

The Economic Benefits of Alcohol and Drug Prevention In California

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Introduction:

In the spirit of presenting alternative prevention practices, The EMT Group, Inc. will be presenting a series of editorials regarding new and promising methods of alcohol and other drug (AOD) prevention. This article is the second in the series. We hope you enjoy this discussion.



It is well documented that alcohol, tobacco, and other drug (AOD) abuse is a vexing problem that imposes a heavy burden on society. Curtailing the problem of AOD abuse has been and will continue to be addressed on many fronts, including access and availability of alcohol and drugs, penalties imposed by the criminal justice system, price controls, education and awareness, and through treatment and prevention programs. The focus of this paper is on prevention programs and the important role they can play in reducing the onset of drug and alcohol abuse and, in turn, alleviating the long-term fiscal impact of the problem of abuse on society. By extrapolating from

research that has assessed the nationwide impact of alcohol and drug abuse, the first objective is to establish some reasonable cost estimates of the impact of alcohol and drug abuse in California. These estimates then provide the basis for the second objective: estimating the cost savings of effective prevention programs if implemented more comprehensively throughout the state.

The focus of the prevention impact analysis is two-fold:

- Given what is known about prevention program effectiveness, determine a reasonable estimate of the number of youth who would be “saved” from later substance abuse if they had been exposed to an effective prevention program.

- Estimate the economic benefit of implementing effective prevention programs in California in terms of the savings borne through prevention efforts.

Although prevention research is still in its infancy and much more work needs to be conducted to determine precisely which prevention programs are effective, for whom, and what elements of the program are most effective, enough literature is available to make some reasonable estimates of prevention program impacts. Similarly, research on identifying risk factors for substance abuse and establishing the prevalence rates of the disease for various population groups is an ongoing



research mission, as is the very science of determining an adequate definition of dependence, abuse and the etiology and long-term consequences of AOD abuse. Nonetheless, enough is known to make some reasonable estimates from which we can determine the scale and impact of drug and alcohol abuse on society.

Most, if not all, prevention efforts are geared toward youth, and it is well established in the literature that early initiation of alcohol and drug use is highly related to future dependence. As such, this paper's approach is to establish a number of youth "saved" through prevention programs, that is, the number of youth who would have gone on to a life of drug abuse and dependency but did not due to their experience with a prevention program. From this number is an extrapolation of how much, in dollar amounts, society would save given the number of youth who were prevented from drug and alcohol abuse. Two approaches are used. The first uses prevention effectiveness estimates and uses a simple extrapolation of the national cost estimates to California, adjusted to present-day dollar amounts. The second follows a similar logic, but applies some recently available data for state-specific expenditures.

Several themes emerge from the analysis. One is that the prevalence of alcohol and drug use in the United States in general, and California specifically, is high and the long-term trends indicate that use is not declining at the levels it once was. In fact, in several categories drug use seems to be on the upswing. As a consequence, the overall cost of alcohol and drug abuse is enormous, totaling over \$276 billion to the Nation in 1995.

The second major theme is that estimating long-term prevention effects is an area of research that is still very much in its infancy, and that rigorous longitudinal studies are needed to get a better understanding of how prevention works, for whom, and why. The estimates of prevention effectiveness in this paper are based on a RAND study that used fairly sophisticated statistical techniques to determine the impact of prevention programs. While this study is state-of-the-art, the authors fully acknowledge that more work needs to be done in the area to build confidence on the very foundation from which the study estimates costs – that is, the basic question of the effectiveness of prevention programs. As such, the range of effectiveness used in the RAND study is quite large. For example, for the effectiveness of prevention programs on cocaine use, the RAND study used a low estimate of 2.9 percent effectiveness rate to a high estimate of 13.6 percent effectiveness rate. Arguably, these are conservative estimates and, on the face of it, the number of youth who would be affected by a prevention program is relatively small, which leads to the third major theme of this paper.

The cost per drug or alcohol abusing person to society is enormous relative to the per capita costs involved in implementing prevention programs, so much so that even if we used the lowest prevention effect estimate, it still makes good economic sense to implement prevention programs. This fact is particularly true as the field advances in identifying youth who are most at risk for alcohol and drug abuse, thereby enabling prevention resources to be directed at those who need them the most.

Alcohol and Drug Use Prevalence and Trends

AOD use is a major societal problem, affecting millions of individuals, their families, and society as a whole. The public is aware of the problems of alcohol and drug use. A recent Gallup poll (March 5-7, 2001) found that drug use, crime and violence, and the availability and affordability of health care are the top three problems Americans worry about “a great deal.” Unfortunately, despite growing public awareness of the problem and efforts designed to curb AOD use, substance use rates still remain high. And rates for youth have actually shown increases during the 1990’s.



According to recent statistics from the National Center for Health Statistics (SAMSHA, 2000), alcohol use in the high school years is the norm rather than the exception. About one-half of all high school students reported drinking in the previous 30 days, and about a third reported binge drinking (more than 5 drinks on one occasion) in that time period. These prevalence rates are conservative considering the fact that the sample does not include the 20 percent of youth who have dropped out of school, a subset with higher rates of drug and alcohol use than the students surveyed.

Nationally, rates of marijuana use are about half that for alcohol use. Almost one half (47%) of high school students had used marijuana during their lifetime and over one-fourth (27%) of high school students had used marijuana one or more times in the past 30 days. Marijuana use dramatically increased during the 90’s. Fifty percent more students had used marijuana at least once in 1999 than in 1990 (47% versus 31%), and almost twice as many students had used marijuana during the 30 days preceding the survey (27% versus 14%).

In California the prevalence rates of illicit drug use appear to be higher than the national rate. According to the National Household Survey on Drug Abuse (NHSDA) in 1998 (SAMSHA), the prevalence of illicit drug use among persons 12 years and older was 7.2 percent in California, compared to 6.1 percent in the rest of the United States. The prevalence of illicit drug use among youth in California was similar to the national prevalence rate of 9.9 percent. Although levels of alcohol and drug use seem to have leveled in recent

years, use increase dramatically for some substances in the early 90's. The California Student Substance Use Survey reports a dramatic nine percent rise in illicit drug use among eleventh graders from 1990 to 1994, from 37.7 percent to 46.5 percent who used any illicit drug over the previous six-month period. Ninth grader illicit drug use during the same time span increased over 12 percent, from 29.3 percent to 41.6 percent. Alcohol and drug use among 11th graders for the years 1990, 1992 and 1994 is shown in Table 1.

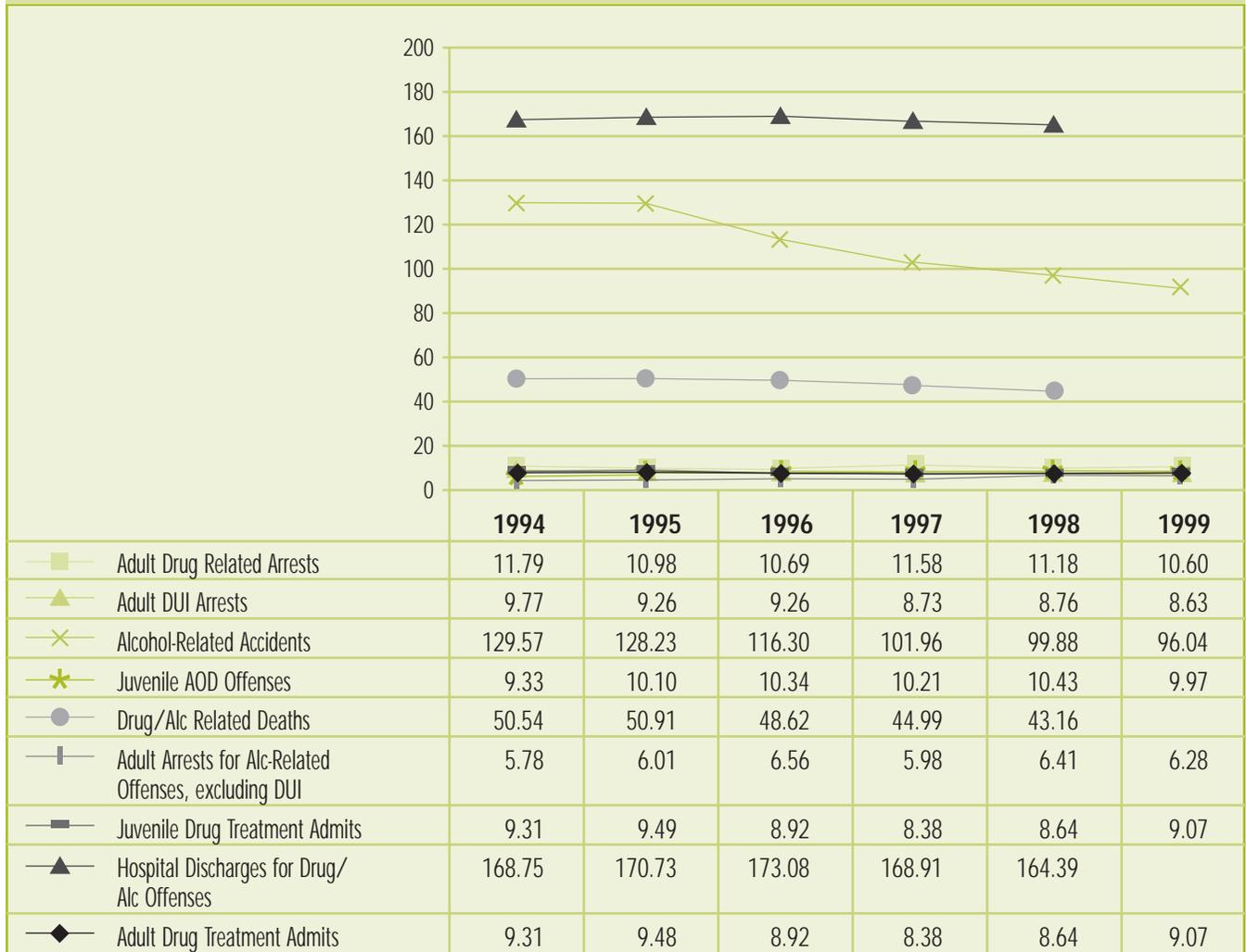
Table 1 11th Grade Substance Use

	1990	1992	1994	Increase
Any illicit drug	37.7%	35.6%	46.5%	8.8%
Marijuana	27.6%	29.4%	40.0%	12.4%

* From California Student Substance Use Survey

On a positive note, it appears that many alcohol and drug related problems are on the wane or are at least stabilized in California, most notably in the area of alcohol-related accidents. The following figure details some of the alcohol and drug related indicator areas from 1994 to 1999.

Figure 1 California Alcohol and Drug Related Trends (1994-1999)

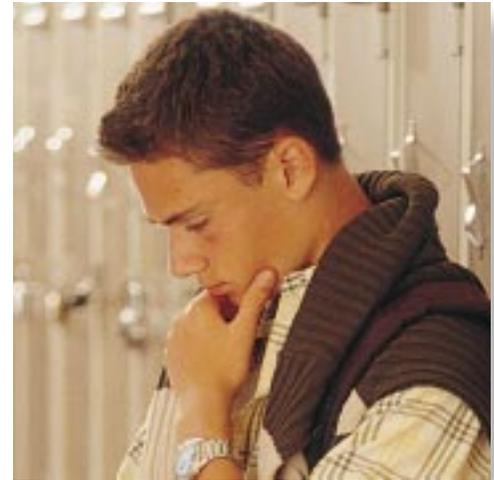


Approach to Estimating Prevention Effectiveness and Cost Savings Estimates

The general approach taken in this paper on prevention effectiveness involves three steps.

1) Derive Reasonable Estimates of Prevention Program Effectiveness.

One of the predominant deficits in prevention research is the paucity of rigorous, longitudinal studies that have examined the long-term impact of prevention programs. Most prevention studies to date have examined program impacts for a relatively short duration of time, and usually they have not examined impact beyond the high school years. While the short-term impact is important, particularly in light of the fact that early initiation is highly correlated with subsequent substance abuse problems, it does not fully address the issue of long-term impact from prevention program participation. To address this question, this report draws heavily on an extensive analysis conducted by RAND on long-term prevention effectiveness. The RAND report is appropriately entitled, “An Ounce of Prevention, A Pound of Uncertainty,” an open admission that long-term effects of prevention programs are elusive. Nonetheless, given what is known about prevention program effects, the relationship between early initial use and future problems, and peer influences, a reasonable range of prevention effectiveness rates are provided.



2) Define the Number of Youth who would Benefit from Prevention Programs.

Most youth do not go on to have substance abuse problems, and it would be costly and inefficient to implement full-blown prevention programs for all youth. A more efficient strategy would be to provide targeted prevention programs for youth who would most likely benefit. Frequently, these youth are labeled “high-risk youth.” There are a host of known factors that are related to substance use, and many prevention programs rely on these risk factors to identify youth who are most likely to develop AOD problems in the future. However, because it is impossible to predict future substance use with any degree of certainty using

these factors, for this report estimates of prevention benefits are based on actual cases of youth with substance abuse problems. These data are based on large-scale surveys sponsored through SAMHSA.

3) Apply Statistics on State Expenditures for Substance Abuse Related Problems in Relation to Youth with Substance Use Problems.

One of the primary goals of this report is to estimate the impact of effective prevention programs and the potential for cost savings to the state. Our final cost estimates are based on two immediate costs – juvenile justice and education – rather than long-term costs, which would include lifetime productivity losses, premature morbidity, career crime, health problems associated with alcohol and drug abuse, and many other factors that are associated with lifelong drug and alcohol problems. These more elaborate cost assessments are addressed in other work being conducted by EMT.

Prevention Effectiveness

Research and evaluation efforts have demonstrated that prevention programs are effective at delaying the onset and reducing the use of alcohol and drugs. For example, a review of the literature on the effects of school-based adolescent drug prevention programs revealed that programs based on social influence strategies demonstrated predominantly positive outcomes (63%; Hansen, 1992). Similarly, Tobler (1992) conducted a thorough meta-analysis of the outcome results for 143 adolescent drug prevention programs and found an average program effect size of 0.24, indicating a significant, albeit small (Cohen, 1988), reduction in alcohol and drug use. When analyzed separately, peer led programs were shown to have an effect size of 0.4 on overall alcohol and drug use, a moderate effect size according to Cohen's classifications.

The Center for Substance Abuse Prevention (CSAP), in its effort to promote science-based prevention, has been promoting model prevention programs that have shown sharp reductions in self-reported AOD use and other substance use risk factors relative to comparison groups not exposed to the program. A sample of some model programs and substance use outcomes are displayed in Table 2.

Table 2 *Model Programs*

Program	Participant Ages	Alcohol use	Marijuana use	Cigarette/Tobacco
Life Skills Training	10-14 years	54 percent reduction in 30-day use	71 percent reduction in 30-day use	75 percent reduction in new cigarette smoking
Project Alert	11-14 years	N/A	60 percent reduction in 30-day use	33 percent reduction in regular use; 55 percent reduction in heavy use
Project Northland	11-13 years	20 percent reduction in 30-day use	50 percent reduction in 30-day use	37 percent reduction in 30-day use
Residential Student Assistance Program	13-17 years	19 percent reduction in 30-day use	24 percent reduction in 30-day use	8 percent reduction in 30-day use
Child Development Project	6-12 years	11 percent reduction in 30-day use	2 percent reduction in 30-day use	8 percent reduction in 30-day use

In one of the largest prevention studies to date, a CSAP-funded cross-site analysis conducted by EMT Associates; 48 prevention programs were evaluated on program effects using standardized assessment instruments. The cross-site analysis was composed of the 48 programs across the United States with a full range of intervention strategies, target populations, and program characteristics. Of the 48 sites, 23 were separately analyzed because of greater certainty of a true “no-treatment” comparison group. At the other sites, the comparison group was “contaminated” by some exposure to some other non-study related prevention program participation. Thus, comparing treatment to comparison at the 23 selected sites ensured a more valid estimate on the percent of high-risk youth who experienced significant prevention benefits through participation in prevention programs. When using a composite score of cigarette, alcohol, and marijuana use over the last 30 days, the study results suggested that the number of primary prevention youth who initiated use during the program period was reduced by approximately 14 percent through participation in the prevention program (Springer, in press).

While these programs and many others throughout the country have provided evidence that prevention programs can lead to reductions in AOD use, unfortunately, few have followed youth for sustained periods of time to understand the long-term effects, and none have followed youth beyond the high school years. Projecting the long-term effects of prevention programs is thus necessarily a process of making reasonable estimates based on the available evidence from short-term outcome studies, and extrapolating a range of possible long-term effects with varying levels of decay rates.

The most rigorous analysis conducted thus far on estimating the long-term effectiveness of prevention programming is within the RAND report, “An Ounce of Prevention, A Pound of Uncertainty” (1999). This study is an analysis of the cost-effectiveness of model school-based prevention programs designed to reduce cocaine consumption. Two model programs were chosen for the analysis, Project Alert and Life Skills Training, both school-based programs designed to inculcate in adolescents the skills to resist social influences to use drugs. Both of these programs are based on the assumption that adolescents use drugs largely because of peer pressures and other social influences. The two programs are widely recognized as being excellent and were chosen for the RAND study because, among other reasons, their design included control groups and treatment groups, their publications clearly describe program content and participants, and they assessed outcomes over a relatively long duration. Life Skills in particular has found significant positive program outcomes up to six years after the intervention.

The RAND study estimated the program effects on cocaine use reduction by inferring from program effects on reductions in the initiation of marijuana use. Initiation of marijuana use was chosen as a risk factor because of its correlation with cocaine use. NHSDA data suggests that delays in marijuana use are associated with a lower likelihood of ever using cocaine and, for those who do use it, lower amount used (1998). Usage data from these two programs suggested a range from Project Alert's 5 percent reduction in initiation to a high of 17 percent reduction, the average of marijuana use indicators at both programs. One of the fundamental differences between these two programs, a difference that may account for the large range in initiation reduction values, is that Project Alert participants were only involved in the program in the seventh and eighth grades, while Life Skills participants were exposed to more long-term program booster sessions. Research has shown that long-term involvement is a necessary prerequisite for sustained effects. For example, a review of longitudinal drug abuse prevention studies conducted by Murray (1994; cited in Pentz, 1998) showed no long-term effects of school-based prevention programs after five years in the absence of follow-up interventions such as booster sessions.

The same logic used for estimating reductions in cocaine use was also used for estimating the effects of programs on marijuana, alcohol and cigarette use. Estimates of program effectiveness were based on program reductions of a risk factor, and NHSDA data was used to correlate the decrease in early initiation, a known risk factor for later substance use problem behaviors. The risk factor used for marijuana was the age of marijuana initiation; for alcohol, the age of first monthly use; and for cigarettes the risk factor used was the age at which a person first tries a cigarette.

As stated above, in the RAND study prevention effectiveness rates are based on data from two model school-based programs, Project Alert and Life Skills. Most published evaluations of prevention programs, including evaluations of these two model programs, focus on reducing drug use, reducing risk factors associated with drug use, and changing attitudes toward drug and alcohol use. Virtually none have examined the long-term effects of the program on substance use beyond the high school years, thus necessitating the use of other data to establish an estimate of program effects in the long term.

However, data on the relationship between age of initiation and later consumption levels is known. The RAND study focused on early marijuana use initiation because of its known correlation with cocaine use, and the same logic was applied to other substances as well. The logic used to estimate reductions in consumption was quite simple: since prevention programs can delay first initial use of substances, and late initiation is inversely related to later substance use problems, an informed calculation can be made on the long-term benefits of prevention programs.

The results of this analysis in the RAND study are displayed in Table 3.

Drug	Low Estimate	Middle Estimate	High Estimate
Cocaine	2.9%	7.6%	13.6%
Marijuana	1.8%	6.1%	12.8%
Alcohol	1.7%	3.5%	5.4%
Cigarettes	0.8%	3.0%	6.7%

The low, middle, and high effectiveness rates are based on several factors, beginning with the low and high effectiveness rates of Project Alert and Life Skills. It is important to note that these effectiveness rates are for a proportion reduction in consumption levels due to program participation. The RAND study goals were to establish some estimate of the cost effectiveness of prevention programs in terms of reducing cocaine consumption relative to other efforts to reduce cocaine consumption, such as drug enforcement measures. A host of other factors were included in this study to measure the overall consumption level decreases associated with prevention programs, such as a discount factor, social multiplier and market multiplier effects on non-participants, and qualifying factors such as a causation/correlation ratio to account for the fact that the causal relationship between age of marijuana initiation and cocaine use is unknown and a scale-up factor, a degradation factor to account for a deterioration in program effectiveness when implemented on a large scale.

In this report, we use the proportional reduction in substance use due to program participation as a proxy for calculating the number of youth who positively benefit from program participation. Applying consumption level reductions to actual persons “saved” through prevention program participation might be considered a stretch, and we recognize the possibility that consumption level reductions do not directly parallel number of lives positively affected through prevention program participation. However, it is also the case that consumption level is theoretically related to substance use problems and, for our analysis, proportion reductions provide a useful benchmark to use for our goal of estimating how many youth are positively affected by their involvement in prevention programs. Moreover, in our view the magnitude of the rates of estimated consumption level reductions in the RAND report, particularly the low reduction estimates, is relatively conservative. For example, the low estimate for marijuana use is a 1.8 percent reduction in use. It seems reasonable to assume that prevention programs positively affect at least 1.8 percent of youth who otherwise would have gone on to have problems related to marijuana.

High Risk Youth

To begin our analysis on prevention program effectiveness, we first need to define our target group. How many youth would be affected by prevention programs? Obviously, this will depend on the targeted substance, and the potential for subsequent abuse of that substance. However, defining this group is further complicated by the nature of prevention programs: preventing substance use, and eventual substance abuse, from happening in the first place. A more critical question, then, is how to derive estimates of the number of youth who are likely to have substance use problems in the future.

There exists a vast body of research that describes “high-risk youth,” youth who are at increased risk for alcohol and drug use problems in the future. Many definitions of high-risk youth have been offered over the last 10 years. In 1989 the Office of Substance Abuse Prevention (OSAP) defined high-risk youth as those who are abused, neglected, homeless, runaway, economically disadvantaged, physically or mentally challenged, pregnant, school dropouts, children of substance abusers, or latchkey children (OSAP, 1989). In 1990 OSAP added conduct-disordered children with social deviancy to its list of high-risk youth, as well as youth who have a minority status. Race was added by OSAP in 1990 as a defining characteristic of high-risk youth because of the high levels of poverty, difficult environments, and educational problems often experienced by minority youth. Dryfoos (1991) noted that 51 percent of African Americans and 47 percent of Hispanic Americans are exposed to poverty, poor living conditions, and perform poorly academically compared to 17 percent of European Americans, and thus can be considered at high risk.

Research over the last 30 years has identified a host of risk factors for substance abuse, including:

- 1) Environmental factors such as the availability of substances, community laws and norms favorable to use, extreme economic deprivation, high rates of transition and mobility, and community disorganization;
- 2) Family factors, including family history of alcoholism, poor family management practices, parental drug use, favorable attitudes towards drug use, and family conflict;
- 3) School factors, including academic failure and low commitment to school; and
- 4) Individual and peer factors, including constitutional factors, peer rejection, early and persistent problem behavior, alienation and rebelliousness, friends who use drugs, favorable attitudes toward drug use, and early initiation of drug use (Hawkins et al, 1992; 1995).

While these risk factors have been shown to be associated with substance use, their causal links have not been clearly established and none stand out as an overarching predictor of later substance abuse. Most youth who grow up in poverty, for instance, do not go on to become substance users.

The National Longitudinal Study of Adolescent Health (Add Health, 1998; Blum et al., 2000) has refined the list of potential risk and protective factors by demonstrating that factors other than race/ethnicity, family structure, and income, are more closely tied to substance use. In particular, the study results suggest that these factors account for little variance as predictors for adolescent health-risk behaviors. For example, for cigarette smoking, only 4.1 percent of the individual differences in the amount of cigarette use among younger adolescents can be explained merely by knowing the youth's race/ethnicity, income, and family structure. For drinking, these same three demographic variables explained only 1.1 percent of the individual differences in frequency of alcohol use. The results of this study suggest factors such as school performance, peer relationships, parental supervision and relations, are much more accurate predictors of risky behaviors in adolescents. Although the relative importance of various risk and protective factors varied depending on the race and sex of the youth, the variance explained by these factors was grossly higher than that explained by simply knowing a youth's race, family structure and income. Considered jointly, the risk and protective factors on an individual level (e.g., school performance, physical maturity, self-esteem, abuse history), peer context (e.g., substance using friends), and family context (e.g., smokers in home, parent relationship), account for between 24 and 49 percent of the variance for cigarette use, and between 28 and 44 percent of the variance for alcohol use, depending on the race and sex of the youth.

One of the predominant problems in using the risk/protective factor approach to defining a target group is the issue of causality. While these factors have been shown to be associated with substance use, it is not clear that these factors are the cause of subsequent substance use. Indeed, personal development and the influence of the environment on behavior are so complex that it may never be possible to ultimately pin down a root cause for substance use. Undoubtedly, it is a consequence of many factors that tend to co-exist and interact with one another, including influences from peers, family context, societal norms, legal restrictions, and law enforcement – and this interaction is what lies behind substance use.

Estimating the Potential Target Youth for Analysis

The number of factors that have been identified as indicators of high-risk behavior is vast and includes a significant number of youth in the United States. While a relationship clearly exists between these factors and substance use, it is also the case that most youth who are characterized with these risk factors and who lack important protective factors do not go on to abuse substances. Thus, the number of youth who will be truly impacted by prevention programs is markedly smaller than the number of youth who are at risk for substance use. In order to derive some reasonable estimates on the number of youth who would potentially benefit from substance use prevention programs, we take two approaches. Neither approach is based on estimating the number of youth who will eventually go on to use substances because the linkages between current definitions of high risk youth and youth who eventually go on to abuse substances is inherently weak and establishing causality is virtually impossible. Both approaches used in this analysis use actual cases identified through a large survey as using and/or abusing substances. Since surveys of this type use self-report methods, the prevalence rates are inherently conservative in their estimates because of self-report censoring.

The first approach is a more conservative approach and takes the number of youth identified in the SAMHSA sponsored National Household Survey on Drug Abuse (1999) as dependent on substances according to DSM IV criteria. The DSM IV substance abuse criteria identify youth who not only use substances heavily, but also provides some indication of the substance use having affected the youth in some harmful way. The second approach, a more liberal approach, uses the number of cases of current users, a decidedly larger value, but one intended to provide an upper boundary on the number of youth who are likely to go on to use and abuse substances in the future.

To start, we must first develop a ratio of the number of youth who fall in each of these two categories relative to the general California youth population. The NHSDA reports data in age blocks, the most relevant for our purposes being the 12-17 year block. According to the survey, almost 3 million youth in California fall in this age bracket in 1999 (Table 4 on next page).

Table 4 California Youth Population

		AGE GROUP (years)		
	Total	12-17	18-25	26 or older
TOTAL	25,542,145	2,819,048	3,435,673	19,287,425

* NHSDA, 1999

The survey reports the number of cases of drug and alcohol dependents by substance. These data are displayed in Table 5.

Table 5 Past Year Dependence – California Youth between 12 and 17; 1999*

	Cases	Percent
Total population between 12 and 17	2,996,832	100.0%
Illicit drug	119,873	4.0%
Illicit drug or alcohol	173,816	5.8%

*NHSDA, 1999

Because the data on drug dependence is aggregated across all illicit drugs, using the prevention reduction estimates from the RAND study is problematic. However, this is potentially not a large issue since the rates suggested by the study vary mostly according to whether the drug is illicit (i.e. marijuana, cocaine) or licit (i.e. alcohol, cigarettes). We thus use a combined average prevention estimate across the two illicit drugs and alcohol separately. This is displayed in Table 6.

Table 6 Estimated Low, Middle, and High Effects of Prevention

Category	Low	Middle	High
Illicit drugs	2.4%	6.9%	13.2%
Alcohol	1.7%	3.5%	5.4%
Average	2.1%	5.2%	9.3%

*RAND

The average of the illicit drugs and alcohol is provided as an estimate for the prevention effects of the total sample of youth who are either alcohol or drug abuse dependent. Translating the estimated number of dependent youth who would have been “saved” by involvement in prevention programs from these varying rates of prevention reduction is simply the product of the total number of dependents and the prevention reduction percentages provided in Table 6. This is presented in Table 7 below.

Table 7 Estimated Number of Avoided Dependent Users Based on Prevention Effects

Category	Low	Middle	High
Illicit drug use	2,877	8,271	15,823
Illicit drugs and alcohol combined	3,650	9,038	16,165

The same logic can be applied to our more liberal definition of the target population, 30-day users. For this analysis, illicit drug use was defined as any use of illicit drugs within the last 30 days, and alcohol use was restricted to binge drinkers (youth who have had five or more drinks on one occasion during the last month). For purposes of comparison, cigarette use is also included. The number of cases and proportion of the youth population are displayed in Table 8.

Table 8 *Estimates of Past Month Use of Selected Drugs in California, 12-17 Year Olds; 1999*

	Cases	Percent
Total population between 12 and 17	2,819,048	100.0%
Any illicit drug	335,467	11.9%
Marijuana	236,800	8.4%
Illicit drug other than marijuana	160,686	5.7%
Cigarette	253,714	9.0%
Binge Alcohol ¹	296,000	10.5%

¹Having 5 or more drinks on at least one occasion in the last 30 days

Prevention effectiveness ratios from Table 6 are replicated on the next page, plus effectiveness for cigarette use prevention (Table 9).

Table 9 *Estimated Low, Middle, and High Effects of Prevention*

Category	Low	Middle	High
Illicit drugs	2.4%	6.9%	13.2%
Alcohol	1.7%	3.5%	5.4%
Average (for illicit drugs and alcohol)	2.1%	5.2%	9.3%
Cigarettes	0.8%	3.0%	6.7%

* RAND

Based on the prevention effectiveness estimates provided in Table 9, the actual number of cases for illicit drugs, alcohol, and cigarettes can be computed, as shown in Table 10.

Table 10 *Estimated Number of Avoided Monthly 12-17 Age Users Due to Prevention*

Category	Low	Middle	High
Illicit drugs	8,051	23,147	44,282
Alcohol	5,032	10,360	15,984
Cigarettes	2,030	7,611	16,999

Cost Effects

Alcohol and drug abuse exert a tremendous cost to individuals and society. The most thorough analysis on the economic costs of alcohol and drug abuse in the United States was conducted by the Lewin Group in 1998, who estimated the costs of AOD use at over \$276 billion in 1995; about \$166 billion for alcohol abuse and about \$109 for drugs. Three major cost categories accounted for these expenses:

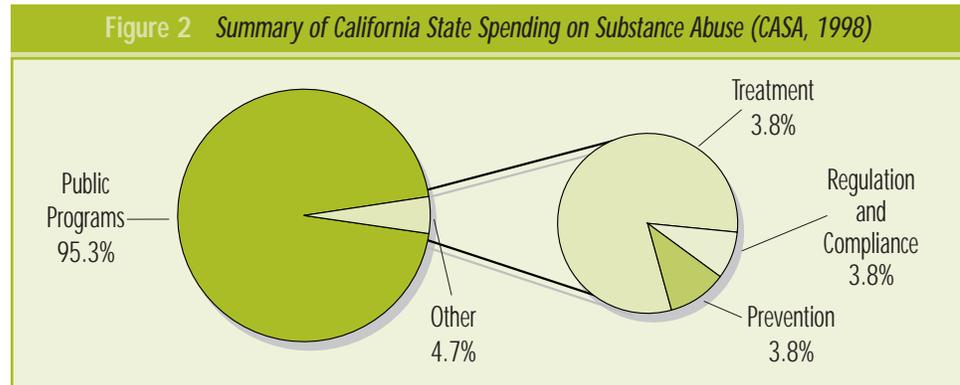
- 1) Health care expenditures, including specialty alcohol and drug services and medial consequences;
- 2) Productivity impacts, including lost earnings due to premature death, illness, and costs due to crime and loss to victims; and
- 3) Other impacts, such as motor vehicle accidents, fire damage, and criminal justice and welfare expenditures related to substance abuse.

While the Lewin Group cost estimates encompassed all costs to society at large, the focus of the current study is to provide some estimates of the impact prevention programs can have on state budget expenditures. Using data from the State perspective is particularly relevant because by far states carry the bulk of the burden of costs due to alcohol and drug abuse. For example, states shoulder the burden for running Medicaid programs, funding and operating child welfare systems and prison systems, and are seriously affected by the burden of alcohol and drug problems in elementary and secondary public school systems. A recent study by the National Center on Addiction and Substance Abuse (CASA, 2001) provides data that offers a glimpse of the magnitude of the burden of substance abuse to states. The study estimates that, on average, over 13 percent of state budgets are used to deal with substance abuse, a total of \$81.3 billion across all states in 1998. In California, the percentage of the state budget used to deal with substance abuse problems is slightly higher than the national average at 16 percent, which translates to a staggering amount totaling almost \$11 billion in 1998. It is worth noting that that this does not include the total financial toll of substance abuse from federal and local spending or the enormous private costs such as lost productivity and premature death. CASA estimates, for example, that local governments spend an amount equal to states for education related costs. California State costs by category are shown in Table 11.

Table 11 Summary of California State Spending on Substance Abuse (1998; CASA, 2001)

	State Spending by Category (\$000)	Spending related to substance abuse			
		Amount (\$000)	Percent	As percent of state budget	Per capita
Affected Programs:	\$51,567,629.9	\$10,428,035.2		15.2%	\$323.67
Justice	\$4,955,896.0	\$4,053,556.7		5.9%	\$125.82
Adult corrections	\$4,560,686.0	\$3,780,101.8	82.9%		
Juvenile Justice	\$393,852.0	\$272,096.8	69.1%		
Judiciary	\$1,358.0	\$1,358.0	100.0%		
Education (elementary/secondary)	\$22,082,082.0	\$2,474,734.9	11.2%	3.6%	\$76.81
Health	\$8,310,362.0	\$2,040,249.0	24.6%	3.0%	\$63.33
Child/Family Assistance	\$6,039,691.0	\$1,404,025.2		2.1%	\$43.58
Child welfare	\$976,837.0	\$709,247.7	72.6%		
Income assistance	\$5,062,854.0	\$694,777.5	13.7%		
Mental Health/Developmentally Disabled	\$1,445,865.0	\$368,168.5		0.5%	\$11.43
Mental health	\$515,348.0	\$279,198.6	54.2%		
Developmentally disabled	\$930,517.0	\$88,969.9	9.6%		
Public Safety	\$220,115.0	\$58,300.1	26.5%	0.1%	\$1.81
State Workforce	\$8,513,618.9	\$29,000.9	0.3%	0.0%	\$0.90
Regulation/Compliance:	\$41,555.0	\$41,555.0	100.0%	0.1%	\$1.29
Licensing and control	\$35,238.0	\$32,238.0			
Collection of taxes	\$6,317.0	\$6,317.0			
Prevention, Treatment and Research:	\$472,442.0	\$472,442.0	100.0%	0.7%	\$14.66
Prevention	\$54,295.0	\$54,295.0			
Treatment	\$418,147.0	\$418,147.0			
Research	\$0.0	\$0.0			
TOTAL		\$10,942,032.2		16.0%	\$339.63

The major spending areas are displayed in Figure 2 below.



Two important points are apparent from the data displayed in Figure 1. The first is that substance abuse problems significantly impact a wide variety of major programs that are largely supported through state tax dollars. The impact of substance abuse on these programs represents 15.2 percent of the overall state budget, over \$10 billion in 1998. The second important point is that the burden of substance abuse to public programs represents 96 percent of all the substance abuse related expenditures. Only about four percent of total expenditures, a little over \$500 million in 1998, is earmarked for regulation and compliance, prevention, treatment, and research.

How Much is the State Saving Due to Prevention Efforts?

In order to roughly gauge the effects of prevention programming on state government costs for alcohol and drug use, we need to multiply our estimates of prevention program reduction effectiveness by the total costs to the state. The logic behind this assumes an equal proportion of costs for each individual with alcohol or drug use problems. For this calculation, we use an average effectiveness rate across both illicit drugs and alcohol, as in the previous analysis: 2 percent for the low estimate, 5.2 percent for the middle estimate, and 9.3 percent for the high estimate. This analysis yields the following estimates for cost savings to California due to prevention programs, displayed in Table 12.

Table 12 *Savings in Juvenile Justice and Education Costs to State of California based Prevention Effects and CASA Data*

	Low (2.1%)	Middle (5.2%)	High (9.3%)
Juvenile Justice	\$5,714,033	\$14,149,034	\$25,305,002
Education	\$51,969,433	\$128,686,215	\$230,150,346
Total	\$57,683,466	\$142,835,248	\$255,455,348

Unfortunately, the health costs provided in the CASA report are not broken down into costs to youth versus costs to adults, so it is not possible to estimate health related cost savings to youth positively affected by prevention programs. Note that the data shown in Table 11 are only for programs directly tied to youth services. They do not include costs to other segments of society, nor do they include future projections of costs related to substance abuse, such as impaired productivity or adult incarceration due to drug involvement, costs to victims of crime, motor vehicle accidents, and the host of negative health consequences due to substance use. Including these factors in estimating state-related cost savings due to prevention programs would make the analysis much more complicated, but it would also offer a more comprehensive picture of the overall burden to the state of alcohol and drug abuse. EMT is currently analyzing this question and will provide a more comprehensive report in the future. The present report constrains the analysis to the two most immediate benefit areas for prevention programs, education, and juvenile justice. Even with this restriction, these data demonstrate an enormous cost to California that can potentially be avoided through prevention efforts.

Based on the data in Table 11, a strong case can be made for increasing funding for the relatively small allocation of the substance abuse budget to prevention efforts of \$54 million. Restricting the savings to the state to only the two most immediate outcomes, juvenile justice and education, and using our low estimate

of prevention effectiveness of 2.1 percent yields slightly higher than a break-even point of over \$57 million. Using our middle effectiveness figure, a total of \$142 million could have been saved through prevention efforts using an effectiveness rate of 5.2 percent for juvenile justice and education costs combined. Assuming an equal return for the prevention dollar, doubling the prevention budget to \$108 million would yield over a quarter billion dollars (\$284 Million) in savings. Using our high prevention effectiveness rate of 9.3 percent yields savings of \$255 million based on current prevention funding. Doubling this figure yields a savings of over one-half a billion dollars (\$511 million) per year. Again, this savings is an immediate savings to the two primary youth areas of juvenile justice and education. It does not include the more significant long-term savings due to the long-term health, safety, and productivity loss costs of adult dependence on substances.

Another factor that has not yet been taken into consideration yet is the social multiplier. The social multiplier is based on the notion that adolescents use drugs and alcohol primarily because of peer pressures and other social influences. If a program prevents a youth from using alcohol or other drugs, then it is reasonable to assume that negative influence on other youth was avoided. In the RAND analysis, several estimates were made of the social multiplier, ranging from a conservative multiplier of one (implying no social influence from a youth prevented from AOD use) to 2.9, implying 2.9 other youth were positively influenced by the prevented youth. RAND estimates a middle value of 2.0. Using these three values yields the following cost savings for the areas of juvenile justice and education, displayed in Table 13.

Table 10 *Juvenile Justice and Education Related Cost Savings to State of California with Social Multiplier of 1, 2, and 2.7*

	Social multiplier		
	1	2	2.7
Juvenile Justice ¹	\$5,714,033	\$28,298,067	\$73,384,507
Education ²	\$51,969,433	\$257,372,430	\$667,436,003
Total	\$57,683,466	\$285,670,497	\$740,820,509

¹ Includes substance abuse related costs (66.3% of total) for juvenile corrections facilities including residential centers, boot camps, and work/study camps; diversion programs + 100% of costs of alcohol and drug programs.

² Includes lost productivity of staff plus added staffing; special programs for at risk youth, special ed programs for Substance Abuse related disabilities, student assistance programs, alcohol and drug related truancy, added administration costs, property damage and liability insurance costs driven by alcohol and drugs, higher health insurance costs for substance involved staff; legal expenses linked to a alcohol and drugs, drug testing costs, employee assistance for substance abusers, employee training.

Conclusion

In this report, we have used some of the available research evidence on the prevalence of alcohol and drug use in combination with estimates for various effectiveness rates for prevention programs. Clearly, much more research is needed to better understand how effective prevention programs are at curbing alcohol and drug use and at delaying the initiation of first use. Longitudinal studies that follow youth who have participated in prevention programs into adulthood are needed to understand if prevention programs have lasting effects and, if they do, the magnitude of the effect. Until then, we are left in the position of making assumptions and using what data is available to make an educated estimate of the relationship of prevention programs and cost savings.

Because of the uncertainty involved in making these estimates, we provide a range of program effectiveness rates, from conservative values in which prevention programs positively influence a small number of individuals (2.1%) to a more liberal estimate of prevention program effectiveness (9.3%). Through this analysis, what is evident is that even low prevention effectiveness rates can have significant cost savings benefits because of the fact that the use of alcohol and drugs is so widespread and the costs associated with each individual who has a drug or alcohol problem are so high. They are so high, in fact, that we estimate a break even point with our lowest estimate of program effectiveness even when we restrict the areas of cost reduction to the two areas most closely tied to youth, education and juvenile justice. In other words, if \$54 million was spent on prevention efforts by the state, then our most conservative effectiveness rate of 2.1 percent yields a cost savings of \$57 million.

If we make any adjustments to our most conservative assumptions the cost benefits of prevention programs skyrocket. For example, if we use our middle estimate of program effectiveness (5.2%), the cost savings are estimated to be \$142 million. Of course, juvenile justice and education are only part of the picture and, if other cost categories were included, the cost savings are immense.

In sum, the state spends an enormous amount of resources on problems associated with alcohol and drugs, and most of this spending is for the consequences of the problem. A very small fraction of state resources are spent on treating the problem and an even smaller fraction is spent on attempting to prevent the problem in the first place. Yet we have seen in this analysis that even very modest prevention program effects can have profound cost savings. The evidence indicates that the old maxim, “An ounce of prevention is worth a pound of cure,” rings true for alcohol and drug use prevention.

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