

Interventions to Promote Health and Increase Health Care Efficiency: *Benefit-Cost Findings*

The Washington State Legislature directed the Washington State Institute for Public Policy (WSIPP) to “calculate the return on investment to taxpayers from evidence-based prevention and intervention programs and policies.”¹ Additionally, WSIPP’s Board of Directors authorized WSIPP to work on a joint project with the MacArthur Foundation and Pew Charitable Trusts to extend WSIPP’s benefit-cost analysis to certain health care topics.

With consultation from the Pew-MacArthur Results First Initiative and Washington State legislative staff, several health care topics were identified as important. In December 2014, WSIPP published a report on the evidence for six of those topics: “lifestyle” programs to prevent diabetes; behavioral interventions to reduce obesity; smoking cessation during pregnancy; transitional care to prevent hospital readmissions; patient-centered medical homes; and programs to reduce avoidable emergency department visits.²

In this report, we present benefit-cost results for five of the six topics.³ In [Section I](#) we review our research approach, and in [Section II](#) we discuss our findings.

¹ Engrossed Substitute House Bill 1244, Chapter 564, Laws of 2009.

² [Bauer, J., Kay, N., Lemon, M., & Morris, M. \(2014\). Interventions to promote health and increase health care efficiency: A review of the evidence, \(Doc. No. 14-12-3402\). Olympia: Washington State Institute for Public Policy.](#)

³ Benefit-cost results for programs targeting smoking cessation during pregnancy will be available in 2016.

Summary

WSIPP’s Board of Directors authorized WSIPP to work on a joint project with the MacArthur Foundation and the Pew Charitable Trusts to extend WSIPP’s benefit-cost analysis to certain health care topics. An important goal is to determine whether there are strategies that can help states control Medicaid and other health care costs.

This report reviews benefit-cost results for five topics: “lifestyle” programs designed to prevent diabetes; behavioral interventions to reduce obesity; transitional care to prevent hospital readmissions; patient-centered medical homes to reduce health care costs; and programs to reduce avoidable emergency department visits.

For each topic, we gathered all of the research we could locate from around the United States and elsewhere. We screened the studies for methodological rigor and computed an average effect of the programs on specific outcomes. We then calculated program benefits and costs and conducted a risk analysis to determine which programs consistently have benefits that exceed costs.

We found evidence that some approaches can achieve benefits that exceed costs but others do not. We explain these results in this report and display them in a summary table, [Exhibit 1](#).

I. Research Methods

When WSIPP is asked to identify “what works” and “what does not work” on a given topic, we begin by locating all of the studies we can find from around the United States and elsewhere.

We analyze all high-quality studies to identify program effects. We look for research studies with strong evaluation designs and exclude studies with weak research methods. For example, to be included in our review, a study must have had a treatment and comparison group and demonstrated comparability between groups.⁴

We first calculate “effect sizes” for each study. An effect size measures the degree to which a program has been shown to change an outcome (such as diabetes incidence) for program participants relative to a comparison group.

Our empirical approach then follows a meta-analytic framework to assess systematically all credible evaluations that have passed our test for methodological rigor. Given the weight of the evidence, we calculate an average expected effect of a policy on a particular outcome of interest, as well as an estimate of the margin of error for that effect. The average effect size is a measure of the degree to which a program works.

Next, we consider the benefits and costs of implementing a program or policy by answering two questions.

- How much would it cost Washington taxpayers to produce the results found in Step 1?
- How much would it be worth to people in Washington State to achieve the results found in Step 1?

That is, in dollars and cents, what are the benefits and costs of each program or policy?

Our benefit-cost results are expressed with standard financial statistics: net present values and benefit-cost ratios. We present monetary estimates from three perspectives:

- 1) program participants
- 2) taxpayers
- 3) other people in society

The sum of these perspectives provides a “total Washington” view on whether a program or policy produces benefits that exceed costs.

⁴ Common reasons for excluding studies include treatment groups consisting solely of program completers, high study attrition rates without intent-to-treat analysis, and insufficient information reported to estimate effect sizes for outcomes of interest.

Benefits to individuals and society may stem from multiple sources. For example, a policy that reduces diabetes incidence decreases the use of health care resources, thereby reducing taxpayer costs and personal, out-of-pocket costs. In addition, preventing diabetes increases a person's employment and earnings outlook. Thus, program participants will have higher earnings, on average, in the labor market. Our benefit-cost model produces estimates of both the health care and labor market effects.

Any tabulation of benefits and costs involves a degree of risk about the estimates calculated. This is expected in any investment analysis, whether in the private or public sector. To assess the riskiness of our conclusions, we perform a "Monte Carlo simulation" in which we vary key factors in our calculations. The purpose of this analysis is to determine the probability that a particular program or policy will at least have benefits that are equal to or greater than costs ("break even").

Thus, we produce two "big picture" findings for each program: an expected benefit-cost result and, given our understanding of the risks, the probability that the program or policy will at least break even.

We describe these methods in detail in WSIPP's [Technical Documentation](#).⁵

⁵ Washington State Institute for Public Policy (2014). *Benefit-cost technical documentation*. Olympia, WA: Author. Retrieved from <http://www.wsipp.wa.gov/TechnicalDocumentation/WsippBenefitCostTechnicalDocumentation.pdf>

II. Summary of Benefit-Cost Findings

This section presents findings for five topics:

- 1) Lifestyle programs designed to prevent type 2 diabetes
- 2) Behavioral interventions to reduce obesity
- 3) Care transition to prevent hospital readmissions
- 4) Patient-centered medical homes
- 5) Programs to reduce avoidable emergency department (ED) visits

Benefit-cost summary statistics are in [Exhibit 1](#). These five topics fall into two broad categories: health promotion and system efficiency. The studies used in our analysis can be found in [Appendix A](#) of the December 2014 WSIPP report.⁶

1) [Lifestyle interventions to prevent diabetes](#)

Lifestyle programs to prevent diabetes target individuals at high risk for developing the disease, providing them with counseling and other support. We found that these programs have benefits that consistently outweigh the costs. This finding holds true for both long-term, intensive programs and shorter-term, group-based programs.

2) [Behavioral interventions to reduce obesity](#)

Behavioral interventions for obesity include behavioral counseling and education delivered remotely, in primary care, or in other clinical environments. The programs often include diet and exercise components.

⁶ Bauer et al. (2015).

We found that high-intensity, in-person programs for adults are cost beneficial on average, though the risk that a given intervention will not break-even is relatively high ([Exhibit 1](#)). Among low-intensity programs, there is only a 50% chance benefits exceed costs.

While behavioral interventions for obesity can have positive short-term effects on weight outcomes in children, we found little evidence that these effects are maintained over time.⁷ On average, benefits do not exceed costs for in-person programs, and programs delivered remotely have only a 50% chance of breaking even.

3) [Transitional care programs to prevent hospital readmissions](#)

Transitional care may include coaches, patient education, medication reconciliation, individualized discharge planning, enhanced provider communication, and patient follow-up after discharge.⁸

⁷ These findings are consistent with U.S. Preventive Services Task Force recommendations regarding obesity in children and adolescents, which found that moderate- to high-intensity interventions showed modest effects on weight status but that evidence for long-term sustainability of BMI changes was limited. U.S. Preventive Services Task Force. (2014). *Final Recommendation Statement: Obesity in Children and Adolescents: Screening*. Retrieved from <http://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/obesity-in-children-and-adolescents-screening>.

⁸ Hansen, L.O., Young, R.S., Hinami, K., Leung, A., & Williams, M.V. (2011). Interventions to reduce 30-day hospitalization: A systematic review. *Annals of Internal Medicine*, 155(8), 520-528.

We found that the benefits of these programs consistently outweigh the costs, especially for comprehensive programs that target high-risk elderly or chronically ill patients.

4) [Patient-centered medical homes](#)

The “patient-centered medical home” (PCMH) model attempts to make health care more efficient by restructuring primary care. The aims are to: (a) facilitate care coordination across providers; (b) ensure that all the patient’s care needs (preventive, acute, chronic, and mental health) are met; (c) promote care quality and patient safety; (d) increase responsiveness to patient preferences and needs; and (e) enhance access to care.

Both physician-led primary care practices and integrated health delivery systems have established medical homes. Some PCMHs include general patient populations and others recruit high-risk elderly or chronically ill patients.⁹

We found that PCMHs targeting high-risk patients are very likely to have benefits that outweigh costs. Those implemented with general patient populations, however, are less likely to “break even.”

5) [Interventions to reduce emergency department \(ED\) use](#)

We examined three interventions to prevent the need for ED visits and reduce non-urgent ED use: (a) intensive case management for frequent ED users, (b) general education on appropriate ED use, and (c) asthma self-management education for children.

We found that, although intensive case management for frequent ED users reduces ED visits, this approach is costly to implement. Therefore, the benefits do not outweigh the costs, on average.

Our analysis found that for both asthma self-management education for children and general education on appropriate ED use there is only about a 50% chance that benefits outweigh the costs.

⁹ The Medicaid Health Home, a more recent variant of the medical home model, focuses on patients with serious mental illness and substance abuse disorders. WSIPP has reviewed the evidence on health homes; those findings are reported on our website: <http://www.wsipp.wa.gov/BenefitCost/Program/496>

Exhibit 1
Health Care

Program name	Total benefits	Taxpayer benefits	Non-taxpayer benefits	Costs	Benefits minus costs (net present value)	Benefit to cost ratio	Chance benefits will exceed costs
Health Promotion							
Lifestyle interventions to prevent diabetes: Long-term, intensive, individual counseling programs	\$27,648	\$10,682	\$16,967	\$3,725	\$23,923	\$7.42	100 %
Lifestyle interventions to prevent diabetes: Shorter-term programs with group-based counseling	\$15,307	\$5,109	\$10,198	\$440	\$14,867	\$34.76	83 %
Behavioral interventions to reduce obesity for adults: High-intensity, in-person programs	\$4,140	\$1,035	\$3,105	\$615	\$3,525	\$6.73	66 %
Behavioral interventions to reduce obesity for adults: Remotely-delivered programs	\$1,385	\$332	\$1,053	\$94	\$1,291	\$14.75	56 %
Behavioral interventions to reduce obesity for adults: Low-intensity, in-person programs	\$243	\$73	\$171	\$182	\$61	\$1.34	50 %
Behavioral interventions to reduce obesity for children: Remotely-delivered programs	\$84	\$22	\$62	\$64	\$20	\$1.31	50 %
Behavioral interventions to reduce obesity for children: Low-intensity, in-person programs	\$20	\$18	\$2	\$162	(\$142)	\$0.12	48 %
Behavioral interventions to reduce obesity for children: Moderate- to high-intensity, in-person programs	\$56	\$36	\$19	\$327	(\$272)	\$0.17	47 %
System Efficiency							
Transitional care to prevent hospital readmissions: Comprehensive programs	\$1,824	\$838	\$987	\$413	\$1,412	\$4.42	100 %
Patient-centered medical homes with high-risk patients	\$670	\$277	\$393	\$81	\$589	\$8.27	87 %
Transitional care to prevent hospital readmissions: All programs, general patient populations	\$437	\$191	\$246	\$51	\$386	\$8.58	89 %
Patient-centered medical homes in integrated health systems	\$267	\$120	\$148	\$81	\$186	\$3.30	57 %
Interventions to reduce unnecessary emergency department visits: General education on appropriate ED use	\$32	\$13	\$20	\$9	\$23	\$3.53	50 %
Interventions to reduce unnecessary emergency department visits: Asthma self-management education for children	(\$30)	\$1	(\$32)	\$77	(\$107)	(\$0.40)	49 %
Patient-centered medical homes in physician-led practices	(\$60)	(\$7)	(\$53)	\$81	(\$141)	(\$0.74)	7 %
Interventions to reduce unnecessary emergency department visits: Intensive case management for frequent ED users	\$2,965	\$2,982	(\$16)	\$9,422	(\$6,456)	\$0.31	44 %

These results are current as of May 2015. More recent results may be available on WSIPP's website <http://www.wsipp.wa.gov/BenefitCost?topicId=6>

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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.