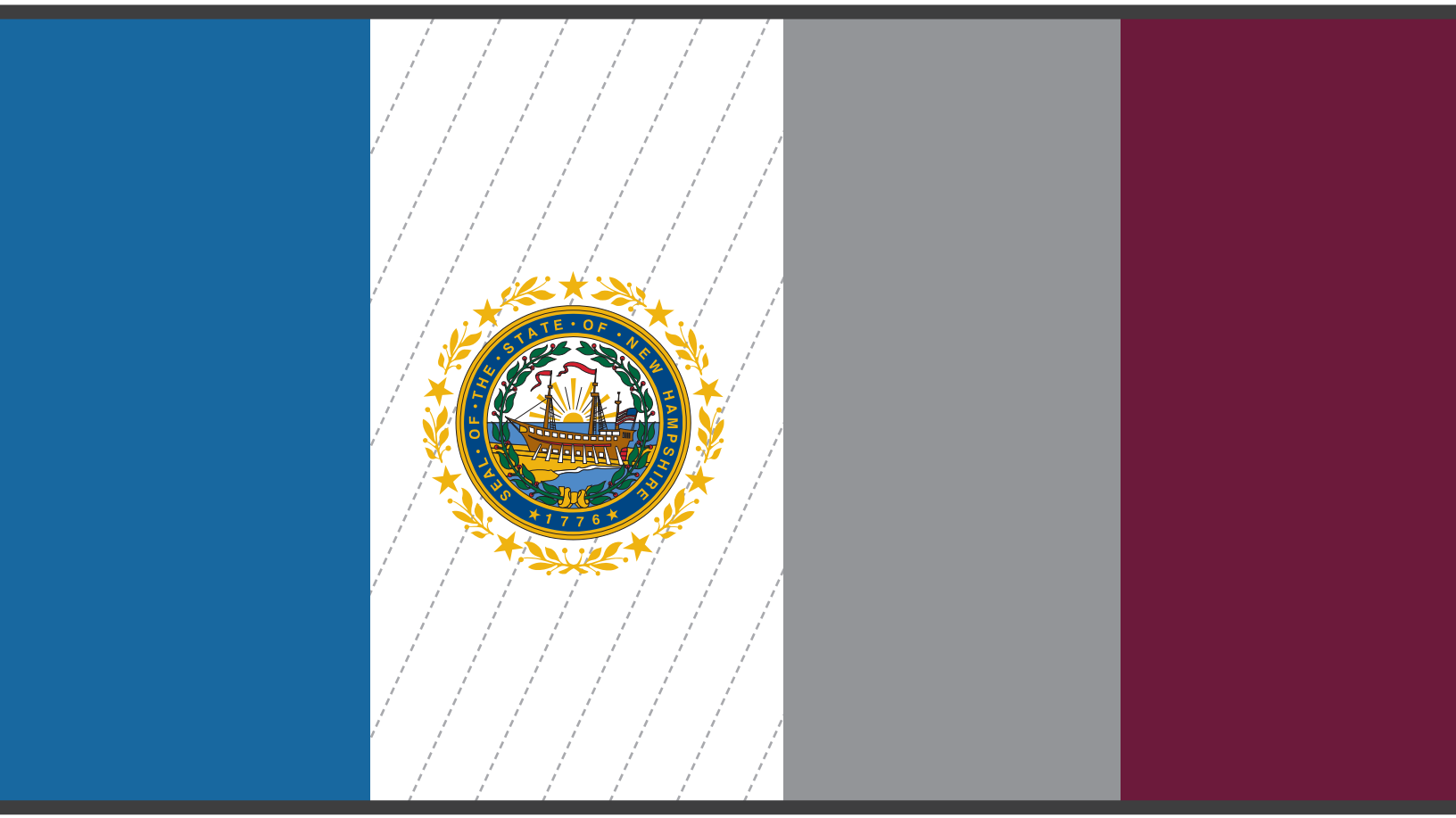
NEW HAMPSHIRE SUBSTANCE MISUSE PREVENTION

Analysis of Cost Effectiveness

December 31, 2020



Pursuant to RSA 12-J: 5, a report relative to the cost effectiveness and outcomes of programs funded in whole or in part by the New Hampshire Governor's Commission on Alcohol and other Drugs.

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EXECUTIVE SUMMARY

Pursuant to RSA 12-J:5, the New Hampshire Department of Health and Human Services commissioned an analysis of cost-effectiveness and evidence of effectiveness of substance misuse prevention programs funded in whole or in part by the Governor's Commission on Alcohol and other Drugs. Four of the eleven prevention programs funded by the Commission in State Fiscal Year (SFY) 2019 were selected for participation in the analysis. They included an after school prevention education program for middle school students, a training and policy program targeting high school athletes, a weekend leadership training for middle school teams, and a one-week summer intensive program for high risk youth in high schools. For analysis of cost effectiveness, each program submitted financial information and outcome data.

Outcome data were analyzed to determine the effect of each program on participants. Two of the four programs used unique identifiers to match pre- and post-program surveys, which were used to calculate two cost effectiveness ratios for each program. The other two programs did not use unique identifiers in their data collection and showed minimal change in average group effect, which did not allow for a cost effectiveness ratio. Outcomes for these programs are presented without a cost-effect calculation. The differences in data collection along with high variability in program type and target population precluded comparability between the four selected programs.

Results of the analysis found that across the four programs, costs ranged from $287 per participant to $1,459 per participant. Composite scores for perception of risk of harm and for substance misuse behavior were calculated to be able to show change within groups across substances. Outcomes included 71% of middle school leadership training participants increasing or sustaining a high perception of risk across multiple substances from pre- to post-training. For the week-long summer program, 74% of participants increased or sustained a high perception of risk from pre- to post-program. For the after school program studied, 100% of participants reported no use for three of four substance categories at the end of the program, and the prevention program for athletes revealed that over 90% enter the program not using substances and that this rate was sustained for the majority of substance misuse measures. Cost effectiveness ratios varied based on the cost of the program and the two different methods utilized for the ratio calculation. The ratios ranged from $561 for a program to have a one-point increase in perceived risk of harm for a middle school participant attending a weekend leadership training to $1,759 for high risk high-school aged youth in a summer leadership program to increase their perception of harm for at least one substance misuse behavior or to sustain the highest level of perceived harm across multiple substance misuse behaviors. Findings were not without significant limitations and challenges that should be considered carefully when interpreting results. In response to limitations encountered, the report offers recommendations to improve future cost effectiveness analyses, including an improved data and evaluation infrastructure for funded prevention programs and consideration of alternative methods to meet the Commission's study goals.

1. INTRODUCTION

The New Hampshire Governor's Commission on Alcohol and Other Drugs (the Commission) was created in 2000 by the New Hampshire (NH) Legislature to develop coordinated leadership and resource development to significantly reduce alcohol and drug problems and their behavioral, health and social consequences for the citizens of NH. A primary role of the Commission is to advise the Governor and Legislature regarding the delivery of effective and coordinated alcohol and drug misuse prevention, treatment and recovery services. In addition, the Commission is involved in developing state-wide planning, supporting comprehensive and effective services, determining unmet needs, recommending legislative action, and authorizing the disbursement of moneys from the alcohol abuse prevention and treatment fund, pursuant to RSA 176-A:1,III.

In 2018, NH House Bill 1626 (HB 1626) was passed into law charging the Commission with analyzing and reporting the cost effectiveness of a selection of programs that it funds in whole or in part, alternating analyses each year by service type, with cost effectiveness analyses of treatment programs reported in odd years and of prevention programs in even years.

This year's analysis of prevention programs is the first of its kind, providing important insights into the state's services and systems related to substance misuse prevention, data collection, outcome measurement, and cost effectiveness analyses.

2. CONCEPTUAL FRAMEWORK

To advise and oversee the analysis required, the NH Department of Health and Human Services (DHHS) Bureau of Drug and Alcohol Services (BDAS) established a workgroup of key staff from BDAS, the NH DHHS Bureau of Program Quality, and the NH Center for Excellence/JSI Research and Training Institute, Inc. (JSI), who were contracted to conduct the analysis. The workgroup provided guidance and oversight relative to data access and availability, contextual factors, analytic approach, and report goals.

The workgroup established steps to form a conceptual approach for meeting the requirements of RSA 12-J:5, including a program selection process; standard definitions for cost effectiveness; methods for data gathering, quality review, and analysis; and the development of recommendations.

2.1 SELECTING THE PROGRAMS

Using RSA 12-J:5 as a guide, the following criteria were applied to each program to progressively narrow the list of prevention programs down from the 11 that were funded by the Commission in whole or in part in State Fiscal Year (SFY) 2019 to the four required by legislation. Programs selected must:

1. Be among the ten highest dollar value prevention programs and not implemented by law enforcement.
2. Be in the same category to allow comparisons between the selected programs.
3. Have available research of effectiveness using a nationally recognized clearinghouse of program evaluations or have documented results of evaluation assessing the effect of the program on the intended outcome for program beneficiaries.
4. Have national data that establish measurable change on prevention indicators or have local data available and accessible that measures change in anticipated outcomes.

The selection process considered the 11 prevention programs funded in whole or in part by the Commission in SFY 2019. These included three programs that focus on parents/caregivers and eight programs that focus on youth. Please refer to Table 1 for a list of these programs.

Table 1: SFY 2019 Commission Funded Prevention Programs	
Program Name	**Target Population**
Parenting Wisely	Parents/Caregivers
Staying Connected with Your Teen	Parents/Caregivers
Upper Room UR Parents/Caregivers	Parents/Caregivers
Adolescent Wellness Program	Youth
Juvenile Court Diversion Services	Youth
Leaders In Prevention	Youth
Life of an Athlete	Youth
Positive Action	Youth
Student Assistance Programs (SAP)	Youth
Summer Leadership Program	Youth
Wilderness Leadership in Adventure (WYLD)	Youth

A set of criteria based on the language of the cost effectiveness legislation was applied to the programs, assessing the extent to which programs have:

- A common target population
- A national registry or research base supporting effectiveness
- Available program-level data demonstrating effectiveness

Seven programs were eliminated from consideration because they served a dissimilar population compared to other programs, lacked accessible program level outcome data, are not listed on a national registry, or lacked a research base supporting their effectiveness. This process of elimination resulted in four programs recommended for analysis and approved by the Commission on June 26, 2020. Upon further review of data submitted by one of the programs, however, the data were determined to be insufficient for the needs of this study. Another program that had met

the majority of selection criteria in the initial review process was then selected to replace the one with insufficient data. This substitution was approved by the Commission on October 23, 2020. For a full description of the methodology for program selection, see Appendix A: *Cost Effectiveness Analysis of Prevention Programs Selection Rationale and Recommendation Report.*

The final list of programs determined for inclusion in the analysis were Leaders In Prevention, Summer Leadership Program, Positive Action and Life of an Athlete. All four are direct service programs. Although they all serve youth, they vary considerably in virtually all other aspects of their service delivery, including their target population type, ages served, program structure, program goals, and evidence base.

One important variable in substance misuse prevention is the population targeted by the program. The Institute of Medicine (IOM) has described three classifications for prevention programs:

- Universal: Serving a total population regardless of any inherent risk of substance misuse;
- Selective: Targeting subsets of a population that are understood to be at risk for substance misuse because they are affiliated with a category of higher risk, such as children whose families have experienced homelessness); and
- Indicated: Targeting services to those showing early warning signs of problem behaviors, such as failing grades and consumption of alcohol and other drugs.

These classifications are important for selecting appropriate programs for target populations and for determining anticipated outcomes.

Regarding the variability of IOM prevention classification across the four programs, three of the four programs that were analyzed focus on serving universal populations. This means participants are not specifically selected or targeted to participate based on a presumption of risk. The fourth is a selective/indicated program serving youth at a higher risk for substance misuse.

Age groups served by the prevention programs also vary, with two serving middle school students and two serving high school aged students. Three of the programs have a research base supporting their design and implementation, while one has been serving youth in NH for over 20 years and conducting program evaluations regularly. General program characteristics and service delivery information collected from programs for SFY 2019 are presented in the following summary Tables 2a -2d. *Additional program detail is provided in Appendix C: Program Descriptions.*

Table 2.a LEADERS IN PREVENTION	
Evidence Base	Developed in 1999 in NH based on identified needs; conducts evaluation
Oversight Agency	NH Teen Institute
Description	Teams of middle school students and adult advisors participate in a weekend training to build leadership skills, encourage positive peer and adult relationships, and develop action plans to improve school and community environments.
Intended Outcomes	-Increased perception of risk of harm of substance misuse -Increased perception of peer or parent/caregiver disapproval of substance misuse -Increased protective factors associated with risk behavior, including school/community connectedness and relationships with healthy peers
Data Collection	Surveys administered before the training begins, immediately after the program and six months after the program. Surveys include a unique identifier that allow pre- and post-surveys to be matched.
Structure/ Intensity	34 hours over 2.5 consecutive days
Target Population Type	Universal/Selective/Indicated[1]
Target Population Age	Middle School
Numbers Served	115
Cost of Program	Total: $70,976.99 % Funding from Governor's Commission: 53.1% Governor's Commission: $37,668.56 Other Revenue Sources: $33,308.43 Total: $70,976.99
Cost Per Participant	$617.19

Table 2.b SUMMER LEADERSHIP PROGRAM	
Evidence Base	NH Service to Science Promising Practice
Oversight Agency	NH Teen Institute
Description	A dynamic residential week of leadership development, self-discovery, and social connection. Experiential workshops are designed as catalysts for personal values exploration and increased school and civic engagement. Participants increase their knowledge on a variety of topics including substance misuse and addiction, bullying, sexual health, conflict resolution, and health and wellness. The program connects participants with their local peers, as well as school and community action organizations so they can channel this new energy toward the betterment of their home communities.
Intended Outcomes	-Increased perception of risk of harm for substance misuse -Increased perception of peer disapproval of substance misuse -Increased protective factors associated with risk behavior, including school/community connectedness and relationships with healthy peers -Decreased substance misuse
Data Collection	Surveys administered to participants at the beginning and end of the week and six months after the program. Surveys include a unique identifier that allow pre- and post-surveys to be matched.
Structure/ Intensity	75 hours over 6 consecutive days
Target Population Type	Selective/Indicated
Target Population Age	High School
Numbers Served[2]	100
Cost of Program	$130,523.87 % Funding from Governor's Commission: 62.4% Governor's Commission: $81,408.63 Other Revenue Sources: $49,115.24 Total: $130,523.87
Cost Per Participant	$1,305.24

Table 2.c POSITIVE ACTION – Salem Site	
Evidence Base	National registry evidence-based program[3]
Oversight Agency	Boys and Girls Club of Greater Salem
Description	An after school program for at least six weeks with multi-aged groups of youth 10 to 13 years of age. The program includes lessons from all six units of a standard, nationally recognized evidence-based curriculum, including units on self-concept, positive actions for body and mind, managing yourself responsibly, treating others the way you like to be treated, telling yourself the truth, and improving yourself continually.[4] Teachers deliver two or three lessons per week in a one-hour block.
Intended Outcomes	-Increased protective factors associated with risk behavior, including school/community connectedness and relationships with healthy peers -Decreased substance misuse
Data Collection	Surveys administered to participants at the beginning of the program and end of the program.
Structure/ Intensity	One hour per week for 6 to 8 weeks
Target Population Type	Universal
Target Population Age	Middle School
Numbers Served	61
Cost of Program	$88,981.96 % Funding from Governor's Commission: 100% Governor's Commission: $88,981.96 Other Revenue Sources: $0.0 Total: $88,981.96
Cost Per Participant	$1,458.72

Table 2.c LIFE OF AN ATHLETE	
Evidence Base	NH Service to Science Promising Practice
Oversight Agency	NH Interscholastic Athletic Association
Description	A multi-component prevention program that empowers and motivates youth participating in athletics and leadership programs to make healthy choices and decisions by educating them on the impact alcohol and other drugs have on performance and development. The program is comprised of five core components: pre-season meetings with athletes, coaches and parents/caregivers; assessment and revision of codes of conduct; training for coaches and youth; youth leadership opportunities associated with conduct and health; and community unity. Life of an Athlete provides trainings and convenes meetings for sports teams, schools and student leaders. Trainings vary in duration from 30 minutes to six hours and are offered at the state, regional and school level. Engagements include three summits, an annual conference for a day and a half, and monthly Statewide Leadership Committee meetings.
Intended Outcomes	-Increased perception of risk of harm of substance misuse -Increased perception of peer disapproval of substance misuse -Increased knowledge regarding the impact of substance misuse on athletic and school performance -Decreased substance misuse
Data Collection	Surveys administered to participants of athletic teams at the beginning and end of each athletic season.
Structure/ Intensity	Varies
Target Population Type	Universal
Target Population Age	High School
Numbers Served	1,293
Cost of Program	$ 371,594.65 % Funding from Governor's Commission: 67.3% Governor's Commission: $250,000 Other Revenue Sources: $121,594.65 Total: $371,594.65
Cost Per Participant	$ 287.39

3. METHODS

The methodology to conduct the cost effectiveness analysis was designed with several factors in mind, including key assumptions and definitions derived from RSA 12-J:5, the small pool from which to select the prevention programs for analysis, and the wide range of outcomes measured by the selected programs through their own evaluations that could be considered the "effect", or measurable change, to be used in the analysis.

3.1 Definitions

Based upon a review of the literature and legislation, JSI developed the following definitions for this cost effectiveness analysis of substance misuse prevention programs:

> **Cost effectiveness** is defined as prevention program expenditures required to achieve a prevention effect. [5,6]
>
> **Costs** are defined as expenditures to deliver services.[7] This includes direct costs to implement the program such as staffing, supplies and marketing as well as indirect or overhead costs such as employee benefits and administrative costs.
>
> **Effectiveness** is a degree of positive change in participants as measured by comparisons of indicators before and after program implementation.

3.2 Measures of Effectiveness

Given that the four programs selected varied in terms of their target populations and intended outcomes, JSI reviewed outcome measures from multiple sources in order to narrow the scope of possible indicators to a common set that might apply to all four programs in the analysis. This review was conducted to support the directive of RSA 12-J:5 to "utilize a cost effectiveness analysis in such a format to permit comparisons between the selected programs within a given category."

JSI reviewed general prevention science literature, the research base of selected programs as well as source documents establishing the programs' intended outcomes. Source documents included the proposals submitted to the NH BDAS by provider agencies for Commission funding as well as the Bureau's final contract stipulations for contracted agencies.

Considered measures and sources of rationale for their inclusion are presented in Table 3 on the following page.

Table 3: Measures of Effectiveness Considered						
Outcome Measure	**Program-Specified**				**Evidence in literature**	**Included in contracted scope of work**
	Leaders in Prevention	Life of an Athlete	Positive Action	Summer Leadership		
Perception of risk or harm of substance misuse	X	X		X	X[8,9]	X
Perception of peer or parent/ caregiver disapproval of substance misuse		X		X	X[10]	X
Knowledge regarding the impact of substance misuse on athletic and school performance		X				
Protective factors associated with risk behavior, including school/community connectedness and relationships with healthy peers	X	X	X	X	X[11]	
Substance misuse		X	X	X	X[12]	

The risk and protective factors associated with these programs have been shown in research studies, in national data sets and in local NH data to be correlated with decreased likelihood of substance misuse and/or the progression of substance misuse disorders. Risk factors include individuals' perception of risk of harm and the perception of disapproval of substance misuse by friends and family. Graphs illustrating the relationship between increased perception of risk and lowered substance misuse can be found in Appendix D. Protective factors include strong neighborhood attachment, success in school, self-control and self-efficacy, and parent monitoring.[12]

There were not any indicators consistently collected across all four program, as Table 3 depicts. Additionally, data submitted by the programs revealed significant variations in how similar outcomes were measured, reducing their comparability. Furthermore, data variability is compounded by substance misuse "multipliers." For example, a single indicator such as

perception of risk expands to understand the measure as it relates to multiple substance misuse behaviors such as weekly or monthly alcohol use or binge drinking, weekly or monthly marijuana use, or lifetime use of opioids or methamphetamines. Therefore, the review of possible outcome measures did not produce a common set of accessible data points that could be compared across the four selected programs. This is a common challenge for data sets asking about substance misuse behaviors, including the National Survey on Drug Use and Health (NSDUH) and the Youth Risk Behavior Surveillance Survey (YRBSS).

As a result, the methodology relied on selecting a set of outcome measures unique to each program for which an increment of change could be established. These outcomes, or "effects", could then be monetized through a calculation that considered participant cost and the degree of change for each indicator and/or participant.

3.3 Accessing Data

Each program selected for the cost effectiveness analysis received a letter (See Appendix B) explaining the purpose of the report and the requirement to submit the following types of program data for SFY 2019: 1) outcome; 2) cost; and 3) implementation. Program representatives were asked to use two standardized forms developed by JSI, one for summarizing cost data (see Appendix B) and another for summarizing program and participant data (see Appendix B). They were asked to submit de-identified program outcome data from participant surveys in the form of an Excel or SPSS file. Table 4 summarizes the types of data requested, criteria, and format.

Table 4: Program Data Requested

Type of Data	Source	Criteria	Format
Outcome	Participant surveys	-Collected from participants before and after participation in a prevention program to determine the outcomes -Includes pre- and post-program responses	-Raw (actual individual responses, not a summary percent) -De-identified (does not identify any individual participant) -Matched if possible (ability to connect pre- and post-surveys for each individual participant) -Excel or SPSS files (not standardized for all programs)

Table 4: Program Data Requested			
Type of Data	**Source**	**Criteria**	**Format**
Cost	Expense reports submitted to the NH BDAS	-Specific to the program being evaluated -Includes direct and indirect costs associated with the delivery of the identified program	-An Excel spreadsheet provided by JSI reflecting SFY 2019 expense report submitted to the state, with columns for programs to add program expenses charged to other funding source.
Program Implementation	Questionnaire sent to program directors	-Program type -Number, duration and frequency of program sessions -Number of participants per session -Evidence of effectiveness -Fidelity and modifications	-Standardized form provided by JSI

Data Review and Program Follow Up. JSI reviewed the data submitted by program representatives and identified areas in need of clarification. These included:

- Missing outcome data (e.g. no or limited outcome data to show program effect, inability to differentiate pre-tests from post-tests, lack of matched pre- and post-test surveys)
- Co-mingled cost data that included programs not included in the cost-effectiveness analysis
- Lack of clarity about number of program sessions, frequency of sessions and participant counts for each session

JSI offered a 30-minute follow up call with each program to clarify the data. In some cases, additional data requests were sent via email. This process revealed that Life of an Athlete did not have sufficient outcome data for SFY 2019. After multiple attempts to access and assess usable data sets, it was determined that outcome data from SFY 2016 would need to be used in this analysis (financial information remained for SFY 2019).

4. ANALYSIS METHODS

For the analysis, each program was treated separately because of differences in data between programs. The four programs had various targeted outcomes, and in cases where they were assessing similar concepts they did not always use the same survey questions to measure that outcome. Additionally, the programs used different tools for measurement and only two of the programs had the ability to match participants' individual pre- and post-surveys, a stronger method of determining change. Finally, not only did the programs have different targeted outcomes, they also had different targeted participants. For example, as noted in the program descriptions, the programs serve different age groups and different levels of risk for substance misuse. While a traditional cost effectiveness analysis compares two or more similar programs as alternatives to each other, it was not possible to conduct a comparison because of these limitations. Although comparisons across programs are not possible, the data did provide an opportunity to determine evidence of effectiveness for each of the programs.

The first step in the analysis was to determine a measure of effect that was most appropriate for the cost effectiveness analysis for each program. A cost effectiveness analysis estimates how much it costs to gain a unit of a health outcome, such as a life year gained or a death prevented.[13] However, when trying to apply cost effectiveness analysis in addiction research, a major challenge encountered is the variety and complexity of outcomes which make it difficult to express economic impact through just one outcome.[14] This is especially true in substance misuse prevention where participants do not receive a dosage of a program that is specific to any particular outcome; rather, the program as a whole aims to target multiple risk and protective factors related to different substances as well as different substance misuse behaviors.

For the current analysis, several outcomes directly related to substance misuse were considered, including behavior, knowledge, and attitudes/perceptions. Table 5 provides a crosswalk of several measures that were considered. Questions about behavior were measured in three programs, but change between pre- and post-program participation was only measured in two of them. Perceptions and beliefs about substances were also measured in three of the programs, but different indicators were used across all of programs. Some additional protective factors that have been shown in the literature to be associated with substance misuse prevention[15] were considered. While not suitable for the cost effectiveness analysis, these data were considered in order to gain more insight about the program.

After exploring the data, perceived risk of harm emerged as the best measure of effect for Leaders In Prevention and Summer Leadership, while substance misuse behavior appeared to be the best measure of effect for Positive Action and Life of an Athlete. This latter selection changed in the course of the study which is explained later in this report. For both of these domains (perceived risk of harm and substance misuse behavior) four types of substances or substance misuse behaviors were combined to create a composite score used as the measure of effect. These varied across programs depending on their data availability. Explanation of how composite scores were created is included below.

Table 5. Crosswalk of measures considered across prevention programs for cost effectiveness analysis

	Leaders in Prevention	Summer Leadership Program	Positive Action	Life of an Athlete
Perception/Beliefs				
Perception of Use	X	X		
Peer Disapproval		X		X
Community Disapproval				X
Risk of Harm	X	X		X
Behavior				
Drink Alcohol		X	X	X
Use Marijuana		X	X	X
Smoke Cigarettes		X	X	X
Use Illicit Drugs		X	X	X
Protective Factors				
Future Goals	X	X	X	
Self Esteem	X	X	X	
Empathy	X	X	X	
Social Support	X	X		X
Life Purpose	X	X		
Community Connectedness		X		

The following methods were used to conduct the cost effectiveness analysis.

ECONOMIC ANALYSIS

Calculation of Measure of Cost: Cost is derived from annual expenditures to deliver the program services. This is an aggregate of all annual program operating costs from different funding sources, provided by the program.

Source: Program financial information provided to JSI which included all program delivery costs, such as staffing, recruitment/marketing, rent, materials, administration, and overhead costs.

Calculation of Cost per Participant: Per participant cost is a calculation of the annual program cost divided by number of participants served. It is likely that some programs had costs associated with participants who did not complete the program, but information on these discrepancies was not known.

EFFECTIVENESS ANALYSIS

Calculation of Measure of Effectiveness: Measure of effectiveness is a calculation of the number and/or percent of program participants who completed the evaluation surveys and had positive change in target outcomes.

Source: Program evaluation data submitted to JSI by each program.

It was determined that creating a composite score across several substances related to the domain, where possible, would allow a single measure of effect while increasing the rigor of the analysis. A composite measure was created for the following reasons: 1) program participants are not identified as needing prevention related to risk of using a particular substance, and 2) survey questions asked about multiple substances and even about the same substance referred to in different ways. A composite measure was seen as the most relevant method to understand the program as a holistic approach to prevention of misuse of a variety of substances. Details about how each composite score was calculated are provided within the results section for each program.

As mentioned previously, the measure of effect varied by program depending on data availability and target outcomes. The measures of effect used for each program are shown in Table 6. This includes the substance misuse indicators summed to create the composite scores.

Table 6. Indicators and related program measures		
Program	**Indicator**	**As Measured by Survey Instruments**
Leaders In Prevention	Perceived Risk of Harm	*How much do you think people risk harming themselves (physically or in other ways) if they:* Smoke one or more packs of cigarettes per day; try marijuana once or twice; smoke marijuana regularly; and take one or two drinks of an alcoholic beverage nearly every day
Summer Leadership		
Positive Action	Substance Misuse Behavior	*How often do you:* Drink alcohol (even a sip); use or try illegal drugs; get drunk or high; smoke cigarettes (even a puff)
Life of an Athlete	Substance Misuse Behavior	*How many times in past 30 days have you used:* Alcohol; tobacco; marijuana; prescription drugs without a doctor's prescription

As previously explained, questions were asked referencing different amounts of use and time points of use.

The planned analysis considered substance misuse behavior as a measure of effect for Positive Action and Life of an Athlete. However, when the analysis was conducted limitations in the data were discovered that led to the exploration of alternate measures of effect and analysis methods. This will be explained in further detail in the results section for these programs.

COST EFFECTIVENESS ANALYSIS

Two methods were planned to calculate cost effectiveness for the programs to better align the analysis with cost effectiveness. Specifically, an "Average Group Effect" analysis was designed for the data from the two programs that did not collect matched pre and post data. Secondly, an "Individual Effect" analysis was designed for the two programs that did collect matched pre and post data.

Analysis Method 1 – "Average Group Effect": This method was applied to all four of the programs to measure and illustrate the effect as the degree of positive change for both types of programs by calculating the difference in the mean composite score across all participants at pre- and post-program participation. It is important to note that while this measures the degree of change along a 4-point scale, it was not determined if the amount of difference between each point in the response option scale was equal in magnitude. This method assessed aggregate change in the group rather than individual change.

A measure of cost effectiveness was calculated by dividing the cost per youth by the average change in aggregate score between pre- and post-program participation. This method answers the question: *How much does it cost this program for a one-point positive change in the effect (i.e. increase in perception of risk of harm) for a group of participants?*

Analysis Method 2—"Individual Effect": This method was only applied to the two programs that had matched pre - and post-participant data (Leaders In Prevention and Summer Leadership) whereby the analysis was also able to measure and illustrate effect as the number of individual youth who had a positive change or sustained the highest perception of risk of harm across substance misuse behaviors. A measure of effect was then calculated as the total number of youth who had at least one positive change or sustained high perceived risk across all substance misuse behaviors used in the composite score.

A measure of cost effectiveness was calculated by dividing the total program cost by the total number of youth with an increase in the outcome or sustainment of an asset (i.e., perceived risk of harm).[16,17] This method answers the question: How much does it cost this program to increase a participant's perception of risk of harm for at least one substance misuse behavior or sustain a high perception of risk of harm across all substances?

Table 7 illustrates the analyses performed for each program that was based on the data collection approach employed by the programs.

5. RESULTS

As described previously, the "Average Group Effect" analysis was conducted for each of the four programs and the "Individual Effect" analysis for two programs. Both analyses were conducted for the two programs with matched pre- and post-data which resulted in two cost effectiveness ratios, one for the "Average Group Effect" method and one for the "Individual Effect" method. Only the "Average Group Effect" analysis was conducted for the two programs without matched pre and post data. However, this analysis was not able to produce a cost-effectiveness ratio due to data limitations.

Table 7 illustrates which methods were applied to each program and which were able to produce a cost effectiveness ratio. As the table shows, two cost effectiveness ratios were calculated for Leaders In Prevention and Summer Leadership; however, no ratios were able to be calculated for Positive Action or Life of an Athlete.

Table 7	Pre-Post Participant Data	Analysis Method Applied & Ratio Output			
		Average Group Effect	Cost Effect Ratio	Individual Effect	Cost Effect Ratio
Leaders In Prevention	Matched	X	Yes	X	Yes
Summer Leadership	Matched	X	Yes	X	Yes
Positive Action	Unmatched	X	No	--	--
Life of an Athlete	Unmatched	X	No	--	--

As noted earlier, comparisons cannot be made between programs because of discrepancies in data, as well as variations in program participants and targeted outcomes. Therefore, results are presented below for each prevention program separately.

5.1. Prevention Programs with Matched Pre- and Post-Participant Data

First are the results for the two programs for which matched pre- and post-data on perceived risk of harm were available: Leaders In Prevention and Summer Leadership. Here we were able to use both methods to calculate cost effectiveness. The analysis produced data on effectiveness as measured by a positive change in perceived risk of harm across four substance misuse behaviors: 1) smoking one or more packs of cigarettes per day; 2) trying marijuana once or twice; 3) smoking marijuana regularly; and 4) taking one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly every day. Perceived risk of harm (physically or in other ways) was measured using a four-

point scale: no risk, slight risk, moderate risk, and great risk (coded 0-3, with 3 being highest perceived risk of harm). Therefore, a composite score at each time point was calculated that ranged from zero (no perceived risk of harm across all four substance misuse behaviors) to 12 (great perceived risk of harm across all four substance misuse behaviors).

LEADERS IN PREVENTION

The following tables and figures display the primary findings for Leaders In Prevention, including detail on the change in perceived risk of harm for each substance misuse behavior separately followed by the composite score and a cost effectiveness ratio for each method. Additionally, given the holistic nature of prevention programs and the protective effect of multiple factors, several other measures of effectiveness were provided, including the following: future goals, social support, self-confidence, empathy, and life purpose.

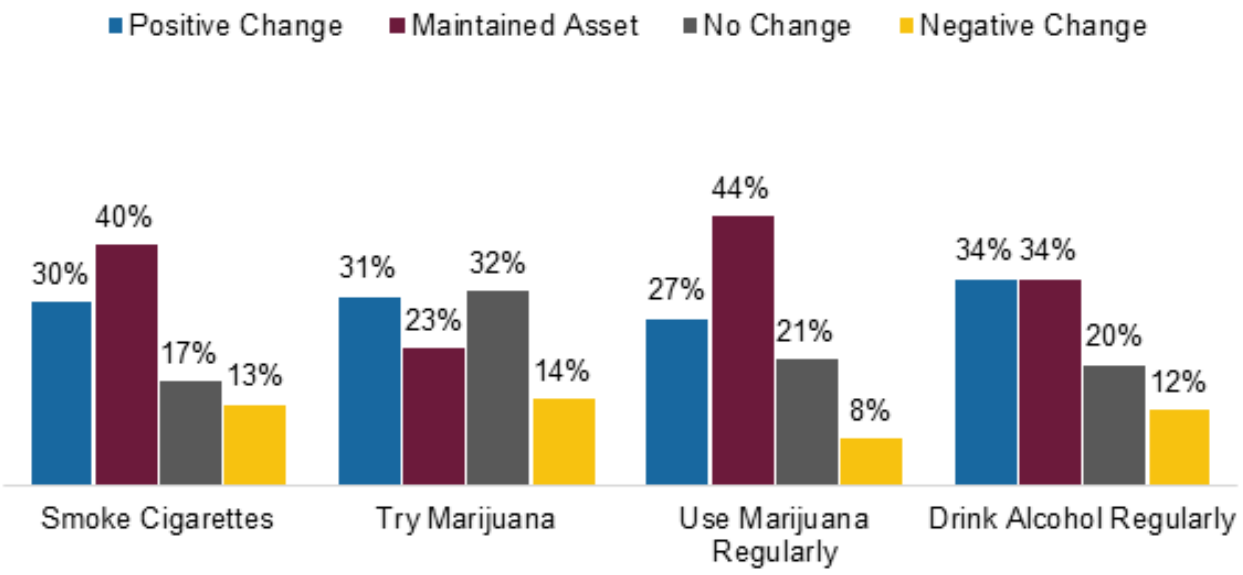
Change in Perceived Risk of Harm for Each Substance Misuse Behavior
A majority of the youth served by Leaders In Prevention in SFY19 completed both the pre- and post-surveys: 106 out of 115 youth. There was an increase in perceived risk of great harm across all substances use behaviors (Table 8). Overall, perceived risk of harm is greatest for smoking cigarettes and lowest for trying marijuana once or twice. Few youth perceived no risk of substance misuse, with 10% or less reporting this across all substance misuse behaviors.

Table 8. Percent of youth reporting level of perceived risk of harm for each substance misuse behavior at pre- and post-program participation – Leaders In Prevention

	No Risk	Slight Risk	Moderate Risk	Great Risk
Perception of Risk: Smoke Cigarettes (at least one pack per day)				
Pre	6.6%	7.5%	37.7%	48.1%
Post	2.8%	5.5%	25.7%	66.1%
Perception of Risk: Try Marijuana (at least once or twice)				
Pre	10.4%	30.2%	34.0%	25.5%
Post	9.2%	25.7%	25.7%	39.4%
Perception of Risk: Use Marijuana Regularly				
Pre	6.6%	15.1%	29.2%	49.1%
Post	2.8%	11.0%	22.0%	64.2%
Perception of Risk: Drink Alcohol Nearly Every Day				
Pre	8.5%	17.0%	34.9%	39.6%
Post	2.8%	13.8%	23.9%	59.6%

Figure 1 shows the direction of change in perceived risk of harm for each substance misuse behavior. About a third of the youth had a positive change in their perceived risk of harm for each substance with the exception of using marijuana regularly. Fewer youth, a little over a quarter, had an increase in perceived risk of harm for using marijuana regularly. It is important to note that this is any change across the four-point scale. For example, two youth may have reported marijuana use as no risk before program participation but after participation one reported slight risk and another great risk. Both would be considered a "positive change" regardless of the difference in degree of change. A high percentage of youth began the program already perceiving the greatest risk across all substances and did not change throughout their participation (i.e., sustained asset). This was particularly true for smoking cigarettes, using marijuana regularly, and drinking alcohol regularly. There was more variability in the change in perceived risk of harm for trying marijuana once or twice. About a third (32%) did not report a change and 14% had a decrease in perceived risk of harm (i.e., negative change).

Figure 1. Direction of change in perceived risk of harm between pre- and post-participation by substance misuse behavior (% of youth) - Leaders In Prevention



Change in Perceived Risk of Harm Across All Substance misuse Behaviors (Composite Score)
As you can see from Figure 2, the composite score for perceived risk of harm across all substance misuse behaviors increased after participating in the program (as mentioned above, scores ranged from zero representing no perceived risk of harm to 12 representing greatest perceived risk of harm). In fact, the percentage of youth that perceived all behaviors as a great risk of harm almost doubled (17% versus 30%) and over half (55%) of the youth had at least some form of positive change in their perceived risk of harm between pre and post participation (Table 9).

Figure 2. Perceived risk of great harm across all substance use behaviors before (pre) and after (post) participating in the program (n=106) (0= no risk, 12= risk) - Leaders In Prevention

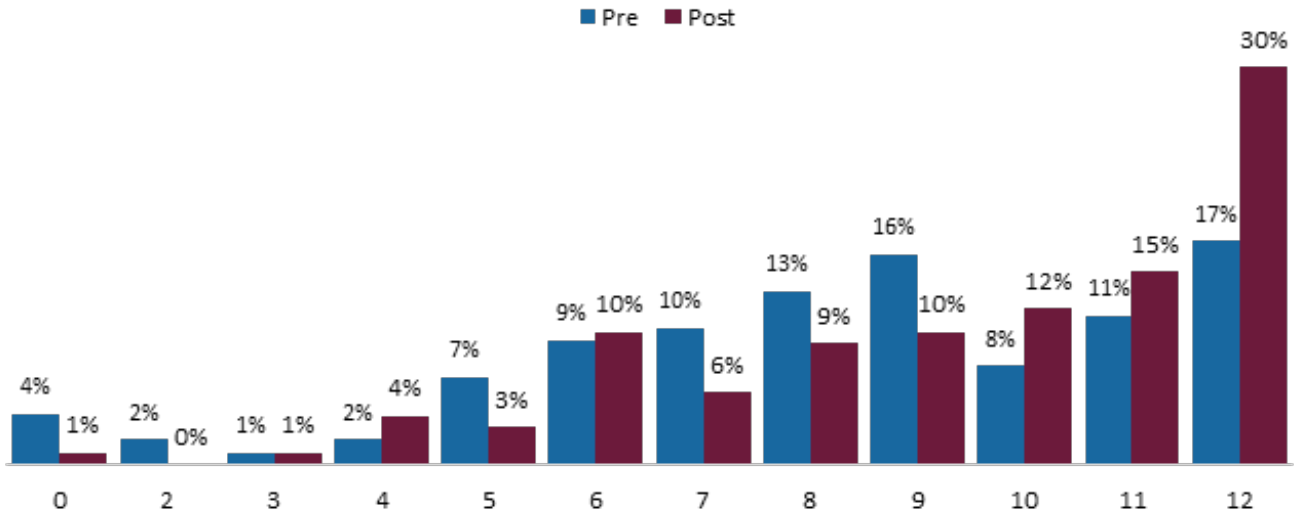


Table 9. Direction of change in perceived risk of harm between pre- and post-participation (composite score across all substance misuse behaviors) – Leaders In Prevention

Type of Change	Percent of youth (n=106)
Positive Change	54.7%
Sustained Asset	17.0%
No Change or Negative Change	28.3%

"Average Group Effect" Cost Effectiveness Ratio: Method 1 for Leaders in Prevention

Table 10 presents the first method (Average Group Effect) in which the observed effect, as measured by the difference in the mean scores, was positive and statistically significant (t=3.839; df=105; p<0.001). On average, youth increased their perceived risk of harm by 1.10 points on a 12-pt scale. As displayed in Table 10, the total cost for the Leaders in Prevention program was $70,976.99 in SFY19 and they served 115 youth. The cost per youth was $617. A measure of cost and effect was calculated by dividing the cost per youth by the average change in perceived risk of harm. Hence, it cost Leaders In Prevention $560.91 for a one point increase in perceived risk of harm (on a 12-pt scale).

Table 10. Average Group Effect" Cost Effectiveness Ratio Method 1 for Leaders in Prevention

Total Cost	Total # Youth Served	Cost per Youth	Mean Pre Score (Std Dev)	Mean Post Score (Std Dev)	Difference (Std Dev)	CE Ratio (Cost per Youth/ Difference)
$70,976.99**	115**	$617	8.28 (3.03)	9.39 (2.67)	1.10* (2.96)	$560.91

**t*=3.839; df=105; *p*<0.001

**SFY19

"Individual Effect" Cost Effectiveness Ratio: Method 2 for Leaders in Prevention

For the second method (Individual Effect) used to calculate cost effectiveness, the number of youth with a positive change or maintenance of high perceived risk of harm between pre- and post-program participation was used as the measure of effect. Given the composite score was created by summing the reported perceived risk for each substance misuse behavior, the possible scale ranges from 0 to 4. A score of 4 represents someone who had a positive change in perceived risk of harm on all four substance misuse behaviors while a score of 0 would be someone who had no change across all substance misuse behaviors. As shown in Table 11 a little over half of the youth (54.8%) increased their perception of risk of harm for at least one substance misuse behavior. As the total number of positive change across all four substance misuse behaviors increased, the percent of youth decreased. In other words, youth were more likely to increase their perception of risk of harm on just one or two substance misuse behaviors rather than all of them. Of the 48 youth who did not make a change, 18 began the program already reporting the highest perceived risk of harm across all substance misuse behaviors.

Table 11. Frequency of the total number of positive changes between pre- and post-program participation across all substance misuse behaviors – Leaders In Prevention		
Number of positive changes	**% of youth (n=106)**	**Number of Youth**
0	45.3%	48*
1	18.9%	20
2	14.2%	15
3	11.3%	12
4	10.4%	11

*n=18 that began program with the highest perceived risk on all four substance misuse behaviors.

Table 12 displays the cost effectiveness ratio using the second method (Individual Effect) in which the total program cost was divided by the total number of youth with an increase in perceived risk of harm for at least one substance misuse behavior or sustaining high-perceived risk across all substance misuse behaviors. Given that the total number of youth is being used for the measure of effect, the measure of cost is the total program cost rather than the cost per youth as used in the first method. The cost per youth was used, however, to re-calculate the total program cost to account for the fact that not all youth served by the program completed the survey. Using this formula, it was found that it costs $860.55 for the program to increase a youth's perception of harm for at least one substance misuse behavior or sustain the highest perceived harm across all substance misuse behaviors.

Table 12. "Individual Effect" Cost Effectiveness Ratio Method 2 for Leaders in Prevention						
Total Cost (a)	**Total # Youth Served (b)**	**Survey Sample Size (c)**	**Total Cost Applied to Survey Sample (d)**	**# Youth Sustained Highest Perceived Risk (e)**	**# Youth with Positive Change (f)**	**CE Ratio (d/e+f)**
$70,976.99**	115	106	$65,402.00	18	58	$860.55

**SFY19

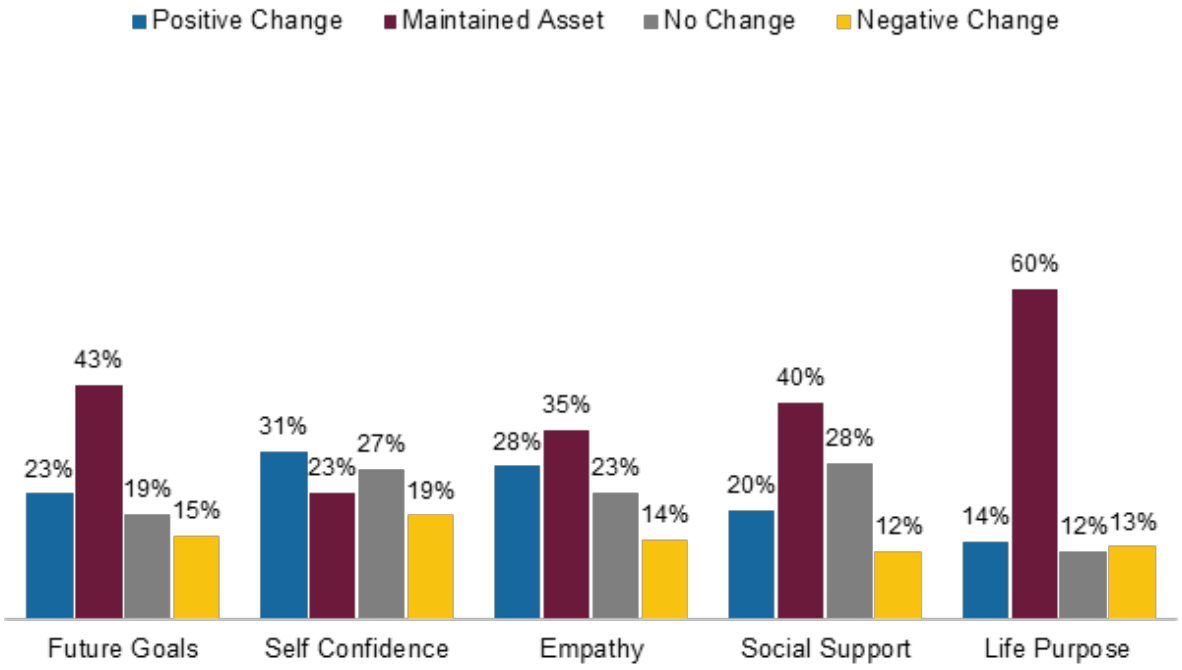
Protective Factors: Additional Measures of Effectiveness for Leaders in Prevention

While cost effectiveness analysis uses only one measure of effect, this section presents a selection of additional measures that have been shown to be salient protective factors for youth. The direction of change was explored for the five protective factors:

- I have plans and goals for the future
- There are many things I do well
- I try to understand what other people are going through
- I know where to go for help with my problems
- There is purpose in my life

Answer choices were on a four-point scale that ranged from not true at all to very much true. Figure 3 shows the frequency of change for each protective factor between pre- and post-program participation. A majority of the youth (60%) started the program with a high degree of life purpose which was retained throughout the program. In contrast, only 23% of the youth started the program with a high level of self-confidence. However, this is the protective factor with the greatest amount of positive change: 31% of the youth increased their self-confidence.

Figure 3. Percent of youth with type of change for each protective factor between pre- and post-participation - Leaders In Prevention



SUMMER LEADERSHIP

The following tables and figures display the primary findings for the **Summer Leadership Program**. Similar to Leaders In Prevention, detail on the change in perceived risk of harm for each substance misuse behavior are presented separately followed by the composite score and a cost effectiveness ratio for each method. Additionally, several other measures of effectiveness are provided, including the following: future goals, social support, self-confidence, empathy, and life purpose.

Change in Perceived Risk of Harm for Each Substance Misuse Behavior
A majority of the youth served in SFY19 completed both the pre- and post-surveys (n=98 pre-surveys and n=94 post-surveys out of 100 youth served). There was an increase in perceived risk of great harm across all substances use behaviors (Table 13). Overall, perceived risk of harm is greatest for smoking cigarettes and drinking alcohol every day, and lowest for trying marijuana once or twice or using it regularly.

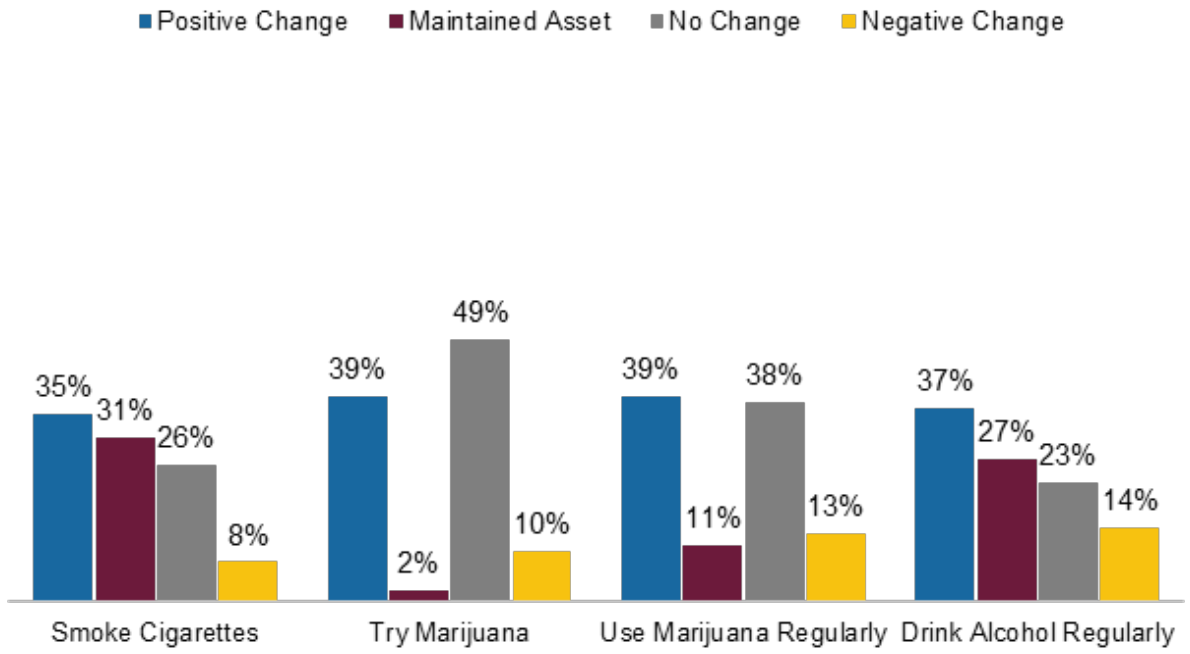
Table 13. Percent of youth reporting level of perceived risk of harm for each substance misuse behavior at pre- and post-program participation – Summer Leadership

	No Risk	Slight Risk	Moderate Risk	Great Risk
Perception of Risk: Smoke Cigarettes (at least one pack per day)				
Pre	7.1%	23.5%	31.6%	37.8%
Post	5.3%	13.8%	30.9%	50.0%
Perception of Risk: Try Marijuana (at least once or twice)				
Pre	32.7%	41.8%	21.4%	4.1%
Post	18.1%	42.6%	29.8%	9.6%
Perception of Risk: Use Marijuana Regularly				
Pre	13.3%	38.8%	33.7%	14.3%
Post	7.4%	26.6%	40.4%	25.5%
Perception of Risk: Drink Alcohol Nearly Every Day				
Pre	9.2%	24.5%	30.6%	35.7%
Post	3.2%	16.0%	31.9%	48.9%

Figure 4 shows the direction of change in perceived risk of harm for each substance misuse behavior. Over a third (between 35% and 39%) had a positive change in their perceived risk of harm for each substance. It is important to note that this is any change across the four-point scale. For example, two youth may have reported marijuana use as no risk before program participation but after participation one reported slight risk and another great risk. Both would be considered

a “positive change” regardless of the difference in degree of change. While over 50% of the youth had no change in perceived risk of harm for smoking cigarettes and using alcohol regularly, this was because a majority of them came into the program already perceiving the greatest risk and sustained that asset. On the contrary, a high percentage of youth did not make a change in their perceived risk of harm for marijuana use (49% for trying marijuana and 38% for using it regularly) and few came into the program perceiving it as a great risk (2% for trying marijuana and 11% for using it regularly).

Figure 4. Direction of change in perceived risk of harm between pre- and post-participation by substance misuse behavior (% of youth) - Summer Leadership



Change in Perceived Risk of Harm Across All Substance Misuse Behaviors (Composite Score)
As you can see from Figure 5, the composite score for perceived risk of harm across all substance misuse behaviors increased after participating in the program (as mentioned above, scores ranged from zero representing no perceived risk of harm to 12 representing greatest perceived risk of harm). In fact, a majority of youth (70%) had at least some form of positive change in their perceived risk of harm between pre and post participation (Table 14).

Figure 5. Perceived risk of great harm across all substance use behaviors before (pre) and after (post) participating in the program (n=93) (0=no risk, 12=risk) - Summer Leadership

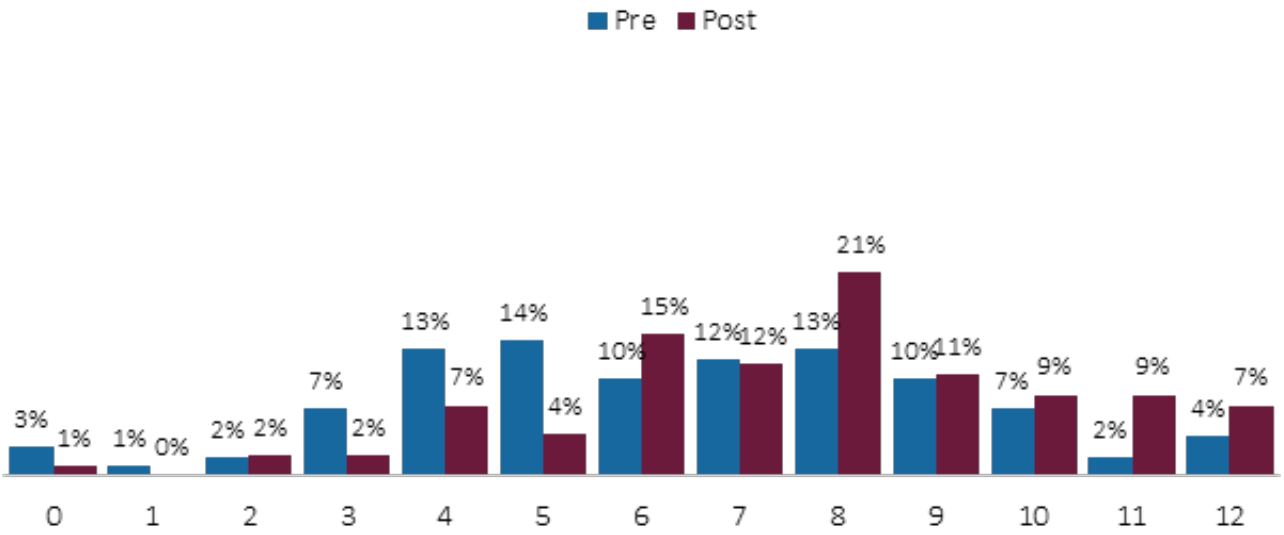


Table 14. Direction of change in perceived risk of harm between pre- and post-participation (composite score across all substance misuse behaviors) – Summer Leadership

Type of Change	Percent of youth (n=106)
Positive Change	69.9%
Sustained Asset	4.3%
No Change or Negative Change	25.8%

"Average Group Effect" Cost Effectiveness Ratio: Method 1 for Summer Leadership

Table 15 presents the first method (Average Group Effect) in which the observed effect, as measured by the difference in the mean scores, was positive and statistically significant ($t=5.430$; $df=92$; $p<0.001$). On average, youth increased their perceived risk of harm by 1.29 points on a 12-pt scale. As displayed in Table 15, the total cost for the program was $130,523.87 in SFY19 and they served 100 youth. The cost per youth was $1,305. A measure of cost effectiveness was calculated by dividing the cost per youth by the average change in perceived risk of harm. Hence, it cost the program $1,011.63 for a one-point increase in perceived risk of harm (on a 12-pt scale).

Table 15. "Average Group Effect" Cost Effectiveness Ratio: Method 1 for Summer Leadership						
Total Cost	**Total # Youth Served**	**Cost per Youth**	**Mean Pre Score (Std Dev)**	**Mean Post Score (Std Dev)**	**Difference (Std Dev)**	**CE Ratio (Cost per Youth/ Difference)**
$130,523.87**	100	$1,305	6.40 (2.77)	7.69 (2.58)	1.29* (2.29)	$1,011.63

**t*=5.430; df=92; *p*<0.001

**SFY19

Summer Leadership Program collected information on substance misuse at the start of the program so it was possible to conduct an exploratory analysis to see if there was a difference in the change in the mean score based on the youths' substance misuse. The survey asked youth to report on the frequency of the following in the past 30 days:

- Drinking alcohol
- Using prescription medications without a doctor's orders
- Using marijuana
- Smoking cigarettes

All variables were dichotomized into *did not use at all* (0) and *used at least once in the past 30 days* (1). Thirteen percent of the youth reported using alcohol in the past 30 days (n=13) and 12% of youth reported using marijuana (n=12). Given the small sample of youth who reported using prescription medications or tobacco (n=3 and n=1, respectively), these variables were not able to be used. Table 16 displays the difference in mean scores at pre- and post-program participation by alcohol and marijuana use. While there is some indication that those who began the program using a substance in the past 30 days had less of an increase in perceived risk of harm than those who did not use a substance, the sample is too small to draw any definitive conclusions.

Table 16. Difference in mean score at pre- and post- participation based on substance misuse at the beginning of the program – Summer Leadership			
	Mean Pre Score (SD) Perceived risk of harm	**Mean Post Score (SD) Perceived risk of harm**	**Difference**
Alcohol			
No	6.58 (2.66)	7.90 (2.44)	1.33
Yes	5.15 (3.18)	6.08 (3.00)	0.93
Marijuana			
No	6.60 (2.78)	7.94 (2.53)	1.34
Yes	4.83 (2.17)	5.64 (2.01)	0.80

"Individual Effect" Cost Effectiveness Ratio: Method 2 for Summer Leadership

For the second method used to calculate cost effectiveness (Individual Effect), the number of youth with a positive change or maintenance of high-perceived risk of harm between pre- and post-program participation was used as the measure of effect. Given the composite score was created by summing the reported perceived risk for each substance misuse behavior, the possible scale ranges from 0 to 4. A score of 4 represents someone who had a positive change in perceived risk of harm on all four substance misuse behaviors while a score of 0 would be someone who had no change across all substance misuse behaviors. As shown in Table 17, a majority of youth (70%) increased their perception of risk of harm for at least one substance misuse behavior. Less than 10% increased their perception of risk of harm in all four substances. Of the 28 youth who did not make a change, four began the program already reporting the highest perceived risk of harm across all substance misuse behaviors.

Table 17. Frequency of the total number of positive changes between pre- and post-program participation across all substance misuse behaviors – Summer Leadership		
Number of positive changes	**% of youth (n=93)**	**Number of Youth**
0	30.1%	28*
1	22.6%	21
2	23.7%	22
3	15.1%	14
4	8.6%	8

*n=4 that began program with the highest perceived risk on all four substance misuse behaviors.

Table 18 displays the cost effectiveness ratio using the second method: dividing the total program cost by the total number of youth with an increase in perceived risk of harm for at least one substance misuse behavior *or* maintenance of high-perceived risk across all substance misuse behaviors. Given that the total number of youth was used as the measure of effect, the measure of cost is the total program cost rather than the cost per youth as used in the first method. However, the cost per youth was used to re-calculate the total program cost to account for the fact that not all youth served by the program completed the survey. Using this formula, it was found that it costs the program $1,758.91 for a youth to increase their perception of harm for at least one substance misuse behavior or sustain the highest perceived harm across all substance misuse behaviors.

Table 18. "Individual Effect" Cost Effectiveness Ratio Method 2 for Summer Leadership

Total Cost (a)	Total # Youth Served (b)	Survey Sample Size (c)	Total Cost Applied to Survey Sample (d)	# Youth Sustained Highest Perceived Risk (e)	# Youth with Positive Change (f)	CE Ratio (d/e+f)
$130,523.87**	100	93	$121,365.00	4	65	$1,758.91

**SFY19

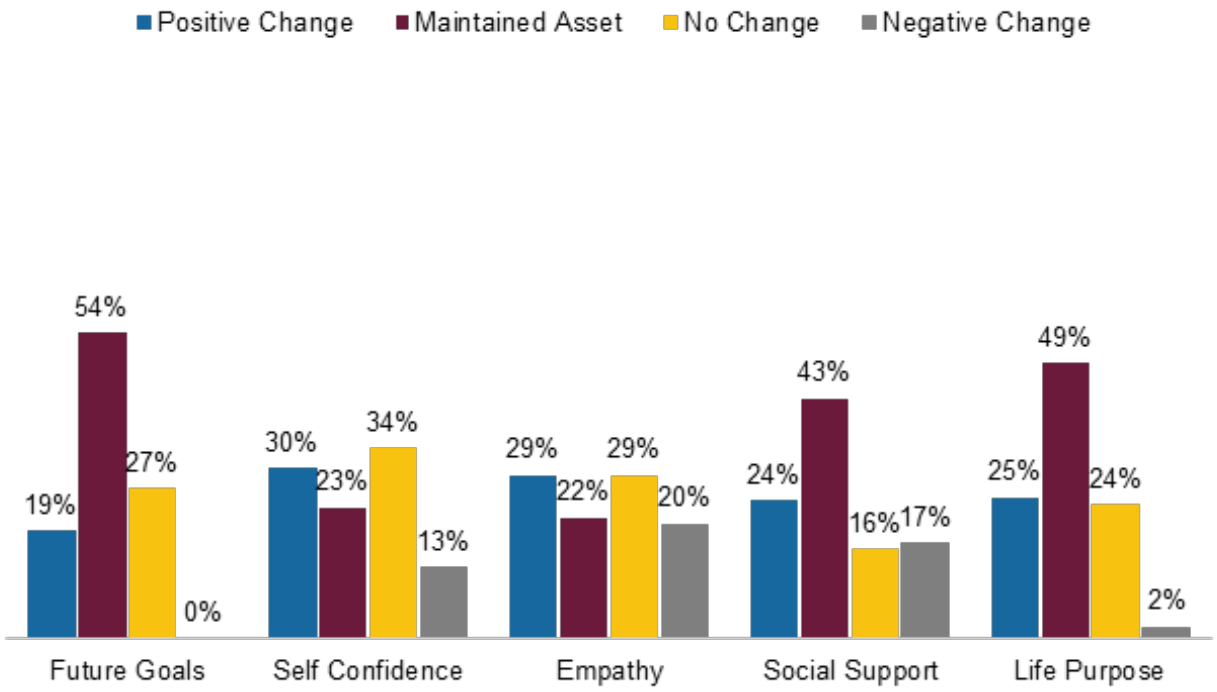
Protective Factors: Additional Measures of Effectiveness for Summer Leadership

While cost effectiveness analysis uses only one measure of effect, this section presents a selection of additional measures shown to be salient protective factors for youth. The direction of change for the following five protective factors was explored:

- I have plans and goals for the future
- There are many things I do well
- I try to understand what other people are going through
- I know where to go for help with my problems
- There is purpose in my life

Answer choices were on a four-point scale that ranged from *not true at all* to *very much true*. Figure 6 shows the frequency of change for each protective factor between pre- and post-program participation. About half of youth started the program with a high degree of future goals and life purpose, which was retained throughout the program (54% and 49%, respectively). Fewer youth started the program with a high level of self-confidence (23%) and empathy (22%). However, there was the greatest amount of positive change in these protective factors: 30% increased self-confidence and 29% increased empathy.

Figure 6. Change in protective factors between pre- and post-program participation (% of youth) - Summer Leadership



5.2 Prevention Programs with Non Matched Pre- and Post-Participant Data

POSITIVE ACTION AND LIFE OF AN ATHLETE

For the two programs (Positive Action and Life of an Athlete) for which individual youth at pre- and post-program participation were not able to be matched, the first method, "Average Group Effect" was applied to attempt to calculate cost effectiveness. As explained previously, the measure of effect for these two programs was substance misuse behavior. However, each program asked about substance misuse differently.

Positive Action survey questions asked: *How often do you do the following: 1) drink alcohol (even a sip); 2) use or try illegal drugs; 3) get drunk or high; and 4) smoke cigarettes (even a puff)?* Answer choices were on a 5-point scale ranging from never to all the time, but were dichotomized into *never* and *at any time* (includes rarely, sometimes, often, and all the time).

Life of an Athlete survey questions asked: *In the past 30 days, on how many days did you use: 1) alcohol; 2) tobacco; 3) marijuana; and 4) prescription drugs without a doctor's prescription?*

Answer choices ranged from 0 days to all 30 days, but were dichotomized into *no use* and *use* (includes anything greater than 0 days).

As mentioned previously, the plan was to create a composite score across all substance misuse behaviors and measure effect as the difference in mean scores across all youth before and after program participation. However, several data limitations prohibited the use of behavior variables as a measure of effectiveness, including small samples, inadequate data, and lack of change in the outcome mostly related to a data ceiling effect per the scale used in the survey. These limitations are explained in more detail for each program below. While these are considered data limitations that were not able to produce a cost effectiveness ratio, it is important to note that sustaining non-substance misuse behaviors is considered a successful outcome for youth participating in these programs. Tables 19 and 20 show the frequency of substance misuse at pre- and post-program participation.

Table 19. Frequency of Substance Misuse at Pre- and Post-Program Participation: Positive Action

	Pre		Post	
	No	**Yes**	**No**	**Yes**
Any SU	85.0% (51)	15.0% (9)	84.7% (50)	15.3% (9)
Alcohol	91.4% (53)	8.6% (5)	84.2% (48)	15.8% (9)
Illegal Drug	98.3% (57)	1.7% (1)	100% (59)	0% (0)
Drunk/High	89.5% (51)	10.5% (6)	100% (58)	0% (0)
Smoke Cigarettes	96.7% (58)	3.3% (2)	100% (59)	0% (0)

Table 20. Frequency of Substance Misuse at Pre- and Post-Program Participation: Life of an Athlete

	Pre		Post	
	No	**Yes**	**No**	**Yes**
Alcohol	90.4% (3,265)	9.6% (347)	89.7% (3,288)	10.3% (377)
Tobacco	96.1% (3,462)	3.9% (142)	95.7% (3,495)	4.3% (157)
Marijuana	93.8% (3,375)	6.2% (222)	93.1% (3,385)	6.9% (249)
Prescription Drug	96.9% (3,476)	3.1% (111)	96.5% (3,516)	3.5% (128)

Given these data limitations, additional measures of effectiveness for each program, as presented below, were explored.

For Positive Action, we created subscales according to their pre-defined scoring key (Table 21). Answer choices for each question were on a 5-point scale ranging from *never (1)* to *all the time (5)*. Two to three questions were added together to create each latent concept subscale. Of note, several questions had answer options in the program surveys in reverse order compared to other questions in a series, which may have led to participants providing inaccurate responses.

Table 21. Positive Action's Pre-Defined Subscale Scoring Key
Self Concept
Feel good about yourself
Do good things
Physical Health
Eat fresh fruits and vegetables
Do physical activities
Decision-Making
Make good choices
Make bad decisions (reverse)
Solve problems well
Violence
Hit others or get into physical fights (reverse)
Bully others (reverse)
Self-Control
Manage your time wisely (not waste it)
Control your feelings
Prosocial
Care about how others feel
Treat others the way you like to be treated
Honesty
Admit your mistakes
Take/steal other people's property (reverse)
Blame others for your mistakes (reverse)
Self-Development
Set goals for your self

Table 22 displays the change in average score at pre- and post-program participation for each latent concept. As is shown, there was very little change in these protective factors between pre- and post-program participation. Those with the largest amount of change were prosocial and honesty, although these were still less than half of a point difference. Furthermore, overlapping confidence intervals show that statistically significant change was not found across any of the indicators. Given no effect was shown, as defined by an increase in protective factors, a cost effectiveness ratio was not able to be calculated. Again, it is worthwhile to note that sustaining protective factors over the course of the program can be considered a successful outcome for these youth.

Table 22. Change in average score at pre- and post-program participation for each latent concept – Positive Action

Indicator (possible range where a higher number is at the more positive end of the scale)	Pre (95% CI)	Post (95% CI)	Difference
Self Concept (0-10)	8.13 (7.75-8.51)	8.34 (7.92-8.76)	0.21
Physical Health (0-10)	7.86 (7.46-8.26)	7.95 (7.50-8.39)	0.09
Decision Making (0-15)	11.60 (11.11-12.10)	11.50 (10.97-12.03)	-0.10
Violence (0-10)	9.07 (8.77-9.37)	9.36 (9.11-9.60)	0.29
Self Control (0-10)	7.26 (6.82-7.70)	7.24 (6.76-7.72)	-0.02
Prosocial	8.22 (7.76-8.69)	8.54 (8.14-8.93)	0.32
Honesty	8.41 (8.14-8.69)	8.75 (8.50-9.00)	0.34
Goals/Self Development (0-5)	3.76 (3.47-4.04)	3.54 (3.25-3.82)	-0.22

For Life of an Athlete several indicators of perception of harm related to alcohol use among athletes, as well as some information on peer and community disapproval and perception of use, were reviewed. Given that only aggregate data were available, there was not the ability to create composite scores or calculate confidence intervals. Table 23 presents the change in the percent of youth reporting strongly agree or agree at both pre- and post-program participation for several indicators. As is shown, a large majority of youth began the program with a high perception of harm related to alcohol use among athletes. Across all nine indicators of perception of harm, there was an absolute percent increase of one – from 92% to 93% – from pre- to post-program participation. The largest increase in specific risks included that athletes who drink are more likely to get injured and alcohol can reduce the amount of testosterone in the body for up to 96 hours. While there was an increase in perceived peer disapproval, there was a decrease in the percent of youth who believed that team leaders avoided substance misuse and an increase in early initiation of alcohol use. Similar to Positive Action, while the calculation of a cost effectiveness ratio was not possible, sustaining perception of harm and peer and community disapproval is a successful outcome.

Table 23. Change in % reporting Strongly Agree or Agree at pre- and post-program participation – Life of an Athlete			
Indicator	**Pre**	**Post**	**Absolute Percent Difference**
There are long term effects of heavy drinking on an athlete's performance	95.9%	96.7%	0.8%
Alcohol use impacts an athlete's performance	96.3%	96.0%	-0.3%
An athlete could lose up to two weeks of athletic training after getting drunk once	84.1%	85.3%	1.2%
Athletes who drink are more likely to get injured	84.2%	87.0%	2.7%
Alcohol reduces the body's ability to repair damaged muscle fibers	94.8%	95.3%	0.5%
Alcohol can reduce the amount of testosterone in the body for up to 96 hours	90.6%	92.5%	1.9%
Alcohol interferes with the messages your brain sends to your muscles	96.5%	97.4%	0.9%
When a person drinks alcohol, it takes more thinking to perform even the simplest tasks	95.9%	96.7%	0.8%
High school athletes can lose 15% to 30% of their potential by drinking alcohol	89.4%	89.9%	0.5%
Perception of Harm Average*	92.0%	93.0%	1.0%
Most people my age think alcohol is unacceptable	53.5%	56.4%	2.9%
Most teens drinking before age 16	62.1%	66.4%	4.3%
The leaders on my team avoid alcohol, tobacco, and other drug use	89.0%	87.0%	-2.1%
The behavior of people in my community shows they disapprove of alcohol, tobacco, and other drug use	68.5%	69.4%	0.9%

*Average of first nine indicators related to perception of harm.

6. METHODOLOGICAL CHALLENGES AND RESEARCH RECOMMENDATIONS

A wide range of challenges and limitations affected the study. The most prominent have been organized into nine focus areas and are presented in the following tables with recommendations for consideration.

DATA COLLECTION		
Area	**Limitation**	**Recommendation**
Prevention programs lack standard outcome measures, instruments and methodology.	Prevention programs lack consistent, standardized and thus comparable outcomes measures, data collection instruments and methods.	*Develop, implement, and support a standardized data collection system.* *Institute regular data stewardship meetings with designated state staff to monitor and support outcome data infrastructure.*
Discussion: Most of the eleven programs funded by the Commission did not collect outcome measure data to be useful in the analysis. Variability across programs included the outcomes being measured; data collection instruments (e.g. survey question wording and response options); the use of unique identifiers to measure individual-level change; and methods. Furthermore, data variability is compounded by substance misuse "multipliers." For example, a single indicator such as perception of risk expands to understand the measure as it relates to multiple substance misuse behaviors such as weekly or monthly alcohol use or binge drinking, weekly or monthly marijuana use, lifetime use of opioids or methamphetamines. Developing and supporting a standardized prevention outcome data system with consideration to common measures, data collection protocols and methods will likely result in more consistent, high quality, accessible and useful outcome data. Necessary inputs and supports for an outcome data system can be established in contract documents and be consistently monitored and supported by the state. This may include designating staff within contracted agencies to serve as data stewards to work with state staff throughout the contract year to ensure adherence to data system protocols.		

SAMPLE SIZE		
Area	**Limitation**	**Recommendation**
Small sample sizes were a limitation for this study.	The number of pre-post surveys ranged from 43 for Summer Leadership Program to 106 for Leaders In Prevention.	*Standardize data collection protocols for all programs to allow for aggregation of data across programs and/or years to increase sample sizes..*
Discussion: Sample sizes were small relative to the needs of the analysis. Reasons for the small sample size included small program size, not all iterations of a program collecting data, and participants not completing pre or post surveys due to absenteeism or other factors. Additionally, unclear or illogical response patterns indicated that survey questions or response options may have been confusing to respondents, resulting in elimination from the analysis. Development, implementation, and support for a standardized data collection system for prevention programs will likely strengthen program-level data collection and improve sample sizes, including data contingency protocols for what to do if a participant is not present on pre and/or post-testing days. Conducting tests of survey instrument validity, reliability, readability and comprehensibility for the target population may improve data quality. Additionally, standardized outcome measures and data collection instruments will allow the aggregation of data, increasing the sample size for aggregate analyses.		

RESPONSE RATES & SELECTION BIAS		
Area	**Limitation**	**Recommendation**
Response Rates and Selection Bias	In some programs, not all participants completed evaluations or it appeared that some may have completed the evaluation more than once, thus the effect measured was for a subset of participants. A selection bias may be present in this subset.	*Standardize data collection protocols to increase response rates and reduce selection bias.*
Discussion: Data submitted for this analysis was insufficient to determine clear response rates, although it was evident that not all participants completed pre- and post-program evaluations. Additionally, some prevention programs are designed to influence a broad population or environment, such as health promotion activities targeting all athletes in a school. Existing protocols for data and evaluation for these types of programs appear to lack readily accessible data on response rates. Establishing specialized data protocols for environmental prevention may improve response rates and/or allow for analyses to control for potential selection bias (e.g. a factor that increases the likelihood that someone will participate in a survey). A comprehensive data system, including sampling protocols, can be established with clear protocols for improving response rates and limiting selection bias.		

VARIABILITY IN PREVENTION EFFECT		
Area	**Limitation**	**Recommendation**
Variability in prevention delivery and impact	Variability in service delivery and individual impacts affect the ability to draw conclusions from data collected.	*Collect data on risk level of participants, participation levels, and implementation fidelity.*
Discussion: Preventive interventions are likely to have differential impact on individuals because (a) participants have different risk and protective factors that cause different responses to the intervention; (b) levels of participation in interventions vary; and (c) interventions are routinely delivered with varying levels of fidelity and other implementation factors. The current data collection efforts of prevention programs do not permit controlling for the assessed risk level of participants at the inception of programming, for an individual participant's level or length of participation in a program (e.g. attendance), nor the extent to which the program was delivered with fidelity. A standardized data collection system can be designed to collect data relative to participants' level of risk at program inception, level of program participation, and companion assessments of fidelity to program delivery.		

CEILING EFFECT		
Area	**Limitation**	**Recommendation**
Ceiling effect	The ability of data to determine the effectiveness of a prevention program is limited if participants already have desired perceptions or behaviors as measured by the survey instruments.	*Consider survey instruments and methodology that address ceiling effect, such as follow up surveys and the use of control groups in data analysis.*
Discussion: A prevention program that attracts youth who may already have low risk and high protective factors will show little change or "effect" even if prevention outcomes are positive. The ability of data to demonstrate evidence of effectiveness is hindered by ceiling effects that vary based on factors such as the assessed risk level of a participant at the beginning of a program and the developmental stage of the participant (e.g. younger children often have higher perceptions of risk and fewer substance using peers, making them more likely to enter prevention programs at the ceiling of multiple outcome measures). Comparing outcome measures to a control group particularly during follow up data collection (e.g. 6 months post program) may allow for improved analytic approaches in light of ceiling effects.		

LIKELIHOOD OF EFFECT		
Area	**Limitation**	**Recommendation**
It is difficult to measure change in prevention.	Prevention programs are often being measured after short periods of time and rely on intermediate outcomes as evidence of effectiveness	*Future prevention research may improve methodologies for studying short-term prevention activities.*
Discussion: Expecting behavior and even perception change may not be realistic given the short time frame of many programs, which vary from one-day trainings or week-long summer programs to a half-hour of prevention education each week for six weeks. The effect of prevention is likely to be gradual over time and the result of many factors. Distinguishing between the effect of a program and other factors affecting a person's perceptions and behaviors is a limitation of measuring prevention outcomes. Furthermore, prevention by definition is to stop something from happening. Determining prevention outcomes is challenged by attempting to measure something that did not happen (e.g. a child continuing to choose not to drink or smoke). Measures of risk and protective factors have been established as reliable intermediate measures that are correlated with preventing substance misuse; however, they do not measure all possible changes associated with a program. Future research may provide improved approaches and methodologies for demonstrating evidence of effectiveness for short-term prevention programs.		

ATTRIBUTION OF COST		
Area	**Limitation**	**Recommendation**
Attributing costs to program components	Expenses reported cover aspects of a program that are not measured by outcome data collection.	*Improve alignment of expenses to measured program delivery.*
Discussion: As program and cost data were collected for this study it was evident that program expenses covered many facets of the program, while outcome measures were only collected for one aspect of the program. For example, Positive Action teaches a 6- to 8-week substance misuse prevention curriculum that was the focus of data collection; however, funding supports the program that serves youth throughout the year in an after school setting, providing academic support, a safe haven during high risk hours, and other health promotion and wellness activities. Furthermore, cost analyses do not account for expenses associated with participants who may drop out of programs, affecting per participant cost calculations. Improving cost allocations and expense reporting to be able to assign costs to components of a program being measured may reduce this limitation.		

UNMEASURED CHANGE		
Area	**Limitation**	**Recommendation**
Prevention programs affect many aspects of participants that are not measured by current data collection.	Prevention is often relational and environmental rather than solely transactional, yet most outcome measurement focuses on a specific transaction, such as a training or education program.	*Future prevention research may improve methodologies for studying contextual and relational factors affecting prevention outcomes.* *Increased capacity and resources to carryout comprehensive evaluation studies will improve understanding of prevention effect.*
Discussion: Prevention data often involve a survey of attitudes, perceptions, behaviors and skills before and after an activity, such as a drug and alcohol risk education class or a leadership training. However, prevention activities, relationships formed, and a sense of purpose that develop because of programming often last throughout the year. Furthermore, programs such as after school sessions may be providing a safe haven for children during high risk hours. The effect of relational and environmental factors are not often measured, limiting the study of prevention. A more comprehensive review of literature from research science will provide additional insights into understanding gaps in prevention measurement[18]. Communications with the four programs selected for this analysis revealed that many aspects of the programs that were funded by the Commission were not measured for a variety of reasons, including feasibility, limited knowledge and capacity for appropriate design methodology, and limited resources for rigorous and comprehensive evaluation. Future prevention research may improve methodologies, while increased capacity and resources for comprehensive evaluations are likely to improve understanding of the full value of prevention efforts.		

COMPARABILITY OF PROGRAMS		
Area	**Limitation**	**Recommendation**
Legislation RSA 12-J:5 directs analysis of four programs to "permit comparisons between the selected programs."	Prevention programs funded by the Commission differ widely in terms of their focus, target population, delivery type, duration of services, and outcome measures. The variability of the programs poses a challenge to comparability of cost-effect ratios.	*Separate cost analysis from evidence of outcomes.*
Discussion: To address the limitations inherent in the wide variability of prevention programs and the challenges of applying cost to effect, the Commission may consider two complementary approaches: 1) Analysis of cost of services across similar program types (e.g. week long intensives, after school support services, or leadership teams) to understand the per participant cost of different program types; and 2) Annual program evaluations designed and implemented to demonstrate effectiveness for intended outcomes.		

7. DISCUSSION

This report is a presentation of findings from an analysis of data conducted in response to a legislative requirement in order to illustrate a relationship between prevention program expenditures and prevention effect. Important for interpretation of findings is the distinction between a research study or evaluation and the cost effectiveness analysis outlined by RSA 12-J:5. In a rigorous evaluation or research study, standardized data collection instruments, common outcome measures, control groups and other methods would be designed, implemented and monitored before program delivery, following best practices in prevention research. Given that this analysis was conducted retrospectively with programs that had not been collecting data for the purpose of cost effectiveness analysis, limitations were numerous. As a result, cost effectiveness ratios that were produced should be viewed cautiously. They are not a specific calculation of the cost of prevention but the product of a first-of-its kind cost attribution exercise using limited data sets from four prevention programs operating in New Hampshire.

The analysis of cost and outcome data submitted by four prevention programs delivering services to New Hampshire residents during State Fiscal Year 2019 was conducted per RSA 12-J:5. Per the legislative requirements, the four prevention programs were selected from a pool of eleven programs funded by the Commission in State Fiscal Year 2019. The programs were asked to submit their program expenses for SFY2019 and outcome data collected from participants during SFY2019. Financial information submitted by the programs reflected direct and indirect (e.g. administration and other overhead) costs incurred to deliver the program that were paid for by Commission funds and other funding sources. Outcome data submitted by the programs were derived from surveys administered to program participants at the beginning and end of a program activity such as a training or educational series. The data submitted and the methodology employed to collect the data were not consistent across programs, preventing their comparability which was a goal of the legislation.

The analysis sought to produce three outputs for each program: 1) a cost per participant; 2) evidence of change in two composite substance misuse scores and evidence of change in protective factor indicators; and 3) a calculation of the cost associated with a specific effect of an intervention.

1) Cost Per Participant. The cost per participant was found to be $617 for Leaders In Prevention, $1,305 for Summer Leadership, $1,459 for Positive Action, and $287 for Life of an Athlete. The wide range of per participant cost corresponds to the variability of programs. The lowest cost program uses environmental messaging through coaches and parents/caregivers as well as policy support to drive the culture of high school athletics toward alcohol- and drug-free behaviors. Environmental approaches to prevention are often less expensive than direct service programs.

The highest cost programs of the four studied involve direct service programs for high risk youth that require specialized staff, facilities, outreach and other associated costs.

2) Evidence of Change. For the two programs, Leaders In Prevention and Summer Leadership, that collected pre- and post-program data using a unique identifier to be able to match individual participant responses, data outputs were more robust. Composite scores were calculated to produce a measure of effect across similar indicators within a domain. The two primary composite scores were perception of risk of harm across multiple substance misuse domains (e.g. tobacco, alcohol, marijuana) and frequency of use of substances (alcohol, tobacco, marijuana, and illegal or misused prescription drugs). An analysis of change in protective factors such as future goals, self-confidence, and empathy were also presented.

For the composite scores calculated for substance misuse behaviors, 54.8% of Leaders In Prevention participants and 70% of Summer Leadership participants had at least one positive change across all substance misuse behaviors. Additionally, 17% of Leaders in Prevention and 4.3% of Summer Leadership participants had sustained a high perception of risk of harm between pre- and post- program participation. Leaders In Prevention had a higher ceiling effect for this composite score than Summer Leadership in that a high number of participants were already reporting no substance misuse across all categories, thereby limiting the percentage of participants who could show change on this cluster of indicators. This difference is likely associated with the target population of the programs (Leaders In Prevention serves middle school students of universal risk while Summer Leadership serves high school students identified as at higher risk for substance misuse).

For Positive Action and Life of an Athlete that did not collect data using a unique identifier to match pre- and post-program responses for individuals, data outputs were extremely limited and more affected by the constraints of a ceiling effect than matched data. Additionally, Life of an Athlete was unable to submit raw data, constraining data analysis even further. For these reasons a cost effectiveness ratio was not able to be calculated for perception of risk nor for substance misuse for either program.

Analyses did reveal that over 85% of Positive Action participants reported not using any substances at the beginning of the program, and for each of the four substance misuse behaviors asked, 90% or more indicated no use at the beginning of the program. Of those, three of the four had 100% of participants reporting no use at the end of the program. Only the percentage of youth reporting no use of alcohol decreased from 91% to 84%. Thus the program sustained high percentages of youth avoiding substance misuse across multiple substance misuse domains.

For Life of an Athlete, over 90% of participants reported not using alcohol or other drugs at the beginning of an athletic season, and that rate was sustained, varying only slightly for all substance misuse behaviors studied. Additionally, an average score for responses on a subset of nine indicators associated with perception of risk and knowledge of harm revealed that the percentage of participants who agree or strongly agree with the knowledge and perception statements increased from 92% before the program to 93% after the program. Overall, changes from pre- to post-survey were slight, likely impacted by a ceiling effect, and their statistical significance was not able to be tested due to data limitations.

All four programs also measured a variety of protective factors associated with risk prevention, such as, self-confidence, empathy, and social supports. Across programs, most protective factor indicators that were low at the onset of programming revealed positive change.

3) Cost associated with a specific effect. As noted earlier, the cost of prevention effect could not be calculated for Positive Action and Life of an Athlete due to data limitations. Two approaches to cost-effectiveness ratios were calculated for Leaders In Prevention and Summer Leadership. The first approach (Average Group Effect) calculated the cost for the program to produce a one-point increase in perceived risk of harm among participants, which was $561 for Leaders In Prevention and $1,012 for Summer Leadership. The second approach (Individual Effect) calculated the cost for a youth to increase their perception of harm for at least one substance misuse behavior or sustain the highest perceived harm across all substance misuse behaviors, which was $861 for Leaders In Prevention and $1,759 for Summer Leadership.

The analysis revealed that many participants come in to prevention programs scoring at or near the ceiling of outcome measures and often sustain positive perceptions and behaviors, making the measurement of change difficult. One may argue that the difficulty of showing change in participants is the very outcome that is desired in prevention – to reach populations before there is a problem behavior and to expand skills and knowledge that sustain those positive perceptions and behaviors through a period of high risk (e.g. adolescence). By this measure, there is evidence in all four programs that prevention is doing what it is intended to do.

Investment in a comprehensive data and evaluation system for prevention programs with a stable and supported infrastructure is recommended to improve the capacity of programs to collect and submit high quality data that is comparable across programs to better serve future cost effectiveness analyses. Also, given the unique aspects of measuring prevention, it is recommended that future studies consider cost *and* effect rather than attempting to construct ratios when there are so many unknown or incalculable effects.

Overall, the analysis demonstrated that, by and large, prevention programs are reaching youth before they are engaging in substance misuse behavior, prevention programs are reinforcing

important perceptions of risk of harm associated with substance misuse, and the cost of prevention is impacted by a program's focus and structure. It is hoped that this report provides much interest in the variety of prevention programs and their related data collection. Furthermore, as stakeholders develop questions in relation to the effect and value of prevention programs, it is hoped that findings in this report will help to guide the identification of the data needed to answer those questions including supporting additional data collection efforts as needed.

ACKNOWLEDGEMENTS

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APPENDIX A: COST EFFECTIVENESS ANALYSIS OF PREVENTION PROGRAMS SELECTION RATIONALE AND RECOMMENDATION REPORT

COST EFFECTIVENESS ANALYSIS of PREVENTION PROGRAMS

Selection Rationale and Recommendation

I. Introduction

This document details the recommended approach for **program selection** to assist the New Hampshire Governor's Commission on Alcohol and Other Drugs (Commission) meet its legislative requirement to report on the cost effectiveness of funded programs.

JSI/dba the NH Center for Excellence Addressing Alcohol and other Drugs/Community Health Institute (Center), the state contractor for technical assistance and reporting support for the Commission, has worked with the *NH DHHS Prevention Cost Effectiveness Work Group* to develop recommendations based on the following:

- A request by the NH Department of Health and Human Services (DHHS) Bureau of Drug and Alcohol Services (BDAS) prevention program administrator;
- A review of the legislation requiring a bi-annual cost effectiveness analysis of substance use disorder prevention programs funded by the Commission;
- A review of literature and field practice associated with analyzing the cost effectiveness of prevention programs; and
- A review implementation and outcome data available from Commission-funded prevention programs.

II. Reviewing Legislation

The Commission was established by law in 2002[1] to significantly reduce alcohol and drug problems and their behavioral, health and social consequences[2]. The Commission accomplishes its mission through a variety of activities which include 1) making recommendations to the Governor and Legislature regarding legislation and funding to address prioritized needs, and 2) authorizing the disbursement of funding.

In service to these two particular responsibilities of the Commission, 2018 legislation was enacted "requiring the governor's commission on alcohol and drug abuse prevention, treatment, and recovery to report on the cost effectiveness of funded programs."[3]

[1] http://www.gencourt.state.nh.us/rsa/html/NHTOC/NHTOC-I-12-J.htm
[2] https://www.dhhs.nh.gov/dcbcs/bdas/commission.htm
[3] http://gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&txtFormat=html&v=SA2&id=1559

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This legislation details the requirements for the cost effectiveness analysis of Commission-funded prevention programs as such:

- A report of the cost effectiveness of prevention programs will be due in even years (e.g. 2020).
- Each report shall contain an evaluation of 4 prevention programs.
- The programs selected shall be chosen from among the 10 highest dollar value programs in that category.
- No law enforcement programs shall be selected.
- The report shall utilize a cost-effectiveness analysis in such a format to permit comparisons between the selected programs within a given category.
- "Outcome" means the program effects in the participant population and shall exclude outputs.
- "Evidence of effectiveness" means documented results of evaluation assessing the effect of the program on the intended outcome for program participants, or program beneficiaries in the case of prevention programs. This may include results of program evaluation conducted in the jurisdiction or an evidence rating developed by matching the program to available research using a nationally recognized clearinghouse of program evaluations, such as those included in the Pew-MacArthur Results First Clearinghouse Database.
- "Cost-effectiveness" means an economic evaluation in which the costs and consequences of alternative interventions are expressed as cost per unit of outcome.

III. Reviewing the Literature and Field of Practice

A review of literature and field practice associated with analyzing the cost effectiveness of prevention programs produced several key articles of focus and relevance for establishing the approach for the analysis and report. Each is summarized below in terms of findings associated with this exercise:

A. Title: **"Substance Abuse Prevention Dollars and Cents: A Cost-Benefit Analysis"**
Miller, T. and Hendrie, D. Substance Abuse Prevention Dollars and Cents: A Cost-Benefit Analysis, DHHS Pub. No. (SMA) 07-4298. Rockville, MD: Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, 2008.
URL: https://www.samhsa.gov/sites/default/files/cost-benefits-prevention.pdf
Relevance: Establishes key definitions and prevention cost benefit detail relative to state investment
Key Information: The article provided helpful clarity of terms, noting that economic literature uses a variety of definitions for cost, cost-effectiveness, and cost benefit. They relied on the following:

- Costs are defined as **expenditures to deliver services** and expenditures to receive
- services (Chatterji et al., 2001)

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- **Cost-effectiveness is defined as expenditures required to achieve an effect**
- (Hurley, 1990)
- Cost benefit is defined as the ratio between expenditures to deliver a program and the
- reduced social costs over time as a result (Plotnick, 1994). [This analysis considers the cost of doing something – such as an educational program – compared to the cost of doing nothing. In other words, is the cost of implementing Project Success, which will in theory reduce the percentage of individuals misusing substances by 10% each year, greater or less than the theoretical costs of those 10% misusing substances (e.g. the cost of lost work productivity, reduced educational level, justice involvement, incarcerations, medical costs, etc)?].

Derived Assumption

The Commission's charge of producing a cost effectiveness analysis will involve analysis that shows a relationship between a prevention expense and a prevention effect.

B. Title: **"Economic Evaluation Enhances Public Health Decision Making"**
URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4478374/
Relevance: Defines "Cost Effective Analysis"
Key info: Cost-effectiveness analyses (CEAs) compare the costs of an intervention with natural health outcome units, such as life-years saved and number of cases averted. For example, a cancer prevention program director at a local health agency may need to decide between a number of interventions addressing the same health outcome. CEAs are appropriate to inform the decision because they maintain health outcomes in their natural units rather than monetize the outcome. Cost-effectiveness ratio (CER) is the summary measure of CEA results, and it is expressed in costs per natural health units such as dollars per life-year saved. For example, the incremental CER of "Outcome Monitoring plus Recovery Management Checkups" of adults with chronic substance abuse in Chicago is $23.38 per abstinent day and $59.51 per reduced substance-related problem (e.g., liver disease).

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Derived Assumption

Models exist to meet the legislative requirement, establishing a relationship between per unit service cost and a unit of outcome measure, such as a time period of reduced risk.

C. Title: **"Substance misuse prevention and economic analysis: Challenges and opportunities regarding international utility"**

URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3724523/

Relevance: Describes rationale for conducting economic analysis of substance misuse prevention programs and factors to consider in doing so when determining the inputs to the calculation including cost and effectiveness.

Key info: Challenges exist in calculating costs of a program. "...cost analysis quantifies the resources required to implement the program. Some of these costs will be readily available to evaluators, insomuch as they are likely to be direct and explicit, including training costs, salaries, supplies, and participation incentives. Less apparent and more challenging to quantify will be overhead costs, and costs borne by others, such as volunteer labor, donations of facilities used, participant transportation costs, and participant time." Challenges also exist in determining the measure of effectiveness. "Cost-effectiveness can provide comparisons between alternatives when the same outcome is assessed for both alternatives. For example, two substance use prevention programs can be compared on the cost to prevent initiation of alcohol use if both assess that outcome."

Derived Assumptions

The determination of the "cost" of each program to be compared in the analysis will need to be based upon the same criteria.

The selection of programs to be included in the analysis will consider whether the same outcomes are intended and measured.

IV: Selection Process

The legislative requirements of the cost effectiveness analysis cited in Section II above include the requirement that it must consist of **four (4) prevention programs** that are among the ten highest value prevention programs that do not include programs implemented by law enforcement.

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Prevention programs funded in FY2019 include the following programs; 3 of which are parent programs and 8 which are youth programs:

Table 1: Prevention Programs Funded in State Fiscal Year 2019	
Parent programs	**Youth programs**
Upper Room UR Parents	Life of an Athlete
Stay Connected with Your Teen	Positive Action
Parenting Wisely	Leaders in Prevention
	Teen Institute Summer Leadership Program
	Adolescent Wellness Program
	Wilderness Leadership in Adventure (WYLD)
	Student Assistance Programs (SAP)
	Juvenile Court Diversion Services

The three parenting programs were excluded due to lack of minimum number of comparable programs which had an evidence base and/or data availability. This resulted in 8 youth prevention programs to consider. An overview of the programs is presented below in tables 2 and 3.

Table 2: Overview of Youth Prevention Programs			
Program Name	**Vendor/Agency**	**Number of participants**	**Total Cost of Program**
Life of an Athlete	NH Interscholastic Athletic Association	1,293	$380,000
Positive Action	Boys & Girls Club of Greater Salem	180	$204, 978
Leaders in Prevention	NH Teen Institute	115	$29,611
Summer Leadership Program	NH Teen Institute	100	$80,502
Adolescent Wellness/ Take Control	The Upper Room	292	$172,109
Wilderness Leadership in Adventure (WYLD)	North Country Education Services	174*	$210,000
Student Assistance Programs	The Youth Council	+	+
Juvenile Court Diversion Services	NH Juvenile Court Diversion Network	149 SBIRT	++

*94 high school students; 27 middle school students; 53 elementary school students.

+The number of participants and total cost of the Youth Council Student Assistance programming was not available at the time of analysis.

++The total cost of the Juvenile Diversion Network SBIRT work was not available at the time of analysis.

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Table 3: Overview of Youth Prevention Programs Evidence Base			
Program Name	**Target Age Range**	**Population Type**	**Evidence Base**
Life of an Athlete	High School (14-18)	Universal	NH Service to Science EBP
Positive Action	Elementary/ Middle School (10-13)	Universal/ Selected / Indicated	Federal/National EBP
Leaders in Prevention	Middle School (10-13)	Universal	Not evidence based
Teen Institute Summer Leadership Program	High School (14-18)	Selected / Indicated	NH Promising Practice
Adolescent Wellness/ Take Control	High School (14-18)	Indicated	Uses NH Service to Science EBP
WYLD	High School (14-18)	Selected Indicated	Uses two federal/national EBP curricula within its program and is based on "Youth Leadership Through Adventure (YLTA)", a NH Promising Practice
Student Assistance Programs	Middle School (10-13) High School (14-18)	Universal Selected Indicated	Based on Federal/National EBP but do not follow EBP to fidelity
Juvenile Court Diversion Services	Under age 18	Selected Indicated	Not evidence based

To select four (4) from this list of seven, additional detail in the legislation was considered (See Appendix A: NH HOUSE BILL 1626 AS AMENDED BY THE SENATE). Below is the legislative language that provides information that can be used as selection criteria to apply to the programs.

> *The report required under paragraph I shall utilize a cost-effectiveness analysis in such a format to permit comparisons between the selected programs within a given category. The report shall be submitted to the speaker of the house of representatives, the president of the senate, the members of the house and senate committee having jurisdiction over health and human services issues, the members of the house and senate finance committees, and the fiscal committee of the general court. For the purposes of this paragraph:*
>
> *(a) "Program" means a set of systematic activities that engage participants in order to achieve desired outcomes.*

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(b) "Outcome" means the program effects in the participant population and shall exclude outputs.

(c) "Evidence of effectiveness" means documented results of evaluation assessing the effect of the program on the intended outcome for program participants, or program beneficiaries in the case of prevention programs. This may include results of program evaluation conducted in the jurisdiction or an evidence rating developed by matching the program to available research using a nationally recognized clearinghouse of program evaluations, such as those included in the Pew-MacArthur Results First Clearinghouse Database.

(d) "Cost-effectiveness analysis" means an economic evaluation in which the costs and consequences of alternative interventions are expressed as cost per unit of outcome.

Based on the legislation's language, the following questions were derived to apply to each program as criteria for exclusion:

Derived Questions

Does the program match a program with available research of effectiveness using a nationally recognized clearinghouse of program evaluations?
If not, does it have documented results of evaluation assessing the effect of the program on the intended outcome for program beneficiaries?

"Leaders in Prevention" and "Juvenile Court Diversion Services" were removed from consideration due to a lack of national recognition and/or engaged in the state recognition through NH Service to Science as of FY19 to determine its effectiveness relative to intended outcomes. (Note: both programs do engage in outcome data collection).

The remaining six programs either have a component of their overall activities related to a national recognized program evaluation ***OR*** they have documented results of evaluation assessing the effect of the program on the intended outcome for prevention beneficiaries ***AND/OR*** they have documented results of evaluation assessing one or both of the outcomes required by their state contracts, namely perception of risk associated with alcohol or drug misuse and perception of peer or parent disapproval of alcohol or drug misuse.

To select the most suitable four programs for the cost effectiveness analysis, JSI gathered information from each of the six programs to be able to compare the quality and accessibility of outcome data, target population type, and program design see Table 3.

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Table 3: Outcome Data, Target Population type, and Program Design							
Program Name	**Target Population**	**Population Type Program Type**	**Program Design**	**National or local data Pre/Post**	**Data years**	**Measured Change (e.g. pre-post)**	**Data on State Measures Risk & Disapproval**
Life of an Athlete	High School	Universal Direct Svc/ Environmnta l hybrid	Youth leadership training of 1-6 hrs & leadership activities	Local Data (NH state evaluatio n)	2013 - 2017	Yes	Both
Positive Action	Elementa ry/Middl e School	Universal Direct Svc	7-8 weeks of 1 hr education sessions	National Data	N/A (Nat' l data)	Yes	N/A (Nat'l data)
Teen Institute Summer Leadership	High School	Selected / Indicated Direct Svc	5 day camp	Local Data	2019	Yes	Both
Adolescent Wellness	High School	Indicated Direct Svc	Multi-session wrap around	Limited local data*	2019	No*	No*
WYLD	High School	Selected/ Indicated Direct Svc	Multi-Session wrap around	Local Data	2019	Yes	Both
Student Assistance Programs	Middle School High School	Universal Selected Indicated Direct Svc	Education curriculum Group Sessions Indv sessions	No Local Data**	2019	No**	No**

*Unable to verify data source, N, question banks, raw data due to staff turnover. One program component, Take Control, recognized by NH service to Science as evidence based.
**Only participant data was qualitative from focus groups with participants 18 and older. No measurable unit of change.

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Of the six programs reviewed at this stage in the selection process, JSI asked two questions relative to data availability:

Derived Questions

Does the program have national data that establishes measurable change on prevention indicators?
If not, are local data available and accessible that measure change in anticipated outcomes?

These questions led to the exclusion of two programs: Adolescent Wellness and Student Assistance Programs. Adolescent Wellness's 2019 data submitted to JSI for this analysis appears not to have data in a format that can be analyzed for units of measurable change. Student Assistance Programs, because they are school-based, were severely limited in their data collection due to recent legislation regarding data collection from students in public schools. As a result, in 2019 the only participant-level data collected was anecdotal data from focus groups with students over the age of 18.

With these exclusions, the selection process for the cost effectiveness analysis resulted in the following four programs:

Recommended Programs for Analysis

1. ***Life of an Athlete***
2. ***Positive Action***
3. ***Teen Institute Summer Leadership Program***
4. ***Wilderness Leadership in Adventure***

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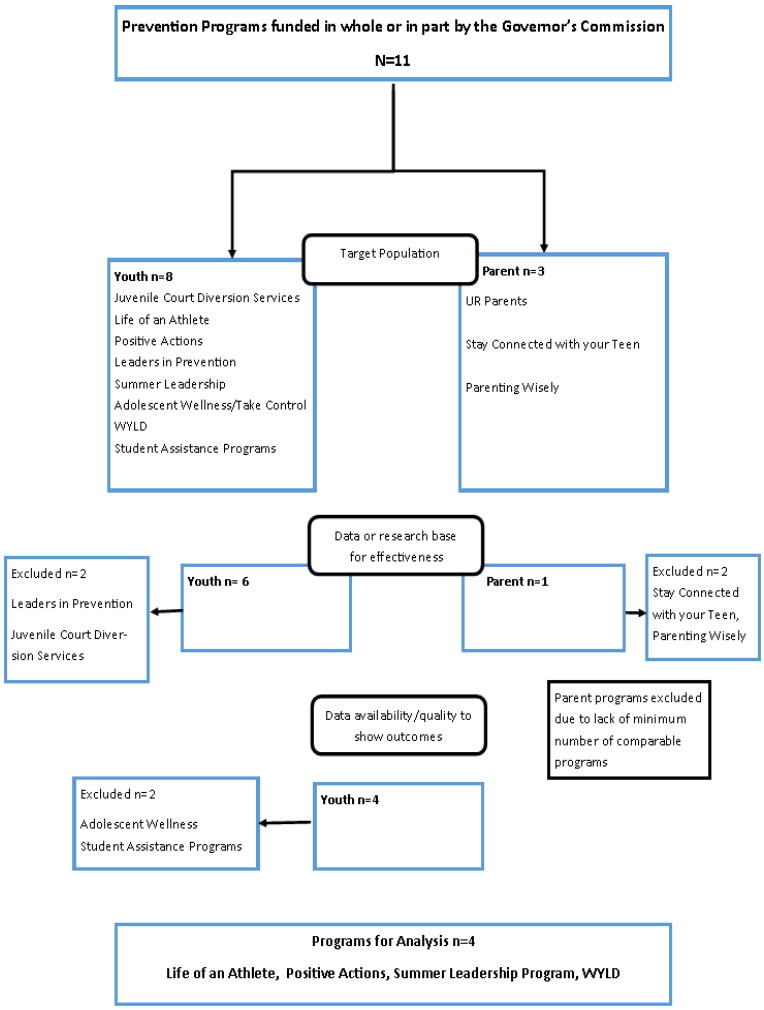
Summary Selection Diagram



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V. Request and Conclusion

The *NH DHHS Prevention Cost Effectiveness Work Group* presents this rationale to the Commission today, requesting approval of the selection of Life of an Athlete, Positive Action, Teen Institute Summer Leadership Program, and Wilderness Leadership in Adventure; as the four Commission funded prevention programs for inclusion in the cost effectiveness analysis and reporting due to the Commission December 1, 2020.

With the Commission's review and approval of the four programs for analysis, the Center will work with the *NH DHHS Prevention Cost Effectiveness Work Group* to communicate with the contractors delivering these programs for access to raw data to complete the cost effectiveness analysis.

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APPENDIX A: FROM NH HOUSE BILL 1626 LANGUAGE AS AMENDED BY THE SENATE[4]

Commencing January 1, 2020 and annually thereafter, the commission shall issue a report reflecting currently funded programs and including findings relative to the cost-effectiveness, outcomes, and evidence of effectiveness of programs funded in whole or in part by the commission. Programs selected for inclusion shall be chosen by majority vote of the commission, provided that the following criteria are met:

(a) Each report shall contain an evaluation of 4 programs selected from one of the following categories; provided that in year one all 4 categories shall be from treatment programs, and in year 2 all 4 categories shall be from prevention programs and this procedure shall continue thereafter on such a rotating basis: (1) Treatment programs. (2) Prevention programs.

(b) The programs selected shall be chosen from among the 10 highest dollar value programs in that category.

(c) No law enforcement programs shall be selected.

II. The report required under paragraph I shall utilize a cost-effectiveness analysis in such a format to permit comparisons between the selected programs within a given category. The report shall be submitted to the speaker of the house of representatives, the president of the senate, the members of the house and senate committee having jurisdiction over health and human services issues, the members of the house and senate finance committees, and the fiscal committee of the general court. For the purposes of this paragraph:

(a) "Program" means a set of systematic activities that engage participants in order to achieve desired outcomes.

(b) "Outcome" means the program effects in the participant population and shall exclude outputs.

(c) "Evidence of effectiveness" means documented results of evaluation assessing the effect of the program on the intended outcome for program participants, or program beneficiaries in the case of prevention programs. This may include results of program evaluation conducted in the jurisdiction or an evidence rating developed by matching the program to available research using a nationally recognized clearinghouse of program evaluations, such as those included in the Pew-MacArthur Results First Clearinghouse Database.

(d) "Cost-effectiveness analysis" means an economic evaluation in which the costs and consequences of alternative interventions are expressed as cost per unit of outcome.

[4] http://gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&txtFormat=html&v=SA2&id=1559

MEMO: COST EFFECTIVENESS ANALYSIS DATA COLLECTION - PREVENTION

To: Selected Prevention Programs

From: Jill Burke, NH BDAS

Date: August 19, 2020

Re: PREVENTION PROGRAM DATA REQUEST

The New Hampshire Governor's Commission on Alcohol and Other Drugs ("the Commission") was established in 2000 through a legislative act that established the original "Alcohol Fund" which designated a percentage of the proceeds from sales of alcohol be distributed for prevention and treatment as directed by the Commission. The mission of the Commission is to prevent and reduce alcohol and other drug problems and their behavioral, health and social consequences for the citizens of New Hampshire. The Commission accomplishes its mission through a variety of activities which include 1) Advise the Governor and Legislature regarding the delivery of effective and coordinated substance misuse prevention, treatment, and recovery services throughout the state and 2) Direct funding appropriated to the Commission.

In service to these two responsibilities of the Commission, 2018 legislation was enacted "requiring the Governor's Commission on alcohol and drug abuse prevention, treatment, and recovery to report on the cost effectiveness of funded programs" with prevention programs analyzed biannually.[1]

This legislation details the requirements for the cost effectiveness analysis of Commission-funded prevention programs, including how to select programs for analysis. A review of the legislation and funded prevention programs led to the selection of a required *four p*rograms for analysis.

Your organization's prevention program that received Commission funding in state fiscal year 2019 was selected for cost effectiveness review for SFY 2019.

As a result of this selection, your organization is required to submit data relative to *program outcomes* and *program costs* for SFY 2019 that will be used to generate the Commission's new legislative reporting mandate.

To support sound methods and analyses, the following principles and parameters have been established for this process:

- All information submitted shall be for the state fiscal year of 2019 (July 1, 2018-June 30, 2019)

[1] http://gencourt.state.nh.us/bill_status/billText.aspx?sy=2018&txtFormat=html&v=SA2&id=1559

- All information submitted shall be *for the specific prevention program* identified in this memo solely.

Information required relates to three main categories for the analysis: 1) Outcome data, to determine the effect; 2) Cost/expenditure data to determine the cost of the effect; and 3) Implementation data to describe the context of the effect.

Please submit the information described below to Anna Ghosh: anna_ghosh@jsi.com along with the data submission form attached by September 4, 2020If you have any questions regarding this request, please contact Jill Burke: jill.burke@dhhs.nh.gov at the NH Bureau of Drug and Alcohol Services and/or Anna Ghosh: anna_ghosh@jsi.com at JSI, the vendor conducting the analysis on behalf of the Bureau.

1. OUTCOME DATA: Program **outcome data** is collected from participants before and after participation in a prevention program to determine the outcomes realized. For the cost effectiveness analysis, please submit **outcome data** for the specified prevention program submitted as follows:

- In raw form (actual individual responses, not a summary percent)
- In a manner that does not identify any individual program participant (e.g. de-identified)
- Includes pre- and post-program responses, with the ability to match respondents if possible
- In an excel or SPSS file

2. COST DATA: Cost data for this analysis involves direct and indirect costs associated with the delivery of the identified prevention program during state fiscal year 2019. An excel spreadsheet of your SFY 2019 expense reports to BDAS has been provided with this letter. Please review and confirm the BDAS reimbursed expenses for the program delivery. A column is provided in the spreadsheet to add other costs incurred for the program's delivery covered by any other source.

3. IMPLEMENTATION DATA: Implementation data are necessary to provide context to the quantitative data being analyzed. Please use the attached form to provide the following information:

a. *SAMHSA/CSAP program type* (e.g. education, alternative activities, other)

b. *Total number of participants who began participation* in the identified prevention program during SFY2019

c. *Month and year of each program iteration* with the number served for each program time period

d. *Dose and duration of each program period* (e.g. # of sessions and frequency of session, such as 5 sessions, one per day or 8 sessions, one per week)

e. *Evidence of effectiveness*: On the attached form please indicate the evidence of effectiveness for the program and provide supporting links.

f. *Fidelity Context*: It is understood that modifications to a program's design may be necessary and even desirable to improve program outcomes. Modifications have been shown in the research to both improve and compromise program efficacy[2]. To account for variations in implementation, the cost effectiveness analysis will benefit from information on modifications made to the program's delivery.

On the attached form you will be asked to provide information that will describe levels of fidelity for each implementation component below:

- *Target Population*
- *Instructor/Facilitator*
- *Dose/Duration*
- *Content*
- *Setting*
- *Other*

Please submit the information above in the attached form and submit with accompanying cost and data files as requested to Anna Ghosh: anna_ghosh@jsi.com by September 4, 2020. Thank you for your assistance!

[2] https://www.samhsa.gov/sites/default/files/ebp_prevention_guidance_document_241.pdf

COST EFFECTIVENESS ANALYSIS DATA COLLECTION – PREVENTION

Please submit the following information to Anna Ghosh anna_ghosh@jsi.com by **August 28, 2020** to assist the state in meeting its legislative requirements for funding allocations from the New Hampshire Governor's Commission on Alcohol and Other Drugs that provides funding to regional and local prevention programs and activities. Thank you for your support and assistance in meeting this obligation.

Organization Name: _____

Key contact information for this submission:

Name: _____

Phone: _____

Email: _____

Additional contact information for data stewards and finance/budget staff for follow up questions

Data Contact:

Name: _____

Phone: _____

Email: _____

Finance Contact:

Name: _____

Phone: _____

Email: _____

1. OUTCOME DATA: Please submit program **outcome data** collected from participants before and after participation in a prevention program as follows:
    - In raw form (actual individual responses, not a summary percent)
    - In a manner that does not identify any individual program participant (e.g. de-identified)
    - Includes pre- and post-program responses, with the ability to match respondents if possible
    - In an excel or SPSS file

2. COST DATA: Attached is the BDAS expenditure report for the identified program for SFY 2019. In the column provided to the right of BDAS/GC expenses, please add expenses incurred for delivery of this program during SFY 2019 that were paid for by other sources.

3. IMPLEMENTATION DATA: Please submit implementation data as follows:

What is the program's SAMHSA/CSAP program type ?	☐ Prevention Education ☐ Alternative Activities ☐ Other: _____
What is the intended population type for the program?	☐ Universal ☐ Selective ☐ Indicated
What was the age range for the program?	☐ Middle School ☐ High School
What was the total # of participants for all iterations during SFY 2019?	☐

What were the implementation months and the dose and duration for each?

For each iteration of the program offered during SFY 2019:

Month of start date	Total # of sessions	Frequency of sessions	Hours per session	# of participants
e.g. January 2019	*4*	*Weekly*	*2*	*14*
e.g July 2018	*5*	*Daily*	*8*	*23*
Total Unduplicated:				

What level of evidence base is the program?	☐ Nationally recognized or registered. Please provide national registry reference: _____ ☐ Research-based with evidence as supported, promising, or emerging. Please provide research citations: _____ ☐ Evidence has been established through the NH Service to Science process.

	☐ Evidence is inconclusive or undetermined. ☐ Rigorous evaluation has been conducted ☐ In process of being reviewed by NH Service to Science
The following questions refer to actual implementation factors versus those prescribed or recommended by the program developers. It is understood that modifications to a program's design may be necessary and even desirable to improve program outcomes. Modifications have been shown in the research to both improve and compromise program efficacy[1]. *Please be candid. Adaptations and modifications are anticipated. This information is only be used as context for the analysis.*	
Target Population: Was the program delivered to the population it was designed for? If not, please describe the difference between the population for which the program was designed and determine effective and the population it was delivered to during your SFY 2019 implementation.	Yes ☐ / No ☐ Describe:
Instructor/Facilitator: Please select the instructor preparation level that best describes the instructor who delivered the program during SFY 2020. If there was more than one instructor, please use and "x" for each instructor.	☐ an individual specifically trained to implement the program either by program developers/sustainers or someone trained by the developers/sustainers; or ☐ a certified prevention professional or similarly credentialed instructor with general knowledge of prevention science, working with target population and/or general curriculum instruction; or ☐ by an individual not specifically trained and/or credentialed in prevention science or program.
Dose/Duration: Please select the most appropriate descriptor for the fidelity level of the SFY 2019 implementation dose and duration. Describe modifications, if any.	☐ High fidelity (e.g. met or exceeded the number of sessions and hours per session as recommended by program developers/sustainers). ☐ Moderate fidelity (Almost met the number of sessions and hours per session recommended by program developers/sustainers.) Describe modifications made and the rationale for them:

[1] https://www.samhsa.gov/sites/default/files/ebp_prevention_guidance_document_241.pdf

	☐ Low fidelity (Provided a very different number of sessions and hours per session from what is recommended by program developers/sustainers) Describe modifications and the rationale for them:
Content: Please select the most appropriate descriptor for the fidelity level of the SFY 2019 implementation of content. Describe modifications, if any.	☐ High fidelity to curriculum content and activities as recommended by program developers/sustainers (followed curriculum materials closely) ☐ Moderate fidelity (followed some of the curriculum materials and made alterations to others) Describe modifications made and the rationale for them: ☐ Low fidelity (made many adaptations and modifications to the curriculum) Describe modifications and the rationale for them:
Setting: Was the program delivered in the setting it was designed for? If not, please describe the difference between the setting in which the program was determined to be effective and the setting it was delivered in during your SFY 2019 implementation.	Yes ☐ / No ☐ Describe:
Other: Were any other significant changes made to the program that may contribute helpful context to the cost effectiveness analysis?	Yes ☐ / No ☐ Describe:

Contractor Name:

Purpose:

Entire Contract Term:

Current Term:

Line Item	Expended & Paid by BDAS/GC	Expended &Paid by all other sources	Total Program Expenses
1. Total Salary/Wages	$ -		$ -
2. Employee Benefits	$ -		$ -
3. Consultants	$ -		$ -
4. Equipment:	$ -		$ -
Rental	$ -		$ -
Repair and Maintenance	$ -		$ -
Purchase/Depreciation	$ -		$ -
5. Supplies:	$ -		$ -
Educational	$ -		$ -
Lab	$ -		$ -
Pharmacy	$ -		$ -
Medical	$ -		$ -
Office	$ -		$ -
6. Travel	$ -		$ -
7. Occupancy	$ -		$ -
8. Current Expenses	$ -		$ -
Telephone	$ -		$ -
Postage	$ -		$ -
Subscriptions	$ -		$ -
Audit and Legal	$ -		$ -
Insurance	$ -		$ -
Board Expenses	$ -		$ -
9. Software	$ -		$ -
10. Marketing/Communications	$ -		$ -
11. Staff Education and Training	$ -		$ -
12. Subcontracts/Agreements	$ -		$ -
13. Other (specific details mandatory):	$ -		$ -
Indirect As A Percent of Direct	$ -		$ -
0	$ -		$ -
0	$ -		$ -
TOTAL			$ -

APPENDIX C: PROGRAM DESCRIPTIONS

Leaders in Prevention

Leaders In Prevention (LIP) brings together six to eight middle school teams from across New Hampshire for a long weekend of workshops and action planning. Teen Institute staff conducts outreach to build awareness and understanding of the program. Schools, afterschool programs and community organizations refer students with leadership potential who are capable of working as part of a team and willing to bring new skills and energy back to their community. LIP staff use information from the referral and pre-test results to categorize students as selected or indicated.

Each LIP team consists of two adult advisors and eight middle school students with diverse backgrounds and skills. Students participate in an array of learning opportunities – both within their own team and together with 6-8 other teams – on topics such as school climate, substance misuse prevention, and community involvement. Every participant has the opportunity to: 1) develop or expand their leadership skills; 2) build positive relationships with peers and mentors; and 3) explore new ideas to improve their schools and communities. Through this process, they learn more about themselves and each other, and about how to work effectively as a team. Throughout the program, each team also engages in an action planning process that reflects the Strategic Prevention Framework and other public health planning processes: assessing their local conditions (strengths and challenges) and designing an action plan for a project they will implement in their school or community upon the completion of the program. Examples of past action plans include fundraising for and organization of the renovation of a baseball field, organization of a blanket drive for homeless youth, and creation of a bulletin board to document observations of positive happenings at school.[19]

In SFY 2019, there were three cycles of LIP with a new cohort of teams for each cycle. The program tuition is $2200 per team, with tuition assistance available through NH Bureau of Drug and Alcohol Services (BDAS) and a number of other funders. Tuition for students who meet the criteria for higher risk of developing a substance misuse disorder is fully subsidized by BDAS. This includes all program materials, meals and accommodations.

To evaluate the program, staff administer surveys at three points in time: before the program begins, immediately after the program and six months after the program. Surveys include a unique identifier that allow pre and post surveys to be matched.

LEADERS IN PREVENTION	
Evidence Base	Developed in 1999 in NH based on identified needs; conducts evaluation
Oversight Agency	NH Teen Institute
Description	Teams of middle school students and adult advisors participate in a weekend training to build leadership skills, encourage positive peer and adult relationships, and develop action plans to improve school and community environments.
Intended Outcomes	-Increased perception of risk of harm of substance misuse -Increased perception of peer or parent/caregiver disapproval of substance misuse -Increased protective factors associated with risk behavior, including school/ community connectedness and relationships with healthy peers
Data Collection	Surveys administered before the training begins, immediately after the program and six months after the program. Surveys include a unique identifier that allow pre- and post-surveys to be matched.
Structure/ Intensity	34 hours over 2.5 consecutive days
Target Population Type	Universal/Selective/Indicated[20]
Target Population Age	Middle School
Numbers Served	115
Cost of Program	Total: $70,976.99 % Funding from Governor's Commission: 53.1% Governor's Commission: $37,668.56 Other Revenue Sources: $33,308.43 Total: $70,976.99
Cost Per Participant	$617.19

Summer Leadership Program

SLP is a dynamic residential week of leadership development, self-discovery, and social connection. Over the course of six consecutive days once a year, SLP offers 75 hours of programming for up to 100 diverse high school students from across NH and New England together. Experiential workshops are designed as catalysts for personal values exploration and increased school and civic engagement. Throughout the week, participants also increase their knowledge on a variety of topics including substance misuse and addiction, bullying, sexual health, conflict resolution, and health and wellness. The program connects participants with their local peers, school and community action organizations so they can channel this new energy toward the betterment of their home communities.

Participants are referred to the program through many channels, including guidance counselors, school staff, parents/caregivers, friends, community coalitions and self-referral. A pre-program survey is designed to identify risk and protective factors. These results are used to identify students with existing risk factors (i.e., those in the selected or indicated category).

The program cost is $850 for participants. This includes all training, lodging, meals, and materials. Tuition assistance is available through NH Bureau of Drug and Alcohol Services (BDAS) and a number of other funders.[21] Tuition for students in the selected/indicated category is fully subsidized by BDAS.

To evaluate the program, staff administer surveys at three time points - before the program began, immediately after the program and six months after the program. Surveys included a unique identifier that allowed pre and post surveys to be matched.

SUMMER LEADERSHIP PROGRAM	
Evidence Base	NH Service to Science Promising Practice
Oversight Agency	NH Teen Institute
Description	A dynamic residential week of leadership development, self-discovery, and social connection. Experiential workshops are designed as catalysts for personal values exploration and increased school and civic engagement. Participants increase their knowledge on a variety of topics including substance misuse and addiction, bullying, sexual health, conflict resolution, and health and wellness. The program connects participants with their local peers, as well as school and community action organizations so they can channel this new energy toward the betterment of their home communities.
Intended Outcomes	-Increased perception of risk of harm for substance misuse -Increased perception of peer disapproval of substance misuse -Increased protective factors associated with risk behavior, including school/community connectedness and relationships with healthy peers -Decreased substance misuse
Data Collection	Surveys administered to participants at the beginning and end of the week and six months after the program. Surveys include a unique identifier that allow pre- and post-surveys to be matched.
Structure/ Intensity	75 hours over 6 consecutive days
Target Population Type	Selective/Indicated
Target Population Age	High School
Numbers Served[22]	100
Cost of Program	$130,523.87 % Funding from Governor's Commission: 62.4% Governor's Commission: $81,408.63 Other Revenue Sources: $49,115.24 Total: $130,523.87
Cost Per Participant	$1,305.24

Positive Action

Positive Action is a systematic educational program that promotes an intrinsic interest in learning and encourages cooperation among students. It works by teaching and reinforcing the intuitive philosophy that you feel good about yourself when you do positive actions. The effects of the program range from increased academic achievement to dramatic reductions in problem behaviors. These results have been replicated in diverse settings and feature the most rigorous efficacy study designs available.

The evidence-base for the Positive Action program[23] comes from programs conducted in schools by grade level over the course of an academic year. In the standard curriculum, there are six units with 24-31 twenty-minute lessons per unit.[24] Students are often exposed to the program for multiple years in a row, and research has shown that program impacts are greater with multiple years of exposure.[25]

The Boys and Girls Club of Greater Salem implements the Positive Action program at its own site and coordinates with two additional sites at Boys and Girls Clubs in Nashua and Souhegan Valley. The program director consulted with representatives from the Positive Action program in order to adapt the program to their setting and achieve fidelity. The NH Boys and Girls Club Positive Action program runs after school for at least six weeks with multi-aged groups of youth 10-13 years of age. The program includes lessons from all six units of the standard curriculum to ensure that all unit objectives are met. Teachers deliver two or three lessons per week in a one hour block. The Boys and Girls Club uses standardized short-form pre- and post-tests supplied by the national Positive Action program in order to evaluate the program. Students only formally participate in the program once, although some may return to the classroom as helpers.

There are some variations in how the program is delivered from session to session. Sessions can last between six and eight weeks. If the teacher believes that the objectives of the curriculum were not met in six weeks, s/he may add up to two additional weeks. There are fluctuations in the students participating in the class that reflect fluctuations in student attendance at the Boys and Girls Club. Drop-ins and more frequent fluctuations are more common in the summer months. There is no guarantee that any one student will participate in all weeks of the program. The specific lessons taught in each session also change. Teachers have the discretion to choose the lessons that work best for their student population.

Pre- and post-test data was only available from the Boys and Girls Club of Greater Salem site. To analyze cost effectiveness, JSI used cost and participation data from just the Greater Salem site.

POSITIVE ACTION – Salem Site	
Evidence Base	National registry evidence-based program[26]
Oversight Agency	Boys and Girls Clubs of Greater Salem
Description	An after school program for at least six weeks with multi-aged groups of youth 10 to 13 years of age. The program includes lessons from all six units of a standard, nationally recognized evidence-based curriculum, including units on self-concept, positive actions for body and mind, managing yourself responsibly, treating others the way you like to be treated, telling yourself the truth, and improving yourself continually.[27] Teachers deliver two or three lessons per week in a one-hour block.
Intended Outcomes	-Increased protective factors associated with risk behavior, including school/ community connectedness and relationships with healthy peers -Decreased substance misuse
Data Collection	Surveys administered to participants at the beginning of the program and end of the program.
Structure/ Intensity	One hour per week for 6 to 8 weeks
Target Population Type	Universal
Target Population Age	Middle School
Numbers Served	61
Cost of Program	$88,981.96 % Funding from Governor's Commission: 100% Governor's Commission: $88,981.96 Other Revenue Sources: $0.0 Total: $88,981.96
Cost Per Participant	$1,458.72

Life of an Athlete

Life of an Athlete is a comprehensive, multicomponent prevention program that empowers and motivates youth participating in athletics and leadership programs to make healthy choices and decisions by educating them on the impact alcohol and other drugs have on performance and development. The program blends prevention and athletics together, focusing on the immediate impact that lifestyle choices have on athletic performance with an emphasis on understanding the impact alcohol, other drugs, and tobacco have on success in academics and athletics. The program is laid out into five sections including: 1) pre-season meetings with athletes, coaches and parents/caregivers; 2) assessing codes of conduct; 3) training for coaches and youth; and 5) community unity (community members enforce and respect that alcohol and other drugs are not part of healthy adolescent development).

A former Olympic trainer developed the Life of an Athlete program, which has been implemented in thousands of schools in 39 states. The program is designed to be flexible in its implementation and there are many variations in how the program is implemented from school to school. While the program was originally intended to be used with high school athletic teams, some schools have adopted it to be used across the entire school. It has also been implemented in middle schools.

Life of an Athlete has resources available for participating schools including a program manual, The Coaches' Playbook, The Leadership Guide for student athletes, and several resource documents about healthy eating and proper sleep. Participating schools are expected to hold a preseason meeting with athletes, coaches and parents/caregivers. The program provides sample agendas, handouts for parents/caregivers and a "code of commitment" for parents/caregivers to sign. Another key element of the program is upholding a code of conduct. There are resources to help schools improve and enforce their codes of conduct.[28]

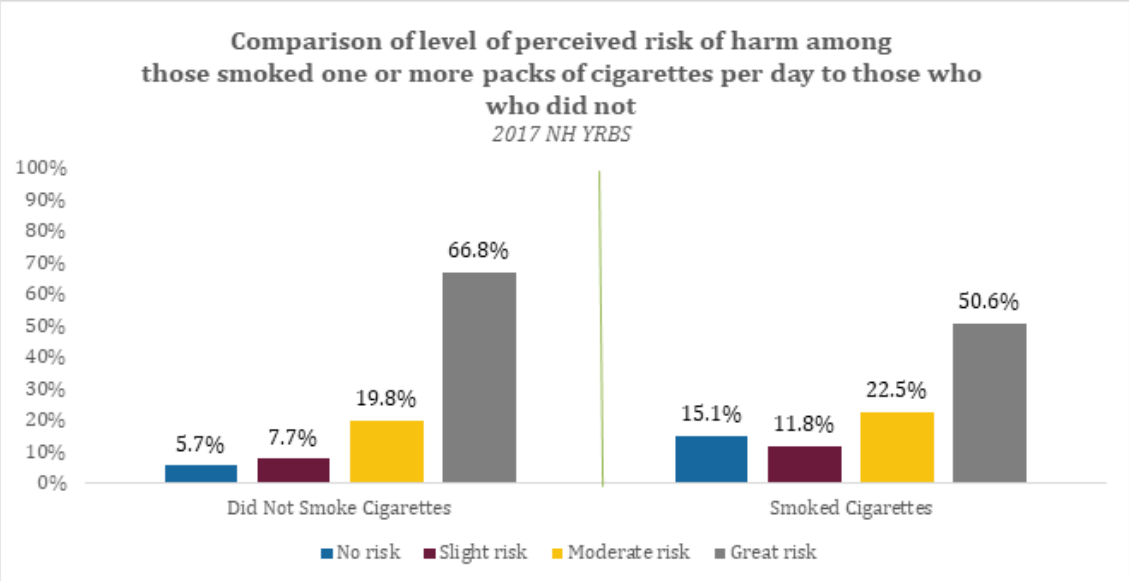
Life of an Athlete also provides trainings and convenes meetings for sports teams, schools and student leaders. Trainings vary from 30 minutes to six hours in duration and are offered at the state, regional and school level. Engagements include three summits, an annual conference for a day and a half, and monthly Statewide Leadership Committee meetings.

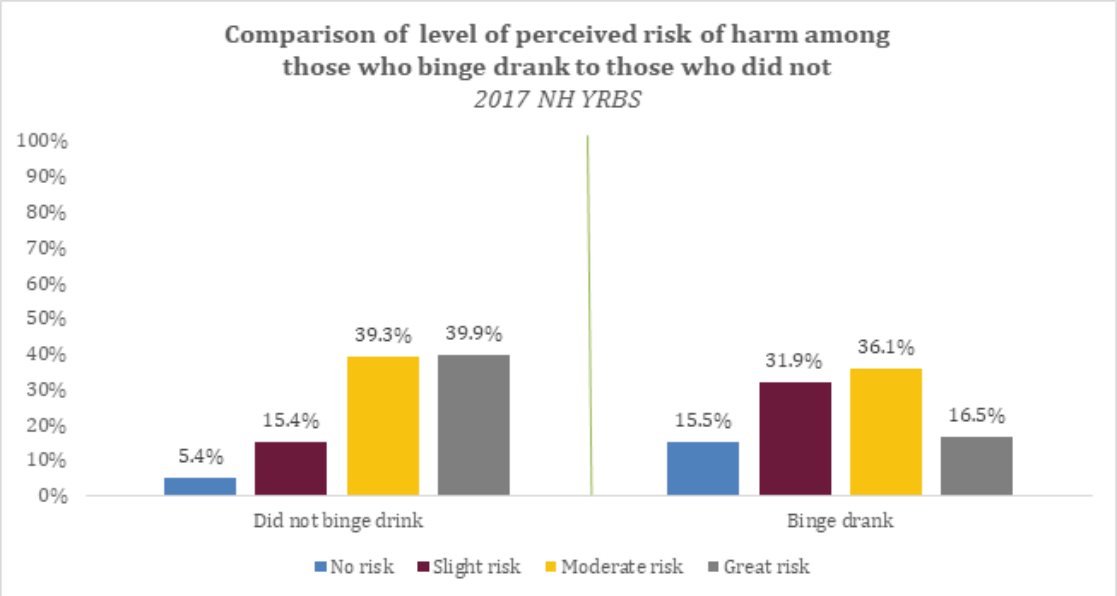
LIFE OF AN ATHLETE	
Evidence Base	NH Service to Science Promising Practice
Oversight Agency	NH Interscholastic Athletic Association
Description	A multi-component prevention program that empowers and motivates youth participating in athletics and leadership programs to make healthy choices and decisions by educating them on the impact alcohol and other drugs have on performance and development. The program is comprised of five core components: pre-season meetings with athletes, coaches and parents/ caregivers; assessment and revision of codes of conduct; training for coaches and youth; youth leadership opportunities associated with conduct and health; and community unity. Life of an Athlete provides trainings and convenes meetings for sports teams, schools and student leaders. Trainings vary in duration from 30 minutes to six hours and are offered at the state, regional and school level. Engagements include three summits, an annual conference for a day and a half, and monthly Statewide Leadership Committee meetings.
Intended Outcomes	-Increased perception of risk of harm of substance misuse -Increased perception of peer disapproval of substance misuse -Increased knowledge regarding the impact of substance misuse on athletic and school performance -Decreased substance misuse
Data Collection	Surveys administered to participants of athletic teams at the beginning and end of each athletic season.
Structure/ Intensity	Varies
Target Population Type	Universal
Target Population Age	High School
Numbers Served	1,293
Cost of Program	$ 371,594.65 % Funding from Governor's Commission: 67.3% Governor's Commission: $250,000 Other Revenue Sources: $121,594.65 Total: $371,594.65
Cost Per Participant	$ 287.39

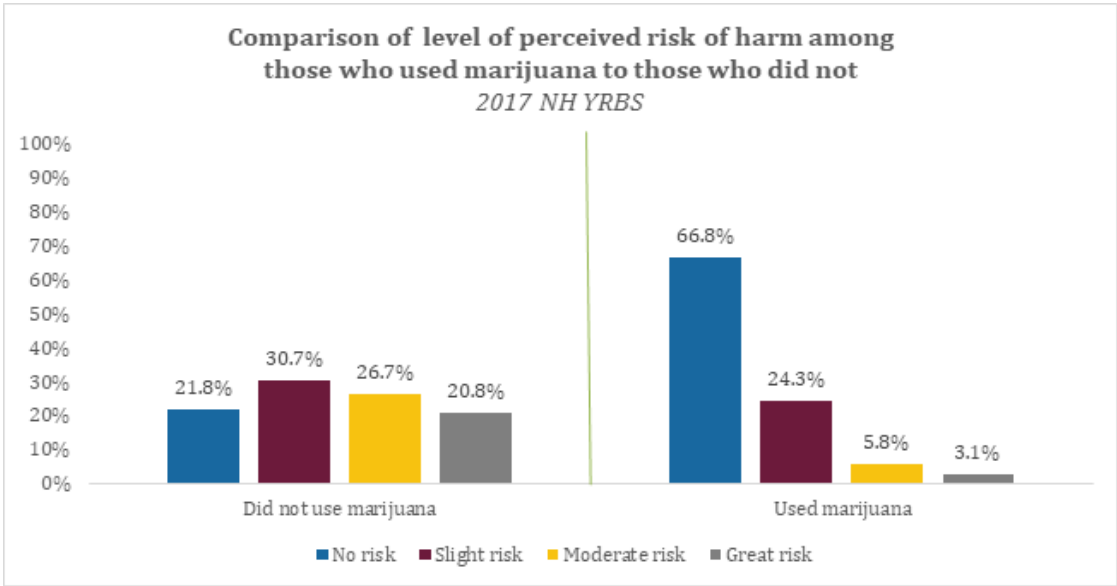
APPENDIX D: GRAPHS OF RELATIONSHIP BETWEEN PERCEIVED RISK OF HARM AND SUBSTANCE USE

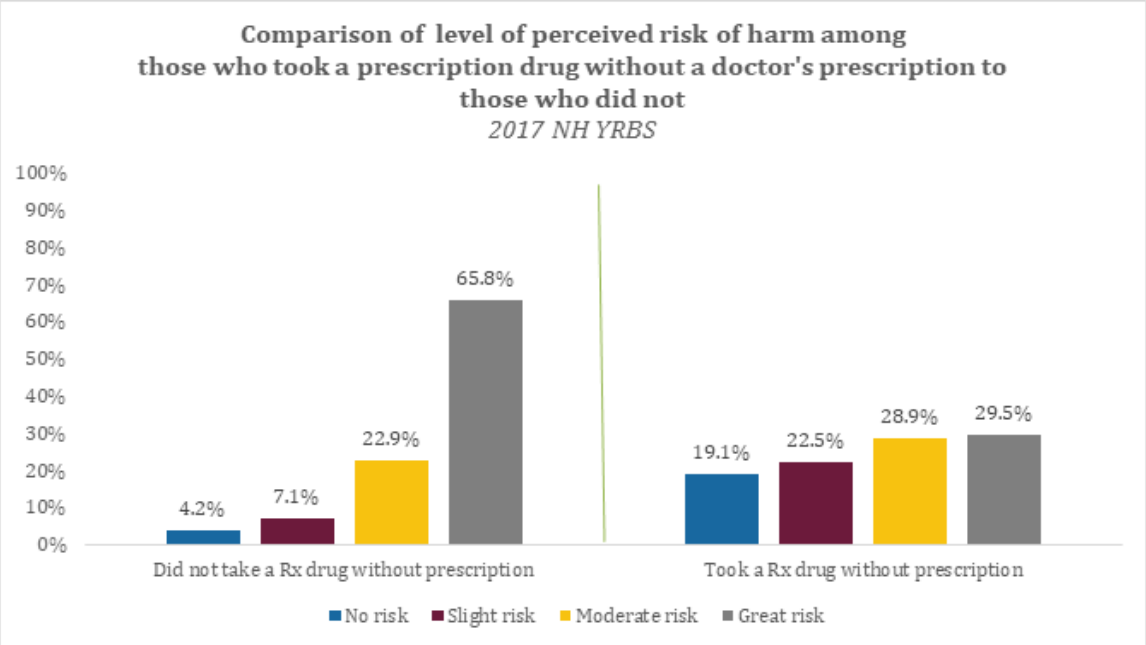
The relationship of perceived risk of harm among those who did not use the substance compared to those who did use the substance can be seen in the following graphs for different substances. The data is from the 2017 New Hampshire Youth Risk Behavior Surveillance Survey (N= 33,996)*. The graphs show that among those who used the substance compared to those who did not, there are higher percentages of youth who perceive great risk of harm of using the substance among those who did not use the substance while there are higher percentages of youth who do not perceive great risk of harm of using the substance among those who used the substance. For example, in the first graph, youth who did not smoke cigarettes showed a higher percentage of perceiving great risk of harm (66.8%) compared to those who smoked cigarettes (50.6%). Meanwhile among the youth who did not smoke cigarettes, a lower percent perceived no risk of harm (5.7%) compared to those who smoked cigarettes (15.1%).

* Tobacco n = 32856, Binge drinking n = 32756, Marijuana n = 32607, Prescription drugs n = 32736




Comparison of level of perceived risk of harm among those who binge drank to those who did not
2017 NH YRBS
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
5.4%
15.4%
39.3%
39.9%
15.5%
31.9%
36.1%
16.5%
Did not binge drink
Binge drank
No risk
Slight risk
Moderate risk
Great risk


Comparison of level of perceived risk of harm among those who used marijuana to those who did not
2017 NH YRBS
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
21.8%
30.7%
26.7%
20.8%
66.8%
24.3%
5.8%
3.1%
Did not use marijuana
Used marijuana
No risk
Slight risk
Moderate risk
Great risk


Comparison of level of perceived risk of harm among those who took a prescription drug without a doctor's prescription to those who did not
2017 NH YRBS
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
4.2%
7.1%
22.9%
65.8%
19.1%
22.5%
28.9%
29.5%
Did not take a Rx drug without prescription
Took a Rx drug without prescription
No risk
Slight risk
Moderate risk
Great risk

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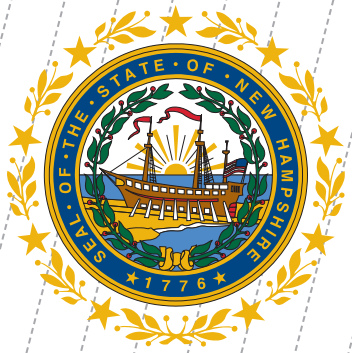
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