

Preventing and Treating Youth Marijuana Use: *An Updated Review of the Evidence*

Initiative 502 (I-502) legalized recreational marijuana use for adults in Washington State. The law directs the Washington State Institute for Public Policy (WSIPP) to conduct a benefit-cost evaluation of the implementation of I-502.¹

The initiative also requires the Division of Behavioral Health and Recovery (DBHR) in the Department of Social and Health Services (DSHS) to allocate at least 85% of its share of disbursements from the state's dedicated marijuana fund to "evidence-based and cost-beneficial programs and practices" to prevent and treat use among middle and high school-aged youth.²

In September 2014, to help DBHR meet this requirement and as part of our broader I-502 assignment, WSIPP published an independent benefit-cost analysis of 13 youth prevention programs from DBHR's preliminary list of evidence-based programs with marijuana prevention outcomes.³

¹ The initiative requires a progress report by September 2015 and the final outcome evaluation by 2032.

² Initiative Measure No. 502. Full text available at <http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Initiatives/Initiatives/INITIATIVE%20502.pdf>

³ Hanley, S., & Aos, S. (2014). *Preventing youth substance use: A review of thirteen programs*. (Doc. No. 14-09-3201). Olympia: Washington State Institute for Public Policy.

Summary

Initiative 502, passed by Washington voters in November 2012, legalized recreational marijuana use for adults in the state. The initiative directs WSIPP to evaluate the policy in a series of reports between 2015 and 2032.

As part of this assignment, we reviewed the evaluation literature on 23 youth marijuana prevention and treatment programs. The evidence indicates that 18 of the 23 programs have, on average, benefits that are greater than costs.

The legislature has established a three-tiered classification for programs: "evidence-based," "research-based," and "promising." Using these definitions, three of the reviewed programs are evidence-based, 14 are research-based, and two are promising.

In this update, we analyze ten additional prevention and treatment programs that have been studied regarding their impacts on youth marijuana use. We apply WSIPP's standard research methodology to determine whether—and to what degree of certainty—each program's benefits are likely to exceed costs. Our methodology involves a three-step procedure, described in the next section.

Suggested citation: Lemon, M., Pennucci, A., Hanley, S., & Aos, S. (2014). *Preventing and treating youth marijuana use: An updated review of the evidence*. (Doc. No. 14-10-3201). Olympia: Washington State Institute for Public Policy.

I. Research Approach

When WSIPP carries out study assignments from the legislature to identify what works in public policy, we implement a three-step research approach.

Step 1: What Works? What Does Not?

In the first step, we estimate whether various programs and policies can achieve desired outcomes, such as reductions in youth marijuana use. We carefully analyze all high-quality studies from the United States and elsewhere to identify those programs and policies found to impact outcomes. We focus on research studies with strong evaluation designs and exclude studies with weak research methods.

Our empirical approach follows a meta-analytic framework to systematically assess all credible evaluations we can locate on a given topic. Given the weight of the collective evidence, we calculate an average expected effect of a program or policy on a particular outcome of interest—in this case, marijuana use.

In our analyses, we consider the programs' effects on all reported outcomes. When we reviewed the evaluation literature for these 23 programs and conducted the meta-analyses, we examined their effects on marijuana use as well as alcohol, tobacco, and other drug use; mental health (e.g., anxiety and depression); school-related outcomes such as test scores and high school graduation; and crime. Examining these additional outcomes allows us to get a comprehensive view of effectiveness and provide better estimates of the overall benefits and costs that can be expected from statewide implementation.

Step 2: What Makes Economic Sense?

Next, we consider the costs and benefits of implementing the 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 costs and benefits of each program or policy?

To answer these questions, we have developed, and continue to refine, an economic model that estimates benefits and costs. The model provides an internally consistent monetary valuation so program and policy options can be compared on an apples-to-apples basis. Our benefit-cost results include standard financial statistics: net present values and benefit-cost ratios.

We present monetary estimates from three perspectives:

- a) program participants,
- b) taxpayers, and
- c) other people in society.

The sum of the three perspectives provides a "total Washington" view on whether a program or policy produces benefits that exceed costs.

Step 3: What is the Risk in the Benefit-Cost Findings?

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 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 will at least have benefits that are greater than costs.

Brief descriptions of the 23 programs contained in this report can be found in the Appendix and on our website.⁴ Readers interested in an in-depth description of our research methods can review our Technical Documentation.⁵

⁴ <http://www.wsipp.wa.gov/BenefitCost>

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

II. Findings

The findings from our benefit-cost analyses are presented in [Exhibit 1](#) (next page).⁶ Of the 21 programs for which we were able to calculate benefits and costs, 18 have a favorable result.⁷ That is, 18 of the programs have, on average, benefits that exceed costs.

In [Exhibit 1](#), we also present the second key bottom-line finding for each program: the odds that benefits will exceed costs, after we take into account the uncertainty in our estimates. The higher the odds, the more confident we are that benefits will, in fact, outweigh cost. For five of 21 programs reviewed, benefits exceed costs at least 75% of the time.

The legislature has established a three-tiered classification for programs: evidence-based, research-based, and promising (see sidebar).⁸ Using these definitions, three programs—Life Skills Training, Communities that Care, and Teen Marijuana Check-Up—have a sufficiently high probability to establish them as top-tier evidence-based programs. Fourteen programs meet the criteria for second-tier research-based programs, while two programs are promising. Two programs (InShape and Project SUCCESS) produce poor outcomes. [Exhibit 2](#) (on page 6) summarizes the classifications.

⁶ For detailed results on each program, please see http://www.wsipp.wa.gov/ReportFile/1572/Wsipp_Preventing-and-Treating-Youth-Marijuana-Use-An-Updated-Review-of-the-Evidence_Benefit-Cost-Results.pdf

⁷ We did not find any evaluations that met our criteria for two programs on DBHR's preliminary list (Project Venture and Red Cliff Wellness School Curriculum). As a result, we cannot determine the potential effectiveness of these two programs, and they are not included in our benefit-cost results.

⁸ RCW 71.24.025. Since 2012, WSIPP has been directed by the legislature to create evidence-based, research-based, and promising program inventories for adult behavioral health, child welfare, children's mental health services, juvenile justice, adult corrections, and the K–12 Learning Assistance Program.

Legislative Definitions of Evidence-Based, Research-Based, and Promising Practices Contained in RCW 71.24.025

Evidence-based

A program or practice that has been tested in heterogeneous or intended populations with multiple randomized, or statistically controlled evaluations, or both; or one large multiple site randomized, or statistically controlled evaluation, or both, where the weight of the evidence from a systemic review demonstrates sustained improvements in at least one outcome. "Evidence-based" also means a program or practice that can be implemented with a set of procedures to allow successful replication in Washington and, when possible, is determined to be cost-beneficial.

Research-based

A program or practice that has been tested with a single randomized, or statistically controlled evaluation, or both, demonstrating sustained desirable outcomes; or where the weight of the evidence from a systemic review supports sustained outcomes [. . .] but does not meet the full criteria for evidence-based.

Promising

A practice that, based on statistical analyses or a well-established theory of change, shows potential for meeting the evidence-based or research-based criteria [. . .].

Exhibit 1

Benefits and Costs for Programs to Prevent or Treat Youth Marijuana Use

Program name	Total Benefits	Taxpayer benefits	Non-taxpayer benefits	Costs	Benefits minus costs (net present value)	Benefit to cost ratio	Odds of a positive net present value
<u>Prevention Programs</u>							
Life Skills Training	\$3,461	\$804	\$2,657	(\$97)	\$3,363	\$35.66	93%
Communities that Care	\$2,079	\$626	\$1,453	(\$574)	\$1,505	\$3.70	85%
Project STAR	\$3,917	\$941	\$2,977	(\$499)	\$3,418	\$7.86	84%
Lions Quest Skills for Adolescence	\$461	\$89	\$372	(\$95)	\$366	\$4.88	75%
SPORT	\$1,339	\$308	\$1,030	(\$38)	\$1,300	\$34.84	73%
keepin' it REAL	\$813	\$244	\$569	(\$48)	\$765	\$16.98	73%
Strengthening Families for Parents and youth 10-14	\$4,259	\$1,061	\$3,197	(\$1,098)	\$3,160	\$3.89	70%
Multidimensional Treatment Foster Care	\$17,286	\$4,256	\$13,031	(\$8,111)	\$9,175	\$2.13	67%
Case management in schools	\$5,252	\$1,479	\$3,773	(\$248)	\$5,005	\$21.21	66%
Project Northland	\$717	\$184	\$533	(\$185)	\$532	\$3.87	65%
Guiding Good Choices (formerly Preparing for the Drug Free Years)	\$1,951	\$653	\$1,298	(\$655)	\$1,296	\$2.99	64%
Caring School Community (formerly Child Development Project)	\$8,611	\$2,171	\$6,440	(\$1,218)	\$7,393	\$7.06	62%
Mentoring for students: Community-based (including volunteer costs)	\$10,694	\$3,513	\$7,181	(\$3,193)	\$7,501	\$3.36	60%
Project ALERT	\$331	\$119	\$213	(\$147)	\$184	\$2.25	55%
Project Towards No Drug Abuse (TND)	\$174	\$44	\$130	(\$64)	\$110	\$2.73	51%
Family Check-Up (also known as Positive Family Support)	\$79	\$53	\$26	(\$323)	(\$244)	\$0.24	47%
InShape	(\$309)	(\$90)	(\$219)	(\$15)	(\$324)	(\$21.00)	47%
Project SUCCESS	(\$209)	(\$20)	(\$189)	(\$155)	(\$364)	(\$1.35)	46%
<u>Treatment Programs</u>							
Teen Marijuana Check-Up	\$1,898	\$588	\$1,310	(\$106)	\$1,793	\$17.94	100%
Adolescent Assertive Continuing Care	\$11,089	\$3,387	\$7,702	(\$2,181)	\$8,907	\$5.09	68%
Multidimensional Family Therapy (MDFT) for substance abusers	\$14,292	\$4,308	\$9,984	(\$7,804)	\$6,488	\$1.84	67%

Exhibit 2

Inventory of Evidence- and Research-Based Practices: Prevention and Treatment of Youth Marijuana Use

Program/intervention	Level of evidence	Benefit-cost percentage	Reason program does not meet evidence-based criteria (see full definitions below)	Percent minority
Prevention Programs				
Life Skills Training	●	93%		33%
Communities that Care	●	85%		33%
Project STAR	◎	84%	Heterogeneity	21%
Lions Quest Skills for Adolescence	◎	75%	Single evaluation	74%
keeping' it REAL	◎	73%	Benefit-cost	83%
SPORT	◎	73%	Single evaluation/Benefit-cost	49%
Strengthening Families for Parents and Youth 10-14	◎	70%	Single Evaluation/Benefit-cost/Heterogeneity	4%
Multidimensional Treatment Foster Care	◎	67%	Benefit-cost/Heterogeneity	26%
Case management in schools	◎	66%	Mixed results/Benefit-cost	76%
Project Northland	◎	65%	Benefit-cost	36%
Guiding Good Choices (formerly Preparing for the Drug Free Years)	◎	64%	Benefit-cost/Heterogeneity	1%
Mentoring for students: Community-based (including volunteer costs)	◎	60%	Mixed results/Benefit-cost	80%
Project ALERT	◎	55%	Benefit-cost/Heterogeneity	NR
Family Check-Up (also known as Positive Family Support)	◎	47%	Benefit-cost	60%
Caring School Community (formerly Child Development Project)	P	62%	Weight of evidence/Benefit-cost	48%
Project Towards No Drug Abuse	P	51%	Mixed results/Weight of evidence/Benefit-cost	69%
InShape	⊖	47%	Produces poor or null outcomes	28%
Project SUCCESS	⊖	46%	Produces poor or null outcomes	38%
Project Venture	NA	NA	Research on outcomes of interest not yet available	NA
Red Cliff Wellness School Curriculum	NA	NA	Research on outcomes of interest not yet available	NA
Treatment Programs				
Teen Marijuana Check-Up	●	100%		39%
Adolescent Assertive Continuing Care	◎	68%	Benefit-cost/Heterogeneity	26%
Multidimensional Family Therapy (MDFT) for substance abusers	◎	67%	Benefit-cost	100%

Key:

- **Evidence-based**
- ◎ **Research-based**
- ⊖ **Produces null or poor outcomes**
- P **Promising**
- NR **Not reported**

Reasons Programs May Not Meet Suggested Evidence-Based Criteria:

Benefit-cost: The WSIPP benefit-cost model was used to determine whether a program meets this criterion. Programs that do not achieve at least a 75% chance of positive net present value do not meet the benefit-cost test.

Heterogeneity: To be designated as evidence-based, a program must have been tested on a "heterogeneous" population. We operationalized heterogeneity in two ways. First, the proportion of minority program participants must be greater than or equal to the minority proportion of children in Washington State aged 0 to 17. From the 2010 Census, for children aged 0 through 17 in Washington, 68% were white and 32% minority. Thus, if the weighted average of program participants had at least 32% minorities then the program was considered to have been tested on a heterogeneous population. Second, the heterogeneity criterion can also be achieved if at least one of the studies has been conducted on youth in Washington and a subgroup analysis demonstrates the program is effective for minorities ($p \leq .20$). Programs passing the second test are marked with a ^. Programs that do not meet either of these two criteria do not meet the heterogeneity definition.

Mixed results: If findings are mixed from different measures (e.g., undesirable outcomes for behavior measures and desirable outcomes for test scores), the program does not meet evidence-based criteria.

Program cost: A program cost was not available to WSIPP at the time of the inventory. Thus, WSIPP could not conduct a benefit-cost analysis.

Research on outcomes of interest not yet available: The program has not yet been tested with a rigorous outcome evaluation.

Single evaluation: The program does not meet the minimum standard of multiple evaluations or one large multiple-site evaluation.

Weight of evidence: Results from a random effects meta-analysis ($p \geq .20$) indicate that the weight of the evidence does not support desired outcomes, or results from a single large study indicate the program is not effective.

Level of Evidence:

Evidence-based: A program or practice that has been tested in heterogeneous or intended populations with multiple randomized and/or statistically-controlled evaluations, or one large multiple-site randomized and/or statistically-controlled evaluation, where the weight of the evidence from a systematic review demonstrates sustained improvements in at least one outcome. Further, "evidence-based" means a program or practice that can be implemented with a set of procedures to allow successful replication in Washington and, when possible, has been determined to be cost-beneficial.

Research-based: A program or practice that has been tested with a single randomized and/or statistically-controlled evaluation demonstrating sustained desirable outcomes; or where the weight of the evidence from a systematic review supports sustained outcomes as identified in the term "evidence-based" in RCW (the above definition) but does not meet the full criteria for "evidence-based."

Promising practice: A program or practice that, based on statistical analyses or a well-established theory of change, shows potential for meeting the "evidence-based" or "research-based" criteria, which could include the use of a program that is evidence-based for outcomes other than the alternative use.

Other Definitions:

Benefit-cost percentage: The percent of the time monetary benefits exceed costs.



Appendix

This appendix provides brief summaries of the programs reviewed in the main report.

[Adolescent Assertive Continuing Care](#)

This intervention was designed for youth returning to the community after residential substance abuse treatment. The aim of the intervention is to encourage youth to continue in outpatient treatment. Caseworkers make weekly home visits, advocate for needed services, and aid in job search and other pro-social activities.

[Caring School Community \(formerly Child Development Project\)](#)

Caring School Community is a whole-school program aimed at promoting positive youth development. Designed for elementary schools, the program attempts to promote prosocial values, improve academic achievement, and prevent drug use, violence, and delinquency by encouraging collaboration among students, staff, and parents.

[Case management in schools](#)

Case management involves placing a full-time social worker or counselor in a school to help identify at-risk students' needs and connect students and families with relevant services in and outside of the K–12 system. Three such models have been evaluated and are included in this analysis (in no particular order): Communities in Schools, City Connects, and Comer School Development Program. In practice, each of these models includes other services (such as extended learning time and educator training), but the program evaluations focus on the impact of the case management component.

[Communities that Care](#)

Communities that Care (CTC) is a coalition-based community prevention program that aims to prevent youth problem behaviors including underage drinking, tobacco use, violence, delinquency, school dropout, and substance abuse. CTC works through a community board to assess risk and protective factors among the youth in their community. The board works to implement tested and effective programs to address the issues and needs that are identified.

[Family Check-Up \(also known as Positive Family Support\)](#)

Family Check-Up is a three-tiered intervention implemented in middle schools. The first tier involves the establishment of a family resource center in the school and the implementation of a six-week prevention curriculum. The second tier is Family Check-Up, an assessment and brief motivational interview component for at-risk students. The third tier is the Family Intervention Menu, which directs parents of substance-using adolescents to treatment options, parenting groups, and family therapy sessions.

[Guiding Good Choices \(formerly Preparing for the Drug Free Years\)](#)

Guiding Good Choices is a skills training program for middle school students and their parents typically implemented outside normal school hours. The five-session drug resistance and education program, implemented one night per week for five weeks, aims to improve parent-child interactions that reduce the risk for substance use initiation.

[InShape](#)

InShape is a college-based brief motivational interviewing intervention that aims to increase physical activity, diet, and stress management while reducing substance use through the promotion of positive self-image. The program components are typically delivered to young adults in a college health clinic setting by a designated fitness specialist.

[keepin' it REAL](#)

keepin' it REAL is a school-based substance use prevention program designed for multicultural settings for middle school students. The curriculum is taught by classroom teachers in 45-minute sessions once a week for ten weeks and is designed to teach students drug resistance skills.

[Life Skills Training](#)

Life Skills Training is a school-based classroom intervention to reduce the risks of alcohol, tobacco, drug abuse, and violence by targeting social and psychological factors associated with initiation of risky behaviors. Teachers deliver the program to middle school students in 24 to 30 sessions over three years.

[Lions Quest Skills for Adolescence](#)

Lions Quest Skills for Adolescence is a school-based life skills education program designed for middle school. The curriculum's 45-minute sessions are designed to prevent substance use and bullying behaviors while also teaching anger and stress management skills.

[Mentoring for students: Community-based \(including volunteer costs\)](#)

In community-based mentoring programs, volunteer adults are paired with at-risk middle- and high-school students to meet weekly at locations of their choosing for relationship building and guidance. Community-based organizations provide the adult mentors with training and oversight. Mentors are expected to build relationships with mentees with the aim of improving a variety of outcomes including crime rates, academic achievement, and substance abuse. This analysis includes evaluation findings (in no particular order) for the Washington State Mentors program, Big Brothers Big Sisters, Across Ages, Sponsor-a-Scholar, Career Beginnings, the Buddy System, and other, locally developed programs.

[Multidimensional Family Therapy \(MDFT\) for substance abusers](#)

Multidimensional Family Therapy (MDFT) is an integrative, family-based, multiple systems treatment for youth with drug abuse and related behavior problems. The therapy consists of four domains: 1) Engage adolescent in treatment, 2) Increase parental involvement with youth and improve limit-setting, 3) Decrease family-interaction conflict, and 4) Collaborate with extra-familial social systems. Youth are generally aged 11 to 15 and have been clinically referred to outpatient treatment. For this meta-analysis, only one study measured the effects of MDFT on delinquency and four measured the effects on subsequent substance use. All five studies included youth who were referred from the juvenile justice system as well as other avenues.

[Multidimensional Treatment Foster Care](#)

Multidimensional Treatment Foster Care is an intensive therapeutic foster care alternative to institutional placement for adolescents who have problems with chronic antisocial behavior, emotional disturbance, and delinquency. Activities include skills training and therapy for youth as well as behavioral parent training and support for foster parents and biological parents.

[Project ALERT](#)

Project ALERT is a middle/junior high school-based program to prevent tobacco, alcohol, and marijuana use. Over 11 sessions in the 7th grade and three boosters in the 8th grade, the program helps students understand that most people do not use drugs and teaches them to identify and resist the internal and social pressures that encourage substance use.

[Project Northland](#)

Project Northland is a multilevel intervention designed to prevent substance use among adolescents in middle school. The 6th grade home component targets parent-child communication via homework assignments, group discussions, and the establishment of a communitywide task force. The 7th grade school-based curriculum focuses on improving resistance skills and social norms regarding teen alcohol use. The 8th grade components include the peer-led Powerlines school curriculum, a mock town meeting, and a community action project.

[Project STAR](#)

Also known as the Midwestern Prevention Project, Project STAR is a multi-component prevention program with the goal of reducing adolescent tobacco, alcohol, and marijuana use. The program consists of a 6th- and 7th-grade intervention supported by parent, community, and mass media components addressing the multiple influences of substance use.

[Project SUCCESS](#)

Project SUCCESS is a school-based prevention program that focuses on high-risk youth. The program's four components include: 1) prevention education provided in small groups by a professional counselor; 2) individual and group counseling; 3) communications with parents; and 4) referrals to community agencies. A program counselor is situated in the school throughout the academic year.

[Project Towards No Drug Abuse](#)

Project Towards No Drug Abuse is a prevention program for youth in regular and alternative high schools. The curriculum comprises twelve 45-minute lessons implemented in classroom settings by teachers or health educators. Using a variety of activities, the program aims to increase self-control, communication, decision-making, and motivation to not use substances.

[Project Venture](#)

Project Venture is a youth development program primarily for 5th- to 8th-grade Native American youth. Through the use of outdoor experiential activities such as hiking and camping trips and service learning projects, the program attempts to help youth develop social and emotional competencies to resist alcohol, tobacco, and other drug use.

[Red Cliff Wellness School Curriculum](#)

The Red Cliff Wellness School Curriculum is a school-based substance use curriculum grounded in Native American tradition and culture. Designed for students in grades K–12, the curriculum aims to reduce risk factors and enhance protective factors related to substance use by enhancing core Native American values such as sharing, kindness, honesty, and respect.

[SPORT](#)

SPORT is a high school-based brief intervention designed to promote a healthy lifestyle via improved physical activity, diet, and sleep. Students participate in a 12-minute, one-on-one counseling session with a fitness specialist during which they receive a booklet and tailored consultation. Students then complete a fitness plan designed to create behavior change and an improved self-image. Four weekly fliers that complement the intervention's core content are then sent to parents.

[Strengthening Families for Parents and Youth 10-14](#)

Strengthening Families for Parents and Youth 10-14 (also known as the Iowa Strengthening Families Program) is a family-based program that attempts to reduce behavior problems and substance use by enhancing parenting skills, parent-child relationships, and family communication. The seven-week intervention is designed for 6th-grade students and their families.

[Teen Marijuana Check-Up](#)

Teen Marijuana Check-Up is a brief, school-based intervention for youth meeting diagnostic criteria for cannabis use disorders. Youth are introduced to the program via classroom presentations. Students receive two 45 to 60 minute motivational interviews a week apart. The intervention is provided during the school day without parental involvement.

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Document No. 14-10-3201



Washington State Institute for Public Policy

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