



Vermont's Early Care & Learning Dividend

F E B R U A R Y 2 0 1 7

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Summary

This study demonstrates the economic value to state government and the public of investing in early care and learning (ECL) for children age 0–5 in Vermont. The analysis focuses on the potential benefits if current ECL programs were expanded to full day or full year, quality of programming was enhanced, and public funding was extended to also address the needs of children birth through age 2 likely to need care, per the recommendations of Vermont’s recent Blue Ribbon Commission on Financing High Quality, Affordable Child Care.

All results are based on Vermont’s demographic and socio-economic information combined with evidence of the impact of high-quality early care and learning programs.

The additional lifetime benefits generated by the expanded ECL programs reaches \$77,413 per child, while the additional government investment required is \$25,112 per child. Society would receive \$3.08 for every additional dollar invested by Vermont’s government in the expansion of ECL programs.

After deducting the added cost of proposed ECL expansion, each child would produce an additional \$52,000 in lifetime benefits. These benefits come from increased future earnings and taxes of children and mothers, reduced health care costs, reduced K–12 costs of special education and repeating grades, as well as reduced future crime, substance abuse, and child welfare costs.

The total net benefits after deducting costs from expanding early care and learning programs in Vermont could reach \$1.3 billion. This stems from annual benefits of nearly \$22 million per year for the next 60 years, just for the 2016 cohort of students under age 6.

The required investment to expand Vermont’s ECL system over the next five years would inject about \$1.9 billion into the local economy via wages paid to families working in the ECL system and increased economic activity for local businesses serving the ECL industry. The ripple effects of this investment would be significant and extend the original \$1.9 billion due to the indirect effects on business purchases, wages, and additional tax revenues generated.

Acknowledgments

The Vermont Business Roundtable believes that investments in early childhood are an important tool in ensuring the economic success of Vermont. After four decades of research into early childhood investments, the cost-benefit relationship has come into clearer focus demonstrating that investments in early childhood yield strong returns. In collaboration with the Permanent Fund for Vermont's Children and Vermont Businesses for Social Responsibility, our Research & Education Foundation determined that there was a need to better understand how investments in early care and learning programs in Vermont impact our young children and our economy.

Our work group would like to thank Wilder Research for their work on this report. Wilder's research utilized Vermont data sets in order to build Vermont-specific analysis. While many early childhood investment studies focus on specific child populations, Wilder was able to build a comprehensive view of how investments in high-quality early care and learning programs could impact Vermont children over the course of their lifetime, and how the benefits children and their families receive from high-quality early experiences directly translate to the broader Vermont economy.

We hope that you find this report useful in your considerations how we, as a state, can work together to increase strategic investments in early childhood to benefit our youngest children, our families, our businesses, and our economy.

Introduction

Research studies have demonstrated that investing in high-quality early care and learning (ECL) programs that prepare young children cognitively, physically, socially, and emotionally for success in school prevents or reduces needless public spending throughout the educational, health care, social welfare, and criminal justice systems for juveniles and adults.

James Heckman summarizes the case for investing in early education:

“Cognitive abilities are important determinants of socioeconomic success. So are socioemotional skills, physical and mental health, perseverance, attention, motivation, and self-confidence. They contribute to performance in society at large and even help determine scores on the very tests that are commonly used to measure cognitive achievement. If society intervenes early enough, it can improve cognitive and socioemotional abilities and the health of disadvantaged children. These interventions are estimated to have high benefit-cost ratios and rates of return.”¹

For example, children who attend high-quality early learning programs require less special education, repeat grades less, have fewer behavioral problems in school, graduate at a higher rate than others, and have less involvement in the very expensive criminal justice system as both juveniles and adults. As adults, they are more likely to be employed, earn higher incomes, and contribute more in taxes. These positive outcomes reduce future costs more effectively than later intervention such as job training or rehabilitation programs.²

Vermont’s ECL programs play a critical role in the economic success of the state. The economic value of these programs can be analyzed for publicly-funded early learning for children age 3–5 and also for the potential benefits of providing high-quality, publicly-supported early care to children 0–2.

¹ Heckman, J.J. (2008). The case for investing in disadvantaged young children. In Darling-Hammond, L., & Grunewald, R. (Eds.), *Big ideas for children: Investing in our nation’s future* (pp. 49-58). Retrieved from <http://heckmanequation.org/content/resource/case-investing-disadvantaged-young-children>

² Martin, J. P., & D. Grubb (2001). What works and for whom: A review of OECD countries’ experiences with active labor market policies. *Swedish Economic Policy Review*, 8(2), 9–56.

This study demonstrates the economic value to state government and the public of investing in early care and learning for children age 0–5 in Vermont. The analysis focuses on the potential benefits if the current ECL programs were expanded to full day or a full year³ and if public funding was extended to also address the needs of children birth through age 2 likely to need care.

All results are based on Vermont’s demographic and socio-economic information. For each estimation, we show per-child benefits, total benefits computed using Vermont’s population and enrollment data, and estimated returns on the additional investment in early care and learning required for the expansion.

The benefits associated with publicly-funded ECL programs identified in the literature⁴ include:

- Savings for Vermont’s government in its K–12 public education system through reduced special education costs and reduced grade retention
- Savings for Vermont’s justice system
- Additional tax revenues
- Reduced future health care costs paid by the government
- Benefits to participating children, including additional net lifetime earnings and reduced future health care costs
- Benefits to other members of society via reduced cost to victims of crime and reduced health care costs accrued by other private payers

³ The costs of the expanded services are based on the Blue Ribbon Commission on Financing High Quality, Affordable Child Care’s *Final Report* assumptions: we assume that center-based programs provide full-time enrollment. They also serve school-aged and vacation (summer and winter) care but this is not included in the model. There are many variations of school-aged services provided by center-based programs. The estimations do not include before- and after-school time care in the center-based model.

⁴ See: <http://www.wsipp.wa.gov/BenefitCost/Program/270> for meta analytic results

Methods and assumptions

Estimates are based on actual school graduation and expenditure data from Vermont’s Agency of Education, poverty rates, crime rates, and other demographic data for Vermont, and impact parameters⁵ from the existing research on effects of early childhood education programs.

In this study, we define “early learning” as pre-kindergarten educational programs. These are structured programs offering educational interventions specifically designed to help children gain emergent literacy and pre-math skills necessary for kindergarten. We also use the term “early care” for programs serving children age 0–2, although the programs targeting this age group may also encompass home visiting and other two-generational support services. We assume throughout the analysis that early care would generate economic benefits as long as early care includes services aiming to enhance children’s development and health and strengthen families.

Total benefits are computed using a combination of the following sources:

- Estimates of potential students computed by The Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care
- Population estimates from census data on Vermont’s school enrollment by age from the American Community Survey (ACS), 3–Year Estimates – Public Use Microdata Sample, 2011–2013
- Current enrollment for early learning from Vermont’s Agency of Education for 2016

Per-child lifetime benefits are estimated from age 5–65. Each outcome is assumed to occur at different times in the future; for example, reduced special education is expected to occur during each child’s school career (K–12), crime reductions and savings are accrued by age 36, while personal earnings and income taxes are accrued through age 65. All monetary values are expressed in 2015 dollars. All future benefits and costs are expressed in present-value terms discounted at a rate of 3 percent from the accruing time for each outcome.

The cost of programs (current investment and estimated cost of expansion) are from the Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care

⁵ Impact parameters or “effect sizes” found in evaluation studies are percentage changes in outcomes associated with participating in ECL programs. For example, ECL participants are 31% more likely to graduate from high school than a comparable group of non-participating children. The full list of effect sizes can be found in the accompanying technical report.

(2016).⁶ We assume participation of 2 years for children age 3–5, and 1.43 years for children age 0–2, and 3.43 years of average participation for children 0–5. Expansion costs account for required increased quality as described in the Blue Ribbon Commission report.

Estimated benefits of universal ECL show the value of a comprehensive approach that includes benefits from all income levels. Since ECL has been shown to have different levels of impact across income levels,⁷ the universal benefits estimates are the weighted average of low-income and high-income children. The low income group is based on eligibility to receive free and reduced price lunch as defined in Vermont’s school system.⁸

ECL has been shown to have a direct impact on health outcomes and social determinants of health. For example, integrating physical activity and improving nutritional requirements in early learning programs would generate improvements in future health, productivity, and other health outcomes which in turn would have positive economic consequences. However, the estimation of the monetary value of this impact is difficult. Our estimates of benefits from improved health only account for the indirect impact of higher educational achievement on future health. It is expected that this indirect impact would partially account for the direct impact of ECL on future health, so the estimated benefits from improved health in this report may be considered conservative.

Detailed methods and assumptions are summarized in a separate report.

⁶ Blue Ribbon Commission on Financing High Quality, Affordable Child Care (2016). *Blue Ribbon Commission on Financing High Quality, Affordable Child Care: Final report*. Report available at: <http://cdn.buildingbrightfutures.org/wp-content/uploads/2015/11/VT-BRC-Final-Report-1.pdf>

⁷ Lynch, R., & Vaghul, K. (2015). The benefits and costs of investing in early childhood education. Retrieved from Washington Center for Equitable Growth website <http://equitablegrowth.org/report/the-benefits-and-costs-of-investing-in-early-childhood-education/>

⁸ We use Vermont’s Agency of Education income eligibility for free and reduced price lunch instead of the eligibility standards from the Child Care Financial Assistance (CCFA). The number of low-income children in this report may be larger than estimates based on the CCFA guidelines. See the Technical Report for details.

Return on investment from expanded early care and learning in Vermont

Research shows that providing high-quality early education to children from birth to age 5 can generate significant benefits to society. Expanding Vermont’s publicly-funded early learning programs to include children age 0–2 and assuming high-quality full-time services would help society reap additional benefits from investing in early learning. We use evidence from the impact of the Abecedarian program to assess the benefits of providing high-quality early learning to children age 0–5.⁹ Wilder Research’s calculations also assume that the extended programs provide some basic services to mothers of participating children. This implies that the mothers would gain some additional economic benefits.

The ECL programs generate benefits across all sectors of society; however, policymakers may be interested in knowing how much society receives for every public dollar invested in the expansion of the ECL programs in Vermont. The return on investment (ROI) estimation demonstrates the benefits derived from the additional investment of public funds.

To compute the return on the expanded services, we compare the benefits generated by ECL programs today and the potential benefits that the expanded and improved ECL would create. We compare these benefits to the *additional* government investment required for the expansion. The ROI on the expanded ECL is the result of dividing the additional benefits by the additional government investment. When the ROI is larger than one dollar, the benefits are larger than the required costs, and thus society benefits from the investment.

$$\frac{\textit{Additional benefits of Expanded ECL}}{\textit{Additional costs of Expanded ECL}} = \textit{ROI of expanded ECL}$$

The additional lifetime benefits generated by the expanded ECL programs reaches \$77,413 per child, while the additional government investment required is \$25,112 per child.¹⁰ Society would receive \$3.08 for every additional dollar invested by Vermont’s government

⁹ Masse, L., & Barnett, W.S., (2010). A benefit cost analysis of the Abecedarian Early Childhood Intervention. Retrieved from https://www.researchgate.net/profile/William_Barnett6/publication/237466690_A_Benefit_Cost_Analysis_of_the_Abecedarian_Early_Childhood_Intervention/links/00b7d52780c8634795000000.pdf

¹⁰ We show the detailed source of costs and benefits in the following sections.

in the expansion of ECL programs. After deducting costs, each child would produce more than \$52,000 in lifetime benefits to society.

1. Return on investment to Vermont’s Government from expanded publicly-funded early care and learning

	Current ECL programs	Expanded ECL programs	Net benefits of ECL expansion (Expanded minus current)
Additional government investment required per child			\$25,112
Benefits minus costs			\$52,301
Total lifetime value per child	\$16,338	\$93,751	\$77,413
Return on investment			\$3.08

The people of Vermont would receive \$3.08 in benefits from every dollar invested by the government in the expansion of early care and learning programs in the state.

Total benefits from expanded early care and learning programs

The Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care said that a significant portion of Vermont’s birth to 5 population is likely to need some form of child care. The report defines this population as children under 6 who have all available parents in the labor force; this equates to 70.4% of Vermont children under age 6. There are 36,607 children under 6 in Vermont and around 25,764 of them would require early care since their parents are in the labor force. We assume that these children could receive high-quality early learning services as defined in this report.

2. Children in need of early care and learning in Vermont

	Population	In need of early learning (70%)
Pop under 6	36,607	25,764
Pop age 0–2	18,247	12,842
Pop age 3–5	18,360	12,922

Note. Estimates from the Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care (2016) and author’s estimation derived from the Vermont Department of Health population estimates.

If Vermont were to expand public funding to provide early learning to all children birth through 5 likely to need this service, the additional lifetime benefits from the more than 25,000 participating children would reach \$1.9 billion, with net benefits of \$1.3 billion after deducting the total additional government investment.

3. Total benefits from expanded publicly-funded early care and learning

	Millions
Benefits for 2016 cohort ^a	\$1,994
Total cost for 2016 cohort	\$647
Net benefits	\$1,347

^a Cohort of 25,764 children with both parents in labor force.

The total net benefits from expanding early care and learning programs in Vermont could reach \$1.3 billion, which equates to nearly \$22 million per year for the next 60 years for this cohort of children.

Future benefits

Each year, enrollment in early learning programs would vary depending on population growth, migration trends, and attrition rates from the programs. Future benefits would increase with each child that enters the system as long as the current investment in ECL programs remains at equivalent levels shown in this report.

Benefits of increasing access to high-quality early care and learning programs in Vermont

The average lifetime benefit per child of expanded publicly-funded, high-quality ECL programs is estimated at \$93,752. The participating children and their parents accrue the majority of these benefits. The combined additional lifetime earnings of mothers and children can reach more than \$78,000. Children who achieve kindergarten readiness are more likely to graduate from high school and, thus, experience higher future earnings. Similarly, mothers whose children are enrolled in ECL programs have more time to work or to attend school, consequently increasing their potential earnings.

Vermont's government accrues approximately 19 percent of these benefits and would receive \$16,637 per child. Most public benefits come from reduced health care costs and increased tax revenues from personal earnings of participants and mothers.

The complete list of benefits from expanded ECL programs include:

4. Per-child benefits from expanded publicly-funded early care and learning

	Benefit per child
Total lifetime value per child	\$93,752
Estimated savings and revenue for VT taxpayers	\$16,637
Estimated K–12 savings	\$1,993
Savings in special education costs due to reduced incidence of non-cognitive disabilities	\$1,328
Savings in K–12 expenditures due to fewer students repeating a grade	\$665
Savings and revenue for VT taxpayers in selected areas	\$14,644
Savings in average incarceration costs (adult justice system only) due to fewer felony incarcerations	\$858
Food assistance	\$39
Savings from reduced child welfare costs (child abuse and foster care)	\$62
Increased tax revenues from educational achievement	\$1,502
Increased tax revenues from increased maternal earnings ^b	\$3,296
Savings in reduced use of unemployment insurance due to increased employment	\$77
Savings in health care costs from increased academic achievement (high school) ^c	\$8,810
Estimated additional savings and benefits to participating children	\$78,876
Additional lifetime income (after taxes)	\$33,957
Increased maternal earnings (after taxes) ^d	\$45,169
Net cash transfers (reduced public assistance payments to individuals)	-\$39
Savings in health care costs from increased academic achievement (high school) ^b	-\$211
Estimated additional savings and benefits to other members of society	-\$1,761
Reduced costs to crime victims	\$303
Savings in treatment costs and value of increased productivity and lifespan associated with reduced substance misuse - Child	\$592
Savings in health care costs from reduced depression symptoms	\$265
Savings in health care costs from increased academic achievement (high school) ^d	-\$2,921

^a Includes benefits from mothers.

^b Earnings taken from Masse & Barnett (2002), average earnings are not specifically from VT.

^c Computed using North East MEPS health expenditures by educational level and adjusted using VT data.

^d Includes savings to federal government

Some outcomes show negative signs. For instance, participants would experience an increase in health care costs paid out of their pocket when they achieve high academic achievement. This is a consequence of increased income and therefore being able to pay for their health care. Similarly, other private payers (more likely private insurers) would experience an increase in health care costs paid to these higher educated children. The government would achieve most of the net benefits associated with improved health, as it would no longer be paying for the care of uninsured or low-income adults. As Vermont transitions to an “all-payer” health care model in the future, the benefits associated with improved health and reduced health care costs would change. There is currently insufficient information to compute future benefits under the new system.

Additional benefits per child from expanded ECL programs

As explained above, the return on investing in expanding ECL programs in Vermont is computed by comparing the potential benefits of the expanded programs to the benefits generated by the ECL programs as they are today. The current benefits generated by existing ECL in Vermont are \$16,338, while the potential benefits per child of the expanded ECL programs can reach \$93,751. The expanded programs would generate \$75,413 more than the current programs for every participating child.

5. Additional per-child benefits from expanded publicly-funded early care and learning

	Current ECL	Expanded ECL	Additional benefits
Total lifetime value per child	\$16,338	\$93,751	\$77,413
Estimated savings and revenue for VT government due to increased early education	\$4,911	\$16,638	\$11,727
Estimated K–12 savings	\$630	\$1,993	\$1,363
Estimated additional savings and benefits to participating children	\$12,284	\$78,876	\$66,591
Estimated additional savings and benefits to other members of society	-\$857	-\$1,762	-\$905

Note. Negative values indicate additional costs.

During early implementation of Vermont’s voluntary, universal pre–K program, known as Act 166, approximately 7,300 children age 3–5 were enrolled in publicly-funded early learning programs (2015–16 school year). Approximately 2,858 children can be categorized as low-income, while 4,443 come from higher income households. Most of these children receive services for approximately 2 years. The economic benefits from each child can reach \$32,337 and total more than \$44 million. Society gets a return of \$1.23 for every dollar currently invested in these programs. Detailed estimates of benefits from

current ECL programs are presented in the Appendix and in the accompanying technical report.

Government investment in expanded early care and learning programs

The cost of the expansion and improvement of the ECL programs requires a significant allocation of public funds. The Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care estimates the total operating cost of high-quality early care and learning for children with both parents in the labor force at \$206 million per year. Dividing this total cost by the 25,764 children in this group results in an average annual cost per child of \$ 7,993. Assuming that each child receives about 3.48 years of service (1.48 years from 0–2 and 2 years until age 5), the present value cost per child for the time of participation is estimated at \$25,112.

6. Cost of providing high-quality early care and learning to Vermont children birth through 5

	Demand	Number of children	Millions			
			Cost of high quality	Current state investments	Estimated family contribution	Estimated additional investment needed
Children with both parents in the workforce	70.4%	25,771	\$598	\$129	\$261	\$206
All children birth to 5	100%	36,607	\$849	\$129	\$371	\$347

Source. The Vermont Blue Ribbon Commission on Financing High Quality, Affordable Child Care (2016). Figure 1. Final Report. Report available at <http://cdn.buildingbrightfutures.org/wp-content/uploads/2015/11/VT-BRC-Final-Report-1.pdf>

This additional investment refers to the “perceived demand” of care from children with parents in the labor force (70.4% of children under 6 in Vermont). This demand assumes full-time enrollment with 50 percent of children attending center-based ECL and the other 50 percent going to home-based programs. The cost includes operating costs of each type of provider and is adjusted by age group and enrollment trends in the state.¹¹

¹¹ See full report from the Blue Ribbon Commission for detailed computations and assumptions.

Conclusions

Investing in early childhood education generates improvements in educational and social outcomes, as well as economic benefits. Some of the benefits associated with early care and learning materialize in the years following participation. These benefits include improved academic performance and reduced need for special education. Also, participating mothers capitalize on more available time to allocate to work or study. The benefits of ECL go far beyond these short-term benefits. As participants age, their improved outcomes in education, health, and social behavior generate benefits across many sectors of society and last for the rest of their life. Long-term benefits include avoided future costs of crime and health care costs. Furthermore, there may be significant benefits from the second generation of children born to ECL participants. For instance, children of participants with higher educational levels would be more likely to attain higher educational levels themselves and carry on similar positive outcomes as their parents.

This report summarizes many of these short- and long-term benefits and shows that investing in expanding ECL programs in Vermont can generate economic returns of more than \$3 for every dollar invested in the expanded ECL programs. Vermont has the potential to accrue more than \$1.3 billion in net benefits from its investment in expanding its ECL programs.

The estimated benefits do not include indirect economic benefits derived from the more than \$1.9 billion invested from other sources in the ECL expansion over the period of five years. This investment would impact the local economy via wages and operational inputs paid to working families and local businesses. Working families with children in the system would directly benefit from this investment, as well families providing services to the programs. The ripple effects would spread thru society, including the public sector, which would benefit local government tax revenues and long-term savings from avoided future costs.

More than \$1.9 billion invested in ECL over the next five years would be directly injected into the local economy via wages paid to working families and increased economic activity for local businesses and increasing revenues and savings to the local government.

Low-income children would generally show higher returns on investment on early learning. This would be particularly relevant in areas such as child welfare and criminal justice. The proposed expanded and high-quality ECL approach would benefit more than 10,000 low-income children at risk of academic failure in Vermont. These are the most vulnerable members of society who, with this early investment, will likely achieve their potential. The cost of not investing in Vermont's ECL today are high. Vermont's economy would lose more than \$1.3 billion in lost earnings, government resources, and other unrealized benefits. Investing in ECL now would allow these children to avoid poverty traps, fully contribute to Vermont's social and economic development, and avoid future costs.

Recommendations and future research

As policy makers, stakeholders, and Vermont citizens work on improving and expanding the ECL system in the state, the Vermont Early Childhood Care and Learning Investment Work Group will continue to monitor the growth and development of the system as a critical piece of Vermont's economic success.

The multiplicative effect of the investment in the new ECL programs can be quantified using standard multiplier analysis. This analysis can be conducted ad-hoc to determine the potential impact of different levels of investment. This type of research would add another layer of information that would complement the economic benefits generated by investing in ECL in the state.

Appendix

Return on investment of Vermont's early care and learning in the context of the pre-K evaluation literature

ROI estimations from early learning interventions like the Child-Parent Centers in Chicago (CPC),¹² Head Start, and other state-managed programs show ROIs between \$2.97 and \$10 per dollar invested. (See meta-analysis results from the Washington State Institute for Public Policy for a summary of cost-benefit results.¹³) A recent report from The Heckman Group shows returns of \$13 per invested dollar in birth to 5 programs such as the Abecedarian program.¹⁴

However, three factors make Vermont's ECL ROI different from other popular ECL evaluations. First, Vermont's ECL investment is significantly higher than CPC, Head Start, and other state-managed early learning programs. For instance, Vermont's per child cost of nearly \$40,000 (with \$24,000 in additional investment for the enhanced programs) is almost three times CPC's cost of \$9,700 (2015 dollars) or \$7,100 of state-managed ECL in Washington State. Vermont's high investment results in a lower ROI. This difference may reflect the quality of programs in Vermont or the more complete cost estimation carried out by the Blue Ribbon Commission that includes: all comprehensive services currently provided in public schools, including special education and a full day with a certified teacher at a slightly higher price point; and low staff-to-student ratios; (Vermont Blue Ribbon Commission Report, 2016). Not all these cost items are included in previous ECL evaluations.

Second, traditional ECL evaluations refer to programs that specifically target children at risk of school failure. The at-risk population generates higher returns than general population children. Vermont's ECL programs are universal, thus the average economic return is expected to be lower than the ROI found in the ECL literature focused on low-income, at-risk children.

Third, the ROI estimations found in the literature include benefits from reduced future crime that include large, intangible, and material costs to victims. We suggest these costs may be too high. Thus, we use average material losses to victims of felonies in Vermont to

¹² Reynolds, A. J., Temple, J. A., White, B. A. B., Ou, S.R. & Robertson, D. L. (2011). Age 26 cost-benefit analysis of the Child-Parent Center Early Education Program. *Child Development*, 82, 379–404. doi:10.1111/j.1467-8624.2010.01563.x

¹³ Washington State Institute for Public Policy. (2016). Benefit-cost results. Retrieved from <http://www.wsipp.wa.gov/BenefitCost?topicId=4>

¹⁴ Heckman, J.J. (2016). *There's more to gain by taking a comprehensive approach to early childhood development* [Summary]. Retrieved from <http://heckmanequation.org/content/resource/lifecycle-benefits-influential-early-childhood-program-one-pager>

approximate the average potential cost to victims that are avoided due to ECL. These average costs are significantly lower than those used in some of the popular ECL literature.

For these reasons, we recommend interpreting Vermont's ECL ROI within the context of the particular characteristics of the state's ECL programs and avoid equating to other ROI of early learning that would not be an "apples to apples" comparison.

Benefits from current enrollment in Vermont's publicly-funded early care and learning programs

During early implementation of Vermont's voluntary, universal pre-K program, known as Act 166, approximately 7,300 children age 3–5 were enrolled in publicly-funded early learning programs (2015–16 school year). Most of these children receive services for approximately 2 years. The economic benefits from each child can reach \$32,337 and total more than \$44 million. Society gets a return of \$5.55 for every dollar invested in these programs. In addition, 434 children under age 3 were enrolled in Early Head Start programs during that period. The benefits for this age group are derived from evaluations of Early Head Start. Although, this program shows a positive impact on many children and family outcomes, the economic benefits of the program are modest and only reach about \$438 per child.¹⁵

Per-child benefits in Vermont's current early care and learning system

The average lifetime benefit per child receiving publicly-funded early learning is estimated at \$32,337. About three-quarters of these benefits are accrued by participating children from their increased future earnings. Vermont's government accrues \$11,699 per low-income child and \$8,149 per high-income child. Most public benefits come from reduced health care costs. The average benefit for children under age 6 currently enrolled in publicly funded early care and learning programs is \$16,338.

¹⁵ Washington State Institute for Public Policy. (2016). Early Head Start. Retrieved from <http://www.wsipp.wa.gov/BenefitCost/Program/97>

A1. Per-child benefits from current publicly-funded early care and learning

	Age 0–2	Age 3–5	Average Age 0–5 ^c
Total lifetime value per child	\$438	\$32,337	\$16,338
Estimated savings and revenue for VT government due to increased early education	\$312	\$9,538	\$4,911
Estimated K–12 savings	\$347	\$915	\$630
Savings in special education costs due to reduced incidence of non-cognitive disabilities	\$282	\$357	\$319
Savings in K–12 expenditures due to fewer students repeating a grade	\$65	\$557	\$311
Savings and revenue for VT government in selected areas	-\$35	\$8,623	\$4,281
Savings in average incarceration costs (adult justice system only) due to fewer felony incarcerations	-	\$1,125	\$561
Net cash transfers (reduced public assistance payments to individuals)	-\$35	-	-\$18
Increased tax revenues from educational achievement	-	\$1,011	\$504
Savings in health care costs from increased academic achievement (high school) ^a	-	\$6,487	\$3,234
Estimated additional savings and benefits to participating children	\$35	\$24,610	\$12,284
Additional lifetime income (after taxes)	-	\$24,765	\$12,344
Net cash transfers (reduced public assistance payments to individuals)	\$35	-	\$18
Savings in health care costs from increased academic achievement (high school) ^b	-	-\$156	-\$78
Estimated additional savings and benefits to other members of society	-	-\$1,810	-\$857
Reduced costs to crime victims	-	\$340	-\$170
Savings in treatment costs and value of increased productivity and lifespan associated with reduced substance misuse - Mother	\$20	-	\$10
Savings in health care costs from reduced depression symptoms	-	-	\$36
Savings in health care costs from increased academic achievement (High school) ^b	-	-\$2,151	-\$1,072

Note. Negative values indicate additional costs.

^a Computed using North East MEPS health expenditures by educational level and adjusted using VT data.

^b Includes savings to federal government.

^c Weighted averages of the 0–2 and 3–5 groups based on the proportion of children in each group in the population.

Return on current investment in publicly-funded early care and learning

The current cost to the government of publicly-funded early learning in Vermont for a child that receives part-time services for about 2 years is \$3,094.¹⁶ The present value of two years of services reaches \$5,825 per child. The total present value cost of participating in an Early Head Start program is \$10,995.¹⁷ The weighted average for both age groups is \$8,418. The return on the current investment in early care and learning in Vermont for children under age 6 is \$1.94.

A2. Return on investment from current publicly-funded early learning

	Age 0–2	Age 3–5	Average age 0–5
Total lifetime value per child	\$438	\$32,337	\$16,338
Government cost per child	10,995	\$5,825	\$8,418
Benefits minus costs	-\$10,557	\$26,512	\$7,920
Return on investment	\$0.04	\$5.55	\$1.94

Total benefits from current enrollment

Approximately 7,300 children age 3–5 are enrolled in publicly-funded early learning programs in Vermont for the 2016 school year. They generate lifetime benefits of more than \$193 million after program costs. The government of Vermont accrues approximately 29 percent of these benefits: nearly \$57 million or approximately \$1 million annually for the next 60 years, just for this cohort of students.

¹⁶ This represents the state contribution to the program. The total average cost to society is close to \$15,000, based on the publicly-funded pre-K 2015-16 academic year tuition payment made by the Vermont Agency of Education for each participating student for 10 hours per week for 35 weeks per year. This is the average annual operating cost for the five settings of pre-K for children age 3 and 4 included by the Blue Ribbon Commission in its report: school based programs, child care center, family center, and NIERC.

¹⁷ Washington State Institute for Public Policy. (2016). Early Head Start. Retrieved from <http://www.wsipp.wa.gov/BenefitCost/Program/97>