Report to
The Vermont Legislature

Lead Poisoning Prevention: Report on 2016 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 value of 5µg/dL. From 2006 through 2016, 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 6.7%, and 2-year-olds from 22.5% to 5.4%). The percentage of 1-year olds tested each year from 2006 through 2016 has held steady at about 80%. Overall, the percentage of 2-year olds tested each year from 2006 through 2016 increased by more than 20%.

The mission of the Vermont Department of Health's Healthy Homes Lead Poisoning Prevention Program (HHLPPP) 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 HHLPPP 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-old children, and support case management for children with elevated blood lead levels. For the amount spent by public and private agencies in Vermont in 2016 to reduce lead hazards and prevent poisoning ($4,354,925), the State of Vermont could see a return on investment (ROI) of between $69,678,800 to $958,083,500[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 2017, the HHLPPP will continue ongoing activities such as working with 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, targeting physicians who are not currently screening patients to improve screening rates to 100% 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 progress report on the status of childhood lead poisoning prevention efforts in 2016 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-old children. Historical data on screening are also presented. In addition, the report describes 2016 outreach and education activities intended to improve screening rates and provide estimates of the annual public and private costs incurred in 2016 to prevent lead poisoning.

Over the last ten years, the percentage of young children who have been screened for lead poisoning has remained at an average of 80% and the percentage of children with elevated blood lead levels has decreased (see Figure 2). In 2008, Vermont became the first state to issue Commissioner of Health's guidance that defined 5µg/dL as an elevated blood lead level. In 2012, the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Childhood Lead Poisoning published a report which declared that no blood level of lead is safe and has stopped using terms such as "level of concern" and "action level." Instead, the CDC calculated a reference value based on the 97.5 percentile of the blood lead level distribution among children age 1 to 5 in the United States. The current reference value aligns with Vermont's definition of an elevated blood lead level at 5µg/dL.

In 2016, the Healthy Homes Lead Poisoning Prevention Program (HHLPPP) continued the cooperative agreement with the CDC for lead poisoning prevention. This funding supports the HHLPPP'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 HHLPPP continues to work toward the goal of universal testing of 1- and 2-year-old children in Vermont. Table 1 presents 2016 data on the number of young children who were tested for blood lead levels and the results of those screenings.

Figure 1

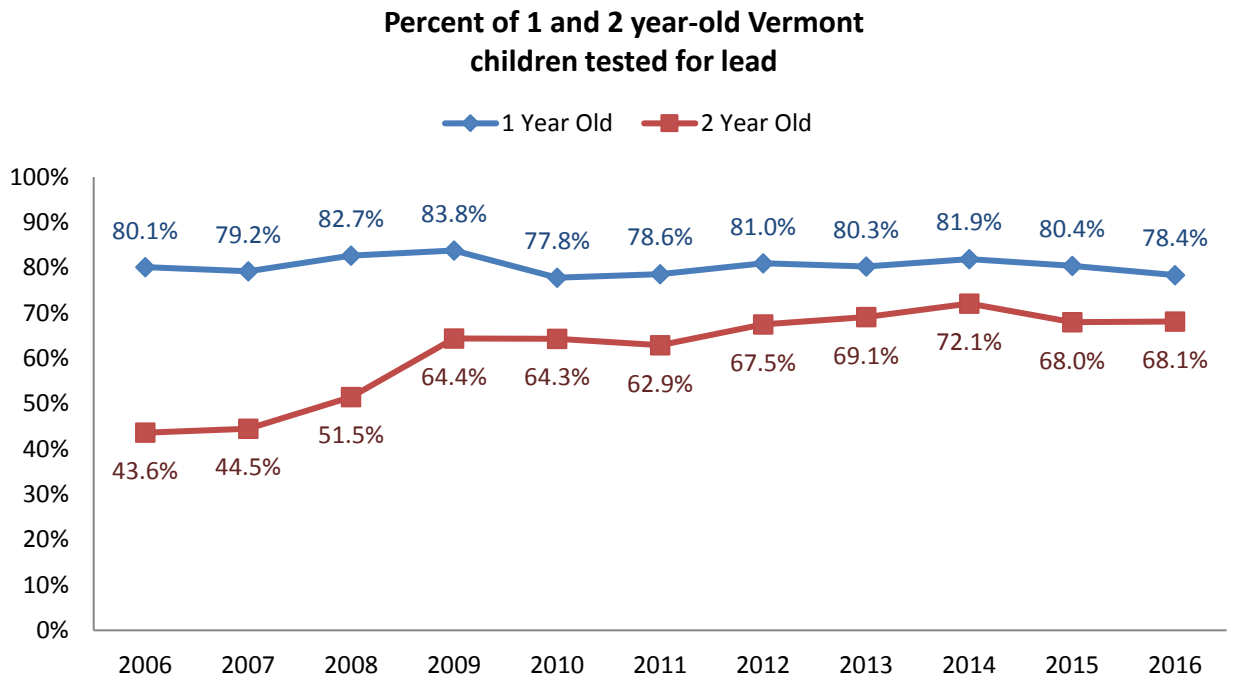

Figure 1 shows the percent of 1-year olds and the percent of 2-year olds tested each year from 2006 through 2016. For 1-year olds, the trend has held steady at about 80% for the time period. For 2-year olds, the trend jumped more than 20% between 2006 and 2009, from 43.6% to 64.4%, and overall has steadily increased from 2009 through 2014, then decreased slightly through 2016.

Figure 2

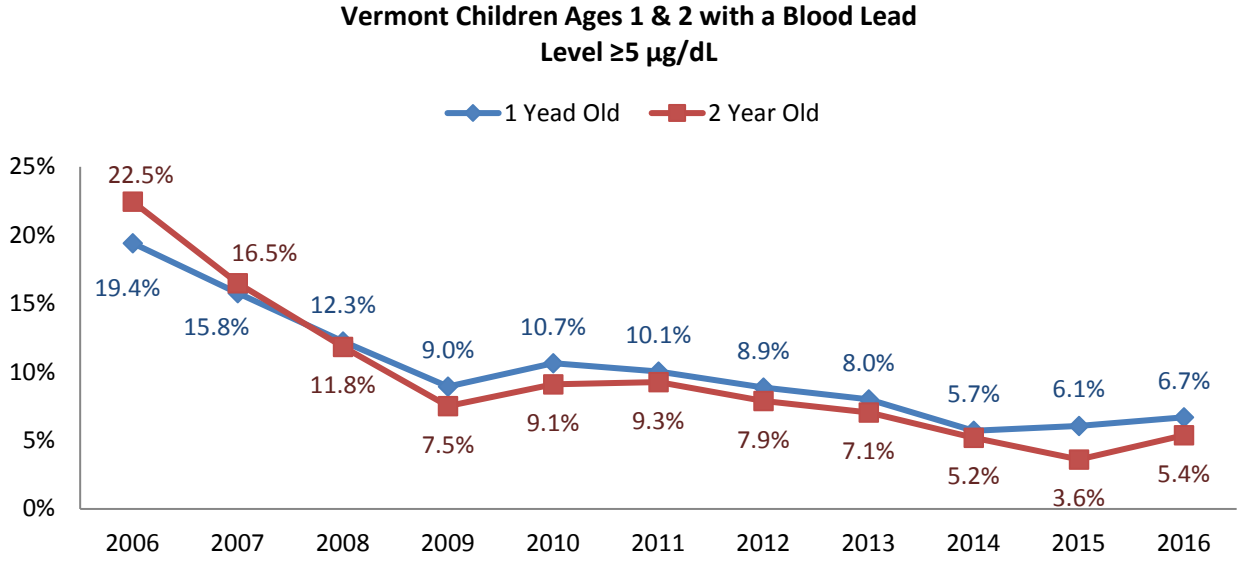

Figure 2 shows the percent of Vermont 1- and 2-year olds tested who had blood lead levels greater than or equal to 5 µg/dL during the period from 2006 through 2016.

Barriers to Universal Screening

A number of barriers to the testing requirements have been identified and continue to persist. Providers have indicated that difficulty obtaining blood samples from infants and young children poses a barrier to testing. Providers have also voiced concerns about inadequate cost reimbursement for lead screening and a lack of insurance coverage for the procedure. There have also been some inaccurate beliefs about who is at risk for lead poisoning and who is not at risk. Finally, parental opposition to testing poses another barrier to universal testing. 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. The Health Department's efforts to educate providers and parents about the health risks of lead are discussed in the next section.

2016 Education and Outreach Activities

The Department 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-old children, and support case management for children with elevated blood lead levels. Below is a sample of activities organized by activity type.

Programmatic Activities

- The Department completed a Healthy Vermonters 2020 (HV2020) data dashboard update. The lead poisoning section of the Environmental Health page within the HV2020 dashboard displays the percentage of children ages 1 to 5 with venous confirmed elevated blood lead levels at the 5 to 9 µg/dL and 10+ µg/dL levels, statewide and can be viewed here (http://healthvermont.gov/scorecard-environment-food-safety). Additionally, data on lead screening and poisoning rates by county can be viewed here (http://healthvermont.gov/tracking) and here (https://ephtracking.cdc.gov/DataExplorer/).
- An integral part of the program is outreach and support to healthcare providers and education to the public. The efforts directed toward public education included development and updating of programmatic outreach materials (an updated website, social media campaign posts, flyers, fact sheets, advertisements, and videos) for education on risks of lead poisoning from hazards including paint, dust, water, soil, hobbies and work activities, as well as toys, and vintage goods/antiques.
- The Department developed videos and fact sheets targeting new American populations in Vermont that have been translated into Nepali, Somali, and Arabic.
- Through the Health Department District Offices the Department continued to educate providers regarding the need to test children at both 12- and 24-month wellness visits. The District Offices conducted outreach during Lead Poisoning Prevention Week in October, which included lobby displays, presentations, social media, letters, and posters on the risk of lead poisoning and the need for screening.

Targeted Education

- All children with a confirmed blood lead level of 10 µg/dL or greater are visited by the HHLPPP case manager. In 2016, the case manager provided environmental investigations, educational home visits, and follow-ups for 104 families. In addition to investigating the home for lead hazards, the case manager also looks for asthma triggers and safety and poisoning dangers.
- Postcards reminding parents and guardians to have their children tested for lead are sent to families of 10-month-old children and 22-month-old children who were born in Vermont (8,170 postcards were mailed in 2016).

- Educational materials and testing recommendations are sent to parents whose child has a blood lead level in the range from 5 µg/dL to 9 µg/dL (580 packets were mailed in 2016). The materials include a request form for a free dust wipe kit that enables families to send floor and windowsill dust samples to a laboratory to test for lead. Lab results are sent directly back to the families accompanied by appropriate lead poisoning prevention literature.

Screening Outreach

- The Department continues to work with the Vermont Chapter of the AAP under a grant to provide the purchase of in-office blood lead testing machines, known as Lead Care II, for selected pediatric and family practices. The grant supports not only purchase of the machines but also peer-to-peer education with the goal of further reducing known barriers to blood lead screening.
- Health Department District Office programs encourage parents to make sure their children are tested. At appropriate Women, Infants, and Children (WIC) appointments, WIC staff distribute lead factsheets and remind parents to have children tested at the 12-month and 24-month Well Child visits with their health care provider. As a back-up measure, children in WIC who were not tested by their providers at 12- and 24-months may be tested by district office staff at their 18-and/or 30-month WIC appointments.
- The Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program routinely sends letters advising parents that age-appropriate screening tests are recommended and covered by Medicaid. Lead screening tests are listed in this EPSDT information sent to parents.

Future of Vermont's Lead Program and Recommendations

In 2017, the Health Department will continue to work to prevent lead poisoning by making homes safer for children and increasing blood lead testing for 1- and 2-year olds by educating parents, giving technical assistance to providers, and enforcing the lead testing rules. The HHLPPP will:

- Continue to:
    - Offer dust wipe kits.
    - Provide outreach to families with children who have tested between 5 and 9 µg/dL.
    - Conduct environmental investigations and case management of children with a venous blood lead level at or above 10 µg/dL.
    - Offer environmental investigations and case management for children with a venous blood lead level between 5 and 9 µg/dL when resources permit.
    - Send reminder postcards with lead testing information to all families whose child was born in Vermont at ages 10- and 22-months.
- Use the web-based immunization registry and new reports to help identify medical providers who have not been testing 1- and 2-year olds.
- Work with our district offices to identify medical providers who have not been testing 1- and 2-year olds.
- Compile a comprehensive data report with lead poisoning, screening, case management, and housing information. It will include geographic information system (GIS) maps featuring areas of elevated blood lead levels, older housing stock, and low-income.
- Work with providers though AAP partners and internal Health Department Information Technology staff to improve Lead Care II data submission and data entry processes.

- Work to bring a new database system developed by the CDC online, replacing the current system.
- 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
- Work with town health officers regarding their role in identifying lead hazards in their communities.
- Continue to build a solid primary prevention initiative based upon the successful aspects of the OB/GYN and midwife campaign.
- Conduct a special project that will focus on the refugee populations in Vermont and their particular needs.

Estimates of Public and Private Costs

Private Costs

It is extremely difficult to estimate the costs incurred since 1993 by the public and the private sector to prevent lead poisoning. The following algorithm is used to estimate the costs incurred by landlords to ensure their rental properties comply with Essential Maintenance Practices (EMP).

- Among the 5,290 rental properties and child care centers for which EMP affidavits were filed in 2016, 25% of these properties were in good condition, 50% were in fair condition, and 25% were in poor condition. Properties in good condition require an estimated $200 in annual maintenance costs to comply with EMP requirements; properties in fair condition likely require $340 in annual maintenance costs; and properties in poor condition entail approximately $520 in annual maintenance costs. This results in an estimated cost of $1,851,500.
- 228 properties filed a compliance statement for the first time in 2016. First-time filing of a compliance statement likely incurs start-up costs to bring a property into compliance (e.g., installing window well inserts and buying a HEPA vacuum). The algorithm assumes an average of $625 for each new property being brought into compliance. Additional start-up costs for new properties being brought into compliance is $142,500.

Therefore, a conservative estimate for the total cost to landlords for all properties that complied with the Lead Law in 2016 is $1,994,000.

Public Costs

In the public sector, the HHLPPP expended an estimated $621,906 in 2016. The Vermont Housing and Conservation Board expended about $1,200,000 from the Department of Housing and Urban Development (HUD) for lead poisoning prevention in 2016, and the Burlington Lead Program spent an estimated $539,019 in HUD Lead Hazard Control funds. Therefore, from these organizations, an estimated $2,360,925 in federal and state funds were spent on reducing lead poisoning in 2016.

The total private and public funds spent on lead poisoning prevention and or lead hazard control in 2016 was an estimated $4,354,925.

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 a year (considered to be an underestimate because special education costs were calculated only for those children with blood lead levels 25 µg/dL or greater). The Dartmouth report also estimated more than $79 million per year in lost future earnings of children whose blood lead levels are 5 µg/dL or greater. Screening costs incurred by families, insurers, and 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-$221 for every dollar spent on lead hazard control. This would suggest that for the $4,354,925 spent in 2016 on reducing lead hazards and preventing poisoning, the State of Vermont could see a return on investment (ROI) of between $69,678,800 to $958,083,500. 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-$16.50 for every dollar spent (Zhou et al., 2005[3]).

[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

Appendix A: Blood Lead Tests and Results for Vermont Children ages 0-<6 years, 2016*

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	6011	205	3.4%	190	92.7%	10	4.9%	*	*
1	6076	4763	78.4%	4443	93.3%	269	5.6%	51	1.1%
2	6123	4169	68.1%	3944	94.6%	196	4.7%	29	0.7%
3	6117	353	5.8%	315	89.2%	32	9.1%	6	1.7%
4	6107	195	3.2%	170	87.2%	19	9.7%	6	3.1%
5	6299	99	1.6%	89	89.9%	9	9.1%	*	*

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 2015, have their one-year old test in January 2016, and then have their two-year old test in December 2016.

Appendix B: Statute

§ 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.)