

State and district early childhood education programs Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated December 2013.

Current estimates replace old estimates. Numbers will change over time as a result of model inputs and monetization methods.

The WSIPP benefit-cost analysis examines, on an apples-to-apples basis, the monetary value of programs or policies to determine whether the benefits from the program exceed its costs. WSIPP's research approach to identifying evidence-based programs and policies has three main steps. First, we determine "what works" (and what does not work) to improve outcomes using a statistical technique called meta-analysis. Second, we calculate whether the benefits of a program exceed its costs. Third, we estimate the risk of investing in a program by testing the sensitivity of our results. For more detail on our methods, see our [Technical Documentation](#).

Program Description: In this analysis, we include pre-kindergarten programs funded by states or school districts that are universal or that target low-income students. Comparison students could have received any other child care options available in the community, including care by family members, another preschool program, subsidized or unsubsidized child care, or Head Start.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$12,989	Benefit to cost ratio	\$4.63
Participants	\$14,311	Benefits minus costs	\$26,802
Others	\$7,730	Chance the program will produce	
Indirect	(\$850)	benefits greater than the costs	83 %
<u>Total benefits</u>	<u>\$34,180</u>		
<u>Net program cost</u>	<u>(\$7,377)</u>		
Benefits minus cost	\$26,802		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to: ¹	Benefits to:				
	Participants	Taxpayers	Others ²	Indirect ³	Total
Crime	\$0	\$1,809	\$3,983	\$908	\$6,700
Labor market earnings associated with high school graduation	\$14,043	\$6,377	\$6,444	\$0	\$26,864
K-12 grade repetition	\$0	\$403	\$0	\$203	\$606
K-12 special education	\$0	\$2,676	\$0	\$1,335	\$4,011
Health care associated with educational attainment	(\$585)	\$2,148	(\$2,330)	\$1,082	\$315
Costs of higher education	(\$1,118)	(\$1,317)	(\$367)	(\$662)	(\$3,463)
Subtotals	\$12,340	\$12,096	\$7,730	\$2,866	\$35,032
From secondary participant					
Labor market earnings associated with employment	\$1,970	\$895	\$0	\$0	\$2,865
Public assistance	\$1	(\$2)	\$0	(\$3)	(\$4)
Subtotals	\$1,971	\$893	\$0	(\$3)	\$2,861
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$3,713)	(\$3,713)
Totals	\$14,311	\$12,989	\$7,730	(\$850)	\$34,180

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

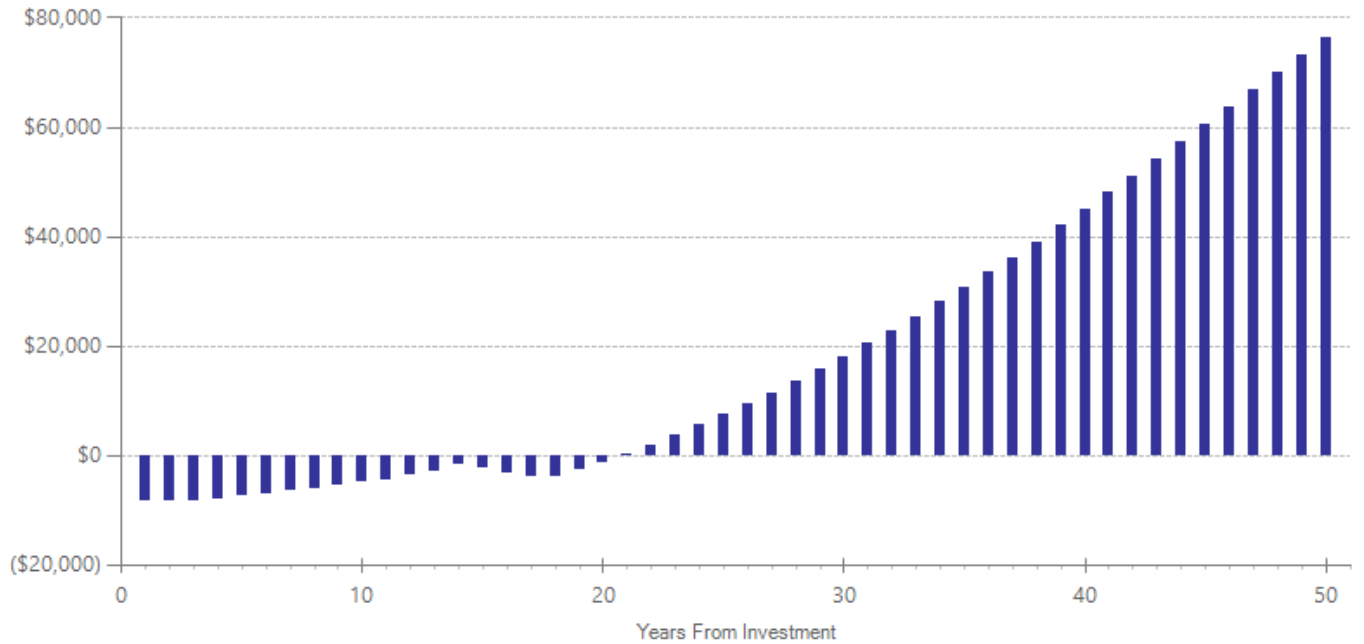
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$6,934	2012	Present value of net program costs (in 2017 dollars)	(\$7,377)
Comparison costs	\$961	2012	Cost range (+ or -)	10 %

Our per-participant estimate reflects the total cost of Washington State’s Early Childhood Education and Assistance Program (ECEAP), including administrative costs per slot plus the amount of state-subsidized child care subsidies distributed to kids in ECEAP (http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf). Comparison group costs reflect the range of other options that low-income children in Washington might receive, including state-subsidized child care and Head Start. Comparison group costs were calculated by dividing the amount of state-subsidized child care subsidies distributed to ECEAP-eligible families who did not participate in ECEAP by the number of children (30,936). The number of eligible students includes all Head Start (HS) students; while HS eligibility is up to 130% of the federal poverty line (FPL), students under 100% FPL are given first priority (http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf and personal communication with Nicole Rose, Department of Early Learning, Early Learning Management System on December 4, 2013).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

Outcomes measured	Treatment age	Primary or secondary participant	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
					First time ES is estimated			Second time ES is estimated				
					ES	SE	Age	ES	SE	Age	ES	p-value
Crime	4	Primary	1	902	-0.251	0.174	26	-0.251	0.174	36	-0.251	0.149
High school graduation	4	Primary	2	1184	0.231	0.091	21	0.231	0.091	21	0.231	0.011
K-12 grade repetition	4	Primary	4	2023	-0.351	0.068	12	-0.351	0.068	12	-0.351	0.001
K-12 special education	4	Primary	3	1670	-0.118	0.193	14	-0.118	0.193	14	-0.118	0.544
Test scores	4	Primary	17	10799	0.303	0.029	4	0.064	0.031	17	0.303	0.001
Earnings*	32	Secondary	1	5253	0.024	0.042	33	0.000	0.000	34	0.024	0.566
Employment	32	Secondary	1	5253	-0.003	0.017	33	0.000	0.000	34	-0.003	0.851
Public assistance	32	Secondary	1	5253	0.000	0.040	33	0.000	0.000	34	0.000	1.000

*The effect size for this outcome indicates percentage change, not a standardized mean difference effect size.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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