

# The Corrosive Effects of Alcohol and Drug Misuse on NH's Workforce and Economy

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**Prepared by:**



*The Corrosive Effects of Alcohol and Drug Misuse on NH's Workforce and Economy*  
New Futures Introduction

According to the Center for Behavioral Health Statistics and Quality's *National Survey on Drug Use and Health*, nearly nine percent of individuals age 12 and over in New Hampshire misused alcohol or drugs in 2012. This means that nearly 100,000 New Hampshire residents are dependent on or abuse alcohol and/or drugs every year. Substance misuse is associated with significant losses in worker productivity in the form of reduced workforce participation, reduced worker productivity, and absenteeism that reduce economic growth; increased healthcare and criminal justice costs; and adverse social and family consequences.

In the last several years two seminal national studies were released that examined the economic impact of alcohol and drug misuse:

- Ellen E. Bouchery, et al, *Economic Costs of Excessive Alcohol Consumption*, released by the United States Centers for Disease Control and Prevention and the Lewin Group in 2012, which found that the cost of excessive alcohol consumption in the United States reached 223.5 billion in 2006, of which 72% of the costs were attributed to workplace productivity;
- National Drug Intelligence Center, *The Economic Impact of Illicit Drug Use on American Society*, released by the United States Department of Justice in 2011, which found that the economic impact of illicit drug use was \$193 billion in 2007, of which 62% of the costs were attributed to workplace productivity.

In 2012, New Futures contracted with PolEcon Research to undertake an independent, comprehensive analysis of the costs of excessive alcohol consumption in New Hampshire. The PolEcon report, *The High Cost of Excessive Alcohol Consumption in New Hampshire*, was released in December 2012. Since that time public concern about drug misuse has increased as alarming data about the dramatic increase in opioid (prescription opioids and heroin) and other drug misuse was released. The need to examine the collective economic impact of both alcohol and drug misuse lead New Futures to contract with PolEcon Research for an independent, comprehensive analysis of the impact of alcohol and drug misuse in New Hampshire which would include both an update of its 2012 report on the economic impact of excessive alcohol consumption and an analysis of the economic impact of drug misuse.

As New Hampshire has emerged from the great recession, much public attention and debate has focused on the state of the post-recession New Hampshire economy and the need to identify strategies and public policies that can be put into place to strengthen our economy and spur economic growth. New Futures believes that the analysis of the economic and societal cost of alcohol and drug misuse in New Hampshire will be of critical importance to policy makers and advocates in 2015 as the state seeks as part of the State Fiscal Year 2016/2017 budget process, to wisely invest its limited resources to promote economic growth and the public health and wellbeing of its citizens. To this end, New Futures is pleased to provide the November 2014 PolEcon Report, *The Corrosive Effects of Alcohol and Drug Misuse on NH's Workforce and Economy*.

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## Executive Summary

According to the Center for Behavioral Health Statistics and Quality's *National Survey on Drug Use and Health*, nearly nine percent of individuals age 12 and older in New Hampshire misused alcohol or drugs in 2012.<sup>a</sup> That means nearly 100,000 Granite State residents are dependent on or abuse drugs and alcohol every year, with tragic consequences for individuals and families that also exert a significant drag on the current performance and longer-term prospects for the New Hampshire economy. Drug and alcohol misuse are major causes of widespread illness, disability, and premature death. The burden on society of these disorders includes significant losses of productivity that reduce economic growth, the use of costly medical resources, serious motor vehicle accidents, and criminal activity. This report estimates the cost borne by citizens, businesses, government, and the larger New

<b>1</b>		
<b>Summary of NH Costs of Substance Misuse in 2012 (\$ Millions)</b>		
	<b>Annual Costs</b>	<b>Lifetime Costs Related to Annual Impacts</b>
<b>Productivity</b>		
Impaired Productivity	\$1,084.36	
Absenteeism	<u>\$66.40</u>	
<b>Subtotal</b>	<b>\$1,150.76</b>	
<b>Premature Death*</b>		<b><u>\$392.9</u></b>
<b>Health Care</b>		
Substance Misuse Treatment	\$15.60	
Medical Care	\$230.76	
<u>Insurance Administration</u>	\$19.61	
<b>Subtotal</b>	<b>\$265.98</b>	
<b>Criminal Justice</b>		
Police Protection	\$139.92	
Judicial System	\$27.64	
Corrections	\$100.06	
Cost to Crime Victims	\$11.69	
<u>Victim Productivity Loss</u>	<u>\$4.77</u>	
<b>Subtotal</b>	<b>\$284.08</b>	
<b>Other Costs</b>		
Motor Vehicle Crashes	\$73.88	
State and Local Tax Revenue	<u>\$61.04</u>	
<b>Subtotal</b>	<b>\$134.92</b>	
<b>Grand Total</b>	<b>\$1,835.74</b>	<b>\$2,228.62</b>
NH Gross State Product \$ Millions (2012)	\$66,111	\$66,111
Substance Misuse Costs as a % of GSP	2.8%	3.4%
*Included in separate total because of difference in accounting		

Hampshire economy as a result of the misuse of alcohol and drugs in 2012.<sup>1</sup> The report estimates the costs attributable to substance misuse in four broad areas: the productivity of individuals and

<sup>a</sup> In this report “alcohol and drug misuse” is used interchangeably with “substance misuse,” with the term “misuse” indicating either “abuse” of, or “dependence” on the substance. In addition, drug misuse includes both the abuse of, or dependence on illegal drugs as well as the non-medical use of prescription drugs.

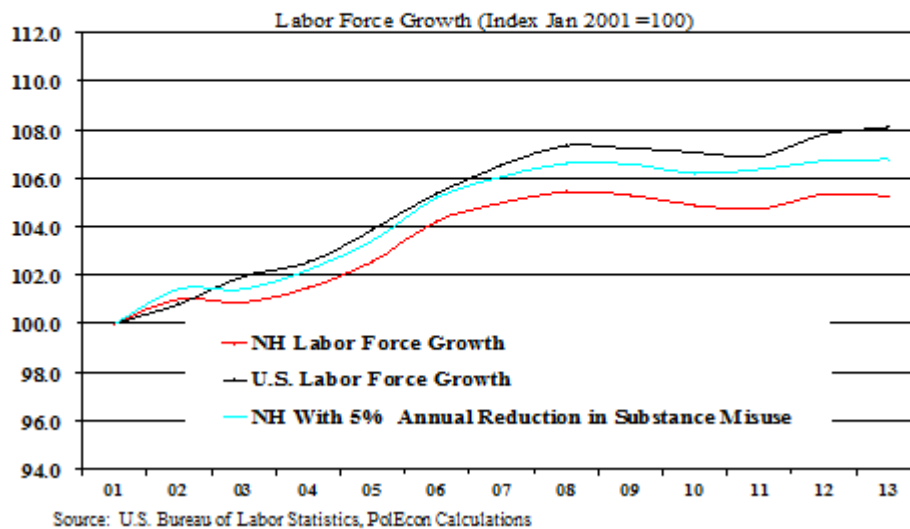
businesses, criminal justice, health care, and other costs. Throughout this report the terms costs and losses are used interchangeably to represent the dollar values assigned to the adverse impacts associated with alcohol and drug misuse, which includes both dependency and misuse of these substances.

In total, alcohol and drug misuse cost the New Hampshire economy over \$1.84 billion dollars in 2012, an amount equal to about 2.8 percent of the state’s gross state product<sup>2</sup> or \$1,393 dollars for every person in the state. Another \$392.5 million in discounted lifetime earnings were lost by the 552 individuals who died prematurely in New Hampshire in 2012 as a result of alcohol and drugs. These additional mortality costs are not included in the \$1.84 billion total cost to New Hampshire.

By far the greatest cost of substance misuse in New Hampshire is in the form of lost productivity of individuals in the state who are dependent on or who abuse alcohol or drugs. Productivity losses attributable to substance misuse cost the state about \$1.15 billion in 2012. The productivity impact of drug and alcohol misuse on the New Hampshire economy is so significant that the problem must be considered in the context of the impact it has on the long-term prospects for the New Hampshire economy. Decades of above average economic growth in the state have more recently been replaced by nearly a decade of below average economic growth in the state. Much of the responsibility for slower economic growth can be attributed to slower growth in the number, skills, and education of working age individuals in the state, to all of which substance misuse contributes. By reducing the number of individuals in New Hampshire’s labor force and by decreasing the skills and productivity of individuals who are in the labor force, substance misuse in NH exacerbates key demographic and human resource issues that contribute to slower economic growth in the state.

A plateau in New Hampshire’s labor force is creating a structural drag on employment and capping job, income, and spending growth in the state. Alcohol and drug misuse reduces the size of New Hampshire’s labor force. The large substance misuse related reduction in the productive

**Figure 1**  
**Small Annual Reductions in Substance Misuse Would Increase the Labor Force, Productivity and Employment Growth of the NH Economy**



capacity of the New Hampshire labor force means that substance misuse is correctly viewed not only as a public health crisis but also as an economic policy issue. Increasing the productive capacity of NH citizens while limiting the costs of the substance misuse in the state can enhance the long-term growth prospects for the New Hampshire economy.

Figure 1 shows how small annual reductions in substance misuse in New Hampshire would have, over time, significantly increased the potential growth in the New Hampshire economy by increasing the growth rate of the New Hampshire labor force. In addition, reducing substance misuse would reduce the productivity losses (and increase earnings) among workers in the New Hampshire workforce who misuse alcohol or drugs.

The most fundamental question raised by the cost estimates presented in this report is whether New Hampshire is committing adequate resources to prevent and treat the serious problem of drug and alcohol misuse. Spending for substance misuse treatment in New Hampshire is low compared to states with similarly sized populations, and even lower than states with half as many citizens as New Hampshire, despite NH having a high or higher percentage of residents with substance misuse problems. A 2011 study by the U.S. Department of Health and Human Services indicated that in only one state (Texas) is an individual in need of substance misuse treatment less likely to receive treatment than in New Hampshire.<sup>3</sup>

Doubling the number of individuals in New Hampshire in need of treatment for substance misuse who receive treatment would still mean that only about 12 percent of those in need would receive treatment and would come at an additional cost of approximately \$15 million (\$30 million total cost). Based on thorough cost benefit studies, however, this increase in treatment can be expected to lower substance misuse costs in the state by as much as \$227 million annually and produce net benefits of as much as \$196 million. Larger reductions in the number of individuals in NH who misuse alcohol or drugs, through prevention, treatment, and recovery support could provide a powerful boost to the productive capacity of the New Hampshire economy.

Other key findings of this report include:

### **Productivity**

- Productivity losses account for the largest share of costs associated with substance misuse in NH, an estimated \$1.15 billion in 2012.
- Alcohol misuse accounts for about 80 percent of the productivity losses attributable to substance misuse.

### **Mortality (Premature Death) Costs**

- Drug attributable deaths in New Hampshire have more than tripled since 2000.
- The 340 alcohol attributable deaths and 212 drug attributable deaths in New Hampshire resulted in a discounted lifetime earnings costs of \$392.9 million in 2012.

## **Health Care**

### **Treatment Services**

- Since 2001, the percentage of all substance misuse treatments in New Hampshire that are for opioids has risen from 11 percent to 45 percent. Opioid treatments have accounted for virtually all of the increase in substance misuse treatments in the state since 2001.
- Over 5,900 individuals received substance misuse treatments services in 2012, at a cost of over \$15 million.
- The majority (53%) of individuals receiving substance misuse treatment in NH in 2012 paid for the services “out-of-pocket,” compared to just 17 percent nationwide.
- State and local government paid no more five percent of substance misuse treatment costs, including one-half of the five percent of treatment costs paid for by Medicaid.

### **Medical Costs**

- Health care costs attributable to substance misuse in New Hampshire were \$265.8 million in 2012.

## **Criminal Justice**

- Crime and criminal just costs attributable to substance misuse cost \$284.08 million in NH in 2012.
- About 39 percent of policing costs in the State of New Hampshire were attributable to substance misuse in 2012.
- Substance misuse was responsible for 23 percent of judicial costs, and 53 percent of corrections costs in New Hampshire in 2012.
- Two-thirds (\$186.6 million) of the crime and criminal justice costs of substance misuse in New Hampshire is the result of drug misuse, while one third (\$97 million) is the result of alcohol misuse.

## **Other Costs**

### **Motor Vehicle Crashes**

- The estimated cost of substance misuse attributable motor vehicle crashes (after subtracting crash-related medical and productivity costs which are included in other cost categories) was \$73.9 million in NH in 2012.

### **State and Local Government Revenue Loss**

- Fewer individuals in NH’s labor force, the lower average earnings and productivity of workers who misuse alcohol or drugs combine to reduce state and local revenues in New Hampshire by about \$61 million annually.

## **Public Policies**

### **Increased Prevention and Treatment**

- Only about six percent of individuals who misuse alcohol or drugs in New Hampshire currently receive treatment for their substance misuse.
- For every one percent increase in substance misuse treatment rates in New Hampshire, net benefits (economic benefits minus the costs of treatment) increase by between \$7 and \$16 million.
- Doubling the substance abuse treatment rate in New Hampshire from six percent to 12 percent is estimated to result in net benefits to the state of between \$83 and \$196 million.

### **I. Introduction**

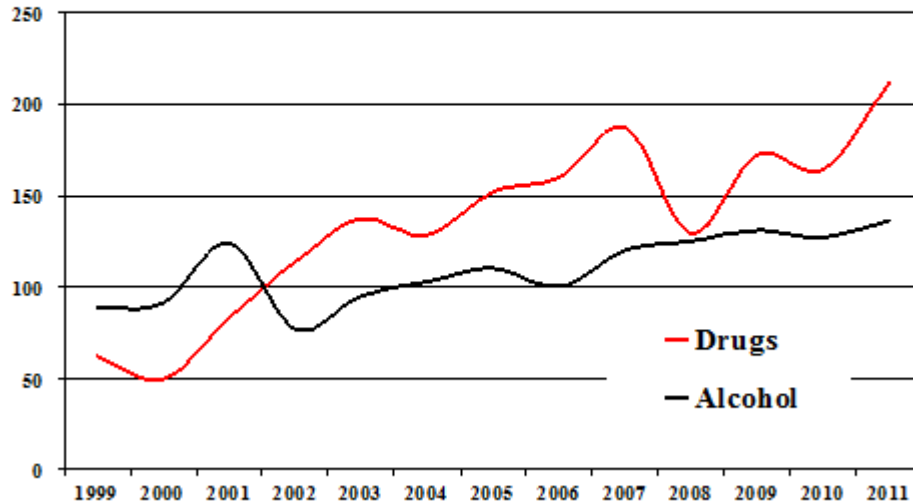
The problem of alcohol and drug misuse continues to be a major economic and public health issue, with serious economic, personal, and social consequences for New Hampshire and the nation. Alcohol and drug misuse are major causes of illness, disability, and premature death. The burden on society of these disorders encompasses significant productivity (economic) losses; the use of costly health care resources; serious injuries from motor vehicle accidents; and criminal activity resulting in property losses, increased use of policing and judicial resources, as well as increased incarceration.

Although it is not possible to monetize all of the consequences of drug and alcohol misuse, some of the economic losses can be estimated. A comprehensive analysis of the economic costs of alcohol and drug misuse is critical for two reasons. First, public and private resources are allocated for prevention, treatment, and recovery support based upon perceived needs and priorities. Understanding the economic impact of substance misuse is necessary in order to assess the need for treatment, prevention, and recovery supports to justify the allocation of resources to meet this need. Second, it is important to determine if the economic impact of substance misuse is changing over time and which cost components are contributing most to this change

In 2012 New Futures released a report on the economic impact of excessive alcohol consumption in New Hampshire.<sup>4</sup> Since that time, there has been a growing alarm nationally over the rise and consequences of drug misuse, with increases in opioid use especially alarming.<sup>5</sup> In New Hampshire these concerns are validated by the dramatic rise in drug-related deaths in the state. Since 2000, drug-related deaths in New Hampshire have tripled (Figure 2).



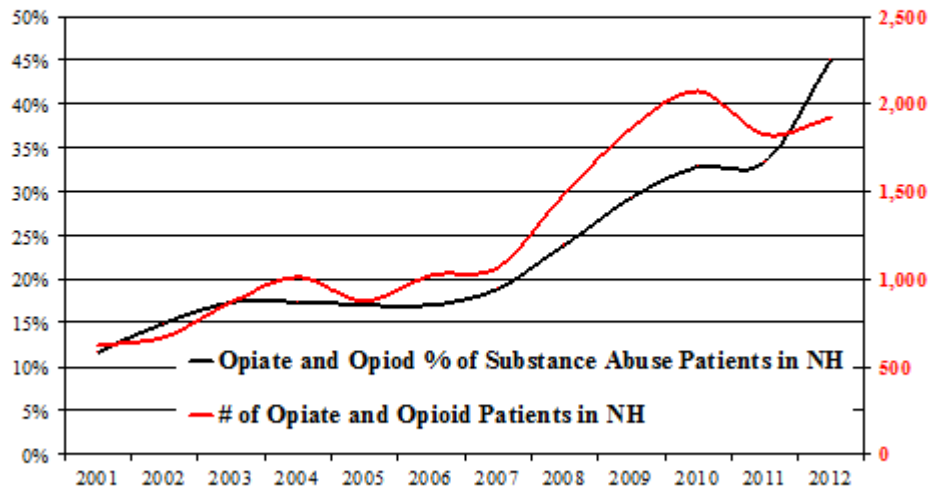
Figure 2  
**Drug Related Deaths in New Hampshire Have More than Tripled Since 2000**



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. "Underlying Cause of Death"

The increasing problem of drug use in New Hampshire, especially opioid misuse, is also apparent from data on substance misuse treatment in the state. Figure 3 shows that in 2012, opioids were the primary substance for which 45 percent of individuals entered substance misuse treatment programs in New Hampshire, up from just 11 percent in 2001. The number of individuals entering treatment for opioid misuse tripled during that time, a number consistent with the percentage increase in drug-related deaths over the same time period. In 2012, the number of individuals entering substance misuse treatment for opiates and opioids in New Hampshire was nearly as large as those seeking treatment for alcohol misuse.

Figure 3  
**More Individuals Receiving Substance Abuse Treatment in NH are Doing So for Opiates and Opioids. Opiate and Opioid Abuse Accounted for 45% of Primary Substance Abuse Treatments in 2012**



Source: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS A)

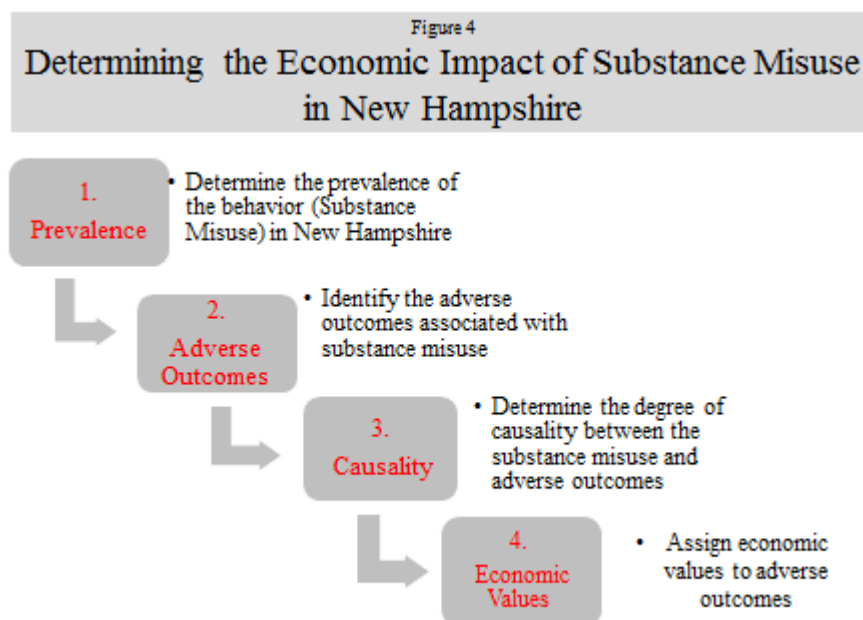
To make informed decisions concerning the allocation of public funds, policymakers need to understand the economic burden imposed by substance misuse in New Hampshire. More specifically, policymakers need an estimate of the potential amount of money saved if substance misuse were reduced or eliminated. Policy studies such as this report highlight the economic impact of substance misuse on society and are routinely used by policymakers to justify and prioritize prevention, intervention, recovery support, and research programs.

## II. Methodology

This study updates the findings from our 2012 report on the economic costs of excessive alcohol consumption in New Hampshire and documents some of the public and private sector costs attributable to drug misuse in New Hampshire. Similar to our 2012 alcohol cost study, this study takes into account losses in productivity (foregone earnings), health care costs, criminal justice and other costs associated with substance misuse. In addition, this study expands some of the measures of productivity and criminal justice costs used in our 2012 report.

Differences in data availability as well as the findings from prior research nationally on the costs of alcohol and drug misuse result in some differences in the methods used and comprehensiveness of costs estimates for alcohol misuse and those for drug misuse in this report. Specifically, the methods used to estimate the productivity impacts of alcohol and drug misuse differ fundamentally. Thus it is problematic to compare the magnitude of cost between alcohol misuse and drug misuse.

The basic approach to estimating the economic costs of substance misuse in New Hampshire involves determining the prevalence of substance misuse in the state; identifying the adverse consequences associated with substance misuse; determining the degree of causality between substance misuse and adverse outcomes; and finally assigning economic values to adverse outcomes. Figure 4 presents an schematic overview of the methodology used in this



report. A more detailed explanation of the methodologies employed for calculating the economic impacts of substance misuse on productivity, medical expenditures, criminal justice, and other costs in New Hampshire is contained in Appendix A.

### III. Productivity Costs of Substance Misuse

Studies of the cost of substance misuse generally view illness, impaired function, hospitalization, incarceration, and death resulting from the misuse or use of alcohol and drugs as a loss of potential productivity. Substance misuse reduces the productivity of the labor force by reducing both the number of individuals in the labor force and the productivity of those individuals who are employed in the labor force. Substance misuse can interfere with an individual's ability to gain employment, it can result in some individuals leaving the workforce, and it can negatively affect an individual's productivity while at work. For this study PolEcon valued losses in productivity using the human capital approach (HCA). HCA assumes an individual's expected future earnings reflect that individual's potential contribution to the economy. In other words, the value of lost productive time is equivalent to what that individual would be expected to earn if they were fully functioning in the labor market. Market productivity includes cash wage and salary earnings and employer provided fringe benefits (i.e., insurance, retirement) and legally required employer costs (i.e., Social Security, Medicare, unemployment insurance, and workers' compensation). Our 2012 study of the costs of excessive alcohol consumption in New Hampshire did not include benefits and employer mandated costs but because most studies of the costs associated with substance misuse include benefit and employer mandated costs, those costs are included in this report. For this reason, the estimates of the productivity losses associated with alcohol misuse from our 2012 report are not directly comparable to the estimates in this report. Table 2 presents a summary of the estimated decrease in total productivity in the New Hampshire economy resulting from substance misuse.

The estimates of the productivity costs from alcohol and drug misuse in this report differ from many studies because our productivity cost estimates do not include the costs associated with lost household productivity by those who misuse alcohol and drugs. Household services are not valued in a market, increasing uncertainty and subjectivity and the potential for errors in their estimation.

<b>Cost Category</b>	<b>Total Productivity Losses</b>	
	<b>Alcohol</b>	<b>Drugs</b>
Labor Participation & Reduced Productivity Impact on Earnings	\$907.91	\$176.45
Absenteeism	\$32.44	\$33.96
Mortality	\$271.00	\$231.53

#### A. The Productivity Costs of Alcohol Misuse

##### Key Findings:

- Productivity losses account for the largest share of costs associated with alcohol misuse in NH, an estimated \$940.4 million in 2012.

Total annual productivity impacts are the sum of labor force participation impacts, the earnings impacts of alcohol misuse by those employed in the labor force, and the impacts of

absenteeism caused by one particular type of alcohol misuse: binge drinking. Premature deaths related to alcohol misuse also reduce productivity as society loses individuals who would otherwise be working and earning if their lives had not been shortened by alcohol-related causes. The calculation of the costs related to premature death involve a discounted, present value analysis of lifetime earnings for those who die prematurely rather than a single year cost estimate. For that reason the mortality costs of excessive alcohol consumption are reported but not tallied in our annual cost estimates. Instead, they are reported as separate cost. The labor force and earnings impacts of alcohol misuse are estimated for males only and thus represent a conservative estimate of the productivity impacts of alcohol misuse. Research nationally found that while alcohol misuse affects female labor force participation and productivity, researchers could not be at least 95 percent certain that the impacts were directly attributable to alcohol misuse. This is discussed more thoroughly in the productivity methods section of Appendix A.

## Reduced Labor Force Participation

### Key Findings:

- Alcohol misuse resulted in an estimated 9,237 fewer male workers in NH’s labor force in 2012, an overall reduction in the state’s labor force of 1.2 percent
- The alcohol-attributable reduction in the state’s labor force resulted in an associated loss of earnings in the NH economy of \$583.4 million in 2012.

### Results:

Alcohol misuse among males in NH age 18-64 results in an estimated loss in labor force participation of 9,237 males from the NH workforce, representing an overall reduction in labor availability among men of 2.2 percent and a total labor force reduction in New Hampshire of 1.2 percent.

Table 3 presents our estimates of the loss of earnings in the New Hampshire economy that results from lower labor force participation rates associated with alcohol misuse. The table shows that the impact of 9,237 fewer workers in the NH labor force as a result of alcohol dependency is an associated productivity loss (as measured by earning loss) of \$583.4 million.

<b>Age</b>	<b>Male Pop.</b>	<b>LF Partic. Rate</b>	<b>Labor Force</b>	<b>Mean Earnings</b>	<b>Total Wages (Millions)</b>	<b># in Labor Force W/Alcohol Dependency<sup>6</sup></b>	<b># Not in Labor Force Because of Alcohol Dependency<sup>7</sup></b>	<b>Labor Force W/O Dependency</b>	<b>Total Wages W/O Depend.</b>	<b>Dependency Cost (\$ Millions)</b>
18-19	18,734	51.7%	9,685	\$6,456	\$62.5	1,819	732	10,418	\$67.26	(\$4.7)
20-24	43,583	82.0%	35,738	\$25,209	\$900.9	8,620	1,213	36,951	\$931.51	(\$30.6)
25-34	73,506	90.5%	66,523	\$52,033	\$3,461.4	14,396	1,468	67,991	\$3,537.8	(\$76.4)
35-44	86,516	93.8%	81,152	\$89,390	\$7,254.1	16,133	1,445	82,597	\$7,383.3	(\$129.2)
45-54	109,934	91.3%	100,370	\$79,060	\$7,935.2	17,846	2,085	102,455	\$8,100.1	(\$164.9)
55-64	91,720	76.4%	70,074	\$77,485	\$5,429.7	9,117	2,293	72,367	\$5,607.4	\$177.7
<b>Totals</b>	<b>423,993</b>		<b>363,542</b>		<b>\$25,043.9</b>	<b>67,930</b>	<b>9,237</b>	<b>372,779</b>	<b>\$25,627.3</b>	<b>(\$583.4)</b>

## Reduced Earnings of Workers Who Misuse Alcohol

### Key Findings:

- The alcohol impaired productivity of workers in the NH labor force costs the NH economy an estimated \$324.5 million in reduced earnings, with a mean earnings reduction of \$4,777 per year for every alcohol-dependent worker.

### Results:

Estimates of the prevalence (percentage of the population in each age group) of one type of alcohol misuse (alcohol dependency<sup>8</sup>) found to significantly impact productivity and earnings by age group from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) were applied to the population of males in New Hampshire to arrive at an estimate of alcohol dependency in NH's working-age population. This result of this procedure produces an estimate of almost 68,000 working age males in the New Hampshire labor force with an alcohol dependency. Impaired productivity associated with alcohol dependency is estimated to cost these individuals over \$324.5 million in lowered earnings annually, with a mean reduction in earnings of \$4,777.

Table 4 provides details of the calculation of costs of the reduced earnings of alcohol dependent male workers in the NH workforce. The adverse impacts of this form of alcohol misuse on the earnings of workers is greatest among workers age 35-54 workers. This occurs because ages 35 to 54 contain the highest percentages of alcohol dependent workers (both because alcohol dependency develops in individuals over time and because there are a large number of workers in this age group) at the same time earnings tend to peak during those years.

<b>Age</b>	<b>Male Labor Force</b>	<b>Mean Earnings</b>	<b>Number Alcohol Dependent</b>	<b>Mean Earnings of Alcohol Dependent</b>	<b>Total Earnings of Alcohol Dependent</b>	<b>Total Earnings if <i>Not</i> Alcohol Dependent</b>	<b>Alcohol Dependency Cost</b>
18-19	9,685	\$6,456	1,819	\$6,366	\$11,578,968	\$11,743,376	(\$164,407)
20-24	35,738	\$25,209	8,620	\$24,453	\$210,783,692	\$217,302,776	(\$6,519,083)
25-34	66,523	\$52,033	14,396	\$49,172	\$707,852,422	\$749,050,182	(\$41,197,760)
35-44	81,152	\$89,390	16,133	\$83,311	\$1,344,059,090	\$1,442,123,487	(\$98,064,397)
45-54	100,370	\$79,060	17,846	\$72,735	\$1,298,009,537	\$1,410,879,932	(\$112,870,395)
<u>55-64</u>	<u>70,074</u>	\$77,485	<u>9,117</u>	\$70,279	<u>\$640,705,660</u>	<u>\$706,400,948</u>	<u>(\$65,695,288)</u>
<b>Totals</b>	<b>363,542</b>		<b>67,930</b>		<b>\$4,212,989,370</b>	<b>\$4,537,500,700</b>	<b>(\$324,511,330)</b>

## B. The Productivity Cost of Drug Misuse

### Key Findings

- Almost 29,000 New Hampshire residents age 15 and older misused drugs in 2012
- An estimated 15,700 working age (15-64) males in New Hampshire experienced, on average, reductions in productivity (earnings) of 17 percent in 2012. The estimated 10,700 working age females in New Hampshire who misused drugs in 2012 experienced, on average, productivity losses of 18 percent related to drug misuse.
- The combined impacts of lower labor force participation and reduced earnings among misusers of drugs in NH resulted in drug-attributable productivity losses of \$176.45 million in 2012.

Appendix A provides greater detail on the methods used to calculate the impacts of alcohol and drug misuse on productivity. Because of the available data and analytical tools, there are differences in the methodology used to produce productivity cost estimates for alcohol and the methodology used to generate productivity estimates for drug misuse. We note the two most significant differences. Estimates for the impact of alcohol dependency on productivity were produced for males only while the productivity loss estimated for drug misuse includes both males and females. Also, total the productivity cost of alcohol misuse is presented at the sum of the costs of reduced labor force participation (the number of people who are not in the labor force due to their alcohol misuse) and the reduced earnings of those workers who misuse alcohol but still participate in the labor force. In contrast, the productivity cost of drug misuse is given as a single number that represents the combined impact of both lower labor force participation and reduced earnings.

<b>Table 5</b>			
<b>Prevalence of Drug Misuse in NH During Past Year</b>			
<b>Age Category</b>	<b>NH Population</b>	<b>NSDUH 2011-2012 Prevalence</b>	<b>Est. Individuals With Drug Misuse</b>
15-17	53,309	5.08%	2,708
18-25	139,180	9.18%	12,777
26+	898,878	1.49%	13,393
Source: SAMHSA, 2014, American Community Survey 2011-13, PolEcon calculations			

Table 5 provides prevalence estimates from the 2011-2012 NSDUH of past year drug misuse for New Hampshire.

Similar to our estimates for the productivity impacts of alcohol misuse, our estimate of the productivity impacts of drug misuse required estimates of the

prevalence of drug misuse by gender and narrower age categories (narrower than presented in Table 5) because of the differences in labor force participation and earnings that occur by age. PolEcon used U.S. estimates of the use of illicit drugs, which were available by gender and the desired age categories, and adjusted them for the percentage of NH's population that misuses drugs (from Table 5) to produce estimates of the prevalence of drug misuse by sex and age category in NH.

Table 6 presents adjusted prevalence estimates and estimates of the number of males and females, by age category, who misused drugs in 2012.

<b>Table 6</b>						
<b>Estimated Number of Drug Abusing or Dependent Individuals in NH - 2012</b>						
	<b>Male Population</b>	<b>Est. Prevalence</b>	<b>Est. Individuals With Drug Misuse or Dependence</b>	<b>Female Population</b>	<b>Est. Prevalence</b>	<b>Est. Individuals With Drug Misuse or Dependence</b>
15-17	27,295	4.89%	1,335	26,014	5.28%	1,374
18-25	70,521	10.98%	7,743	68,660	7.33%	5,033
26-34	65,841	3.87%	2,548	65,962	2.15%	1,418
35-49	140,336	1.97%	2,765	142,843	1.36%	1,943
50-64	147,523	0.90%	1,328	150,932	0.64%	966
		<b>Total</b>	<b>15,718</b>		<b>Total</b>	<b>10,733</b>

The total estimate of productivity loss associated with past year drug misuse is presented in Table 7. As the table shows, drug misuse among New Hampshire residents aged 18-64 resulted in a loss in productivity of approximately \$176.45 million dollars in 2012.

<b>Table 7</b>					
<b>Productivity Losses Attributable to Drug Misuse in 2012</b>					
	<b>Estimated Prevalence</b>	<b>Estimated Prevalence</b>	<b>Per Person Productivity</b>	<b>Productivity With Drug Misuse</b>	<b>Total Prod. Loss</b>
<b>Male Losses @ 17%</b>					
15-17	4.89%	1,335	\$3,258	\$2,704	\$739,156
18-25	10.98%	7,743	\$21,549	\$17,886	\$28,365,668
26-34	3.87%	2,548	\$57,728	\$47,914	\$25,005,916
35-49	1.97%	2,765	\$89,402	\$74,204	\$42,017,588
50-64	0.90%	1,328	\$93,962	\$77,988	\$21,208,071
				<b>Sub Total</b>	<b>\$117,336,398</b>
<b>Female Losses @ 18%</b>					
15-17	5.28%	1,373	\$3,733	\$3,061	\$922,920.56
18-25	7.33%	5,033	\$18,759	\$15,382	\$16,993,527.54
26-34	2.15%	1,418	\$44,518	\$36,505	\$11,364,311.13
35-49	1.36%	1,943	\$56,253	\$46,127	\$19,670,434.56
50-64	0.64%	966	\$58,364	\$47,858	\$10,147,925.16
				<b>Sub Total</b>	<b>\$59,099,118.95</b>
				<b>Grand Total</b>	<b>\$176,435,517.22</b>
Totals may not sum due to rounding					

## **Caveats**

Reasons for avoiding direct comparisons in productivity losses between alcohol and drug dependence and misuse have been noted previously. However, several points about the relationship between the productivity costs of alcohol and drug misuse should be important to consider. First, the population of alcohol misusers is currently much larger than is the population of drug misusers and this accounts for much of the difference in costs. Second, drug misusers are much more heavily concentrated among the youngest working age population and these are individuals early in their working lives who have much lower earnings, on average, than do older workers. In contrast, alcohol misuse becomes magnified and more pronounced among workers as they age and the larger number of alcohol dependent workers among higher earning age groups accounts for a large portion of the relative difference in costs. In addition, co-occurrence of substance misuse can sometimes make it unclear under which substance the costs of misuse should be categorized. The co-occurrence problem is magnified by the fact that the availability and quality of data and research related to the adverse impacts of alcohol misuse is more extensive and thorough than it is for drug misuse. Because it is easier to identify and monetize the adverse impacts of alcohol misuse, more of the adverse impacts may be assigned to alcohol misuse where co-occurrence is present (automobile crashes is just one example where data is not collected on drug attributable crashes).

### **C. Direct Costs to Industry: Absenteeism**

#### **Key Findings:**

- Over \$32 million in alcohol attributed absenteeism costs are incurred by NH businesses because of alcohol misuse and another \$34 million of costs are incurred because of drug misuse.
- The output (value of goods and services) of industries was reduced by more than \$187 million because of substance misuse attributable absenteeism in NH in 2012.

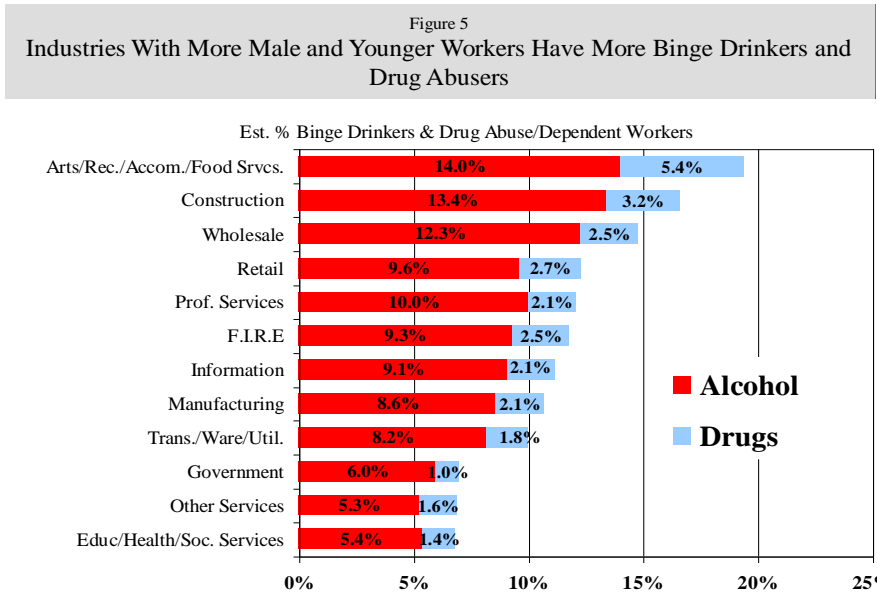
Almost 75 percent of adults who misuse alcohol work. Among adults that meet the diagnostic criteria for drug dependence, 65 percent work (48% work full-time and 17% work part-time). Even higher workforce participation rates are found among adults who meet the diagnostic criteria for drug misuse, 74 percent work.<sup>9</sup> Employees with substance misuse problems miss substantially more workdays per month than other employees. Employees with a substance misuse problem miss an average of .98 days per month, while employees who do not misuse substances missed an average of .63 days per month.<sup>10</sup>

Estimates of the prevalence of binge drinking and drug misuse by industry developed by the Center for Integrated Behavioral Health Policy, using data from the National Survey on Drug Use and Health, were adjusted to substance misuse patterns in New Hampshire to estimate the number of employees in NH, by industry, who binge drink and who misuse illicit drugs and or prescription medications. The difference between the mean numbers of reported days missed from work between employees who misuse substances and those who do not are the basis for our estimates. The estimates for alcohol-related absenteeism differ from our 2012 report in that we included self-employed individuals who are not also employed by a business as a wage and salary worker.



**Results:**

Figure 5 shows the number and percentage of workers employed in each industry in NH estimated to be binge drinkers or drug misusers. Industries with higher percentages of male and younger workers (25 and under) can be expected to have higher rates of binge drinking<sup>11</sup> and drug misuse than industries that employ a higher percentage of female and older workers. Other demographic and socioeconomic factors also influence the rates of misuse across industries.



Although the prevalence of binge drinking is greater than is the prevalence of drug misuse among employed individuals, the estimated total number of work days missed due to drug misuse is greater. The employee compensation value of alcohol attributable absenteeism in NH is estimated to be \$32.44 million in 2012 and the cost of drug related absenteeism is \$33.96 million.

Absenteeism reduces the earnings of employees but also has a broader impact on businesses and industries. The total cost to business is the lost productivity and output of goods and services that occurs when workers are absent. Employee compensation as a percentage of industry output is a measure of how much labor compensation goes into each dollar of industry output. Absenteeism may or may not result in lost earnings for all workers but a missing worker can produce no goods or services. Dividing the loss of compensation in each industry by the ratio of employee compensation in the industry in NH to industry output yields an implied loss of industry output (production of goods or services) resulting from substance misuse attributable absenteeism in NH.

Combined, the earnings lost associated with substance misuse-related absenteeism is estimated at \$66.4 million in 2012 (Table 7). The implied decrease in the value of goods and services produced by NH businesses associated with alcohol and drug attributable absenteeism in 2012 is \$186.63 million. To avoid double counting, the total implied loss of output due to absenteeism is reported here for informational purposes only and not included in total reported productivity impacts

**Table 7  
Industry Costs of Absenteeism From Binge Drinking & Drug Misuse in NH in 2012**

Industry (Includes Self- Employed)	Emp.	Prod. per Day	Alcohol -Excess Days Absent/ Month per 1000 Emp.	Total Alcohol Excess Days Absent	Alcohol Aggregate Industry Cost (\$ Mil)	Drugs- Excess Days Absent /Month per 1000 Emp	Total Drug Excess Days Absent	Drugs Aggregate Industry Cost (\$ Mil)	Earnings/ Output Ratio <sup>12</sup>	Impact on Industry (Output)
Arts/Ent./Rec.	45,246	\$92.34	20	10,859	\$1.00	31	16,832	\$1.55	29.9%	\$8.55
Educ/Health/Soc. Services	168,277	\$158.84	15	30,290	\$4.81	12	24,232	\$3.85	51.0%	\$16.98
F.I.R.E	42,286	\$251.67	8	4,059	\$1.02	10	5,074	\$1.28	31.0%	\$7.42
Information	14,791	\$206.45	14	2,485	\$0.51	12	2,130	\$0.44	26.2%	\$3.64
Manufacturing	80,387	\$231.38	18	17,364	\$4.02	35	33,763	\$7.81	26.6%	\$44.47
Construction	48,818	\$143.32	28	16,403	\$2.35	53	31,048	\$4.45	26.8%	\$25.38
Other Services	23,205	\$121.49	23	6,405	\$0.78	10	2,785	\$0.34	35.0%	\$3.19
Prof. Services	77,313	\$186.28	28	25,977	\$4.84	9	8,350	\$1.56	48.3%	\$13.24
Government	95,054	\$209.74	12	13,688	\$2.87	17	19,391	\$4.07	43.6%	\$15.91
Retail	94,400	\$161.12	35	39,648	\$6.39	24	27,187	\$4.38	39.5%	\$27.26
Trans./Ware/Util.	32,829	\$224.78	20	7,879	\$1.77	11	4,333	\$0.97	40.7%	\$6.74
Wholesale	17,369	\$248.47	40	8,337	\$2.07	63	13,131	\$3.26	38.5%	\$13.86
<b>Totals</b>	<b>739,975</b>			<b>183,393</b>	<b>\$32.44</b>		<b>188,255</b>	<b>\$33.96</b>		<b>\$186.63</b>

#### D. Mortality Costs

##### Key Findings:

- In 2011 there were 340 alcohol-attributable deaths in NH and 212 drug-attributable deaths.
- The present value of the lost productivity due to alcohol-related deaths is \$213.9 million and the present value of lost productivity due to drug-related deaths is \$179.0 million.

Premature death due to alcohol and drug misuse imposes economic losses on society. Premature death through illness or injury can occur as a result of a number of causes, including: auto accidents, suicide, through increasing the risk of disease, or through violence involving alcohol or drugs. When an individual dies prematurely there is an economic cost to society in the form of loss of that individual's productive capacity. Although calculated as a productivity cost, our mortality estimates are not included in our estimates of the total annual cost to New Hampshire of alcohol and drug misuse. They are presented here to illustrate the earnings costs associated with one year of alcohol-related premature deaths. Table 8 shows the number of deaths in NH attributable to alcohol and drug use in 2011.

<b>Table 8</b>			
<b>Substance Misuse Deaths in New Hampshire 2011</b>			
	<u>Overall</u>	<u>Males</u>	<u>Females</u>
<b>Acute Alcohol Causes</b>	175	114	61
<b>Chronic Alcohol Causes</b>	<u>165</u>	<u>120</u>	<u>45</u>
<b>Alcohol Subtotal</b>	<b>340</b>	<b>234</b>	<b>106</b>
<b>Drug Causes</b>	<u>212</u>	<u>130</u>	<u>82</u>
Total	<b>552</b>	<b>364</b>	<b>188</b>

Source: Centers for Disease Control and Prevention

## Results:

Table 9 shows that the estimated cost of NH's 340 alcohol attributable deaths in 2011 (the latest year for which cause of death by age data is available) is \$213.9 million in 2012 dollars. In 2011, 234 deaths attributable to alcohol were male and 106 were female. The 212 drug attributable deaths in New Hampshire have present value lifetime cost of \$179.0 million dollars (Table 10). Combined premature mortality attributable to alcohol and drug use cost more than an estimated \$392.9 million annually in New Hampshire in lost, market-valued productivity.

<b>Table 9</b>						
<b>Cost of Alcohol-Attributable Premature Deaths in NH</b>						
<u># of Deaths</u>	<u>0-19</u>	<u>20-34</u>	<u>35-49</u>	<u>50-64</u>	<u>65+</u>	<u>Totals</u>
<b>Male</b>	5	36	53	94	46	234
<b>Female</b>	4	16	21	26	38	106
					<b>Total</b>	<b>340</b>
<b>Present Value of Lost Earnings</b>						
	<u>0-19</u>	<u>20-34</u>	<u>35-49</u>	<u>50-64</u>	<u>65+</u>	<u>Total</u>
<b>Per Male Death</b>	\$1,349,525	\$1,651,046	\$1,210,290	\$495,424	\$47,279	
<b>Total Male</b>	\$6,747,626	\$59,437,659	\$64,145,356	\$46,569,840	\$2,174,823	<b>\$179,075,304</b>
<b>Per Female</b>	\$742,435	\$852,512	\$575,159	\$211,848	\$16,998	
<b>Total Female</b>	\$2,969,741	\$13,640,187	\$12,078,340	\$5,508,055	\$645,926	<b>\$34,842,250</b>
					<b>Grand Total</b>	<b>\$213,917,554</b>

<b>Table 10 Cost of Drug-attributable Premature Deaths in NH</b>						
<b># of Deaths</b>	<b>0-19</b>	<b>20-34</b>	<b>35-49</b>	<b>50-64</b>	<b>65+</b>	<b>Totals</b>
<b>Male</b>	8	33	40	49	0	130
<b>Female</b>	1	24	25	25	7	82
					<b>Total</b>	<b>212</b>
<b>Present Value of Lost Earnings</b>						
	<b>0-19</b>	<b>20-34</b>	<b>35-49</b>	<b>50-64</b>	<b>65+</b>	<b>Total</b>
<b>Per Male Death</b>	\$1,349,525	\$1,651,046	\$1,210,290	\$495,424	\$47,279	
<b>Total Male</b>	\$10,796,201	\$54,484,521	\$48,411,590	\$24,275,768	\$0	<b>\$137,968,079</b>
<b>Per Female</b>	\$742,435	\$852,512	\$575,159	\$211,848	\$16,998	
<b>Total Female</b>	\$742,435	\$20,460,281	\$14,378,977	\$5,296,207	\$118,986	<b>\$40,996,886</b>
				<b>Grand Total</b>		<b>\$178,964,965</b>

### **E. The Secondary or Multiplier Impacts of Productivity Losses**

This report calculated the direct productivity losses in NH related to alcohol and drug misuse to be over \$1 billion in 2012. The direct loss of earnings resulting from alcohol and drug misuse in New Hampshire also has indirect and induced “multiplier impacts” on the NH economy. Combined, the reduced earnings of alcohol and drug misuse by individuals in New Hampshire had indirect and induced “multiplier impacts” that resulted in an estimated 7,784 fewer jobs and \$332.19 million less labor income in the state in 2012.<sup>13</sup>

These estimates of the indirect and induced losses in income and employment that occur in response to the direct productivity losses from alcohol and drug misuse are large and are another indication of how the adverse productivity impacts (reductions in labor force and earnings) from substance misuse reverberate throughout the New Hampshire economy. Nevertheless, the purpose of this report is to document the direct impacts on the New Hampshire economy from substance misuse and therefore the negative indirect and induced impacts from substance abuse in this section of the report are presented for informational purposes only, and are not included in our overall estimate of the impact of substance misuse on the New Hampshire economy.

### **IV. Medical Costs**

Alcohol and drug misuse increases the risk of illness or injury and results in an increase in the use of health care services. The effects of substance misuse on health care utilization can be obvious and immediate or more indirect and long term. When an individual overdoses on drugs or when a drunk driver sustains a serious injury that requires hospitalization, the link between substance misuse and medical expenses is clear. But prolonged alcohol misuse can also increase the risk for a number of diseases, increasing the demand for costly medical care as well as nursing home care.

Research on the health effects of prolonged drug misuse is less extensive but there are many illnesses and medical conditions for which drug misuse is the primary or prominent contributing factor. This section estimates the costs incurred by use of the health care resources in New Hampshire (health care goods or services) for specialty treatment and medical care of conditions that are attributable to the use or misuse of alcohol and drugs.

<b>Table 11</b>		
<b>Medical Costs of Substance Misuse in NH</b>		
<b>(\$ Millions 2012)</b>		
	<b>Alcohol</b>	<b>Drugs</b>
Specialty Treatment	\$6.92	\$8.69
Medical Care Services	\$191.10	\$39.66
Insurance Administration	\$16.24	\$3.37
<b>Medical Costs Totals</b>	<b>\$214.26</b>	<b>\$51.72</b>

### **A. Specialty Treatment Costs**

#### **Key Findings:**

- Substance misuse treatment at facilities in New Hampshire cost an estimated \$15.6 million in 2012.
- Estimated weighted mean cost per individual treated was \$2,632 in 2012.
- Only about six percent of substance misusers received treatment in NH in 2012.
- An especially high percentage of payments for substance misuse treatment in NH are paid for “out-of-pocket” by individuals in New Hampshire, and this may contribute to the comparatively low treatment levels and expenditures.
- Combined, “self-pay” and free, charity, or research-based care paid for three-quarters of the cost of substance misuse treatment in NH during 2012.
- State and local governments paid about five percent of the cost of substance misuse treatment in 2012.

Treatment services available in New Hampshire to help persons with substance misuse problems include inpatient residential programs, outpatient programs, detoxification, and special youth treatment programs. Resources, both public and private, used to support these services constitute one of the types of economic costs associated with excessive use of alcohol. PolEcon estimated the costs of these treatment services provided in New Hampshire in 2012. A detailed explanation of methods used in calculating treatment costs is contained in Appendix A.

#### **Results:**

Based on the reports filed by treatment facilities with the federal government, just under 6,000 substance misuser received treatment in NH in 2012, representing about six percent of the estimated number alcohol or drug misusers in the state.<sup>14</sup> Table 12 shows our estimate of treatment costs for 2012 (2011 discharge data inflated to 2012 costs) total \$15.6 million dollars. The estimated weighted (according to substance and type of treatment) mean cost of treatment per individual in NH in 2012 was \$2,632.

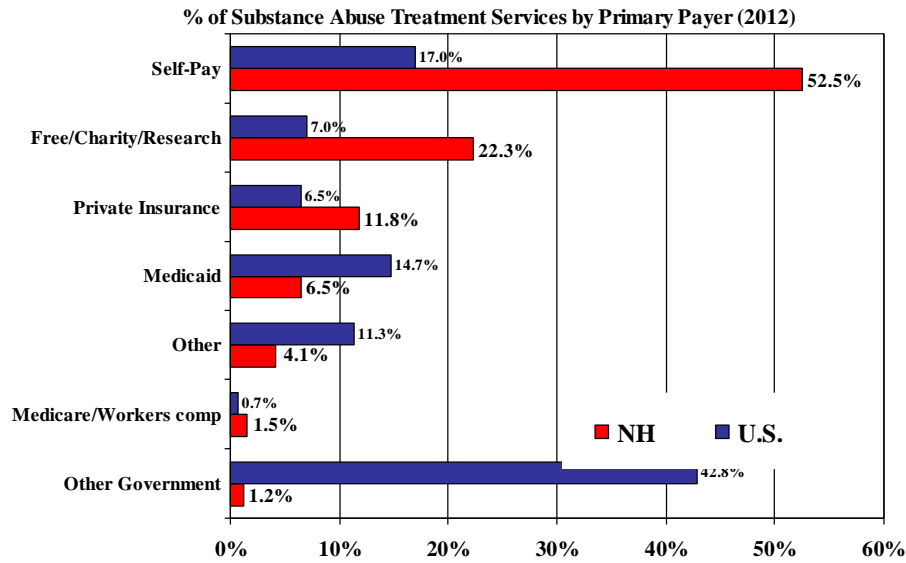
<b>Table 12</b>						
<b>Substance Misuse Treatment Costs in NH - 2012</b>						
<b>Substance</b>	<b>Treatment Type</b>	<b>NH Discharges</b>	<b>% Discharges by Substance</b>	<b>Total # of Treatment Days</b>	<b>Treatment Cost per Day</b>	<b>Total Treatment Costs</b>
<b>Alcohol</b>	Detoxification	262	10.3%	4,360	\$337.27	\$1,470,499
	Residential	435	17.1%	16,683	\$107.96	\$1,801,113
	Outpatient	1,846	72.6%	190,344	\$15.94	\$3,033,893
					<b>Subtotal</b>	<b>\$6,305,506</b>
<b>With N-SSATS Adjustment</b>						<b>\$6,919,141</b>
<b>Drugs</b>						
	Detoxification	464	16.2%	6,034	\$337.27	\$2,035,090
	Residential	737	25.8%	29,059	\$107.96	\$3,137,239
	Outpatient	1,661	58.0%	172,335	\$15.94	\$2,746,848
					<b>Subtotal</b>	<b>\$7,919,176</b>
<b>With N-SSATS Adjustment</b>						<b>\$8,689,849</b>
<b>Grand Total</b>						<b>\$15,608,990</b>
Mean Cost per Treatment (w/o N-SSATS Adjustment)						<b>\$2,632</b>

To put NH's specialty treatment costs into perspective, estimates of treatment costs in the State of Maine (a state with a similar size population) in 2010 were \$47 million, and for the State of Wyoming (a state with less than one-half the number of residents as NH) in 2010 were \$27 million. Data on the prevalence of alcohol and drug misuse in NH from SAMSHA suggest that NH has rates of drug and alcohol misuse as high or higher than that of the nation as a whole. It is likely then that the relatively lower level of spending on specialty treatment for substance misuse in NH is a function of a much smaller percentage of individuals with a substance misuse problem receiving treatment in the state. As PolEcon noted in our 2012 report on the cost of alcohol misuse in New Hampshire, national research suggests the state has the second highest percentage of individuals needing but not receiving treatment among all states. That situation may be similar for drug misusers.

In our 2012 report we speculated that the high percentage of payments for substance misuse treatment that are paid for by individuals (out-of-pocket) may be a contributing factor to relatively low treatment rates in the state. Figure 4 shows that a much higher percentage of all substance misuse treatments in NH are paid for "out-of-pocket" (52.5%) than are paid for "out-of-pocket" in the U.S. (17%). Government funding other than Medicaid and Medicare (primarily state and local) funded a much lower percentage of treatments in NH than in the U.S.

Figure 4

A Majority of Treatments for Substance in NH are Paid for “Out-of-Pocket” and This May Contribute to Lower Treatment Rates and Lower Overall Treatment Costs



Source: Author’s calculation using data from the Treatment Episode Data Set (TEDS), SAMHSA

## B. Medical Care Costs

### Key Findings:

- Medical care expenditures attributable to substance misuse were an estimated \$230.76 million in 2012.
- Insurance administration costs associated add another \$19.61 million of costs.

Alcohol and drug misuse can increase the risk of illness or injury, increasing the use and cost of health care services. These services include hospital costs, inpatient and outpatient/emergency room care, physician’s charges, prescription drug costs and the costs of nursing home care. The estimated medical care costs for inpatient hospital care and other medical care services for primary diagnosis are presented in this section. Appendix A contains a thorough discussion of the methodology used to arrive at our estimates substance misuse related medical care costs.

### Results:

Our total estimate of the cost of medical care in NH that is attributable to excessive alcohol use in 2012 was \$285 million in charges for medical care, with \$191 in actual payments for services being made. For drug dependence and misuse, our estimate is \$59 million in charges and \$40 million in payments. Total estimated medical care expenditures attributable to alcohol and drug misuse and dependence is estimated at \$344 million in medical charges and \$231 in medical

payments. This total represents about two percent of NH's estimated total health care spending in 2012.<sup>15</sup> In addition to direct medical expenditures, the insurance administration costs related to charges for alcohol-attributable medical costs are estimated to be \$19.6 million in 2012.

<b>Table 14</b>				
<b>Substance Misuse Attributable Medical Expenses (\$Millions)</b>				
	<b>Alcohol</b>		<b>Drugs</b>	
<b>Type of Service</b>	<b>Charges</b>	<b>Payments</b>	<b>Charges</b>	<b>Payments</b>
Hospital Inpatient	\$135.88	\$91.04	\$28.20	\$18.90
Other Health Professionals	\$28.54	\$19.12	\$5.92	\$3.97
Ambulatory/Outpatient	\$53.40	\$35.78	\$11.08	\$7.43
Prescription Drug/Non-Durables	\$48.37	\$32.41	\$10.04	\$6.73
Nursing Home	\$19.02	\$12.75	\$3.95	\$2.65
Subtotal	\$285.22	\$191.10	\$59.20	\$39.66
Insurance Administration		\$16.24		\$3.37
<b>Totals</b>		<b>\$207.34</b>		<b>\$43.03</b>

## V. Crime, Justice, and Corrections Costs

Both alcohol and drug misuse significantly increase crime costs in New Hampshire. The burden that substance misuse places on the criminal justice system is second only to the productivity costs of substance misuse in New Hampshire. The estimates in this report indicate that drug misuse has a much larger impact on crime and the criminal justice system than does alcohol misuse. Crime costs include victimization

<b>Table 15</b>			
<b>Substance Misuse Attributable Criminal Justice Costs</b>			
<b>(2012 \$ millions)</b>			
	<b>Alcohol</b>	<b>Drugs</b>	<b>Total</b>
Policing	\$46.16	\$93.76	\$139.91
Judicial	\$11.07	\$16.57	\$27.64
Corrections	\$36.78	\$63.28	\$100.06
Property Losses	\$2.41	\$9.28	\$11.70
Victim Productivity	\$1.02	\$3.75	\$4.76
<b>Totals</b>	<b>\$97.43</b>	<b>\$186.64</b>	<b>\$284.08</b>

costs of crime (e.g., property loss or damage and productivity costs) and criminal justice system costs. Criminal justice system costs include policing costs, legal and adjudication costs, and corrections costs. Evidence accumulated over the past twenty years shows a strong link between drug and alcohol misuse and crime. Surveys of incarcerated populations provide further evidence of the link between crime and substance misuse. In 2004, approximately one in four federal inmates (26%) and one in three state inmates (32%) reported that they were under the influence of alcohol or illicit drugs at the time of their current offense (U.S. Department of Justice, 2007).



## A. Policing Costs

### Key Findings:

- Alcohol-attributable offenses accounted for 31 percent of all arrests and about 12.8 percent of all crimes committed in New Hampshire in 2012.
- Drug-attributable offenses in New Hampshire account for about 26 percent of all arrests in New Hampshire in 2012.
- Policing and public safety costs related to alcohol and drugs total an estimated \$139.9 million in New Hampshire in 2012, representing about 39 percent of all policing costs in the state.
- The largest portion of substance misuse-attributable policing costs \$108.7 million is borne by local government in New Hampshire.

### Results:

To calculate the percentage of police protection costs related to substance misuse, the total number of violent offenses, property offenses, and motor vehicle offenses attributable to alcohol and drugs were divided by the total number of offenses (reported crimes, motor vehicle offenses etc.) in the state. This percentage was then multiplied by state and local police protection expenditures in NH (as reported in the U.S. Census Bureau, “Census of State and Local Government Finance, 2011”) and inflated to 2012 values to arrive at our estimate of police protection costs of alcohol. A more complete explanation of the methodology for calculating policing costs is contained in Appendix A.

Table 16 shows that the estimated cost of police protection attributable to alcohol in NH is \$46.2 million in 2012, or about one-third of the total substance misuse-attributable policing costs in 2012. At \$93.8 million, the estimated costs of policing in New Hampshire that are attributable to drug use and misuse is more than twice the cost associated with alcohol misuse, representing 67 percent of total of substance misuse-attributable policing costs in the state. Combined, our estimate is that alcohol and substance misuse is responsible for almost \$140 million in policing costs in New Hampshire in 2012, representing 39 percent of all policing costs in the state.

<b>Table 16</b>				
<b>Alcohol and Drug Misuse-Attributable Policing Costs in NH</b>				
<b>(2012 \$Million)</b>				
	<b>Police Protection Costs</b>	<b>Alcohol Attributable @12.8%</b>	<b>Drug Attributable @26.0%</b>	<b><u>Total</u> Costs</b>
<b>State</b>	\$57.29	\$7.33	\$14.90	\$22.23
<b>Counties</b>	\$23.08	\$2.95	\$6.00	\$8.95
<b>Municipalities</b>	\$280.24	\$35.87	\$72.86	\$108.73
<b>Total</b>	<b>\$360.60</b>	<b>\$46.16</b>	<b>\$93.76</b>	<b>\$139.91</b>

## B. Judicial Costs

### Key Findings:

- The judicial costs to New Hampshire attributable to drugs and alcohol are estimated to be \$27.7 million in 2012, with alcohol accounting for \$11.1 million and drugs \$16.6 million.
- Almost one-quarter (23.4%) of judicial expenditures by state and local government are attributable to alcohol and drug use.

A majority of the offenses that are directly (by definition) attributable to alcohol, such as liquor law violations, drunkenness, driving under the influence of alcohol are resolved with a limited impact on judicial costs, while violent and property crimes are much more likely to involve extensive use of the resources of the state's judicial system. A higher percentage of drug attributable offenses result in more extensive use of judicial resources. To estimate the judicial costs to state and local government associated with substance misuse we used the percentage of criminal offenses by type of offense that are attributable to alcohol and drug misuse times the number of reported crimes in New Hampshire (by type of offense) and multiplied that percentage by the percentage of all judicial cases that are criminal to arrive at an estimate of the percentage of judicial cases attributable to alcohol and drug misuse and multiplied that percentage by the reported judicial costs in the state (see Appendix A for additional details on methodology).

### Results:

Table 17 shows estimated judicial costs related to alcohol and drugs in NH in 2012. Overall, substance misuse increases judicial costs in the state by almost \$28 million, accounting for almost one-quarter of all judicial costs in the state. Alcohol-attributable judicial costs are estimated to be \$11 million and drug attributable judicial costs are estimated at \$16.6 million for 2012.

<b>Table 17</b>				
<b>Alcohol and Drug Misuse-Attributable Judicial Costs in NH</b>				
<b>(2012 \$Millions)</b>				
	<b>Judicial Costs</b>	<b>Alcohol Attributable</b>	<b>Drug Attributable</b>	<b>Total Costs</b>
<b>State</b>	\$91.94	\$5.95	\$12.91	\$18.86
<b>Counties</b>	\$15.98	\$3.03	\$2.24	\$5.27
<b>Municipalities</b>	\$10.13	\$2.08	\$1.42	\$3.51
<b>Total</b>	<b>\$118.05</b>	<b>\$11.07</b>	<b>\$16.57</b>	<b>\$27.64</b>

## C. Corrections Costs

### Key Findings:

- Alcohol and drug attributable incarcerations increase corrections costs by \$100.6 million in New Hampshire in 2012.
- Alcohol and drug misuse accounted for over one-half (53%) of all incarceration costs in New Hampshire in 2012.

Surveys of inmate populations show that a large majority of prisoners are alcohol and/or drug misusers and that a drug or alcohol use occurred prior to criminal activity. A number of factors contribute to crimes that result in incarceration and in many cases consumption of alcohol or use of drugs are correlates rather than causes of criminal activity. Still, research overwhelmingly demonstrates a strong causal link between alcohol consumption, drug use, and criminal activity. Crime-related alcohol-attributable fractions (AAF's) reported by Bouchery, et. al. (2010) applied to the offenses for which inmates were sentenced suggests that about 21.2% of state inmates and 16.9% of local (county) inmates nationally, are incarcerated because of alcohol-attributable offenses. Lacking more specific detail on the inmate populations of NH's state and county jails, we adopted these estimates for our analysis. Applying drug attributable crime fractions to New Hampshire criminal offense data suggest that between 26 and 28 percent of the crimes that result in incarceration in New Hampshire are the result of drug misuse. For this study the more conservative estimate of 26 percent was used. The estimates of incarcerations attributable to substance misuse was multiplied by corrections expenditure data to arrive at an estimate of substance abuse attributable corrections costs.

### Results:

Corrections costs resulting from excessive alcohol consumption in NH are estimated at \$36.8 million in 2012, with \$24.5 million of that amount at the state level, and \$12.3 million at the county/local level. At an estimated \$63.8 million in 2012, drug-attributable offenses account for an even larger portion of corrections costs in New Hampshire. Combined, alcohol and drug misuse are responsible for over one-half (53%) of all corrections costs in the State of New Hampshire in 2012, with alcohol accounting for 19.5 percent and drugs accounting for 33.6 percent of total corrections costs (Table 18).

<b>Table 18</b>				
<b>Alcohol and Drug Misuse Attributable Corrections Costs in NH</b>				
<b>(2012 \$Millions)</b>				
	<b>Corrections Costs</b>	<b>Alcohol Attributable</b>	<b>Drug Attributable</b>	<b>Total Costs</b>
<b>State</b>	\$115.37	\$24.46	\$39.23	\$63.68
<b>Counties</b>	\$72.90	\$12.32	\$24.06	\$36.38
<b>Municipalities</b>	-	-	-	-
<b>Total</b>	<b>\$188.27</b>	<b>\$36.78</b>	<b>\$63.28</b>	<b>\$100.06</b>

## D. Victimization Costs

### Key Findings:

- The cost to victims of substance abuse attributable crime in New Hampshire in 2012 was \$11.7 million.
- Drug attributable crime is responsible for 79 percent of substance misuse related crime victimization costs in New Hampshire.

Victims of crime suffer damage or loss of their property that can be assigned a monetary value. PolEcon estimated victims' costs (excluding medical and productivity costs) by multiplying the number of alcohol and drug attributable offenses, by type of offense, in New Hampshire by the average dollar value of victim losses reported by the U.S. Bureau of Justice Statistics' criminal justice statistical Table 82: "Total Economic Loss to Victims of Crime, by Type of Crime, 2007" and inflated those 2007 dollar value to 2012 values.

			Alcohol		Drugs		Totals
Offense	# Reported	Loss per Victim	Attri. %	Victim Costs	Attri. %	Victim Costs	Total Costs
Forcible Rape	449	\$155	22.5%	\$15,659	12.0%	\$8,351	\$24,010
Aggravated Assault	1,545	\$131	30.0%	\$60,719	2.4%	\$4,857	\$65,576
Robbery	472	\$1,295	3.4%	\$20,782	27.2%	\$166,257	\$187,039
Burglary	5,444	\$1,708	3.6%	\$334,741	30.0%	\$2,789,506	\$3,124,246
Larceny	24,226	\$582	2.8%	\$394,787	29.6%	\$4,173,461	\$4,568,248
Motor Vehicle Theft	1023	\$6,745	23.0%	\$1,587,031	31.0%	\$2,139,042	\$3,726,073
	<b>33,159</b>			<b>\$2,413,718</b>		<b>\$9,281,475</b>	<b>\$11,695,193</b>

The estimated property losses of victims of alcohol and drug attributable crime in New Hampshire was \$11.7 million in 2012, with alcohol accounting for 21 percent of the total and drugs accounting for 79 percent.

## E. Productivity Losses of Crime Victims

### Key Findings:

- Productivity losses by the victims of alcohol and drug misuse attributable crimes are estimated to be \$4.7 million in 2012.
- Victims of drug attributable crimes experienced the majority of productivity losses (\$3.75 million) attributable to substance abuse.

Victims of crime suffer productivity losses when they are unable to work because

of judicial activity, injury, of for other reasons related to their victimization. The number of criminal offenses by type of crime in NH for 2012 from the Uniform Crime Reporting System of the federal Bureau of Investigation was multiplied by attributable drug and alcohol fractions to determine the number of offenses, and thus victims) attributable to alcohol or drugs by type of crime. Estimates of mean number of work days lost for alcohol attributable and drug attributable crimes were obtained from data from the 2007 National Crime Victimization Survey (NCVS) statistical tables. Daily productivity estimates (the amount of productivity lost per day per crime victim) are the average annual salary of NH workers in 2012 divided by 52 weeks and 5 work days per week with 30 percent added for the average benefit and employer costs.. The number of victims multiplied by the average number of days lost due to victimization times the average daily productivity of NH produced a total productivity loss of \$4.8 million.<sup>16</sup> Not all crime victims are employed, however the data on mean days of work lost includes both individuals who are employed and those who are not and thus no adjustment for employment status is necessary.

Offense	# Reported	Avg. Work Days Lost	Mean Cost per Day	Alcohol Attributable Victim Productivity Costs	Drug Attributable Victim Productivity Costs	Total Productivity Losses
Forcible Rape	449	6.2	\$223.6	\$140,053	\$74,695	\$214,748
Aggravated Assault	1,545	3.8	\$223.6	\$393,827	\$31,506	\$425,333
Robbery	472	4.5	\$223.6	\$16,147	\$129,180	\$145,327
Burglary	5,444	2.1	\$223.6	\$92,026	\$766,885	\$858,912
Larceny	24,226	1.6	\$223.6	\$242,679	\$2,565,460	\$2,808,138
Motor Vehicle Theft	1,023	2.5	\$223.6	\$131,527	\$177,276	\$308,803
<b>Totals</b>	<b>33,159</b>			<b>\$1,016,259</b>	<b>\$3,745,002</b>	<b>\$4,761,261</b>

## VI. Other Costs

Two other alcohol-attributable costs, the cost of motor vehicle crashes and the reduction in state and local revenues from lower productivity attributable to alcohol, are estimated for this report.

### A. Motor Vehicle Crashes

#### Key Findings:

- The overall cost of all motor vehicle crashes in NH is conservatively estimated at \$814 million in 2012.<sup>17</sup>
- After subtracting medical and productivity costs associated with alcohol attributable crashes from total costs (to avoid double counting from our prior medical and

productivity/mortality cost analyses) the estimated annual costs of alcohol-attributable motor vehicle crashes is \$67.2 million in NH in 2012.

- The cost of drug attributable crashes is estimated at \$6.17 million for 2012.

Use or misuse of drugs and alcohol is a significant risk factor for motor vehicle accidents. Costs resulting from alcohol or drug-related motor vehicle accidents result from premature death, medical care, vehicle damage, and legal and court costs. The costs related to premature death and the costs related to medical care are included in prior sections of this report and are excluded in the calculation of our substance misuse attributable motor vehicle accident costs. This section reports on other motor vehicle accident costs, including legal and court costs, insurance administration, and vehicle damage. Data on the cost per accident comes from a detailed study by Blincoe (2014).<sup>18</sup> While drug misuse is believed to contribute to some accidents, there is no published, reliable research on the frequency of drug-related accidents that do not involve alcohol. Because of this lack of data, studies of substance misuse costs limit their cost estimates to alcohol-related automobile accidents. It is unrealistic, however, to believe that drugs are not responsible for any automobile crashes in New Hampshire. A study for the State of Wyoming using data from the Wyoming Department of Transportation indicated that the percentage of drug attributable crashes was equal to about 10 percent of the alcohol attributable crashes.<sup>19</sup> This study uses that same ratio to estimate the cost of drug attributable motor vehicle crashes.

### **Results:**

Our results show that alcohol related motor vehicle crashes cost NH citizens over \$307.8 million in 2012 out of a total estimated cost of crashes of \$814 million (Table 21). When we subtract medical costs (shaded cells) that are included in our analysis of alcohol-attributable medical expenditures, and market productivity costs (shaded cells) that are captured in our estimates of mortality costs and productivity costs that may be partially captured in our analysis of productivity losses due to alcohol, and multiply the NHTSA determined percentage of all crash costs attributable to alcohol involving crashes, the result is a conservative estimate of \$67.7 million in annual motor vehicle crash costs attributable to alcohol. Drug attributable crash costs were estimated at two percent of total crash costs less productivity and medical costs of \$307.80, or \$6.16 million.

**Table 21**  
**Cost of All Motor Vehicle Crashes & Substance Misuse Attributable Crashes in**  
**New Hampshire (\$ Millions - 2012)**

	<u>PDO</u>	<u>MAIS0</u>	<u>MAIS1</u>	<u>MAIS2</u>	<u>MAIS3</u>	<u>MAIS4</u>	<u>MAIS5</u>	<u>Fatal</u>	<u>Total</u>
# of Crashes	19,102	4,406	6,122	1,731	619	156	73	97	32,306
<b>INJURY COMPONENTS</b>									
Medical	\$0.00	\$0.00	\$24.97	\$45.47	\$47.06	\$32.99	\$34.67	\$1.18	\$186.34
Emergency	\$0.57	\$0.10	\$0.58	\$0.36	\$0.28	\$0.14	\$0.07	\$0.09	\$2.20
Market Productivity	\$0.00	\$0.00	\$18.78	\$73.61	\$73.07	\$29.27	\$27.65	\$97.15	\$319.53
HH Productivity	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insurance Admin.	\$3.92	\$0.68	\$25.85	\$17.40	\$13.21	\$6.26	\$6.28	\$2.95	\$76.54
workplace Costs	\$1.27	\$0.22	\$2.24	\$4.91	\$3.83	\$1.07	\$0.87	\$1.23	\$15.64
Legal Costs	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$9.26</u>	<u>\$12.52</u>	<u>\$13.04</u>	<u>\$5.91</u>	<u>\$7.22</u>	<u>\$11.08</u>	<u>\$59.03</u>
Subtotal	<b>\$5.76</b>	<b>\$1.00</b>	<b>\$81.69</b>	<b>\$154.27</b>	<b>\$150.50</b>	<b>\$75.64</b>	<b>\$76.75</b>	<b>\$113.68</b>	<b>\$659.28</b>
<b>NON-INJURY COMP.</b>									
Travel Delay	\$22.08	\$3.59	\$7.29	\$2.22	\$0.95	\$0.25	\$0.12	\$0.60	\$37.10
Property Damage	\$50.10	\$8.64	\$35.50	\$10.73	\$7.22	\$2.74	\$1.18	\$1.17	\$117.29
Subtotal	<u>\$72.18</u>	<u>\$12.24</u>	<u>\$42.79</u>	<u>\$12.95</u>	<u>\$8.18</u>	<u>\$2.99</u>	<u>\$1.30</u>	<u>\$1.76</u>	<u>\$154.39</u>
<b>Totals</b>	<b>\$77.94</b>	<b>\$13.23</b>	<b>\$124.48</b>	<b>\$167.22</b>	<b>\$158.67</b>	<b>\$78.63</b>	<b>\$78.05</b>	<b>\$115.44</b>	<b>\$813.67</b>
<b>Totals Excluding Medical &amp; Market Productivity</b>									<b>\$307.80</b>
<b>Alcohol Attributable x .22 =</b>									<b>\$67.72</b>
<b>Drug Attributable x .02 =</b>									<b>\$6.16</b>
<b>Total Substance Misuse =</b>									<b>\$73.87</b>

Totals may not add due to rounding

Note: MAIS is the maximum injury severity level experienced by the victim. PDO is property damage only

## B. State and Local Tax Revenue

### Key Findings:

- Combined, the productivity losses attributable to drug and alcohol misuse reduced state and local revenues by an estimated \$61 million in 2012.

The productivity and earnings losses attributable to substance misuse in New Hampshire reduce the income of residents, their expenditures on goods and services, and the output of businesses and industries in the state of New Hampshire that otherwise would have yielded significant revenue for state and local government.

### Methods and Results:

We used alcohol and drug attributable productivity losses associated with lower labor force participation and reduced earnings of workers along with an economic model of the State of New Hampshire<sup>20</sup> to estimate the overall reduction in the volume of economic activity in New

Hampshire from alcohol-attributable productivity losses.

The revenue impact estimated here (\$51.05 million attributable to alcohol misuse and \$9.99 million attributable to drug misuse) is a ratio-based estimate based on the overall reduction in the volume of economic activity in NH resulting from productivity losses attributable to drugs and alcohol. Using ratios derived from the U.S. Census Bureau's "Census of Government Finances" reports for NH, and its local governments, along with measures of the overall level of economic activity in the state and region (gross state product and gross regional product) from the U.S. Department of Commerce, Bureau of Economic Analysis, we can estimate the amount of state and local tax revenue likely to be lost as a result of the reduction in productivity attributable to substance misuse in New Hampshire.

## **VII. Policy Implications**

The most fundamental question raised by the cost estimates presented in this report is whether New Hampshire is committing adequate resources to prevent and treat the serious problem of drug and alcohol misuse. The results of this study can also be placed in context by considering the amount of revenue collected by the state from alcohol sales and taxes in relation to the total economic loss resulting from alcohol misuse. In fiscal year 2012, approximately \$138 million in state revenue was gathered via sales of liquor and wine by the NH Liquor Commission and by the state's excise tax on beer.<sup>21</sup> For every \$1 the state collected in tax revenue from alcohol sales in 2012, \$12 was "spent" on problems arising from alcohol misuse.

The first step in policy making to address the burden of substance misuse on the New Hampshire economy is to integrate the impact of substance misuse into the fiscal and economic policymaking of the state. Alcohol is already factored into the revenue side of New Hampshire's fiscal policy, as alcohol sales and taxes contribute a substantial amount of revenue to the state's general fund. However, little attention is focused on the impact of alcohol and drug misuse on the expenditure side of the state's fiscal policies or on the impact that substance misuse has on the current performance and future prospects of the NH economy. As elected and appointed officials, citizens, and businesses across the state struggle to develop policies to accelerate growth in the New Hampshire economy, the issues of demographics, the size of the labor force, and the education and skill level of individuals in the labor force, are all prominent considerations. To date, however, little attention has been given to the large impact that substance misuse has on each of these factors critical to the health of the NH economy. As this report highlights, by reducing the number of individuals in New Hampshire's labor force and by decreasing the skills and productive capacity of individuals who are in the labor force, substance misuse in NH exacerbates key demographic and human resource issues and contributes to slower economic growth in the state.

### **Reducing Substance Misuse and Increasing Treatment Rates**

Table 12 (page 20) showed the estimated mean, weighted, per treatment cost of substance misuse treatments in New Hampshire at \$2,632 for 2012. At the same time, dividing the documented annual costs (excluding mortality) of substance misuse presented in this report by the number of individuals in the state who misuse alcohol or drugs indicates that the average annual



cost for every individual that misuses alcohol or drugs in New Hampshire is \$19,063.<sup>22</sup> This suggests that reducing substance misuse would have a benefit-cost ratio of 7:2.

Until recently there was a paucity of data related to the cost/benefit calculations of substance misuse treatment. Research in some states now suggests that there is a major benefit to treatment. Treatment has been shown to have a benefit-cost ratio of 7:1 in California, with the largest savings due to increased employer earnings and reduced crime costs.<sup>23</sup> . A study in North Dakota also estimated a benefit-cost ratio of 7:1 for substance misuse treatment.<sup>24</sup> According to these researchers”

*“A large body of scientific research (See References), which includes meta-analysis of multiple complex studies, supports the cost/benefit relationships identified in this report (7:1 for all treatment, 11:1 for outpatient, and 6:1 for residential).”*

An intake-to-follow-up assessment study of nearly 500 people treated at Kaiser Permanente’s Addiction Medicine program demonstrated significant reduction in missed work, conflict with coworkers, and tardiness as a result of substance misuse treatments. It also noted that employers break even on investing in chemical dependency treatment.<sup>25</sup> A review of over 1,000 patients in a Sacramento chemical dependency program noted a substantial decline in hospital (35%), emergency room (39%), and total medical costs (26%) when compared to a control group.<sup>26</sup>

Regardless of the exact benefit to cost ratio for substance misuse treatment, the preponderance of evidence indicates that the benefits are tangible and substantial. In New Hampshire, most substance misuse treatments are paid for directly by the individuals receiving treatment (53%) or provided without charge as charity, free or research-based care (22%). State and local government paid no more than five percent of the more than \$15 million estimated cost of treatment in 2012. This includes one-half of the five percent of treatment costs that were paid for by Medicaid in 2012. It is possible that expanded Medicaid coverage as well as some provisions of the Affordable Care Act may result in more individuals in NH receiving substance misuse treatment through public and private insurance in future years.

Based on reported Treatment Episode Data (TEDS data) numbers of substance misuse treatments and our estimates of the number not included in the TEDS data, as well as the Substance Abuse and Mental Health Services Administration reported prevalence of substance misuse in NH from the 2011-2012 National Survey on Drug Use and Health, it appears that about six percent of individuals (or 5,929 of the estimated 96,296 with substance misuse problems) received treatment in 2012. Based on the findings in this report and the research nationally on the cost-benefit ratio of substance misuse treatment, Table 22 presents our estimates of the net benefits of current treatment rates and increases above that rate for two levels of treatment effectiveness. That is, we assume two levels of effectiveness, one where treatment is 100% effective in reducing substance misuse (admittedly unrealistic) and another where 50 percent of treatments are effective. The actual effectiveness probably lies somewhere in between.

Table 22 shows that the current substance misuse treatment rate in the state produces net benefits of between \$43 million and \$101 million. The table also shows that for each one percent

(1%) increase in NH’s treatment rate for substance abuse (above the current rate of 6%) results in net benefits (economic benefits minus costs of treatment) to New Hampshire of between \$7 million and \$16 million dollars. Doubling the substance abuse treatment rate in New Hampshire from six percent to 12 percent would reduce the costs of substance abuse by \$227 million and result in net benefits to the state of as much as \$196 million, helping offset some of the \$1.84 billion in annual substance abuse costs in the state.

<b>Table 22 Impact of Increased Substance Misuse Treatment Rates in New Hampshire</b>						
New Treatment Rate	# Treated	l Cost	Benefits @ 100% Effective	Net Benefits	Benefits @50% Effective	Net Benefits
6.1% (current)	5,929	\$15,605,128	\$116,226,187	\$100,621,059	\$58,113,094	\$42,507,966
8.0%	7,704	\$20,276,086	\$151,015,239	\$130,739,153	\$75,507,620	\$55,231,534
9.0%	8,667	\$22,810,596	\$169,892,144	\$147,081,547	\$84,946,072	\$62,135,475
10.0%	9,630	\$25,345,107	\$188,769,049	\$163,423,942	\$94,384,524	\$69,039,417
11.0%	10,593	\$27,879,618	\$207,645,954	\$179,766,336	\$103,822,977	\$75,943,359
12.0%	11,556	\$30,414,129	\$226,522,859	\$196,108,730	\$113,261,429	\$82,847,301
13.0%	12,518	\$32,948,639	\$245,399,763	\$212,451,124	\$122,699,882	\$89,751,242
14.0%	13,481	\$35,483,150	\$264,276,668	\$228,793,518	\$132,138,334	\$96,655,184
15.0%	14,444	\$38,017,661	\$283,153,573	\$245,135,912	\$141,576,787	\$103,559,126
16.0%	15,407	\$40,552,172	\$302,030,478	\$261,478,307	\$151,015,239	\$110,463,068
17.0%	16,370	\$43,086,682	\$320,907,383	\$277,820,701	\$160,453,691	\$117,367,009
18.0%	17,333	\$45,621,193	\$339,784,288	\$294,163,095	\$169,892,144	\$124,270,951
19.0%	18,296	\$48,155,704	\$358,661,193	\$310,505,489	\$179,330,596	\$131,174,893
20.0%	19,259	\$50,690,214	\$377,538,098	\$326,847,883	\$188,769,049	\$138,078,834

Prior to developments related to the ACA and Medicaid expansion New Hampshire has had an exceptionally high percentage of substance misuse treatments paid for “out-of-pocket.” At a weighted average (by substance and type of treatment) cost of treatment of about \$2,600, it is likely that this fact has been a major contributor to the low treatment rate in the state. The probability that New Hampshire will see increases in the treatment rate and realize substantial economic benefits from an increase in the percentage of substance misusers receiving treatment is greatly enhanced by provisions of the Affordable Care Act that increases insurance coverage for substance misuse treatment, and by the expansion of Medicaid eligibility (with coverage for treatment) to a population with relatively high rates of substance misuse. An additional 50,000 individuals in New Hampshire are eligible for Medicaid in the state (with about 20,000 of those having been enrolled to date). Any increase in substance misuse treatment resulting from the expansion of Medicaid will, for the first three years, come at virtually no cost to the State of New Hampshire and thus will have the highest benefit to cost ratio. After the initial years, the state and federal government cost sharing features of Medicaid still mean that the benefit to costs ratio for substance misuse paid for by Medicaid are even greater in New Hampshire than indicated in Table 22. The net increase of over 20,000 individuals with insurance coverage as a result of the Affordable Care Act (those receiving coverage via the ACA network minus those who lost coverage) also increases the number of individuals with coverage for substance misuse. With

only about six percent of substance misusers in New Hampshire currently receiving treatment, there is a large amount of “unmet demand” for treatment in the state. An increase in insurance coverage and concomitant reduction in the percentage of “self-payers” should help meet a portion of that demand for treatment. Combined, increased insurance coverage via Medicaid and the ACA suggest that the probability that treatment rates in New Hampshire could double (another 6,000 individuals receiving treatment) is high. To a degree, this will depend on the ability of treatment providers to expand their capacity to meet additional demand for treatment.

While substance misuse treatments have been shown to produce large net benefits for states, the most cost-effective method to reduce the cost of substance misuse is to prevent it from occurring in the first place. Programs aimed at preventing substance misuse among young people or their cost-benefit ratios were not examined for this report. The potential for these programs to have benefit-to-cost ratios as high or higher than those for substance misuse treatments, however, seems clear.

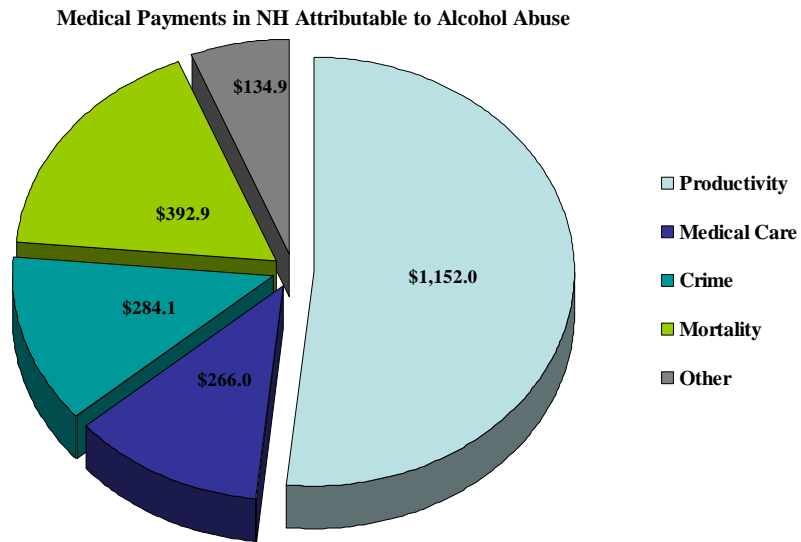
The benefits to productivity and the overall NH economy from increased substance misuse treatment and prevention activities would accrue over time. Prevention and treatment programs are investments in the human capital of the state and like any human capital investment (like education and training), the benefits are not all realized immediately, but grow over time. Such things as reductions in medical costs for chronic diseases and conditions affected by substance misuse would decline gradually, as would mortality and police, crime and corrections costs. But other benefits would be realized quickly. Labor force participation, impaired productivity of workers, absenteeism, and motor vehicle crashes would begin responding immediately and quickly produce benefits. Regardless, substance misuse prevention and treatment will have significant long-term fiscal and economic benefits for the state.

## **VIII. Conclusions**

This study has attempted a comprehensive evaluation of the costs borne by individuals, businesses and governments in New Hampshire as a result of adverse impacts of substance misuse in New Hampshire. It is important to quantify the costs incurred by citizens, businesses, and government as a result of substance misuse when considering the use of scarce public funds. Substance misuse squanders individual skills, talents, and resources and make the State of New Hampshire and its residents poorer. The report identifies many of the ways in which substance misuse produces outcomes that make New Hampshire collectively poorer. Although the goal of this report was to document the economic costs associated with drug and alcohol misuse the authors recognize that drug and alcohol misuse also have serious consequences that affect families and individuals in ways that cannot be quantified through economic analysis.

Drug and alcohol misuse place an annual \$1.84 billion burden on the citizens and economy of New Hampshire, an amount equal to over \$1,400 per state resident. Figure 5 summarizes the costs analyzed in this report. As shown, the largest single cost category was productivity, which accounted for \$1.15 billion. The next largest cost category was mortality, \$393 million, followed by crime at \$284 million.

Figure 5  
Substance Abuse Cost NH \$1.84 Billion in 2012 and Over \$2 billion When the  
Costs of Premature Death are Included



The findings in this report suggest that reducing substance misuse would produce substantial benefits for the New Hampshire economy. So much so, that we believe the issue of substance misuse prevention, treatment, and recovery support should be fully integrated into the workforce development and any larger economic development strategies adopted by State of New Hampshire, its communities, and businesses.

## Appendix A

### Methods for Calculating Economic Impacts

#### A. General Methodology

This report follows many of the procedures used in two seminal national studies of the costs of alcohol<sup>27</sup> and drug<sup>28</sup> misuse. These studies used the same general approach, employing prevalence-based data and the human capital method to estimate substance misuse costs. Prevalence-based costs provide an estimate of the direct and indirect economic burden incurred in a time period that result from the prevalence of a behavior or condition (e.g., substance misuse).

The process of estimating the costs of substance misuse can be broken down into the following three steps:

- Step 1: Identify the prevalence of substance misuse
- Step 2: Identify the adverse outcomes associated with substance misuse;
- Step 3: Determine the degree of causality between substance misuse and the associated adverse outcomes; and
- Step 4: Assign economic values to these adverse outcomes

#### B. Estimating Productivity Impacts

##### Alcohol-Related Productivity Impacts

PolEcon used estimates of reductions in productivity by age from Bouchery et al. (2010) and a two-stage model to estimate changes in productivity resulting from alcohol misuse. Stage one estimated the probability of labor force participation for working-age individuals in New Hampshire and the impact that one form of alcohol misuse (alcohol dependency) has on participation. The reduction in labor force participation, by age, was multiplied by the average NH earnings in 2012 obtained from the 2012 March supplement of the current population survey for the appropriate age category to arrive at aggregate amount of lost earnings for each age group. Unlike our 2012 study of the costs of alcohol misuse in NH, compensation in the form of employer-provided fringe benefits and legally-required employer costs (obtained from the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor) were added to arrive at total lost productivity. PolEcon chose not to include estimates of household productivity in the costs of alcohol and drug misuse. These services are not valued in a market, making estimates of their value more subjective and prone to error.

Stage two estimated the earnings impact of alcohol misuse on individuals in the New Hampshire labor force. Bouchery's research showed a significant reduction in labor force participation and earnings for men but showed no effect on workplace productivity for women. The implausible finding of no negative impacts on women is likely the result of several factors. According to Bouchery et. al. it is:

*“more likely due to imprecise estimation resulting from several common problems and data gaps that plague attempts to estimate women’s wages (e.g., breaks in the earnings histories of women because of childbirth). Further, the surveys that were used to assess the impact of alcohol dependence on earnings included a relatively small number of women, which made it difficult to accurately assess the impact of alcohol dependence on earnings history”.*

Nevertheless because of the absence of significant impacts for females, we calculate the impact of alcohol misuse on labor force participation and earnings, only for males age 18-64. The result is an underestimate of the true productivity costs of alcohol misuse.

Our estimates of productivity losses associated with alcohol misuse are divided into four categories:

- Losses related to reduced labor force participation;
- Losses associated with reduced earnings of those in the labor force who misuse alcohol;
- Losses associated with alcohol-related absenteeism; and
- The cost of the lost productive capacity of individuals who die prematurely due to alcohol misuse.

This study does not include productivity losses associated with such things as the time spent by individuals in substance misuse treatment, hospitalization, or incarceration. Some, if not all, of these factors likely contribute to the overall reduction in labor force participation and earnings among misusers of alcohol that is evident in the earnings differences between those individuals who misuse alcohol and the population that does not misuse alcohol. Thus separate measures of productivity losses from time spent in substance misuse treatment, hospitalization or incarceration risks double counting of the costs associated with these events among misusers of alcohol.

### **Drug-Related Productivity Impacts**

There are no estimates of the impact of drug misuse and dependence on labor force participation similar to the estimates similar to those used for alcohol dependence. Our estimates of the impact of illicit drug use on productivity followed the National Drug Intelligence Center (NDIC 2011) approach.<sup>29</sup> The NDIC estimated the decrease in productivity as a result of past year misuse of or dependence upon illicit drugs. For the NDIC study the authors defined illicit drugs as all Schedule 1 drugs and non-medical use of Schedule II-IV drugs (cocaine, and methamphetamine as well as prescription pain relievers, tranquilizers, stimulants, and sedatives). Relying on data from the 2007 NSDUH to provide prevalence estimates of drug misuse and dependence, the authors produced estimates of reduced productivity attributable to illicit drug use. Among respondents aged 15 and older, the authors found a 17% and 18% reduction in productivity attributable to drug misuse or dependence for males and females, respectively. Consistent with our productivity estimates for alcohol misuse, these reductions were applied to the population of *working age men and women ages 18-64* in New Hampshire and represent the

combined impacts of both lower labor force participation and reduced earnings.

PolEcon used the same estimates of productivity (earnings, as well as benefits and employer costs) used for our analysis of the productivity impacts of alcohol misuse for working age NH residents to produce productivity losses among drug abusing and dependent NH residents. Estimates of productivity by age and sex from the Current Population Survey (CPS) include individuals who both do and don't misuse drugs. To adjust the estimates of total productivity to reflect this, PolEcon multiplied the productivity estimates for each age category by the factor  $1/(1-ab)$ , where  $a$  is the drug dependent proportion of the population in a given age category, and  $b$  is the reduction in earnings (i.e., 17% for males and 18% for females reported in the 2011 NDIC national study of the cost of drug misuse).

### **Absenteeism Related Productivity Impacts**

The mean number of additional days of missed work attributable to binge drinking and drug misuse by industry was multiplied by the estimated number of workers who binge drink and who misuse drugs to arrive at a total number of substance misuse attributable days absent by industry. Average earnings by industry in NH (from the Current Population Survey) was converted to a daily wage (including benefits) for each industry and multiplied by alcohol-attributable days absent for each industry to arrive at a total earnings cost for alcohol and drug attributable absenteeism.

Absenteeism reduces the earnings of employees but also has a broader impact on businesses and industries. The total cost to business is the lost productivity and output of goods and services that occurs when workers are absent. Employee compensation as a percentage of industry output is a measure of how much labor compensation goes into each dollar of industry output. Absenteeism may or may not result in lost earnings for all workers but a missing worker can produce no goods or services. We calculated compensation as a percentage of industry output in NH for each of 13 major industry groupings. Dividing the loss of compensation in each industry by the ratio of employee compensation in the industry to industry output yields an implied loss of industry output (production of goods or services) resulting from substance misuse attributable absenteeism in NH.

### **Mortality Related Productivity Impacts**

The cost of substance misuse-related premature deaths (mortality costs) in NH were estimated using data on alcohol-attributable deaths from the Alcohol-Related Disease Impact (ARDI) software of the Centers for Disease Control and Prevention (for alcohol-related deaths) and the Wonder data analysis tool (for drug-related deaths). Both data sources are products of the Centers for Disease Control and Prevention. The largest causes of annual alcohol attributable deaths in New Hampshire were motor vehicle crashes, alcoholic cirrhosis and other liver diseases, and suicide. For drug deaths, accidental overdose is by far the largest cause of acute drug-related deaths.<sup>30</sup>

We used estimates of the net present value of the stream of future lifetime earnings by age and gender at a 3% discount rate from a study conducted at the University of California, San

Francisco<sup>31</sup> and adjusted them to 2012 values using the consumer price index. Consistent with other sections of this report we did not include household productivity in the net present value calculation of lifetime earnings estimates. Household productivity varies by age but in this analysis we discounted our calculation of the present value of lifetime earnings by the weighted average of household productivity for all age groups by gender (.1667 for males and .3785 for females).

## **Caveats**

Nearly all studies of the costs of alcohol and drug misuse measure productivity losses due to premature mortality from drug and alcohol use by calculating the annual costs of the net present value of the remaining years of productivity (wage and salary earnings and household productivity) of individuals who died prematurely due to drugs or alcohol. This estimation method, however, is inconsistent with other measures in this report which calculate productivity losses due to alcohol and drug attributable illness or events (crimes, crashes, medical treatments) in the year in which they occur.

A more consistent measure of productivity cost of premature death for a particular year would calculate the annual productivity losses associated with everyone who died from drugs or alcohol-attributable causes in the year of interest, as well as the productivity losses for individuals who would have been productivity in the year studied had they not died prematurely in the years prior to the year of study. This is a more complicated task and beyond the scope of this report so we have used the more common, net present value of lifetime productivity measure for our estimates. However, because the measure is inconsistent with other measures in the report we do not include the mortality losses in our estimates of total productivity losses related to alcohol and drugs. Rather, we report it for information purposes only.

## **C. Estimating Medical Costs**

### **Specialty Treatment Costs**

Data on service utilization (number receiving treatment, type of substance, type of treatment, length of treatment/stay, etc.) were obtained from the 2012 Treatment Episodes Data-Admissions (TEDS-A) and 2011 Treatment Episodes Data-Discharges (TEDS-D) public-use data file (SAMHSA, 2014). Data from the National Survey of Substance Misuse Treatment Services (N-SSATS) report was used to estimate the numbers of clients treated at facilities that are not required to report to the federal government on the number of clients served.

In 2011 (the latest year for which both treatment discharge data are available), there were over 5,400 admissions and discharges at substance misuse treatment facilities in New Hampshire. TEDS does not provide complete data on all admissions because it does not capture data for treatment programs that receive no public funds or programs that report to federal agencies such as the Bureau of Prisons or the Veterans Administration. TEDS includes admissions to treatment programs that receive any public funding either directly or through state agencies. To the extent that treatment programs in New Hampshire do not receive any public funds, and are not required



and do not report admissions or discharges, these numbers will undercount treatment costs in NH. While not providing a complete count of all admissions, TEDS provides the most complete data on admissions and discharges available. The degree of undercounting inherent in TEDS data is unknown.

The N-SSATS data set is a survey of treatment facilities, including those that do not accept public funds and are not required to report on client services. We compared treatment numbers from NH facilities using N-SSATS data with data from TEDS and estimate that TEDS data cover almost 90 percent of substance misuse clients in NH.

There is no data readily available on substance misuse treatment costs in New Hampshire. Harwood et al. (2001)<sup>32</sup> estimated the unit costs of substance misuse treatment using the Substance Misuse Treatment Cost Allocation and Analysis Template (SATCAAT). The SATCAAT, developed in collaboration with SAMHSA, provides a standardized method and tool to collect data on unit costs of substance misuse treatment by service type. The SATCAAT follows generally accepted accounting principles in measuring treatment costs. PolEcon adopted the unit cost treatment services from Harwood et al. and adjusted it to 2012 dollars, using the medical Consumer Price Index (CPI).

For each substance reported in the TEDS data, information on the type of treatment and length of treatment (stay) is available for discharges from treatment facilities in NH. PolEcon multiplied the number of discharges by substance by type of treatment and length of stay to arrive at a total number of treatment days by type of treatment and substance in 2011 and then multiplied by the average daily cost of treatment by type of treatment to arrive at cost of treatment estimates. Finally, we multiplied our cost of treatment estimate by 1.097 to account for under reporting of treatment series in the TEDS data.

### **Medical Care Costs**

Data on hospital discharges by primary diagnosis at admission in NH, collected for the national Healthcare Cost and Utilization Project (HCUP), was combined with the fraction of each illness, accident or condition determined to be attributable to both alcohol and illicit and prescription drug misuse to determine the number of hospital stays in NH attributable to alcohol and drug misuse (by ICD-9 diagnosis). Alcohol attributable fractions were obtained from the Alcohol-Related Disease Impact (ARDI) software of the Centers for Disease Control and Prevention.<sup>33</sup> Drug use attributable fractions were obtained from the Office of National Drug Control Policy (ONDC).

The number of alcohol and drug-attributable hospital stays by primary diagnosis in NH was then multiplied by the average charge in the state for each diagnosis to estimate the total amount of hospital charges for alcohol and drug-attributable diagnoses in NH. The amounts were summed to arrive at a total estimate of alcohol-attributable hospital charges in NH. Unfortunately, New Hampshire is the only state in the nation to not have HCUP hospital discharge data more recent than 2009 on the number of hospital discharges and cost per discharge by primary diagnosis or treatment. Hospital discharge data is available for 2012 for all states except Maine (which as 2011 data available and NH 2009). To the extent that hospital stays for

alcohol and drug attributable diagnoses increased between 2009 and 2012 the estimates in this report will undercount medical expenditure for substance misuse. The documented rise in treatments for drug misuse and drug-related deaths in New Hampshire suggests that the number of medical procedures and associated costs related to drug misuse increased between 2009 and 2012, suggesting the estimates in this report undercount drug attributable medical costs. Without a sound method of estimating the increase in drug related hospital discharges by diagnoses, however, data from 2009 was used and inflated to 2012 values using the consumer price index for medical expenditures.

The patient discharge data used in this report only report hospital “charges” and not actual payments. Most payers negotiate a contract which includes payments that are less than, and in some cases substantially less than, reported charges. For our estimates, we converted hospital charges to expenditures, using a mean expenditure-to-charge ratio of 67 percent.

In addition to hospital inpatient costs, other cost estimates representing outpatient medical care, prescription drugs, nursing home care and other professional care are presented. Data sources for directly estimating the costs of these services for New Hampshire are not available. Instead, PolEcon followed an indirect estimation method employed by previous state-level studies (for example, Max, Wittman, Stark, & West, 2004; Wickizer, 2007).<sup>34</sup> Max, Wittman et al. provided ratios for alcohol-related and drug-related other medical care services based on national cost estimates. Using this method, a ratio of other medical care cost to hospital inpatient care cost was calculated for each of the itemized other medical care services. The hospital inpatient care costs were multiplied by those ratios to derive the costs of other medical care services. Table 13 shows the ratios used to estimate the costs of other medical care in relation to hospital charges.

<b>Table 13</b> Ratio of Other Medical Expenses to per Dollar Hospital Inpatient Care Costs	
<b>Provider and Service Type</b>	
Hospital Inpatient Care	1
Outpatient Medical Care	0.393
Nursing Home Care	0.14
Prescription Drugs	0.356
Other Health Professionals' Services	0.21
Insurance Administration	0.085

Finally, the cost of health insurance administration for medical care attributable to alcohol was estimated as a percentage of health treatment costs attributable to alcohol. Administration costs vary substantially by payment source, ranging from a low of 0% for out-of-pocket payments to 14.6% for private insurance. Here, we use a weighted average of payers (8.5%) as calculated by Bouchery, et. al (2010).

## **D. Estimating Crime, Justice, and Corrections Costs**

### **Policing Costs**

To calculate the percentage of police protection costs related to substance misuse, the total number of violent, property, and motor vehicle offenses attributable to alcohol and drugs were divided by the total number of offenses (reported crimes, motor vehicle offenses etc.) in the state. To calculate the percentage of crimes attributable to alcohol we applied the alcohol-attributable fractions (AAF's) for violent and property crimes as reported Wickizer (2007) to NH crime data

reported as reported by the Uniform Crime Reporting (UCR) system of the Federal Bureau of Investigation. Reports filed by local governments in NH capture over 90% of the crimes reported in the state. For our alcohol-attributable estimates we added all directly-attributable alcohol offenses (offense such as liquor law violations, and DWI, which by definition are alcohol related, and divided the number of alcohol-attributable crimes by total crimes to arrive at a percentage of alcohol attributable offenses. A relatively small percentage of violent and property crime arrests in NH are attributable to alcohol while a large number of offenses in NH are completely attributable to alcohol, such as public drunkenness and liquor law violations. Driving while-under-the-influence is at least 90% related to alcohol. Overall, violent and property crimes take more police resources per offense and are a much smaller percentage of crimes committed, but a much larger percentage of policing and public safety time is spent on more routine offenses (such as disorderly conduct, traffic offenses, etc.) that are much more affected by alcohol. Simply adding the percentage violent crime arrests that are alcohol-attributable to the more numerous arrests that are completely alcohol attributable would likely overstate the role of alcohol in policing costs.

We adjusted crime and arrest data to more accurately reflect the fact that although a high number of arrests are for alcohol-attributable traffic offenses, the time and costs associated with violent and property crimes (not traffic related offenses) place a larger, per offense, burden on policing resources. For this analysis we, conservatively, estimate the percentage of policing resource-adjusted offenses (crimes) attributable to alcohol at 12.8% in NH in 2012. This percentage was multiplied by state and local police protection expenditures in NH (as reported in the U.S. Census Bureau, “Census of State and Local Government Finance, 2011”) and inflated to 2012 values to arrive at our estimate of police protection costs of alcohol.

The UCR system does not report drug offenses and thus we lacked data on the total number of drug law violations in the state. To estimate the overall percentage of offenses attributable to drug misuse we calculated the percentage of violent and property crimes in NH that were drug attributable (28%) without making any adjustments for drug law violations. As a check on the reasonableness of this percentage we consulted the NDIC 2011 study of the cost of drug misuse in the U.S.. That study calculated the total percentage of offenses that are drug related at 24 percent. For this study we chose to use the middle point (26%) between the two estimates for calculating drug-attributable policing costs. This percentage was then multiplied by state and local police protection expenditures in NH (as reported in the U.S. Census Bureau, “Census of State and Local Government Finance, 2011”) and inflated to 2012 values to arrive at our estimate of police protection costs of alcohol.

### **Judicial Costs**

Alcohol: A majority of the offenses that are directly (by definition) attributable to alcohol, such as liquor law violations, drunkenness, driving under the influence of alcohol are resolved with a limited impact on judicial costs, while violent and property crimes are much more likely to involve extensive use of the resources of the state’s judicial system. In addition, a significant portion of judicial costs in the state are unrelated to criminal cases. To estimate judicial costs attributable to alcohol, the percentage of violent or property crimes in NH attributable to alcohol in 2012 (5.1%) was multiplied by judicial expenditures in the state in 2011 and inflated to 2012 values. In addition, for directly-attributable alcohol offenses such as driving under the influence,

liquor law violations etc., we multiplied the number of offenses in NH times the estimated judicial cost per arrest as reported in Bouchery, et. al. (2010), and inflated to 2012 values (\$1,069 for driving under the influence, and \$135 for all others). While many arrests result in much higher judicial costs, many alcohol-attributable driving offenses and liquor law violations are resolved with guilty pleas or otherwise little judicial costs.

Drugs: To estimate the judicial costs to state and local government associated with drug-attributable offenses we used the percentage of criminal offenses by type of offense that are attributable to drug misuse as reported in New Hampshire attributable to drugs (26%) and multiplied that percentage by the percentage of all judicial cases that are criminal. The NDIC national drug study examined a number of state judicial systems and found, on average, that 54 percent of judicial cases in the states examined were criminal cases. Without having NH specific data we used that percentage for our analysis. This procedure results in a percentage of judicial costs attributable to drugs of 14 percent ( $.26 \times .54 = .1404$ ).

### **Corrections Costs**

Alcohol: Crime-related alcohol-attributable fractions (AAF's) reported by Bouchery, et. al. (2010) applied to the offenses for which inmates were sentenced suggests that about 21.2% of state inmates and 16.9% of local (county) inmates nationally, are incarcerated because of alcohol-attributable offenses. Lacking more specific detail on the inmate populations of NH's state and county jails, we adopted these estimates for our analysis. We multiplied the percent of incarcerations attributable to alcohol by NH's state and county corrections expenditures for 2011 (as reported in the Census of State and Local Government Finances) and inflated this amount to 2012 dollars to estimate alcohol-attributable corrections expenditures in NH.

Drugs: There are no New Hampshire specific data on the on the number of prisoners in state and county jails attributable to drug use and misuse. Using drug-attributable fractions for criminal offenses and applying those fractions to the population of sentenced prisoners in the U.S., the National Drug Intelligence Center report estimated that 34 percent of prisoners sentenced to state prisons and 33 percent of those sentenced in local and county jails are attributable to drug use and misuse. Applying drug attributable fractions specific to each type of criminal offense to the number of criminal offenses in New Hampshire suggests between 26 and 28 percent of incarcerated individuals in New Hampshire are attributable to drug misuse. For this study we adopted the most conservative estimate of 26 percent. We then multiplied the percent of incarcerations attributable to drug misuse by NH's state and county corrections expenditures for 2011 (as reported in the Census of State and Local Government Finances) and inflated this amount to 2012 dollars to estimate drug-attributable corrections expenditures in NH.

### **E. Estimating Motor Vehicle Crash Costs**

The annual report of the New Hampshire Highway Safety Agency (NHSA) contains data on the number of motor vehicle crashes in NH. It includes information on the number of fatal crashes, the number of crashes with no reported injuries, and the number of crashes where injuries were reported. The most recent annual report available from the NHSA is for 2010, containing crash data for 2009, the same data used for our 2012 report on the cost of excessive alcohol consumption NH. According to NHSA annual reports, motor vehicle crashes in NH have been

on a downward trend, decreasing from 41,843 in 2003 to 33,265 in 2009. Some of the decline in crashes is a function of fewer miles being driven in the state as a result of weak economic conditions, the cost of gasoline, or other reasons. Whatever the cause, we adjusted 2009 crash data to 2012 by reflecting the downward trend in automobile crashes. To the extent that the longer-term trend of declining crashes was reversed between 2009 and 2012, our estimates will understate the true cost of substance misuse attributable crashes. The per crash unit costs cost of alcohol-related motor vehicle crashes in New Hampshire was drawn from a U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) Report, “The Economic Impact of Motor Vehicle Crashes, 2010”.<sup>35</sup>

The 2010 per crash unit costs reported by the NHTSA were applied to our estimate of the number of crashes in NH in 2012 and inflated to 2012 dollar values to estimate the total cost of crashes with fatalities and crashes where no injury was reported. For crashes that involved injury, the NHTSA reports unit costs according to the severity of injuries in the crash along the “maximum injury severity index” (MAIS 0-5) scale. NH crash data does not report crashes involving injury according to the MAIS scale so NH crashes involving injuries were allocated to MAIS categories of severity in the same percentages as reported nationally. Crashes by severity were multiplied by the unit costs for crashes of each severity to produce our estimate of the total costs of crashes by severity of injury. For all crashes, medical costs included in NHTSA estimates of crash costs were excluded from our cost calculations to avoid double counting because those costs are captured in our estimates of medical costs related to alcohol. Similarly, productivity costs are excluded to avoid double counting.

Total motor vehicle crash costs, excluding medical and productivity costs (to avoid double counting), were multiplied by the NHTSA estimate of 22 percent of crash expenditures being alcohol attributable to arrive at our final estimate of alcohol-attributable motor vehicle crash costs. To estimate the cost of drug attributable motor vehicle crashes we multiplied the total estimated cost of motor vehicle crashes in NH by 2 percent (equal to about one-tenth of alcohol attributable crashes costs).

## End Notes

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<sup>1</sup> Substance Misuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2011 and 2012, Statistical Table # 20.

<sup>2</sup> Gross state product is the total value (value added) of goods and services produced in the state.

<sup>3</sup> Hahn, Beth, et. al., "State and Sociodemographic Variations in Substance Use Treatment Need and Receipt in the United States," Center for Behavioral Statistics and Quality, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, April, 2011.

<sup>4</sup> New Futures, Inc., "The High Cost of Excessive Alcohol Consumption in New Hampshire," January 2013, available at <http://new-futures.org/resources/high-cost-excessive-alcohol-consumption-new-hampshire-december-2012>.

<sup>5</sup> Opiates are naturally occurring opium-based narcotic substances such as morphine and codeine, while opioids are synthetic and semi-synthetic forms of opiates such as heroin, oxycodone, hydrocodone, and methadone.

<sup>6</sup> These estimates are for one form of alcohol misuse "dependency" found to significantly impact labor force participation and earnings of those alcohol dependent workers in the labor force. Coefficient's for the impact that alcohol dependency has on labor force participation, by age, are from: Ellen E. Bouchery, et. al "Economic Costs of Excessive Alcohol Consumption in the United States, 2006," The Centers for Disease Control and Prevention, 2010.

<sup>7</sup> The number of individuals not in the labor force is an estimate using national coefficients for labor force participation among individuals with and without alcohol dependency (by age) found in Bourchery et. al. . The age appropriate coefficient s were applied to the male population of NH population to determine the number of individuals not participating in the NH labor force because of alcohol dependency.

<sup>8</sup> For this estimate alcohol impaired productivity refers to one type of alcohol misuse: alcohol dependency.

<sup>9</sup> The Center for Integrated Behavioral Health Policy at George Washington University. A description of the methods they use to develop their estimates of alcohol dependency and misuse by industry sector is available online at: <http://www.alcoholcostcalculator.org/alcohol/about/?page=1>

<sup>10</sup> Ibid.

<sup>11</sup> This differs from alcohol dependency where dependency is more prevalent as the age category of workers increases.

<sup>12</sup> For each industry, the amount of labor required to produce goods and services is different. Some industries use more capital (machinery, equipment, technology etc.) to produce their goods and services and those differences are reflected in these ratios. In some industries such as health services, the value of the goods and services produced relies heavily on the input of the workers in the industry, while industries such as manufacturing, rely more heavily on capital to produce their goods.

<sup>13</sup> The secondary or "multiplier" impacts from alcohol and drug misuse productivity losses were estimated using the IMPLAN economic modeling system and a structural model of the NH economy.

<sup>14</sup> Only treatment facilities that receive federal or state funding are required to report on the number of individuals treated. Our estimates of the number of NH residents receiving treatment for substance misuse includes a small percentage (just under 10%) to account for treatment by facilities that do not report. It should be noted that some reviewers of this report believe that the report underestimates the number of NH residents receiving treatment but did not have data to verify that contention.

<sup>15</sup> Total health care expenditure data for NH are from the Kaiser Family Foundation's "State Health Care Facts." For 2009 and inflated to 2012 values using the consumer price index for medical care.

<sup>16</sup> This analysis includes on market-based measures of productivity. That is, only the earning of workers as valued in the labor market. Some studies include productivity measures that include "household productivity" (or the estimated value of services performed by individuals in their homes) in their estimate of the total productivity of individuals. To maximize the accuracy of our estimates, we believe only market-valued measures should be included in our estimates.

<sup>17</sup> A 2010 study for the National Highway Safety Administration estimated the cost of crashes in NH in 2010 at over \$1.5 billion. Our estimate excludes medical costs and market productivity to avoid double counting. Our total also exclude household productivity losses for consistency with other estimates in this report.

<sup>18</sup> Lawrence Blincoe, et. al., "The Economic and Societal Impact of Motor Vehicle Crashes, 2010," U.S. Dept. of Transportation, National Highway Safety Administration, May 2014.

<sup>19</sup> Nanette Nelson, et. al. "The Cost of Substance Misuse in Wyoming, 2010," Wyoming Survey and Analysis Center, 2012.

<sup>20</sup> The IMPLAN model of the State of NH (2010 Version) was used. Information about the IMPLAN model can be found at [www.IMPLAN.com](http://www.IMPLAN.com).

<sup>21</sup> NH Dept. of Administrative Services, Bureau of Accounting Services state revenue reports.

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- <sup>22</sup> The costs associated with each individual who misuses alcohol or drugs vary greatly depending on which of the adverse outcome associated with substance misuse that occur. The estimate here is an average across all individuals. And is calculated as follows: Cost of substance misuse in 2012 = \$ 1,835,740,000.00 / Pop. Age 12+ (1,132,897) \* % misusers (.085) = 96,296 = \$19,063. Reduced cost of \$19,063 / cost of treatment (\$2,632) = 7.24
- <sup>23</sup> S.L. Ettner, D. Huang, et al. (2006). "Benefit-cost in the California treatment outcome project: does substance misuse treatment 'pay for itself?'" *Health Services Research*, 41(1): 192-213.
- <sup>24</sup> North Dakota Department of Human Services, "What are the Average Costs of Substance Misuse Treatment in the Public Sector in North Dakota?" December, 2006.
- <sup>25</sup> N. Jordan, G. Grissom, et al. (2008). "Economic benefit of chemical dependency treatment to employers." *Journal of Substance Misuse Treatment*, 34(30): 311-19.
- <sup>26</sup> S. Parthasarathy, C. Weisner, et al. (2001). "Association of outpatient alcohol and drug treatment utilization and cost: revisiting the offset hypothesis." *Journal of Studies on Alcohol and Drugs*, 62(1): 89-97.
- <sup>27</sup> Ellen E. Bouchery, et. al., "Economic Costs of Excessive Alcohol Consumption", op. cit.
- <sup>28</sup> National Drug Intelligence Center, "The Economic Impact of Illicit Drug Use on American Society", Washington D.C.: United States Department of Justice. Available at <http://www.justice.gov/archive/ndic/pubs44/44731/44731p.pdf>
- <sup>29</sup> Op. cit. National Drug Intelligence Center, 2011.
- <sup>30</sup> NH Bureau of Alcohol and Drug Services, "NH State Epidemiological Profile of Mental, Emotional, and Behavioral Health," December, 2011.
- <sup>31</sup> Wendy Max, et. al., "Valuing Human Life: Estimating the Present Value of Future Earnings, 2000". Center for Tobacco Control and Research, University of California San Francisco, 2004.
- <sup>32</sup> H. J. Harwood, et. al., "The Cost and Components of Substance Misuse Treatment," Substance Misuse and Mental Health Services Administration, 2001.
- <sup>33</sup> Accessed online at: [http://apps.nccd.cdc.gov/DACH\\_ARDI/Default/Default.aspx](http://apps.nccd.cdc.gov/DACH_ARDI/Default/Default.aspx)
- <sup>34</sup> W. Max, F. Wittman, B. Stark & A West. "The Cost of Alcohol Misuse in California: A Briefing Paper," Institute for the Study of Social Change, 2004. Thomas M. Wickizer, "The Economic Costs of Drug and Alcohol Misuse in Washington State, 2005," Division of Alcohol and Substance Misuse, Washington Department of Social and Health, 2007.
- <sup>35</sup> Lawrence Blincoe, et. al., op. cit.