

Childhood Lead Poisoning: Blood Lead Level by Birth Cohort

Type of EPHT Indicator	Exposure
<p>Measures</p>	<ol style="list-style-type: none"> 1. Number of children born in the same year tested prior to age 36 months 2. Percent of children born in the same year tested prior to age 36 months 3. Number of children born in the same year and tested prior to age 36 months in each blood lead level (BLL) category^{1,2} 4. Percent of children born in the same year and tested prior to age 36 months in each blood lead level (BLL) category^{1,2} 5. Number of children born in the same year and tested prior to age 36 months with confirmed elevated blood lead levels (EBLLs)^{2,3} 6. Percent of children born in the same year and tested prior to age 36 months with confirmed elevated blood lead levels (EBLLs)^{2,3} <p>¹ BLL categories (in units of µg/dL) are <10, 10-14, 15-19, 20-24, 25-44, 45-69, and ≥ 70. An additional category for unconfirmed elevated single capillary or unknown specimen tests is used to calculate the total number of children tested. Any test result given in tenths or hundredths should be rounded to the nearest whole number (e.g., round 0.5 to 1).</p> <p>² Details about selecting the appropriate test to classify a child are in the "How-To-Guide for Creating CLP-1 and CLP-2 datasets."</p> <p>³ A BLL is considered elevated if the laboratory result is > 10 µg/dL. An elevated BLL is confirmed if there is either: (1) one elevated venous test or (2) two elevated capillary and/or unknown tests <12 weeks apart.</p>
<p>Derivation of measure</p>	<ul style="list-style-type: none"> • Select children's records from childhood lead poisoning database. • Classify test results. • Aggregate by residential 5-digit ZIP code and birth cohort, or county of residence and birth cohort. • Merge with total number of births by ZIP code or county to obtain the denominator. <ol style="list-style-type: none"> 1. Number of children born in the same year tested prior to age 36 months <ul style="list-style-type: none"> ○ Sum all BLL categories including the unconfirmed elevated 2. Percent of children born in the same year tested prior to age 36 months <ul style="list-style-type: none"> ○ Divide number of children tested by the total number of children in the birth cohort 3. Number of children born in the same year and tested prior to age 36 months in each blood lead level (BLL) category^{1,2} <ul style="list-style-type: none"> ○ Number of children by BLL category 4. Percent of children born in the same year and tested prior to age 36 months in each blood lead level (BLL) category^{1,2} <ul style="list-style-type: none"> ○ Divide number of children for each BLL category by

	<p>the total number of children tested and multiply by 100</p> <ol style="list-style-type: none"> 5. Number of children born in the same year and tested prior to age 36 months with confirmed elevated blood lead levels (EBLLs)^{2,3} <ul style="list-style-type: none"> ○ Sum number of children in BLL categories > 10 µg/dL (BLLs10_14,...,BLLs70), excluding unconfirmed elevated 6. Percent of children born in the same year and tested prior to age 36 months with confirmed elevated blood lead levels (EBLLs)^{2,3} <ul style="list-style-type: none"> ○ Divide number of children tested with EBLLs by the total number of children tested and multiply by 100
Unit	Number and percent
Geographic Scope	Iowa
Geographic Scale	State and County
Time Period	2000 and later
Time Scale	3 years
Rationale	<p>Elevated blood lead levels in young children have been associated with adverse health effects ranging from learning impairment and behavioral problems to death. Because children may have elevated BLLs and not have any specific symptoms, CDC recommends blood lead testing for young children at risk for lead poisoning. The risk factors identified by the National Health and Nutrition Examination Surveys (NHANES) include living in housing built before 1950, especially housing in deteriorating condition, being African American, and living in poverty.</p> <p>Many states have adopted a targeted testing strategy (i.e., test children at high risk), whereas some states recommend universal testing (i.e., test all children). For both universal and targeted testing strategies, children should be tested at least once before the age of 3 years. Some states require more than one test between the ages of 6 and 36 months.</p> <p>The BLL at which CDC recommends public health actions be initiated is > 10 µg/dL. Many states initiate follow-up testing at BLLs > 10 µg/dL and environmental investigations at either BLLs > 20 µg/dL or persistent BLL results that are 15-19 µg/dL. Chelation therapy is recommended for children with BLLs > 45 µg/dL. BLL results \geq 70 µg/dL represent a medical emergency.</p> <p>This indicator uses a birth cohort approach. Using these measures, it is possible to determine how many children born in a specific year were tested before the age of 36 months and how many had an elevated BLL. For children with more than one test before the age of 36 months, this indicator uses (1) the highest venous specimen results or (2) the results from a confirmatory test to classify the child's BLL. Using the highest results allows for examination of the peak BLLs for the birth cohort (up to age 3). Inclusion of multiple cohorts will allow for the evaluation of trends in testing and elevated BLLs.</p>
Use of the Measure	<ul style="list-style-type: none"> • To identify and monitor temporal and spatial changes in BLL testing, risk factors, and EBLLs. • To better understand BLL surveillance data when interpreting

	<p>number of EBLLs.</p> <ul style="list-style-type: none"> • To compare BLLs (when applicable) within and across states for the purpose of targeting interventions • To link data on risk factors and compare risk factors within and across states. • To guide interventions and allocation of resources related to BLL testing and prevention of EBLLs in children. • To develop and support public health policy and legislation related to BLL testing and prevention of childhood lead poisoning. • To monitor progress towards eliminating BLLs > 10 µg/dL
<p>Limitations of the Measure</p>	<ul style="list-style-type: none"> • The analysis uses the ZIP code and county of the child's residence at the time of the test, which may be different from the ZIP code and county where the child was exposed to lead. • There are limitations when using ZIP code as the geographic scale: <ul style="list-style-type: none"> ○ A ZIP code is not homogenous with respect to the distribution of lead hazards or risk factors for lead exposure. ○ The number of children in a ZIP code may be small, especially in rural areas, which may require procedures to preserve confidentiality and to stabilize the estimated measures. • Counties are not homogenous with respect to the distribution of lead hazards or risk factors for lead exposure. • Number and percent of EBLLs cannot be interpreted as prevalence or incidence for the population. • State to state comparisons must be made cautiously and require additional information about the states' testing practices, confirmatory testing practices, and reporting laws. • Because the capillary test is subject to contamination it can result in a false positive EBLL. The number and percent of EBLLs may be overestimated when non-venous test results are used.
<p>Data Source</p>	<p>Childhood Blood Lead Surveillance Data Vital Statistics Birth Data</p>
<p>Limitations of the Data Source</p>	<p>Childhood Blood Lead Surveillance Data</p> <ul style="list-style-type: none"> • Surveillance data are not randomly sampled or representative of the population. • Complete residential addresses are not available for all children tested. • Sometimes the address of the clinic is incorrectly listed as the child's address. <p>Vital Statistics Birth Data</p> <ul style="list-style-type: none"> • The number of children born from Vital Statistics does not include children who have moved in or out of the area since birth. Therefore, as a denominator, it may under or over estimate the number of 3 year old children in the area.