

# LEAD POISONING BURDEN AND SCREENING CHILDREN UNDER SIX, TENNESSEE, 2011 – 2020

Tennessee Childhood Lead Poisoning Prevention Program

## Summary:

In the past decade Tennessee has seen a significant increase in lead screening and reduction in the burden of lead poisoning among children under six years of age. The aggregate screening rate increased from 59% in 2011–2015 to 66% in 2016–2020. The annual rate of elevated blood lead levels (EBLL, i.e., blood lead level  $\geq 5 \mu\text{g}/\text{dL}$ ) dropped from 4% in 2011 to 1.1% in 2020, the lowest in a decade. While there is **no** safe blood lead level<sup>†</sup> this decline is certainly encouraging. Children living in non-urban areas were more likely to receive lead screening and to have EBLL compared to their urban counterparts.

## Definitions/Methods:

- Annual screening rate: Number of children screened for blood lead in a year divided by the under six population.
- Aggregate screening rate: Number of children who had at least one blood lead test prior to age six divided by the under six population estimate for the last year in the aggregate time interval.
- EBLL: A single blood lead test (capillary or venous)  $\geq 5 \mu\text{g}/\text{dL}$ . Children with a confirmed history of EBLL are not included in yearly totals after the year of confirmation.
- EBLL rate: Number of unique children with a blood lead test result  $\geq 5 \mu\text{g}/\text{dL}$  divided by the total number of children screened for lead. Children with a confirmed history of EBLL are excluded.
- Deduplication methodology:
  - Annual screening: Each child’s first elevated result was kept. If multiple results were collected on the same date, the lowest elevated result was kept. If a child had no elevated results, the lowest result collected on the first date was kept. Annual totals include one test per child and exclude children with a confirmed EBLL in prior years.
  - Five-year aggregated screening: Same procedure as the annual screening except the time period is expanded to five years.

Fig. 1 Annual Blood Lead Screening Among Children Under Age 6, Tennessee, 2011–2020

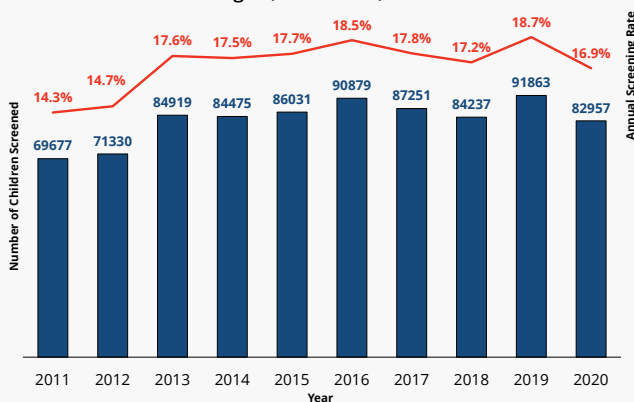


Fig. 2 Blood Lead Burden Among Screened Children Under 6 Years of Age, Tennessee, 2011-2020

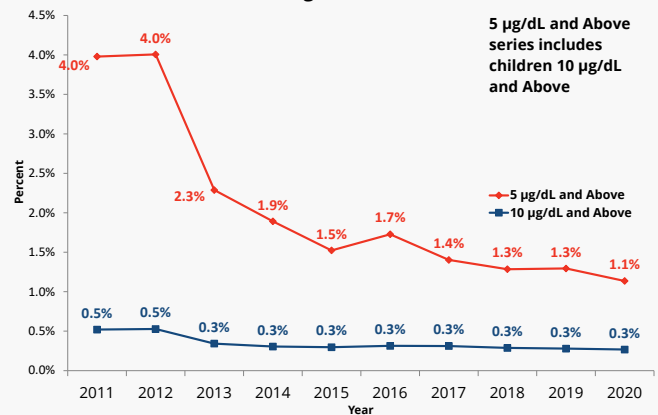
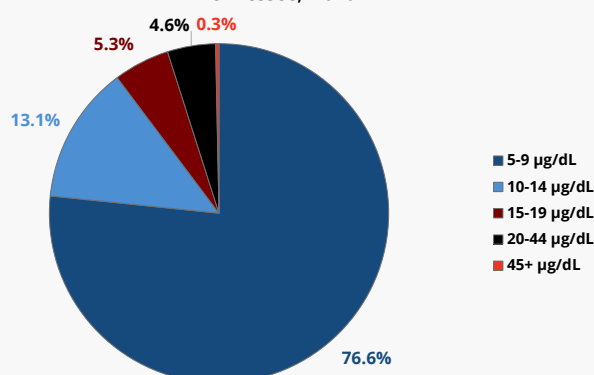


Fig. 3 Children Under 6 with EBLL by Blood Lead Level, Tennessee, 2020

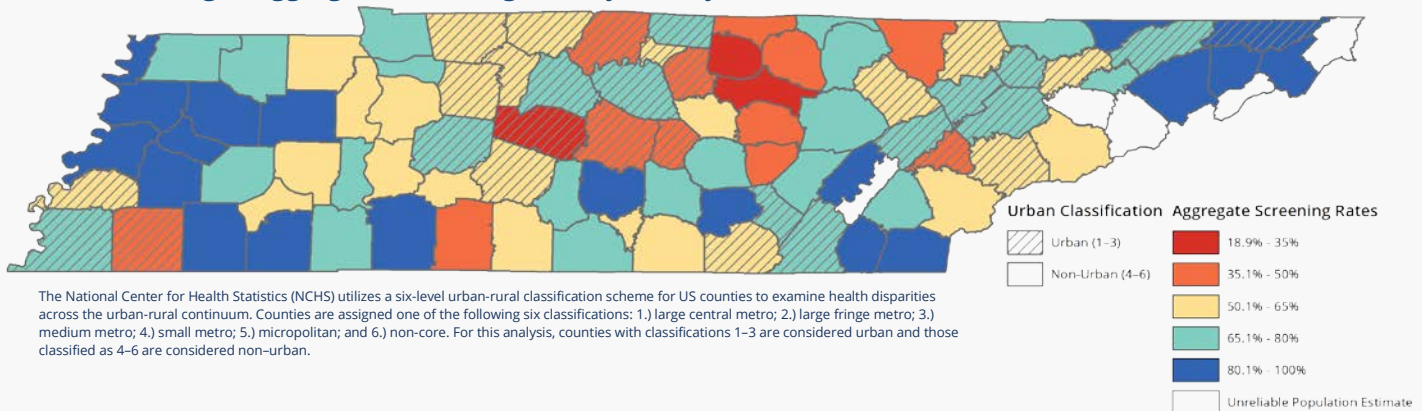


- In 2019, TN screening total and rate were the highest in the period from 2011-2020 (Fig. 1).
- The annual screening rate decreased by nearly 10% from 2019 to 2020 (Fig. 1) due to the COVID-19 pandemic.
- The rate of EBLL  $\geq 5 \mu\text{g}/\text{dL}$  decreased sharply over time and reached a low of 1.1% in 2020.
- The rate of EBLL  $\geq 10 \mu\text{g}/\text{dL}$  remained 0.3% for the 8<sup>th</sup> consecutive year in 2020 (Fig. 2).
- In 2020, about three in four (76.6%) children with EBLL had blood lead levels between 5 and 9 µg/dL. 95% of children with EBLL had blood lead levels below 20 µg/dL (Fig. 3).

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Fig. 4 Aggregate Screening Rate by County, Tennessee, 2016-2020



The National Center for Health Statistics (NCHS) utilizes a six-level urban-rural classification scheme for US counties to examine health disparities across the urban-rural continuum. Counties are assigned one of the following six classifications: 1.) large central metro; 2.) large fringe metro; 3.) medium metro; 4.) small metro; 5.) micropolitan; and 6.) non-core. For this analysis, counties with classifications 1-3 are considered urban and those classified as 4-6 are considered non-urban.

Fig. 5 Population Under Six by Residency Location

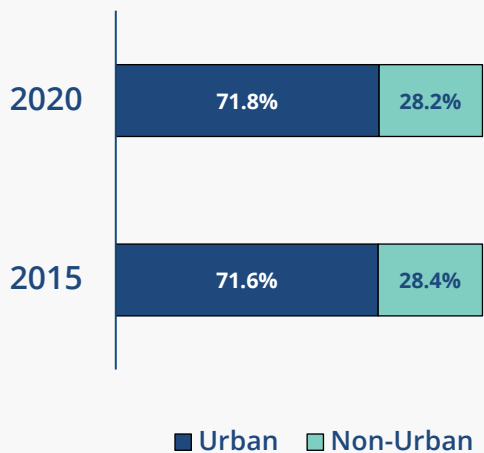


Fig. 6 Aggregate Screening Rates by Residency Location and Time Period

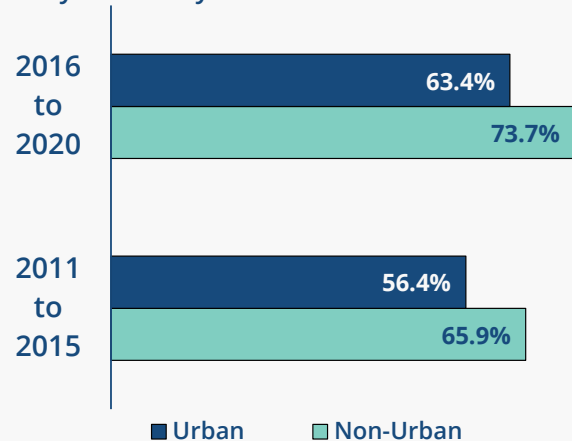
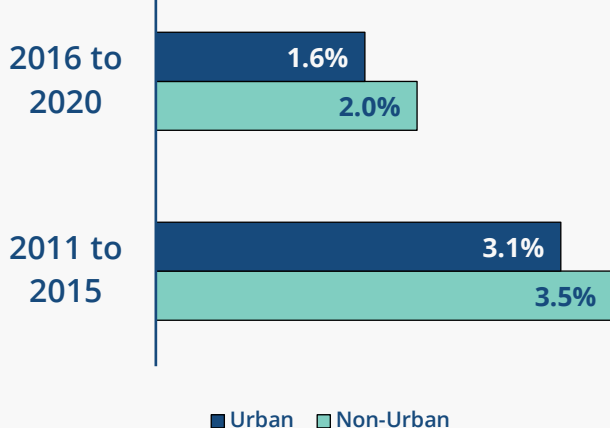


Fig. 7 EBLR Rates by Residency Location and Time Period



- Nearly 72% of TN children under age six reside in urban counties (Fig. 5).
- Over both 2011–2015 and 2016–2020 periods, children in non-urban areas had higher aggregate screening rates when compared to urban children. Differences were statistically significant\* over both periods (Fig. 6).
- Over both periods, children in non-urban areas had higher EBLR rates than their urban counterparts. Differences were statistically significant\* over both periods (Fig. 7).
- During 2016–2020, non-urban children were 42% more likely to receive lead screening and were 16% more likely to have EBLR.

**Data Sources:**

Lead Screening Data: LeadTRK. Division of Family Health and Wellness, Tennessee Department of Health. Data updated on July 30, 2021.  
Statewide and county level population: Division of Vital Records and Vital Statistics, Tennessee Department of Health.

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\*The Centers for Disease Control and Prevention (CDC), Childhood Lead Poisoning Prevention. <https://www.cdc.gov/nceh/lead/prevention/default.htm>.

\*Chi-square test was performed on screening and EBLR rates for urban and non-urban resident locations stratified by time interval and the significance level was set at 0.05.