Interventions to prevent excessive gestational weight gain (population with obesity-related risk factors)

Health Care: Maternal and Infant Health

Benefit-cost estimates updated December 2019. Literature review updated December 2016.

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: A wide range of programs aim to prevent excessive gestational weight gain in a population with obesity-related risk factors (based on their pre-pregnancy BMI). We included programs that offer an exercise class and programs that offer counseling on recommended weight gain during pregnancy. Typically athletic trainers lead exercise programs in groups and counseling is delivered one-on-one in a clinical setting by a health educator, midwife, psychologist, or obstetrician.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	($238)
Participants	($15)
Others	($236)
Indirect	($268)
Total benefits	($757)
Net program cost	($213)
Benefits minus cost	($970)

Benefit to cost ratio	($3.56)
Benefits minus costs	($970)
Chance the program will produce benefits greater than the costs	47 %

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	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	SE	Age	ES	SE	Age	ES	p-value
Blood pressure^	30	Primary	6	1641	-0.038	0.070	30	n/a	n/a	n/a	-0.038	0.584
Cesarean sections	30	Primary	8	2525	-0.063	0.058	30	0.000	0.000	31	-0.063	0.276
Excess gestational weight gain^	30	Primary	10	1846	-0.240	0.110	30	n/a	n/a	n/a	-0.240	0.029
Gestational diabetes^	30	Primary	13	2906	-0.124	0.074	30	n/a	n/a	n/a	-0.124	0.093
Hospitalization^^	30	Primary	1	1075	-0.034	0.041	30	0.000	0.000	31	-0.034	0.398
Low birthweight birth***	30	Primary	3	1101	0.252	0.209	30	0.000	0.000	31	0.252	0.230
Postpartum depression^	30	Primary	2	134	0.000	0.285	30	n/a	n/a	n/a	0.000	1.000
Preeclampsia^	30	Primary	5	2432	0.019	0.076	30	n/a	n/a	n/a	0.019	0.805
Preterm birth***	30	Primary	4	2016	-0.132	0.087	30	0.000	0.000	31	-0.132	0.132
Small for gestational age (SGA)***	30	Primary	1	124	0.190	0.267	30	0.000	0.000	31	0.190	0.476
Infant mortality	1	Secondary	1	783	0.001	0.221	1	0.000	0.000	2	0.001	0.997
Low birthweight birth***	1	Secondary	3	1101	0.252	0.209	1	0.000	0.000	2	0.252	0.230
Macrosomia ***^	1	Secondary	7	2565	-0.118	0.053	1	n/a	n/a	n/a	-0.118	0.026
NICU admission	1	Secondary	3	1891	-0.005	0.050	1	0.000	0.000	2	-0.005	0.926
Preterm birth***	1	Secondary	4	2016	-0.132	0.087	1	0.000	0.000	2	-0.132	0.132
Small for gestational age (SGA)***	1	Secondary	1	124	0.190	0.267	1	0.000	0.000	2	0.190	0.476

^WSIPP's benefit-cost model does not monetize this outcome.

^^WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

***We report this outcome twice: once for mothers (designated as the primary participant) and once for infants (designated as the secondary participant). We do this because the outcome is associated with costs and benefits for both mothers and infants, and the amount of the cost or benefit is different for mothers than it is for infants.

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
Cesarean sections	Health care associated with Cesarean sections	$37	$1	$37	$18	$93
Low birthweight birth	Health care associated with low birthweight births	($43)	($2)	($43)	($22)	($110)
	Subtotals	*($7)*	*$0*	*($7)*	*($3)*	*($17)*
From secondary participant						
Infant mortality	Infant mortality	($2)	($5)	$0	($44)	($52)
Preterm birth	Health care associated with preterm births	$155	$6	$155	$77	$394
Low birthweight birth	Health care associated with low birthweight births	($384)	($16)	($384)	($192)	($976)
	Subtotals	*($231)*	*($15)*	*($229)*	*($159)*	*($634)*
Program cost	Adjustment for deadweight cost of program	$0	$0	$0	($106)	($106)
Totals		($238)	($15)	($236)	($268)	($757)

[1]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.

[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.

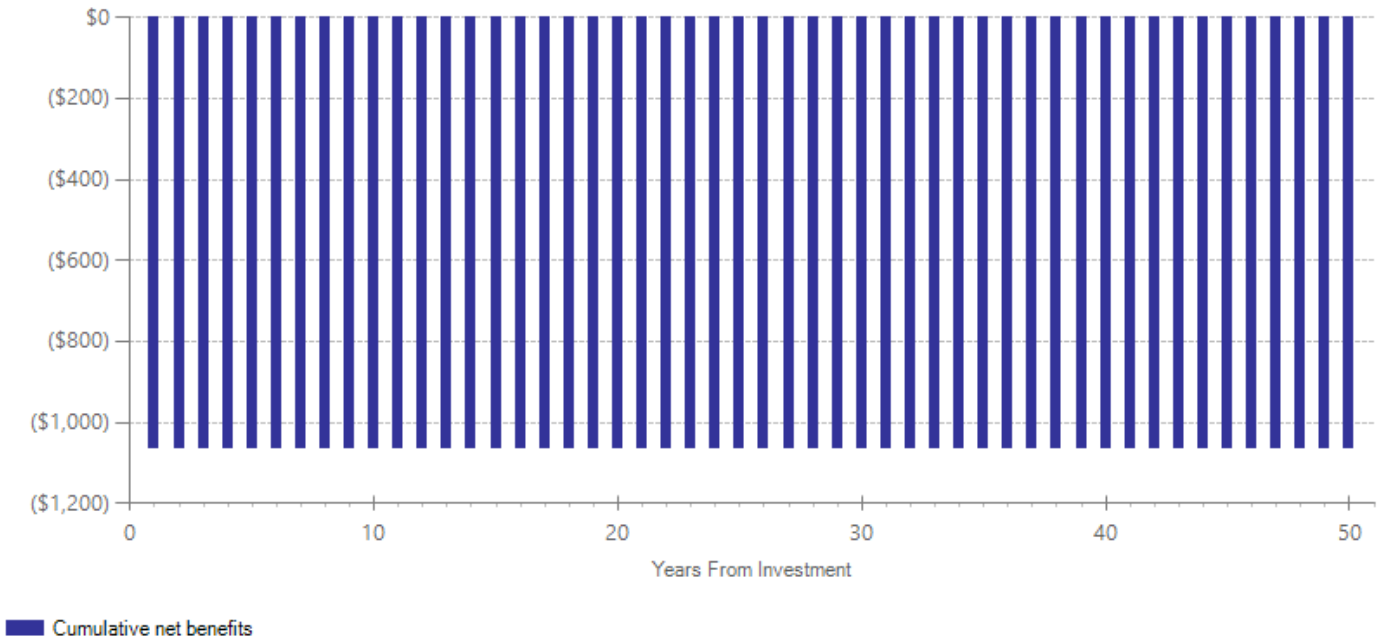
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	$200	2015	Present value of net program costs (in 2018 dollars)	($213)
Comparison costs	$0	2015	Cost range (+ or -)	50 %

These interventions varied in length, from a single session to seven months. The per-participant cost was calculated by multiplying the number of staff hours per participant by the average 2015 salary of the staff member as reported by the Bureau of Labor Statistics (http://www.bls.gov/oes/current/oes_wa.htm#29-0000). We multiplied the average salary by 1.441 to estimate the total staff costs including benefits.

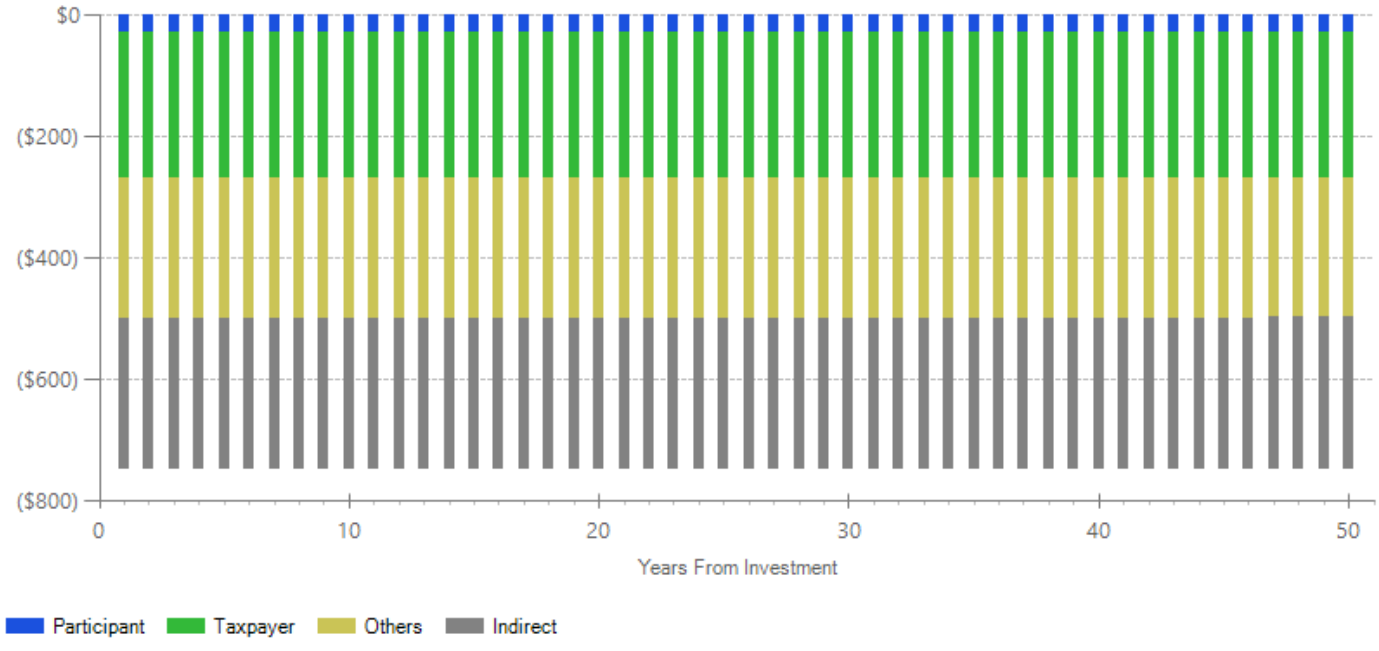
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty 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

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