

## Head Start

### Pre-K to 12 Education

Benefit-cost estimates updated December 2019. 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: Head Start is a federal program that funds early childhood education, social services, and health services for low-income children ages 0-5 to support child development and learning. Studies in this analysis focus on preschool Head Start programs for children ages 3-5 years old. Head Start offers half- and full-day programs that typically last during the school year.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$7,694	Benefit to cost ratio	\$2.42
Participants	\$10,053	Benefits minus costs	\$12,657
Others	\$6,704	Chance the program will produce	
Indirect	(\$2,871)	benefits greater than the costs	69 %
<b>Total benefits</b>	<b>\$21,580</b>		
<b>Net program cost</b>	<b>(\$8,923)</b>		
<b>Benefits minus cost</b>	<b>\$12,657</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2018). 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	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	p-value
					ES	SE	Age	ES	SE	Age		
Alcohol use before end of middle school <sup>^^</sup>	4	Primary	1	634	-0.211	0.069	12	-0.211	0.069	23	-0.211	0.002
Crime	4	Primary	3	988	-0.144	0.137	19	-0.144	0.137	27	-0.144	0.295
Employment <sup>^^</sup>	4	Primary	1	461	-0.157	0.099	20	0.000	0.000	0	-0.157	0.114
Enroll in any college <sup>^</sup>	4	Primary	4	1658	-0.071	0.051	25	0.000	0.000	0	-0.071	0.163
Externalizing behavior symptoms	4	Primary	7	6203	-0.030	0.026	8	-0.016	0.017	11	-0.030	0.258
Grade point average <sup>^</sup>	4	Primary	1	255	0.012	0.071	13	0.000	0.000	0	0.012	0.868
High school graduation	4	Primary	4	1485	0.126	0.069	18	0.126	0.069	19	0.126	0.069
Illicit drug use before end of middle school	4	Primary	1	634	0.116	0.091	12	0.116	0.091	23	0.116	0.201
Internalizing symptoms	4	Primary	2	1905	0.013	0.048	8	0.013	0.048	11	0.013	0.784
K-12 grade repetition	4	Primary	6	2848	-0.122	0.063	13	-0.122	0.063	13	-0.122	0.051
K-12 special education	4	Primary	4	1734	-0.112	0.101	14	-0.112	0.101	14	-0.112	0.268
Major depressive disorder	4	Primary	1	526	-0.190	0.062	15	0.000	0.310	19	-0.190	0.002
Obesity	4	Primary	2	1419	0.124	0.157	6	0.000	0.101	9	0.124	0.430
School attendance <sup>^</sup>	4	Primary	1	214	0.080	0.075	13	0.000	0.000	0	0.080	0.288
Smoking before end of middle school <sup>^^</sup>	4	Primary	1	634	-0.131	0.072	12	-0.131	0.072	23	-0.131	0.070
Social and emotional development	4	Primary	4	4158	0.012	0.039	7	0.000	0.000	0	0.012	0.749
Suspensions/expulsions <sup>^</sup>	4	Primary	1	263	0.064	0.093	13	0.000	0.000	0	0.064	0.490
Teen births under age 18	4	Primary	2	824	-0.126	0.253	17	-0.126	0.253	17	-0.126	0.619
Test scores	4	Primary	7	6046	0.129	0.029	5	0.040	0.032	17	0.129	0.001
Youth binge drinking <sup>^^</sup>	4	Primary	1	584	-0.096	0.078	16	-0.096	0.078	27	-0.096	0.218
Employment	29	Secondary	2	1775	0.079	0.094	31	0.000	0.000	32	0.079	0.401
GED attainment <sup>^</sup>	29	Secondary	2	1775	0.062	0.043	31	0.000	0.000	0	0.062	0.148
Graduate with any degree <sup>^</sup>	29	Secondary	2	1775	0.088	0.089	31	0.000	0.000	0	0.088	0.321

<sup>^</sup>WSIPP's benefit-cost model does not monetize this outcome.

<sup>^^</sup>WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

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: <sup>1</sup>	Benefits accrue to:				
		Taxpayers	Participants	Others <sup>2</sup>	Indirect <sup>3</sup>	Total
Crime	Criminal justice system	\$1,235	\$0	\$2,769	\$618	\$4,622
High school graduation	Labor market earnings associated with high school graduation	\$3,174	\$7,457	\$4,067	\$0	\$14,698
K-12 grade repetition	K-12 grade repetition	\$140	\$0	\$0	\$70	\$211
K-12 special education	K-12 special education	\$2,419	\$0	\$0	\$1,209	\$3,628
Externalizing behavior symptoms	Health care associated with externalizing behavior symptoms	\$58	\$16	\$60	\$29	\$164
Internalizing symptoms	Health care associated with internalizing symptoms	(\$7)	(\$2)	(\$8)	(\$4)	(\$21)
Obesity	Labor market earnings associated with obesity	\$0	\$0	\$0	\$0	\$0
High school graduation	Costs of higher education	(\$665)	(\$565)	(\$185)	(\$332)	(\$1,747)
Major depressive disorder	Mortality associated with depression	\$0	\$0	\$0	\$1	\$1
Obesity	Mortality associated with obesity	\$0	\$0	\$0	\$0	\$0
	<i>Subtotals</i>	<i>\$6,355</i>	<i>\$6,906</i>	<i>\$6,704</i>	<i>\$1,591</i>	<i>\$21,556</i>
From secondary participant						
Employment	Labor market earnings	\$1,340	\$3,146	\$0	\$0	\$4,486
	<i>Subtotals</i>	<i>\$1,340</i>	<i>\$3,146</i>	<i>\$0</i>	<i>\$0</i>	<i>\$4,486</i>
Program cost	Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$4,462)	(\$4,462)
<b>Totals</b>		<b>\$7,694</b>	<b>\$10,053</b>	<b>\$6,704</b>	<b>(\$2,871)</b>	<b>\$21,580</b>

<sup>1</sup>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.

<sup>2</sup>"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.

<sup>3</sup>"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

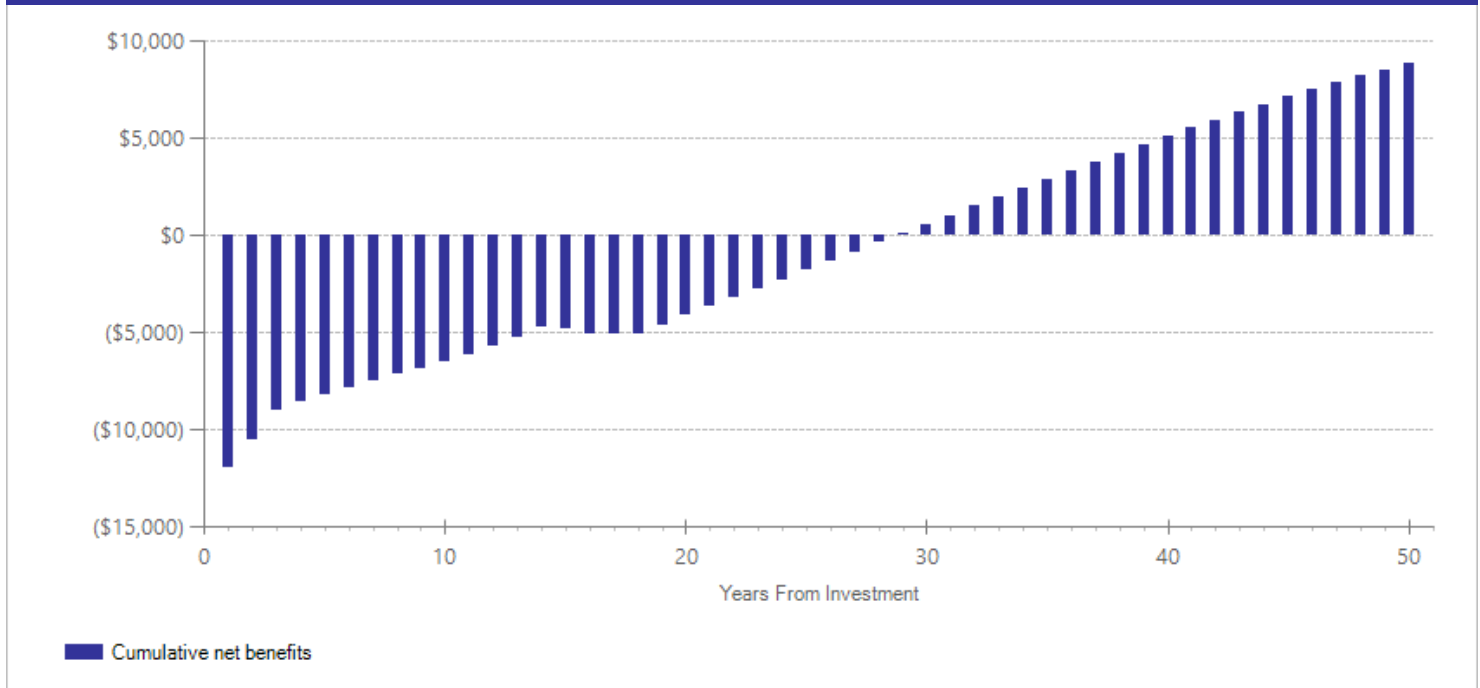
## Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$13,550	2018	Present value of net program costs (in 2018 dollars)	(\$8,923)
Comparison costs	\$4,750	2018	Cost range (+ or -)	20 %

The costs of Head Start participation are calculated by dividing the total federal funding by the total enrollment in Washington in 2019. The costs of Head Start participation were provided by T. Saenz-Thompson (personal communication, Office of Head Start Region 10, October 24, 2019). The comparison group consists of children receiving state-funded pre-kindergarten services, state-funded childcare subsidies, or children receiving no state-funded care. Costs for these children are estimated from Washington's Early Childhood Education Assistance Program (ECEAP) for low-income preschoolers (2018-19 ECEAP Caseload Forecast Report December 2018 [https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP\\_Caseload\\_Forecast.pdf](https://www.dcyf.wa.gov/sites/default/files/pdf/eceap/ECEAP_Caseload_Forecast.pdf)) and Washington's childcare subsidy reimbursement rates as of February 2019 (<https://www.dcyf.wa.gov/node/1640>). Comparison group costs are a weighted average of the costs in pre-kindergarten, state subsidized childcare, and no state-funded care.

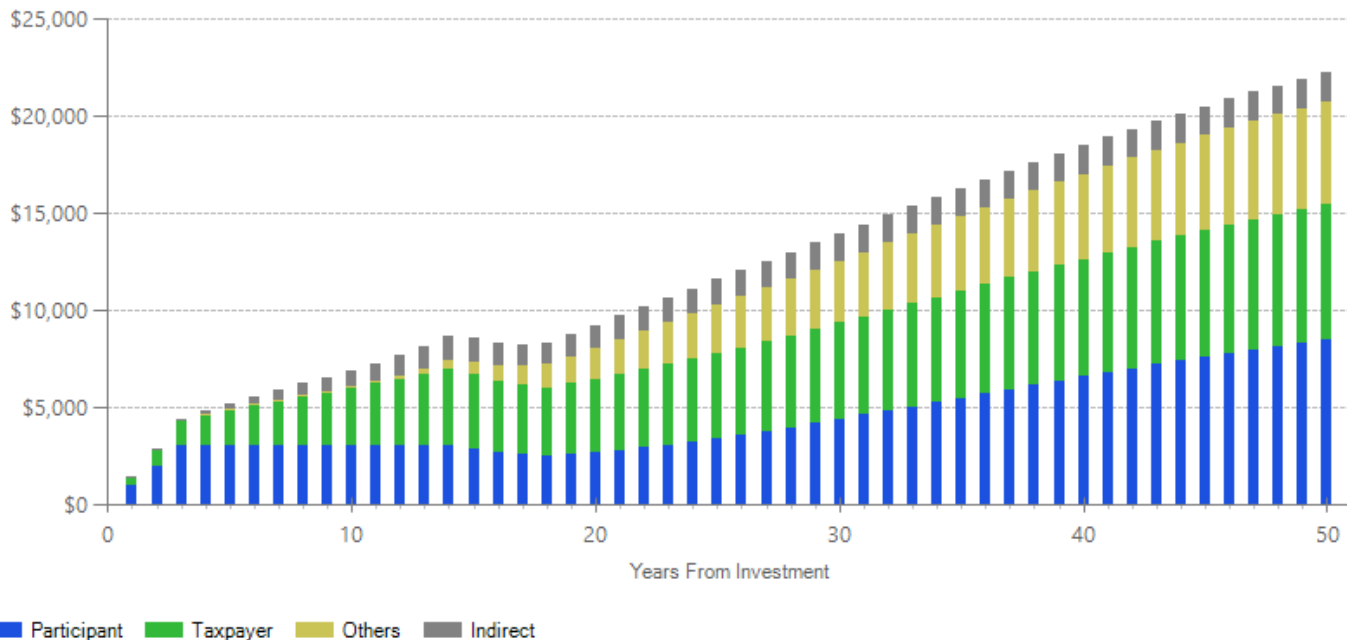
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty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

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



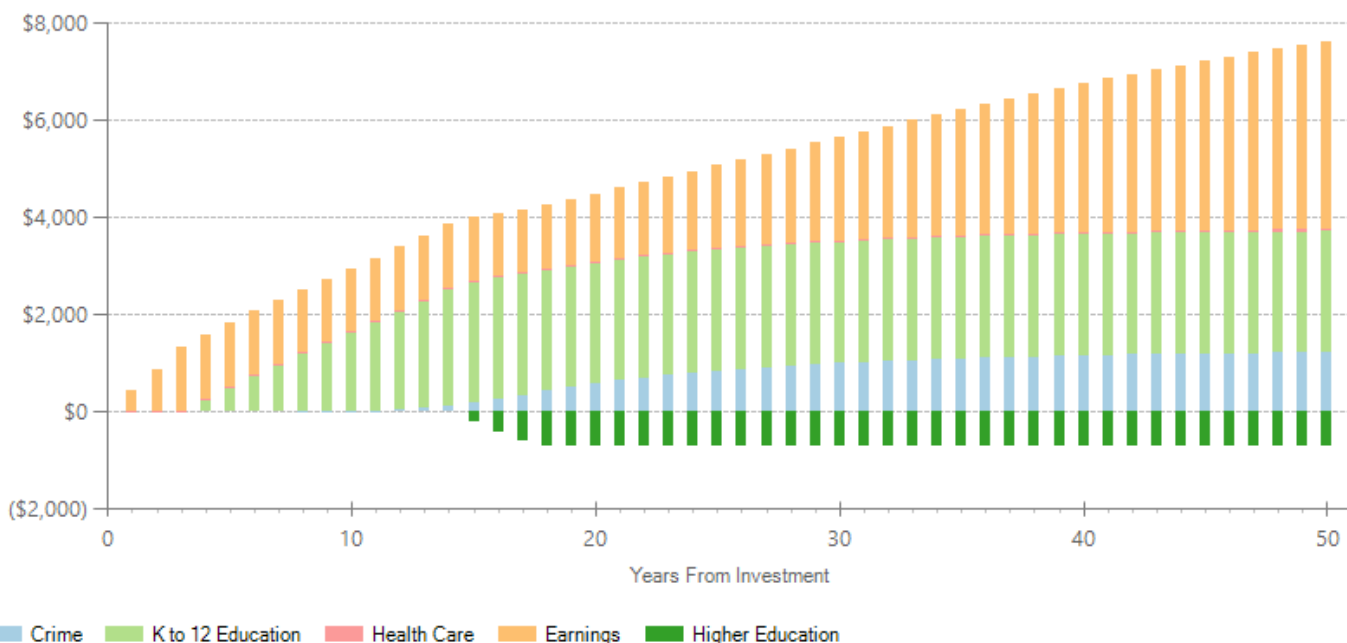
The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in discounted dollars. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost 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

- Aughinbaugh, A. (2001). Does Head Start yield long-term benefits? *The Journal of Human Resources*, 36(4), 641-665.
- Carneiro, P., & Ginja, R. (2014). Long-term impacts of compensatory preschool on health and behavior: Evidence from Head Start. *American Economic Journal: Economic Policy*, 6(4), 135-173.
- Coley, R.L., Votruba-Drzal, E., Collins, M., & Cook, K.D. (2016). Comparing public, private, and informal preschool programs in a national sample of low-income children. *Early Childhood Research Quarterly*, 36(3), 91-105.
- Currie J., & Thomas, D. (1995). Does Head Start make a difference? *The American Economic Review*, 85(3), 341-364.
- Currie, J., & Thomas, D. (1999). Does Head Start help Hispanic children? *Journal of Public Economics* 74(2), 235-262.
- Deming, D. (2009). Early childhood intervention and life-cycle skill development: Evidence from Head Start. *American Economic Journal: Applied Economics*, 7(3), 111-134.
- Frisvold, D. (2006). *Head Start Participation and childhood obesity* (Vanderbilt University Economics Working Paper No. 06-WG01). Nashville, TN: Vanderbilt University.
- Garces, E., Thomas, D., & Currie, J. (2002). Longer-term effects of Head Start. *The American Economic Review*, 92(4), 999-1012.
- Gormley, W.T., Phillips, D., & Gayer, T. (2008). Preschool programs can boost school readiness. *Science*, 320(5884), 1723-4.
- Lee, R., Zhai, F., Han, W., Brooks-Gunn, J., & Waldfogel, J. (2013). Head Start and children's nutrition, weight, and health care receipt. *Early Childhood Research Quarterly*, 28(4), 723-733.
- Lee, R., Zhai, F., Brooks-Gunn, J., & Han, W. (2014). Head Start participation and school readiness: Evidence from the early childhood longitudinal study-birth cohort. *Journal of Developmental Psychology*, 50(1), 202-215.
- Pages, R.J.C., Lukes, D.J., Bailey, D.H., & Duncan, G.J. (2019). *Elusive longer-run impacts of Head Start: Replications within and across cohorts* (EdWorkingPaper No. 19-27). Providence, RI: Annenberg Institute.
- Phillips, D., Gormley, W., & Anderson, S. (2016). The effects of Tulsa's CAP Head Start program on middle-school academic outcomes and progress. *Journal of Developmental Psychology*, 52(8), 1247-1261.
- Puma, M., Bell, S., Cook, R., Heid, C., Shapiro, G., Broene, P., . . . Spier, E. (2010). *Head Start impact study: Final report*. Washington, DC: U.S. Department of Health and Human Services.
- Roy, A. (2003). *Evaluation of the Head Start Program: Additional evidence from the NLSCM79 data* (Doctoral dissertation, University at Albany, State University of New York).
- Sabol, T.J., & Chase-Lansdale, P.L. (2015). The influence of low-income children's participation in Head Start on their parents' education and employment. *Journal of Policy Analysis and management*, 34(1), 136-161.
- U.S. Department of Health and Human Services. (2010). *Head Start impact study: Final report*. Washington, DC.
- Zhai, F., Brooks-Gunn, J., & Waldfogel, J. (2011). Head start and urban children's school readiness: A birth cohort study in 18 cities. *Developmental Psychology*, 47(1), 134-152.

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