

Full-day kindergarten

Benefit-cost estimates updated June 2016. 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 compare the effects of full day kindergarten programs with the effects of half day kindergarten among public school students.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$416	Benefit to cost ratio	\$0.10
Participants	\$860	Benefits minus costs	(\$2,448)
Others	\$358	Chance the program will produce	
Indirect	(\$1,350)	benefits greater than the costs	38 %
<u>Total benefits</u>	<u>\$283</u>		
<u>Net program cost</u>	<u>(\$2,731)</u>		
Benefits minus cost	(\$2,448)		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2015). 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
Labor market earnings associated with test scores	\$882	\$400	\$390	\$0	\$1,672
Health care associated with educational attainment	(\$7)	\$25	(\$28)	\$13	\$4
Costs of higher education	(\$15)	(\$10)	(\$5)	(\$5)	(\$35)
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$1,358)	(\$1,358)
Totals	\$860	\$416	\$358	(\$1,350)	\$283

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.

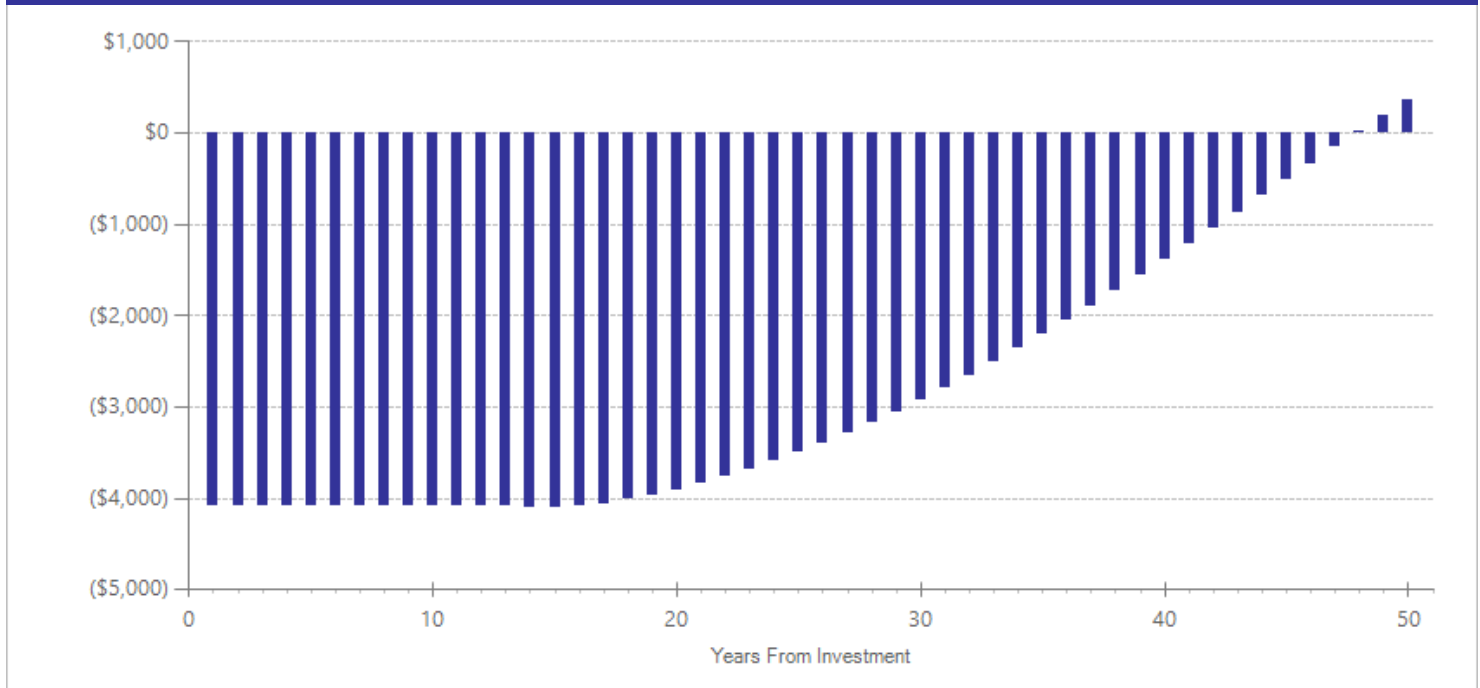
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$3,151	2012	Present value of net program costs (in 2015 dollars)	(\$2,731)
Comparison costs	\$505	2012	Cost range (+ or -)	10 %

Treatment costs are the increased cost to provide full-day kindergarten rather than half-day kindergarten including twice the staff costs and additional classroom space. We estimated the construction costs of new classrooms based on a kindergarten class size of twenty, 90 square foot of space per student and \$188.55 (2012 dollars) of construction costs per square foot; We estimated that 50% of the comparison group students who were eligible would use a half day of child care subsidies. We estimated that 48.91% of students would be eligible for child care subsidies based on the number of students eligible for free and reduced-priced meals (Office of Superintendent of Public Instruction. (2012). 2012-2013 Washington Public School Free and Reduced-Price Meal Eligibility. <http://k12.wa.us/ChildNutrition/Reports/FreeReducedMeals.aspx> and Department of Early Learning. (2013). Child Care Subsidy Rates. <http://www.del.wa.gov/publications/subsidy/docs/ChildCareSubsidyRates.pdf>)

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	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		
Test scores	2	23127	0.022	0.091	8	0.012	0.068	17	0.022	0.812

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

- Cannon, S. J., Jacknowitz, A., & Painter, G., (2006). Is full better than half? Examining the longitudinal effects of full-day kindergarten attendance. *Journal of Policy Analysis and Management*, 25(2), 299-321.
- Cannon, J. S., Jacknowitz, A., & Painter, G. (2011). The effect of attending full-day kindergarten on English learner students. *Journal of Policy Analysis and Management*, 30(2), 287-309.
- Chang, M., & Singh, K. (2008). Is all-day kindergarten better for children's academic performance? Evidence from the Early Childhood Longitudinal Study. *Australian Journal of Early Childhood*, 33(4), 35-42.
- DeCicca, P. (2007). Does full-day kindergarten matter? Evidence from the first two years of schooling. *Economics of Education Review*, 26(1), 67-82.
- Holmes, C. T., & McConnell, B. M. (1990). *Full-day versus half-day kindergarten: An experimental study*. Paper presented at the Annual Meeting of the American Educational Research Association: Boston, MA.
- Le, V.-N., Kirby, S. N., Barney, H., Setodji, C. M., & Gershwin, D. (2006). *School readiness, full-day kindergarten, and student achievement: An empirical investigation*. Santa Monica, CA: RAND Corporation.
- Lee, V. E., Burkam, D. T., Ready, D. D., Honigman, J., & Meisels, S. J. (2006). Full-day versus half-day kindergarten: In which program do children learn more? *American Journal of Education*, 112(2), 163-208.
- Votruba-Drzal, E., Li-Grining, C. P., & Maldonado-Carre o, C. (2008). A developmental perspective on full- versus part-day kindergarten and children's academic trajectories through fifth grade. *Child Development*, 79(4), 957-978.
- Warburton, W. P., Warburton, R. N., & Hertzman, C. (2012). Does full day kindergarten help kids? *Canadian Public Policy*, 38(4), 591-603.
- Zvoch, K., Reynolds, R. E., & Parker, R. P. (2008). Full-day kindergarten and student literacy growth: Does a lengthened school day make a difference? *Early Childhood Research Quarterly*, 23(1), 94-107.

For further information, contact:
(360) 586-2677, institute@wsipp.wa.gov

Printed on 09-27-2016



Washington State Institute for Public Policy

The Washington State Legislature created the Washington State Institute for Public Policy in 1983. A Board of Directors—representing the legislature, the governor, and public universities—governs WSIPP and guides the development of all activities. WSIPP's mission is to carry out practical research, at legislative direction, on issues of importance to Washington State.