

Good Behavior Game Public Health & Prevention: School-based

Benefit-cost estimates updated December 2023. Literature review updated March 2018.

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 Good Behavior Game is a two-year classroom management strategy designed to improve aggressive/disruptive classroom behavior and prevent later criminality. After teachers establish shared behavior expectations in their classroom, teams of students play the game throughout the day and may receive rewards by minimizing negative behaviors. The program is universal and can be applied to general populations of early elementary school children (1st and 2nd grades).

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$3,223	Benefit to cost ratio	\$64.42
Participants	\$4,095	Benefits minus costs	\$11,392
Others	\$3,501	Chance the program will produce	
Indirect	\$752	benefits greater than the costs	77%
Total benefits	\$11,571		
Net program cost	(\$180)		
Benefits minus cost	\$11,392		

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	p-value
				ES	SE	Age	ES	SE	Age		
High school graduation	7	2	181	0.075	0.145	20	0.075	0.145	20	0.198	0.183
Smoking before end of middle school	7	1	263	-0.238	0.092	11	-0.238	0.092	13	-0.238	0.010
Regular smoking	7	2	181	-0.107	0.206	20	-0.107	0.206	30	-0.280	0.175
Alcohol use disorder	7	1	176	-0.118	0.322	20	-0.118	0.322	30	-0.312	0.374
Major depressive disorder	7	3	424	-0.118	0.145	15	0.000	0.310	17	-0.126	0.388
Illicit drug use disorder	7	2	181	-0.095	0.209	20	-0.095	0.209	30	-0.242	0.264
Anxiety disorder	7	3	424	-0.089	0.138	15	-0.035	0.071	16	-0.069	0.615
Externalizing behavior symptoms	7	2	425	-0.586	0.124	8	-0.322	0.158	11	-0.586	0.001
Suicide attempts [^]	7	1	178	-0.118	0.173	20	n/a	n/a	n/a	-0.309	0.106
Antisocial personality disorder [^]	7	1	179	-0.112	0.294	20	n/a	n/a	n/a	-0.295	0.350
Smoking before end of high school	7	1	348	-0.073	0.083	13	-0.073	0.083	18	-0.193	0.023
Attention-deficit/hyperactivity disorder symptoms	7	1	263	-0.270	0.092	9	0.000	0.141	10	-0.270	0.004
Suicidal ideation [^]	7	1	178	-0.159	0.151	20	n/a	n/a	n/a	-0.420	0.015

[^]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
Externalizing behavior symptoms	Criminal justice system	\$129	\$0	\$293	\$65	\$487
High school graduation	Labor market earnings associated with high school graduation	\$1,774	\$4,179	\$2,269	\$0	\$8,222
Anxiety disorder	K-12 grade repetition	\$4	\$0	\$0	\$2	\$6
Externalizing behavior symptoms	K-12 special education	\$552	\$0	\$0	\$276	\$829
Alcohol use disorder	Property loss associated with alcohol abuse or dependence	\$0	\$5	\$9	\$0	\$14
Externalizing behavior symptoms	Health care associated with externalizing behavior symptoms	\$1,013	\$286	\$1,045	\$506	\$2,851
High school graduation	Costs of higher education	(\$253)	(\$383)	(\$115)	(\$126)	(\$877)
Regular smoking	Mortality associated with smoking	\$3	\$8	\$0	\$119	\$131
Program cost	Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$90)	(\$90)
Totals		\$3,223	\$4,095	\$3,501	\$752	\$11,571

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.

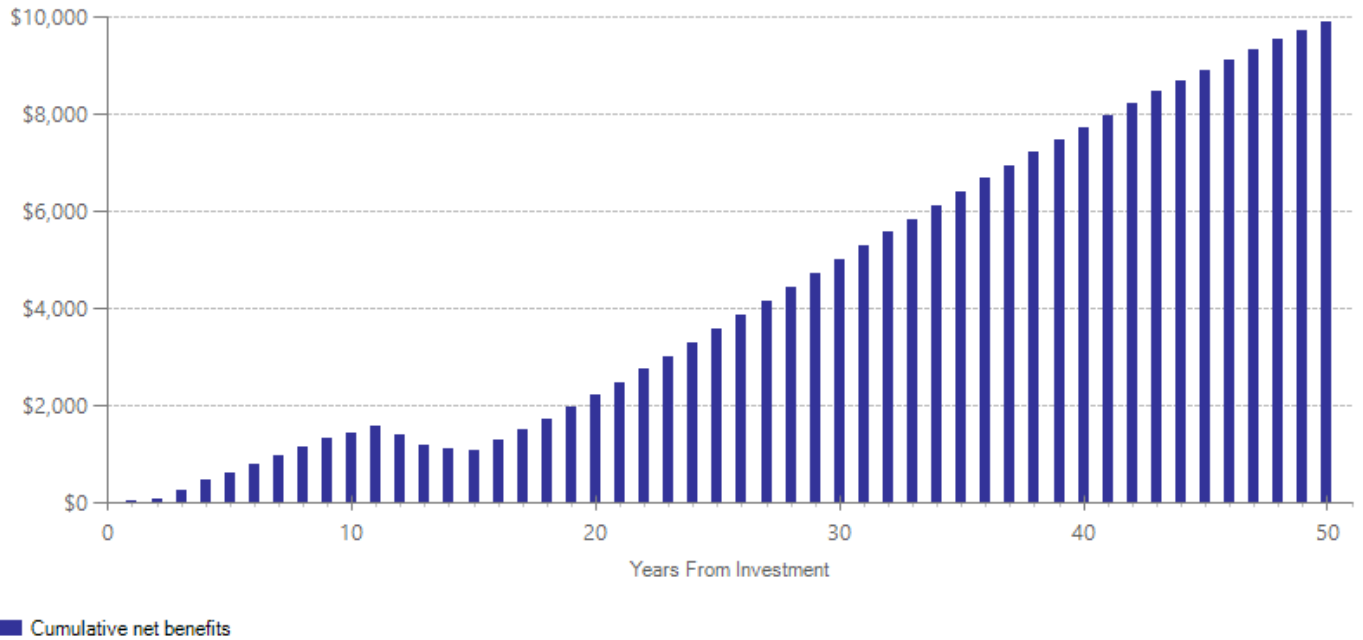
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$73	2011	Present value of net program costs (in 2022 dollars)	(\$180)
Comparison costs	\$0	2011	Cost range (+ or -)	10%

Costs include teacher training, classroom supplies, district GBG coach training, subcontractor support, and travel costs. The estimate is based on training for 60 teachers and one coach over two years and a cumulative 6,750 students served in GBG classrooms over five years. Information for this cost estimate was provided by Megan Sambolt, American Institutes for Research.

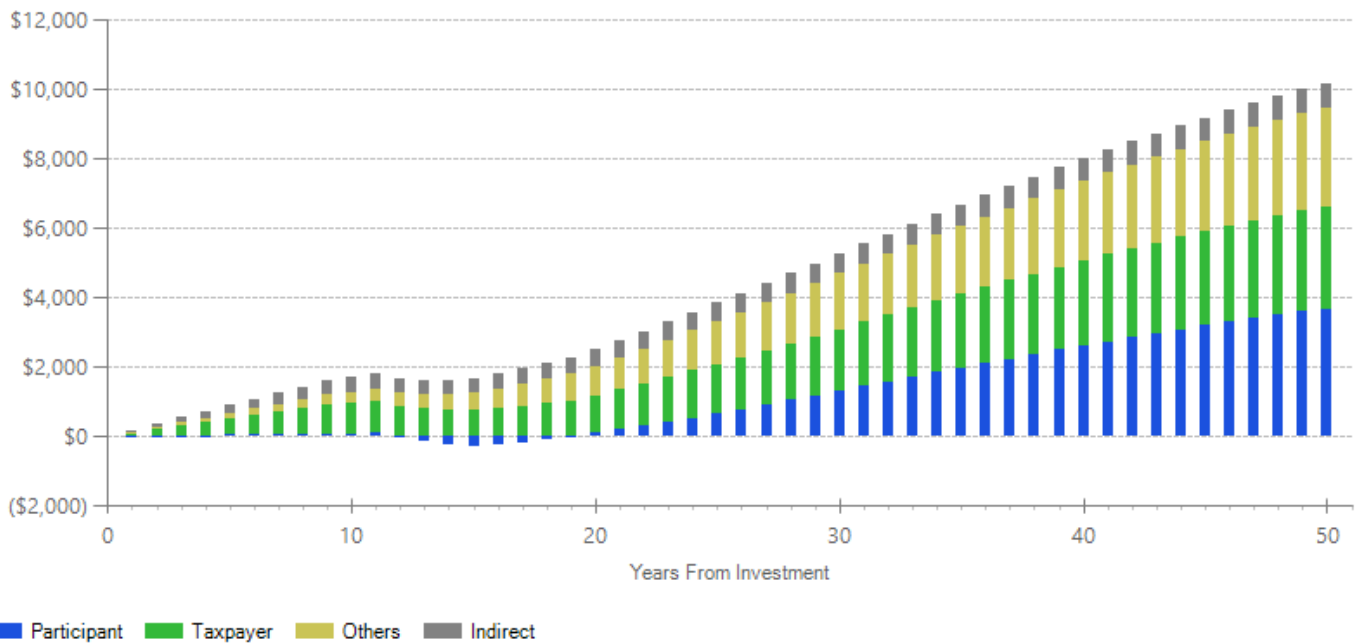
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty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

Benefits Minus Costs Over Time (Cumulative Discounted Dollars)

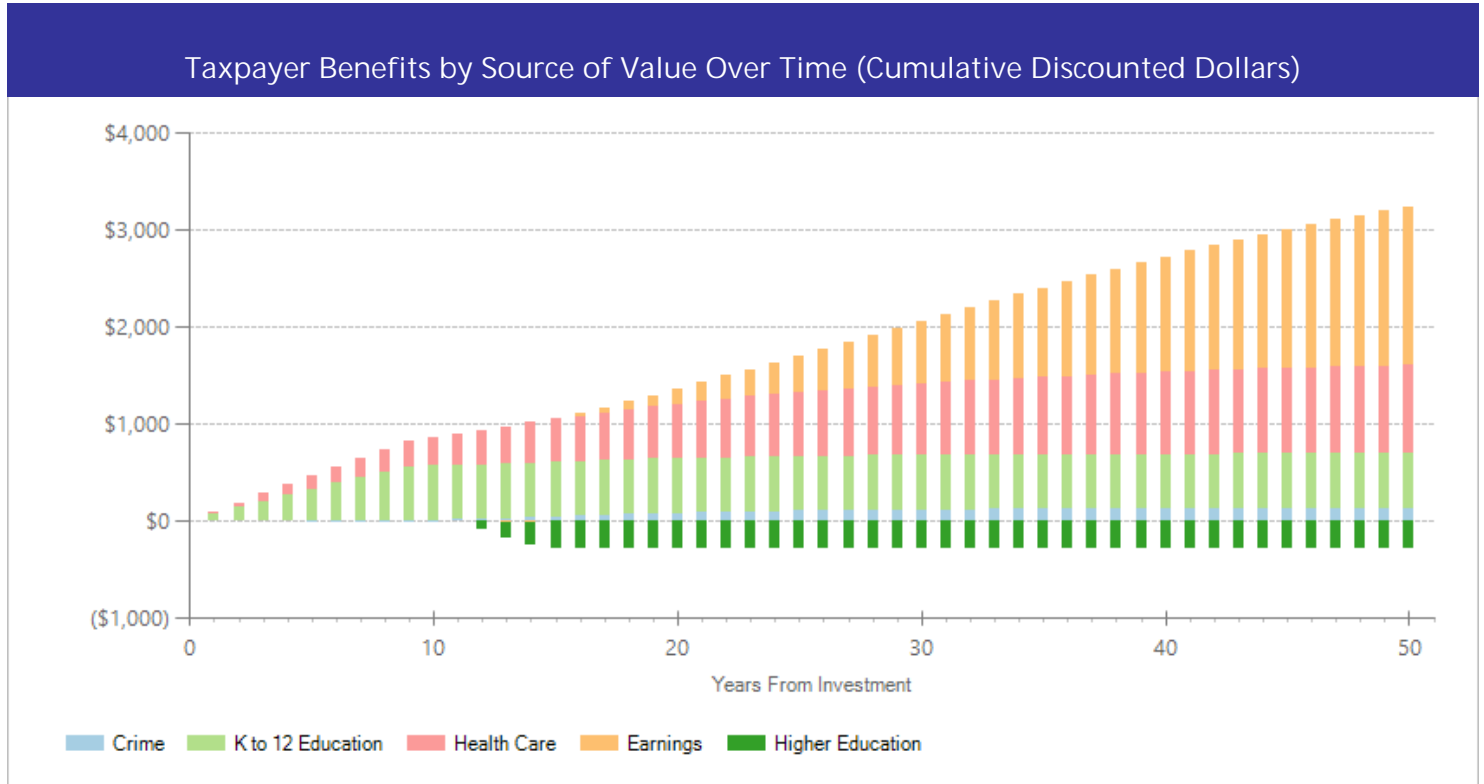


The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in discounted dollars. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost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



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

- Breeman, L.D., van Lier, P.A., Wubbels, T., Verhulst, F.C., van der Ende, J., Maras, A., . . . Tick, N.T. (2016). Effects of the Good Behavior Game on the behavioral, emotional, and social problems of children with psychiatric disorders in special education settings. *Journal of Positive Behavior Interventions, 18*(3), 156–167.
- Furr-Holden, C.D.M., Ialongo, N.S., Anthony, J.C., Petras, H., & Kellam, S.G. (2004). Developmentally inspired drug prevention: Middle school outcomes in a school-based randomized prevention trial. *Drug and Alcohol Dependence, 73*(2), 149.
- Healthy Child Manitoba. (2016). *Improving the early mental health and well-being of Manitoba's children: First findings from the province wide pilot and evaluation of PAX.*
- Huizink, A.C., van Lier, P.A.C., & Crijnen, A.A.M. (2009). Attention Deficit Hyperactivity Disorder symptoms mediate early-onset smoking. *European Addiction Research, 15*(1), 1-9.
- Ialongo, N., Poduska, J., Werthamer, L., & Kellam, S. (2001). The distal impact of two first-grade preventive interventions on conduct problems and disorder in early adolescence. *Journal of Emotional and Behavioral Disorders, 9*(3), 146-160.
- Kellam, S.G., & Anthony, J.C. (1998). Targeting early antecedents to prevent tobacco smoking: Findings from an epidemiologically based randomized field trial. *American Journal of Public Health, 88*(10), 1488-1495.
- Kellam, S.G., Reid, J., & Balster, R.L. (2008). Effects of a universal classroom behavior program in first and second grades on young adult problem outcomes. *Drug and Alcohol Dependence, 95*(Suppl. 1), S1-S4.
- Kellam, S.G., Ialongo, N.S., Wang, W., Mackenzie, A.C.L., Brown, C.H., Ompad, D.C., Or, F., Ialongo, N., Poduska, J., & Windham, A. (2014). The impact of the Good Behavior Game, a universal classroom-based preventive intervention in first and second grades, on high-risk sexual behaviors and drug abuse and dependence disorders into young adulthood. *Prevention Science, 15*, 6-18.
- Petras, H., Kellam, S.G., Poduska, J.M., Brown, C.H., Muthen, B.O., & Ialongo, N.S. (2008). Developmental epidemiological courses leading to antisocial personality disorder and violent and criminal behavior: Effects by young adulthood of a universal preventive intervention in first- and second-grade classrooms. *Drug and Alcohol Dependence, 95*(Suppl. 1), S45-S59.
- Smith, E.P., Osgood, D.W., Oh, Y., & Caldwell, L.C. (2018). Promoting afterschool quality and positive youth development: Cluster randomized trial of the PAX Good Behavior Game. *Prevention Science, 19*(2), 159-173.
- Storr, C.L., Ialongo, N.S., Kellam, S.G., & Anthony, J.C. (2002). A randomized controlled trial of two primary school intervention strategies to prevent early onset tobacco smoking. *Drug and Alcohol Dependence, 66*(1), 51-60.

- Vuijk, P., van Lier, P.A.C., Crijnen, A.A.M., & Huizink, A.C. (2007). Testing sex-specific pathways from peer victimization to anxiety and depression in early adolescents through a randomized intervention trial. *Journal of Affective Disorders, 100*(1-3), 221-226.
- Wilcox, H.C., Kellam, S.G., Brown, C.H., Poduska, J.M., Ialongo, N.S., Wang, W., & Anthony, J.C. (2008). The impact of two universal randomized first- and second-grade classroom interventions on young adult suicide ideation and attempts. *Drug and Alcohol Dependence, 95*(Suppl. 1), S60-S73.
- Witvliet, M., van Lier, P.A.C., Cuijpers, P., & Koot, H.M. (2009). Testing links between childhood positive peer relations and externalizing outcomes through a randomized controlled intervention study. *Journal of Consulting and Clinical Psychology, 77*(5), 905-915.

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