Multifactorial programs: physician-led (high-risk population)

Health Care: Falls Prevention for Older Adults

Benefit-cost estimates updated December 2019. Literature review updated November 2017.

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: Multifactorial falls prevention programs offer more than one type of intervention, with each participant receiving a tailored combination of interventions following an initial falls risk assessment. Physician-led multifactorial interventions begin with a comprehensive medical exam in an outpatient setting which may be accompanied by some or all of the following: occupational therapy assessment; activities of daily living, home environmental, and behavioral assessment; cognition assessment; gait stability assessment; medication review, and other elements. Participants typically receive multiple clinical risk assessments after the initial comprehensive medical exam. Among included studies, the most commonly prescribed interventions following these assessments were exercise or physical therapy, occupational therapy, and medication review.

This meta-analysis includes interventions delivered to community-dwelling older adults with a high risk of falling. We classify participants as high-risk if they were selected for falls risk factors or if they were recruited from an inpatient setting.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	$516	Benefit to cost ratio	$1.25
Participants	$65	Benefits minus costs	$400
Others	$81	Chance the program will produce benefits greater than the costs	65 %
Indirect	$1,326		
Total benefits	$1,988		
Net program cost	($1,589)		
Benefits minus cost	$400		

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.

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:[1]	Benefits to:				
	Participants	Taxpayers	Others[2]	Indirect[3]	Total
Health care associated with falls	$65	$516	$81	$258	$920
Mortality associated with falls	$0	$0	$0	$1,862	$1,862
Adjustment for deadweight cost of program	$0	$0	$0	($794)	($794)
Totals	$65	$516	$81	$1,326	$1,988

[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.

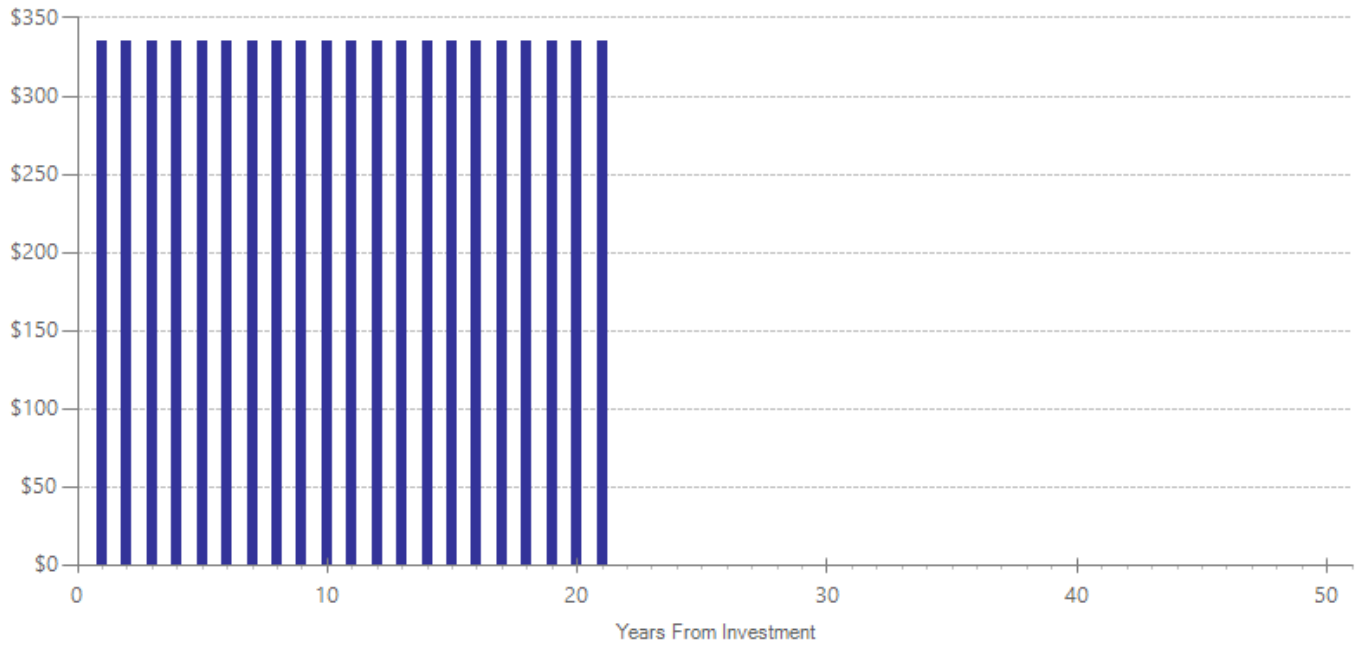
Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	$1,508	2016	Present value of net program costs (in 2018 dollars)	($1,589)
Comparison costs	$0	2016	Cost range (+ or -)	70 %

Per-participant cost estimates are based on a weighted average of the costs in the included studies. We use a cost study on multifactorial falls prevention programs (Day, L., Hoareau, E., Finch, C., Harrison, J., Segal, L., Bolton, T., & Ullah, S. (2009). Modelling the impact, costs and benefits of falls prevention measures to support policy-makers and program planners. Monash University Accident Research Centre) to inform our assumptions around resource use; apply 2016 mean hourly wages for relevant providers in Washington from the U.S. Bureau of Labor Statistics (retrieved March 2018); and increase wages by a factor of 1.441 to account for the cost of employee benefits. Based on the work of Day et al., 2009, we estimate the cost of services including initial assessments, a team meeting, administrative assistance, and a geriatric review. We assume the initial physician assessment lasted 40 minutes; initial assessments by a nurse, physical therapist, and occupational therapist lasted 27 minutes each; and administrative assistance by a medical secretary lasted 30 minutes. For each intervention that delivered treatment based on assessment results, we include an average per-participant cost for such treatment, based on the components reported by Day et al., 2009. To convert the healthcare costs reported in Day et al., 2009 (in Australian dollars), we compute a conversion factor by comparing compensation rates reported in that study with those in Washington State. To convert non-healthcare costs reported in Day et al., 2009, we compute a conversion factor using Campbell and Cochrane Economics Methods Group & the Evidence for Policy and Practice Information and Coordinating Centre. (n.d.). CCEMG – EPPI-Centre Cost Converter (v.1.5). Retrieved 3/16/2018, from https://eppi.ioe.ac.uk/costconversion/.

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
Emergency department visits^^	79	1	159	-0.079	0.184	79	n/a	n/a	n/a	-0.079	0.668
Fall-related hospitalization^	79	2	369	0.030	0.092	79	n/a	n/a	n/a	0.030	0.741
Falls‡	79	2	278	0.675	0.047	79	1.000	0.000	80	0.675	0.001

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

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

‡The effect size for this outcome indicates an incidence rate ratio (IRR), not a standardized mean difference effect size. An IRR less than one indicates a lower rate of the outcome in the treatment group relative to the comparison group; an IRR greater than one indicates a higher rate of the outcome. The treatment n for this outcome represents person-years.

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

Conroy, S., Kendrick, D., Harwood, R., Gladman, J., Coupland, C., Sach, T., . . . Masud, T. (2010). A multicentre randomised controlled trial of day hospital-based falls prevention programme for a screened population of community-dwelling older people at high risk of falls. *Age and Ageing, 39*(6), 704-710.

Davison, J., Bond, J., Dawson, P., Steen, I.N., & Kenny, R.A. (2005). Patients with recurrent falls attending Accident & Emergency benefit from multifactorial intervention—a randomised controlled trial. *Age and Ageing, 34*(2), 162-8.

Spice, C.L., Morotti, W., George, S., Dent, T.H., Rose, J., Harris, S., & Gordon, C.J. (2009). The Winchester Falls Project: A randomised controlled trial of secondary prevention of falls in older people. *(Age and Ageing, 38*((1), 33-40.

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