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Blood Lead Levels in Children Under Six Years Old — Nebraska, 2019-2023

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Background

Childhood lead poisoning is a major public health issue and poses a significant threat to children in Nebraska. Despite substantial progress since 1970 in reducing lead exposures in children, exposure risks still exist. Lead is a toxic metal that can be found throughout a child's environment. Lead exposure can come from various sources, including but not limited to lead-contaminated paint and dust, soil, and consumer products (1). Lead exposure in children can cause learning, behavioral, and health problems. Lead detected in blood has been shown to affect children's school performance, ability to pay attention, and IQ. Fortunately, the harmful effects of childhood lead exposure can be prevented (2).

Methods

Blood lead testing data were obtained from the Nebraska Department of Health and Human Services Childhood Lead Poisoning Prevention Program Blood Lead Surveillance System. Population data were obtained from the U.S. Census Bureau Annual Population Estimates. Blood lead tests among children less than six years old and collected during 2019 and 2023 were identified. Tests were deduplicated so that only one test per child per year was included. Age-specific testing rates were calculated by dividing the number of children tested per age group by the population of children within that age group.

A case of elevated blood lead is defined as a child with a blood lead level (BLL) at or above the blood lead reference value. The reference value was 5.0 micrograms per deciliter (µg/dL) from 2012 to 2021 and was lowered to 3.5µg/dL in 2022. A suspect case is defined as a child with BLL at or above reference value from a capillary or unknown blood sample. A confirmed case is defined as any child with BLL at or above reference value from a confirmatory venous sample or two capillary/unknown samples within 12 weeks.

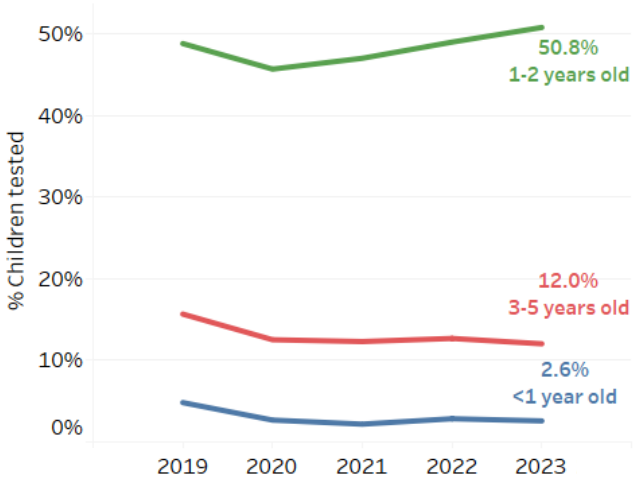
Results

In 2023, 34,669 children under age six (23.2%) received at least one blood lead test, representing a slight increase from the previous year (Figure 1). Age-specific blood lead testing rates demonstrate that approximately half (50.8%, n = 24,807) of all one- and two-year-old children in Nebraska received a blood lead test in 2023. The testing rate was 12% (n = 9,234) for children aged 3–5 years and 2.6% (n = 628) for children aged <1 year (Figure 2).

Figure 1: Children under 6 years tested for blood lead, Nebraska, 2019-2023

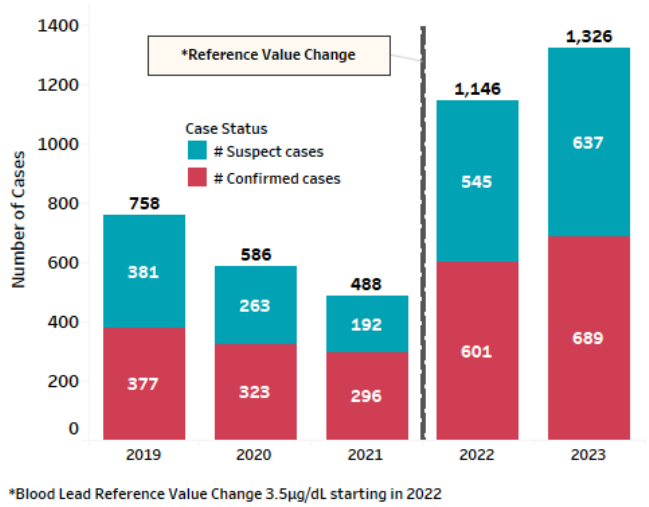
Year	# of Children Tested	Population	% of Children Tested
2019	39,174	157,848	24.8%
2020	33,755	157,283	21.5%
2021	33,503	154,092	21.7%
2022	34,358	151,166	22.7%
2023	34,669	149,684	23.2%

Figure 2: Annual blood lead testing rates for children under 6 years old, by age group, Nebraska, 2019–2023



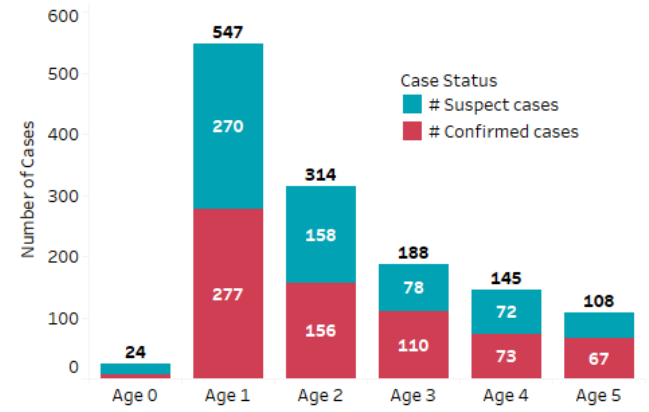
Among the 34,669 children under the age of six in Nebraska tested in 2023, 1,326 (3.8%) had a blood lead level at or above the reference value of 3.5 µg/dL. Of these, 689 (2.0%) were confirmed cases, while 637 (1.8%) were classified as suspect cases (Figure 3). As Figure 4 shows, out of 1,326 cases in 2023, most blood lead cases occurred among children aged one (n = 547 or 41.3%) and two years (n = 314 or 23.7%).

Figure 3: Blood lead cases among children under 6 years old tested for lead, by case status, Nebraska, 2019-2023



*Blood Lead Reference Value Change 3.5µg/dL starting in 2022

Figure 4: Blood lead cases among children under 6 years old tested for lead, by single age, Nebraska, 2023



Discussion

A blood lead level test is the best way to know if a child is exposed to lead. The percentage of children tested for lead exposure declined in 2020 and 2021 but increased in 2022 and 2023 (Figure 1). The decline in children tested in 2020 and 2021 is likely attributed to disruptions in routine health services during the COVID-19 pandemic.

Approximately half of children aged one–two years old had a blood lead test in 2023 (Figure 2). Children should be tested at age one and two years if they are enrolled in Medicaid, live in a high-risk zip code, or have any other exposure risk identified on a risk questionnaire (e.g. live in house built before 1950). Strengthening efforts to increase testing rates among children aged one and two will help to identify children with lead poisoning.

Some children older than two years may also need a test if they were not tested at a younger age or if they have other risk factors like living in an older house (built prior to 1978). Testing rates were only 12% among two–five-year-olds and declined over the five-year period. Lower testing rates in this age group could result in missed cases of lead poisoning for at risk children.

Figure 3 depicts trends of elevated blood lead cases since 2019. Despite progress in reducing lead exposures in children, more than 1,000 children still have blood lead levels higher than the reference value. The number of blood lead cases more than doubled in 2022 and 2023 compared to previous years. This increase is due to the new CDC blood lead reference value of 3.5 µg/dL.

Most of the elevated blood lead cases occurred among children aged one and two. According to the CDC, children under age six, especially those under age two, are at highest risk due to their rapidly growing bodies and hand-to-mouth activity (2).

Lead exposure in children often occurs with no symptoms but can seriously impact a child's health, growth, and development. Because there is no known safe level of blood lead, it is important to prevent children and pregnant women from being exposed to lead, because the neurological and behavioral effects of lead are believed to be irreversible. Blood lead testing is a critical prevention step because it can detect lead poisoning and initiate case management and environmental interventions to lower blood lead levels. A new DHHS resource Does My Child Need a Blood Lead Test website shows the blood lead testing recommendations for areas of the state with higher case rates of lead poisoning by zip code. Parents and caregivers can help prevent lead poisoning by keeping their children away from chipping and peeling paint, routinely cleaning floors and windowsills to remove lead dust, encouraging frequent handwashing, and avoiding products known to be contaminated with lead.

For more resources about lead poisoning prevention, visit the DHHS Lead Website at https://dhhs.ne.gov/lead.

References

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