Report to
The Vermont Legislature

Lead Poisoning Prevention: Report on 2020 Program Outcomes and Activities

In Accordance with 18 V.S.A. § 1756

Submitted to: Vermont General Assembly

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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's progress increasing the percentage of children tested each year has been mixed. After holding steady at approximately 80% for many years, the percentage of 1-year olds tested each year declined steadily from 82% in 2014 to 74% in 2020. While the percentage of 2-year olds tested increased by almost 30% from 2006 to 2014, there was a sharp decline in 2020. The percentage of 2-year olds tested decreased from 72% in 2019 to 64% in 2020. This decline is likely the result of the shutdown that started in March 2020 due to COVID-19.

Steady progress has been made in reducing the number of children with blood lead levels at or above 5 micrograms per deciliter (µg/dL). From 2006 through 2020, the percentage of 1- and 2-year olds with blood lead levels greater than or equal to 5 µg/dL declined (1-year olds from 19.4% to 5.1%, and 2-year olds from 22.5% to 3.2%). There were 336 children ages 1 and 2 who had a blood lead level greater than or equal to 5 µg/dL, slightly lower than 355 in 2019. In total, 400 children under the age of 6 had a blood lead level greater than or equal to 5 µg/dL in 2020, lower than 427 in 2019. The lower number of children who had high lead levels is likely due to the reduced number of children getting tested this year.

For the dollar amount spent by public agencies in Vermont in 2020 to reduce lead hazards and prevent lead poisoning ($1,661,971), the State of Vermont could see a return on investment (ROI) of between $28 million to $367 million. The uncertainty of this estimate reflects the complexities associated with accounting for the national costs of lead hazard control, reduced health care costs, lifetime earnings, tax revenue, special education costs, behavioral disorders, and crime.

In 2021, the Program will continue working with the U.S. Department of Housing and Urban Development (HUD)-funded partners to reduce lead hazards in the homes of lower-income families; working to increase Vermont lead law compliance among rental property owners; working with Vermont Child Health Improvement Program (VCHIP) to improve screening rates among health care professionals; and conducting educational outreach to parents of young children, emphasizing the importance of lead screening.

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Introduction

The Vermont Department of Health (Department) submits this report on the status of childhood lead poisoning prevention efforts in 2020 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 special focus on 1- and 2-year olds. Historical data on screening rates are also presented. In addition, the report describes 2020 outreach and educational activities intended to improve screening rates and provide estimates of the annual public and private costs incurred in 2020 to prevent lead poisoning.

In 2020, 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. However, staff were reassigned to Vermont's COVID-19 response beginning in March 2020. Therefore, only essential work, such as case management of children with high blood lead levels, environmental investigations, and data surveillance, continued.

The Department updated the Blood Lead Testing, Reporting, and Response Rule in September 2020, lowering the State's definition of an elevated blood lead result from 5 µg/dL to *any* detected level.

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. 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 Department works toward achieving the goal of universal testing of 1- and 2-year olds in Vermont as currently required. While the State updated the definition of an elevated blood lead result from 5 µg/dL to *any* reported level, the level at which the Department will contact the family to help find lead hazards is 5 micrograms per deciliter (µg/dL). This aligns with the current CDC reference level.

Table 1 presents 2020 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 - <6 years, 2020*

Age	Population	# of Tests	% Tested	# < 5 µg/dL	% < 5 µg/dL	# 5-9 µg/dL	% 5-9 µg/dL	# ≥10 µg/dL	% ≥10 µg/dL
Under 1	5682	71	2.6%	62	87.3%	*	*	*	*
1	5746	4233	73.7%	4019	94.9%	152	3.6%	62	1.5%
2	5959	3830	64.3%	3708	96.8%	92	2.4%	30	0.8%
3	6069	245	4.0%	206	84.1%	31	12.7%	8	3.3%
4	6130	114	1.9%	102	89.5%	*	*	*	*
5	6157	90	1.5%	86	95.6%	*	*	*	*
Total	35743	8583	24.0%	8183	95.3%	291	3.4%	109	1.3%

Notes:

* Indicates fewer than eight cases in a category that year. When counts and percentages are based on only a few cases, it is impossible to distinguish random fluctuation from true changes in data.
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 (2017, 2018, 2019).
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 2018, have their 1-year old test in January 2020, and then have their 2-year old test in December 2020.

Figure 1

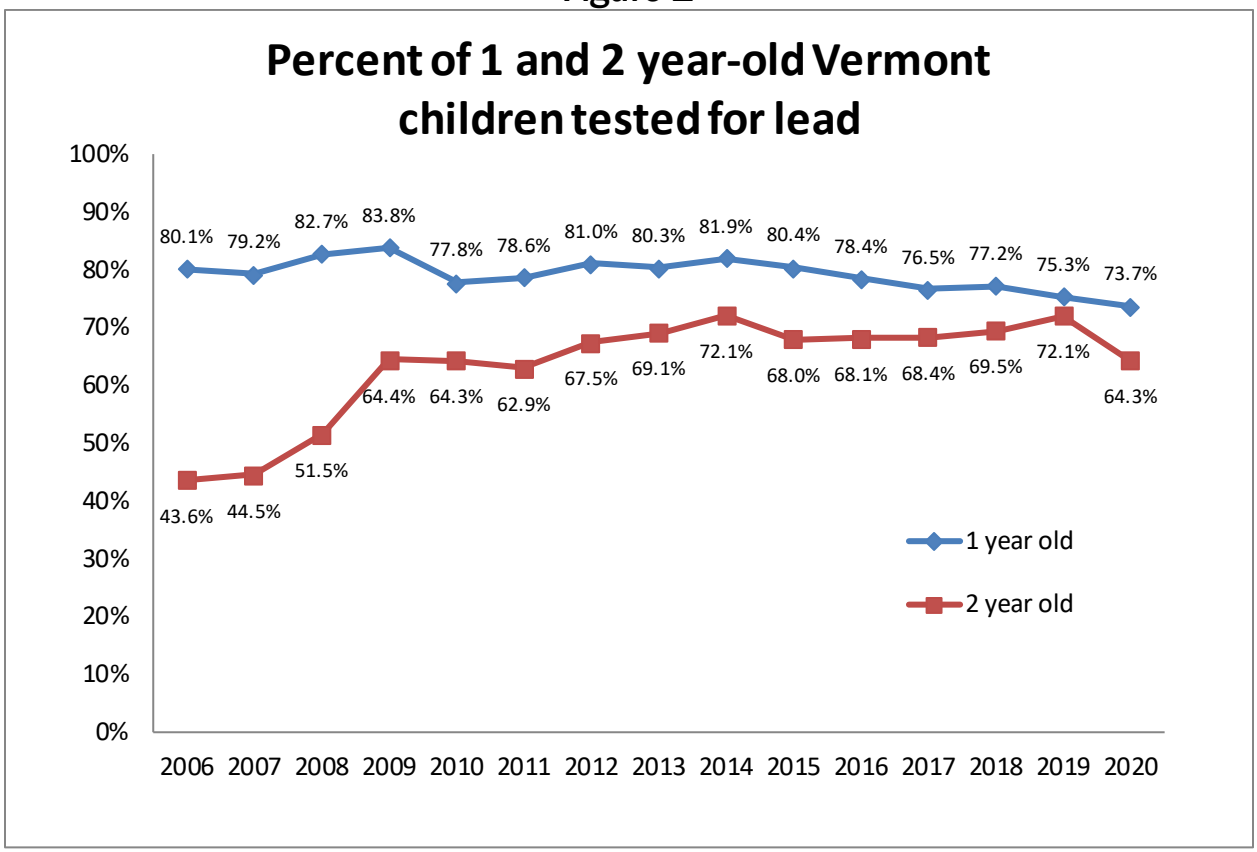

Figure 1 shows the percentage of 1-year olds and the percentage of 2-year olds tested each year from 2006 through 2020. For 1-year olds, a steady decrease is observed from 2014 (82%) to 2020 (74%). Statistical analysis indicates that this decrease is statistically significant. While the percentage of 2-year olds tested increased by almost 30% from 2006 to 2014, there was a sharp decline in 2020, from 72% in 2019 to 64% in 2020. This decline is likely the result of the shutdown that started in March 2020 due to COVID-19.

Figure 2

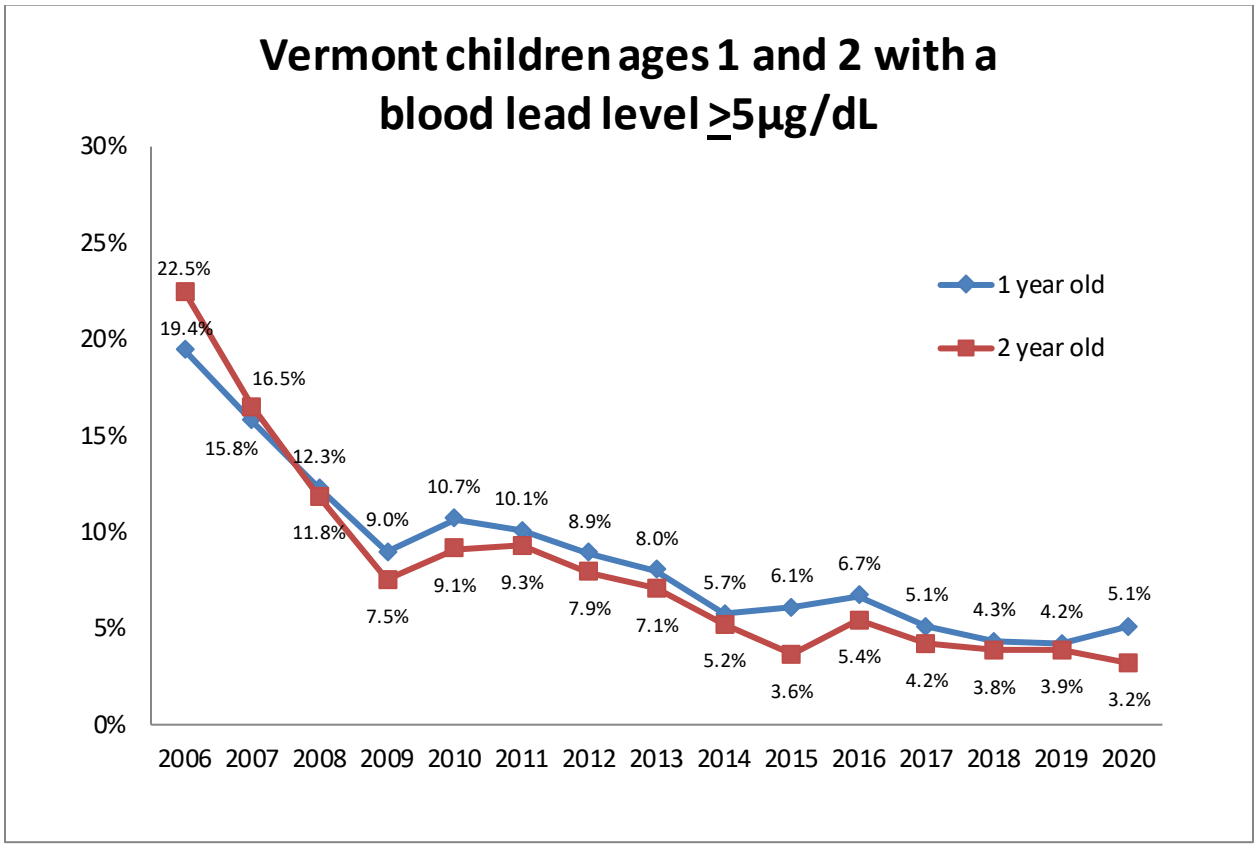

Figure 2 shows the percentage of Vermont 1- and 2-year olds tested who had blood lead levels greater than or equal to 5 µg/dL during the period from 2006 through 2019. This trend shows a decrease in the percentage of 1- and 2-year olds who had elevated blood lead levels, with a slight increase in 2020 for 1 year olds.

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 obvious signs or symptoms of lead poisoning. Testing is the only way to know if a child has been exposed to lead. Preventing exposure, therefore, is the key to keeping children safe from lead.

The current biggest barrier to testing over the last year was directly related to the restrictions that started in March 2020 due to COVID-19. Most healthcare practices shifted to telehealth visits except for their youngest patients, making blood lead testing less accessible. Vermont's Local Health Offices also started operating WIC clinics virtually and were unable to provide back-up testing at 18- and 30-month WIC appointments for children not tested by their healthcare professional.

2020 Education and Outreach Activities

The goal of the Department is to reduce lead exposure in children and adults. Outreach and support for health care professionals and education to the public is an integral part of the Program. The Department conducts a variety of lead education and outreach activities 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 high blood lead levels. In March, Department staff were reassigned part time to Vermont's COVID-19 response, reducing the amount of outreach we were able to accomplish. Below is a sample of 2020 activities, organized by activity type.

Programmatic Activities and Outreach

- Completed a data update on the Healthy Vermonters 2020 dashboard, which displays the percentage of children ages 1 to 5 with venous blood lead levels in the ranges of 5 to 9 µg/dL and 10 µg/dL and above.
- Conducted limited outreach during Lead Poisoning Prevention Week (October 25-31, 2020) using the *How Would You Know?* campaign materials and Halloween-themed poster and video on our social media channels.
- Worked with HUD-funded partners (Vermont Housing Conservation Board and Burlington Lead Program) to reduce lead hazards in the homes of lower-income families.
- Collaborated with the Department's Division of Alcohol and Drug Abuse Programs (ADAP) to launch the second phase of the campaign, *Healthy at Home*. *Healthy at Home* educated Vermonters on simple steps to keeping their home, and everyone in it, healthy and safe. The second phase included the following five messages:
    - Clean up lead dust in your home;
    - Be aware of dangerous household chemicals;
    - Secure your home against potentially harmful substances;
    - Keep your drinking water safe; and
    - Check for indoor air pollutants

  The Fall 2020 campaign produced 11,100 visits to our website among 7,351 new users.

Targeted Education

- Developed a virtual (due to COVID-19 restrictions) visit protocol with families that includes sending lead dust kits to them after the virtual visit.
- Provided environmental investigations, educational home (and virtual) visits, and follow-ups for 72 families of children with confirmed blood lead levels of 5 µg/dL or greater.[1]
- Mailed 10,038 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 209 packets to families whose children had a blood lead level from 5 µg/dL to 9 µg/dL that include educational materials and follow-up testing recommendations.
- Mailed 47 packets to families whose children had a blood lead level of 10 µg/dL or higher that include educational materials, follow-up testing recommendations.

[1] The Department called 106 families to offer phone consultations, educational materials, and/or environmental investigations that included an educational home (and virtual) visit. Of these, 72 initial and follow up home (and virtual) visits were conducted.

Screening Outreach

- Continued education to health care professionals via the Department's district offices regarding the need to test children for lead at both 12- and 24-month well-child visits. Since March, outreach has been limited.
- Educated parents at Women, Infants, and Children (WIC) appointments on the importance of getting their children tested for lead.
- In January and February, provided back-up lead testing of children at their 18- and/or 30-month WIC appointments who were not tested by their health care professionals at 12 and 24 months. Since March, Vermont's local health offices have operated WIC clinics virtually and therefore, no longer provide back-up testing at 18- and 30-month WIC appointments.
- Continued to work with the Vermont Chapter of American Academy of Pediatrics under a grant to provide the purchase of in-office blood lead testing machines, known as LeadCare II, for selected pediatric and family practices. The grant supports the purchase of the machines and peer-to-peer education and training with the goal of further reducing known barriers to blood lead screening.
- Continued a project in partnership with the VCHIP to offer peer to peer support and solutions to practices with low testing rates.
- Included information about lead screening in letters sent by the Early and Periodic Screening, Diagnosis and Treatment Program advising parents that age-appropriate screening tests are recommended and covered by Medicaid.

Future of Vermont's Healthy Homes Lead Poisoning Prevention Program and Recommendations

In 2021, the Program will continue work to prevent lead poisoning by making homes safer for children and increasing blood lead testing rates for 1- and 2-year olds through parental education, providing technical assistance to health care professionals, and enforcing the lead testing rules. The Program will:

- Continue to provide outreach, conduct environmental investigations, and provide case management to families with children that have confirmed elevated blood lead levels.
- 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.
- 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. The goal is to encourage required testing among health care professionals by reporting practice-specific testing rates and providing education and guidance about blood lead testing.
- Identify health care professionals who have not been testing 1- and 2-year olds for lead and work with them to increase their testing rates.

- Continue working with VCHIP to initiate more specific individualized opportunities to provide outreach and train health care professionals on the importance of screening and reporting of results.
- Work with VCHIP to provide lead testing expertise to the CHAMP Network providers via the CHAMP Learning Session, dissemination of fact sheets and reports, and additional webinars.
- 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.
- Work with Lead Care II users to improve the accuracy and timeliness of lead test reporting.
- Maintain and create partnerships with internal and external partners, such as:
    - Vermont Housing and Conservation Board
    - Children's Integrated Services
    - Burlington Lead Program
    - Vermont Child Health Improvement Program
    - Environmental Public Health Tracking Program
    - Vermont Department of Health's Asthma Program
    - Vermont Department of Health's Asbestos and Lead Regulatory Program

Estimates of Public and Private Costs

The Program expended an estimated $551,872 in fiscal year 2020. The Vermont Housing and Conservation Board expended about $566,136 from HUD for lead poisoning prevention, and the Burlington Lead Program spent an estimated 543,962.58 in HUD Lead Hazard Control funds. Combined, these organizations spent an estimated $1,661,971 in federal and state funds to reduce lead poisoning in 2020.

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 (Gould, 2009[2]) estimated a return of $17 to $221 for every dollar spent on lead hazard control. This would suggest that for the $1,661,971 spent in 2020 on reducing lead hazards and preventing poisoning, the State of Vermont could see a return on investment (ROI) of between $28,253,505 to $367,295,564. 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. For comparison, the estimated ROI of vaccinations is estimated at between $5.40 to $16.50 for every dollar spent (Zhou et al., 2005[3]).

The Pew Center on the States released an issue brief, *Cutting Lead Poisoning and Public Costs*, in 2010. [4] 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.

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[1]Carlson, 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

[2]Gould, 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/

[3]Zhou F, Santoli J, Messonnier ML, Yusuf HR, Shefer A, Chu SY. 2005. Economic evaluation of the 7-vaccine routine childhood immunization schedule in the United States, 2001. Arch Pediatr Adolesc Med 159:1136–1144

[4]The 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.)