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The Cost of Alcohol and Drug Abuse in Maine, 2010

Substance Abuse and Mental Health Services

Maine Department of Health and Human Services

The Cost of Alcohol and Drug Abuse in Maine, 2010

April 2013

Substance Abuse and Mental Health Services
An Office of the Department of Health and Human Services

Paul R. LePage, Governor
Mary C. Mayhew, Commissioner

Prepared for: Office of Substance Abuse and Mental Health Services
Department of Health and Human Services

Anne L. Rogers, Maine Office of Substance Abuse and Mental Health Services
Marcella H. Sorg, Margaret Chase Smith Policy Center, University of Maine
Jamie A. Wren, Margaret Chase Smith Policy Center, University of Maine

For more information, contact:

Maine Office of Substance Abuse and Mental Health Services
Information & Resource Center
#11 State House Station
Augusta, ME 04333-0011
Web: http://www.maine.gov/dhhs/samhs/osa/
Email: osa.ircosa@maine.gov
1-800-499-0027 or (207)287-8900
TTY: 711 (Maine Relay)

TABLE OF CONTENTS

List of Tables iii

List of Figures v

Executive Summary 1

Chapter 1: Introduction 6
- Introduction and Background 6
- Methodology 6
- Limitations 7
- Organization 8

Chapter 2: Substance Abuse Treatment 9
- Major Findings 10
- Methodology 10
- Results 11
- Summary and Implications 14

Chapter 3: Morbidity 16
- Major Findings 16
- Methodology 17
- Results 17
- Summary 21

Chapter 4: Mortality 22
- Major Findings 22
- Methodology 23
- Results 24
- Summary 26

Chapter 5: Crime 32
- Major Findings 32
- Methodology 33
- Results 34
  - Law Enforcement 34
    - Police Protection 34
    - Drug Control 36
  - Judicial 38
  - Corrections 39
    - State Corrections 40
    - County Corrections 41
  - Other Societal Costs 43
    - Productivity Losses Due to Incarceration 44

Property Destruction 45
Criminal Victimization 46
Summary 48

Chapter 6: Medical Care 50
Major Findings 50
Methodology 51
Results 51
Summary 57

Chapter 7: Other Related Costs 58
Major Findings 58
Methodology 58
Results 59
Child Welfare 59
Social Welfare Administration 59
Fire Destruction 61
Motor Vehicle Crashes (Non-Medical) 62
Summary 63

Chapter 8: Summary 64
Major Findings 64
Overview 56
Conclusions 59
References 60

Appendices

A. Calculation of Estimated Morbidity Costs, 2010

B.1 ICD-9 Codes and Alcohol Attributable Fractions for Alcohol-Related Injuries and Associated Hospital Inpatient Charges, Maine, 2010

B.2 ICD-9 Codes and Alcohol Attributable Fractions for Alcohol-Related Injuries and Associated Hospital Outpatient Charges, Maine, 2010

C. Estimated Costs of Alcohol Related Motor Vehicle Crashes, Maine, 2010

D. Data Sources for this Report

LIST OF TABLES & FIGURES

Table **Page**

2.1 Treatment funding by payer, Maine, 2010 11
2.2 DEEP Funding, Maine, 2010 11
2.3 Number of admissions for treatment by type of disorder, Maine, 2010 12
2.4 Number of clients receiving treatment by type of disorder, Maine, 2010 12
2.5 Admissions for treatment by race, Maine, 2010 13
2.6 Admissions for treatment by age, Maine, 2010 13
3.1 Estimated number of adults with abuse or dependence, by gender and age, Maine, 2006-2009 18
3.2 Estimated number of adults with abuse or dependence, by gender, age, and employment status, Maine, 2010 19
3.3 Morbidity costs, Maine, 2010 23
4.1 Number of alcohol- and drug-related deaths by age and gender, Maine, 2010 24
4.2 Deaths attributable to alcohol by diagnosis and gender, Maine, 2010 27
4.3 Deaths attributable to drugs, Maine, 2010 29
4.4 Estimated mortality costs and years of potential life lost, Maine, 2010 30
5.1 Attributable fractions 34
5.2 Estimated cost of police protection, Maine, 2010 35
5.3 Drug Control Expenditures, Maine, 2010 36
5.4 Substance Control Expenditures, Maine, 2010 37
5.5 Legal and adjudication costs, Maine, 2010 38
5.6 Estimated cost of state corrections, Maine, 2010 40
5.7 Estimated cost of county corrections, Maine, 2010 42
5.8 Estimated productivity losses due to incarceration, Maine, 2010 45
5.9 Property destruction due to crime, Maine, 2010 46
5.10 Estimated productivity losses for victims of crime, Maine, 2010 47
5.11 Summary of crime costs, Maine, 2010 48
6.1a Estimated alcohol-related hospital inpatient direct costs, Maine, 2010 53

List of Tables & Figures (continued)

6.1b Estimated drug-related hospital inpatient direct costs, Maine, 2010 54
6.2a Estimated alcohol-related hospital outpatient charges, Maine, 2010 55
6.2b Estimated drug-related hospital outpatient charges, Maine, 2010 56
6.2c Total estimated hospital inpatient/outpatient charges, Maine, 2010 57
6.3 Other medical costs due to alcohol, Maine, 2010 58
7.1 Estimated administrative costs of selected social welfare programs attributed to substance abuse, Maine, 2010 61
7.2 Estimated alcohol-related cost of fire protection and property damage and destruction due to fire, Maine, 2010 62
7.3 Estimated non-medical cost of alcohol-related motor vehicle crashes, Maine, 2010 64
8.1 Summary: Estimated cost of alcohol and drug abuse by category, Maine, 2010 66

Figure **Page**

2.1 2010 Public Funds Spent on Treatment 14
2.2 2010 Private Funds Spent on Treatment 15
4.1 Percent of alcohol and drug deaths by age group, 2010 26
8.1 Comparison of costs, 2000, 2005, & 2010 67
8.2 Distribution of substance abuse costs, Maine, 2010 68

The Cost of Alcohol and Drug Abuse in Maine: 2010

Executive Summary

Published by the Maine Office of Substance Abuse and Mental Health Services, April 2013

Summary findings

- In 2010, the total estimated cost of substance abuse in Maine was $1.403 billion.
- This $1.403 billion translates into a cost equaling $1,057 for every resident of Maine.
- This was a 56.2% increase from 2005.
- Substance abuse treatment ($47.0 million) comprised the smallest proportion of total cost (3.4%), while mortality, $409.6 million, comprised the largest proportion of costs (24.8%).

Substance abuse treatment

Treatment services available in Maine to help persons with substance use disorders include various levels of residential programs, outpatient programs, medication assisted treatment, detoxification, and specialty programs for youth, pregnant women, and persons who are diagnosed with both mental health and substance use disorders.

Summary findings:

- The total estimated cost of providing treatment and intervention in Maine in 2010, based on reported annual revenue in the Treatment Data System (TDS), was $47.0 million, $45.6 million of which was spent on admissions for treatment, shelter, and detoxification.
- Of the $45.6 million; 79% is from public funds (state and federal) 21% from private funding sources. Of public funds, 53% is from Federal Medicaid and 16% is from other Federal grants. Of private funds, 74% is from client payments and 26% is from private insurance.

- An additional $1.4 million was spent on Driver Education and Evaluation Program (DEEP), which was covered fully by client payments.
- Approximately 16,818 admissions for drug and/or alcohol related treatment was reported during 2010, representing 14,996 distinct individuals.
- It is estimated that more than 10% of 18-24 year olds in Maine meet the criteria for drug abuse or dependence.

Morbidity

Alcohol and drug abuse or dependence may adversely affect an individual's work productivity as well as his or her ability to function in other roles. Examples of reduced work productivity would include a worker calling in sick or working while hung-over from heavy drinking the night before, using drugs or alcohol on the job, or leaving work early to use drugs and consume alcohol. An individual's productivity in other non-work roles may also be affected by alcohol or drug use, e.g. performing household or child-care duties. In all these cases, reduced output resulting from alcohol or drug use can be measured as an economic loss. It is often assumed, incorrectly, that the affected worker or individual incurs all of the costs for his or her behavior. However, productivity loss due to alcohol and drug abuse or dependence creates an economic loss borne by society at large.

Summary findings:

- Total estimated morbidity costs in 2010 due to alcohol or drug abuse was $188.6 million.
- Males accounted for 66.9% of total costs.
- Males aged 45-64 accounted for the largest portion of alcohol morbidity costs.

Mortality

A major economic loss is imposed on society by premature death from substance use and abuse. Premature death through illness or injury can occur through auto and other accidents

involving alcohol, through liver diseases such as hepatitis and cirrhosis, through increasing the risk of cancer or cerebrovascular disease, and through violence involving drugs or alcohol. When an individual dies prematurely, there is an economic cost to society in the form of the loss of that individual's productive capacity.

Summary findings:

- 713 deaths related to drug and alcohol abuse occurred in 2010, (538 alcohol-related and 175 drug-related deaths), resulting in 15,896 years of potential life lost.
- Major causes of death were:
    a. cancer (various types) – 132 deaths
    b. accidental drug poisoning – 128 deaths
    c. cirrhosis and liver damage – 102 deaths
    d. motor vehicle accidents – 66 deaths
    e. drug-induced suicide - 52 deaths
- Total mortality costs for 2010 were $409.6 million. Of this amount, $240.9 million resulted from alcohol abuse and $168.7 million from drug abuse.
- The average cost per death in 2010, measured in lost earnings, was $574,534.

Crime

Recent surveys of incarcerated populations provide evidence of the strong link between crime and substance abuse. In 2004, 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. Fifty-three percent (53%) of State and 45% of Federal prisoners met the diagnostic criteria for drug dependence or abuse (US Department of Justice, 2006).

Summary findings:

- Of 19 arrests for homicide in 2010, an estimated 6 were related to alcohol and 3 to drug abuse.

- In 2010 there were 7,083 assault (aggravated, sexual and other) related arrests, of which an estimated 2,120 were related to alcohol abuse and 345 to drug abuse.
- Total estimated drug- and alcohol-related crime costs in 2010 were $343.4 million.
- Of the four major crime cost categories analyzed, law enforcement costs were highest ($119.7 million), followed by the cost of corrections ($111.0 million).

Medical care

Alcohol and drug abuse increases the risk of illness or injury and thereby increases the use of health care services. The effects of substance abuse on health care utilization may be obvious and immediate or more indirect and long term. The link between substance use and health care costs is clear in the case of an individual overdosing on drugs and then requiring hospitalization, or a person who is injured in an alcohol or drug involved auto accident or other accident and requires emergency hospital treatment. But prolonged alcohol and drug abuse can also increase the risk for a number of diseases, including stomach cancer, cancer of the esophagus, respiratory tuberculosis, stroke, liver damage and pancreatitis, thereby increasing the demand for costly medical care as well as premature nursing home care.

Summary findings:

- There were approximately 8,302 hospital discharges in Maine in 2010 directly or indirectly related to drug and alcohol use or abuse.
- The total cost of providing hospital inpatient care for these patients, including adjustment for longer stays due to co-occurring substance dependency, was estimated at $145.1 million, 83.4% of which was related to alcohol use.
- The estimated cost of 2010 outpatient medical care was $122.6 million; 74.7% of those costs were attributable to alcohol use.
- Prescription drug costs and nursing home costs attributable to alcohol were, respectively, $27.7 million and $7.5 million.
- The total estimated medical cost in 2010 was $302.8 million.

Other related costs

Substance use and abuse impacts a number of areas not included in the previous sections: These include child welfare and the administration of other social welfare programs, fire protection and the destruction caused by fire, and the non-medical costs of motor vehicle accidents.

Summary findings:

- An estimated $45.9 million in child welfare costs related to substance abuse was spent in Maine during 2010.
- An estimated $3.5 million was spent on the administration of other social welfare programs related to drug and alcohol abuse in Maine during 2010.
- Alcohol is plays a role in many fires. In 2010, the estimated cost of these alcohol related fires in Maine was $9.5 million.
- The cost of alcohol-related motor vehicle crashes in Maine in 2010 is estimated at $53.1 million.
- The combined cost of all three cost categories was $111.9 million

Chapter 1

Introduction

Introduction and Background

This report uses nationally accepted practices in an attempt to quantify, in monetary terms, the consequences of alcohol and drug abuse for the State of Maine. The problem of alcohol and drug abuse continues to be a major social concern, with serious personal, social and economic consequences. Alcohol and drug abuse cause illness, disability and premature death. The burden on society includes the use of costly health care resources, significant productivity (economic) losses due to morbidity, serious injuries from accidents, and criminal activity resulting in property damage and incarceration. Earlier reports sponsored by the Office of Substance Abuse estimated the cost of substance abuse as $485 per Maine citizen in 2000, and $682 per Maine citizen in 2005. The current report provides an update using 2010 data; it estimates a total of $1,040 costs per person.

Methodology

This study used the following to estimate costs: 1) review of the literature on updated substance related cost estimates (in particular, proportions and attributable fractions); and 2) review of the 2005 study to align as close as possible to prior methodology to allow comparison. In general this study follows "Cost of Illness" guidelines focusing on tangible costs. Prevalence-based cost estimation studies measure how many cases there are of a disorder or consequence over a period of time, the costs or value of the resources used to treat the disorder, and the lost productivity during a specified period of time. For the current study, the base period is calendar year 2010. The population of interest resides in the State of Maine, estimated as 1,328,361 persons in 2010 (US Census Bureau, 2010).

Cost of illness studies require a monetary value to be placed on human life. This study uses the same approach in determining a *life value* as was done in the 2005 report: the human capital approach, which measures an individual's value to society in terms of his or her production potential, reflected in earnings. Using this perspective, the value of an individual to

society is his or her earnings, and the value of a life lost due to premature death is calculated as the missed future earnings of that individual.

Studies using the human capital approach measure both the direct and indirect costs of specific disease categories. Direct costs are those for which payments are made (e.g., medical care or alcohol treatment); indirect costs are those for which resources are lost (e.g., lost productivity due to morbidity or mortality). Using this approach the estimation of direct costs is straightforward; but indirect costs are more difficult to analyze because they require a value based upon a person's earnings and production potential. This may undervalue certain members of society: children, elderly, people with disabilities, ethnic minorities and women. Despite its limitations, the human capital approach remains widely used and provides a useful method for analyzing the cost of disease.

Limitations

This analysis has several limitations that merit mention. First, any cost estimation study may miss certain costs. It's important to remember that this report provides a conservative estimate of the costs of substance abuse to Maine, but does not capture all of the associated economic costs.

Second, to estimate costs related to drug and alcohol abuse, the analyses often had to assign a portion of total costs to substance abuse. Prior studies have developed these "attributable fractions" based upon research and surveys conducted that can be used to estimate the portion of total costs that can reasonably be attributed to alcohol or drug use (US DOJ/NDIC, 2011; The Lewin Group, 2010; NIDA/NIAAA, 1998). For example, if research shows that alcohol abuse contributes to approximately 30% of all stomach cancers, then only 30% of medical costs incurred in treating stomach cancer should be attributable to alcohol abuse. The attributable fractions used here are the same as those used for a national cost analysis (US DOJ/NDIC, 2011; The Lewin Group, 2010; NIDA/NIAAA, 1998; Brucker, 2007). Some of the attributable fractions we will be using in this report were originally developed from research conducted as much as 25 years ago.

Third, though an effort was made to replicate the study completed on year 2005 data, slight differences in data sources, revisions in attributable fractions, and changes in methodology

arose. Differences are noted where applicable. Comparisons between this report and the previous report should therefore be made with caution.

In addition, although efforts were made to obtain Maine data for the year 2010, this was not always possible. In certain cases, national data were used to provide estimates for Maine and were adjusted for inflation or cost of living differences to provide estimates for 2010.

Organization

The report is organized into eight chapters. Chapters two through seven present cost estimates for each of the six cost areas analyzed: substance abuse treatment, morbidity, mortality, crime, medical care, and other related costs. The final chapter summarizes the findings of the analyses and outlines some policy implications.

Chapter 2

Substance Abuse Treatment

This chapter documents treatment costs in Maine for 2010 and also presents information concerning service utilization. Complete and detailed information regarding treatment costs is difficult to obtain because of the multiplicity of funding sources and the large number of programs. The best source of current information on treatment cost is the Treatment Data System (TDS) maintained by the Maine Office of Substance Abuse (as of September 2012, the Office became the Office of Substance Abuse and Mental Health Services). The service utilization data presented in this chapter are from the TDS.

The following substance abuse treatment services were available in Maine, and those costs are included in the report: residential, outpatient, intensive outpatient, medication assisted therapy, detoxification, shelter, and specialty programs for youth, pregnant women, and persons who have co-occurring mental health and substance use disorders.

The major findings of the analysis were:

- The total estimated cost of providing treatment in Maine in 2010, based on reported annual revenue, was $47.0 million, of which $45.6 million is for admissions for treatment, shelter and detoxification, and another $1.3 million is for OUI intervention (DEEP).
- Of the $45.6 million for admissions for treatment, shelter and detoxification, $36.1 million (79.1%) is from public funds and $9.5 million (20.9%) is from private funds.
- Of public funds, 53.9% is from Medicaid Federal portion; 9.2% is from the federal Substance Abuse Prevention and Treatment Block Grant; 15.8% is from other federal, state and local funds; 18.3% is from MaineCare State portion.
- Of private funds, 69.1% is from Client payments; 30.7% is from Private Insurance.
- $1.4 million were spent on DEEP services in 2010, serving approximately 5,500 in-state clients.
- Approximately 16,818 admissions to drug and/or alcohol related treatment services, representing 14,996 distinct individuals, were reported during 2010.

Methodology

Cost estimates in this chapter were based on discharge data extracted from the Treatment Data System, 2012 (TDS). The data included payer source, number of clients, and the number of units times the cost per unit (see table 2.1). The data in the TDS system are collected from approximately 90% of the treatment facilities located throughout the State. The proportion of clients whose data are included in TDS is even higher than 90% because most of the facilities that are not required to report or do not report tend to be small. While all licensed treatment facilities in Maine are required to report to TDS, there were still a few in Maine who had not begun reporting. Primary care providers treating patients in provider's offices do not report to TDS. Therefore the admission counts given are considered to be an underestimate of the total number of persons treated for substance abuse in Maine.

In addition to costs associated with those admitted to treatment, shelter or detoxification, the State conducts an intervention program for those who receive an arrest for OUI (Operating Under the Influence), called the Driver Education and Evaluation Program (DEEP). Cost data on DEEP was extracted from the Maine Department of Administrative and Financial services [1]financial database. These include all costs: administration in the completion of treatment; Under 21 program; and PRIME FOR LIFE program. Non client administration and out-of-state/military administration were not included in this total. DEEP funding is shown in table 2.2. DEEP is considered a revenue neutral program, where all costs of the program are covered by fees paid by DEEP clients. The fees go into the State General Fund, from which a portion is then returned to the Office of Substance Abuse to pay for program administration.

Results

Major sources of treatment funding are shown in Tables 2.1 and 2.2. Treatment, shelter, and detoxification costs totaled approximately $45.6 million, 79.1% of which was from public funds (state and federal). The single largest payer source was Medicaid/MaineCare and Medicare, which accounted for 59.3% of all treatment funding. The second largest source was state and federal government funds (including general and local funds, and federal grant funds), which accounted for 19.8%. The third largest source was client payments, accounting for 14.4%

[1] These figures do not include the costs associated with treatment by private physicians prescribing buprenorphine (Suboxone and subutex).

of all funding. DEEP funding adds an additional $1.4 million for a total of $47.0 million for intervention and treatment.

Table 2.1
Treatment funding by payer
Maine, 2010[2]

Public	2010	% Total	Attrib. Alc 22.2%	Attrib. Drug 28.88%	Attrib. Alc & Drug 49%
OSA	$3,248,277	7.1%	$721,117	$938,102	$1,591,656
Medicaid Fed	$19,459,027	42.7%	$4,319,904	$5,619,767	$9,534,923
Medicaid State	$6,590,541	14.4%	$1,463,100	$1,903,348	$3,229,365
Medicare	$1,014,229	2.2%	$225,159	$292,909	$496,972
SA BG	$3,307,877	7.3%	$734,349	$955,315	$1,620,860
Other	$2,461,790	5.4%	$546,517	$710,965	$1,206,277
Total Public	**$36,081,741**	**79.1%**	**$8,010,147**	**$10,420,407**	**$17,680,053**
Private					
Client Payment	$6,589,056	14.4%	$1,462,770	$1,902,919	$3,228,637
Private Insurance	$2,928,691	6.4%	$650,169	$845,806	$1,435,059
Other Funding	$11,591	0.0%	$2,573	$3,347	$ 5,679
Total Private	**$9,529,337.15**	**20.9%**	**$2,115,513**	**$ 2,752,073**	**$ 4,669,375**
TOTAL 2010	**$45,611,078.26**				

Source: SAMHS/TDS

Table 2.2
DEEP funding
Maine, 2010

DEEP	2010
DEEP – Self-Pay to General Fund	$ 1,364,822

Source: Maine DHHS Financial database

Data gathered through TDS includes information about treatment services, utilization and program capacity. Data can be broken down by type of disorder and type of service setting. Admissions include persons who reported a primary problem of substance use as well as affected others such as family members. Of all admissions (16,818) for treatment in 2010, 78.5% were for outpatient services (Table 2.3); 28.8% of admissions were for drug problems only, 22.2% were for alcohol problems only, and the remaining 49.0% of admissions were for treatment of combined alcohol and drug problems. There were approximately 5,500 in-state clients served by DEEP in calendar year 2010

[2] In this and later tables "Attrib." refers to the amount of the cost attributed to alcohol or drugs

Table 2.3
Number of admissions for treatment by type of disorder
Maine, 2010

Type of disorder	Treatment type		Total	Percent (%)
	Inpatient	Outpatient		
Alcohol disorder	1,044	2,695	3,739	22.2
Drug disorder	800	4,037	4,837	28.8
*Dual disorder	1,764	6,478	8,242	49.0
Total	**3,608**	**13,210**	**16,818**	**100.00**
Percent	**(21.5)**	**(78.5)**		

Source: SAMHS/TDS
*Dual disorder are those who have both an alcohol and drug disorder combined.

Persons may be admitted to treatment multiple times over the course of a year, either as new admissions to different facilities for different levels of care or as re-admissions to the same facilities or levels of care. Table 2.4 shows that these 16,818 admissions represented 14,996 individual clients. 79.3% of the (unduplicated) clients were admitted to outpatient services.

Table 2.4
Number of clients receiving treatment by type of disorder
Maine, 2010

Type of disorder	Treatment type		Total	Percent (%)
	Inpatient	Outpatient		
Alcohol disorder	902	2,559	3,461	23.1
Drug disorder	704	3,588	4,292	28.6
Dual disorder	1,491	5,752	7,243	48.3
Total	**3,097**	**11,899**	**14,996**	**100.00**
Percent	**(20.7)**	**(79.3)**		

Source: SAMHS/TDS
*Dual disorder are those who have both an alcohol and drug disorder combined.

As shown in Table 2.5, 93.9% of all admissions to treatment were categorized as *White* clients, 2.6% were *Black*, 2.2% were *American Indian/Alaskan Native*, and the remaining small portion included "Asians" and clients of other races. The demographic profile of the state population overall is shown in the last column of Table 2.5. In general, the treatment population reflects the state population, although Black and Native American clients are over- represented in the treatment population and Whites and other races are under-represented, when compared to the US Census distribution in Maine.

Table 2.5
Admissions for treatment by race
Maine, 2010

Race	Inpatient	Outpatient	Treatment population (%)	State population (%)
White	3,466	12,341	**15,807 (93.9)**	1,264,971 (95.2)
Black	76	353	**429 (2.6)**	15,707 (1.2)
American Indian/Alaskan Native	40	331	**371 (2.2)**	8,568 (0.6)
Other	26	185	**211 (1.3)**	39,115 (2.9)
Total	**3,608**	**13,210**	**16,818**	**1,328,361**

*Due to the small cell size, "Asian" was placed within the "Other" category to protect confidentiality

As shown in Table 2.6, approximately 7% of admissions were clients under age 18, 18.5% were age 18-24, 31.6% were age 25-34, 28.5% were age 35-49, 13% were age 50-64, and 1.4% were 65 or older. Outpatient services comprised 13,210 admissions, 78.5% of all admissions.

Table 2.6
Admissions for treatment by age
Maine, 2010

Age group	Inpatient	Outpatient	Treatment (%)	State population (%)
Under 18	62	1,111	1,173 (7.0)	274,533 (20.7)
18-24	450	2,662	3,112 (18.5)	116,072 (8.7)
25-34	1,004	4,310	5,314 (31.6)	144,624 (10.9)
35-49	1,330	3,464	4794 (28.5)	278,995 (21.0)
50-64	699	1,491	2,190 (13.0)	303,057 (22.8)
65+	63	172	235 (1.4)	211,080 (15.9)
Total	**3,608**	**13,210**	**16,818 (100.0)**	**1,328,361 (100.0)**

Source: SAMHS/TDS

Summary and Implications

Treatment costs in Maine in 2010 were estimated at $45.6 million[3], representing a per capita expenditure of approximately $34.33 (a 79.7% increase per capita since 2005), using the 2010 US Census population of 1,328,361 Maine residents. The largest funding source remained the same in 2010 as in 2005, government funding, but the amount of client self-pay in 2010 was over 9 times higher than in 2005.

Despite the large amount spent for treatment, this expenditure represents only a fraction of the estimated need. According to a two year annual average of 2010-2011 National Survey of Drug Use and Health (NSDUH) approximately 6.8% (+/- 1.8%) of the Maine population aged 18 or over needed treatment for an alcohol and/or drug problem. (SAMHSA, 2013) Using this percentage, and based on the 2010 US Census, which estimates 1,053,828 adult residents living in Maine, approximately 71,660 adults, were in need of treatment for alcohol and/or drug addiction. In 2010, only 14,996 individuals were reported to have received treatment, which is 20.9% of the total number of individuals who needed treatment.

The total amount of resources devoted to treatment and intervention, $47.0 million, is only about 3.4% of the total cost of substance abuse in Maine, $1.381 billion.

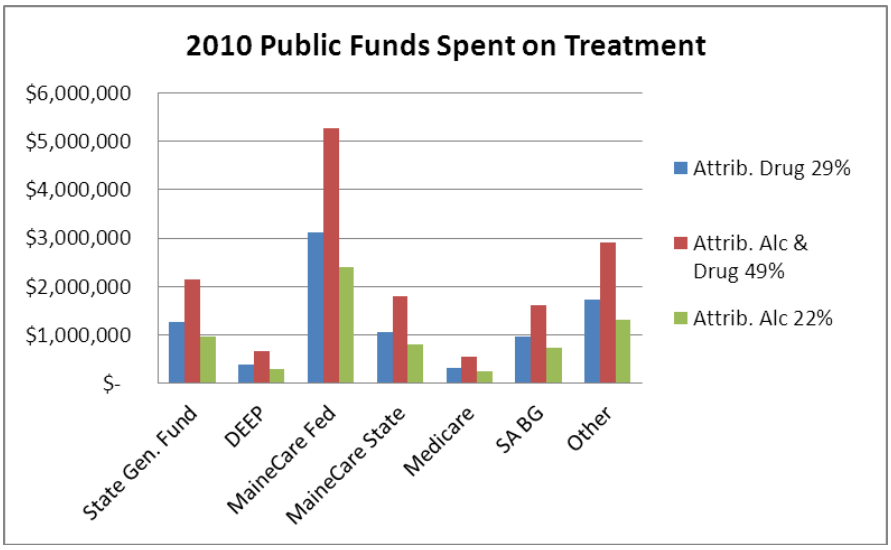

Figure 2.1

[3] This total excludes the OUI intervention program, DEEP.

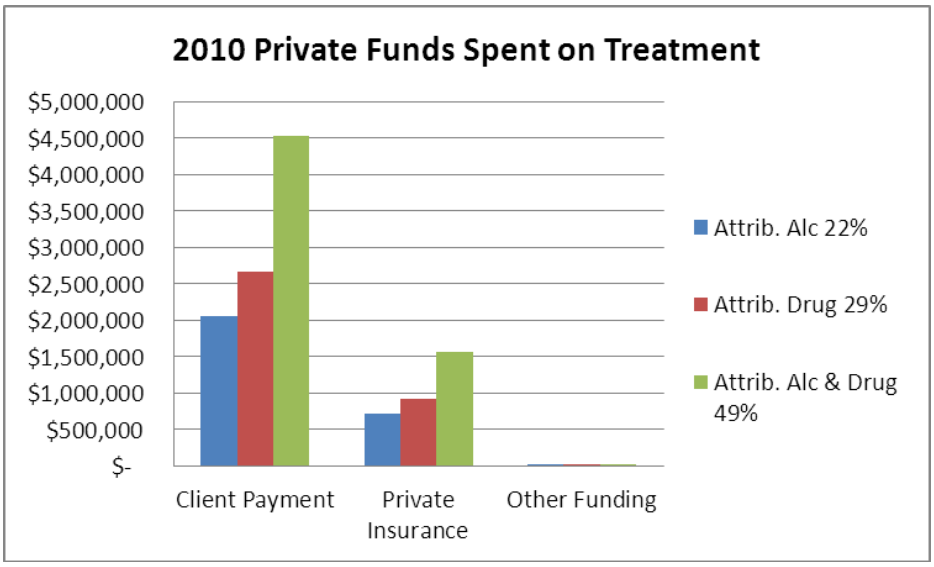
2010 Private Funds Spent on Treatment
$5,000,000
$4,500,000
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
Client Payment
Private Insurance
Other Funding
Attrib. Alc 22%
Attrib. Drug 29%
Attrib. Alc & Drug 49%

Figure 2.2

Chapter 3

Morbidity

Alcohol and drug use, abuse, or dependence may adversely affect the ability of an individual to participate in work or other activities, such as maintaining a household. This chapter measures morbidity costs as reduced productivity from alcohol and drug abuse, measured in terms of either wage earnings for workers or housekeeping values for non-workers.

The major findings of the analysis were:

- Total morbidity costs in 2010 due to alcohol or drug abuse were $188.6 million;
- Males accounted for 75.9% of total costs;
- Males aged 45-64 accounted for the largest portion of alcohol morbidity costs.

Methodology

This chapter generally follows the established methodology used in previous Maine studies and other studies nationally to estimate morbidity costs associated with alcohol or drug use (Baird et al., 2004; Wickizer, 1999; Rice et al., 1990).

First, the number of persons with a drug abuse disorder, the number with an alcohol abuse disorder, and the total number with either or both substance use disorders were estimated based upon prevalence data gathered for Maine by the federal survey, NSDUH[4]. Due to relatively small NSDUH sample sizes each year, data from 2006 through 2009 (SAMHSA, 2011) had to be combined to develop reasonably reliable prevalence estimates, and were then weighted by age/gender proportions from the 2010 Census. Then the prevalence rates were applied to Maine Census population estimates for the year 2010 (U.S. Census Bureau, 2010) to estimate the numbers of persons within each age group and gender category who met the criteria for a substance disorder. The number of persons who met criteria for a substance disorder in each age/gender category was multiplied by the labor force participation rate within each subgroup to estimate the expected number who would be employed. Next, the number of persons with a substance use disorder who were not employed was estimated by subtracting the

[1] Total persons with a substance abuse disorder is less than the sum of persons with an alcohol or drug abuse disorder because some persons have both disorders.

number of employed persons from the total number of persons who met the substance disorder criteria.

Median earnings for male and female age groups were estimated by adjusting the earnings listed in the 2005 Cost Report (OSA, 2007). The alcohol and drug use disorder impairment rates were determined by averaging the rates used by Wickizer (1999). To develop an estimate of an impairment rate to apply to the alcohol or drug use disorder estimates, the impairment rates for the two separate categories were weighted according to the percentage of age specific prevalence reported from the NSDUH. [5]

Median earnings for each age/gender/labor participation group were multiplied by the relevant impairment rate to generate estimates of lost earnings due to drug and alcohol abuse. [6]

Results

Approximately 80,091 adults in Maine had an alcohol use disorder in 2010; 29,507 adults had a drug use disorder, and 99,060 adults had either or both disorders (Table 3.1).

The prevalence of abuse or dependence was highest among the 18-24 year old age group. The prevalence of alcohol abuse or dependence was 22.1% for males and 13.4% for females in the 18-24 year old age group. An estimated 10.4% of males and 10.9% of females in that age group met the criteria for drug abuse or dependence. Criteria for illicit drug or alcohol abuse or dependence were met by 27.4% of males and 20.2% of females in the 18-24 year old age group.

Based upon the labor force participation rates included in Table 3.2, an estimated 56,685 employed persons had an alcohol use disorder, at least 21,854 employed persons had a drug use disorder, and an estimated 70,824 employed persons had either or both disorders in Maine in 2010. Of persons who were not participating in the labor force, an estimated 17,095 persons were estimated to have an alcohol use disorder, 7,435 persons had a drug use disorder, and 21,881 persons had either or both disorders.

[5] See Appendix A for details of the calculations.
[6] See Appendix A for details of the calculations.

Table 3.1
Estimated number of adults with abuse or dependence, by gender and age
Maine, 2006-2009

	Alcohol disorder prevalence	Drug disorder prevalence	Alcohol and/or drug disorder prevalence	2010 Maine Population	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder
	%	%	%	N	N	N	N
Male							
18-24	22.1	10.4	27.4	59,258	13,096	6,163	16,237
25-44	13.7	4.5	15.8	156,066	21,381	7,023	24,658
45-64	8.6	2.1	10.7	201,212	17,304	4,225	21,530
65+	*	*	*	92,468	*	*	*
Total	11.1	3.5	13.2	509,004	56,499	17,815	67,189
Female							
18-24	13.4	10.9	20.2	56,814	7,613	6,193	11,476
25-44	6.9	2.9	9.4	159,934	11,035	4,638	15,034
45-64	1.6	0.5	1.8	209,464	3,351	1,047	3,770
65+	*	*	*	118,612	*	*	*
Total	4.4	2.3	6.0	544,824	23,972	12,531	32,689
TOTAL	**7.6**	**2.8**	**9.4**	**1,053,828**	**80,091**	**29,507**	**99,060**

Sources: SAMHSA, 2011; US Census, 2010

Table 3.2
Estimated number of adults with substance abuse or dependence, by gender, age, and employment status
Maine, 2010

	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder	Labor force participation rate	Employed			Not employed		
	N	N	N	%	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder
Male										
18-24	13,096	6,163	16,237	61.6	8067	3796	10002	5029	2367	6235
25-44	21,381	7,023	24,658	89.4	19115	6279	22044	2266	744	2614
45-64	17,304	4,225	21,530	77.4	13393	3270	16664	3911	955	4866
65+	*	*	*	21.6	*	*	*	*	*	*
Female										
18-24	7,613	6,193	11,476	66.7	5078	4131	7654	2535	2062	3822
25-44	11,035	4,638	15,034	78.2	8629	3627	11757	2406	1011	3277
45-64	3,351	1,047	3,770	71.7	2403	751	2703	948	296	1067
65+	*	*	*	13.9	*	*	*	*	*	*

Sources: SAMHSA, 2011; US Census, 2010; US Dept of Labor 2010

Median annual wages in Maine in 2010 ranged from a low of $16,227 for males aged 65 and older to $46,447 for males aged 45-64 (Table 3.3). Housekeeping values, which represent imputed market values for maintaining the home, are also included in Table 3.3. Employment earnings do not capture all of the productive capacity of individuals, because people have to maintain households apart from their jobs. Thus, Table 3.3 includes two sets of housekeeping values, one for persons in the labor force, the second for persons not in the labor force. Housekeeping values are significantly higher for females than males, reflecting the relative amount of time spent in this activity. These housekeeping values were calculated by taking the values from the 2005 Cost Report and adjusting for inflation (14.93% from 2005 to 2010, InflationData.com).

Table 3.3
Morbidity costs
Maine, 2010

	Employed			Not in labor force			Median earnings	Housekeeping		Impairment rates			Morbidity costs		
	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder		In labor force	Not in labor force	Alcohol	Drugs	Alcohol and/or drugs	Alcohol	Drugs	Alcohol and/ or drugs
	N	N	N	N	N	N	$	$	$				$	$	$
Male															
18-24	8,067	3,796	10,002	5,029	2,367	6,235	26,127	3,910	8,103	1.40	1.10	1.61	3,962,819	1,465,203	5,650,332
25-44	19,115	6,279	22,044	2,266	744	2,614	40,641	4,918	9,186	4.25	5.45	5.17	37,896,220	15,963,014	53,163,875
45-64	13,393	3,270	16,664	3,911	955	4,866	46,447	5,326	9,604	7.40	7.80	7.40	54,090,820	13,920,623	67,301,397
65+	*	*	*	*	*	*	16,227	3,973	7,550	9.30	7.30	*	*	*	*
													95,949,859	31,348,840	**126,115,604**
Female															
18-24	5078	4131	7654	2535	2062	3822	19,882	12,367	20,474	0.80	0.20	0.65	1,725,296	350,876	2,113,056
25-44	8629	3627	11757	2406	1011	3277	26,796	14,658	22,718	7.35	1.45	6.74	30,308,906	2,513,163	37,866,773
45-64	2403	751	2703	948	296	1067	34,835	12,938	21,092	15.30	4.55	14.87	20,623,441	1,916,494	22,542,231
65+	*	*	*	*	*	*	16,257	6,142	10,068	18.70	7.30	*	*	*	*
													52,657,644	4,780,533	**62,522,060**
TOTAL EST													**148,607,503**	**36,129,373**	**$188,637,664**

Sources: US Census Bureau, 2010; Baird, Lanctot and Clough, 2004; Rice et al., 1990

Table 3.3 uses impairment rates for different age-gender groups for alcohol and drugs.[7] These impairment rates provide an estimate of reduced productivity, measured by earnings, associated with drug and alcohol use disorder. For example, the alcohol impairment rate of 7.4% for males aged 45-64 indicates that males in this age group would, on average, earn 7.4% less than males of a similar age who did not have an alcohol disorder.

Total morbidity costs for alcohol in 2010 were estimated at $148,607,503. Males accounted for 64.6% ($95,949,859) of these costs. Total morbidity costs for drugs were $36,129,373 million, with 86.8% ($31,348,840) of this cost attributable to males. Total morbidity cost for alcohol and/or drug use is estimated at $188,637,664 million in 2010.

Summary

Alcohol and drug abuse result in substantial economic loss to Maine by reducing productivity. Total morbidity costs for 2010 for alcohol or drug use were estimated at $188.6 million. Compared with 2005 estimates, costs associated with alcohol abuse were higher in 2010, estimated at $148.6 million, compared to a cost of $135.7 million in 2005. Costs associated with drug abuse were higher in 2010 ($36.1 million) than drug abuse morbidity costs in 2005 ($17.3 million). One reason for the substantial increase is that this cost estimate had a more complete data set than the estimate completed in 2005.

[7] The impairment rates for alcohol and drug use were adapted from Rice et al., 1990 (Table 40).

Chapter 4

Mortality

Premature death due to drug and alcohol use and abuse imposes a major economic cost on society. Premature death through illness or injury can occur through auto accidents involving alcohol, through increasing the risk of cancer or cerebrovascular disease, or through violence involving drugs or alcohol. When an individual dies prematurely, there is an economic cost to society in the form of loss of that individual's productive capacity.

This chapter analyzes mortality costs for Maine in 2010. It has three aims:

1. To determine the number of alcohol- and drug-related deaths.
2. To estimate the number of years of potential life lost from these deaths.
3. To estimate the total economic costs of drug- and alcohol-related deaths.

The major findings of the analysis were:

- 713 deaths related to drug and alcohol abuse occurred in 2010, (538 alcohol-related and 175 drug-related deaths), resulting in 15,896 years of potential life lost.
- Major causes of death were:
    a. cancer (various types) – 132 deaths
    b. accidental drug poisoning – 128 deaths
    c. cirrhosis and liver damage – 102 deaths
    d. motor vehicle accidents – 66 deaths
    e. suicide - 52 deaths and 31 deaths from drugs
- Total mortality costs for 2010 were $409.6 million. Of this amount, 58.8% resulted from alcohol abuse and 41.2% from drug abuse.
- The average cost per death in 2010, measured in lost earnings, was $574,534.
- Drugs accounted for a higher relative proportion of the costs per death than did alcohol. Only 24.5% of deaths were attributable to drugs, yet 41.2% of costs were attributable to drugs,
- With drug deaths tending to occur at younger ages than alcohol deaths, the number of years of life lost per person on average was higher in drug related deaths.

Methodology

In brief, three steps were followed. First, the number of deaths due to diseases associated either directly or indirectly with alcohol or drug use was obtained from the death certificate file of the Maine Office of Data, Research and Vital Statistics (ODRVS), Department of Health and Human Services (DHHS, 2012)[8]. The authors of this report were informed that in 2010 there were many death certificates entered into the death database system as "unknown" for the cause of death, so a complete picture of the drug deaths was not available. Therefore the authors decided to use the data from the State Medical Examiner's Office to provide a more accurate estimation of drug related deaths in 2010. Alcohol Attributable Fractions (AAF) and Drug Attributable Fractions (DAF) used by NIDA/NIAAA were applied to the data to estimate the number of alcohol- and drug-related deaths in Maine for non-substance categories. A review of the literature, was performed to check for any updates to industry standards in calculating year per life lost and cost attribution. This report uses the methodology in *Economic Costs of Excessive Alcohol Consumption*, 2006 produced by the Lewin group. Because of this change in methodology, caution should be used when trying to compare Maine cost reports 2005 and 2010.

Second, the mortality cost for each age-gender cohort was determined by using the same cost per potential life lost as used by The Lewin Group (2010) and Max, D., et. al. (2004). An average net present value (NPV) with 3% discount was obtained by using table IV-11 in the 2010 Lewin Group Economic Cost of Excessive Alcohol Consumption report to calculate the average per age/gender group cost used in this report. Cost figures were adjusted for inflation from the 2006 rate estimates by The Lewin Group (2010) using the inflation cost calculator (InflationData.com, 2012) based upon the CPI for 2010. This produced the "net present value of future earnings" as shown in table 4.4a. This is a different methodology than was used in the 2005 Maine Cost report, but has been used by Federal agencies such as the US Center for Disease Control and the US Department of Justice, among many other highly respected organizations. The final adjusted mortality cost figure was then multiplied by the number of substance-related deaths in Maine. To further adjust for difference in median income rates between Maine and the US, total drug and alcohol costs were multiplied by .9383 to calculate the total loss overall (which is the percent of Maine wages compared to national wages).

[8] Preliminary data for drug related deaths were provided by the Office of Chief Medical Examiner, pending final data from Vital Statistics.

Third, the number of years of potential life lost was calculated for each age group and gender by first determining Maine's current life expectancy by gender obtained from the Social Science Research Council, Measure of America (www.measureofamerica.org). The life expectancy at birth for females in Maine was 81 years; for males it was 76 years.

Results

There were 713 deaths in Maine in 2010 related to drug or alcohol use. A breakdown of the deaths by age and gender is shown in Table 4.1. Alcohol accounted for 75.5% of the substance abuse deaths, and older persons represented the greatest proportion of alcohol related deaths (ARD) particularly those 55-64 (21.0%) and 65 and over (48.3%). In contrast, the highest proportion of drug-related deaths (DRD) was among middle aged adults 35-44 (25.7%) and 45-54 (29.1%) (see Figure 4.1).

Table 4.1
Number of alcohol and drug related deaths by age and gender
Maine 2010

	Alcohol related deaths			**Drug related deaths**			**Total**
	Female	**Male**	**Total**	**Female**	**Male**	**Total**	
Age	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
1-18	3 (1.6)	10 (2.8)	13 (2.4)	1 (0.0)	0 (0.0)	1 (0.0)	14 2.0%
19-24	5 (2.7)	14 (3.9)	19 (3.5)	5* (8.0)	11* (17.5)	16 (13.8)	35 4.9%
25-34	4 (2.2)	16 (4.5)	20 (3.7)	10* (12.0)	18* (27.5)	28 (21.5)	48 6.7%
35-44	9 (4.9)	12 (3.3)	21 (3.9)	21* (32.0)	24* (22.5)	45 (26.2)	66 9.3%
45-54	23 (12.6)	65 (18.1)	88 (16.4)	19* (32.0)	32* (27.5)	51 (29.2)	139 19.5%
55-64	35 (19.1)	82 (22.8)	113 (21.0)	9* (4.0)	9* (2.5)	18 (3.1)	131 18.4%
65+	103 (56.3)	157 (43.7)	260 (48.3)	3* (12.0)	5* (2.5)	8 (6.2)	268 37.6%
Unknown	1 (0.5)	3 (0.8)	3 (0.6)	5* (12.0)	3* (2.5)	8 (6.2)	12 1.7%
Total	**182** (100.0)	**359*** (100.0)	**538*** (100.0)	**73** (100.0)	**102** (100.0)	**175** (100.0)	**713** (100.0)

Source: Maine Department of Health and Human Services, Office of Data, Research and Vital Statistics, 2010; * Office of the Chief Medical Examiner, 2013

* 6 unknown age male and 6 unknown age female

More detailed information concerning alcohol-and drug-related deaths is presented in Tables 4.2 and 4.3, which show how mortality estimates were derived. Table 4.2 includes respective alcohol-attributable fractions (AAF), representing the percentage of deaths within a given diagnosis believed to be attributable to alcohol. For example, the AAF for cancer of the larynx is 0.50, indicating that research has suggested that 50 percent of deaths linked to this form of cancer could reasonably be associated with alcohol use. Table 4.3 has a column labeled drug-attributable fraction (DAF), which provides corresponding information for drug-related deaths. Multiplying the total number of deaths within a diagnostic category by the AAF or DAF gives an estimate of the number of deaths attributable to alcohol or drug use. The AAF and DAF values used for this report are the same as those used in by NIDA/NIAAA (1998).

Table 4.2 shows that different types of cancers accounted for the greatest number of alcohol-related deaths (132), followed by accidental drug poisonings (128), cirrhosis/liver damage (102), alcohol related suicide (52) and cerebrovascular disease (40). Motor vehicle accidents accounted for 66 alcohol-related deaths. Accidental poisoning was the leading cause of drug-related death (128 deaths). (Table 4.3)

Table 4.4a and 4.4b provides detailed information on the number of years of potential life lost (YPLL) due to drug and alcohol use and the estimated economic cost of premature death. In 2010, deaths associated with drug and alcohol use resulted in 15,896 years of potential life lost. Alcohol accounted for a greater proportion (63.2%) of total years of life lost than drugs (36.7%). The category representing the single greatest number of years of lost life for those dying of alcohol-related causes was males age 45-54 (1,690 or 16.8%).

Multiplying lost earnings by the years of life lost can provide an estimate of the economic impact of substance abuse. Cost figures were derived from The Lewin Group (2010) and Max et al. (2004). More details are available in the methodology section. Using this newer methodology is one major factor in the increase (100.1%) shown between 2005 and 2010 reports, although the numbers of deaths also increased, especially drug related deaths, which tend to occur at younger ages than alcohol related deaths.[9] Other factors contributing to the increase includes increase in average wages and a slight increase in Maine's average lifespan.

[9] The total drug death numbers reported in the 2005 report were an underestimate of the actual total number of deaths, particularly accidental overdoses.

Premature death due to alcohol and drug use resulted in an estimated economic loss of approximately $409.6 million. As reflected in Table 4.4a the estimated economic loss due to premature death in 2010 related to alcohol use was $240.9 million ($256.7 adjusted with the .9383 income discount), as compared to $168.7 million for drug use. Drug and alcohol-related deaths among males aged 45-54 accounted for the largest single age group costs, $89.2 million.

Summary

In 2010, 713 people died in Maine from drug and alcohol-related causes, resulting in 15,898 years of potential life lost. Nearly half of alcohol related deaths occurred in persons 65 or older (Figure 4.1), whereas drug related deaths occurred more often in persons 35-44 and 45-54 years old. Translated into economic terms, this loss of life combined represented an economic cost of approximately $409.6 million. Approximately 58.8% of this cost represents premature death related to alcohol use and abuse.

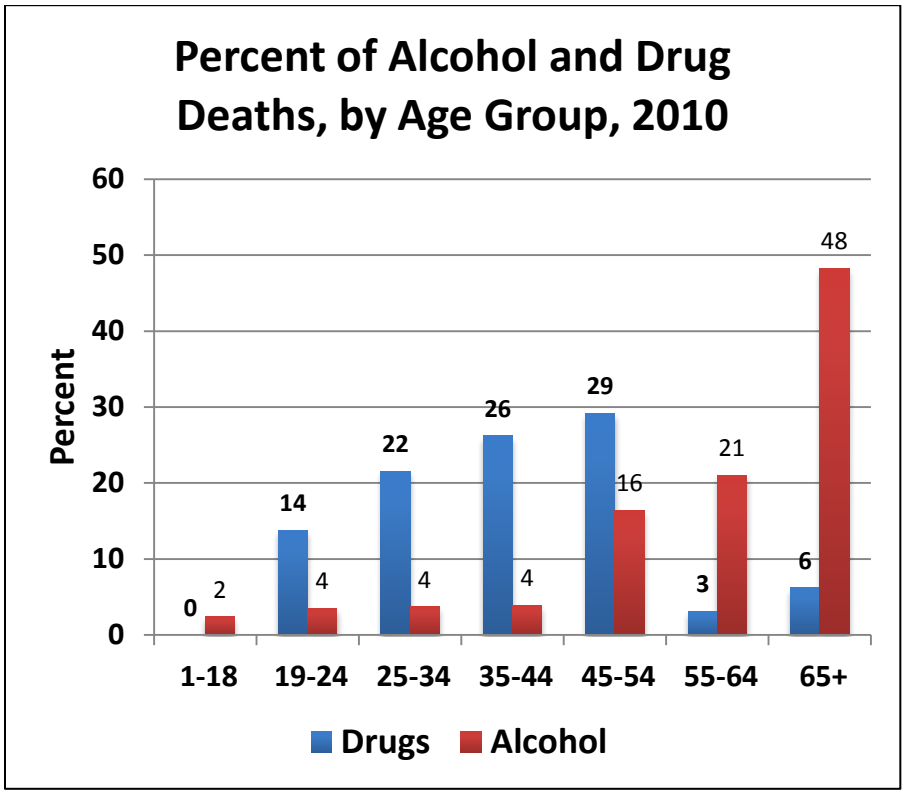

Figure 4.1

Table 4.2
Deaths attributable to alcohol by diagnosis and gender
Maine, 2010

Diagnosis	ICD-10-CM diagnostic codes	AAF	Age (Years)	Total deaths	Male		Female		Total ARD
					Deaths	ARD	Deaths	ARD	
Direct Causes									
Excessive blood levels of alcohol	F10.0	1	≥15	0	0	**0**	0	**0**	**0**
Alcohol abuse	F10.1	1	≥15	10	9	**9**	1	**1**	**10**
Alcohol dependence syndrome	F10.2	1	≥15	17	16	**16**	1	**1**	**17**
Other mental/behavioral problems due to alcohol	F10.3-.9	1	≥15	7	4	**4**	3	**3**	**7**
Alcoholic cardiomyopathy	I42.6	1	≥15	3	2	**2**	1	**1**	**3**
Alcoholic fatty liver	K70.0	1	≥15	0	0	**0**	0	**0**	**0**
Acute alcoholic hepatitis	K70.1	1	≥15	2	0	**0**	2	**2**	**2**
Alcoholic cirrhosis	K70.3	1	≥15	60	41	**41**	19	**19**	**60**
Alcoholic hepatic failure	K70.4	1	≥15	13	7	**7**	6	**6**	**13**
Alcoholic liver damage	K70.9	1	≥15	10	6	**6**	4	**4**	**10**
Indirect Causes									
Respiratory tuberculosis	A15,A16	0.25	≥35	2	0	**0**	2	**0**	**0**
Malignant neoplasm of the oral cavity[10]	C00-C14	0.50	≥35	40	25	**13**	15	**8**	**21**
Malignant neoplasm of the esophagus	C15	0.75	≥35	106	85	**64**	21	**16**	**80**
Malignant neoplasm of the stomach	C16	0.20	≥35	37	21	**4**	16	**3**	**7**
Malignant neoplasm of the liver	C22	0.15	≥35	105	69	**10**	36	**5**	**15**
Malignant neoplasm of the larynx[7]	C32	0.50	≥35	18	16	**8**	2	**1**	**9**
Diabetes mellitus	E10-E14	0.05	≥35	365	207	**10**	158	**8**	**18**
Cerebrovascular disease	G45, I60-I69	0.07	≥35	574	229	**16**	345	**24**	**40**
Essential hypertension	I10	0.08	≥35	53	24	**2**	29	**2**	**4**
Pneumonia and influenza	J10-J18	0.05	≥35	227	102	**5**	119	**6**	**11**
Diseases of the stomach esophagus, duodenum	K20-K31(excl. K29.2)	0.10	≥35	28	12	**1**	16	**2**	**3**
Cirrhosis of liver, w/o mention of alcohol	K74.3-K74.6	0.50	≥35	62	27	**14**	35	**18**	**32**
Portal hypertension	K76.6	0.50	≥35	0	0	**0**	0	**0**	**0**
Acute pancreatitis	K85	0.42	≥35	11	4	**2**	7	**3**	**5**

[10] The AAF for females is 0.40.

Unintentional Injuries									
Accidental drowning & submersions	W65-W74	0.38	≥0	22	19	**7**	3	**1**	**8**
Accidental falls	W00-W19	0.35	≥15	76	44	**15**	32	**11**	**26**
Accidents caused by fire & flames	X00-X09	0.45	≥0	7	4	**2**	3	**1**	**3**
Air and space transport accidents	V95-V97	0.16	≥0	5	5	**1**	0	**0**	**1**
Other injuries and adverse effects	[11]	0.25	≥15	18	12	**3**	6	**2**	**5**
Motor vehicle accidents	[12]	0.42	≥0	156	106	**45**	50	**21**	**66**
Pedal cycle & other road vehicle accidents	[13][6]	0.20	≥0	1	1	**0**	0	**0**	**0**
Water transport accidents	V90-V94	0.20	≥0	3	3	**1**	0	**0**	**1**
Intentional Injuries									
Suicide	X60-X84.9,Y87.0	0.28	≥15	185	150	**42**	35	**10**	**52**
Homicide	X85-Y09,Y87.1	0.46	≥15	23	15	**7**	8	**4**	**11**
Total				2261	1277	**359**	984	**183**	**542**

Sources: Maine Department of Health and Human Services, Office of Data, Research and Vital Statistics, 2012; International Classification of Diseases, 10th revision, Clinical Modification (ICD-10-CM); Bouchery et. al., 2010; Wickizer, 1999; NIDA/NIAAA, 1998

* ARD – Alcohol Related Deaths

[11] X31, W78, W79, W50, W51, W22-W24, W27-W34, Y10, Y13, Y14, Y18, Y19

[12] V02-V04, V09 (.0, .2), V12-V14 (.3-.9), V19 (.0-.2, .4-.6), V20-V79, V80 (.3-.5), V81 (.0, .1), V82 (.0, .1), V83-V86, V87 (.0-.8), V88 (.0-.8), V89 (.0, .2)

[13] V01, V06, V09 (.1, .3, .9), V10-V11, V12-V14 (.0-.2), V16-V18, V19 (.3, .8, .9), V82 (.2-.9), V87.9, V88.9, V89 (.1, .3)

Table 4.3
Deaths attributable to drugs
Maine, 2010

Diagnosis	ICD-10-CM Diagnostic Code	DAF	Age (Years)	Total Deaths	Male		Female		Total Drug Related Deaths
					Total Deaths	Drug Related Deaths	Total Deaths	Drug Related Deaths	
Direct Causes									
Drug Dependence	F11-F19(.2)	1	≥0	2	0	0	2	2	**2**
Nondependent abuse of drugs	F11-F19(.1)	1	≥0	2	0	0	2	2	**2**
Accidental poisoning by drugs*		1	≥0	128	76	76	52	52	**128**
Poisoning by drugs undetermined intent*		1	≥0	8	4	4	4	4	**8**
Self-inflicted drug poisoning*		1	≥0	31	19	19	12	12	**31**
Indirect Causes									
HIV/AIDS	B20-B24	0.05	≥0	9	8	0	1	0	**0**
Hepatitis B	B16.9	0.28	≥0	2	2	1	0	0	**1**
Homicide*	X85-Y09,Y87.1	0.13	≥15	25	17	2	8	1	**3**
Total				**97**	**64**	**102**	**81**	**73**	**175**

Sources: Maine Department of Health and Human Services, Office of Data, Research and Vital Statistics, 2012; *Maine Office of the Chief Medical Examiner, 2013; International Classification of Diseases, 10th revision, Clinical Modification (ICD-10-CM); Wickizer, 1999; NIDA/NIAAA, 1998

Table 4.4a
Estimated mortality costs

		ARD deaths	NPV Future Earning	ALC Total costs Before income discount	DRD deaths	NPV Future Earning	DRUG Total costs Before income discount	ME/National per cap inc. ratio	Total Loss
Male*	1-18	10	$1,659,719	$16,597,189	0	$1,659,719	$ -	0.9383	$15,573,143
	19-24	14	$1,921,027	$26,894,371	11	$1,921,027	$21,131,292	0.9383	$45,062,479
	25-34	16	$1,797,244	$28,755,898	18	$1,797,244	$32,350,385	0.9383	$57,336,026
	35-44	12	$1,500,876	$18,010,517	24	$1,500,876	$36,021,034	0.9383	$50,697,804
	45-54	65	$980,606	$63,739,365	32	$980,606	$31,379,380	0.9383	$89,249,919
	55-64	82	$425,099	$34,858,152	9	$425,099	$3,825,895	0.9383	$36,297,241
	65+	157	$111,117	$17,445,330	5	$111,117	$555,584	0.9383	$16,890,257
Total Males				**$206,300,822**			**$125,263,570**	**.9383**	**$ 311,106,868**
Female*	1-18	3	$1,226,949	$3,680,846	1	$1,226,949	$1,226,949	0.9383	$4,604,984
	19-24	5	$1,374,168	$6,870,841	5	$1,374,168	$6,870,841	0.9383	$12,893,820
	25-34	4	$1,260,684	$5,042,736	10	$1,260,684	$12,606,841	0.9383	$16,560,598
	35-44	9	$967,656	$8,708,908	21	$967,656	$20,320,785	0.9383	$27,238,561
	45-54	23	$ 594,882	$13,682,285	19	$594,882	$11,302,757	0.9383	$23,443,466
	55-64	35	$235,570	$8,244,933	9	$235,570	$2,120,126	0.9383	$9,725,534
	65+	103	$40,910	$4,213,750	3	$40,910	$122,731	0.9383	$4,068,919
Total Females				**$50,444,299**			**$54,571,030**	**.9383**	**$ 98,535,881**
TOTAL				**$256,745,121**			**$179,834,600**		**$409,642,749**

Source: The Lewin Group (2010); Max, D. et. al. (2004); Maine Department of Health and Human Services, Office of Data, Research and Vital Statistics, 2012

Excluded from above, 6 males and 6 female due to unknown age

NPV is the Net Present Value based upon national rates.

Table 4.4b
Estimated Years of Potential Life Lost (YPLL)

		ALC YPLL	DRUG YPLL
Male*	1-18	660	0
	19-24	756	594
	25-34	736	828
	35-44	432	864
	45-54	1,690	832
	55-64	1,312	144
	65+	864	28
Total males		**6,450**	**3,290**
Female*	1-18	213	71
	19-24	295	295
	25-34	204	510
	35-44	369	861
	45-54	713	589
	55-64	735	189
	65+	1,082	32
Total females		**3,611**	**2,547**
TOTAL (%)		**10,061 (63.3%)**	**5,837 (36.7%)**

Excluded from above, 6 males and 6 females due to unknown age

Chapter 5

Crime

Research and data collected for over two decades have shown a strong link between drug and alcohol abuse and its impact on crime. Although the exact nature and strength of the relationship with each type of crime is not fully known, there is little doubt that substance abuse increases the likelihood that certain crimes will be committed. A 1989 Department of Justice study found that in some cities as many as 50%-80% of persons arrested for felonies tested positive for drugs (Tonry & Wilson, 1990). Recent surveys of incarcerated populations provide further evidence of the strong link between crime and the use of drugs and alcohol. 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). In 2010, the Office of National Drug Control Policy conducted urinalysis testing of male arrestees across ten urban sites nationally, finding that presence of at least one test substance ranged from 52% in Washington, DC to 83% in Chicago; in addition, a low of 11% of arrestees in Washington, DC to 38% in Sacramento tested positive for the presence of multiple substances. (ONDCP, 2011).

This chapter analyzes crime costs for Maine in 2010. It examines five types of costs related to criminal activity: (1) Law enforcement, (2) Judicial, (3) Correctional, and (4) Other societal costs.

The major findings of the analysis were:

- Of 19 arrests for homicide, an estimated 6 were related to alcohol and 3 to drug abuse.
- In 2010 there were 7,083 assault (aggravated, sexual and other) related arrests, of which an estimated 2,120 were related to alcohol abuse and 345 to drug abuse.
- Total estimated drug- and alcohol-related crime costs in 2010 were $343.4 million.
- Of the four major crime cost categories analyzed, law enforcement costs were highest ($119.7 million), followed by the cost of corrections ($111.0 million).

Methodology

Information was gathered from various sources on different criminal activities (offenses and arrests), corrections populations, numbers of crime victims, and property destruction. The variables were then adjusted to reflect criminal activity related specifically to drug and alcohol abuse.

The analysis was restricted to the set of crimes believed to be most closely linked to substance abuse (NIDA/NIAAA, 1998). They included the following Part I felonies:

- homicide
- assault (aggravated, sexual and other)
- robbery
- burglary
- larceny (property theft)
- auto theft

Less serious Part II offenses analyzed included:

- operating under the influence (OUI)
- liquor law violations
- public drunkenness
- stolen property (buying, receiving and selling)
- prostitution
- drug law violations (possession, sale, use, or manufacture).

The numbers of drug- and alcohol-related crimes were estimated by multiplying crime figures by attributable fractions in the same manner as done to derive other cost estimates. The attributable fractions used for this report were those used by NIDA/NIAAA (1998; Table C.1) and represent the most current evidence available regarding drug- and alcohol-related crime. The attributable fractions ranged from 5.1% for drug-related sexual assault to 100% for OUI. In other words, it was assumed that 5.1% of all sexual assaults are related to drug use; by definition, 100% of OUI offenses are related to alcohol use.

The attributable fractions used for tables 5.1-5.5 analyses are the same as were used in the 2005 report, which allows for consistency and comparison between the types of crimes and between the 2005 and 2010 reports. Table 5.1 shows the fractions used (crimes such as OUI with attributable fractions of 100% are not shown):

Table 5.1 Attributable fractions

	Alcohol	Drugs
	(%)	(%)
Homicide	30.0	15.8
Aggravated Assault	30.0	5.1
Sexual Assault	22.5	5.1
Other Assault	30.0	5.1
Robbery	3.4	27.2
Burglary	3.6	30.0
Larceny	2.8	29.6
Auto Theft	3.5	6.8
Stolen Property	0.0	15.1
Prostitution	0.0	12.8

To derive some of the cost estimates (judicial costs), it was necessary to convert numbers of arrests or offenses into dollar equivalents. This conversion was done using the same procedure as Rice et al. (1990), which assumed that costs were proportional to the numbers of crimes committed.

Results

Law Enforcement Costs

Police Protection:

Police protection costs were estimated based on the 33,020 arrests (Maine DPS, 2010) for Part I and II offenses committed in 2010 (Table 5.2). The numbers of the offenses were multiplied by the above attributable fractions to obtain estimates of the number of drug- and alcohol-related offenses committed. In 2010 the police protection costs for alcohol- and drug-related crimes were estimated at $47.7 million (Table 5.2). Based on 2005 Cost Report data (OSA, 2007) and adjusted for inflation (InflationData.com, 2012; US Department of Justice, 2007), cost per arrest is estimated at $4,082. For OUI, liquor law offenses, and public drunkenness offenses, the arrest cost from Baird et al. (2004) was used and adjusted for inflation, for a total of $50.64 (the cost per arrest for those offenses in 2005 was $45.63 and in 2000 was $39.14).

There were an estimated 6 homicides and 2,120 assaults in 2010 related to alcohol use or abuse. There were fewer drug-related crimes in these two categories, 3 and 345, respectively, but levels of drug-related robberies, burglaries and thefts were substantially higher compared to alcohol-related robberies, burglaries and thefts.

5.2 Estimated cost of police protection
Maine, 2010

Type of offense	Total arrests	Attributable Fraction		Number of arrests due to:		Cost per arrest	Police protection costs		
		Alcohol	Drugs	Alcohol	Drugs		Alcohol	Drug	Total
Homicide	19	.30	.158	5.7	3	$4,082.31	$23,269.	$12,247	$35,516
Aggravated assault	610	.30	.024	183	14.64	$4,082.31	$747,063	$59,765	$806,828
Sexual assault	68	.225	.051	15.3	3.47	$4,082.31	$62,459	$14,166	$76,625
Other assaults	6,405	.30	.051	1921.5	326.66	$4,082.31	$7,844,159	$1,333,527	$9,177,686
Robbery	191	.034	.272	6.5	51.95	$4,082.31	$26,535	$212,076	$238,611
Burglary	1,440	.036	.30	51.84	432	$4,082.31	$211,627	$1,763,558	$1,975,185
Larceny-theft	6,119	.028	.296	171.33	1811.22	$4,082.31	$699,422	$7,393,962	$8,093,384
Auto theft	229	.035	.068	8	15.57	$4,082.31	$32,658	$63,562	$96,220
OUI	6,245	1.00	.0	6,245	0	$50.64	$316,247	$0	$316,247
Liquor laws	4,950	1.00	.0	4,950	0	$50.64	$250,668	$0	$250,668
Public drunkenness	39	1.00	.0	39	0	$50.64	$1,975	$0	$1,975
Stolen property	211	0.00	.151	0	31.86	$4,082.31	$0	$130,062	$130,062
Prostitution	14	0.00	.128	0	1.79	$4,082.31	$0	$7,307	$7,307
Drug laws	6,479	0.00	1	0	6,479	$4,082.31	$0	$26,449,286	$26,449,286
TOTAL	**33,020**						**$10,216,082**	**$37,439,518**	**$47,655,600**

Sources: Maine Department of Public Safety, 2010; Harwood et al., 1998; OSA, 2007

Drug Demand and Supply Control:

Demand reduction refers to programs and research related to drug abuse treatment and prevention that are designed to reduce the demand for drugs. Supply reduction refers to a wide scope of law enforcement related activities designed to reduce the supply of drugs (this is often referred to as drug control). (National Drug Control Strategy, 2010)

Drug traffic control is a national priority involving a wide range of federal, state and local agencies. Because so many different agencies are involved in drug control it is difficult to accurately estimate the costs for Maine. National data on drug traffic control costs were used to compute the per capita costs for the relevant expenditure categories shown in Table 5.3 below. Per capita costs were applied to Maine. Total estimated drug control expenditures for Maine in 2010 were estimated at $64.7 million.

Table 5.3
Drug Control Expenditures
Maine, 2010

Activity	Expenditures
Demand reduction	$22,633,774
Supply reduction	$42,047,983
TOTAL	**$64,681,757**

Source: U.S. Department of Justice; National Drug Control Strategy, 2010.

The mandated duties of the Office of Substance Abuse and Mental Health Services include providing funds for the prevention and treatment of substance abuse disorders. The expenditures given in the Prevention category in Table 5.4 include only administrative and prevention expenditures that were incurred by the Office of Substance Abuse in 2010. The majority of the funds were granted out to community coalitions, schools, and prevention organizations. The largest portion (83%) of the $7.3 million prevention budget was federal grant money that provides funding to community coalitions so that they may develop and implement evidence-based prevention practices.

Table 5.4
Substance Control Expenditures
Maine Office of Substance Abuse, 2010

Funding source	Total expenditures	Expenditures	
Prevention - OSA		Alcohol (50%)	Drug (50%)
State general fund	$577,461	$288,730	$288,730
Federal categorical	$3,304,764	$2,597,636	$707,128
Fund for Health Maine	$670,428	$335,214	$335,214
Safe and Drug Free Schools and Communities Act	$1,342,346	$671,173	$671,173
Substance Abuse Prevention and Treatment Block Grant	$1,441,946	$720,973	$720,973
Total	**$7,336,944**	**$4,613,726**	**$2,723,219**

Judicial:

Legal and judicial costs were estimated based on the number of arrests for Part I and II crimes (Table 5.5). The FBI lists the following as Part I crimes: homicide, forcible rape, robbery, aggravated assault, burglary, larceny, motor vehicle theft, and arson. Part II crime includes liquor offenses, simple assault, forgery, fraud, embezzlement, stolen property (buying, receiving, possessing), vandalism, weapons, prostitution, sex offenses, drug violations, gambling, alcohol violations, etc. Since only 2002 cost figures were available from the U.S. Bureau of Justice Statistics, these data were used and adjusted for inflation. In 2002, 54,800 arrests were made in Maine. Total legal and adjudication costs were estimated at $80.0 million (U.S. Department of Justice, 2007). In 2002, the cost per arrest was estimated as $1,460.29; after adjustment for inflation (.0768) it was $1,572.44 in 2005. We further adjusted for inflation from 2005 to 2010 time frame using .1256. A final cost per arrest of $1,770 was used for legal and adjudication costs in 2010.

The most costly Part I crime category was Other Assaults, $4.0 million, due to the large number of alcohol- related arrests. The most costly Part II crime category was drug law violations, $11.5 million. The total estimated 2010 cost for drug- and alcohol-related legal and adjudication activities was $21.0 million, with drug abuse accounting for 77.4% of the costs.

Table 5.5
Legal and adjudication costs 2010

Type of offense	Total arrests	Attributable Fraction		Number of arrests due to:		Cost per arrest	Legal and adjudication costs		
		Alcohol	Drugs	Alcohol	Drugs		Alcohol	Drug	Total
Homicide	19	0.3	0.158	5.7	3	$1,770	$10,089	$5,310	$15,399
Aggravated assault	610	0.3	0.024	183	14.64	$1,770	$323,910	$25,913	$349,823
Sexual assault	68	0.225	0.051	15.3	3.47	$1,770	$27,081	$6,142	$33,223
Other assaults	6,406	0.3	0.051	1921.5	326.66	$1,770	$3,401,055	$578,188	$3,979,243
Robbery	191	0.034	0.272	6.5	51.95	$1,770	$11,505	$91,952	$103,457
Burglary	1,440	0.036	0.3	51.84	432	$1,770	$91,757	$764,640	$856,397
Larceny-theft	6,119	0.028	0.296	171.33	1811.22	$1,770	$303,254	$3,205,859	$3,509,114
Auto theft	229	0.035	0.068	8	15.57	$1,770	$14,160	$27,559	$41,719
OUI	6,245	1	0	6,245	0	$51	$315,373	$0	$315,373
Liquor laws	4,950	1	0	4,950	0	$51	$249,975	$0	$249,975
Public drunkenness	39	1	0	39	0	$51	$1,970	$0	$1,970
Stolen property	211	0	0.151	0	31.86	$1,770	$0	$56,392	$56,392
Prostitution	14	0	0.128	0	1.79	$1,770	$0	$3,168	$3,168
Drug laws	6,479	0	1	0	6,479	$1,770	$0	$11,467,830	$11,467,830
TOTAL	**33,020**						**$4,750,128**	**$16,232,953**	**$20,983,081**

Sources: Wickizer, 1999; Maine Department of Public Safety, 2010; OSA, 2007 (US DOJ (2007); Harwood et al, 1998; Rice et al., 1990

Corrections

State Corrections:

Total state substance abuse related corrections costs were estimated at $68.4 million (Table 5.6). This is 2.4 times higher than it was in 2005. The average annual estimated cost per inmate in 2010 was $46,404 (Vera Institute of Justice, 2012). This includes funds spent on capital and state wide administration. Incarcerations related to drugs accounts for 59.8% of total costs, equaling $40.9 million.

The Maine Department of Corrections provided the number of state correctional inmates imprisoned for each offense in 2010. Table 5.6 uses attribution fractions from The Lewin Group, Inc. (2010) and the National Drug Intelligence Center (2011) to estimate the proportion of offenses attributable to alcohol or drug use. These are different than the ones used for the other crime data, but these are thought to be a more accurate representation of those who are incarcerated. The number of alcohol and drug related offenses were then multiplied by the average annual cost per inmate of $46,404 (Vera Institute of Justice, 2012). As Table 5.6 shows, the most costly offender category was drug law violations ($14.2 million) followed by homicide ($10.7 million) and burglary ($9.4 million).

Table 5.6
Estimated cost of state corrections, Maine, 2010

Offense	Total Inmates	Attributable fraction		Substance related crimes		State corrections costs		
		Alcohol[1]	Drugs[2]	Alcohol	Drugs	Alcohol	Drugs	Total
Homicide	307	0.47	0.28	144	86	$6,695,633	$3,988,888	$10,684,521
Aggravated assault	125	0.294	0.25	37	31	$1,705,347	$1,450,125	$3,155,472
Sexual assault	237	0.283	0.18	67	43	$3,112,363	$1,979,595	$5,091,957
Other assault	91	0.188	0.22	17	20	$793,880	$929,008	$1,722,888
Robbery	216	0.265	0.46	57	99	$2,656,165	$4,610,701	$7,266,866
Burglary	270	0.272	0.48	73	130	$3,407,910	$6,013,958	$9,421,868
Larceny-theft	199	0.199	0.49	40	98	$1,837,645	$4,524,854	$6,362,499
Motor vehicle theft	5	0.222	0.42	1	2	$51,508	$ 97,448	$148,957
Arson	41		0.29	0	12	$ -	$551,744	$551,744
Vandalism	0	0.268	0.25	0	0	$ -	$ -	$ -
Drug laws	307	0	1	0	307	$ -	$14,246,028	$14,246,028
Liquor laws	1	1	0	1	0	$46,404	$ -	$46,404
Public Drunkeness	0	1	0	0	0	$ -	$ -	$ -
OUI	129	0.907	0.09	117	12	$5,429,407	$538,750	$5,968,158
Prostitution	0		0.25	0	0	$ -	$ -	$ -
Sex Offenses	51	0.215	0.13	11	7	$508,820	$307,659	$816,478
Other	166	0.159	0.22	26	37	$1,224,787	$1,694,674	$2,919,461
TOTAL	**2145**					**$27,469,869**	**$ 40,933,432**	**$68,403,301**

Sources: Maine Department of Corrections, 2012;
[1] Lewin Group, Inc. 2010. Economic Costs of Excessive Alcohol Consumption in the United States, 2006.
[2] 2011 The Economic Impact of Illicit Drug Use on American Society. Washington D.C.: US Department of Justice.

County Corrections:

In Maine, some individuals arrested for alcohol- and drug-related crimes are booked into county jails. Thus, some of the expense of operating these jails should be included in the analysis as drug- and alcohol-related costs. No one source captures all county jail costs. Some counties do not keep electronic records on reason for incarceration; therefore multiple contacts had to be made to estimate the number of persons in county jails for the entire state and the average annual cost per inmate. So to help estimate the total for 2010 the following information was collected: the average daily census in 4 of the county jails was 875 (Cumberland, Kennebec, Lincolns 2 bridges, and Somerset). Because these are thought to contain approximately half of Maine's County Inmate population, this number was doubled to get the estimated average daily county inmate population for the State.The U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics conducts an annual survey of state jails. In the 2011 survey the estimated number of jail inmates was 1,750. We were also provided actual number of offenses booked by Cumberland County Corrections. In Table 5.7, to get proportion of offenses we used the actual number of offenses booked (not people) to determine an estimated proportion by general category and applied that ratio to the average number of inmates in all Maine county jails per day in 2010. The average cost per Cumberland County inmate in 2011 was $130/day or $47,450/year. To adjust this to 2010 rates, we deducted 3.16% which was the 2011 rate of inflation per inflationdata.com. After deducting the rate of inflation, the annual cost per inmate used was $45,951.

In 2010, there were an estimated 9,463 incarcerated in Maine County jails. Total alcohol- and drug-related county corrections costs for 2010 are estimated at $42.6 million. In 2005 66% of costs were due to alcohol related arrests; in 2010 this decreased to 49.8% of costs. The cost of drug related arrests, $21.4 million, inched past that of alcohol related arrest costs, $21.3 million.

Table 5.7
Estimated cost of county corrections Maine, 2010

CC Offense	Est. count	Prop. of total CC	Avg. # all county inmates	Attributable Fraction		No. Inmate Attributed Substance Use		Cost attributable Substance Use		
				Alcohol	Drug	Alcohol	Drug	Alcohol	Drug	Total
OUI	927	0.0980	171	1	0.12	171.4	21	$7,877,418	$945,290	$8,822,709
Drug Laws	796	0.0841	147	0	1	0.0	147	$0	$6,764,213	$6,764,213
Arson	6	0.0006	1	0.05	0.13	0.1	0.1	$2,549	$6,628	$9,178
Liquor laws	270	0.0285	50	1	0	49.9	0.0	$2,294,394	$0	$2,294,394
Burglary	259	0.0274	48	0.272	0.45	13.0	22	$598,650	$990,413	$1,589,063
Stolen Prop.	77	0.0081	14	0.199	0.25	2.8	4	$130,211	$163,582	$293,793
Theft	842	0.0890	156	0.199	0.39	31.0	61	$1,423,867	$2,790,493	$4,214,359
Robbery	56	0.0059	10	0.265	0.51	2.7	5	$126,107	$242,696	$368,803
Homicide	11	0.0012	2	0.47	0.15	1.0	0.3	$43,933	$14,021	$57,955
Agg Assault/	53	0.0056	10	0.294	0.23	2.9	2	$132,394	$103,574	$235,968
Sex. Assault/abuse	46	0.0049	9	0.283	0.2	2.4	2	$110,624	$78,179	$188,803
Other Assault	988	0.1044	183	0.188	0.22	34.3	40	$1,578,307	$1,846,954	$3,425,261
Prostitution	5	0.0005	1	0.21	0.73	0.2	0.7	$8,923	$31,017	$39,939
Sub Total	**4336**					0.0				
Other Offense	**5127**	0.5418	948	0.159	0.17	150.8	161.2	$6,927,310	$7,406,558	$14,333,868
TOTAL	**9463**							**$21,254,686**	**$21,383,618**	**$42,638,304**

Other Societal Costs:

Other social costs arising from drug and alcohol abuse include the costs of lost productivity due to incarceration, the value of lost productivity due to criminal victimization, and the cost of property damage arising from substance abuse-related accidents.

Productivity Losses Due to Incarceration:

Inmates of state prisons and local jails are unable to participate in the economy as workers. This results in a substantial economic cost to society in the form of lost productivity. The cost estimates were based upon the numbers of individuals entering state prisons and local/county jails shown in the previous section. We assumed, as did Rice et al. (1990), that one year was served per offense even though that would tend to inflate the cost of Part II offenses. Since annual costs were calculated, the analysis was based upon a maximum of 12 months served, even though individuals served much longer for some crimes (e.g., homicide). Numbers of person years served related to alcohol and drug use match the number of inmates in the state and county system as included in Tables 5.6 and 5.7. Productivity losses were calculated based upon 2011 US Department of Labor, Bureau of Labor Standards showing Maine's median annual wage of $40,190, this was then adjusted to 2010 rates using inflationdata.com. This produced an estimated 2010 median annual wage for Maine of $38,960. No discount is being applied even though it is expected that those incarcerated are likely to earn less than the average. They are being treated as if there were no drug or alcohol abuse incarcerations (this approach was used in the 2011 US DOJ Economic Impact of Illicit Drug Use report as well).

The findings are presented in Table 5.8. Total productivity losses due to incarceration were estimated to be $81.5 million, with $57.5 million representing losses associated with incarceration in state prisons. Productivity losses were higher for drug-related productivity losses, $46.3 million (56.8%), than for alcohol-related productivity losses, $35.2 million (43.1%).

Table 5.8
Estimated productivity losses due to incarceration, Maine, 2010

	Alcohol		Drugs		Total losses
Offense	**Person years served**	**Productivity losses**	**Person years served**	**Productivity losses**	
State prisons					
Homicide	144.0	$5,610,240	86.0	$3,350,560	$8,960,800
Assault	121.0	$4,714,160	94.0	$3,662,240	$8,376,400
Robbery	57.0	$2,220,720	99.0	$3,857,040	$6,077,760
Burglary	73.0	$2,844,080	130.0	$5,064,800	$7,908,880
Auto theft	1.0	$38,960	2.0	$77,920	$116,880
OUI	117.0	$4,558,320	12.0	$467,520	$5,025,840
Larceny/theft	40.0	$1,558,400	98.0	$3,818,080	$5,376,480
Drug laws	0.0	$0	307.0	$11,960,720	$11,960,720
Arson	0.0	$0	12.0	$467,520	$467,520
Liquor laws	1.0	$38,960	0.0	$0	$38,960
Sex Offenses	11.0	$428,560	7.0	$272,720	$701,280
Other	26.0	$1,012,960	37.0	$1,441,520	$2,454,480
Total	**591.0**	**$23,025,360**	**884.0**	**$34,440,640**	**$57,466,000**
County/Local jails					
Homicide	1.0	$38,960	0.3	$11,688	$50,648
Assault	39.6	$1,542,816	44.0	$1,714,240	$3,257,056
Robbery	2.7	$105,192	5.0	$194,800	$299,992
Burglary	13.0	$506,480	22.0	$857,120	$1,363,600
Theft	31.0	$1,207,760	61.0	$2,376,560	$3,584,320
OUI	171.4	$6,677,744	21.0	$818,160	$7,495,904
Stolen property	2.8	$109,088	4.0	$155,840	$264,928
Drug laws	0.0	$0	147.0	$5,727,120	$5,727,120
Liquor laws	49.9	$1,944,104	0.0	$0	$1,944,104
Arson	0.1	$3,896	0.1	$3,896	$7,792
Prostitution	0.2	$7,792	0.7	$27,272	$35,064
Total	**311.7**	**$12,143,832**	**305.1**	**$11,886,696**	**$24,030,528**
Total state and local	**902.7**	**$35,169,192**	**1189.1**	**$46,327,336**	**$81,496,528**

Property Destruction:

State data on property destruction costs for 2010 were available from the Maine Department of Public Safety, Crime in Maine 2010 report. Estimate of property destruction costs attributable to alcohol and drug use were calculated using the drug and alcohol attributable fractions included in Table 5.1 earlier in this chapter. Overall, property destruction costs attributable to drug or alcohol use were estimated at $7.2 million, with drug-related costs accounting for $6.4 million (89.0%).

Table 5.9
Property destruction due to crime, Maine, 2010

Type of offense	Property destruction losses	Alcohol related losses	Drug related losses	Total losses
Robbery	$439,414	$14,940	$119,521	$134,461
Murder	$1,178	$353	$186	$540
Larceny	$11,863,202	$332,170	$3,511,508	$3,843,677
Burglary	$8,370,639	$301,343	$2,511,192	$2,812,535
Motor vehicle theft	$4,283,407	$149,919	$291,272	$441,191
TOTAL	**$24,957,840**	**$798,725**	**$6,433,678**	**$7,232,403**

Criminal Victimization:

The economic cost associated with criminal victimization is the value of lost productivity, including time lost from work and the cost of medical care that the victim requires. There were no state level data on the number of crime victims, so the number of Part I offenses were used for the analysis, based upon the assumption that there was one victim per offense. The average number of days lost from work was estimated in an earlier report by Liu (1992). The number of offenses was multiplied by the estimated monetary loss, based on lost workdays, and the product was then multiplied by the appropriate attributable fraction for the offense. The estimated cost of a work day loss was calculated by taking the median salary, using the rate estimated earlier in this chapter, $38,960 for Maine by adjusting for inflation the rate from the 2005 cost report to and dividing by 260 work days ($149.84/day). To calculate the loss of a work day for forcible rape, the median annual salary for women was used, ($34,965/260=$134.48). The findings are shown in Table 5.10. As indicated, the total economic loss in 2010 due to criminal victimization related to drug and alcohol abuse was $3.0 million, with drug abuse accounting for 85.0% of costs ($2.5 million).

Table 5.10
Estimated productivity losses for victims of crime, Maine, 2010

Offense	Number[14] of offenses	Average[15] work days	Cost per work day[16]	Total	AAF	DAF	Alcohol losses	Drug losses	Total losses
Forcible rape	389	4.6	$134.48	$240,639	0.225	0.024	$54,144	$5,775	**$59,919**
Aggravated assault	760	3.7	$149.84	$421,350	0.300	0.051	$126,405	$21,489	**$147,894**
Robbery	416	4.4	$149.84	$274,267	0.034	0.272	$9,325	$74,601	**$83,926**
Burglary	7,343	1.7	$149.84	$1,870,468	0.036	0.300	$67,337	$561,140	**$628,477**
Larceny	24,490	1.7	$149.84	$6,238,289	0.028	0.296	$174,672	$1,846,533	**$2,021,206**
Motor vehicle	985	2.7	$149.84	$398,499	0.035	0.068	$13,947	$27,098	**$41,045**
TOTAL	**34,383**			**$9,443,512**			**$445,830**	**$2,536,637**	**$2,982,467**

[14] Crime in Maine, 2010
[15] Liu, 1992
[16] Based on Median income

Summary

Summary information is included in Table 5.11. With total costs estimated at $343.4 million, criminal activity represents a major component of overall drug and alcohol-related costs, accounting for 24.9% of all statewide drug and alcohol costs. Within the crime category, subcategories with the greatest cost were law enforcement ($119.7 million), followed closely by corrections ($111.0 million).

Table 5.11
Summary of crime costs Maine, 2010

Cost type	Cost subtype	Total cost	Percent of total cost	Alcohol cost	Drug cost
Law enforcement	Police protection	$47,655,600	13.9%	$10,216,082	$37,439,518
	Drug control	$72,018,701	21.0%	$4,613,726	$67,404,976
Judicial		$20,983,081	6.1%	$4,750,128	$16,232,953
Corrections	State	$68,403,301	19.9%	$27,469,869	$40,933,432
	County	$42,638,303	12.4%	$21,254,686	$21,383,618
Productivity loss		$81,496,528	23.7%	$35,169,192	$46,327,336
Property destruction		$7,232,403	2.1%	$798,725	$6,433,678
Victimization		$2,982,467	0.9%	$445,830	$2,536,637
TOTAL		**$ 343,410,384**	**100.0%**	**$104,718,237**	**$238,692,148**
PERCENT				**30.5%**	**69.5%**

Chapter 6

Medical Care

Alcohol or drug abuse may increase the risk of illness or injury and thereby increase the use of health care services. The effects of substance abuse on health care utilization may be obvious and immediate or more indirect and long term. The link between alcohol and drug use is clear in the case of an individual overdosing on drugs and then requiring hospitalization, or a drunk driver who sustains serious injury in an auto accident and requires emergency hospital treatment. But prolonged alcohol abuse can also increase the risk for a number of diseases, including stomach cancer, cancer of the esophagus, respiratory tuberculosis, diabetes, and hypertension, thereby increasing the demand for costly medical care as well as nursing home care.

This chapter analyzes 2010 medical costs for Maine related to drug and alcohol abuse. Four types of medical costs are reported: inpatient hospital costs, outpatient hospital costs, prescription drugs and non-durable medical supplies, and nursing home costs.

The major findings of the analysis were:

- There were approximately 6,453 hospital (inpatient) discharges in Maine in 2010 directly or indirectly related to drug and alcohol use or abuse.
- The total cost of providing hospital inpatient care for these patients, including adjustment for longer stays due to co-occurring substance dependency, was estimated at $145.1 million, 83.4% of which was related to alcohol use.
- The estimated cost of outpatient medical care was $122.6 million; 74.7% of those costs were alcohol related.
- Prescription drug costs and nursing home costs attributable to alcohol were, respectively, $27.7 million and $7.5 million.
- The total estimated medical cost was $302.8 million.

Methodology

The estimation of hospital inpatient and outpatient costs were based upon 2010 data from the Maine Health Data Organization (MHDO, 2013), which gathers information on total hospital charges, length of stay, diagnosis, gender and age for all hospital discharges in Maine. For this analysis, MHDO supplied data on patients discharged within selected diagnostic categories related to drug and alcohol abuse. These data were used to estimate inpatient hospital costs. The adjustment process used followed the same approach as used to estimate mortality costs (see Chapter 4) and is commonly known as the illness-specific approach (NIDA/NIAAA, 1998).

This illness-specific approach does not take into account the extra days a patient may stay in an inpatient hospital setting if he or she has a co-occurring alcohol or drug disorder. Estimating the costs of these extra days was not possible using the data obtained for this analysis, but it was possible to use cost estimates generated by the NIDA/NIAAA (1998) national study and extrapolate these costs to Maine. The NIDA/NIAAA study, which was based on analysis of over 200,000 records from the U.S. Hospital Discharge Survey, found that hospital inpatient costs associated with longer stays due to co-occurring alcohol or drug conditions represented 21.3% of substance abuse specific- and substance abuse related-costs. The Maine 2005 cost estimates derived from the analysis of inpatient discharge data were increased by this same percentage (21.3%) to account for the longer hospital stays associated with secondary (co-occurring) diagnoses related to substance abuse. The 2010 cost report continues with this method.

The estimation of alcohol- and drug-related outpatient costs was also based upon data from the MHDO. The same approach was used to apply attributable fractions to these costs.

Cost estimates for prescription drugs in Maine came from data from the Kaiser Family Foundation (2013). As reported in NIDA/NIAAA (1998), the attributable fraction of 2.2% can be applied to prescription drugs used for the medical treatment of diseases and injuries related to substance abuse. This figure is based upon earlier research by Harwood et al. (1984), indicating that 2.2% of expenditures in this category can reasonably be attributed to alcohol abuse (no equivalent estimates have been made for drug abuse). Cost estimates for nursing home care also came from the Kaiser Family Foundation (2007). Based upon research from the 1985 National Nursing Home Survey (NIDA/NIAAA, 1998), it was assumed that 1.0% of all nursing home expenditures could reasonably be related to alcohol abuse.

Results

As shown in Tables 6.1a and 6.1b, 6,453 inpatient hospital discharges occurred as a result of a medical condition or injury related to drug or alcohol abuse. Approximately 4,189 or 64.9% of these were related to alcohol abuse. Males accounted for 3,941 discharges (61.1%). Of the $119.6 million in hospital inpatient costs for alcohol and drugs combined, shown in Table 6.1a and 6.1b, $99.8 million (83.4%) were for hospital care for an alcohol-related condition or injury. The major cost categories were: injuries and poisonings, alcohol psychoses and dependence, acute pancreatitis, drug psychoses and dependence, and cerebrovascular disease.

As discussed earlier, the $119.6 million in hospital inpatient costs shown in Tables 6.1a and 6.1b is based on data from the MHDO. These costs do not include incremental expenses associated with treating patients requiring longer hospitalization resulting from co-occurring alcohol or drug dependence. A 1998 NIDA/NIAAA report estimated these incremental costs at 21.3% of direct alcohol- and drug-related hospital costs. To remain consistent with the 2005 cost report, the 2010 continued with this method. To account for these other indirect costs, the estimate of $119.6 million should be multiplied by 1.213, yielding a total cost estimate for alcohol- and drug-related hospital inpatient costs of $145.1 million.

The estimation of alcohol- and drug-related outpatient costs was also based upon data from the MHDO. The same approach was used to apply attributable fractions to these costs. The total alcohol- and drug-related outpatient cost, as shown in Table 6.2 was $122.6 million. Alcohol related costs represented $91.6 million (74.7%) of these outpatient costs.

Two other medical cost categories included here are prescription drug and nursing home costs. The estimates for these two categories are shown in Table 6.3. Of the over $2 billion spent on these two categories it is estimated that $35.2 million is due to alcohol abuse. For prescription drugs, the estimated cost was $27.7 million. The estimated cost for nursing home care was $7.5 million. Both of these cost categories are attributable to alcohol alone.

Table 6.1a
Alcohol-related hospital inpatient direct costs, Maine 2010

Diagnosis or condition	ICD-9 code	Age range	AAF	Est. number of alcohol-related discharges		Estimated alcohol-related inpatient charges		
				Males	Females	Male	Female	Total
Alcoholic mental disorders & psychoses	291	All	1	1342	539	$10,027,053	$ 3,558,079	$ 13,585,132
Alcohol dependence syndrome	303	All	1	698	277	$ 3,523,814	$ 1,801,475	$ 5,325,289
Non-dependent abuse of alcohol	305	All	1	59	32	$ 585,283	$ 250,450	$ 835,733
Alcoholic polyneuropathy	357.5	All	1	0	1	$ -	$ 30,954	$ 30,954
Alcoholic gastritis	535.3	All	1	2	1	$ 25,571	$ 16,316	$ 41,887
Alcoholic fatty liver	571	All	1	1	0	$ 17,308	$ -	$ 17,308
Acute alcoholic hepatitis	571.1	All	1	16	9	$ 327,857	$ 346,564	$ 674,421
Alcoholic cirrhosis of the liver	571.2	All	1	22	6	$ 403,543	$ 224,766	$ 628,309
Alcoholic liver damage, unspecified	571.3	All	1	2	0	$ 12,344	$ -	$ 12,344
Toxic effect of alcohol	980	All	1	90	96	$ 1,852,943	$ 1,489,444	$ 3,342,387
Accidental poisoning by alcohol	E860.0-.1	All	1	3	1	$ 40,414	$ 21,873	$ 62,287
Cancer of the lip, tongue, oral cavity, pharynx	140-149	>=35	0.5	11	4	$ 155,323	$ 106,566	$ 261,889
Cancer of the esophagus	150	>=35	0.75	32	4	$ 1,623,296	$ 122,630	$ 1,745,927
Cancer of the stomach	151	>=35	0.2	6	4	$ 182,974	$ 172,933	$ 355,907
Cancer of the liver and intrahepatic bile ducts	155.0-155.2	>=35	0.15	4	1	$ 73,568	$ 32,291	$ 105,858
Cancer of the larynx	161	>=35	0.49	4	1	$ 119,684	$ 109,002	$ 228,686
Essential hypertension	401	>=35	0.08	7	10	$ 94,496	$ 158,972	$ 253,469
Cerebrovascular disease	430-438	>=35	0.07	110	109	$ 2,265,830	$ 2,135,263	$ 4,401,093
Respiratory tuberculosis	011-012	>=35	0.25	0	0	$ 3,657	$ 6,312	$ 9,969
Diabetes mellitus	250	>=35	0.05	24	15	$ 474,304	$ 288,274	$ 762,578
Pneumonia and influenza	480-487	>=35	0.05	103	109	$ 1,936,020	$ 1,985,425	$ 3,921,444
Diseases of the esophagus, stomach, duodenum	530-537*	>=35	0.1	17	24	$ 399,583	$ 541,127	$ 940,709
Chronic hepatitis	571.4	>=35	0.5	1	1	$ 9,769	$ 3,751	$ 13,520
Cirrhosis without mention of alcohol	571.5	>=35	0.5	10	5	$ 123,106	$ 95,761	$ 218,866
Other chronic nonalcoholic liver damage/disease	571.8	>=35	0.5	0	1	$ -	$ 44,501	$ 44,501
Portal hypertension	572.3	>=35	0.5	1	0	$ 44,127	$ -	$ 44,127
Acute pancreatitis	577	>=35	0.42	210	139	$ 5,537,993	$ 2,716,143	$ 8,254,136
Chronic pancreatitis	577.1	>=35	0.6	18	10	$ 349,639	$ 145,554	$ 495,193
Injuries and poisonings (see Appendix B1)						$25,097,405	$28,082,231	$ 53,179,636
TOTAL				**2,791**	**1,398**	**$55,306,903**	**$44,486,655**	**$99,793,558**

*Excluded 535.5 ICD9's ran but zero cases found: 425.5, 571.9, 790.3
Due to rounding, totals may not equal 100%.

Table 6.1b
Drug-related hospital inpatient direct costs, Maine 2010

Diagnosis or condition	ICD-9 code	Age range	DAF	Est. number of drug-related discharges		Estimated drug-related inpatient charges		
				Males	Females	Male	Female	Total
Drug mental disorders & psychoses	292	All	1	655	526	$ 4,354,798	$3,417,555	$7,772,353
Drug dependence	304	All	1	217	162	$ 1,763,578	$1,351,869	$3,115,447
Nondependent abuse of drugs	305.2-.9	All	1	29	10	$ 254,725	$99,766	$354,491
Polyneuropathy due to drugs	357.6	All	1	1	0	$ 22,719	$ -	$ 22,719
Drug dependence complicating pregnancy, childbirth, or puerperium	648.3	All	1	0	60	$ -	$33,762	$ 333,762
Drugs affecting fetus or newborn via placenta or breast	760.72, .73, .75	All	1	1	0	$ 21,752	$ -	$ 21,752
Drug withdrawal syndrome in newborn	779.5	All	1	10	6	$ 301,079	$113,582	$414,661
Fetal damage due to drugs	655.5	All	1	0	1	$ -	$ 3,614	$ 3,614
Poisoning by opiates and related narcotics	965	All	1	88	128	$1,385,769	$1,779,549	$3,165,318
Poisoning by sedatives and hypnotics	967	All	1	13	16	$190,896	$154,555	$ 345,451
Poisoning by central nervous system muscle tone depressants	968	All	1	0	0	$ -	$ -	$ -
Poisoning by psychotropic agents	969	All	1	127	199	$1,625,010	$2,441,492	$ 4,066,502
Poisoning by central nervous system Stimulants	970	All	1	9	6	$163,925	$ 24,476	$ 188,401
TOTAL				**1150**	**1114**	**$10,084,482**	**$ 9,720,220**	**$19,804,471**

Table 6.2a
Estimated alcohol-related hospital outpatient charges, Maine, 2010

Diagnosis or condition	ICD-9 code	Age range	AAF	Est. number of alcohol related visits		Estimated alcohol related outpatient charges		
				Males	Females	Male	Female	Total
Alcohol induced mental disorders & psychoses	291	All	1	485	172	$741,999	$243,717	$985,715
Alcohol dependence syndrome	303	All	1	7861	4304	$6,110,719	$2,892,095	$9,002,815
Non-dependent abuse of alcohol	305	All	1	2627	1369	$2,766,308	$1,449,714	$4,216,022
Alcoholic polyneuropathy	357.5	All	1	7	9	$1,463	$4,690	$6,154
Alcoholic cardiomyopathy	425.5	All	1	23	3	$13,256	$989	$14,245
Alcoholic gastritis	535.3	All	1	9	3	$12,714	$3,639	$16,353
Alcoholic fatty liver	571	All	1	25	3	$11,688	$3,976	$15,664
Acute alcoholic hepatitis	571.1	All	1	62	52	$35,618	$29,376	$64,994
Alcoholic cirrhosis of the liver	571.2	All	1	267	151	$146,122	$99,663	$245,785
Alcoholic liver damage, unspecified	571.3	All	1	41	22	$25,991	$10,371	$36,362
Excessive blood levels of alcohol	790.3	All	1	4	2	$1,093	$2,633	$3,726
Toxic effect of alcohol	980	All	1	2837	4463	$2,067,653	$2,432,257	$4,499,910
Accidental poisoning by alcohol	E860.0-.1	All	1	5	1	$13,714	$1,770	$15,484
Cancer of the lip, tongue, oral cavity, pharynx	140-149	>=35	0.5	781	318	$2,057,675	$759,786	$2,817,461
Cancer of the esophagus	150	>=35	0.75	1098	244	$2,421,961	$402,243	$2,824,204
Cancer of the stomach	151	>=35	0.2	104	46	$290,610	$79,694	$370,304
Cancer of the liver and intrahepatic bile ducts	155.0-155.2	>=35	0.15	64	39	$218,889	$66,162	$285,051
Cancer of the larynx	161	>=35	0.49	259	67	$1,024,094	$134,827	$1,158,921
Essential hypertension	401	>=35	0.08	5070	6385	$1,269,645	$1,573,849	$2,843,494
Cerebrovascular disease	430-438	>=35	0.07	742	761	$661,688	$681,708	$1,343,396
Respiratory tuberculosis	011-012	>=35	0.25	6	6	$3,075	$1,641	$4,716
Diabetes mellitus	250	>=35	0.05	3875	4088	$1,159,829	$1,145,406	$2,305,235
Pneumonia and influenza	480-487	>=35	0.05	375	460	$302,869	$320,930	$623,799
Diseases of the esophagus, stomach, duodenum	530-537, exc 535.3	>=35	0.1	1239	1756	$1,491,191	$1,959,198	$3,450,389
Chronic hepatitis	571.4	>=35	0.5	43	146	$29,380	$53,163	$82,542
Cirrhosis without mention of alcohol	571.5	>=35	0.5	678	451	$382,561	$287,207	$669,768

Other chronic nonalcoholic liver damage & disease	571.8	>=35	0.5	277	333	$265,018	$199,717	$464,735
Unspecified chronic liver disease w/o mention of alcohol	571.9	>=35	0.5	37	51	$12,411	$16,487	$28,897
Portal hypertension	572.3	>=35	0.5	22	15	$35,881	$17,093	$52,974
Acute pancreatitis	577	>=35	0.42	337	299	$467,210	$399,631	$866,841
Chronic pancreatitis	577.1	>=35	0.6	225	163	$358,438	$235,220	$593,658
Injury (see appendix B2)				23,404	23,415	$28,900,354	$22,755,260	$51,655,614
***Total (Alcohol)**				**29,482**	**26,179**	**$ 53,301,117**	**$ 38,264,112**	**$ 91,565,229**

* Total may not equal above due to rounding

Table 6.2b
Estimated drug-related hospital outpatient charges, Maine, 2010

				Est. Number of Drug Related Visits		Estimated Alcohol Related Outpatient Charges		
Diagnosis or Condition	**ICD-9 Code**	**Age Range**	**AAF**	**Males**	**Females**	**Male**	**Female**	**Total**
Drug psychoses	292	All	1	734	722	$625,984	$648,422	$625,984
Drug dependence	304	All	1	18237	18728	$11,586,512	$10,735,846	$11,586,512
Nondependent abuse of drugs	305.2-.9	All	1	3072	3003	$1,946,450	$1,842,284	$1,946,450
Polyneuropathy due to drugs	357.6	All	1	2	12	$326	$7,457	$326
Drug dependence complicating pregnancy, childbirth, or puerperium	648.3	All	1	0	1072		$522,266	$0
Drugs affecting fetus or newborn via placenta or breast	760.72, .73, .75	All	1	15	15	$9,003	$12,040	$9,003
Drug withdrawal syndrome in newborn	779.5	All	1	45	38	$6,068	$5,722	$6,068
Fetal damage due to drugs	655.5	All	1	0	316		$253,023	$0
Poisoning by opiates and related narcotics	965	All	1	228	299	$421,481	$551,374	$421,481
Poisoning by sedatives and hypnotics	967	All	1	46	65	$74,920	$147,729	$74,920
Poisoning by central nervous system muscle tone depressants	968	All	1	3	2	$2,091	$2,003	$2,091
Poisoning by psychotropic agents	969	All	1	315	462	$662,017	$884,209	$662,017
Poisoning by central nervous system Stimulants	970	All	1	28	22	$40,272	$34,777	$40,272
*** Total (Drug)**				**22,725**	**24,756**	**$ 15,375,123**	**$ 15,647,151**	**$ 31,022,274**

* Total may not equal above due to rounding.

Table 6.2C
Total estimated alcohol and drug-related hospital inpatient and outpatient charges, Maine, 2010

	Male	Female	Cost-Male	Cost-Female	Total	Total Adjusted
Inpatient						
Alcohol	2,791	1,398	$55,306,903	$44,486,655	$99,793,558	$99,793,558
Drug	1,150	1,114	$10,084,482	$9,720,220	$19,804,471	$19,804,471
Adjust for long-term inpatient (.213)						$25,474,380
Total Inpatient	3,941	2,512	$65,391,385	$54,206,875	$119,598,260	145,072,409
Outpatient						
Alcohol	29,482	26,179	$53,301,117	$38,264,112	$91,565,229	$91,565,229
Drug	22,725	24,756	$15,375,123	$15,647,152	$31,022,275	$31,022,275
Total Outpatient	**52,207**	**50,935**	**$68,676,240**	**$53,911,264**	**$122,587,504**	**$122,587,504**
TOTAL	**56,148**	**53,447**	**$120,120,913**	**$100,458,657**	**$242,285,764**	**$267,659,913**

Table 6.3
Other medical costs due to alcohol, Maine, 2010

Cost category	Total cost	Attributable fraction	Cost
Prescription drugs[17]	$1,257,720,222	2.2%	$27,669,845
Nursing home care[18]	$750,000,000	1.0%	$7,500,000
TOTAL	**$2,007,720,222**		**$35,169,845**

Summary

Total medical costs associated with drug and alcohol abuse for Maine in 2010 were estimated at $302.8 million, including the added cost of treating illnesses unrelated to substance abuse among persons with a co-occurring drug or alcohol disorder. Of this amount $145.1 million represents inpatient hospital care, of which 70% of the total was related to medical problems and injuries resulting from alcohol use and abuse. Outpatient medical services accounted for $122.6 million (double what it was in 2005), while alcohol problem-related prescription drugs accounted for $27.7 million, and nursing home care another $7.5 million.

[17] Kaiser Family Foundation. (2013). Total retail sales for prescription drugs filled at pharmacies, 2011. Available: www.statehealthfacts.org (Accessed February 14, 2013).
[18] Kaiser Family Foundation. (2013). Maine: Distribution of health care expenditures by service (in millions), 2009. Available: www.statehealthfacts.org (Accessed February 14, 2013).

Chapter 7

Other Related Costs

In addition to the costs examined in the previous chapters, there are three other drug and alcohol-related costs that are included in this analysis. These are the substance abuse related costs of: 1) child welfare and the administration of other social welfare programs, 2) fire protection and the destruction caused by fire, and 3) the non-medical costs of motor vehicle accidents. The general methodology used to estimate these costs was similar to that used to estimate other costs. Attributable risk coefficients, used by Rice at al. (1990) and NIDA/NIAAA (1998), were applied to cost data obtained from secondary data sources and used to generate estimates of costs related to drug and alcohol abuse.

The major findings of the analysis were:

- An estimated $45.9 million in child welfare costs related to substance abuse was spent in Maine during 2010.
- An estimated $3.5 million was spent on social welfare administration in Maine during 2010 related to drug and alcohol abuse.
- Alcohol is believed to play a role in a large proportion of fires. In 2010, the estimated cost of these fires in Maine was $9.5 million.
- The non-medical cost of alcohol-related motor vehicle crashes in Maine in 2010 is estimated at $53.0 million.
- The combined cost of all of these cost categories was $111.9 million.

Methodology

Since the methods used to derive the cost estimates vary among the three areas, the methodological description is provided as part of the results sections.

Results

Child welfare

Although there is little documented data on this subject for Maine, a report by the Maine Bureau of Child and Family Services (BCFS, 2003) to the Maine Legislature indicates that 50% or more of the Bureau's clients in SFY03 needed substance abuse services. This estimate is supported by data from the National Center on Addiction and Substance Abuse at Columbia University (CASA, 1999), which states that in a survey of child welfare professionals, the vast majority felt that "substance abuse causes or contributes to at least half of all cases of child maltreatment." This report goes on to suggest that, based on additional research, an average of 70% of cases of child abuse and neglect are directly or indirectly associated with substance abuse. Data in the Child Protective Services 2010 report (OCFS, 2010) recognized alcohol and drug misuse of the caretaker or family member was identified 1,943 times as a stress factor during assessments. For this report, with agreement from the Office of Child and Family Services we will use 52.6% (1,119 cases), which is the exact percentage of *substantiated* cases of child abuse where alcohol and or drug abuse was identified as one of the multiple risk factors for removing a child. We will continue to use the 2005 methodology that assumes that of the substance-abuse related cases, 67% were due to alcohol abuse by parents or guardians and 33% were due to drug abuse, based on NIDA/NIAAA's distribution of social welfare administration costs.

The estimated total cost of protecting Maine's children from abuse and neglect in 2010 was $87,250.00 (MDHHS OCFS, 2013). The 2010 expenditures were lower than 2005 due to multiple factors, including increase in attrition, salary freezes, and state government shut down days, etc., rather than a decrease in the need for social services. Applying the above-mentioned proportion 52.6% to this total, child welfare costs due to substance abuse were $45.9 million, with $30.7 million due to alcohol abuse and $15.1 million due to drug abuse.

Social Welfare Administration

Social welfare programs serve individuals with substance abuse problems. Therefore, it is appropriate to include a portion of these expenses as part of the overall costs of substance abuse. Direct welfare payments to clients, however, are considered transfer (redistribution) payments, and thus are not included.

Drug and alcohol-related administrative costs for social welfare programs are shown in Table 7.1. The first two program categories shown are OASDI and SSI, two federal programs representing Old Age, Survivors and Disability Insurance (Social Security Administration, OASDI, Table 2) and Supplemental Security Income (Social Security Administration, Table SSI-7). In December 2010 in Maine, 299,875 persons (22.6% of the total population, which is 10% higher than in 2005) were receiving Social Security benefits (185,849 retired workers, 22,473 widows and widowers, 55,525 disabled workers, 11,878 wives and husbands, and 24,150 children). In December 2010, 35,426 persons were receiving Supplemental Security Income (SSI). Of these, 1,988 were aged, 215 were blind, and 33,223 were disabled (SSA, 2010). The next program category represents Temporary Assistance for Needy Families (U.S. Department of Health and Human Services, 2007, TANF, Table C) and the food stamp program, SNAP (U.S. Department of Agriculture, 2007). The final category is veterans' pensions and rehabilitation (U.S. Veterans Administration, Table 22). After applying the relevant attributable fractions, the total estimated cost for all social welfare programs combined is approximately $3.5 million, $2.4 million attributed to alcohol and $1.2 million to drugs.

Table 7.1
Estimated administrative costs of selected social welfare programs attributed to substance abuse, Maine, 2010

Program	Total administrative Costs	AAF/DAF % [1]	Alcohol and drug admin. costs combined	Attributed to: Alcohol (67%) [1]	Drugs (33%) [1]
OASDI [2]	$94,484,000	1.7	$1,606,228	$1,076,173	$530,055
SSI [3]	$13,547,943	3.0	$406,438	$272,314	$134,125
TANF [4]	$2,813,267	5.2	$146,290	$98,014	$48,276
SNAP [5]	$21,009,743	5.2	$1,092,507	$731,979	$360,527
Veterans compensation and pension [6]	$17,042,056	1.7	$289,715	$194,109	$95,606
Total	**$148,897,009**		**$3,541,178**	**$2,372,589**	**$1,168,589**

Notes and Sources:

[1] NIDA/NIAAA, 1998, Table D.3.

[2] Social Security Administration; Old Age, Survivors and Disability Insurance (OASDI), 2006, Table 5

[3] Social Security Administration; Supplemental Security Income (SSI), 2006,Table 7.B7

[4] U.S. Dept. of Health and Human Services; Temporary Assistance for Needy Families (TANF), Table B (FY 2005)

[5] U.S. Dept. of Agriculture; Food Stamp Program Annual Benefits (FY 2005)

[6] U.S. Department of Veterans Affairs, 2011: Veterans Benefits Administration, Annual Benefits Report (FY 2010) p. 130.

Fire Destruction

Alcohol plays a role in economic losses resulting from fire destruction. While the precise extent of this role is unknown, the best available information from an early study (Berry & Boland, 1973) suggests that approximately 6.1% of structural fire destruction and 11.2% of fire protection costs can be associated with alcohol use. Because the total cost of structural damage and fire protection in Maine is not available, these values were determined by using national data and adjusting for inflation and Maine's population size. The source of structural fire damage cost was from the National Fire Protection Association (2012) and the costs of fire protection were originally from the U. S. Census Bureau (1994) and cited in NIDA/NIAAA (1998). The National Fire Protection Association estimated a cost of $34.60 per capita for the Northeast region for structural fire damage (Karter, 2012). Northeast was defined to include Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The resulting estimated cost of fire destruction related to alcohol abuse is $9.5 million.

Table 7.2
Estimated Alcohol-Related Cost of Fire Protection and Property Damage and Destruction
Maine, 2010

Type of Cost/Loss	Total Costs/Losses	Alcohol Attributable Fraction [3]	Total Alcohol-Related Losses ($)
Fire Protection Costs [1]	$61,835,205	0.112	$6,925,543
Property Damage/Destruction [2]			
Residential Structure	$33,031,556	0.061	$2,014,925
Other Structure	$8,413,307	0.061	$513,212
Total			**$9,453,680**

Notes and Sources:

[1] U. S. Bureau of the Census, 1994; adjusted for Maine population and inflation
[2] National Fire Protection Association, 2011; Fire Loss in the United States During 2010

Motor Vehicle Crashes (Non-Medical Costs)

Use or abuse of drugs and alcohol is a significant risk factor for motor vehicle accidents. Costs resulting from alcohol- or drug-related accidents result in premature death, medical care, vehicle damage, and legal and court costs. The costs related to premature death were presented in Chapter 4 and those related to medical care were reported in Chapter 6. This section reports on other motor vehicle accident costs, including legal and court costs, insurance administration, and vehicle damage. The source of the cost data is NIDA/NIAAA (1998, Table 6-17). Data on the percent of alcohol-related fatalities in Maine was provided by the U.S. Department of Transportation, Traffic Safety Facts, 2010.

While drug abuse is known to contribute to some accidents, there is no published, reliable research on the frequency of drug-related accidents. Because of this lack of data, a national cost study (NIDA/NIAAA, 1998) limited the cost estimates to alcohol-related crashes only. The same approach is followed here. National data on the costs of motor vehicle crashes presented in NIDA/NIAAA (1998) were adjusted for inflation and Maine's population size. Table 7.3 shows the resulting estimates by type of cost for Maine and the percentage attributable to alcohol abuse (Appendix C shows greater detail). In Maine during 2010, there were 161 total motor vehicle fatalities. Thirty-eight (23% of total) were instances in which a driver had a blood alcohol level of 0.08 g/dl or greater. The total non-medical costs of alcohol-related automobile accidents were estimated at $53.1 million. The most costly accident category was property damage, which accounted for 35.4% of the total costs, followed by minimum/moderate injury accidents, 27.4%.

Table 7.3
Estimated Non-Medical Cost of Alcohol-Related Motor Vehicle Crashes, Maine, 2010

Type of Cost [1]	Type/Severity of Crash				Total
	Fatal	Severe/ Critical Injury	Minimum/ Moderate Injury	Property Damage Only	
Legal/Court Costs	$22,884,177	$22,641,159	$18,685,369	$0	$63,597,242
Insurance Administration	$15,593,643	$25,618,127	$21,142,549	$22,971,933	$84,511,053
Vehicle/Roadway Damage	$2,598,940	$8,390,865	$108,426,445	$211,574,004	$327,828,004
Total	**$41,076,760**	**$56,650,151**	**$148,254,364**	**$234,545,938**	**$475,936,299**
Percent Attributed to Alcohol Abuse [2][3]	23%	18.2%	9.8%	8.0%	
Costs Attributable to Alcohol Abuse	**$9,447,655**	**$10,310,328**	**$14,528,928**	**$18,763,675**	**$53,050,585**

Notes and Sources:
[1] NIDA/NIAAA (1998) (see http://archives.drugabuse.gov/EconomicCosts/Table6_17.html) adjusted for inflation
[2] U.S. Department of Transportation, Traffic Safety Facts 2010, Table 117 - the percentage of fatal crashes involving a driver with a BAC ≥0.08 g/dl
[3] Brucker (2007) Cost Report; NIDA/NIAAA (1998) (see http://archives.drugabuse.gov/EconomicCosts/Table6_17.html). Calculated for BAC≥0.10 g/dl (injury and property damage rate is approximately 57.6% of national rate shown in NIDA/NIAAA report)

Summary

This chapter presented estimates for selected costs not included in previous chapters. Of the three cost categories examined, social welfare administration ($49.4 million), fire destruction ($9.5 million), and non-medical motor vehicle accident costs ($53.0 million), the motor vehicle crashes were the highest, accounting for 47.4% of the total cost ($111.9 million). .

Chapter 8

Summary

The purpose of this report has been to determine in economic terms the cost to society of substance abuse among Maine residents in 2010. We have quantified these costs according to the major categories in which actual costs are expended or opportunities for economic productivity are lost: substance abuse treatment; morbidity; mortality; crime; medical care; and other related costs. Although this type of analysis cannot measure the emotional toll exacted by alcohol and drug abuse, and devalues certain segments of the population (e.g., youth, homemakers and the elderly), it nonetheless provides a valuable comparison between the resources invested in the prevention and treatment of substance abuse, and the costs resulting from these disorders. This report also provides a benchmark for tracking changes in these costs over time; allowing comparisons between the similarly structured 2000 and 2005 cost reports.[19]

Major Findings

- In 2010, the total estimated cost of substance abuse in Maine was $1.403 billion.
- This $1.403 billion translates into an annual cost of $1,057 for every resident of Maine.
- Substance abuse treatment ($47.0 million) comprised the smallest category of total cost (3.3%), while mortality ($409.6 million) comprised the largest (29.2%).

Overview

The total 2010 economic cost of drug and alcohol abuse in Maine was estimated at $1.403 billion (see Table 8 for a breakdown by category). Figure 8.1 graphically compares the 2000, 2005 and 2010 category amounts. The largest single cost category in 2010 was mortality, accounting for an estimated $409.6 million, followed by crime, $343.4 million, medical care, $302.8 million, morbidity $166.1 million, and other related costs, $111.9 million. The total cost of $1.381 billion translates to a per capita cost of $1,040 for every Maine resident in 2010. The proportion

[19] As we have specified throughout the report, care is needed in making comparisons with previous cost reports. It is important to verify the details of the methodology to verify the same procedures and attributable were used. Although we have utilized the same methods in most sections, there are changes; these are specified in the report.

of the total cost attributed to different categories have not changed dramatically since 2005, but nearly all categories have increased. Shown as percentages of the total cost in 2010 (Figure 8.2), crime and mortality accounted for the largest portions of the total cost.

Table 8
Summary: Estimated Cost of Alcohol and Drug Abuse by Category
Maine, 2010

Category	Cost	%
TREATMENT	**$46,975,900**	**3.3%**
MORBIDITY	**$188,637,664**	**13.4%**
MORTALITY	**$409,642,749**	**29.2%**
CRIME	**$343,410,384**	**24.5%**
Law Enforcement	$119,674,301	
Police Protection	$47,655,600	
Drug Control	$72,018,701	
Supply/Demand Reduction (Federal)	$64,681,757	
Prevention (State)	$7,336,944	
Judicial	$20,983,081	
Corrections	$111,041,604	
State	$68,403,301	
County	$42,638,303	
Other	$91,711,398	
Productivity Loss Due to Incarceration	$81,496,528	
Property Destruction Due to Crime	$7,232,403	
Productivity Loss for Victims	$2,982,467	
MEDICAL CARE	**$302,829,757**	**21.6%**
Hospital Care	$267,659,913	
Inpatient	$145,072,409	
Outpatient	$122,587,504	
Other Costs	$35,169,844	
Prescription Drugs	$27,669,844	
Nursing Home	$7,500,000	
OTHER	**$111,938,943**	**8.0%**
Social Welfare	$49,434,678	
Child Welfare	$45,893,500	
Other Welfare (Administration Only)	$3,541,178	
Fire Protection and Destruction Due to Fire	$9,453,680	
Motor Vehicle Crashes (Non-Medical Costs)	$53,050,585	
TOTAL	**$1,403,435,398**	**100.00%**

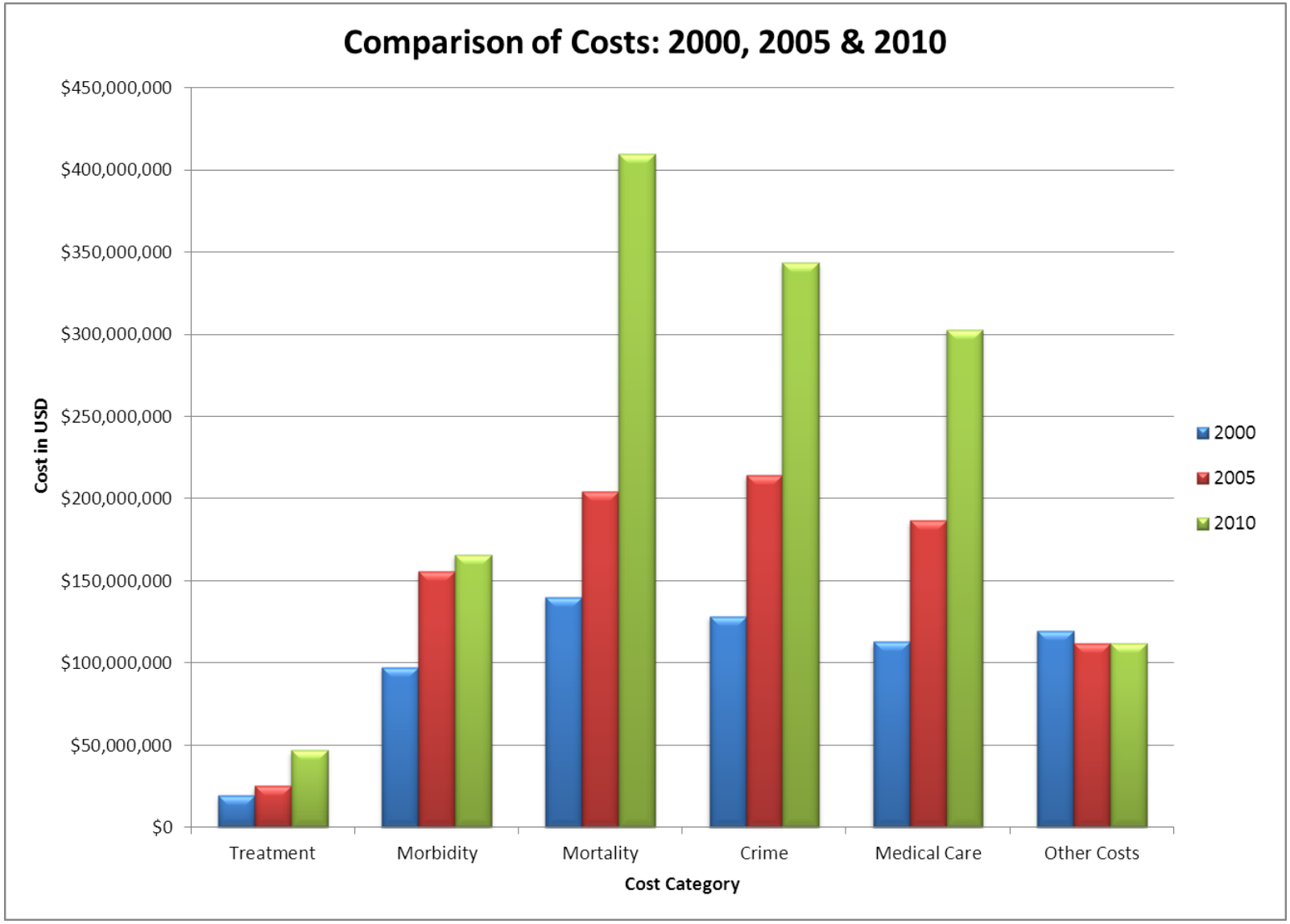
Comparison of Costs: 2000, 2005 & 2010
$450,000,000
$400,000,000
$350,000,000
$300,000,000
$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$0
Cost in USD
Treatment
Morbidity
Mortality
Crime
Medical Care
Other Costs
Cost Category
2000
2005
2010

Figure 8.1

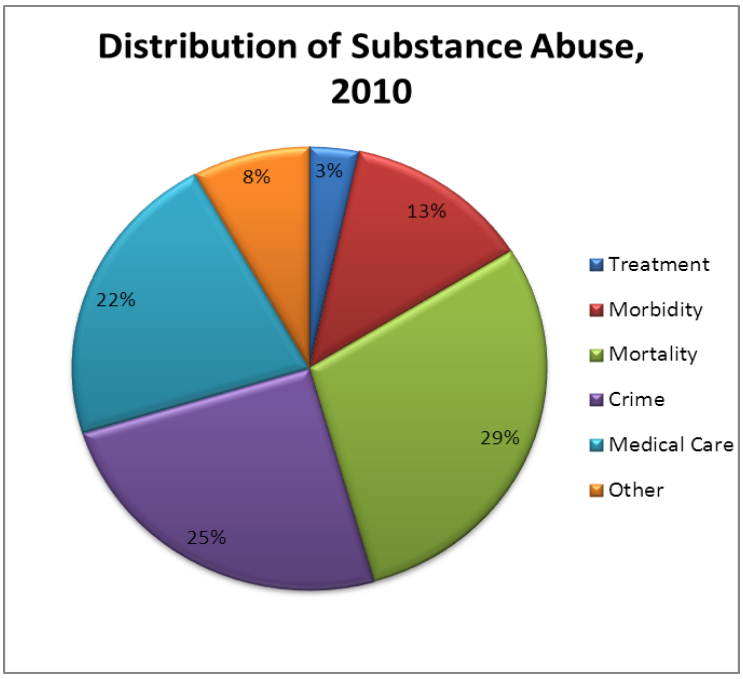

Figure 8.2

Conclusions

The total estimated cost of substance abuse in Maine in 2010 was $1.403 billion, compared to $898.4 million in 2005, an increase of 56.2%. The category comprising the smallest proportion of the total cost (3.3%) was substance abuse treatment at $47.0 million. At $409.6 million, the category showing the highest estimated cost was mortality (29.2% of total). This is a change from the 2000 and 2005 reports where crime was the highest cost factor. At least 39% of total costs of substance use and abuse are due to drugs. Because some of the cost categories, such as motor vehicle crashes, do not measure the impact of drugs, this percent is likely an underestimate.

Although the goal of this report was to document the economic costs associated with drug and alcohol abuse, readers should keep in mind that substance abuse also has serious consequences that affect individuals and their families in ways that cannot be quantified through economic analysis. In 2010, it was estimated that 713 persons in Maine died of causes related to drug or alcohol abuse, resulting in a potential loss of 15,896 years of life, and substantially more people suffered from substance-related illnesses, injuries, and domestic violence. Clearly, the consumption of alcohol and other drugs creates costs that are not only born by the producer or the consumer of the products, but also by society as a whole, including substantial lost economic productivity.

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Appendix A
Calculation of Estimated Morbidity Costs

	A	B	C	D	E	F	G	H	I	J	K	L [1]	M [2]	N [3]	O [4]
	Employed			Not in labor force			Median earnings	Housekeeping		Impairment rates			Morbidity costs		
	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder	Alcohol disorder	Drug disorder	Alcohol and/or drug disorder		In labor force	Not in labor force	Alcohol	Drugs	Alcohol and/or drug disorder	Alcohol	Drugs	Alcohol and/or drug disorder
	N	N	N	N	N	N	$	$	$				$	$	$
Male															
18-24	8067	3796	10002	5029	2367	6235	26,127	3,910	8,103	0.0140	0.0110	0.0161	$3,962,819	$1,465,203	$5,650,332
25-44	19115	6279	22044	2266	744	2614	40,641	4,918	9,186	0.0425	0.0545	0.0517	$37,896,220	$15,963,014	$53,163,875
45-64	13393	3270	16664	3911	955	4866	46,447	5,326	9,604	0.0740	0.0780	0.0740	$54,090,820	$13,920,623	$67,301,397
65+	*	*	*	*	*	*	16,227	3,973	7,550	0.0930	0.0730	*	*		
													$95,949,859	$31,348,840	$126,115,604
Female															
18-24	5078	4131	7654	2535	2062	3822	19,882	12,367	20,474	0.0080	0.0020	0.0065	$1,725,296	$350,876	$2,113,056
25-44	8629	3627	11757	2406	1011	3277	26,796	14,658	22,718	0.0735	0.0145	0.0674	$30,308,906	$2,513,163	$37,866,773
45-64	2403	751	2703	948	296	1067	34,835	12,938	21,092	0.1530	0.0455	*	$20,623,441	$1,916,494	$22,542,231
65+	*	*	*	*	*	*	16,257	6,142	10,068	0.1870	0.0730	*			
													$52,657,644	$4,780,533	$62,522,060
Total													**$148,607,503**	**$36,129,373**	**$188,637,664**

Sources: US Census Bureau, 2010; Baird, Lanctot and Clough, 2004; Rice et al., 1990

Notes:

[1] L= [(A/C)*J] + [(B/C)*K]

[2] M=[(A*(G+H) + (D*I)]*J

[3] N=[(B*(G+H) + (E*I)]*K

[4] O=[(C*(G+H) + (F*I)]*L

Appendix B.1

ICD-9 Codes and Alcohol Attributable Fractions for Alcohol-Related Injuries and Associated Hospital Inpatient Charges, Maine, 2010

		Total Discharges [1]		Total Charges [1]		AAF	Alcohol-Related Discharges		Alcohol-Related Charges		
		Males	Females	Males	Females	[2]	Males	Females	Males	Females	Total
800-968 980-995	Injuries/poisonings (excl. 965.0, 967, 968.0) Injuries/poisonings (excl. 980.0)	3058 90	3785 96	$93,755,006 $1,852,943	$94,066,536 $1,489,444	0.10 0.10	305.8 9	378.5 9.6	$9,375,501 $185,294	$9,406,654 $148,944	$18,782,154 $334,239
E810-E825	Motor vehicle traffic/nontraffic accidents [3]	184	111	$14,217,323	$6,960,197	0.23	40.48	24.42	$3,127,811	$1,531,243	$4,659,054
E826-E829	Pedal cycle/other road vehicle accidents	7	7	$271,721	$374,827	0.20	1.4	1.4	$54,344	$74,965	$129,310
E830-E838	Water transport accidents	1	2	$42,780	$456,576	0.20	0.2	0.4	$8,556	$91,315	$99,871
E840-E945	Air/space transport accidents	2	0	$333,394	$ -	0.16	0.32	0	$53,343	$0	$53,343
E880-E888	Accidental falls	933	1757	$29,230,309	$44,495,236	0.35	326.55	614.95	$10,230,608	$15,573,333	$25,803,941
E890-E899	Accidents caused by fire/flames	11	2	$602,701	$23,349	0.45	4.95	0.9	$271,215	$10,507	$281,723
E910	Accidental drowning/submersions	108	72	$3,662,268	$1,877,406	0.38	27	18	$915,567	$469,352	$1,384,919
E950-E959	Suicide/self inflicted injury	2	0	$16,414	-	0.28	0.76	0	$6,237	$0	$6,237
E960-E969	Homicide	99	133	$1,677,599	$2,328,149	0.46	27.72	37.24	$469,728	$651,882	$1,121,609
E901,E911 E917,E918 E919,E920 E922,E980	Other injuries/adverse effects	28	15	$ 867,827	$269,644	0.25	12.88	6.9	$399,200	$124,036	$523,237
Total		**4,523**	**5,980**	**$146,530,285**	**$152,341,364**		**757**	**1,092**	**$25,097,405**	**$28,082,231**	**$53,179,636**

Notes and Source:

[1] Maine Health Data Organization, 2010

[2] NIDA/NIAAA, 1998

[3] AAF is the proportion of fatal crashes in Maine involving a driver with a BAC $\geq$0.08 g/dl (U.S. Department of Transportation, 2012).

APPENDIX B.2

ICD-9 Codes and Alcohol Attributable Fractions for Alcohol-Related Injuries And Associated Hospital Outpatient Charges, Maine, 2010

		Total Outpatient Visits [1]		Total Charges [1]		AAF	Alcohol-Related Visits		Alcohol-Related Charges		
		Males	Females	Males	Females	[2]	Males	Females	Males	Females	Total
800-968	Injuries/poisonings (excl. 965.0, 967, 968.0)	105,622	97,221	$78,041,608	$63,915,965	0.10	10,562	9,722	$7,804,161	$6,391,596	$14,195,757
980-995	Injuries/poisonings (excl. 980.0)	3,949	4,572	$1,770,086	$1,778,704	0.10	395	457	$177,009	$177,870	$354,879
E810-E825	Motor vehicle traffic/nontraffic accidents [3]	746	1,102	$796,804	$885,015	0.22	172	253	$183,265	$203,553	$386,818
E826-E829	Pedal cycle/other road vehicle accidents	62	48	$38,620	$28,563	0.20	12	10	$7,724	$5,713	$13,437
E830-E838	Water transport accidents	14	6	$12,643	$2,677	0.20	3	1	$2,529	$535	$3,064
E840-E845	Air/space transport accidents	1	2	$1,097	$3,878	0.16	0	0	$176	$620	$796
E880-E888	Accidental falls	2,222	3,308	$2,220,061	$2,889,997	0.35	778	1,158	$777,021	$1,011,499	$1,788,520
E890-E899	Accidents caused by fire/flames	49	30	$35,175	$17,796	0.45	22	14	$15,829	$8,008	$23,837
E910	Accidental drowning/submersions	4	2	$2,261	$5,154	0.38	2	1	$859	$1,959	$2,818
E950-E959	Suicide/self inflicted injury	275	454	$337,518	$524,937	0.28	77	127	$94,505	$146,982	$241,487
E960-E969	Homicide	154	306	$138,632	$223,388	0.46	71	141	$63,771	$102,758	$166,529
E901,E911 E917,E918 E919,E920 E922,E980	Other injuries/adverse effects	1,070	852	$704,230	$559,460	0.25	268	213	$176,058	$139,865	$315,923
Total		**150,843**	**149,844**	**$168,484,020**	**$137,854,841**		**23,404**	**23,415**	**$28,900,354**	**$22,755,261**	**$51,655,615**

Sources:

[1] Maine Health Data Organization, 2007

[2] NIDA/NIAAA, 1998

[3] AAF is the proportion of fatal crashes in Maine involving a driver with a BAC $\geq$0.10 g/dl (U.S. Department of Transportation, 2005).

APPENDIX C
Calculation of Estimated Costs of Alcohol-Related Motor Vehicle Crashes, Maine, 2010

Type of Costs	Type/Severity of Crash											
	Fatal			Severe/Critical Injury			Minimum/Moderate Injury			Property Damage Only		
	U.S. 1992 [1]	U.S. 2010 Est. [2]	Maine [4]	U.S. 1992 [1]	U.S. 2010 Est. [2]	Maine [4]	U.S. 1992 [1]	U.S. 2010 Est. [2]	Maine [4]	U.S. 1992 [1]	U.S. 2010 Est. [2]	Maine [4]
Legal/Court Costs (million)	3,390.0	5,318.9	**22.8**	3,354.0	5,262.4	**22.6**	2,768.0	4,343.0	**18.7**		--	**--**
per capita cost [3]		*$17.23*			*$17.04*			*$14.07*				
Insurance Administration (million)	2,310.0	3,624.3	**15.6**	3,795.0	5,954.3	**25.6**	3,132.0	4,914.1	**21.1**	3,403.0	5,339.3	**22.9**
per capita cost [3]		*$11.74*			*$19.29*			*$15.92*			*$17.29*	
Vehicle and Roadway Damage (million)	385.0	604.0	**2.6**	1,243.0	1,950.2	**8.4**	16,062.0	25,201.3	**108.4**	31,342.0	49,175.6	**211.6**
per capita cost [3]		*$1.96*			*$6.32*			*$81.62*			*$159.27*	
Total			**$41.1**			**$56.6**			**$148.2**			**$234.5**

Proportion of Costs due to Alcohol:	**Fatalities**	**Severe Injury**	**Moderate Injury**	**Property**
U.S. 1992 [1]	39.7%	31.5%	17.0%	13.9%
Maine, 2005 [5]	23%	18.2%	9.8%	8.0%
	actual	est.	est.	est.

Notes and Sources:

[1] NIDA/NIAAA (1998), Table 6.17 (p.6-28)

[2] 1992 U.S. data adjusted for inflation using the Consumer Price Index rate of 56.9% over the 13-year period

[3] 2010 U.S. estimate divided by the 2010 U.S. population: 296,507,061

[4] 2010 U.S. per capita cost multiplied by the 2010 Maine population: 1,328,361

[5] The proportion of fatalities due to alcohol is the percent of fatal crashes in Maine involving a driver with a BAC $\geq$ 0.08 g/dl (U.S. DOT, 2010); the proportion of less serious crashes due to alcohol is estimated using the same Maine to US proportion as for fatalities, 57.9% .

Appendix D

Data Sources

Chapter 2: Maine Department of Health and Human Services, Office of Substance Abuse and Mental Health Services

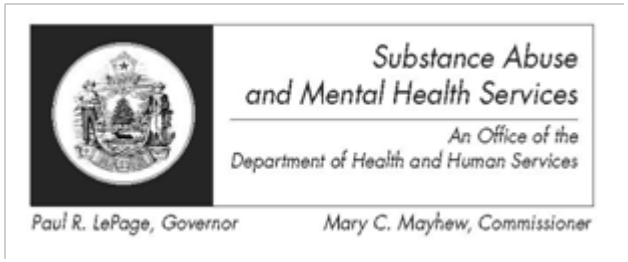
Chapter 3 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration – National Survey on Drug Use or Health;
U. S. Census Bureau;
U. S. Department of Labor

Chapter 4: Maine Department of Health and Human Services, Office of Data, Research and Vital Statistics, 2010 (Retrieved 2012/2013) Produced by Kim Haggan, Health Planner.
Maine Office of Chief Medical Examiner, 2010, Produced by Marcella Sorg, University of Maine

Chapter 5: Maine Department of Public Safety; U.S. Department of Justice, Todd Minton; State of Maine Department of Corrections, Ellis King; Cumberland County Corrections Office, Wendy Clark.

Chapter 6: Maine Health Data Organization, William Kilbreth

Chapter 7: Maine Office of Child and Family Services, Mandy Milligan and Robert Blanchard; U. S. Social Security Administration; U. S. Department of Health and Human Services; U. S. Department of Agriculture; National Fire Protection Administration; U. S. Department of Transportation.



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