

Behavioral interventions to reduce obesity for adults: Remotely-delivered programs

Health Care: Obesity and Diabetes

Benefit-cost estimates updated December 2017. 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: Behavioral interventions for obesity include behavioral counseling, therapy, and educational components, and often include diet and exercise components as well. For this review of interventions for obese adults, we excluded studies that targeted diabetic populations as well as those aimed at preventing obesity.

Programs in this specific category are delivered to obese adults, and conducted remotely, usually via computer or phone.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$153	Benefit to cost ratio	\$8.48
Participants	\$279	Benefits minus costs	\$712
Others	\$94	Chance the program will produce	
Indirect	\$280	benefits greater than the costs	54 %
Total benefits	\$807		
Net program cost	(\$95)		
Benefits minus cost	\$712		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2016). 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 obesity	\$266	\$121	\$0	\$316	\$703
Health care associated with obesity	\$14	\$33	\$94	\$11	\$152
Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$48)	(\$48)
Totals	\$279	\$153	\$94	\$280	\$807

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.

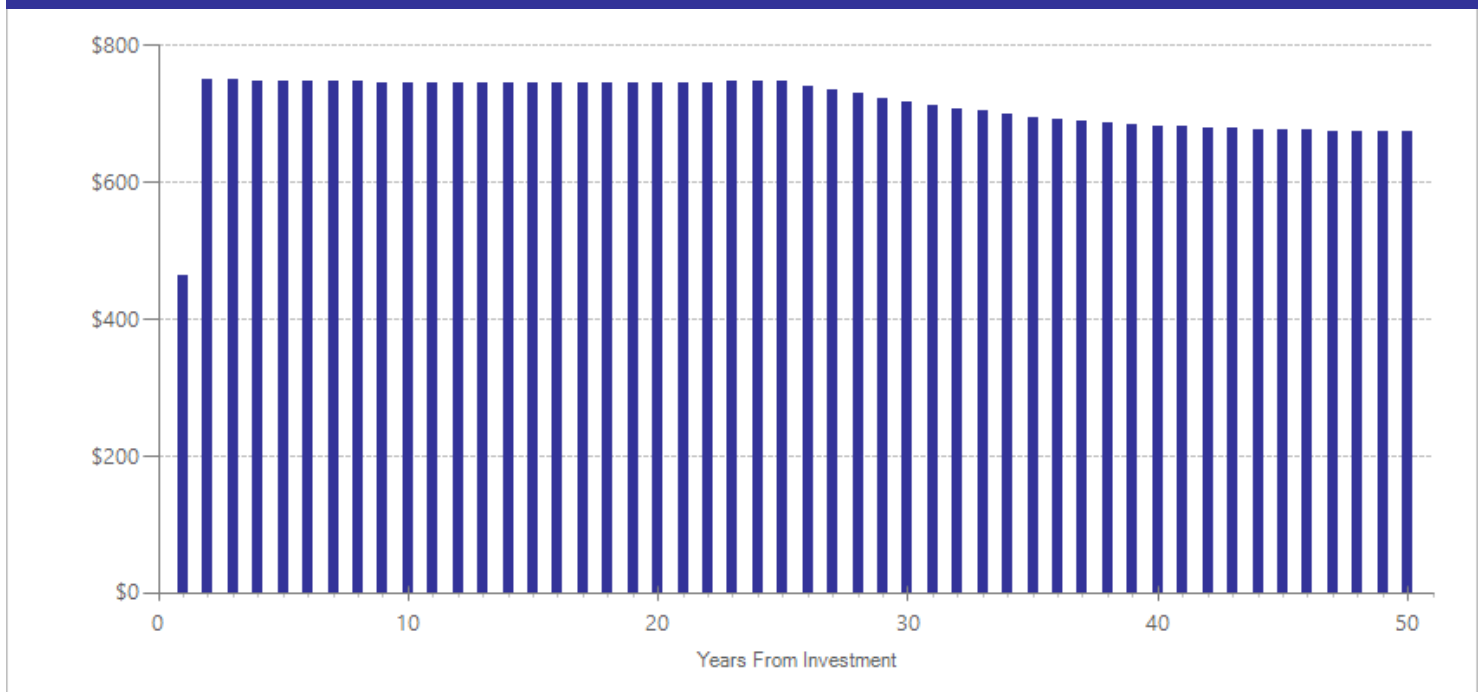
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$94	2014	Present value of net program costs (in 2016 dollars)	(\$95)
Comparison costs	\$0	2014	Cost range (+ or -)	25 %

On average, these interventions occur over approximately 18 months. For programs that require intervention staff time, participants received an average of approximately 2.5 contact hours. 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). For the remote programs with "eHealth" technology (web or computer programs, automated phone programs), we estimated costs from the calculations of Ritzwoller, D.P. et al., (2013). Economic analyses of the Be Fit Be Well Program: A weight loss program for community health centers. *Journal of General Internal Medicine*, 28(12), 1581-1588.

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	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	SE	Age	ES	SE	Age	ES	p-value
Diastolic blood pressure [^]	50	5	627	-0.069	0.056	50	n/a	n/a	n/a	-0.069	0.219
Obesity	50	5	608	-0.139	0.057	50	0.000	0.086	52	-0.139	0.015
Systolic blood pressure [^]	50	5	627	-0.101	0.056	50	n/a	n/a	n/a	-0.101	0.073
Weight change	50	9	1092	-0.115	0.046	50	0.000	0.012	52	-0.115	0.013

[^]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](#).

Citations Used in the Meta-Analysis

- Appel, L.J., Clark, J.M., Yeh, H.C., Wang, N.Y., Coughlin, J.W., Daumit, G., Miller, E.R., Dalcin, A., Jerome, G., Geller, S., Noronha, G., Pozefsky, T., Charleston, J., Reynolds, Durkin, N., Rubin, R., Louis, T.A., & Brancati, F.L. (2011). Comparative effectiveness of weight-loss interventions in clinical practice. *The New England Journal of Medicine*, 365(21), 1959-1968.
- Bennett, G.G., Herring, S.J., Puleo, E., Stein, E.K., Emmons, K.M., & Gillman, M.W. (2010). Web-based weight loss in primary care: a randomized controlled trial. *Obesity (silver Spring, Md.)*, 18(2), 308-313.
- Bennett, G.G., Warner, E.T., Glasgow, R.E., Askew, S., Goldman, J., Ritzwoller, D.P., Emmons, K.M., ... Be Fit, Be Well Study Investigators. (2012). Obesity treatment for socioeconomically disadvantaged patients in primary care practice. *Archives of Internal Medicine*, 172(7), 565-574.
- Bennett, G.G., Foley, P., Levine, E., Whiteley, J., Askew, S., Steinberg, D.M., Batch, B., Greaney, M.L., Miranda, H., Wroth, T.H., Holder, M.G., Emmons, K.M., & Puleo, E. (2013). Behavioral treatment for weight gain prevention among black women in primary care practice. *JAMA Internal Medicine*, 173(19), 1770-1777.
- Haapala, I., Barengo, N.C., Biggs, S., Surakka, L., & Manninen, P. (2009). Weight loss by mobile phone: a 1-year effectiveness study. *Public Health Nutrition*, 12(12), 2382-2391.
- Logue, E., Sutton, K., Jarjoura, D., Smucker, W., Baughman, K., & Capers, C. (2005). Transtheoretical model-chronic disease care for obesity in primary care: a randomized trial. *Obesity Research*, 13(5), 917-927.
- Tate, D.F., Wing, R.R., & Winett, R.A. (2001). Using Internet technology to deliver a behavioral weight loss program. *JAMA*, 285(9), 1172-1177.
- Tate, D.F., Jackvony, E.H., & Wing, R.R. (2006). A randomized trial comparing human e-mail counseling, computer-automated tailored counseling, and no counseling in an Internet weight loss program. *Archives of Internal Medicine*, 166(15), 1620-1625.
- Werkman, A., Hulshof, P.J.M., Stafleu, A., Kremers, S.P.J., Kok, F.J., Schouten, E.G., & Schuit, A.J. (2010). Effect of an individually tailored one-year energy balance programme on body weight, body composition and lifestyle in recent retirees: a cluster randomised controlled trial. *BMC Public Health*, 10(1).

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

Printed on 06-21-2018



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.