years, resulting from the 2015–2016 and 2017–2018 National Health and Nutrition Examination Survey cycles. The CDC reference value should not be interpreted as a “safe” level, and the CDC continues to stress that there is no safe level of lead exposure.

In October 2018, pediatric lead poisoning was established as a reportable medical event (RME) for Army dependents aged 0 to 6 years, according to the Army Lead Hazard Management Control Program.<sup>5</sup> Based on the Defense Health Agency’s Armed Forces Health Surveillance Division guidelines, Army dependents with a BLL that exceeds the CDC BLRV must be reported to the Disease Reporting System internet (DRSi). In November 2022, the Tri-Service Reportable Medical Event Working Group updated the case definition of the elevated blood lead RME to reflect the change in the CDC reference value.

This annual report tracks all available BLL laboratory test results within the Army dependent population and monitors the occurrence of BLLs that exceed the CDC BLRV.

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## METHODS

### Laboratory Data

The Defense Centers for Public Health – Portsmouth (DCPH-P) provided available BLL laboratory results for Army dependents from the Military Health System (MHS) GENESIS.<sup>6</sup> Records are dated according to the BLL collection date, and this report covers test results collected from 1 October through 31 December 2024 (CY2024 Q4), as well as a summary of all CY2024 results. The data include all BLL test results above and below the CDC BLRV collected within the MHS. These include test results for Army dependents who receive care at medical treatment facilities (MTFs) on Army installations and other Department of Defense facilities. Test results were excluded from the analysis when the unit of measure or the quantitative result could not be determined, or the biological sample was not blood.<sup>7</sup> Zinc protoporphyrin (ZPP), point of care (POC), and capillary blood tests (n=214) were also not included as these tests are not considered in the case definition in the *Armed Forces Reportable Medical Events – Guidelines and Case Definitions*<sup>8</sup>, hereafter referred to as the Armed Forces RME Guidelines.

Only BLL results for Army dependents aged 0 to 6 years were analyzed for this report. According to the Armed Forces RME Guidelines, a child with a BLL higher than the CDC BLRV can be counted as a case only once per calendar year.<sup>8</sup> If an individual had more than one BLL result (e.g., duplicate record or follow-up blood test) during CY2024, the highest BLL result was retained. The frequency of BLL test results is displayed by BLL range (<3.5 µg/dL, 3.5–9 µg/dL, 10–19 µg/dL, ≥20 µg/dL), Medical Readiness Command (MRC), and installation. Results ≥3.5 µg/dL are considered elevated.

### Disease Reporting System Internet Data

The DRSi is a tri-service reportable medical event system. Since 18 October 2018, pediatric lead poisoning has been reportable through the DRSi for children aged 0 to 6 years.<sup>5</sup> Only Army dependent cases reported to DRSi are included in this report. Among Army dependents, DRSi cases with medical event report dates from 1 October through 31 December 2024 were counted.

### DRSi Reporting Compliance

DRSi report dates can differ from the BLL test collection date. Taking this into consideration, cases with test collection dates during CY2024 Q4 were considered in the measure of compliance with the eBLL reporting policy. Reporting compliance was determined using the proportion of laboratory results that exceeded the CDC BLRV within MHS GENESIS collected during CY2024 Q4 that were also reported via a medical event report in DRSi..

### Public Health Nurses Program Status Report (PHN-PSR)

Starting in April 2019, specific questions regarding childhood lead exposure were included in the PHN-PSR to assess the Environmental Health Hazard Management Control Program.<sup>9</sup> As part of installation safety and housing office-led environmental investigations, the installation's Department of Public Health (Preventive Medicine Services) conducts parent/guardian interviews after a child 6 years of age or younger is confirmed to have a BLL higher than the CDC BLRV. The PHN-PSR captures the following Lead Hazard Management Control Plan metrics based on the past fiscal quarter: (1) number of pediatric BLL tests conducted and reported to the state/local authorities; (2) number of confirmed elevated pediatric BLL test results reported to the state/local authorities per the state/local reporting requirements; (3) number of elevated pediatric BLL cases managed by Public Health Nursing.

## RESULTS

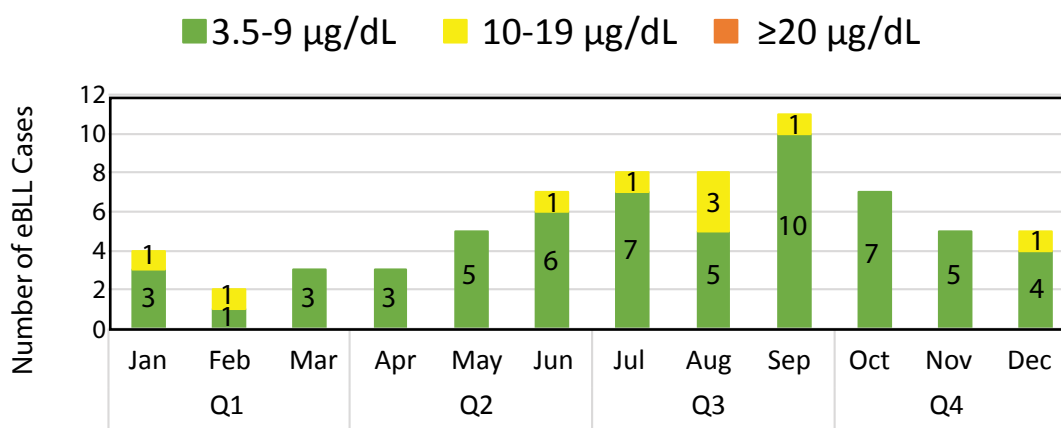
### Laboratory Test Results

During CY2024, 7,954 Army dependents aged 0 to 6 years received a blood lead test within the MHS; 68 of those results (0.8%) indicated a BLL that exceeded the CDC BLRV (≥3.5 µg/dL), as shown in Table 1. Because of the lower reference value, 35 additional children with a BLL higher than the CDC BLRV were identified. In CY2024, no child's BLL exceeded the level at which chelation therapy is typically recommended (≥45 µg/dL) or fell within the highest range (≥20 µg/dL, Table 1). When repeat blood lead tests were examined 11 out of the 68 (16.2%) with elevated results within the calendar year had a follow-up blood lead test result below the CDC BLRV by the end of CY2024 (i.e., <3.5 µg/dL).

**Table 1.** Total Count of Pediatric (ages 0–6) Blood Lead Levels in CY2024

BLL Ranges (µg/dL)	CY2024 Q4 n (%)	CY2024 n (%)
<3.5	1,718 (98.7%)	7,886 (99.2%)
3.5–9	21 (1.2%)	59 (0.7%)
10–19	2 (0.1%)	9 (0.1%)
≥20	0	0
<b>Total</b>	<b>1,741 (100%)</b>	<b>7,954 (100%)</b>

In CY2024 Q4, 1,741 Army dependents received a blood lead test within the MHS, and 23 of those results (1.3%) were above the CDC BLRV ( $\geq 3.5$  µg/dL) (Table 1). Fifteen of the elevated results in CY2024 Q4 are new eBLL cases. Eight Army dependents had a result greater than 3.5 µg/dL reported previously in CY2024. Figure 1 summarizes the number of test results above the CDC BLRV from each month in CY2024 based on the highest BLL test result for each child dependent.



**Figure 1.** Number of Cases Exceeding the CDC Blood Lead Reference Value ( $\geq 3.5$  µg/dL) by Month in CY2024  
Data source: MHS GENESIS

The highest BLL test results from CY2024 were retained for each child dependent; Table 2 summarizes these BLLs by MRC and installation. The results that exceeded the CDC BLRV were from Fort (Ft.) Benning (2), Ft. Bliss (6), Ft. Bragg (12), Ft. Campbell (2), Ft. Carson (7), Ft. Cavazos (3), Ft. Drum (7), Ft. Eisenhower (1), Ft. Irwin (1), Ft. Johnson (1), Ft. Leavenworth (1), Ft. Leonard Wood (3), Ft. Riley (7), Ft. Sill (4), Joint Base (JB) Elmendorf-Richardson (1), JB Lewis-McChord (1), Eglin Air Force Base (AFB) (2), Little Rock AFB (1), Naval Air Station Oceana (1), Schofield Barracks (3), Vicenza (1), and Vilseck (1). Appendix A shows a list of U.S. Air Force (USAF), Space Force, Marine Corps, and Navy locations where Army dependents received BLL testing during CY2024.

**Table 2.** Pediatric (ages 0–6) Blood Lead Levels (BLL), by Medical Readiness Command and Installation, CY2024

MRC	BLL Ranges				Total
	<3.5 µg/dL	3.5–9 µg/dL	10–19 µg/dL	≥20 µg/dL	
<b>EAST</b>					
Aberdeen Proving Ground	96	0	0	0	96
Ft. Belvoir	173	0	0	0	173
Ft. Benning*	286	2	0	0	288
Ft. Bragg*	707	11	1	0	719
Ft. Campbell*	211	2	0	0	213
Ft. Detrick	46	0	0	0	46
Ft. Drum*	387	5	2	0	394
Ft. Eisenhower*	15	1	0	0	16
Ft. Gregg-Adams	76	0	0	0	76
Ft. Jackson	8	0	0	0	8

**Table 2 (continued).** Pediatric (ages 0–6) Blood Lead Levels (BLL), by Medical Readiness Command and Installation, CY2024

MRC	BLL Ranges				Total
	<3.5 µg/dL	3.5–9 µg/dL	10–19 µg/dL	≥20 µg/dL	
Ft. Knox	131	0	0	0	131
Ft. Meade	119	0	0	0	119
Ft. Novosel	100	0	0	0	100
Ft. Stewart	335	0	0	0	335
Redstone Arsenal	3	0	0	0	3
Walter Reed NMMC	32	0	0	0	32
West Point	30	0	0	0	30
<b>WEST</b>					
Ft. Bliss*	785	6	0	0	791
Ft. Carson*	386	7	0	0	393
Ft. Cavazos*	595	3	0	0	598
Ft. Huachuca	7	0	0	0	7
Ft. Irwin*	12	0	1	0	13
Ft. Johnson*	242	1	0	0	243
Ft. Leavenworth*	60	0	1	0	61
Ft. Leonard Wood*	159	3	0	0	162
Ft. Riley*	446	7	0	0	453
Ft. Sill*	113	2	2	0	117
<b>PACIFIC</b>					
Camp Zama	3	0	0	0	3
Ft. Shafter	67	0	0	0	67
Ft. Wainwright	99	0	0	0	99
Schofield Barracks*	677	3	0	0	680
USAG Humphreys	1	0	0	0	1
<b>EUROPE</b>					
Baumholder	5	0	0	0	5
Grafenwoehr	66	0	0	0	66
Hohenfels	17	0	0	0	17
Kaiserslautern	2	0	0	0	2
Landstuhl	71	0	0	0	71
Patch Barracks	3	0	0	0	3
Vicenza*	19	1	0	0	20
Vilseck*	65	0	1	0	66
Wiesbaden	5	0	0	0	5
<b>JOINT BASES</b>					
JB Elmendorf-Richardson*	54	1	0	0	55
JB Langley-Eustis	129	0	0	0	129
JB Lewis-McChord*	299	0	1	0	300
JEB Little Creek-Ft Story	3	0	0	0	3
JB McGuire-Dix-Lakehurst	21	0	0	0	21
JB Meyer-Henderson Hall	21	0	0	0	21
JB San Antonio	354	0	0	0	354
<b>USAF MTF**</b>					
	249	3	0	0	252
<b>NAVAL/MARINE CORPS MTF**</b>					
	96	1	0	0	97

\*Installation where a blood lead level exceeds the CDC blood lead reference value (BLRV ≥3.5 µg/dL)

\*\* See Appendix A for the list of USAF, Space Force, Navy, and Marine Corps locations where Army dependents received BLL tests in CY2024.

## DRSi Reporting Results

Among Army dependents, 13 cases with a BLL higher than the CDC BLRV were reported in DRSi during CY2024 Q4 (Table 3). Due to the differences in the report date compared to the test collection date in the DRSi system, one child had a BLL test result from CY2024 Q3 reported, and the remaining 12 had test results from CY2024 Q4 reported. During CY2024, a total of 54 cases were reported in DRSi among Army dependents. Table 3 summarizes the locations of the cases.

**Table 3.** DRSi Report Location for Cases Exceeding the CDC Blood Lead Reference Value\*

Installation	CY2024 Q4	CY2024
Ft. Benning	0	1
Ft. Bliss	0	6
Ft. Bragg	4	9
Ft. Campbell	0	2
Ft. Carson	2	4
Ft. Cavazos	1	3
Ft. Drum	2	6
Ft. Eisenhower	0	1
Ft. Irwin	0	1
Ft. Johnson	0	1
Ft. Leonard Wood	0	2
Ft. Riley	1	4
Ft. Sill	0	4
JB Elmendorf-Richardson	0	1
JB Lewis-McChord	0	1
Little Rock AFB	1	1
Tripler Army Medical Center	0	2
Vicenza	0	1
Vilseck	1	1
Walter Reed	0	1
Wright-Patterson AFB	1	2
<b>Total</b>	<b>13</b>	<b>54</b>

\*Blood lead reference value (BLRV)  $\geq 3.5$   $\mu\text{g}/\text{dL}$

Note: Case counts are based on DRSi reporting date and may not reflect the counts in Table 1.

## DRSi Reporting Compliance

Ten of the 15 new cases exceeding the CDC BLRV identified in the laboratory data in CY2024 Q4 were reported to DRSi, a 67% reporting compliance. Ft. Carson and Ft. Riley each had two BLL results above 3.5  $\mu\text{g}/\text{dL}$  that were unreported during CY2024 Q4, and Ft. Leonard Wood had one unreported BLL result during CY2024 Q4.

## Public Health Nurses Program Status Report (PHN-PSR)

The results of the PHN-PSR indicated that a total of 1,130 BLL test results were reported to State and/or local authorities during CY2024 Q4 (Table 4). The PHN-PSR question related to pediatric lead is relevant for installations located in State and local jurisdictions that require reporting of all BLL test results, including those below 3.5  $\mu\text{g}/\text{dL}$  (e.g., Louisiana, New York, North Carolina). MRC-West reported the most BLL test results to state and local authorities (n=689), followed by MRC-East (n=287), MRC-Pacific (n=150), and MRC-Europe (n=4). Twenty-four (2.1%) of those results (n=1,130) indicated BLLs higher than the CDC BLRV, and Public Health Nursing managed 18 cases.

**Table 4.** Blood Lead Levels (BLL) Reported through the PHN-PSR by Medical Readiness Command and Installation, CY2024 Q4

MRC	Number of BLL tests reported to the State/local authorities	Number of eBLL tests reported to the State/local authorities	Number of eBLL cases managed by Public Health Nursing
<b>EAST</b>			
Carlisle Barracks	7	0	0
Ft. Belvoir	92	0	0
Ft. Benning	1	1	1
Ft. Bragg	3	3	1
Ft. Drum	112	2	0
Ft. Eisenhower	7	0	0
Ft. Novosel	27	0	0
JB Langley-Eustis	38	0	0
<b>WEST</b>			
Ft. Bliss	200	2	1
Ft. Carson	139	1	1
Ft. Cavazos	144	1	1
Ft. Leavenworth	15	1	0
Ft. Sill	53	6	6
JB San Antonio	126	1	1
<b>PACIFIC</b>			
JB Lewis-McChord	123	0	0
Presidio of Monterey	25	0	0
Tripler AMC/Schofield Barracks	2	2	2
<b>EUROPE</b>			
USAG Vicenza	3	3	3
Vilseck (USAG Bavaria)	1	1	1

Note: Installations that are not listed did not report BLL tests or eBLL ( $\geq 3.5$   $\mu\text{g}/\text{dL}$ ) tests.

## DISCUSSION

Less than 1% of the results of BLL tests performed in CY2024 (1 January – 31 December 2024) exceeded the CDC BLRV. Because of the lower reference value, 35 additional children with a higher BLL were identified. The number of Army dependents tested during CY2024 (n=7,954 BLL tests) increased by approximately 50% compared to the number tested in CY2023 (n=5,276 BLL tests). This increase is likely due to a more complete capture of MHS GENESIS laboratory test results.

Since there is no safe level of lead in the blood, the Army will continue its Lead Hazard Management Control Program to both prevent childhood lead exposure and monitor children with a BLL higher than 3.5  $\mu\text{g}/\text{dL}$  to ensure each case receives proper treatment and management. Reporting these cases to DRSi is an important aspect of that control and prevention program. This quarter, reporting compliance was lower, with MTFs reaching 67% reporting compliance. For comparison, the reporting compliance during the first three quarters of 2024 ranged from 67 – 85%. Reporting cases with BLLs higher than the CDC BLRV is critical to reliably identifying installations where children may be at increased risk of lead exposure. Children with a BLL that exceeds the CDC BLRV are reportable to DRSi once per calendar year. Contact the Disease Epidemiology Branch ([dha.apg.pub-health-a.mbx.disease-epidemiologyprogram13@health.mil](mailto:dha.apg.pub-health-a.mbx.disease-epidemiologyprogram13@health.mil)) for any questions regarding DRSi reporting.

## LIMITATIONS

This report may not include all Army dependent BLL test results. The DCPH-P extracted the blood lead laboratory results from MHS GENESIS one month after the end of Q4 to minimize the chance of missing any results collected during that quarter. However, it is still possible that some of the results were not certified by the laboratory and entered into MHS GENESIS at the time the DCPH-P performed the data extraction. In addition, only BLLs collected within the MHS are available through MHS GENESIS, meaning blood samples collected and tested outside the MHS are not represented in this report.

## REFERENCES

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# Appendix A

**Table A-1.** U.S. Air Force, Space Force, Navy, and Marine Corps locations where Army Dependents Received a Blood Lead Test, CY2024

USAF/Space Force Bases	Naval/Marine Corps Stations
Aviano AB	Annapolis
Barksdale AFB	Camp Lejeune
Beale AFB	Chesapeake
Davis-Monthan AFB	Dahlgren
Dover AFB	Groton
Eglin AFB	Guantanamo Bay
F.E. Warren AFB	Indian Head
Goodfellow AFB	Jacksonville
Grand Forks AFB	JB Pearl Harbor-Hickam
Hanscom AFB	Joint Region Marianas
Hill AFB	Kaneohe
Holloman AFB	New England
JB Anacostia-Bolling	Norfolk
JB Andrews	North Chicago
Keesler AFB	Okinawa
Little Rock AFB	Patuxent River
Luke AFB	Portsmouth VA
MacDill AFB	Quantico
Malmstrom AFB	San Diego
Maxwell AFB	Suffolk
McConnell AFB	Virginia Beach
Nellis AFB	Whidbey Island
Offutt AFB	
Osan AB	
Patrick SFB	
Peterson SFB	
Ramstein AB	
Robins AFB	
Scott AFB	
Shaw AFB	
Sheppard AFB	
Tinker AFB	
Travis AFB	
USAF Academy	
Vance AFB	
Vandenberg SFB	
Whiteman AFB	
Wright-Patterson AFB	