

Quantum Opportunities Program Public Health & Prevention: Community-based

Benefit-cost estimates updated December 2016. Literature review updated April 2012.

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: The Quantum Opportunities Program (QOP) provides year-round services for disadvantaged high school students. The program's main goal is to improve academic deficiencies among high school-aged youth with low grades who are at risk of dropping out of school. Students enroll as they enter high school; are mentored by program coordinators; and engage in 250 hours of activity in each of three areas every year—education, community service and development activities meant to reduce risky behavior, promote cultural awareness and/or promote recreation. Students are also provided financial incentives, through stipends and bonuses, for participating in QOP activities and remaining in school.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$17,081	Benefit to cost ratio	\$1.66
Participants	\$25,570	Benefits minus costs	\$17,933
Others	\$13,913	Chance the program will produce	
Indirect	(\$11,597)	benefits greater than the costs	61 %
Total benefits	\$44,967		
Net program cost	(\$27,034)		
Benefits minus cost	\$17,933		

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
Crime	\$0	\$1,398	\$3,867	\$711	\$5,976
Labor market earnings associated with high school graduation	\$31,824	\$14,452	\$14,616	\$0	\$60,892
Labor market earnings associated with alcohol abuse or dependence	(\$2,880)	(\$1,308)	\$0	(\$26)	(\$4,213)
Health care associated with alcohol abuse or dependence	(\$25)	(\$143)	(\$136)	(\$71)	(\$375)
Property loss associated with alcohol abuse or dependence	(\$5)	\$0	(\$9)	\$0	(\$14)
Public assistance	(\$599)	\$1,409	\$0	\$716	\$1,526
Health care associated with educational attainment	(\$939)	\$3,426	(\$3,757)	\$1,724	\$455
Costs of higher education	(\$1,835)	(\$2,170)	(\$686)	(\$1,092)	(\$5,783)
Subtotals	\$25,540	\$17,065	\$13,895	\$1,962	\$58,463
From secondary participant					
Labor market earnings associated with high school graduation	\$32	\$15	\$15	\$0	\$62
K-12 grade repetition	\$0	\$0	\$0	\$0	\$1
Health care associated with educational attainment	(\$1)	\$3	\$3	\$2	\$7
Costs of higher education	(\$2)	(\$2)	(\$1)	(\$1)	(\$5)
Subtotals	\$30	\$17	\$17	\$1	\$65
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$13,561)	(\$13,561)
Totals	\$25,570	\$17,081	\$13,913	(\$11,597)	\$44,967

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.

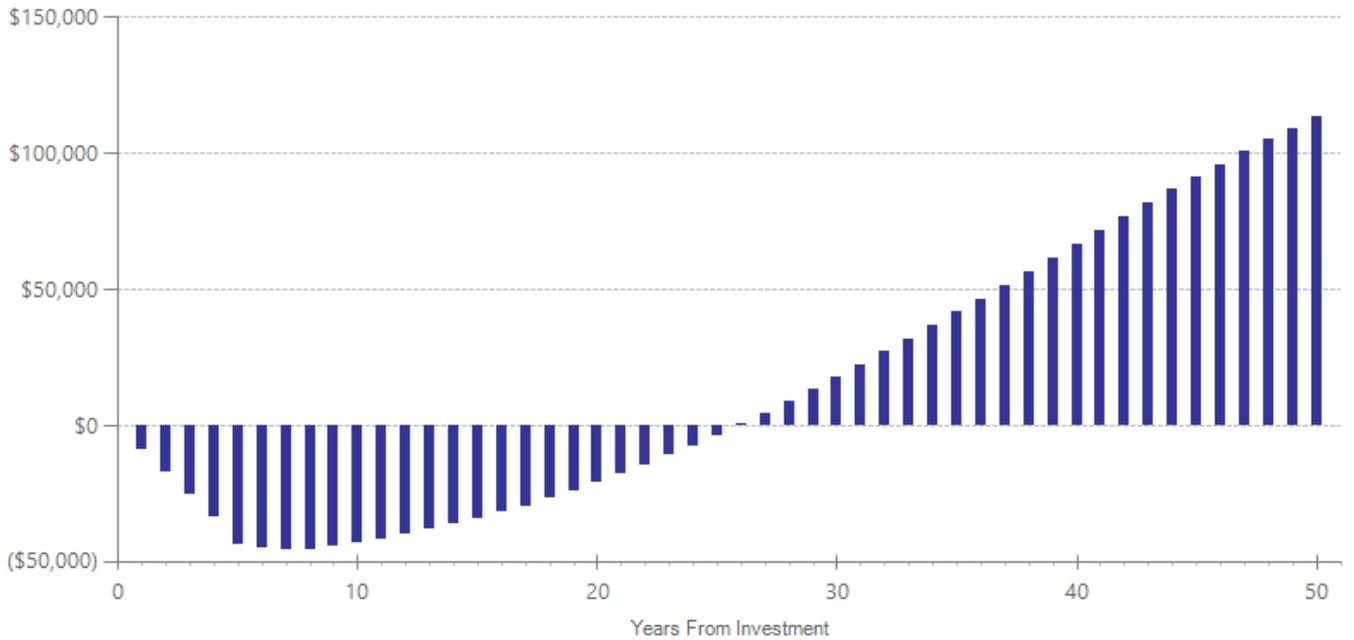
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$5,000	2006	Present value of net program costs (in 2015 dollars)	(\$27,034)
Comparison costs	\$0	2006	Cost range (+ or -)	30 %

Average cost per youth is \$25,000 for five years. We used a 30% uncertainty estimate around this figure because the average costs vary widely by site, as reported by Maxfield, M., Schirm, A., & Rodriguez-Planas, N. (2003). *The Quantum Opportunity Program demonstration: Implementation and short-term impacts* (Document No. PR03-18). Princeton, NJ: Mathematica Policy Research, p. 12.

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	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		
Crime	Primary	2	636	-0.230	0.384	19	-0.230	0.384	29	-0.231	0.548
High school graduation	Primary	3	724	0.340	0.178	19	0.340	0.178	19	0.340	0.056
Public assistance	Primary	3	724	-0.112	0.182	21	-0.112	0.182	21	-0.112	0.539
Teen births under age 18	Primary	2	668	-0.138	0.242	19	-0.138	0.242	19	-0.138	0.569
Teen births (second generation)	Secondary	2	668	-0.138	0.242	19	-0.138	0.242	19	-0.138	0.569
Suspensions/expulsions	Primary	1	580	-0.100	0.249	16	-0.100	0.249	18	-0.100	0.688
Alcohol abuse or dependence	Primary	1	580	0.093	0.197	22	0.093	0.197	32	0.093	0.638
Employment	Primary	2	636	0.188	0.222	22	0.188	0.222	34	0.188	0.397

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

- Hahn, A., Leavitt, T., & Aaron, P. (1994). *Evaluation of the Quantum Opportunities Program (QOP): Did the program work? A report on the post secondary outcomes and cost effectiveness of the QOP program (1989-1993)*. Waltham, MA: Brandeis University, Center for Human Resources.
- Lattimore, C.B., Mihalic, S.F., Grotmeter, J.K., & Taggart, R. (1998). *Blueprints for violence prevention, book four: The Quantum Opportunities Program* (Document No. NCJ 174197). Boulder: University of Colorado, Boulder; Center for the Study and Prevention of Violence.
- Maxfield, M., Schirm, A., & Rodriguez-Planas, N. (2003). *The Quantum Opportunity Program demonstration: Implementation and short-term impacts* (Document No. PR03-18). Princeton, NJ: Mathematica Policy Research.
- Schirm, A., Stuart, E., & McKie, A. (2006). *The Quantum Opportunity Program Demonstration: Final impacts* (Document No. PR06- 70). Princeton, NJ: Mathematica Policy Research.

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