Report to
The Vermont Legislature

Lead Poisoning Prevention: Report on 2017 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. Over the past 20 years, Vermont has made steady progress in reducing the number of children with blood lead levels at or above Vermont's current level of 5 micrograms per deciliter (µg/dL). From 2006 through 2017, 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 4.2%). After holding steady at about 80% for many years, the percentage of 1-year olds tested each year has declined steadily from 82% in 2014 to 77% in 2017. The percentage of 2-year olds tested each year increased by more than 20% over the past 10 years, although the increase has stagnated in recent years. In 2017, 77% and 68% of 1- and 2-year olds, respectively, were tested for lead and 412 of them had an elevated blood lead level.

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 targeted at 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. For the amount spent by public agencies in Vermont in 2017 to reduce lead hazards and prevent poisoning ($2,616,154), the State of Vermont could see a return on investment (ROI) of between $78,806,118 to $1,024,479,534[2]. This estimate takes into account the national costs of lead hazard control, reduced health care costs, lifetime earnings, tax revenue, special education costs, behavioral disorders, and crime.

In 2018, the Program will continue ongoing activities such as 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, increasing Vermont lead law compliance among rental property owners, reaching out to health care providers who are not currently screening patients to help improve upon screening rates of 1- and 2-year olds, 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 is pleased to submit this report on the status of childhood lead poisoning prevention efforts in 2017 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 are also presented. In addition, the report describes 2017 outreach and education activities intended to improve screening rates and provide estimates of the annual public and private costs incurred in 2017 to prevent lead poisoning.

In 2017, the Healthy Homes Lead Poisoning Prevention Program (Program) continued the cooperative agreement with the 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. 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 works toward achieving the goal of universal testing of 1- and 2-year olds in Vermont as currently required. Vermont's definition of an elevated blood lead level is 5 µg/dL, which is aligned with the current Centers for Disease Control or Prevention (CDC) reference level. Table 1 presents 2017 data on the number of young children who were tested for blood lead levels and the results of those screenings.

Table 1
Blood Lead Tests and Results for Vermont Children ages 0 - <6 years, 2017*

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	6023	141	2.3%	132	93.6%	6	4.3%	*	*
1	6067	4644	76.5%	4408	94.9%	193	4.2%	43	0.9%
2	6136	4194	68.4%	4017	95.8%	142	3.4%	34	0.8%
3	6130	319	5.2%	285	89.3%	27	8.5%	7	2.2%
4	6133	189	3.1%	171	90.5%	10	5.3%	8	4.2%
5	6195	97	1.6%	90	92.8%	6	6.2%	*	*

Notes:

* Indicates fewer than 6 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. Small numbers are also suppressed to prevent identification of individuals.
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 3 previous years (2014, 2015, 2016).
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 2016, have their one-year old test in January 2017, and then have their two-year old test in December 2017.

Figure 1 shows the percentage of 1-year olds and the percentage of 2-year olds tested each year from 2006 through 2017. For 1-year olds, about 80% have been tested each year across the time period. However, a steady decrease is observed from 2014 (82%) to 2017 (77%). Statistical analysis indicates that this decrease is statistically significant. For 2-year olds, the percentage tested increased more than 20% between 2006 and 2009. This increase continued, overall, until 2014. The percentage of 2-year olds tested has been stagnant from 2014 to 2017.

Figure 1

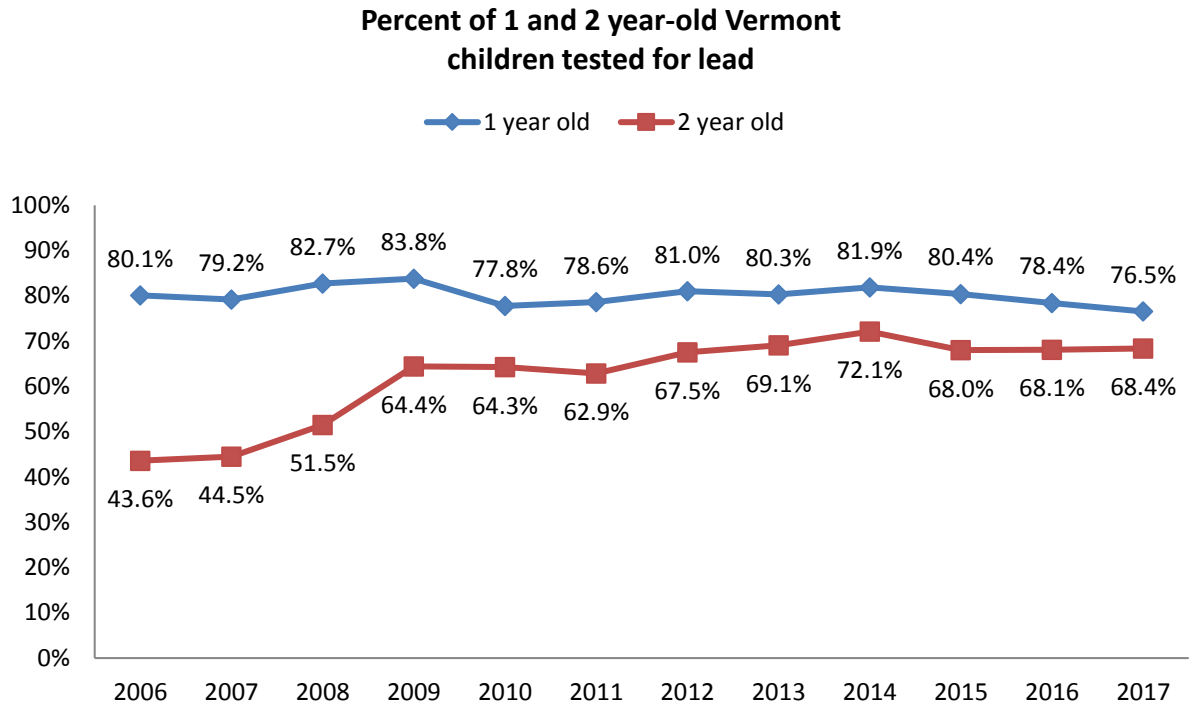
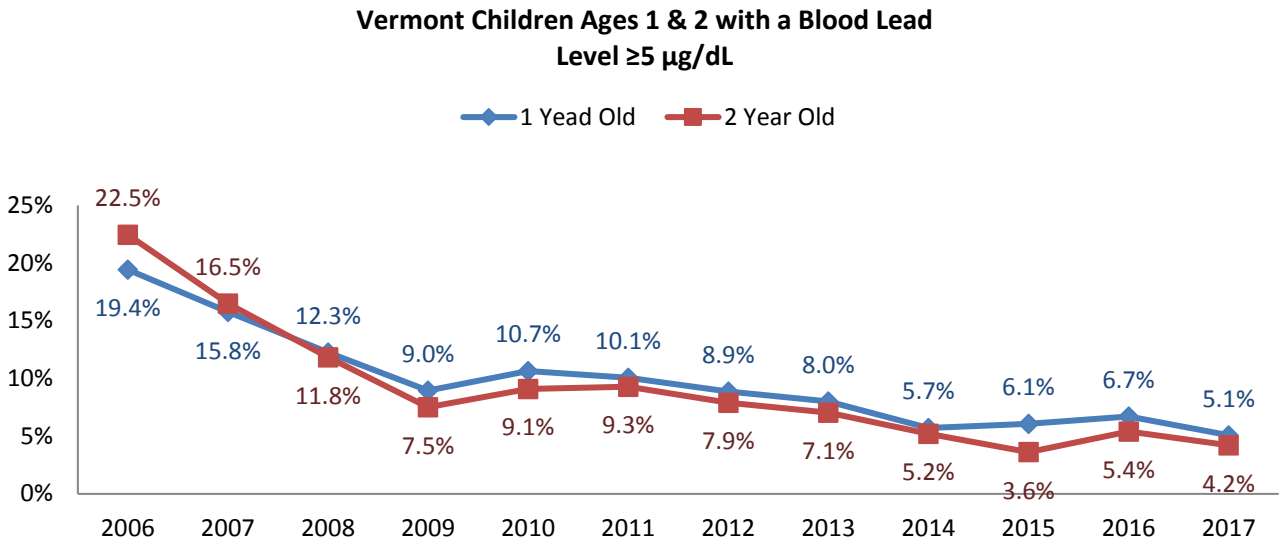


Figure 2 shows the percentage of Vermont 1- and 2-year olds tested who had blood lead levels greater than or equal to 5 µg/dL during the period from 2006 through 2017. This trend shows a decrease in the percentage of 1- and 2-year olds who had elevated blood lead levels; however, 412 1- and 2-year olds had an elevated blood lead level in 2017.

Figure 2



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. 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 Department's efforts to educate Vermonters about the health risks of lead are discussed in the next section.

In the past, a number of barriers to the testing requirements have been identified. Health care providers have indicated that difficulty obtaining blood samples from infants and young children poses a barrier to testing. Health care providers have also voiced concerns about inadequate cost reimbursement for lead testing and lack of insurance coverage for the procedure. Other barriers have included inaccurate beliefs about who is and who is not at risk for lead poisoning and parental opposition to testing.

In 2017, the Vermont Chapter of the American Academy of Pediatrics (AAP), in partnership with the Department, embarked on a project to more accurately determine the current barriers to testing 1- and 2-year olds for lead. This project involves directly contacting health care providers and asking them what barriers keep them from testing and offering them support and solutions to increase their testing rates.

2017 Education and Outreach Activities

The goal of the Program is to reduce lead exposure in children and adults. An integral part of the program is outreach and support for health care providers and education to the public. The program conducts a variety of lead education and outreach activities targeted at 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. Below is a sample of 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 (viewed here: www.healthvermont.gov/scorecard-environment-food-safety).
- Created a landing page for lead information (www.healthvermont.gov/lead) as part of the Department's website redesign, which includes information on lead hazards and directs parents and health care providers to lead poisoning prevention web pages and directs landlords and do-it-yourselfers to lead regulatory web pages.
- Launched a campaign around vintage, antique, and salvaged items that included a fact sheet, a video, social media posts, and advertisements in the *NEST*, a quarterly publication of *Seven Days*, and *Green Living* to target do-it-yourselfers and homeowners.
- Produced a how-to video on the usage of dust wipe kits to test homes for lead.
- Posted a statewide Front Porch Forum post about lead poisoning prevention ahead of spring cleaning.

- Developed a new Halloween-themed poster and video for Lead Poisoning Prevention Week (October 22 – 28, 2017). The Department's district offices used these materials and conducted additional outreach during the week, which included lobby displays, presentations, social media, letters, and posters.
- Helped develop guidance for health care providers as part of the State's initiative to test 16 schools for lead in drinking water.
- Met with the Early Childhood Alliance organization to lay groundwork for encouraging child care providers to distribute the Program's outreach materials.
- Worked with HUD-funded partners (Vermont Housing Conservation Board and Burlington Lead Program) to reduce lead hazards in the homes of lower-income families.
- Engaged Town Health Officers to refresh their knowledge on the Program's lead poisoning prevention materials on the Department's website.

Targeted Education

- Provided environmental investigations, educational home visits, and follow-ups for 146 families of children with a confirmed blood lead level of 10 µg/dL or greater.
- Mailed 10,129 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 531 packets to families whose child had a blood lead level from 5 µg/dL to 9 µg/dL that include educational materials, follow-up testing recommendations, and a request form for a free dust wipe kit that enables families to test their home for lead.
- Developed guidance for health care providers in assessing the lead exposure risk for pregnant and breastfeeding women.

Screening Outreach

- Continued education to health care providers via the Department's district offices regarding the need to test children for lead at both 12- and 24-month well-child visits.
- Educated parents at Women, Infants, and Children (WIC) appointments on the importance of getting their children tested for lead.
- Continued back-up lead testing of children at their 18- and/or 30-month WIC appointments who were not tested by their health care providers at 12 and 24 months.
- Continued to work with the AAP 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 with the goal of further reducing known barriers to blood lead screening.
- Began a project in partnership with the AAP to directly contact health care providers with low testing rates to determine what their barriers to testing are and to offer support and solutions to help them increase their 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 2018, 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 educating parents, providing technical assistance to health care providers, and enforcing the lead testing rules. The Program will:

- Continue to:
  - Offer dust wipe kits as long as supplies last;
  - Provide outreach, conduct environmental investigations, and provide case management to families with children that have confirmed elevated blood lead levels; and
  - Send reminder postcards with lead testing information to all families whose child was born in Vermont at ages 10- and 22-months.
- Update the post card sent to families whose child was born in Vermont at ages 10- and 22-months and evaluate the best method of mailing them (e.g. ensure the post cards are being forwarded to families who have had a change of address).
- Use the Department's web-based immunization registry to develop a new report for health care providers to track children in their practice who need a venous confirmation and those who have had a confirmed elevated blood lead level and need venous follow-up tests.
- Identify health care providers who have not been testing 1- and 2-year olds for lead and work with them to increase their testing rates.
- Continue working with the AAP to contact health care providers to determine barriers to testing and offer support to increase their testing rates.
- 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 health care providers though the AAP to improve Lead Care II data submission.
- Work to bring a new database system developed by the CDC online, replacing the current system.
- Work with town health officers regarding their role in identifying lead hazards in their communities.
- Maintain and create partnerships with internal and external partners, such as:
  - Vermont Housing and Conservation Board
  - Children's Integrated Services
  - Burlington Lead Program
  - Parks Place Lead Safe and Healthy Homes Program
  - Head Start
  - Environmental Public Health Tracking Program
  - Asbestos and Lead Regulatory Program

Estimates of Public and Private Costs

In the public sector, the Program expended an estimated $302,706 in 2017. The Vermont Housing and Conservation Board expended about $1,000,500 from the Department of Housing and Urban Development (HUD) for lead poisoning prevention in 2017, and the Burlington Lead Program spent an estimated $1,312,948 in HUD Lead Hazard Control funds. Combined, these organizations spent an estimated $2,616,154 in federal and state funds to reduce lead poisoning in 2017.

A study[1] 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). 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 providers 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 $4,635,654 spent in 2017 on reducing lead hazards and preventing poisoning, the State of Vermont could see a return on investment (ROI) of between $78,806,118 to $1,024,479,534. This estimate takes into account the national 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*[4], in 2010. 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. <http://ago.vermont.gov/assets/files/The%20Cost%20of%20Lead%20Poisoning%20in%20Vermont.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://ehp.niehs.nih.gov/wp-content/uploads/117/7/ehp.0800408.pdf

[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. Retrieved February 7, 2018 from 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.)