



**Children's
Safety
Network**

Injury Prevention: What Works?

A Summary of Cost-Outcome Analysis for Injury Prevention Programs



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FAST FACTS

How can you convey the cost-effectiveness of the injury intervention that you are considering? Use a fast fact! These can be written for any of the interventions summarized in these Fact Sheets based on the information in the table. The format of the fast facts is “[*Intervention name*] yields an estimated cost savings of [Total Benefits] for a cost of only [Cost per Unit].” For example, [*Zero Alcohol Tolerance for Drivers Under 21*] yields an estimated cost savings of [\$1,222] for a cost of only [\$47 per driver].

- » **Midnight Driving Curfew Combined with Provisional Licensing** for teenage drivers yields an estimated cost savings of \$859 for a cost of only \$102 per driver.
- » **Sobriety Checkpoints** yield an estimated cost savings of \$105,059 for a cost of only \$15,558 per checkpoint.
- » **Battery-Operated Smoke Alarms** yield an estimated cost savings of \$1,048 for a cost of only \$54 per smoke alarm.
- » **Treatment Foster Care** yields an estimated cost savings of \$234,239 for a cost of only \$12,228 per child.
- » A **20% Alcohol Tax** yields an estimated cost savings of \$132 for an annual cost of only \$13 per drinker.
- » **Poison Control Centers** yield an estimated cost savings of \$440 for a cost of only \$55 per call.
- » A **Bicycle Helmet, Ages 3-14**, yields an estimated cost savings of \$751 for a cost of only \$15 per helmet.
- » **Child Safety Seat Distribution, Ages 0-4**, yields an estimated cost savings of \$2,855 for a cost of only \$64 per seat provided.

1. METHODOLOGY

INTRODUCTION

Injuries and violence are among the most serious social, economic, medical, and public health issues. Injuries and violence are a leading killer among all ages, and the number one killer among kids, teens, and adults ages 1-44.¹ Injuries and violence affect all of us including the families left behind, disabled survivors, and the general public who support our overburdened health care system. However, the majority of injuries and violence can be prevented through education, behavior and environmental changes, policy implementation and enforcement, and technology.

Figure 1 shows some of the factors that you should consider to determine if a particular prevention program or intervention is right for you, your family, and/or your community; the only factor discussed in these Fact Sheets are costs. Costs are a universal metric that allow you to compare dissimilar interventions on the same scale. Costs can be used to produce cost-outcome analyses (see glossary for definitions of terms in bold) that are useful tools for the evaluation of prevention and intervention programs. These Fact Sheets can be used as an advocacy tool, to assist with the development of injury prevention plans, to guide the selection of an intervention, to provide technical assistance, to assist with resource allocation, or to promote a particular intervention in educational materials. Disciplines that are essential or tangential to injury prevention have a need to evaluate programs in terms of costs.

These Fact Sheets present cost-outcome analyses for motor vehicle, impaired driving, open-flame/burn, substance use, violence, and other interventions. In a resource-constrained world, decision makers want to know if a program produces desired results less expensively than alternative approaches. For example, cost-outcome analyses allow you to say:

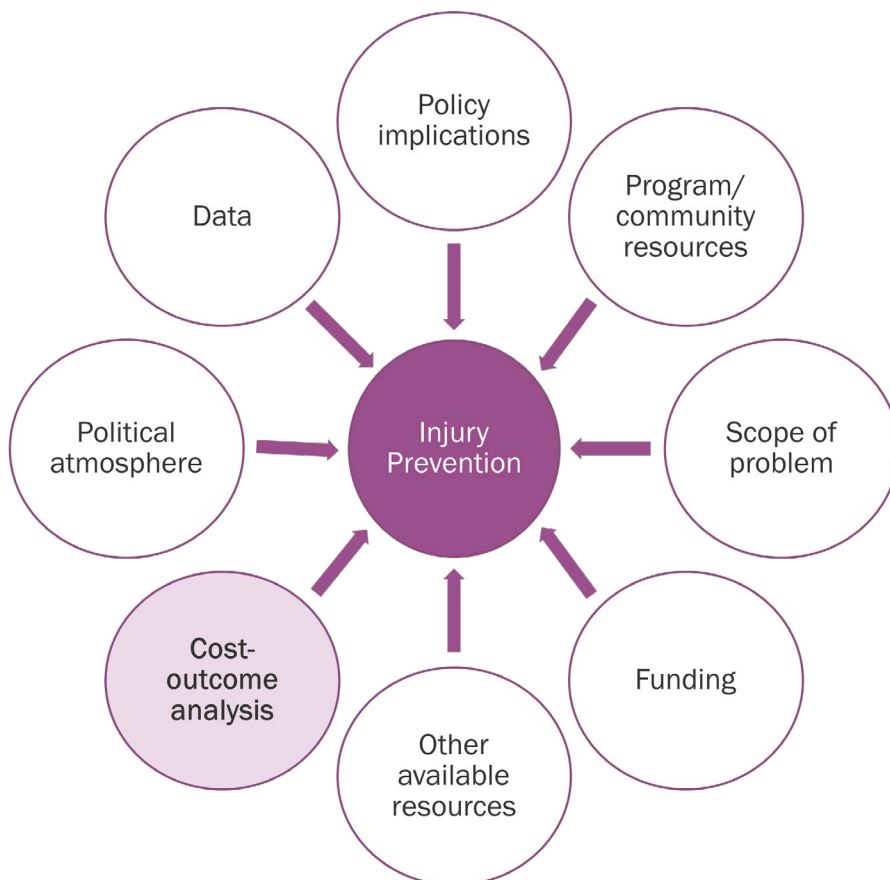
- » On average, a \$64 child safety seat generates \$2,855 in benefits to society, or stated another way, child safety seats yield an estimated cost savings of \$2,855 for an average cost of only \$64.
- » On average, a \$42 booster seat generates \$3,247 in benefits to society.
- » On average, a \$15 bicycle helmet for ages 3-14 years generates \$751 in benefits to society.
- » On average, a \$54 battery-operated smoke alarm generates \$1,048 in benefits to society.
- » Childproof cigarette lighters cost \$0.06 per lighter and generate \$5 in benefits to society.
- » The average call to a poison control center costs \$55 and saves \$440 in medical costs. At \$55 a call, each \$1 spent on poison control center services saves \$8 in benefits to society.
- » The average admission to a triaged regional trauma system costs \$2,563 and saves \$6,774.

¹ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2022). Leading Causes of Death Reports 2020.

- » On average, injury prevention counseling by pediatricians (TIPP) costs \$15 per child ages 0-4 and generates \$126 in benefits to society.
- » A sobriety check point costs \$15,558 and generates an average of \$105,059 in benefits to society.
- » The Harlem Hospital Safe Communities program costs an average of \$96 per child and generates an average of \$4,939 in benefits to society.

The majority of the interventions presented reduce injuries, disability, and death. However, these Fact Sheets are a partial literature summary of available injury interventions with cost outcome analysis results. Children’s Safety Network (CSN) is not suggesting that you choose any of the interventions over others. The focus of these Fact Sheets is on the cost-effectiveness of interventions, but cost effectiveness should **NOT** be the only factor considered when choosing an intervention to replicate or endorse. Interventions should be chosen based on a multitude of factors, including policy implications, program or community resources, funding, political atmosphere, cost implications, scope of problem, data, votes, personal interests, understanding the problem, time, competing priorities/ interest groups, feeling of control over the situation, and other available resources (see Figure 1).

FIGURE 1: SOME FACTORS TO CONSIDER WHEN CHOOSING WHICH INJURY PREVENTION INTERVENTION IS RIGHT FOR YOU.



METHODS FOR THE COST-OUTCOME ANALYSIS OF INJURY INTERVENTION PROGRAMS

The purpose of this section is to help the user properly use the tables and information provided. Details about suggested values to use in determining the appropriateness of an intervention are NOT meant to solely be used in determining the selection of an intervention. Cost-outcome analyses that show cost-savings are just one of many factors to consider.

One hundred and eighty injury-related interventions for youths and adults are included in these Fact Sheets: 62 youth only interventions, 60 adult only interventions, and 58 youth and adult interventions. Estimated cost savings (benefits to society) per injury prevented are made based on a set of related studies or use compatible values from the United States Consumer Product Safety Commission's Injury Cost Model. In several highway safety studies, intervention costs included increased travel time or reduced mobility. We valued travel time at 50% of the wage rate for production workers and valued mobility loss at the average cost of vehicle operation including amortization (Miller & Levy, 2000; Miller TR, Hendrie D. (2012a). All costs take society's viewpoint (everyone's costs and savings count) and use 2020 dollars and a 3% discount rate (National Academies of Sciences, Engineering, and Medicine, 2016). Savings from any demonstration programs were reduced by 25% (Miller & Levy, 2000; Miller, Finkelstein, Zaloshnja, & Hendrie, 2012). When demonstration programs are replicated by others, there are usually differences between the replication and the original (demonstration) program, such that the savings are usually lower.

Savings for some interventions would be higher if we looked at the government perspective. For example, the cost of a sobriety checkpoint includes the time spent by drivers stopped at the checkpoints. If this were excluded, the savings would be higher.

The injury interventions presented were selected from published and unpublished studies from 1987-2020 identified through Medline and internet searches, bibliographic reviews, and federal agencies. Serious study flaws were corrected when possible (Miller & Hendrie, 2009; Miller & Levy, 2000; Miller & Hendrie, 2012a). For example, Ted and Hendrie (2009) recomputed the costs of all school-based substance use prevention program to value middle school teacher time at the same price. However, some studies were subjectively excluded based on the rigor of program cost and effectiveness estimates. Analyses of occupational, air, rail, and water transport safety programs were also excluded. In addition, studies which showed reductions in fatalities, but ignored nonfatal injuries were excluded. All excluded studies are not shown in these Fact Sheets.

There are two cost measures which can be used to compare interventions: benefit-cost ratios (BCR) and cost per QALY (quality adjusted life years) saved. If the BCR is greater than 1.0, the cost of implementing the intervention is less than the total benefits gained by preventing injuries. The total benefits include the dollar value of medical costs, work loss, and lost quality of life costs. A BCR greater than 1 means the intervention offers a positive return on investment and is cost-effective. Costs per QALY is a more stringent measure because it only includes savings from medical costs and other tangible resources and does not include quality of life savings. If the medical and other resource cost savings generated by the prevented injuries exceed the total cost of the intervention, the intervention is cost-saving and the cost/QALY is "<\$0." If the intervention is effective, but the cost

of the intervention exceeds the medical and other resource cost-savings, the cost/QALY will be greater than the \$0. If the intervention is not effective at all, the cost/QALY will be infinite (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes). In summary the best interventions are cost-effective (a BCR > 1) and cost-saving (cost/QALY < \$0). In general interventions with a BCR > 2 and a cost/QALY < \$100,000 are considered acceptable interventions (Miller & Levy, 2000; Miller, Finkelstein, Zaloshnja, & Hendrie, 2012; Miller & Hendrie, 2012b).

SUMMARY OF NUMBER AND TYPES OF COST-OUTCOME ANALYSIS INTERVENTIONS

Intervention	Youth	Adult	Youth and Adult	Total
Motor Vehicle and Highway Safety	9	0	30	39
Impaired Driver	1	16	0	17
Open-Flame/Burn	1	0	11	12
Violence	15	17	2	34
Other Injury	6	2	3	11
Alcohol and Substance Use	26	8	12	46
Tobacco	4	17	0	21
Total	62	60	58	180

STUDY SUPPORTERS AND REFERENCES

Development and update of this Fact Sheet Series is supported by a contract from the Children's Safety Network (CSN), funded by a cooperative agreement from the Health Resources Services Administration Maternal and Child Health Bureau Support for the estimates also came from the Center for Substance Abuse Prevention, National Institute on Alcohol Abuse and Alcoholism, and National Highway Traffic Safety Administration. All cost-outcome analyses presented in these Fact Sheets were conducted by or compiled by Ted Miller, PhD and others from the CSN Economics and Data Analysis Resource Center at the Pacific Institute for Research and Evaluation (PIRE). Most of the analyses are in the following sources:

- » Miller TR, Levy DT. (2000). Cost-outcome analysis in injury prevention and control: Eighty-four recent estimates for the United States. *Medical Care* 38(6):562–582.
- » Miller TR. (2001). The effectiveness review trials of Hercules and some economic estimates for the stables. *American Journal of Preventive Medicine* 21(4S):9-12.
- » Zaloshnja E, Miller TR, Galbraith M, Lawrence BA. (2003). Reducing injuries among Native Americans: Five cost-outcome analyses. *Accident Analysis and Prevention* 35(5):631-639.
- » Miller TR, Hendrie D. (2009). Substance abuse prevention dollars and cents: A cost-benefit analysis, Rockville MD: Substance Abuse and Mental Health Services Administration, DHHS Publication No. (SMA) 07-4298.

- » Miller TR, Finkelstein E, Zaloshnja E, Hendrie D. (2012). The cost of child and adolescent injuries and the savings from prevention. In K Liller (ed.), *Injury Prevention for Children and Adolescents: Research, Practice, and Advocacy*, Second Edition, Washington DC: American Public Health Association, 21-81.
- » Miller TR, Hendrie D. (2012a). Economic evaluation of public health laws and their enforcement. In S Burris, A Wagenaar, (ed.), *Public Health Law Research: Theory and Methods*, Wiley.
- » Miller TR, Hendrie D. (2012b). Economic evaluation of injury prevention and control programs. In G Li, S Baker (ed.), *Injury Research: Theories, Methods and Approaches*, New York: Springer, 641-666.
- » Miller TR, Courser M, Shamblen SR, Lange JE, Tippetts AS, Ringwalt C. (2020). Efficacy and cost-effectiveness of subsidized ridesharing as a drunk driving intervention in Columbus, OH. *Accident Analysis and Prevention* 146:105740.
- » National Academies of Sciences, Engineering, and Medicine. (2016). *Advancing the power of economic evidence to inform investments in children, youth, and families*. Washington DC: National Academies Press.

2. MOTOR VEHICLE

COST ANALYSIS OF MOTOR VEHICLE AND PEDESTRIAN SAFETY INTERVENTION PROGRAMS

Motor vehicle collisions are a leading cause of fatal injuries.² Motor vehicle crashes contribute to over 38,000 fatalities in the United States.³ The economic costs of these crashes was \$242 billion in 2010, which included lost productivity, medical costs, legal and court costs, emergency service costs, insurance administration costs, congestion costs, property damage, and workplace losses.⁴ Interventions to reduce motor vehicle injuries include interventions to improve driver and pedestrian safety, vehicle design, and road design.

Driver and pedestrian safety interventions include broad federal traffic safety programs, speed limits, provisional licenses and curfews for teenage drivers, laws requiring child seats, and distribution of child seats. Vehicle design interventions include installing airbags, seatbelts, and automatic daytime vehicle lights. Road design interventions include bridge end guard rails, median barriers, and post mounted reflectors.

DRIVER AND PEDESTRIAN SAFETY PROGRAMS

Of the nineteen driver and pedestrian programs reviewed, twelve were cost-saving; for these programs, the medical, property damage, and other resource cost savings exceed the intervention costs. *Child Safety Seats (Ages 0-4)* and *Booster Seats (Ages 4-7)* reduce injuries to children in

Child Seats

Child seats are an effective way of reducing child injuries in motor vehicle crashes. Three types of child seat programs with cost-benefit analyses are included in these fact sheets: *Pass Child Safety Seat Law – Ages 0-4*, *Child Safety Seat Distribution - Ages 0-4*, and *Child Seat Misuse Reduction & Design Improvement* through education campaigns and check points. *Child Safety Seat Laws* require that children ages 0-4 be appropriately restrained when traveling in passenger vehicles. *Child Safety Seat Distribution (Ages 0-4)* encompasses giving away approved child safety seats to parents and caregivers and a *Child Seat Misuse Reduction & Design Improvement* at a car seat checkpoint involves ensuring that child safety seats are properly installed in vehicles, that children are appropriately fastened in the child seat, and that parents and caregivers have an understanding of procedures. Uniform latches to anchor seats contributed to the effectiveness of this intervention.

2 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2022). Leading Causes of Death Reports 2020.

3 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2022). Fatal Injury and Violence Data 2020.

4 Blincoe, L. J., Miller, T. R., Zaloshnja, E., & Lawrence, B. A. (2015, May). The economic and societal impact of motor vehicle crashes, 2010. (Revised) (Report No. DOT HS 812 013). Washington, DC: National Highway Traffic Safety Administration.

motor vehicle accidents, and the amount saved by preventing these injuries was more than the costs to implement the program. Other cost-saving interventions are *Safety Belt Laws*, *Bicycle Helmets*, *Motorcycle Helmets*, and *Installing Bridge-End Guardrail*. For communities with limited resources to invest in driver and pedestrian safety programs, these programs also offer the highest return.

The remaining programs produced benefits in injuries prevented but were less cost-effective. *Motorcycle Helmet Laws* and *All-Terrain Vehicle Helmets* were effective in reducing injuries, but they had a net cost for every year of perfect health gained.

BENEFIT-COST RATIOS OF MOTOR-VEHICLE INJURY AND PEDESTRIAN SAFETY INTERVENTION PROGRAMS (2020 DOLLARS)
For information on the research methodology, see Methodology section of this Fact Sheet Series.

		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
Driver and Pedestrian Safety Interventions					
1	Pass Child Safety Seat Law, Ages 0-4	\$71/new user	\$2,855	40.2	<\$0
2	Child Safety Seat Distribution, Ages 0-4	\$64/seat provided	\$2,855	44.6	<\$0
3	Pass Booster Seat Law, Ages 4-7	\$48/new user	\$3,247	67.6	<\$0
4	Booster Seat, Ages 4-7	\$42/seat	\$3,247	77.3	<\$0
5	Pass Safety Belt Law	\$419/new user	\$7,857	18.8	<\$0
6	Upgrade Secondary Belt Law to Primary	\$419/new user	\$7,857	18.8	<\$0
7	Enhanced Belt Law Enforcement	\$459/new user	\$7,857	17.1	<\$0
8	Driver Airbag	\$523/bag	\$2,463	4.7	\$13,447
9	Passenger Airbag	\$269/bag	\$582	2.2	\$76,375
10	Pass Motorcycle Helmet Law	\$2,538/new user	\$7,839	3.1	\$53,666
11	Voluntarily Wear a Motorcycle Helmet	\$119/helmet	\$7,839	65.9	<\$0
12	Pass Bicycle Helmet Law, Ages 3-14	\$16/new user	\$751	47.0	<\$0
13	Pass Bicycle Helmet Law, Ages 15 & Over	\$494/new user	\$365	0.7	\$341,784
14	Bicycle Helmet Distribution, Ages 3-14	\$15/helmet	\$751	50.1	<\$0
15	Bicycle Helmet, Ages 15 & Over	\$23/helmet	\$365	15.9	<\$0
16	Voluntarily Wear an ATV Helmet	\$63/helmet	\$740	11.7	\$11,840
17	Install Bridge-End Guardrail	\$13,658/bridge	\$544,637	39.9	<\$0
18	Install Median Barrier (1-12 foot median)	\$287,003/mile	\$783,877	2.7	\$65,746
19	Install Median Barrier (>13 foot median)	\$287,003/mile	\$182,918	0.6	\$372,644

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

VEHICLE DESIGN SAFETY RESEARCH AND REGULATION

Of these twenty-two interventions reviewed, thirteen were cost-saving. Even personal protective equipment with very low average benefits may be worth the cost to some consumers. For example, among this list, adding *Rear Seat Shoulder Belts* is the least cost-effective safety equipment, in part because there are no rear seat passengers in many collisions. However, a car purchaser who expects to regularly have passengers in the back seat might find that rear shoulder belts offered a positive return on investment.

Driving curfews for youth may force them to curtail their drinking and reduce impaired driving and resulting injuries. However, curfews have a social cost from lost mobility. A *Midnight Driving Curfew Combined with Provisional Licensing* offers a higher return than a *10 PM Driving Curfew* and is an appropriate intervention for many communities.

**BENEFIT-COST RATIOS OF MOTOR-VEHICLE INJURY AND PEDESTRIAN SAFETY INTERVENTION PROGRAMS (2020 DOLLARS)
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		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
Vehicle Design Safety Research and Regulation and Road Design and Upgrading					
20	Federal Traffic Safety Programs	\$4/driver	\$263	65.8	<\$0
21	Federal Vehicle Safety Program	\$80/vehicle	\$469	5.9	\$6,922
22	Federal Road Safety Program	\$8/driver	\$293	36.6	<\$0
23	Mobile Speed Camera	\$896,665/camera-year	\$18,013,476	20.1	<\$0
24	Red Light Camera	\$14,027/camera-year	\$63,490	4.5	<\$0
25	Striping / Painting Lines on Roads	\$325/mile	\$23,254	71.5	<\$0
26	Post-mounted Reflectors	\$453/reflector	\$53,051	117.1	<\$0
27	Flatten Crest Vertical Curves	\$390,555/curve	\$296,326	0.8	\$276,873
28	Flashing Beacons on Hazardous Curves	\$25,588/beacon	\$432,395	16.9	<\$0
29	Side Impact Protection	\$448/vehicle	\$1,420	3.2	\$40,783
30	Automatic Daytime Vehicle Lights	\$97/vehicle	\$387	4.0	\$23,385
31	55MPH speed limit	\$11/added travel hour	\$31	2.7	\$30,336
32	Child Pedestrian Safety Program	\$2,285/child/year	\$21,885	9.6	<\$0
33	Safety Belts, Front Seat	\$93/vehicle	\$5,302	57.0	<\$0
34	Shoulder Belts, Rear Seat	\$34/vehicle	\$15	0.4	\$490,131
35	Child Seat Misuse Reduction & Design Improvement	\$7/seat in use	\$747	101.1	<\$0
36	Livestock Control, Native American	\$60,047/impound vehicle	\$103,483	1.7	<\$0
37	Livestock Control, Native American	\$9/grate	\$18	2.0	<\$0
38	Provisional Licensing + Midnight Driving Curfew	\$102/driver	\$859	8.4	<\$0
39	Change Driving Curfew to 10 PM	\$196/driver	\$515	2.6	\$43,158

3. IMPAIRED DRIVING

COST ANALYSIS OF IMPAIRED DRIVING AND PEDESTRIAN INTERVENTION PROGRAMS

Impaired driving, or driving under the influence of alcohol, is a major source of fatalities and injuries. Even a small amount of alcohol can affect driving ability. In 2019, 10,142 people died in alcohol-impaired driving, accounting for 28% of all traffic-related deaths in the United States crashes.⁵ There were 6,132 traffic crashes in 2019 that had one or more pedestrian fatalities. Of those fatal pedestrian crashes, 46% involved a driver or pedestrian with a blood alcohol concentration (BAC) of 0.01 g/dL or higher.⁶ Fifteen prevention programs are reviewed here.

Streetlights at Bars

In the *Streetlights at Bars* intervention, the Eastern Arizona District of the IHS’s Office of Environmental Health and the White Mountain Apache Tribe (population 10,000) installed 28 streetlights along a 1.1-mile section of highway to reduce pedestrian injuries, primarily to intoxicated victims, in Whiteriver, Arizona. The project also involved the State Transportation Department and the local electric utility.

BENEFIT-COST RATIOS OF IMPAIRED DRIVING PREVENTION PROGRAMS (2020 DOLLARS)

For information on the research methodology, see Methodology section of this Fact Sheet Series.

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Impaired Driving Prevention Programs					
40	0.08% Driver Blood Alcohol Limit	\$4/driver	\$70	17.4	<\$0
41	Reduce Driver Blood Alcohol Limit to 0.05 from 0.08	\$20/driver	\$121	6.0	<\$0
42	Zero Alcohol Tolerance, Drivers Under 21	\$47/driver	\$1,222	26.0	<\$0
43	Sobriety Checkpoints	\$15,558/checkpoint	\$105,059	6.8	<\$0
44	Saturation Patrols + Media Campaign	\$33,654/10,000 drivers	\$396,851	11.8	<\$0
45	Administrative License Revocation (ALR)	\$4,306/ALR	\$76,693	17.8	<\$0
46	ALR with Per Se Law	\$4,043/ALR	\$91,212	22.6	<\$0
47	Alcohol-Testing Ignition Interlock Permitted	\$1,434/vehicle	\$10,347	7.2	<\$0
48	Alcohol-Testing Ignition Interlock Mandate	\$1,434/vehicle	\$25,126	17.5	<\$0
49	DWI Offender Auto Impoundment	\$1,227/vehicle	\$7,039	5.7	<\$0
50	DWI Offender Electronic House Arrest	\$2,146/arrestee	\$7,839	3.7	<\$0

5 National Highway Traffic Safety Administration, National Center for Statistics and Analysis. (2020, December). Overview of motor vehicle crashes in 2019. (Traffic Safety Facts Research Note. Report No. DOT HS 813 060).

6 National Highway Traffic Safety Administration, National Center for Statistics and Analysis. (2021, May). Pedestrians: 2019 data (Traffic Safety Facts. Report No. DOT HS 813 079).

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
51	DWI Intensive Probation + Treatment	\$2,038/probation	\$7,786	3.8	<\$0
52	Driving Under the Influence Court	\$4,025/client	\$15,224	3.8	<\$0
53	Australia-Style Anti-DWI Media Campaign	\$1,059/million population	\$15,885	15.0	<\$0
54	Safe Ride Program with media campaign	\$33/roundtrip coupon used	\$10	0.3	\$792,284
55	Safe Ride Program with media campaign	\$27/one-way coupon used	\$10	0.4	\$648,232
Impaired Pedestrian Harm Reduction					
56	Streetlights at Bars, Native American	\$551/light	\$4,998	9.1	<\$0

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

Impaired driving fatalities and injuries can be prevented by lessening the number of drinking drivers, and the number of times that drinking drivers drive while impaired. Safety measures that improve the survivability of traffic crashes (i.e., proper in-car restraints, airbags, or guardrails) also prevent or improve the outcomes of impaired driving crashes; however, they are listed on the Motor Vehicle Safety section of this Fact Sheet Series.

Fifteen of the seventeen measures reported here directly reduce harm from drinking by reducing impaired driving frequency. These interventions all offer excellent returns for the amount invested. These interventions were cost-saving (cost/QALY < \$0) meaning that the medical, property damage, and other resource costs saved by these programs exceeded the costs of the program.

These interventions may avert specific incidents and also have a general deterrence effect. For example, Sobriety Checkpoints avert specific incidents by apprehending impaired drivers who would otherwise have crashed. Sobriety Checkpoints also have a general deterrence effect because some people choose not to drive after drinking to avoid getting caught in checkpoints. Typically, this general deterrence effect dominates.

Measures such as *Zero Alcohol Tolerance for Drivers Under 21* and *0.08% Driver Blood Alcohol Limits* may have additional benefits such as reducing consumption and associated harms including crime, high-risk sex, and suicide acts. However, only their impact on impaired driving has been evaluated.

Some interventions work well in combination. As a package, automatic *Administrative License Revocation* invoked when caught driving at a blood alcohol level above a 0.08% or even a 0.10% limit and *Zero Alcohol Tolerance for Drivers Under 21* during the first year of driving, and intensive *Sobriety Checkpoints* have worked well in concert to reduce impaired driving deaths among young drivers.

Interventions that can prevent re-offending include Alcohol-Testing Interlocks that prevent automobile use by impaired drivers, *DWI Offender Auto Impoundment*, and *DWI Offender Electronic House Arrest*. Any of these three interventions probably should be coupled with intensive case managed treatment. *Auto Impoundment* and *DWI Offender Electronic House Arrest* are also still at demonstration stages.

IMPAIRED PEDESTRIAN PREVENTION MEASURE

One intervention, *Streetlights at Bars*, was designed to protect intoxicated pedestrians. Streetlights were installed on a bar-lined street to increase visibility and reduce the likelihood of drivers hitting impaired pedestrians. It merits replication where similar conditions exist.

4. OPEN-FLAME/BURNS

COST ANALYSIS OF PREVENTING OPEN-FLAME BURNS

Fire/burn is the seventh leading cause of unintentional injury deaths in the United States. In 2018, 3,064 people were killed from unintentional fire or burn injuries and nearly 300,000 were admitted to a hospital or treated in an emergency department.^{7,8} Thermal burns, or burns from flames or hot objects, are the most common type of burns.⁹ An open flame is the leading cause of burn injury for adults, while scalding is the leading cause of burn injury for children. Twelve inexpensive prevention devices are reviewed here.

BENEFIT-COST RATIOS OF OPEN-FLAME BURN PREVENTION PROGRAMS (2020 DOLLARS)

For information on the research methodology, see Methodology section of this Fact Sheet Series.

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
57	Childproof Cigarette Lighter	\$0.06/lighter	\$5	75.8	<\$0
58	Less Porous Cigarette Paper	\$0.0002/pack	\$0.10	481.0	<\$0
59	Pass Smoke Alarm Law	\$59/new user	\$1,048	17.8	<\$0
60	Battery-Operated Smoke Alarm	\$54/home	\$1,048	19.4	<\$0
61	Lithium-Battery Smoke Alarm Installation & Fire Education (SAIFE) Program	\$375/home	\$1,950	5.2	\$26,920
62	Sprinkler System: Colonial	\$2,768/home	\$7,244	2.6	\$62,464
63	Sprinkler System: Townhouse	\$2,528/home	\$7,244	2.9	\$55,696
64	Sprinkler System: Ranch House	\$1,105/home	\$7,244	6.6	\$15,568
65	Require Sprinkler System, New Colonial House	\$2,989/home	\$7,244	2.4	\$68,697
66	Require Sprinkler System, New Townhouse	\$2,730/home	\$7,244	2.7	\$61,393
67	Require Sprinkler System, New Ranch House	\$1,194/home	\$7,244	6.1	\$18,077
68	Mattress Flammability Standard	\$32/mattress	\$95	3.0	\$57,981

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

7 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2022). Fatal Injury and Violence Data 2020.

8 Agency for Healthcare Research and Quality. (2021). National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS) databases, Healthcare Cost and Utilization Project (HCUP), 2018.

9 National Electronic Injury Surveillance System. (2015-2018). Washington DC: US Consumer Product Safety Commission

FIRE PREVENTION MEASURES

Smoke Alarm Laws and voluntary *Smoke Alarm Purchases* are a proven way to reduce death, injury, and property damage resulting from fires, providing \$1,048 in benefits for as little as \$54 per smoke alarm. *Less Porous Cigarette Paper* will self-extinguish if left to smolder, thus reducing the chance of cigarette fires. *Less Porous Cigarette Paper* has a very high return on investment. Although it may only provide benefits of 10 cents per cigarette, the cost of the paper is very low, and the number of potential cigarette burns is high. *Child Resistant Cigarette Lighters* reduce unintentional fires and injuries by making it more difficult for young children to operate the lighters. All of these interventions are cost-saving, meaning the medical, property damage, and other resource cost savings exceed the intervention costs.

WHAT IS “LESS POROUS” CIGARETTE PAPER?

Various methods for slowing the burn rate of a cigarette by making the paper less porous are currently in use. Some new paper has rings of ultra-thin paper that are applied on top of traditional cigarette paper during the paper-making process. These rings act as “speed bumps” to slow down the rate at which the cigarette burns as the lit end crosses over them. Some brands use a “double wrap” around the tobacco column. This has the effect of making the cigarette paper less porous, thereby decreasing the flow of oxygen to support combustion.

CHILD RESISTANT SAFETY LIGHTERS

In 1994, the United States Consumer Product Safety Commission (CPSC) set a *Safety Standard for Cigarette Lighters* that required outfitting disposable and novelty cigarette lighters with a child-resistant mechanism making the lighter difficult for children under the age of 5 to operate. This has resulted in an estimated savings of \$83 for every dollar spent.

5. VIOLENCE

COST ANALYSIS OF VIOLENCE PREVENTION PROGRAMS

Homicide is the fifth leading cause of death. In 2020, 24,576 lives were lost due to homicide, accounting for 9% of all injury deaths in the United States.¹⁰ Interpersonal violence can be physical, sexual, or psychological (also called emotional violence). It involves the intentional use of force or power against other persons by an individual or small group of individuals.¹¹ It includes rape, sexual assault, child maltreatment, intimate partner violence, robbery, arson, murder, and other assault. In 2010, interpersonal violence in the United States cost was approximately \$1 trillion.¹² The costs include medical costs, mental health costs, property damage, police costs, victim services, and adjudication and sanctioning costs (e.g., incarceration and probation). Added to these costs are the value of lost work and quality of life. Thirty-four prevention programs are reviewed here.

NONOFFENDER PROGRAMS

Two of the non-offender programs, the *Perry Pre-School and Home Visits Program* and the *Nurse-Family Partnership 2-Yr Home Visits*, were cost-saving, meaning that the medical, property damage, and other resource costs saved by these programs exceeded the costs to implement the program. Intensive home visitation programs can reduce infant/toddler abuse and other problems as the targeted low-income toddlers reach adolescence and adulthood. However, the return on these costly investments takes decades and is not always obtained. Other programs such as *Parent Training (Child Behavior Monitoring)* and *Big Brothers/Big Sisters Mentoring* do not produce as many benefits, but may be appropriate when resources are limited.

BENEFIT-COST RATIOS OF VIOLENCE/CRIME PREVENTION PROGRAMS (2020 DOLLARS)

For information on the research methodology, see Methodology section of this Fact Sheet Series.

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Nonoffender Programs					
69	Perry Preschool Program (includes home visitation)	\$25,936/child	\$126,862	4.9	<\$0
70	Nurse-Family Partnership 2-Yr Home Visits	\$13,825/child	\$67,063	4.9	<\$0

10 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2022). Fatal Injury and Violence Data 2020.

11 Mercy, J. A., Hillis, S. D., Butchart, A., Bellis, M. A., Ward, C. L., Fang, X., & Rosenberg, M. L. (2017). Interpersonal Violence: Global Impact and Paths to Prevention. In C. N. Mock (Eds.) et. al., *Injury Prevention and Environmental Health*. (3rd ed.). The International Bank for Reconstruction and Development/The World Bank.

12 Miller, T., Ali, B., & Swedler, D. (2017). Costs of interpersonal violence in the United States. *Injury Prevention*, 23(Suppl 1). <http://dx.doi.org/10.1136/injuryprev-2017-042560.143>

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
71	Syracuse Family Development Research Program (includes 5-Yr home visitation)	\$84,711/child	\$77,115	0.9	\$158,059
72	Parent Training (child behavior monitoring)	\$5,963/child	\$23,310	3.9	\$32,799
73	Big Brothers/Big Sisters Mentoring Cost	\$5,806/child	\$10,936	1.9	\$24,835
74	Financial graduation incentives & intensive counseling for disadvantaged youth	\$29,306/child	\$15,373	0.5	\$331,353

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

YOUTH OFFENDER PROGRAMS

The four youth offender programs focus on intensively treating troubled youth ages 12–17 and three of them are cost-saving. These interventions address the causes of delinquency and seek to improve family and school/community functioning. *Multi-Systemic Therapy* is very effective if resources are available, but *Functional Family Therapy* also is a credible choice. *Treatment Foster Care* produces considerable benefits but may be limited by the number of trained, dedicated foster parents; therefore, this approach is best offered as a complement to one of the other two programs and primarily for extreme, abusive, or neglectful situations where the child should be removed from the home.

ADULT OFFENDER PROGRAMS

Nine of the fifteen adult offender programs were cost-saving. Measures that are strong candidates for adoption are *Drug Courts* that case-manage substance use treatment, *In-Prison Vocational* and *Adult Basic Education*, *Job Search Counseling at Release* to help offenders transition back into society, cognitive-behavioral *Moral Reconditioning Therapy* to raise moral development and treat moral reasoning disorders of treatment-resistant populations. *Subsidized Jobs* produced benefits only for individuals older than 27 years. These adult offender programs address different aspects of violent crime and should yield large returns when used in concert with each other.

NARROWLY TARGETED CRIME PREVENTION MEASURES

Nine measures are intended exclusively to reduce crime. Four of these measures are cost-saving, *20-Bed Domestic Violence Shelter*, *Youth Offender Aggression Replacement Training*, *Diversion* of low-risk first offenders from juvenile court to a service-oriented system, and *Intensive Probation Supervision of Youth*. However, *Intensive Probation Supervision* for young offenders yields net cost-savings primarily because it is less expensive than incarceration, not because it improves outcomes. *Young Offender Boot Camp* was less expensive per client than incarceration, but this program produced negative benefits: those who were exposed to it significantly increased their criminal behavior compared to a control group of offenders.

BENEFIT-COST RATIOS OF VIOLENCE / CRIME PREVENTION PROGRAMS (2020 DOLLARS) CON'T.

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Youth Offender Programs					
75	Multi-Systemic Therapy	\$10,110/client	\$327,627	32.4	<\$0
76	Functional Family Therapy	\$3,979/client	\$121,990	30.7	<\$0
77	Multidimensional Treatment Foster Care	\$12,228/client	\$234,239	19.2	<\$0
78	Delinquency Supervision	\$19,944/child	\$37,188	1.9	\$89,036
Adult Offender Programs					
79	Drug Courts	\$3,743/client	\$15,224	4.1	<\$0
80	In-Prison Substance Use Therapy	\$10,244/client	\$29,420	2.9	<\$0
81	Post-release Substance Use Treatment	\$3,991/client	\$0	Infinite	Infinite
82	Optimized Sentencing	\$20,211/crime	\$46,696	2.3	\$74,741
83	3 Strikes & You're Out	\$27,242/crime	\$46,696	1.7	\$104,458
84	Job Search/Counseling at Release	\$1,002/client	\$10,727	10.7	<\$0
85	Financial Assistance at Release	\$4,323/client	\$14,559	3.4	<\$0
86	Subsidized Jobs, Age < 27	\$16,049/client	\$0	Infinite	Infinite
87	Subsidized Jobs, Age >+27	\$16,049/client	\$47,256	2.9	<\$0
88	Work-Release Programs	more than \$0/client	\$0	Infinite	Infinite
89	In-Prison Vocational Education	\$3,491/client	\$30,214	8.7	<\$0
90	In-Prison Adult Basic Education	\$3,514/client	\$22,546	6.4	<\$0
91	In-Prison Life Skills Programs	\$1,506/client	\$0	Infinite	Infinite
92	Moral Reconciliation Therapy	\$532/client	\$16,310	30.7	<\$0
93	Reasoning & Rehabilitation	\$551/client	\$5,176	9.4	<\$0
Crime Prevention, Narrowly Targeted					
94	20-Bed Domestic Violence Shelter	\$21,786/bed	\$257,394	11.8	<\$0
95	Monitored Burglar and Fire Alarms	\$1,110/home/year	\$1,255	1.1	\$147,531
96	Aggression Replacement Training (Youth Offender)	\$1,839/client	\$67,996	37.0	<\$0
97	Lansing Adolescent Diversion	\$2,810/client	\$110,080	39.2	<\$0
98	Intensive Probation Supervision, Youth	\$2,795/client	\$12,409	4.4	<\$0
99	Intensive Probation Supervision, Adult	\$6,225/client	\$8,445	1.4	\$47,904
100	Scared Straight Type Programs (Young Offenders)	\$125/client	\$0	Infinite	Infinite
101	Young Offender Boot Camp	\$3,655/client	-\$40,297	-0.1	Infinite
102	Cognitive-Behavioral Sex Offender Treatment	\$11,985/client	\$25,020	2.1	\$27,865

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

6. SUBSTANCE USE

COST ANALYSIS OF SUBSTANCE USE INTERVENTION PROGRAMS

According to 2020 national data, approximately 162.5 million people aged 12 and older (58.7%) used tobacco, alcohol, or an illicit drug in the past month, and 40.3 million (14.5%) had a substance use disorder in the past year.¹³ Substance abuse involving alcohol, drugs, or both is associated with a range of physical, psychological, behavioral, and social problems, including injuries (e.g., motor vehicle crashes, falls, drownings, and burns), violence (e.g., homicide, suicide, sexual assault, and intimate partner violence), risky sexual behaviors, crime, mental health conditions (e.g., depression and anxiety), chronic health conditions (e.g., liver disease, heart disease, stroke, and cancers), social problems (e.g., failure in school, financial problems, family problems), and lost productivity.^{14,15} Substance abuse in the United States cost over \$600 billion annually, which includes lost productivity and health- and crime-related costs.¹⁶ Sixty-seven prevention programs are reviewed here that target reducing consumption or over-the-limit consumption of alcohol, drug use, underage drinking, and youth tobacco use.

SUBSTANCE USE INTERVENTION MEASURES

The first set of twenty-two interventions reduces substance use in various ways, including raising the price by increasing taxes (*20% Alcohol Tax* and *30% Alcohol Tax*), inducing servers to discontinue service for the intoxicated (*Enforce Serving Intoxicated Patron Law*), combining peer pressure with random testing for illicit drugs or alcohol in a workplace (*Workplace Peer Support and Drug Testing*, and *Workplace Peer Support and Alcohol Testing*), and medical interventions (*Brief Medical Alcohol Intervention*). Seventeen of these twenty-two interventions are cost-saving (cost/QALY < \$0), meaning the cost of implementing the programs is less than the medical and other resource cost savings they yield. Among the interventions listed, several warrant widespread implementation: the *20% Alcohol Tax*, *Substance Use Treatment*, and *Brief Medical Alcohol Intervention* in primary care and hospital (physician lecture to heavy drinkers). In workplaces, coupling a peer support and workplace culture change program, management support for substance use rehabilitation, and drug and alcohol testing is quite promising (*Workplace Peer Support and Drug Testing*, *Workplace Peer Support and Alcohol*

13 Substance Abuse and Mental Health Services Administration. (2021). Key substance use and mental health indicators in the United States: Results from the 2020 National Survey on Drug Use and Health (HHS Publication No. PEP21-07-01-003, NSDUH Series H-56). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration.

14 Centers for Disease Control and Prevention. (2022). Alcohol use and your health. Retrieved from <https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>.

15 National Institute on Drug Abuse. (2022). Addiction and health. Retrieved from <https://nida.nih.gov/publications/drugs-brains-behavior-science-addiction/addiction-health>.

16 National Institute on Drug Abuse (2020). Is drug addiction treatment worth its cost? Retrieved from <https://nida.nih.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/frequently-asked-questions/drug-addiction-treatment-worth-its-cost>.

Testing) and merits broader evaluation. *Enforcing Laws Against Serving Intoxicated Patrons* seems very promising but needs wider evaluation before moving to national implementation.

BENEFIT-COST RATIOS OF SUBSTANCE USE INTERVENTIONS (2020 DOLLARS)

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Substance Use Interventions					
103	20% Alcohol Tax	\$13/drinker/year	\$132	10.1	<\$0
104	30% Alcohol Tax	\$26/drinker/year	\$171	6.6	\$8,073
105	Minimum Price of \$0.65 per Drink	\$7/drinker/year	\$19	2.8	<\$0
106	21 Minimum Legal Drinking Age	\$247/youth 18-20	\$926	3.7	\$24,740
107	Mandatory Server Training	\$75/driver	\$250	3.3	\$36,012
108	Enforce Serving Intoxicated Patron Law	\$0.60/driver	\$40	66.2	<\$0
109	Enforce Underage Drinking Law	\$3/youth	\$48	19.3	<\$0
110	TV Alcohol Advertising Ban	\$7,469/million population	\$72,467	9.7	<\$0
111	10% Outlet Density Reduction	\$1,919/ million population	\$18,117	9.4	<\$0
112	10 Fewer Sales Hours/Week	\$4,698/ million population	\$45,292	9.6	<\$0
113	Retain PA's State-Run Wine & Spirits Retail Store Monopoly	\$0.55/drink forgone	\$7	12.9	<\$0
114	Retain ID's State-Run Spirits Retail Store	\$0.40/drink forgone	\$6	15.0	<\$0
115	Team Awareness, Retail Workers	\$251/participant	\$1,665	6.6	<\$0
116	Team Resilience, Restaurant Workers under Age 26	\$252/participant	\$3,237	12.8	<\$0
117	Prime Life	\$18/participant	\$400	22.2	<\$0
118	PREVENT for Young Workers	\$463/participant	\$1,569	3.4	\$38,521
119	Workplace Peer Support + Drug Testing	\$92/employee	\$2,305	25.1	<\$0
120	Add Alcohol Testing to Peer Support	\$16/employee	\$993	62.1	<\$0
121	Brief Alcohol Intervention, Primary Care	\$270/client	\$4,695	17.4	<\$0
122	Brief Alcohol Intervention, Hospital Inpatient	\$159/client	\$4,246	26.7	<\$0
123	Brief Alcohol Intervention, Emergency Department	\$430/client	\$3,470	8.1	\$6,803
124	Substance Use Treatment	\$20,779/client	\$954,765	45.9	<\$0
Youth Development Programs					
125	Across Ages	\$2,567/pupil	\$3,320	1.3	\$168,788
126	Adolescent Transitions	\$1,782/pupil	\$3,082	1.7	\$116,110
127	CASASTART (National Center on Addiction and Substance Abuse, Striving Together to Achieve Rewarding Tomorrow)	\$8,282/pupil	\$5,559	0.7	\$367,785
128	Child Development Project	\$340/pupil	\$3,772	11.1	<\$0

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
129	Good Behavior Game	\$89/pupil	\$3,041	34.2	\$3,410
130	Guiding Good Choices (formerly Preparing for the Drug Free Years)	\$1,046/family	\$5,025	4.8	\$7,166
131	Project PATHE	\$1,173/pupil	\$0	0	infinite
132	Seattle Social Development Program-Parent-Teacher Training/SOAR (Skills Opportunity and Recognition)	\$4,693/child	\$2,979	0.6	\$383,397
133	Social Competence Promotion	\$519/pupil	\$3,451	6.6	3,876
134	Strengthening Families	\$1,295/family	\$29,630	22.9	<\$0
135	Communities That Care	\$717/youth	\$12,422	17.3	<\$0
Youth Substance Use Prevention Programs					
136	All Stars	\$207/pupil	\$10,146	49.0	<\$0
137	Family Matters	\$232/family	\$8,013	34.5	<\$0
138	Keepin' It Real	\$188/pupil	\$0	0	infinite
139	Life Skills Training	\$329/pupil	\$4,581	13.9	\$5,496
140	Lions Quest Skills for Adolescents	\$315/student	\$71	0.2	\$1,621,902
141	Positive Action, Grades 3-8	\$1,725/student	\$38,698	22.4	<\$0
142	Position Action, Grades 3-5	\$931/student	\$12,986	13.9	\$1,297
143	Project ALERT (Adolescent Learning Experience in Resistance Training)	\$170/pupil	\$0	0	infinite
144	Project Northland	\$587/pupil	\$8,853	15.1	\$7,321
145	Project STAR (Students Taught Awareness and Resistance, Midwest Prevention Program) aka MPP	\$587/pupil	\$5,567	9.5	\$15,524
146	Project Toward No Drugs (TND)	\$265/pupil	\$1,439	5.4	<\$0
147	STARS for Families	\$179/family	\$0	0	infinite
148	Too Good for Drugs	\$122/student	\$645	5.3	\$13,196
Youth Tobacco Programs					
149	Know Your Body (smoking)	\$219/pupil	\$12,405	56.6	<\$0
150	MN Smoking Prevention Program	\$145/pupil	\$9,773	67.4	<\$0
151	Project Toward No Tobacco (TNT)	\$276/pupil	\$5,253	19.0	\$7,540
152	Youth Anti-smoking Mass Media Campaign	\$573/pupil	\$4,590	8.0	\$23,574
Tobacco Cessation Programs					
153	Stop Smoking Mass Media Campaign	\$1,624/quitter	\$99,742	61.4	<\$0
154	Reduce Cessation Program Prices	\$317/quitter	\$111,025	350.2	<\$0
155	Minimal Tobacco Counseling	\$9,523/quitter	\$111,025	11.7	\$10,040
156	Add Nicotine Patch	\$6,591/quitter	\$111,025	16.8	\$6,189
157	Instead Add Nicotine Gum	\$12,463/quitter	\$111,025	8.9	\$13,901
158	Brief Tobacco Counseling	\$8,099/quitter	\$111,025	13.7	\$8,169

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
159	Add Nicotine Patch	\$5,834/ quitter	\$111,025	19.0	\$5,195
160	Instead Add Nicotine Gum	\$10,261/ quitter	\$111,025	10.8	\$11,009
161	Full Tobacco Counseling	\$4,028/ quitter	\$111,025	27.6	\$2,823
162	Add Nicotine Patch	\$3,814/ quitter	\$111,025	29.1	\$2,542
163	Instead Add Nicotine Gum	\$5,959/ quitter	\$111,025	18.6	\$5,359
164	Individual Intensive Tobacco Counseling	\$4,924/ quitter	\$111,025	22.5	\$4,000
165	Add Nicotine Patch	\$4,042/ quitter	\$111,025	27.5	\$2,841
166	Instead Add Nicotine Gum	\$5,042/ quitter	\$111,025	22.0	\$4,155
167	Group Intensive Tobacco Counseling	\$2,887/ quitter	\$111,025	38.5	\$1,324
168	Add Nicotine Patch	\$3,232/ quitter	\$111,025	34.4	\$1,777
169	Instead Add Nicotine Gum	\$6,214/ quitter	\$111,025	17.9	\$5,694

For information on the research methodology, see Methodology section of this Fact Sheet Series.

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

The remaining forty-five programs focus on general youth development, strengthening families, substance use prevention in youth specifically, and tobacco use. Eleven of these programs are cost-saving (cost/QALY < \$0). Some of these programs are family centered interventions with a school component such as the *Strengthening Families Program*, *Seattle Social Development Program* (Parent-Teacher Training), *Family Matters*, and *STARS for Families*. Other programs are school-based life skills training programs, such as *The Child Development Project*, *All Stars*, *Keepin' It Real*, and *Life Skills Training*, which focus on students. A broader family program like the *Strengthening Families Program* can be more costly than school-based life skills training but may also offer larger returns. School-based programs also offer solid returns. With a limited budget, they will let a school system reach the most children, but the same money may yield greater benefits if spent targeting the broader family-centered programs.

7. HEALTH SERVICES AND MISCELLANEOUS

COST ANALYSIS OF HEALTH SERVICES AND MISCELLANEOUS INJURY PREVENTION PROGRAMS

Injuries and violence, including suicide, homicide, poisonings, motor vehicle crashes, and falls, are the 10 leading causes of death for all age groups in the United States. The economic cost of injuries in the United States was \$4.2 trillion in 2019, which included \$327 billion in medical care, \$69 billion in work loss, and \$3.8 trillion in value of statistical life and quality of life losses.¹⁷ Health services interventions to prevent injury and improve injury outcomes include poison control centers, triaged regional trauma systems, and pediatrician injury prevention counseling. Miscellaneous injury prevention programs in Native American settings include a youth suicide prevention program and a winter coats that float to reduce drowning. Other injury prevention programs include the Harlem Hospital Safe Communities child safety program and a fall prevention program for the elderly.

BENEFIT-COST RATIOS OF HEALTH SERVICES INTERVENTIONS AND MISCELLANEOUS INJURY PREVENTION PROGRAMS (2020 DOLLARS)

For information on the research methodology, see Methodology section of this Fact Sheet Series.

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Health Services Interventions					
170	Pediatrician Injury Prevention Counseling for Children Ages 0-4 (TIPP)	\$15/child	\$126	8.4	\$8,145
171	Poison Control Center Services	\$55/call	\$440	8.0	<\$0
172	Regional Trauma System Services	\$2,563/admit	\$6,774	2.6	<\$0
173	Tetanus-Diphtheria-Pertussis Vaccination, Ages 0-6	\$124/child	\$2,963	23.9	<\$0
Miscellaneous Injury Prevention Programs					
174	Youth Suicide Prevention, Native American	\$277/youth	\$9,799	35.4	\$4,202
175	Baby Walker Redesign to Prevent Stairway Falls	\$4/walker	\$241	60.2	<\$0
176	Impact-Absorbing Playground Surfacing	\$17,426/playground	\$36,503	2.1	\$39,570
177	Winter Coats that Float Drowning Prevention, Native Alaska	\$0.14/person	\$323	2,309.9	<\$0
178	Harlem Hospital Injury Prevention Program	\$96/child	\$4,939	51.5	<\$0
179	Fall Prevention: High Risk Elderly	\$1,720/person	\$15,886	9.2	<\$0
180	Fall Prevention: Low Risk Elderly	\$1,470/person	\$987	0.7	\$312,290

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving. If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes).

¹⁷ Peterson, C., Miller, G. F., Barnett, S. B., & Florence, C. (2021). Economic Cost of Injury — United States, 2019. *Morbidity and Mortality Weekly Report*, 70, 1655-1659. DOI: <http://dx.doi.org/10.15585/mmwr.mm7048a1>

HEALTH SERVICES INTERVENTIONS

The four health services interventions reduce the cost of injuries. Three of these programs were cost-saving (cost/QALY < \$0) which means that the medical costs and other tangible resources saved by these programs exceeded the costs to implement the program.

Health services improve outcomes of trauma cases, including injuries associated with alcohol and violence. Establishing regional hospital specialties in trauma care, then triaging serious injuries to these hospitals (*Triaged Regional Trauma System Services*), raises the costs of initial treatment, but ultimately improves outcomes and reduces the medical care costs required to achieve maximum medical recovery. A regional or national phone-in poison control center (*Poison Control Center*) consults 24-hours a day on intentional and unintentional poisonings, including drug overdose, food poisoning, suicide, and children accidentally taking medications. The centers greatly reduce poisoning treatment costs and probably improve outcomes by advising on whether treatment is needed, supervising home treatment of minor poisonings without more costly medical intervention, more quickly linking serious cases to appropriate treatment, and providing toxicological consultation to hospital staff. Both measures will reduce the harm from injury and warrant implementation.

Pediatrician Injury Prevention Counseling for Children Ages 0-4 is part of *The Injury Prevention Program* (TIPP). TIPP is a national program that provides pediatricians with age-appropriate topics for counseling parents about ways to reduce child injuries (e.g., car seats). While this program did reduce injuries, the costs of prevention counseling by pediatricians exceeded the medical and other resource cost savings from the prevented injuries.

MISCELLANEOUS INJURY PREVENTION PROGRAMS

Two of the miscellaneous interventions have only been tried in Native American settings and need further evaluation prior to widespread implementation. One is a *Native American Youth Suicide Prevention* program that combines counseling, peer support and prevention of alcohol use, child abuse, and domestic violence. The second, *Winter Coats that Float Drowning Prevention*, located winter coats that float and convinced local residents who use small boats to buy them, thus aiding boaters who fall overboard. This intervention demonstrates cost-savings (cost/QALY < \$0), that is, the cost of implementing the program is less than the medical and other resource cost savings they yield.

The *Fall Prevention* program was a comprehensive community-based fall prevention demonstration targeting the elderly. Benefits were analyzed separately for elderly participants who were at high risk for fall injuries and participants who were at low risk. There was a net cost-saving for high-risk elderly, but its costs exceeded its benefits for low-risk elderly. The *Harlem Hospital Safe Communities* program is a comprehensive community-based child safety program. It also demonstrated cost-savings.

GLOSSARY OF DEFINITIONS

Benefit-cost ratios (BCR) express the total benefits in saved medical and other costs compared to the costs of the program. A BCR is calculated for each intervention by dividing the total savings, including the value of preserving quality of life and preventing pain and suffering, by the unit cost of the intervention. The BCR describes the return on investment in the intervention.

Cost-effective means the BCR is greater than 1.0 and the cost of implementing the intervention is less than the total benefits gained by preventing injuries. The total benefits include medical costs, other resource costs, work loss, and quality of life costs. A cost-effective intervention offers a positive return on investment.

Cost-outcome analysis is the calculation of the economic benefits and costs associated with an intervention so that the intervention can be compared to other interventions.

Cost per quality-adjusted life year (cost/QALY) is the cost of the intervention minus the medical and other tangible resource savings divided by the number of QALYs saved. It does not include quality of life savings.

Cost-saving means the expected resource cost savings (not including quality of life savings) exceed the cost of the intervention. The **cost/QALY** <0.

Discount rates are used because money earns interest. If you have to pay \$10 five years from now, you could put less money in the bank today and have \$10 when the bill comes due. The discount rate essentially is the inflation-free interest rate. With the discount rate, we calculate the present value of future costs. A 2.5% to 3% discount rate is recommended for health policy.

Medical costs include averted emergency medical care, acute care (in hospital, clinic, and office settings), rehabilitation, follow-up care (including physician, allied health, and mental health care), long-term medical and institutional care, prescriptions, ancillary expenses, coroner services, and the costs of health insurance claims processing.

Other resource costs include direct nonmedical costs for police, fire services, criminal adjudication and sanctioning, property damage or loss, and travel delay.

QALY stands for quality adjusted life years. QALYs are a health outcome measure that assigns a value of 1 to a year a perfect health, a 0 to death, and some value in between to impaired health (e.g., from injury). Preventing injuries saves fractions of QALYs and preventing a death saves a lifetime of QALYs. QALYs for different injuries were calculated based on physician ratings of loss of function for victims of injury, probability of permanent work-related disability, and values from surveys of the general population for different functional losses. QALYs are routinely used to evaluate the outcomes of clinical trials and preventive health interventions.

Quality of life costs place a dollar value on the pain, suffering, and lost quality of life that children and their families experience due to death and injury.

Resource costs include medical and mental health, property damage, police and fire services, victim assistance, insurance claims processing, litigation, incarceration, and other sanctioning, and other out of pocket costs resulting from injury.

Total benefits reported in this Fact Sheet Series are the amount these interventions saved by preventing injuries. These benefits to society include medical costs, other resource costs, work loss, and quality of life costs.

Unit cost is the cost of the intervention for a single individual.

Work Loss (productivity) includes wages, fringe benefits, and household work for adults. It includes short-term work loss and the present value of a lifetime's worth of wage and household work that a child or adult will be unable if he or she is killed or permanently disabled.

APPENDIX

BENEFIT-COST RATIOS OF MOTOR-VEHICLE INJURY AND PEDESTRIAN SAFETY INTERVENTION PROGRAMS (2020 DOLLARS)

		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
Driver and Pedestrian Safety Interventions					
1	Pass Child Safety Seat Law, Ages 0-4	\$71/new user	\$2,855	40.2	<\$0
2	Child Safety Seat Distribution, Ages 0-4	\$64/seat provided	\$2,855	44.6	<\$0
3	Pass Booster Seat Law, Ages 4-7	\$48/new user	\$3,247	67.6	<\$0
4	Booster Seat, Ages 4-7	\$42/seat	\$3,247	77.3	<\$0
5	Pass Safety Belt Law	\$419/new user	\$7,857	18.8	<\$0
6	Upgrade Secondary Belt Law to Primary	\$419/new user	\$7,857	18.8	<\$0
7	Enhanced Belt Law Enforcement	\$459/new user	\$7,857	17.1	<\$0
8	Driver Airbag	\$523/bag	\$2,463	4.7	\$13,447
9	Passenger Airbag	\$269/bag	\$582	2.2	\$76,375
10	Pass Motorcycle Helmet Law	\$2,538/new user	\$7,839	3.1	\$53,666
11	Voluntarily Wear a Motorcycle Helmet	\$119/helmet	\$7,839	65.9	<\$0
12	Pass Bicycle Helmet Law, Ages 3-14	\$16/new user	\$751	47.0	<\$0
13	Pass Bicycle Helmet Law, Ages 15 & Over	\$494/new user	\$365	0.7	\$341,784
14	Bicycle Helmet Distribution, Ages 3-14	\$15/helmet	\$751	50.1	<\$0
15	Bicycle Helmet, Ages 15 & Over	\$23/helmet	\$365	15.9	<\$0
16	Voluntarily Wear an ATV Helmet	\$63/helmet	\$740	11.7	\$11,840
17	Install Bridge-End Guardrail	\$13,658/bridge	\$544,637	39.9	<\$0
18	Install Median Barrier (1-12 foot median)	\$287,003/mile	\$783,877	2.7	\$65,746
19	Install Median Barrier (>13 foot median)	\$287,003/mile	\$182,918	0.6	\$372,644
Vehicle Design Safety Research and Regulation and Road Design and Upgrading					
20	Federal Traffic Safety Programs	\$4/driver	\$263	65.8	<\$0
21	Federal Vehicle Safety Program	\$80/vehicle	\$469	5.9	\$6,922
22	Federal Road Safety Program	\$8/driver	\$293	36.6	<\$0
23	Mobile Speed Camera	\$896,665/camera-year	\$18,013,476	20.1	<\$0
24	Red Light Camera	\$14,027/camera-year	\$63,490	4.5	<\$0
25	Striping / Painting Lines on Roads	\$325/mile	\$23,254	71.5	<\$0
26	Post-mounted Reflectors	\$453/reflector	\$53,051	117.1	<\$0
27	Flatten Crest Vertical Curves	\$390,555/curve	\$296,326	0.8	\$276,873
28	Flashing Beacons on Hazardous Curves	\$25,588/beacon	\$432,395	16.9	<\$0
29	Side Impact Protection	\$448/vehicle	\$1,420	3.2	\$40,783

		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
30	Automatic Daytime Vehicle Lights	\$97/vehicle	\$387	4.0	\$23,385
31	55MPH speed limit	\$11/added travel hour	\$31	2.7	\$30,336
32	Child Pedestrian Safety Program	\$2,285/child/year	\$21,885	9.6	<\$0
33	Safety Belts, Front Seat	\$93/vehicle	\$5,302	57.0	<\$0
34	Shoulder Belts, Rear Seat	\$34/vehicle	\$15	0.4	\$490,131
35	Child Seat Misuse Reduction & Design Improvement	\$7/seat in use	\$747	101.1	<\$0
36	Livestock Control, Native American	\$60,047/impound vehicle	\$103,483	1.7	<\$0
37	Livestock Control, Native American	\$9/grate	\$18	2.0	<\$0
38	Provisional Licensing + Midnight Driving Curfew	\$102/driver	\$859	8.4	<\$0
39	Change Driving Curfew to 10 PM	\$196/driver	\$515	2.6	\$43,158

BENEFIT-COST RATIOS OF IMPAIRED DRIVING PREVENTION PROGRAMS (2020 DOLLARS)

		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
Impaired Driving Prevention Programs					
40	0.08% Driver Blood Alcohol Limit	\$4/driver	\$70	17.4	<\$0
41	Reduce Driver Blood Alcohol Limit to 0.05 from 0.08	\$20/driver	\$121	6.0	<\$0
42	Zero Alcohol Tolerance, Drivers Under 21	\$47/driver	\$1,222	26.0	<\$0
43	Sobriety Checkpoints	\$15,558/checkpoint	\$105,059	6.8	<\$0
44	Saturation Patrols + Media Campaign	\$33,654/10,000 drivers	\$396,851	11.8	<\$0
45	Administrative License Revocation (ALR)	\$4,306/ALR	\$76,693	17.8	<\$0
46	ALR with Per Se Law	\$4,043/ALR	\$91,212	22.6	<\$0
47	Alcohol-Testing Ignition Interlock Permitted	\$1,434/vehicle	\$10,347	7.2	<\$0
48	Alcohol-Testing Ignition Interlock Mandate	\$1,434/vehicle	\$25,126	17.5	<\$0
49	DWI Offender Auto Impoundment	\$1,227/vehicle	\$7,039	5.7	<\$0
50	DWI Offender Electronic House Arrest	\$2,146/arrestee	\$7,839	3.7	<\$0
51	DWI Intensive Probation + Treatment	\$2,038/probation	\$7,786	3.8	<\$0
52	Driving Under the Influence Court	\$4,025/client	\$15,224	3.8	<\$0
53	Australia-Style Anti-DWI Media Campaign	\$1,059/million population	\$15,885	15.0	<\$0
54	Safe Ride Program with media campaign	\$33/roundtrip coupon used	\$10	0.3	\$792,284
55	Safe Ride Program with media campaign	\$27/one-way coupon used	\$10	0.4	\$648,232

		Cost per Unit	Total Benefits	Benefit Cost Ratio	Cost/QALY
Impaired Pedestrian Harm Reduction					
56	Streetlights at Bars, Native American	\$551/light	\$4,998	9.1	<\$0

BENEFIT-COST RATIOS OF OPEN-FLAME BURN PREVENTION PROGRAMS (2020 DOLLARS)

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
57	Childproof Cigarette Lighter	\$0.06/lighter	\$5	75.8	<\$0
58	Less Porous Cigarette Paper	\$0.0002/pack	\$0.10	481.0	<\$0
59	Pass Smoke Alarm Law	\$59/new user	\$1,048	17.8	<\$0
60	Battery-Operated Smoke Alarm	\$54/home	\$1,048	19.4	<\$0
61	Lithium-Battery Smoke Alarm Installation & Fire Education (SAIFE) Program	\$375/home	\$1,950	5.2	\$26,920
62	Sprinkler System: Colonial	\$2,768/home	\$7,244	2.6	\$62,464
63	Sprinkler System: Townhouse	\$2,528/home	\$7,244	2.9	\$55,696
64	Sprinkler System: Ranch House	\$1,105/home	\$7,244	6.6	\$15,568
65	Require Sprinkler System, New Colonial House	\$2,989/home	\$7,244	2.4	\$68,697
66	Require Sprinkler System, New Townhouse	\$2,730/home	\$7,244	2.7	\$61,393
67	Require Sprinkler System, New Ranch House	\$1,194/home	\$7,244	6.1	\$18,077
68	Mattress Flammability Standard	\$32/mattress	\$95	3.0	\$57,981

BENEFIT-COST RATIOS OF VIOLENCE / CRIME PREVENTION PROGRAMS (2020 DOLLARS)

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Nonoffender Programs					
69	Perry Preschool Program (includes home visitation)	\$25,936/child	\$126,862	4.9	<\$0
70	Nurse-Family Partnership 2-Yr Home Visits	\$13,825/child	\$67,063	4.9	<\$0
71	Syracuse Family Development Research Program (includes 5-Yr home visitation)	\$84,711/child	\$77,115	0.9	\$158,059
72	Parent Training (child behavior monitoring)	\$5,963/child	\$23,310	3.9	\$32,799
73	Big Brothers/Big Sisters Mentoring Cost	\$5,806/child	\$10,936	1.9	\$24,835
74	Financial graduation incentives & intensive counseling for disadvantaged youth	\$29,306/child	\$15,373	0.5	\$331,353
Youth Offender Programs					
75	Multi-Systemic Therapy	\$10,110/client	\$327,627	32.4	<\$0
76	Functional Family Therapy	\$3,979/client	\$121,990	30.7	<\$0
77	Multidimensional Treatment Foster Care	\$12,228/client	\$234,239	19.2	<\$0
78	Delinquency Supervision	\$19,944/child	\$37,188	1.9	\$89,036

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Adult Offender Programs					
79	Drug Courts	\$3,743/client	\$15,224	4.1	<\$0
80	In-Prison Substance Use Therapy	\$10,244/client	\$29,420	2.9	<\$0
81	Post-release Substance Use Treatment	\$3,991/client	\$0	Infinite	Infinite
82	Optimized Sentencing	\$20,211/crime	\$46,696	2.3	\$74,741
83	3 Strikes & You're Out	\$27,242/crime	\$46,696	1.7	\$104,458
84	Job Search/Counseling at Release	\$1,002/client	\$10,727	10.7	<\$0
85	Financial Assistance at Release	\$4,323/client	\$14,559	3.4	<\$0
86	Subsidized Jobs, Age < 27	\$16,049/client	\$0	Infinite	Infinite
87	Subsidized Jobs, Age >+27	\$16,049/client	\$47,256	2.9	<\$0
88	Work-Release Programs	more than \$0/client	\$0	Infinite	Infinite
89	In-Prison Vocational Education	\$3,491/client	\$30,214	8.7	<\$0
90	In-Prison Adult Basic Education	\$3,514/client	\$22,546	6.4	<\$0
91	In-Prison Life Skills Programs	\$1,506/client	\$0	Infinite	Infinite
92	Moral Reconation Therapy	\$532/client	\$16,310	30.7	<\$0
93	Reasoning & Rehabilitation	\$551/client	\$5,176	9.4	<\$0
Crime Prevention, Narrowly Targeted					
94	20-Bed Domestic Violence Shelter	\$21,786/bed	\$257,394	11.8	<\$0
95	Monitored Burglar and Fire Alarms	\$1,110/home/year	\$1,255	1.1	\$147,531
96	Aggression Replacement Training (Youth Offender)	\$1,839/client	\$67,996	37.0	<\$0
97	Lansing Adolescent Diversion	\$2,810/client	\$110,080	39.2	<\$0
98	Intensive Probation Supervision, Youth	\$2,795/client	\$12,409	4.4	<\$0
99	Intensive Probation Supervision, Adult	\$6,225/client	\$8,445	1.4	\$47,904
100	Scared Straight Type Programs (Young Offenders)	\$125/client	\$0	Infinite	Infinite
101	Young Offender Boot Camp	\$3,655/client	-\$40,297	-0.1	Infinite
102	Cognitive-Behavioral Sex Offender Treatment	\$11,985/client	\$25,020	2.1	\$27,865

BENEFIT-COST RATIOS OF SUBSTANCE USE INTERVENTIONS (2020 DOLLARS)

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Substance Use Interventions					
103	20% Alcohol Tax	\$13/drinker/year	\$132	10.1	<\$0
104	30% Alcohol Tax	\$26/drinker/year	\$171	6.6	\$8,073
105	Minimum Price of \$0.65 per Drink	\$7/drinker/year	\$19	2.8	<\$0
106	21 Minimum Legal Drinking Age	\$247/youth 18-20	\$926	3.7	\$24,740
107	Mandatory Server Training	\$75/driver	\$250	3.3	\$36,012

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
108	Enforce Serving Intoxicated Patron Law	\$0.60/driver	\$40	66.2	<\$0
109	Enforce Underage Drinking Law	\$3/youth	\$48	19.3	<\$0
110	TV Alcohol Advertising Ban	\$7,469/million population	\$72,467	9.7	<\$0
111	10% Outlet Density Reduction	\$1,919/million population	\$18,117	9.4	<\$0
112	10 Fewer Sales Hours/Week	\$4,698/million population	\$45,292	9.6	<\$0
113	Retain PA's State-Run Wine & Spirits Retail Store Monopoly	\$0.55/drink forgone	\$7	12.9	<\$0
114	Retain ID's State-Run Spirits Retail Store	\$0.40/drink forgone	\$6	15.0	<\$0
115	Team Awareness, Retail Workers	\$251/participant	\$1,665	6.6	<\$0
116	Team Resilience, Restaurant Workers under Age 26	\$252/participant	\$3,237	12.8	<\$0
117	Prime Life	\$18/participant	\$400	22.2	<\$0
118	PREVENT for Young Workers	\$463/participant	\$1,569	3.4	\$38,521
119	Workplace Peer Support + Drug Testing	\$92/employee	\$2,305	25.1	<\$0
120	Add Alcohol Testing to Peer Support	\$16/employee	\$993	62.1	<\$0
121	Brief Alcohol Intervention, Primary Care	\$270/client	\$4,695	17.4	<\$0
122	Brief Alcohol Intervention, Hospital Inpatient	\$159/client	\$4,246	26.7	<\$0
123	Brief Alcohol Intervention, Emergency Department	\$430/client	\$3,470	8.1	\$6,803
124	Substance Use Treatment	\$20,779/client	\$954,765	45.9	<\$0
Youth Development Programs					
125	Across Ages	\$2,567/pupil	\$3,320	1.3	\$168,788
126	Adolescent Transitions	\$1,782/pupil	\$3,082	1.7	\$116,110
127	CASASTART (National Center on Addiction and Substance Abuse, Striving Together to Achieve Rewarding Tomorrow)	\$8,282/pupil	\$5,559	0.7	\$367,785
128	Child Development Project	\$340/pupil	\$3,772	11.1	<\$0
129	Good Behavior Game	\$89/pupil	\$3,041	34.2	\$3,410
130	Guiding Good Choices (formerly Preparing for the Drug Free Years)	\$1,046/family	\$5,025	4.8	\$7,166
131	Project PATHE	\$1,173/pupil	\$0	0	infinite
132	Seattle Social Development Program-Parent-Teacher Training/SOAR (Skills Opportunity and Recognition)	\$4,693/child	\$2,979	0.6	\$383,397
133	Social Competence Promotion	\$519/pupil	\$3,451	6.6	3,876
134	Strengthening Families	\$1,295/family	\$29,630	22.9	<\$0
135	Communities That Care	\$717/youth	\$12,422	17.3	<\$0
Youth Substance Use Prevention Programs					

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
136	All Stars	\$207/pupil	\$10,146	49.0	<\$0
137	Family Matters	\$232/family	\$8,013	34.5	<\$0
138	Keepin' It Real	\$188/pupil	\$0	0	infinite
139	Life Skills Training	\$329/pupil	\$4,581	13.9	\$5,496
140	Lions Quest Skills for Adolescents	\$315/student	\$71	0.2	\$1,621,902
141	Positive Action, Grades 3-8	\$1,725/student	\$38,698	22.4	<\$0
142	Position Action, Grades 3-5	\$931/student	\$12,986	13.9	\$1,297
143	Project ALERT (Adolescent Learning Experience in Resistance Training)	\$170/pupil	\$0	0	infinite
144	Project Northland	\$587/pupil	\$8,853	15.1	\$7,321
145	Project STAR (Students Taught Awareness and Resistance, Midwest Prevention Program) aka MPP	\$587/pupil	\$5,567	9.5	\$15,524
146	Project Toward No Drugs (TND)	\$265/pupil	\$1,439	5.4	<\$0
147	STARS for Families	\$179/family	\$0	0	infinite
148	Too Good for Drugs	\$122/student	\$645	5.3	\$13,196
Youth Tobacco Programs					
149	Know Your Body (smoking)	\$219/pupil	\$12,405	56.6	<\$0
150	MN Smoking Prevention Program	\$145/pupil	\$9,773	67.4	<\$0
151	Project Toward No Tobacco (TNT)	\$276/pupil	\$5,253	19.0	\$7,540
152	Youth Anti-smoking Mass Media Campaign	\$573/pupil	\$4,590	8.0	\$23,574
Tobacco Cessation Programs					
153	Stop Smoking Mass Media Campaign	\$1,624/ quitter	\$99,742	61.4	<\$0
154	Reduce Cessation Program Prices	\$317/ quitter	\$111,025	350.2	<\$0
155	Minimal Tobacco Counseling	\$9,523/ quitter	\$111,025	11.7	\$10,040
156	Add Nicotine Patch	\$6,591/ quitter	\$111,025	16.8	\$6,189
157	Instead Add Nicotine Gum	\$12,463/ quitter	\$111,025	8.9	\$13,901
158	Brief Tobacco Counseling	\$8,099/ quitter	\$111,025	13.7	\$8,169
159	Add Nicotine Patch	\$5,834/ quitter	\$111,025	19.0	\$5,195
160	Instead Add Nicotine Gum	\$10,261/ quitter	\$111,025	10.8	\$11,009
161	Full Tobacco Counseling	\$4,028/ quitter	\$111,025	27.6	\$2,823
162	Add Nicotine Patch	\$3,814/ quitter	\$111,025	29.1	\$2,542
163	Instead Add Nicotine Gum	\$5,959/ quitter	\$111,025	18.6	\$5,359
164	Individual Intensive Tobacco Counseling	\$4,924/ quitter	\$111,025	22.5	\$4,000
165	Add Nicotine Patch	\$4,042/ quitter	\$111,025	27.5	\$2,841
166	Instead Add Nicotine Gum	\$5,042/ quitter	\$111,025	22.0	\$4,155
167	Group Intensive Tobacco Counseling	\$2,887/ quitter	\$111,025	38.5	\$1,324
168	Add Nicotine Patch	\$3,232/ quitter	\$111,025	34.4	\$1,777

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
169	Instead Add Nicotine Gum	\$6,214/quitter	\$111,025	17.9	\$5,694

BENEFIT-COST RATIOS OF HEALTH SERVICES INTERVENTIONS AND MISCELLANEOUS INJURY PREVENTION PROGRAMS (2020 DOLLARS)

		Unit Cost	Total Benefits	Benefit Cost Ratio	Cost/QALY
Health Services Interventions					
170	Pediatrician Injury Prevention Counseling for Children Ages 0-4 (TIPP)	\$15/child	\$126	8.4	\$8,145
171	Poison Control Center Services	\$55/call	\$440	8.0	<\$0
172	Regional Trauma System Services	\$2,563/admit	\$6,774	2.6	<\$0
173	Tetanus-Diphtheria-Pertussis Vaccination, Ages 0-6	\$124/child	\$2,963	23.9	<\$0
Miscellaneous Injury Prevention Programs					
174	Youth Suicide Prevention, Native American	\$277/youth	\$9,799	35.4	\$4,202
175	Baby Walker Redesign to Prevent Stairway Falls	\$4/walker	\$241	60.2	<\$0
176	Impact-Absorbing Playground Surfacing	\$17,426/playground	\$36,503	2.1	\$39,570
177	Winter Coats that Float Drowning Prevention, Native Alaska	\$0.14/person	\$323	2,309.9	<\$0
178	Harlem Hospital Injury Prevention Program	\$96/child	\$4,939	51.5	<\$0
179	Fall Prevention: High Risk Elderly	\$1,720/person	\$15,886	9.2	<\$0
180	Fall Prevention: Low Risk Elderly	\$1,470/person	\$987	0.7	\$312,290

Note: If the cost/QALY is <\$0, the intervention is effective and cost saving (text highlighted in gray). If the cost/QALY is infinite, the intervention is not effective (i.e., an infinite number of dollars can be spent on the intervention without improving health outcomes),



Children's Safety Network
43 Foundry Avenue
Waltham, MA 02453

Facebook: facebook.com/childrenssafetynetwork

Twitter: twitter.com/ChildrensSafety

Pinterest: pinterest.com/childrenssafety

Newsletter: go.edc.org/csn-newsletter

For questions about methods and data in this Fact Sheet Series, contact:
Children's Safety Network Economics and Data Analysis Resource Center
E-mail: bali@pire.org

Pacific Institute for Research and Evaluation
4061 Powder Mills Road, Suite 350
Beltsville, MD 20705