
**Report to
The Vermont Legislature**

**Lead Poisoning Prevention:
Report on 2022 Program Outcomes and Activities**

In Accordance with 18 V.S.A. § 1756

Submitted to: Vermont General Assembly

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Lead Poisoning Prevention: Report on 2022 Program Outcomes and Activities

Executive Summary

This annual report on the status of childhood lead poisoning prevention is submitted pursuant to 18 V.S.A. § 1756.

The mission of the Vermont Department of Health's Healthy Homes Lead Poisoning Prevention Program (Program) is to improve the health and safety of all Vermont home environments through surveillance, collaboration, education, and implementation of comprehensive policies and coordinated programmatic activities. The Program conducts a variety of lead education and outreach activities that are intended for multiple audiences and designed to prevent lead poisoning, encourage lead screening of 1- and 2-year-olds, and support case management for children with elevated blood lead levels. Vermont defines an elevated blood lead level as any detected and reported level of lead in the body. Previous legislative reports used the definition as 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) and greater and therefore, caution is urged when comparing data in this report with previous reports.

Vermont's progress increasing the percentage of children tested each year has been mixed. After sharp declines in 2020 and 2021 among 1- and 2-year-olds due to the COVID-19 pandemic and a LeadCare II analyzer test kit recall, the percentages of both 1- and 2-year-olds tested increased in 2022. The percentage of 1-year-olds tested increased from 69.1% in 2021 to 72.5% in 2022. The percentage of 2-year-olds tested increased from 61.5% in 2021 to 64.1% in 2022. Testing rates are still lower than pre-pandemic rates.

Lead was detected in 1,561 Vermont children under the age of 6, and about half of those (752) had levels greater than or equal to 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$). Among 1-year-olds, 18.8% (764) had some lead detected in their blood. There were 370 (9.1%) 1-year-olds with blood lead levels greater than or equal to 3.5 $\mu\text{g}/\text{dL}$ and 180 (4.4%) of those had levels greater than or equal to 5 $\mu\text{g}/\text{dL}$. Among 2-year-olds, 17.3% (639) had some lead detected in their blood. There were 304 (8.2%) 2-year-olds who had blood lead levels greater than or equal to 3.5 $\mu\text{g}/\text{dL}$ and 143 (3.9%) of those had levels greater than or equal to 5 $\mu\text{g}/\text{dL}$.

In 2023, the Program has prioritized the following activities: continue work with the U.S. Department of Housing and Urban Development (HUD)-funded partners to reduce lead hazards in the homes of lower-income families; increase Vermont lead law compliance among rental property owners; work with Vermont Child Health Improvement Program (VCHIP) to improve screening rates among health care professionals; and conduct educational outreach to parents of young children, emphasizing the importance of lead screening.

Table of Contents

Introduction	4
Measuring Progress	4
Barriers to Universal Screening.....	8
2022 Education and Outreach Activities	9
Planned Activities and Recommendations.....	10
Estimates of Public and Private Costs	12
Appendix: Statute	12

Lead Poisoning Prevention: Report on 2022 Program Outcomes and Activities

Introduction

The Vermont Department of Health submits this report on the status of childhood lead poisoning prevention efforts in 2022 pursuant to 18 VSA § 1756. This annual report documents the Department's efforts over the past year to prevent lead poisoning in young children. It presents the latest data on the number and percentage of Vermont children younger than 6 years old who have been tested for lead, with a particular focus on 1- and 2-year-olds. Historical data on screening rates are also presented. In addition, the report describes 2022 outreach and educational activities intended to improve screening rates and provide estimates of the annual public and private costs incurred in 2022 to prevent lead poisoning.

In 2022, the Healthy Homes Lead Poisoning Prevention Program (Program) continued the cooperative agreement with the Centers for Disease Control and Prevention (CDC) for lead poisoning prevention. This funding supports the Program's efforts to improve the health and safety of all Vermont home environments through surveillance, collaboration, education, and implementation of comprehensive policies and coordinated programmatic activities.

Measuring Progress

Testing young children for lead in blood is a critical step in the process of reducing the incidence of elevated blood lead levels. Generally, a child's exposure to lead can easily be identified through testing and appropriate interventions can be initiated to prevent further exposure to this harmful toxicant. In addition, testing helps inform the development of lead poisoning prevention policies by giving the Department the opportunity to track statewide trends in childhood exposure to lead. The Program's goal of universal testing of 1- and 2-year-olds in Vermont is required per 18 V.S.A. § 1755.

This year, the Program updated Vermont's pediatric blood lead testing and treatment guidelines to be in line with the State's current definition of an elevated blood lead level. Since July 2022, *any* detected and reported level of lead in a child is monitored by their healthcare professional, and the Program contacts the family to offer prevention education. Lowering the level means that more children can be identified as having lead exposure, allowing parents, doctors, public health officials, and communities to act earlier to reduce the child's future exposure to lead.

Table 1 presents 2022 data on the number of young children who were tested for lead and the results of those screenings.

Table 1
Blood Lead Tests and Results for Vermont Children ages 0 – 5 years, 2022*

Age	Population	# of Tests	% Tested	No Lead Detected	≤3.4 µg/dL	3.5 to 4.9 µg/dL	≥5 µg/dL
Under 1	5,394	50	0.9%	40 (80.0%)	8 (16.0%)	*	*
1	5,596	4,056	72.5%	3,292 (81.2%)	394 (9.7%)	190 (4.7%)	180 (4.4%)
2	5,766	3,695	64.1%	3,056 (82.7%)	335 (9.1%)	161 4.4%	143 (3.9%)
3	5,903	334	5.7%	258 (77.2%)	34 (10.2%)	22 (6.6%)	20 (6.0%)
4	6,104	113	1.9%	79 (69.9%)	20 (17.7%)	*	*
5	6,270	93	1.5%	55 (59.1%)	18 (19.4%)	8 (8.6%)	12 (12.9%)
Total	35,033	8,341	23.8%	6,780 (81.3%)	809 (9.7%)	386 (4.6%)	366 (4.4%)

Notes:

* Indicates fewer than five cases in a category that year. A cell may also be suppressed when row and column totals are provided to prevent the computation of the cell with fewer than five cases. Suppression of small numbers insures confidentiality and data reliability.

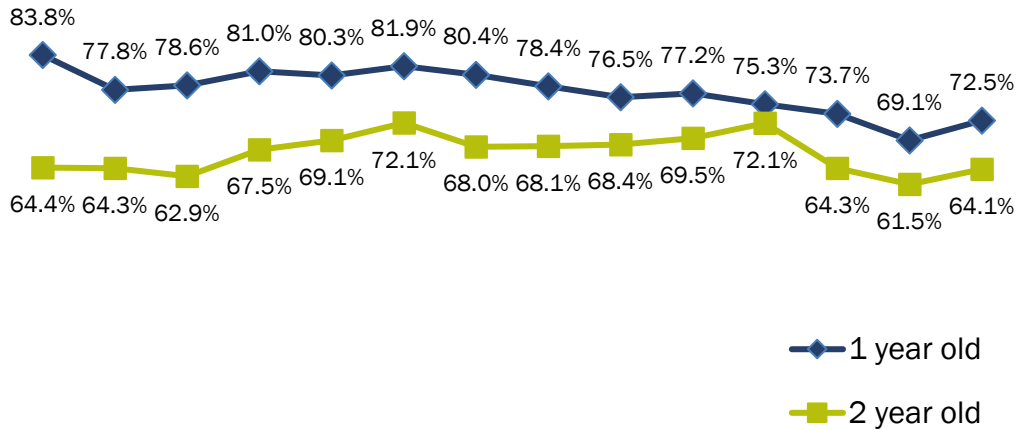
Ages: < 1 year: <11 months, 1 year: 11-22.99 months, 2 years: 23-34.99 months, 3 years: 35-46.99 months, 4 years: 47-58.99 months, 5 years: 59-70.99 months.

Population is the average of census estimates or counts from the three previous years of data available (2019,2020,2021).

Data include one blood lead test per child by age: the highest venous test result or if there is no venous test, then the capillary test result. This may result in a child having two tests per calendar year. For example, a child may be born in December 2020, have their 1-year old test in January 2022, and then have their 2-year old test in December 2022.

Figure 1

Percent of 1 and 2 year-old Vermont children tested for lead



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

Figure 1 shows the percentages of 1- and 2-year-olds tested from 2009 to 2022. After sharp declines in 2020 and 2021 among 1- and 2-year-olds due to the COVID-19 pandemic and a LeadCare II analyzer test kit recall, the percentages of both 1- and 2-year-olds tested increased in 2022. The percentage of 1-year-olds tested significantly increased from 69.1%, 95% confidence interval (CI) [67.9,70.3] in 2021 to 72.5%, 95% CI [71.3,73.6] in 2022. The percentage of 2-year-olds tested significantly increased from 62%, 95% CI [60.2,62.7] in 2021 to 64%, 95% CI [62.8,65.3] in 2022. Testing rates are still lower than pre-pandemic rates.

Figure 2

Blood lead levels among Vermont children ages 1 and 2

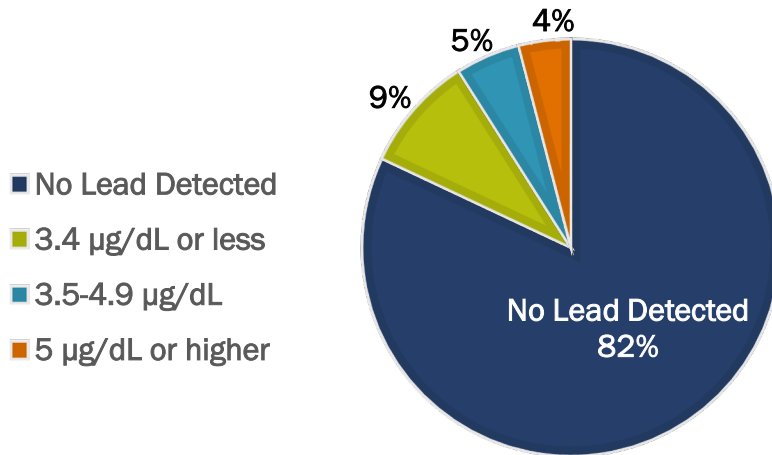


Figure 2 shows the breakdown of blood lead levels of 1- and 2-year-olds combined. Overall, 1403 (18%) had some level of lead detected in their body.

Figure 3

Vermont children ages 1 and 2 with a blood lead level $\geq 5\mu\text{g}/\text{dL}$

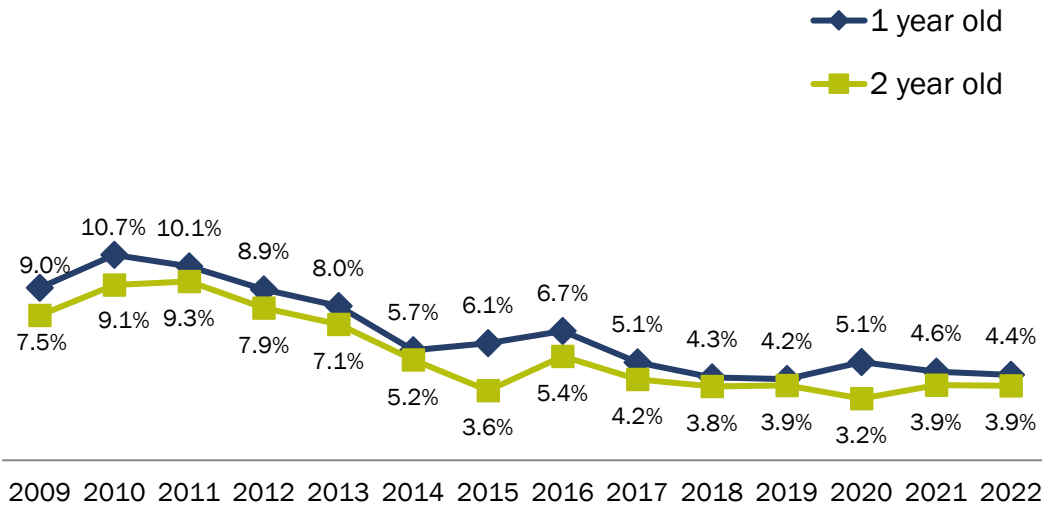


Figure 3 shows the percentage of Vermont 1- and 2-year-olds tested who had blood lead levels greater than or equal to 5 $\mu\text{g}/\text{dL}$ (the previous definition of elevated blood lead level) during the period from 2009 through 2022. There was a decrease in the percentage of 1- and 2-year-olds who had blood lead levels greater than or equal to 5 $\mu\text{g}/\text{dL}$ from 2009 to 2018. Since 2018, the percentage has been fairly consistent. Future legislative reports will transition to presenting the percent of 1 and 2 year olds with any detected and reported level of lead in the body.

Barriers to Universal Screening

Lead screening of 1- and 2-year-olds is a nationally recognized standard of pediatric care, and Vermont’s universal testing requirement is consistent with this standard. There are no immediate signs or symptoms of lead poisoning, so testing is the only way to know if a child has been exposed to lead.

In 2019, the Vermont Child Health Improvement Program (VCHIP), in partnership with the Program, surveyed health care professionals in Vermont to understand the barriers to universal blood lead screening. Unfortunately, the response was poor. VCHIP is now reaching out directly to practices with low screening rates to offer peer-to-peer support and solutions to practices with low testing rates.

Barriers to testing in 2022 are similar to those in 2021. The recall of the test kits for the in-office point of care analyzer was not resolved until Spring of 2022 and left some practices reluctant to start using the LeadCare II analyzer again. Some practices sent families for a venous blood draw

at a local hospital laboratory, requiring an extra trip which can be a deterrent to timely lead testing. In some cases, practices identified as having low screening rates are indeed screening for lead but not sending those results to the Program in a timely manner. The Program is working with practices to ensure that these barriers are addressed.

Another barrier to lead testing was the absence of in-person WIC clinics. Vermont's local health offices continued to operate WIC clinics virtually in 2022. Local health offices were therefore not able to provide back-up lead screening for children not tested by their health care professionals. The USDA waiver that allows WIC to provide remote services will expire in August 2023, and we anticipate WIC clinics will resume back-up lead testing as capacity allows.

2022 Education and Outreach Activities

Outreach and support for health care professionals and education to the public is an integral part of the Program's work. The Program conducts a variety of lead education and outreach activities intended for families with young children and healthcare providers and designed to prevent lead poisoning, encourage lead screening of 1- and 2-year-olds, and support case management for children with high blood lead levels. Listed below is a sample of activities organized by the Program in 2022.

Programmatic Activities and Outreach

- Conducted *How Would You Know?* digital campaign July 11, 2022 to August 21, 2022 targeting parents of 1- and 2-year-old children resulting in approximately 1.8 million impressions, over 7,000 clicks and video views, and over 2700 visits to our webpage.
- Conducted limited outreach during Lead Poisoning Prevention Week (October 23-29, 2022) using the *How Would You Know?* campaign materials and Halloween-themed poster and video on our social media channels.
- Referred families to HUD-funded partners (Vermont Housing Conservation Board and Burlington Lead Program) to reduce lead hazards in the homes of lower-income families.

Targeted Education

- Called, texted or emailed 311 families with children who had any venous detected level of lead providing lead poisoning prevention education materials.
- Provided 95 environmental investigations, educational home visits and follow-ups for families of children with venous blood lead levels of 5 µg/dL or greater.
- Mailed 9,829 postcards to families with 10-month-old children and 22-month-old children who were born in Vermont reminding them to have their children tested for lead.
- Mailed 929 packets to families whose children had any detected capillary blood lead level that included educational materials and follow-up testing recommendations.

Screening Outreach

- Continued a project in partnership with the VCHIP to offer peer-to-peer support and solutions to practices with low testing rates. The goals of the project are to promote proper adherence to the blood lead screening guidelines, help practices achieve high screening rates, and improve reporting rates of lead screening results.
 - Provided outreach to family and pediatric practices promoting adherence to screening guidelines and addressing barriers to universal screening.
 - Presented lead screening information to medical providers during CHAMP call and hosted a table to distribute information about lead screening at the annual CHAMP in person learning session.
 - Leveraged relationships with Building Bright Futures, Bi-State Primary Care Association, Blueprint Quality Improvement Facilitators and Maternal and Child Health Coordinators (MCHCs) to discuss declining lead screening rates and to support outreach to practices.
- Continued to work with the Vermont Chapter of American Academy of Pediatrics under a grant to provide the purchase of LeadCare II machines for selected pediatric and family practices. In 2022, 13 LeadCare II machines were ordered enabling more practices to provide families with blood lead results during their child's well child visit.
- Since March 2020, Vermont's local health offices operated WIC clinics virtually, and therefore no longer provided a back-up testing option (to that offered by pediatricians) at 18- and 30-month WIC appointments. They do, however, remind parents to get their children tested for lead. The USDA waiver that allows WIC to provide remote services will expire in August 2023, and we anticipate WIC clinics will resume back-up lead testing as capacity allows.

Planned Activities and Recommendations

In 2023, the Program will continue with efforts to reduce lead poisoning by making homes safer for children and increasing blood lead testing rates for 1- and 2-year-olds. This will be achieved through educating parents, providing technical assistance to health care professionals, and enforcing the lead testing rules.

Specific activities for the Program in 2023 to increase screening rates include:

- Continue to send reminder postcards with lead testing information to all families whose children were born in Vermont and are ages 10 and 22 months.
- Summer 2023, interview a sample of the ~3,000 families with children ages 2-6 years old who have never had a lead test to explore the reasons their child did not get tested for lead. Families will be encouraged to test their child and information gathered from the interviews will be used to address barriers to lead testing.

For example, if parents respond that their child was not tested for lead because:

- their only testing option was a venous draw at the local hospital, we will work with those medical practices on how to conduct in office capillary draws and use of the VT Public Health Laboratory for free supplies and lead analysis.
- they are considered low risk due to living in a post 1978 home (or other reasons) we will highlight the importance of universal testing and strengthen our existing *How Would You Know?* campaign

- their child's healthcare professional did not mention it, we will focus our efforts on educating those medical practices about the lead law and importance of universal testing.

Strategies will be evaluated to ensure our efforts are making a difference and increasing lead testing rates.

- Vermont Child Health improvement Project (VCHIP) will be provided a list of practices with poor testing rates (e.g., more than 40 percent of 1- and 2-year-olds overdue for lead screening) to contact. Practices that have fully engaged in ongoing discussions with VCHIP have shown improvement in screening rates. Practices that refuse to engage (as defined as failure to respond to 3 consecutive phone calls) will be contacted by Vermont Health Commissioner, Dr. Levine, with a request for the practice to meet with HHLPPP.
- Fall 2023, create and disseminate annual practice reports on blood lead testing for all medical practices in Vermont who have 20 or more 1- and 2-year-old patients. Practices will be reminded of the law and VCHIP will use the practice reports to initiate more specific individualized discussions with medical practices that have more than 40% of kids overdue.
- Explore adding when a lead test is needed to the Immunization Forecaster tool in the Immunization Registry. Many healthcare practitioners use this tool to keep track of when immunizations are needed.
- Continue to work with Lead Care II users to improve the accuracy and timeliness of lead test reporting.
- Support WIC as they transition back to in-person visits and resume back-up lead testing as capacity allows.

General activities for the Program in 2023 include:

- Continue to provide outreach, conduct environmental investigations, and provide case management to families with children that have confirmed elevated blood lead levels.
- Compile a comprehensive data report with lead poisoning, screening, case management, and housing information that includes geographic information system (GIS) maps featuring areas of elevated blood lead levels, older housing stock, and low-income status
- Continue to collaborate with the Department's Asbestos and Lead Regulatory Program to educate rental property owners and childcare facilities on the requirements of the Vermont regulations pertaining to lead exposure.
- Maintain and expand partnerships with internal and external partners, such as:
 - Vermont Housing and Conservation Board
 - Burlington Lead Program
 - Vermont Child Health Improvement Program
 - Environmental Public Health Tracking Program
 - Asthma Program
 - Asbestos and Lead Regulatory Program
 - WIC

Estimates of Public and Private Costs

In the public sector, the Program expended an estimated \$455,994 in fiscal year 2022. The Vermont Housing and Conservation Board expended \$946,714 from HUD for lead poisoning prevention, and the Burlington Lead Program spent an estimated \$960,916 in HUD Lead Hazard Control funds. Combined, these organizations spent an estimated \$2,363,625 to reduce lead poisoning in 2022. This amount is up from 2021 and 2020 (\$1,678,529 and \$1,661,971, respectively), but lower than pre-pandemic spending in 2019 (\$2,528,442).

A study completed by Dartmouth College as part of the *Get the Lead Out of Vermont* Task Force Report in 2006 estimated direct health care costs of all children with elevated blood lead levels at \$51,814 per year and special education costs at \$219,841 per year (considered to be an underestimate because they were calculated only for those children with blood lead levels 25 µg/dL or greater).¹ The report also estimated lost future earnings at more than \$79 million per year for Vermont children (calculated in 2006 and for children with blood lead levels 5 µg/dL or greater). Screening costs incurred by families, insurers, and health care professionals are not represented in these cost estimates.

Another study on the social and economic benefits of lead hazard control estimated a return of \$17 to \$221 for every dollar spent on lead hazard control.² This would suggest that for the \$2,363,625 spent in 2022 on reducing lead hazards and preventing poisoning, the State of Vermont could see a return on investment (ROI) of between \$40,181,622 to \$522,361,081. This estimate takes into account the costs of lead hazard control, reduced health care costs, lifetime earnings, tax revenue, special education costs, behavioral disorders, and crime.

The Pew Center on the States released an issue brief, *Cutting Lead Poisoning and Public Costs*, in 2010.³ Their research indicated that despite dramatic improvements over the past 30 years, lead poisoning remains a serious hazard for hundreds of thousands of young children in the United States. They concluded that returns on large-scale lead abatement efforts would yield at least \$17 for each dollar invested, which translates to a net benefit of \$181 to \$269 billion. These benefits would be observed in reduced health care utilization, reduced IQ loss, decreased special education needs, higher earnings, and fewer behavior problems and crime.

¹Carlson, C., Y. Feng, D. McClurg, and J. Trummel. "The Costs of Lead Poisoning in Vermont." Dartmouth Center for Evaluative Clinical Sciences (CECS) (2006): 1-27. <https://ago.vermont.gov/wp-content/uploads/2018/03/The-Cost-of-Lead-Poisoning-in-Vermont.pdf>

²Gould, E. (2009, July). Childhood lead poisoning: Conservative estimates of the social and economic benefits of lead hazard control. *Environmental Health Perspectives*, 117(7), 1162-1167. Retrieved February 21, 2017, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717145/>

³The Pew Center on the States. 2010. *Cutting Lead Poisoning and Public Costs. Partnership for America's Economic Success*, Issue Brief #14. http://www.pewtrusts.org/~media/assets/2010/02/22/063_10_paes-costs-of-lead-poisoning-brief_web.pdf

Appendix: Statute

18 V.S.A. § 1756. Annual report

(a) The Commissioner shall, at least annually, analyze and summarize all aggregate lead screening and testing information provided by physicians, health care facilities, and laboratories and provide this information to all other local and State agencies involved with case management and lead hazard reduction.

(b) The Commissioner shall also at least annually provide to the General Assembly, the health community, and the general public an analysis and summary of such data and a progress report on the Commissioner's efforts to prevent lead poisoning in young children in a format that is easily understandable to nontechnical readers. The report shall include:

(1) The number and percentage of children under the age of six who have been screened and tested for lead poisoning, and the number found to have lead poisoning at various levels.

(2) Estimates of the public and private costs incurred since July 1, 1993 to prevent, correct, or treat lead poisoning.

(3) An analysis of barriers to universal blood screening of children under the age of six years.

(4) The Commissioner's recommendations for action. (Added 1993, No. 94, § 3.)