State early childhood education programs: Universal
Pre-K to 12 Education
Benefit-cost estimates updated December 2023. Literature review updated July 2019.

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: To be considered a pre-kindergarten program, the program must have had an age requirement of three or four at the start of the program and an education focus. This analysis includes studies of children attending a state- or district-funded universal pre-kindergarten program, where all children in the state/district are eligible for the program, after 1975. Programs examined offered ECE services on a part-time and/or full-time basis. Comparison students may have received child care provided by family/non-family members, another preschool program, or Head Start.

We exclude programs that provided childcare subsidies, focused on the provision of general childcare, focused on parent and child development, and/or provided more extensive wraparound services.

Benefit-Cost Summary Statistics Per Participant

Benefits to:			
Taxpayers	$8,457	Benefit to cost ratio	$3.59
Participants	$15,001	Benefits minus costs	$20,516
Others	$7,906	Chance the program will produce	
Indirect	($2,920)	benefits greater than the costs	80%
Total benefits	$28,445		
Net program cost	($7,929)		
Benefits minus cost	$20,516		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2022). 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.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | 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
K-12 grade repetition	4	3	513943	-0.156	0.117	9	-0.156	0.117	9	-0.156	0.181
Grade point average^	4	1	991	0.056	0.045	12	n/a	n/a	n/a	0.056	0.212
K-12 special education	4	1	991	-0.079	0.060	12	-0.079	0.060	12	-0.079	0.186
Suspensions/expulsions^	4	1	991	0.015	0.060	12	n/a	n/a	n/a	0.015	0.801
Executive function^	4	1	1009	0.183	0.045	4	n/a	n/a	n/a	0.183	0.001
Office discipline referrals^	4	1	29709	-0.010	0.011	7	n/a	n/a	n/a	-0.010	0.348
School attendance^	4	1	991	0.000	0.045	12	n/a	n/a	n/a	0.000	1.000
Test scores	4	4	4055	0.470	0.083	5	0.146	0.092	17	0.470	0.001

^WSIPP's benefit-cost model does not monetize this outcome.

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.

Detailed Monetary Benefit Estimates Per Participant

| Affected outcome: | Resulting benefits:[1] | Benefits accrue to: | | | | |
		Taxpayers	Participants	Others[2]	Indirect[3]	Total
Test scores	Labor market earnings associated with test scores	$6,368	$15,001	$7,906	$0	$29,275
K-12 grade repetition	K-12 grade repetition	$192	$0	$0	$96	$289
K-12 special education	K-12 special education	$1,897	$0	$0	$949	$2,846
Program cost	Adjustment for deadweight cost of program	$0	$0	$0	($3,964)	($3,964)
Totals		$8,457	$15,001	$7,906	($2,920)	$28,445

[1]In 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.
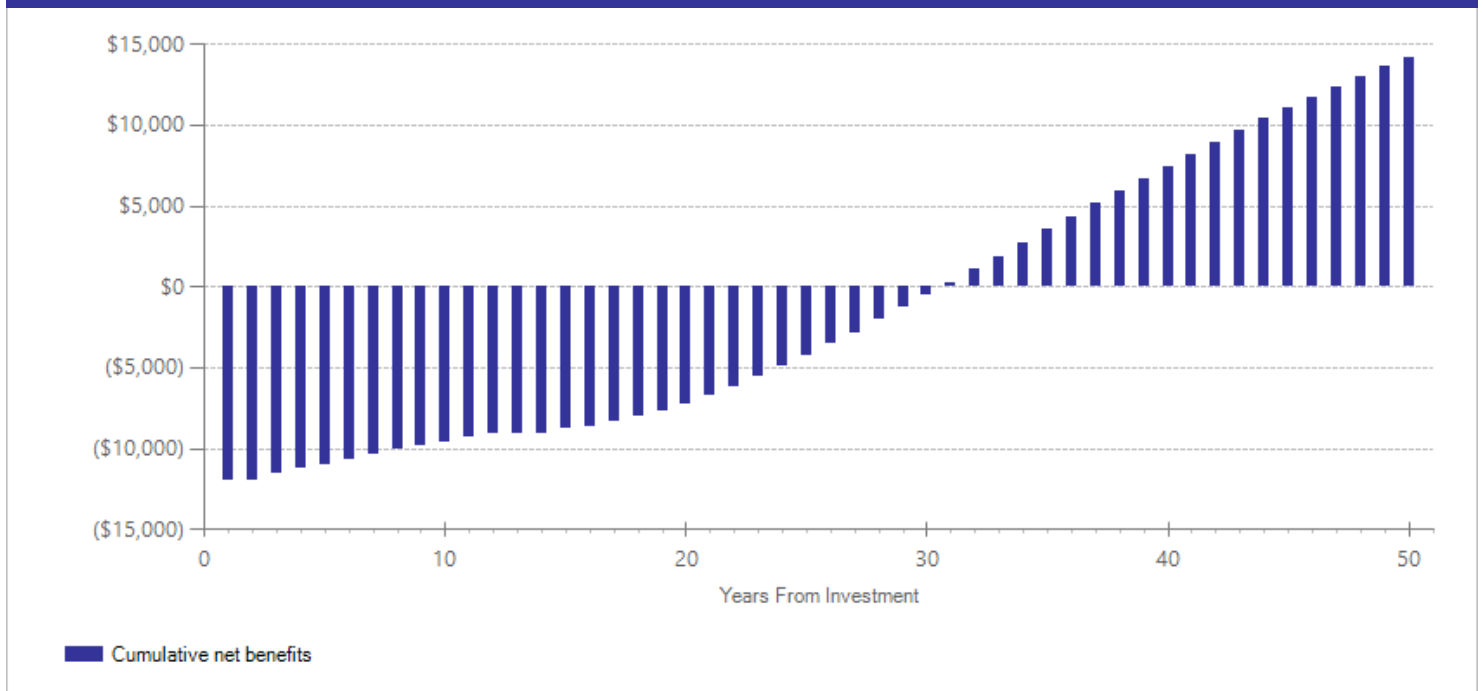
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	$9,330	2018	Present value of net program costs (in 2022 dollars)	($7,929)
Comparison costs	$2,340	2018	Cost range (+ or -)	25%

The cost of participation in universal early childhood education programs are estimated from Washington's Early Childhood Education Assistance Program (ECEAP) for low-income preschoolers (2019-20 ECEAP Contractor Slots, Models, Overincome Allotments, and Funding https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP_Contractor_slots_models_funding.pdf). The comparison group cost consists of an estimate of all children in Washington who would have been age-eligible to participate in ECEAP/Head Start (ignoring income/ other eligibility requirements) who are participating in Head Start, receiving state-funded childcare subsidies, or receiving no state-funded care. The cost of Head Start participation was provided by T. Saenz-Thompson (personal communication, Office of Head Start Region 10, October 24, 2019). The cost of receiving state-funded childcare subsidies is based on Washington's childcare subsidy reimbursement rates as of February 2019 (https://www.dcyf.wa.gov/node/1640). The comparison group cost is a weighted average of the costs of Head Start, state-subsidized childcare, and no state-funded care.
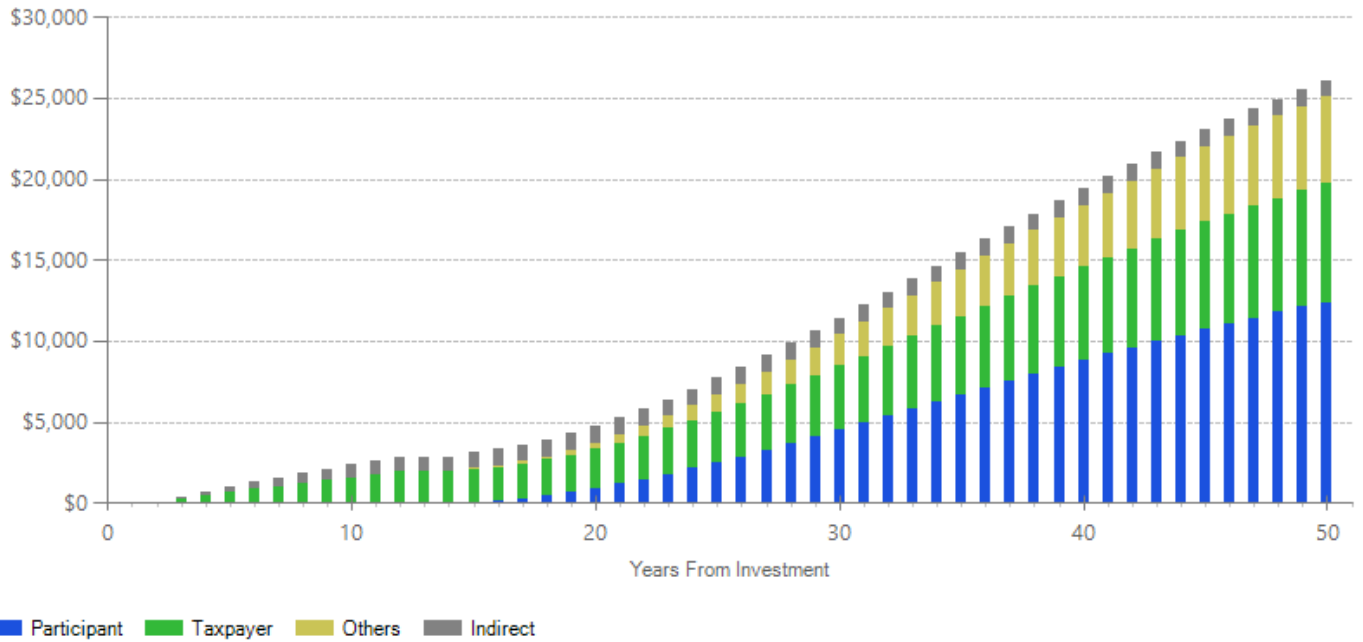
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our Technical Documentation.

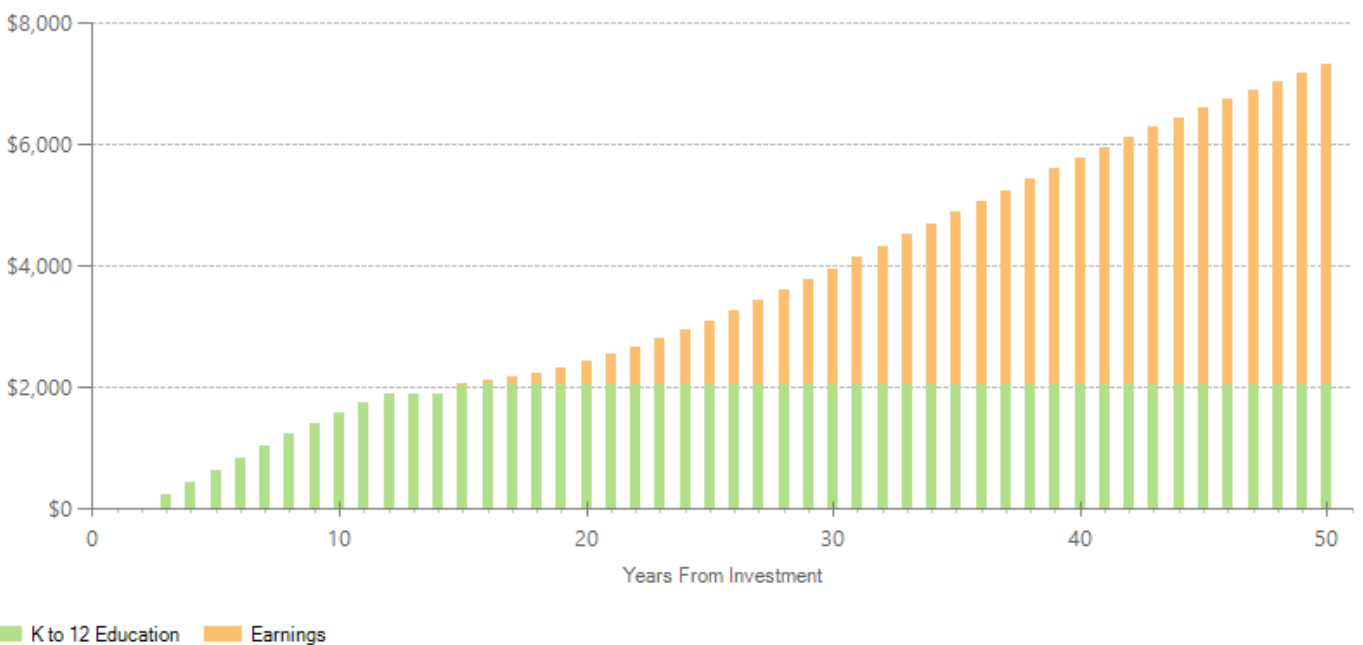## Benefits Minus Costs Over Time (Cumulative Discounted Dollars)

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 discounted dollars. 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.

Benefits by Perspective Over Time (Cumulative Discounted Dollars)

The graph above illustrates the breakdown of the estimated cumulative benefits (not including program costs) per-participant for the first fifty years beyond the initial investment in the program. These cash flows provide a breakdown of the classification of dollars over time into four perspectives: taxpayer, participant, others, and indirect. "Taxpayers" includes expected savings to government and expected increases in tax revenue. "Participants" includes expected increases in earnings and expenditures for items such as health care and college tuition. "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. "Indirect benefits" includes estimates of the changes in the value of a statistical life and changes in the deadweight costs of taxation. If a section of the bar is below the $0 line, the program is creating a negative benefit, meaning a loss of value from that perspective.

Taxpayer Benefits by Source of Value Over Time (Cumulative Discounted Dollars)

The graph above focuses on the subset of estimated cumulative benefits that accrue to taxpayers. The cash flows are divided into the source of the value.

Citations Used in the Meta-Analysis

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