

## Behavioral interventions to reduce obesity for children: Moderate- to high-intensity, face-to-face programs

Health Care: Obesity and Diabetes

Benefit-cost estimates updated December 2019. Literature review updated December 2014.

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 behavioral interventions included in this analysis target obese and overweight youth under age 18, providing them with counseling, education, and other supports to improve diet, increase physical activity, and reduce weight. The programs use techniques designed to promote and sustain behavioral changes, including goal setting, self-monitoring, stimulus control, and other strategies.

The programs in this specific category provided at least 25 hours of face-to-face intervention.

### Benefit-Cost Summary Statistics Per Participant

#### Benefits to:

Taxpayers	\$37	Benefit to cost ratio	(\$0.07)
Participants	\$17	Benefits minus costs	(\$374)
Others	\$76	Chance the program will produce	
Indirect	(\$155)	benefits greater than the costs	43 %
<b>Total benefits</b>	<b>(\$25)</b>		
<b>Net program cost</b>	<b>(\$350)</b>		
<b>Benefits minus cost</b>	<b>(\$374)</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	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		
Obesity	12	14	638	-0.378	0.087	12	0.000	0.101	14	-0.378	0.001
Weight change	12	11	493	-0.206	0.070	12	0.000	0.070	14	-0.206	0.003

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
Obesity	Labor market earnings associated with obesity	\$0	\$0	\$0	\$0	\$0
Obesity	Health care associated with obesity	\$37	\$17	\$76	\$18	\$148
Obesity	Mortality associated with obesity	\$0	\$0	\$0	\$2	\$2
Program cost	Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$175)	(\$175)
<b>Totals</b>		<b>\$37</b>	<b>\$17</b>	<b>\$76</b>	<b>(\$155)</b>	<b>(\$25)</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.

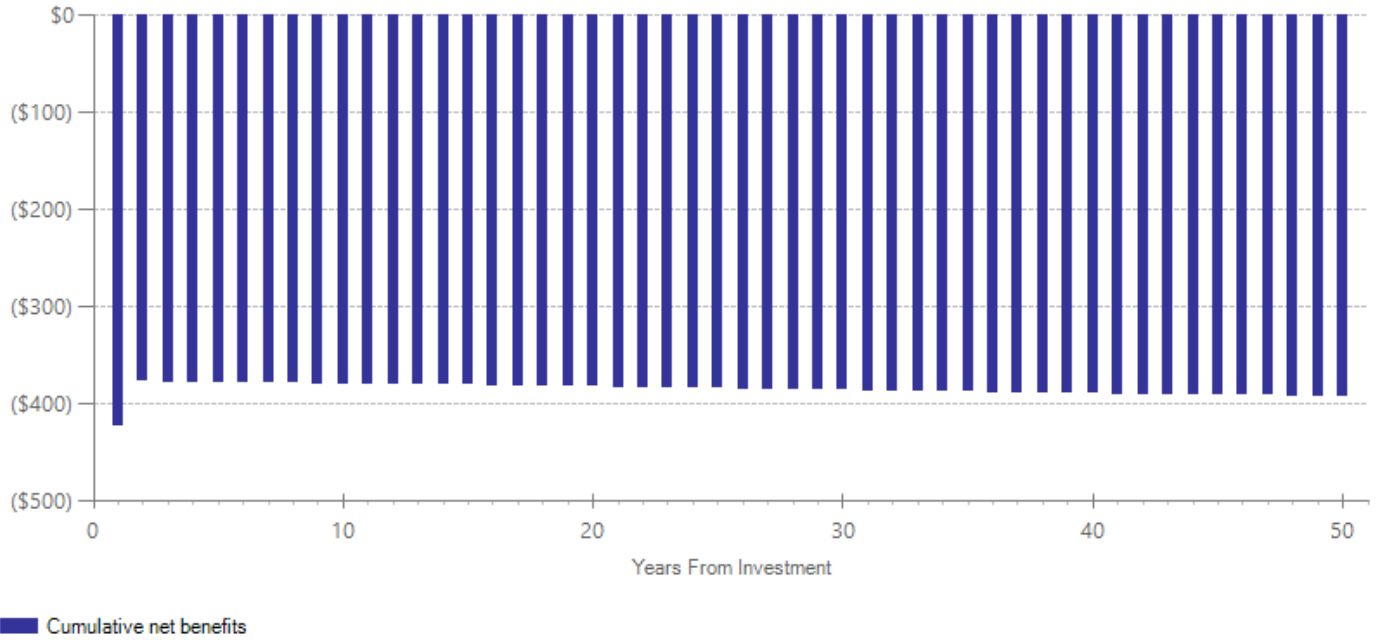
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary
Program costs	\$328	2014	Present value of net program costs (in 2018 dollars) Cost range (+ or -)
Comparison costs	\$0	2014	
			(\$350) 25 %

On average, these programs provide approximately 48 contact hours over six months, including both group and individual sessions. The average per-participant cost of these programs was computed using contact hours and average Washington State 2014 hourly wages of the appropriate professionals who conducted the intervention (generally dietitians, nurses, general practitioners, or therapists).

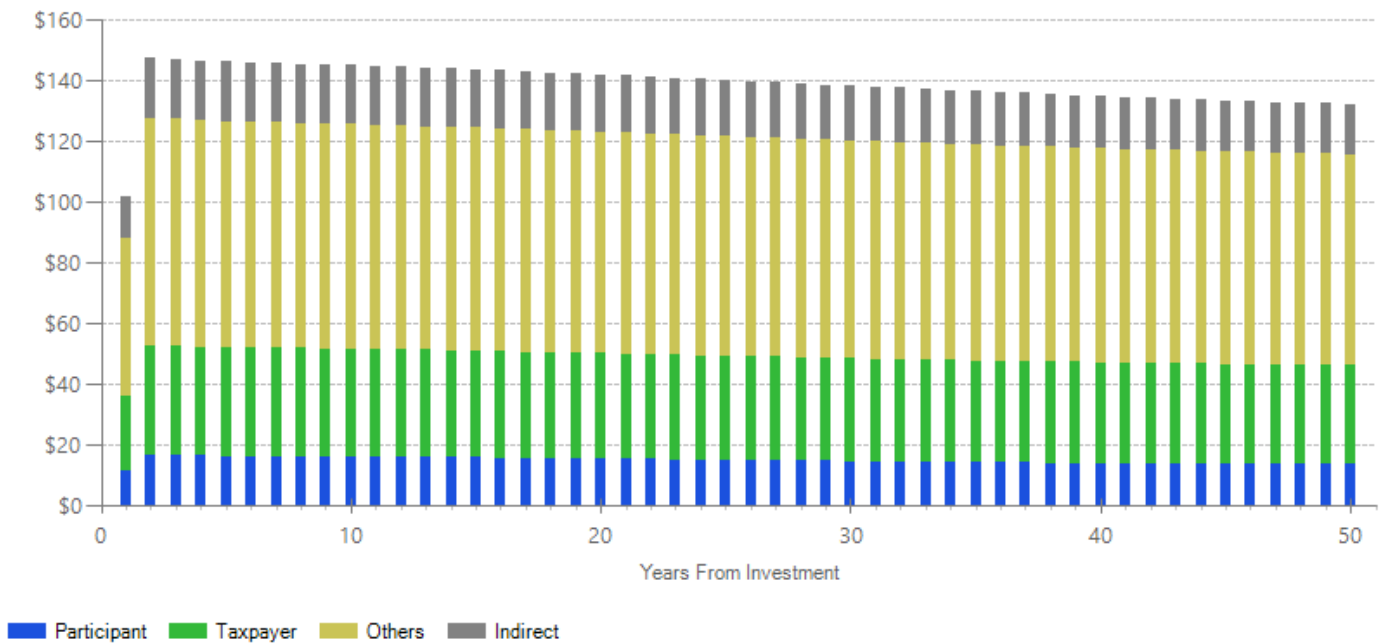
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty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

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

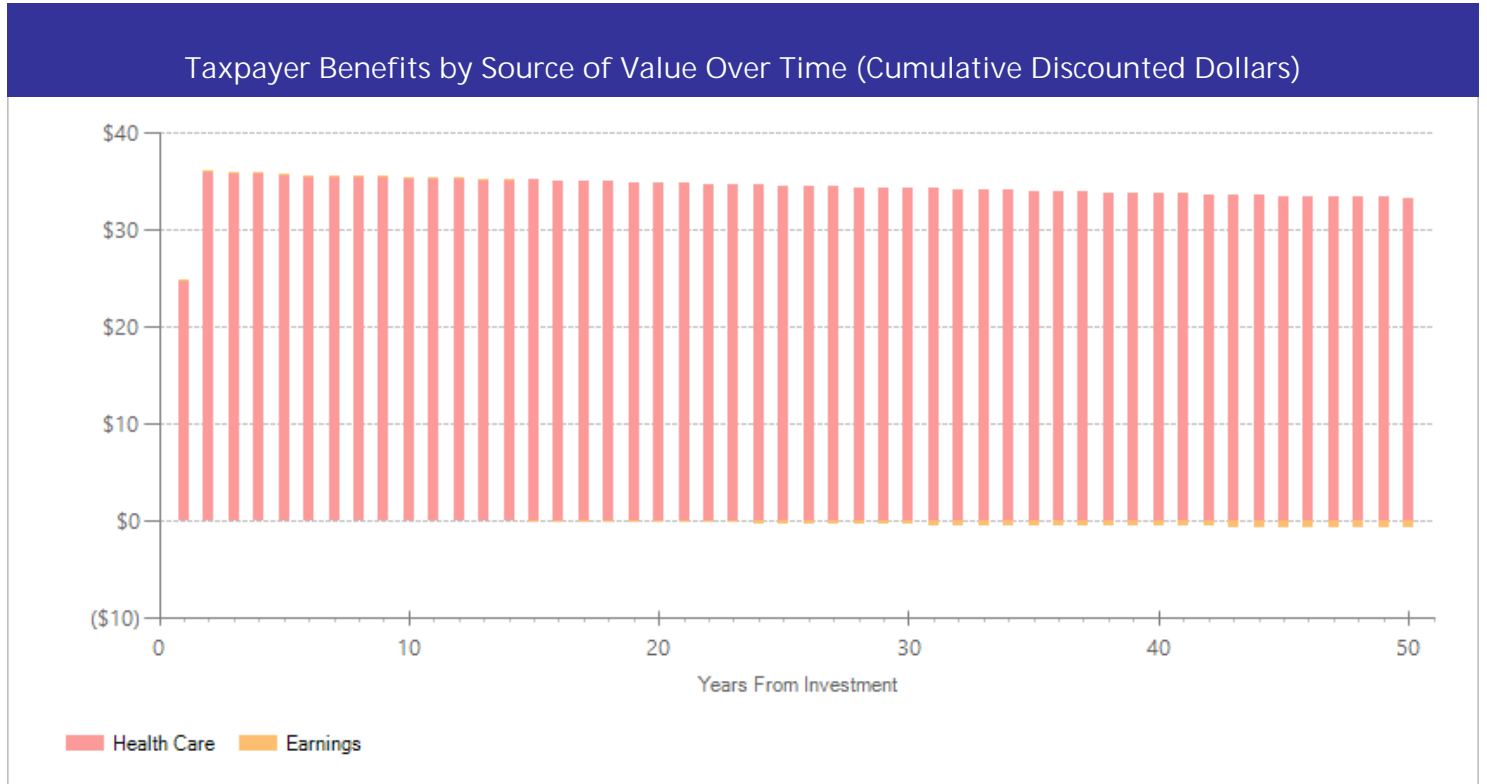


The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in discounted dollars. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost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

- Bocca, G., Corpeleijn, E., Stolk, R.P., & Sauer, P.J. (2012). Results of a multidisciplinary treatment program in 3-year-old to 5-year-old overweight or obese children: a randomized controlled clinical trial. *Archives of Pediatrics & Adolescent Medicine, 166*(12), 1109-15.
- Davis, J. N., Tung, A., Chak, S. S., Ventura, E. E., Byrd-Williams, C. E., Alexander, K. E. et al. (2009). Aerobic and strength training reduces adiposity in overweight latina adolescents. *Medicine and Science in Sports and Exercise, 41*, 1494-1503.
- DeBar, L.L., Stevens, V.J., Perrin, N., Wu, P., Pearson, J., Yarborough, B.J., Dickerson, J., & Lynch, F. (2012). A primary care-based, multicomponent lifestyle intervention for overweight adolescent females. *Pediatrics, 129*(3), 611-20.
- Diaz, R.G., Esparza-Romero, J., Moya-Camarena, S.Y., Robles-Sardin, A.E., & Valencia, M.E. (2010). Lifestyle intervention in primary care settings improves obesity parameters among Mexican youth. *Journal of the American Dietetic Association, 110*(2), 285-90.
- Ford, A.L., Bergh, C., Sodersten, P., Sabin, M.A., Hollinghurst, S., Hunt, L.P., & Shield, J.P. (2010). Treatment of childhood obesity by retraining eating behaviour: A randomised controlled trial. *BMJ*, doi: 10.1136/bmj.b5388.
- Israel, A.C., Stolmaker, L., & Andrian, C.A.G. (1985). The effects of training parents in general child management skills on a behavioral weight loss program for children. *Behavior Therapy, 16*(2), 169-180.
- Janicke, D.M., Sallinen, B.J., Perri, M.G., Lutes, L.D., Huerta, M., Silverstein, J.H., & Brumback, B. (2008). Comparison of parent-only vs family-based interventions for overweight children in underserved rural settings: outcomes from project STORY. *Archives of Pediatrics & Adolescent Medicine, 162*(12), 1119-1125.
- Kalarchian, M.A., Levine, M.D., Arslanian, S.A., Ewing, L.J., Houck, P.R., Cheng, Y., Ringham, R.M., ... Marcus, M.D. (2009). Family-based treatment of severe pediatric obesity: randomized, controlled trial. *Pediatrics, 124*(4), 1060-1068.
- Kalavainen, M.P., Korppi, M.O., & Nuutinen, O.M. (2007). Clinical efficacy of group-based treatment for childhood obesity compared with routinely given individual counseling. *International Journal of Obesity, 31*(10), 1500-8.
- Nemet, D., Barkan, S., Epstein, Y., Friedland, O., Kowen, G., & Eliakim, A. (2005). Short- and long-term beneficial effects of a combined dietary-behavioral-physical activity intervention for the treatment of childhood obesity. *Pediatrics, 115*(4), 443-9.
- Nemet, D., Barzilay-Teeni, N., & Eliakim, A. (2008). Treatment of childhood obesity in obese families. *Journal of Pediatric Endocrinology & Metabolism, 21*(5), 461-7.

- Reinehr, T., Schaefer, A., Winkel, K., Finne, E., Toschke, A.M., & Kolip, P. (2010). An effective lifestyle intervention in overweight children: findings from a randomized controlled trial on "Obeldicks light." *Clinical Nutrition, 29*(3), 331-6.
- Rocchini, A.P., Katch, V., Anderson, J., Hinderliter, J., Becque, D., Martin, M., & Marks, C. (1988). Blood pressure in obese adolescents: effect of weight loss. *Pediatrics, 82*(1), 16-23.
- Sacher, P.M., Kolotourou, M., Chadwick, P.M., Cole, T.J., Lawson, M.S., Lucas, A. et al. (2010). Randomized controlled trial of the MEND program: A family-based community intervention for childhood obesity. *Obesity, 18*, S62-S68.
- Savoie, M., Shaw, M., Dziura, J., Tamborlane, W.V., Rose, P., Guandalini, C., Goldberg-Gell, R., ... Caprio, S. (2007). Effects of a weight management program on body composition and metabolic parameters in overweight children: A randomized controlled trial. *JAMA: The Journal of the American Medical Association, 297*(24), 2697-2704.
- Weigel, C., Kokocinski, K., Lederer, P., Dotsch, J., Rascher, W., & Knerr, I. (2008). Childhood obesity: Concept, feasibility, and interim results of a local group-based, long-term treatment program. *Journal of Nutrition Education and Behavior, 40*(6), 369-373.

For further information, contact:  
(360) 664-9800, [institute@wsipp.wa.gov](mailto:institute@wsipp.wa.gov)

Printed on 05-16-2021



## 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.