

Economic Costs of Underage Drinking in Florida

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Executive Summary

Background. Underage drinking is a persistent public health problem that generates significant costs to society from alcohol-related consequences such as criminal activity/delinquency, antisocial behavior, academic difficulties, risky sexual behavior, health problems, unintentional injuries, and traffic crashes. Florida faces a particularly tough challenge in this regard as Florida youth have higher rates of alcohol use than the national average (Florida's State Epidemiology Workgroup (FL SEW), 2007). Moreover, Florida is a popular tourist destination, attracting thousands of youth each year for Spring Break, sporting events, and other holidays. According to the 2007 Florida Youth Substance Abuse Survey (FYSAS), alcohol is the most prevalent substance used by Florida students; 55.6% reported any lifetime use and 31.2% reported past-30-days-use. More than 78% of high school seniors report having tried alcohol at least once. 9.9% of 6th graders and more than 48% of 12th graders report using alcohol in the past month, and about one out of six Florida students (16.4%) report binge drinking within the past two weeks. Policies and programs that successfully target underage drinking have the potential to generate significant savings to state government, taxpayers, businesses, schools, and other segments of society by reducing many of the negative consequences that are associated with underage drinking.

Objective: The present study developed Florida-specific estimates of the costs associated with underage drinking across numerous domains. The estimates can be used for a variety of purposes, but they are particularly geared toward state and local government. The methods, data, results, and policy implications of the cost analysis are described below.

Methods: The cost algorithms are based on work by Miller and colleagues (2006). The analysis incorporates direct and indirect costs, but excludes costs related to chronic consequences of underage drinking (e.g., alcohol related problems later in life). For each consequence of underage drinking, we estimate the incidence in the Florida population for those under age 21. We then estimate the percentage of cases where alcohol is involved, and among these, the number of cases directly attributable to alcohol use. We apply monetary conversion factors to the number of cases attributable to alcohol to estimate the total cost of each consequence. Finally, the total cost of underage drinking in Florida is calculated by summing the estimated costs for all consequences. All cost estimates are reported in 2007 dollars.

Data: Data were obtained from multiple sources to examine underage drinking costs at the state, regional, and county levels (e.g., FL Department of Highway Safety and Motor Vehicles; FL Department of Health; FL Department of Law Enforcement; FYSAS; Drug and Alcohol Services Information System; CDC; Miller et al., 2006). The main data sources are listed below.

Results. The estimates generated from this study are detailed and extensive. Some of the key figures are summarized below.

- The total cost of underage drinking in the state of Florida in 2007 was \$3.073 billion or \$165 per Florida resident.
- Consistent with previous state and national estimates (PIRE, 2006; Miller et al., 2006), alcohol-attributable violent crime (murder, rape/sexual assault, aggravated assault, and robbery) was responsible for the greatest costs to society, accounting for 49% of total underage drinking cost.
- Traffic crashes comprise the next largest component of total underage drinking costs, at \$642.7 million. These costs include medical and emergency services, lost productivity, insurance, administration, workplace and legal costs, travel delay, property damage, as well as quality adjusted life years (QALYs) lost.
- Alcohol-attributable property and other crime costs (motor vehicle theft, household burglary, larceny/theft) were estimated to be \$316.3 million.
- Other categories and corresponding costs associated with underage drinking include:
 - Risky sexual behavior: \$291.1 million.
 - Fetal alcohol syndrome: \$75.4 million in medical costs (medical treatment, special education, and residential care for persons with mental retardation), and reduced productivity.
 - Suicides and suicide attempts: \$48.3 million.
 - Alcohol abuse treatment: \$2.8 million.
 - Medical costs, productivity losses, and costs associated with fewer QALYs related to other injuries (drowning, burns, and poisonings): \$202.5 million.
- Six counties accounted for more than half of the total estimated cost (52%) in the state: Miami-Dade, Broward, Orange, Palm Beach, Hillsborough, and Duval.
 - Hillsborough County had the highest cost for motor vehicle crashes in Florida (\$52.3 million).
 - Dade County has the highest property crime (\$55.8 million), violent crime (\$275.4 million), and risky sexual activity costs (\$38.7 million), which makes it the county with the highest overall cost of underage drinking.

Policy Implications: This study provides the most current estimates of the economic impact of underage drinking in the state of Florida. Alcohol-attributable criminal activity and traffic crashes generate the greatest losses to society from underage drinking. Thus, programs targeting crime prevention and driving safety in addition to alcohol use prevention among Florida youth have the greatest potential to reduce societal costs associated with underage drinking.

Counties located in the Central and Suncoast regions of the state generated the largest share of total state-wide costs. However, cost per Florida resident is higher in the Southern (US\$187) and Northeast (US\$181) regions with the Suncoast region having the highest cost per youth under 21 (US\$679); therefore, these regions offer the greatest opportunity for effective intervention.

Policy makers in Florida can use these cost estimates to identify problem areas and to later evaluate the economic impact of programs and interventions that promote reduced alcohol use, driving safety, and crime prevention among Florida's youth. Ideally, these estimates should be updated every 3-5 years to maintain a current perspective on the impact of underage drinking in Florida.

1. Introduction

Underage drinking is a persistent public health problem that generates significant costs to society from alcohol-related consequences such as criminal activity/delinquency, antisocial behavior, academic difficulties, risky sexual behavior, health problems, unintentional injuries, and traffic crashes. Florida faces a particularly tough challenge in this regard as Florida youth have higher rates of alcohol use than the national average (FL SEW, 2007). Moreover, Florida is a popular tourist destination, attracting thousands of youths each year for sporting events, spring break, and other holidays. According to the 2007 Florida Youth Substance Abuse Survey (Florida Department of Children & Families, 2007), alcohol is the most commonly used substance among Florida students, with 55.6% reporting any lifetime use and 31.2% reporting past-30-days use. More than 78% of high school seniors report having tried alcohol at least once. Nearly ten percent of 6th graders and more than 48% of 12th graders report using alcohol in the past month, and approximately one out of six Florida students (16.4%) report binge drinking within the past two weeks. Policies and programs that successfully target underage drinking have the potential to generate significant savings to state government, taxpayers, businesses, schools, and other segments of society by reducing many of the negative consequences associated with underage drinking.

Few studies have estimated the economic costs of drinking from a societal perspective. Rice and colleagues (1991) estimated the economic costs of alcohol and drug abuse as well as mental illness in the U.S. for the years 1985 and 1988. The cost of alcohol abuse was estimated at \$85.8 billion, which includes the costs associated with medical care, morbidity and mortality, crime, motor vehicle crashes, fire destruction, social welfare administration, and fetal alcohol syndrome, among others. Harwood, Fountain, and Livermore (1999) estimated the economic costs to society of alcohol abuse and alcoholism in the U.S. in 1992 at \$148 billion, including health care spending (\$18.8 billion), productivity loss (\$107 billion), and other costs (\$22.2 billion) such as crime, social

welfare administration, motor vehicle crashes, and fire destruction. The study also found that most of the economic burden of alcohol abuse falls on those individuals who do not abuse alcohol. The government (i.e., taxpayers) bore 38.6% of the total costs.

These earlier studies do not report costs by age and therefore reveal little about the economic costs of underage drinking. A more recent national-level study by Miller and colleagues (2006) estimated the economic costs of underage¹ drinking in the U.S. in 2005. The estimates include direct costs (e.g., medical costs and property losses), indirect costs (e.g., work loss), and intangible costs (e.g., pain, suffering, and lost quality of life). The total cost of underage drinking was estimated at \$61.9 billion and included \$5.4 billion in medical costs, \$14.9 billion in work loss, and \$41.6 billion in quality of life lost. The study also found that alcohol use by youth resulted in 3,170 deaths and 2.6 million injuries and other events.

Other studies have focused on the cost of drinking in a particular state (Rosen, Miller, and Simon, 2008) or on a particular alcohol-related problem (Miller et al., 2006; Miller, Spicer, and Levy, 1999). Miller, Spicer, and Levy (1999) found that those driving with a BAC of 0.08% or above are almost 50 times as costly to have on the road as sober drivers. Miller, Levy, Cohen, and Cox (2006) reported the cost of alcohol and other drug-involved crimes at \$205 billion, with violent crime accounting for more than 85% of this total. This estimate includes medical, mental, and other tangible expenses, as well as the value of pain, suffering, and lost quality of life.

To the best of our knowledge, PIRE (2006) is the only study that has estimated the costs of underage drinking in Florida. The authors calculated a national estimate for the total cost of underage drinking and then used several methods to break down the national estimate by state². The total cost of underage drinking in the state of Florida was found to be \$3.687 billion (in 2005

¹ Under the age of 21.

² For example, the national crime cost estimate was allocated between states in proportion to the number of crimes reported in the Uniform Crime Reports by state.

dollars). This estimate includes medical costs, productivity costs, and pain and suffering costs. Fifty-eight percent of the total cost was attributed to youth violence and 24% to youth traffic crashes. An important limitation of this study stems from the fact that the cost estimates are based on national level incidence data.

The present study used county-level incidence data to develop Florida-specific estimates of the costs associated with underage drinking across numerous domains. The estimates can be used for a variety of purposes, but they were particularly geared toward policymakers in state and local government. The data, methodology, results, and policy implications of the cost analysis are described below.

2. Data

Data were obtained from multiple sources to examine underage drinking costs at the state, regional, and county levels. Some of our main data sources include the Florida Department of Highway Safety and Motor Vehicles, the Florida Department of Health, the Florida Department of Law Enforcement, the Florida Youth Substance Abuse Survey, the Drug and Alcohol Services Information System, the Center for Disease Control and Prevention, and Miller and colleagues (2006). Specific information on data is contained in the following section within each cost category, and a summary of primary data sources is presented in the References section.

3. Methodology

The cost algorithms employed in this study are based on work by Miller and colleagues (2006). The analysis incorporates direct costs (e.g., medical costs, property losses), indirect costs (e.g., productivity losses at work or in the household), and intangible costs (e.g., monetized quality-adjusted life years [QALYs] lost). The market and household productivity losses were measured as the present value of lifetime loss of wages or household work due to mortality or temporary or permanent impaired functioning resulting from an alcohol-attributable injury or death (discounted to

a present value at a 3% discount rate). The household work lost is usually valued at the mean wage for a non-supervisory position in private non-agricultural industries. To monetize the number of QALYs lost, we used the value of a statistical life (\$3.5 million) from Miller and colleagues (2006). The estimation valued only the acute costs of underage drinking; it excluded costs related to chronic consequences of underage drinking (e.g., alcohol-attributable problems later in life).

The total alcohol-attributable costs of each consequence ($Costs_i$) of underage drinking were calculated by following the same underlying approach:

$$Costs_i = Cases_i \times AIF_i \times AAF_i \times UC_i$$

First, we estimated the total number of fatalities and injuries among Florida youths in 2007 ($Cases_i$). We then estimated the percentage of these cases that involved alcohol using the alcohol-involved fraction (AIF_i). Among these, we used the alcohol-attributable fraction (AAF_i) to estimate the number of cases that are directly attributable to alcohol use. Finally, we applied monetary conversion factors/unit costs (UC_i) to the number of cases attributable to alcohol to estimate the total cost of each underage drinking consequence. All monetary conversion factors were converted to 2007 dollars using the U.S. Consumer Price Index (CPI). Cost estimates are therefore reported in 2007 dollars. The total cost of underage drinking in the state of Florida was calculated by summing the estimated costs of all consequences. The specific methodology used for each drinking consequence is presented below.

Motor vehicle crashes

Data on alcohol-related traffic crash fatalities and injuries were obtained from the 2007 Florida Traffic Crash Statistics Report from the Florida Department of Highway Safety and Motor Vehicles (FHSMV, 2009). The same report provided the percentage of drivers in all crashes and in

fatal crashes who had consumed alcohol just prior to the event, by age.³ Using this information, we estimated that 10.2% of all alcohol-related crashes and 10.6% of fatal alcohol-related crashes involved a driver under the age of 21. Next, we estimated the number of injuries and fatalities that occurred in alcohol-involved traffic crashes involving an underage driver. To estimate the percentage of these alcohol-related incidents that were directly attributable to alcohol, we used the percentage of persons killed in crashes (41%) where the blood alcohol concentration (BAC) of the driver was higher than 0.01 (Fatality Analysis Reporting System, 2007). Based on these criteria, we estimated that 54 fatalities and 681 injuries in motor vehicle crashes in the state of Florida in 2007 can be attributed directly to underage alcohol use.

The unit costs per motor vehicle crash fatality/injury were based on Blincoe and colleagues (2002). They include medical and emergency services, market and household productivity lost, insurance, workplace, legal, travel delay, property damage, and QALYs loss. Medical costs include ambulance, emergency, physician, hospital, rehabilitation, prescription, and related treatment costs as well as ancillary costs (for crutches, physical therapy, etc.) and the administrative costs of processing medical payments to providers. The unit cost per fatal case was \$4,052,564 (in 2007 dollars). The unit cost per traffic injury was calculated as the average cost (\$623,624) across six types of injuries.

Criminal activity

Crime incidence data were obtained from the 2007 Uniform Crime Reports of the Florida Department of Law Enforcement, which reported statistics on the total number of offenses for the entire state. To estimate the number of offenses committed by youths under 21, we used national percentages of juvenile offending estimated by the Bureau of Justice Statistics (2003). According to Police and Child Protective Services, perpetrators under 21 commit approximately 30% of murders, 31% of rapes, 46% of robberies, 50% of burglaries, 45% of larcenies, and 52% of motor vehicle

³ For example, 0.9% of all crashes and 1.1% of fatal crashes involved alcohol-consuming drivers who were 17 years old.

thefts (Miller et al., 2006). According to Miller and colleagues (2006), relying on victim reports rather than agency records yields higher estimates. By this standard, our estimates are conservative. For the state of Florida, a total of 349,368 property crimes (including burglary, larceny, and motor vehicle theft) and 43,319 violent crimes (including murder, sexual offenses, aggravated assault, and robbery) were committed by perpetrators under the age of 21 in 2007.⁴

To estimate the number of offenses involving alcohol, we used Miller and colleagues' (2006) alcohol-involvement fractions (24% of property crimes, 41% of murders, 43% of sexual assaults, and 37% of other assaults). Based on standard practices in the literature, we assumed that half of these alcohol-involved offenses were directly attributable to alcohol (Harwood et al., 1999; Miller et al., 2006). We thus estimated that among perpetrators under 21, 41,924 property-crime cases and 6,946 violent-crime offenses were alcohol-attributable in 2007.

Unit crime-cost estimates are based on a recent study by McCollister, French, and Fang (2009, under review). They include the following components: victim costs (direct economic losses suffered by crime victims, including medical care costs, lost earnings, and property loss/damage); criminal justice system costs (local, state, and federal government funds spent on police protection, legal and adjudication services, and corrections programs, including incarceration); crime career costs (opportunity costs associated with the criminal's choice to engage in illegal rather than legal and productive activities); and intangible costs (indirect losses suffered by crime victims, including pain and suffering).

The intangible costs are based on the difference between an average jury award in comparable wrongful death and injury cases and the direct economic loss to the victim, which are referred to as *specials*. These *specials* include the medical expenses and lost earnings incurred by the victim, which are determined during the trial and acknowledged by the jury when deciding on the

⁴ County incidence data for arson, stolen property, vandalism, forgery and counterfeiting, embezzlement, fraud, and other offenses were not available.

appropriate compensatory award. These estimates were based on national crime statistics and other data from the Uniform Crime Reports (Florida Department of Law Enforcement, 2007), National Crime Victimization Survey (Bureau of Justice Statistics), and National Incident-Based Reporting System (Bureau of Justice Statistics); reports from the Bureau of Justice Statistics; and published articles. The unit cost for an average property crime is \$7,544. The unit cost per murder is valued at \$8.7 million and the unit cost for average violent (but non-fatal) crime is \$125,261.

Risky sexual behavior

To estimate the percentage of sexually active youth involved in risky sexual behavior in the state of Florida, we used data from the 2007 Youth Risk Behavior Survey for 9th to 12th grade individuals, a national school-based survey conducted by the CDC. Among the respondents, 35% had had sexual intercourse with at least one person in the 3 months before the survey. Among these, 61.5% did not use a condom in the most recent episode of sexual intercourse. The incidence of unprotected sex was estimated as the percentage of the total Florida population between the ages of 14 and 20 that is sexually active and did not use a condom in the most recent episode of sexual intercourse. This is a very conservative estimate, as it was calculated based on 14-17 year-olds and then applied to the population between the ages of 14 and 20. We applied the same alcohol-involved (20%) and alcohol-attributable (50% for cases involving only alcohol, 25% for alcohol and other drugs) estimated fractions used in Miller and colleagues (2006). Given these assumptions, we determined that 20,027 cases of unprotected sex were alcohol-attributable in 2007.

To estimate the total cost of risky sexual activity in the state, we used risky sexual behavior unit cost estimates from Biglan and colleagues (2004). The unit cost per case (\$14,536) include medical costs, work loss, and QALY decrements for AIDS, other sexually transmitted infections (STIs), and unwanted pregnancy.

Fetal alcohol syndrome (FAS)

We used data from the Florida Department of Health (FL Community Health Assessment Resource Tool Set - CHARTS) for the average number of live births in Florida per year for the years 2005-2007. Based on Harwood and colleagues' (1998) assumption of 2 cases of FAS per 1,000 live births, we estimated a total of 468 FAS cases per year in Florida. We then used Miller and colleagues (2006) assumption of 15% of FAS births to mothers under the age of 21. The total number of FAS cases to underage mothers was estimated at 70.

To monetize these cases, we used a lifetime unit cost of \$1,073,950 for each individual with FAS (Lupton, Burd and Hardwood, 2004).⁵ These include medical treatment services (such as surgery, treatment for deficits), special education, residential care and support services for persons with mental retardation, lost employment, and reduced productivity.⁶

Alcohol Abuse/Dependence Treatment

The number of cases of alcohol abuse/dependence treatment among underage youth was estimated using the number of substance abuse treatment admissions in Florida in 2007 (Treatment Episode Data Set - TEDS, SAMHSA, 2007).⁷ It should be noted that TEDS includes records on treatment admissions mostly from facilities that receive state alcohol and/or drug agency funds.⁸ We believe, however, that it comprises a significant proportion of all admissions to substance abuse treatment and therefore can be used to approximate the total number of admissions in the state.

The total number of treatment admissions in Florida in 2007 for alcohol-only and alcohol with secondary drug was 12,870. Among these, 7.6% of the alcohol-only admissions and 13.3% of the alcohol with secondary drug admissions were individuals under the age of 21. Based on these percentages, we estimated the incidence in the underage population at 1,295 cases. The best available information at this time indicates that the unit cost of treatment for alcohol dependence

⁵ These costs were discounted at 3% by Lupton, Burd and Hardwood (2004).

⁶ These estimates exclude QALYs lost for a lack of reliable estimates.

⁷ The number of admissions included treatment for alcohol only and alcohol with a secondary drug.

⁸ Some private for-profit facilities might not be included.

syndrome is \$2,200 per episode of treatment (based on personal correspondence with the FL Department of Children and Families officials). This estimate is a very crude measure for treatments that vary considerably in intensity and duration. In addition, it does not include intangible costs such as productivity and quality-of-life losses. Miller and colleagues (2006) and Goodman et al. (1997) use an average of \$17,760 (in 2001 dollars) for outpatient and residential treatment for adolescents. Based on research by French, Popovici, and Tapsell (2008), the true average probably falls somewhere between these two extremes. It should be noted that the State of Florida is about to initiate a new study to compile comprehensive, current, and reliable data on the cost of substance abuse treatment in Florida.

*Drowning and submersion*⁹

We obtained the number of deaths from drowning and submersion of individuals 20 years of age or younger from the Florida Department of Health. To estimate the percentage of these where alcohol was involved, we used Miller and colleagues' (2006) fraction (30%). The same study provided the fraction of these alcohol-involved cases that were directly attributable to alcohol (80%). Using these percentages, we estimated 31 deaths from drowning and submersion.

To estimate the number of non-fatal drowning cases, we used 2006 outpatient emergency department discharge data from the Florida Department of Health.¹⁰ The source provided the number of emergency department visits for non-fatal drowning and submersion injuries by age groups (<1, 1-4, 5-14, 15-24). To limit the incidence to the population under the age of 21, we assumed that the cases were uniformly distributed among the population aged 15 to 24. We then used Miller and colleagues' (2006) fraction of these cases involving alcohol (7%) and the percentage directly attributable to alcohol (80%) to estimate 18 cases of non-fatal drowning in the state. The

⁹ For the classification of non-fatal injuries from drowning and submersion, see the International Classification of Diseases, Version 9, Clinical Modification. For the classification of fatal injuries from drowning and submersion, see the International Classification of Diseases, Version 10 (<http://www.cdc.gov/nchs/icd9.htm>).

¹⁰ Although we would have preferred 2007 data, 2006 data were the most recent available.

unit cost for a non-fatal drowning was based on Miller and colleagues (2000) and included medical costs and other resources, productivity costs, and monetized QALYs lost. Medical costs included emergency medical services, physician, hospital, rehabilitation, prescription drug, and related treatment costs as well as ancillary costs (e.g., crutches, physical therapy), funeral/coroner expenses for fatalities, and the administrative costs of processing medical payments to providers. Other direct costs included police and fire department costs. Work-related costs included victims' lost wages and the value of lost household work, fringe benefits, and the administrative costs of processing compensation for lost earnings through litigation, insurance, or public welfare programs. Work losses by family and friends who care for injured children also were included. The cost per fatal drowning was set at \$4.1 million and the cost per non-fatal drowning and submersion was equal to \$160,265.

*Burns and fire-related injuries*¹¹

To estimate the number of fatal cases in 2007, we used the number of deaths from smoke, fire, and flame exposure for individuals 20 years of age or younger (Florida Department of Health (CHARTS)). There were 8 such deaths reported in 2007. To estimate the alcohol-attributable incidence, we used Miller and colleagues' (2006) alcohol-involved (30%) and alcohol-attributable (60%) fractions. We estimated 1 death due to burns and fire-related injuries in the state in 2007.

To estimate the number of non-fatal cases, we used the 2006 number of emergency department visits due to non-fatal fire or flame injuries from the Outpatient Emergency Department Discharge Data published by the Florida Department of Health.¹² To limit the incidence to those under age 21, we assumed that the cases were uniformly distributed among the population aged 15 to 24 (see above). The number of non-fatal cases of burns for those under the age of 21 was 1,106

¹¹ For the classification of non-fatal injuries from burns, see the International Classification of Diseases, Version 9, Clinical Modification. For the classification of fatal injuries from burns, see the International Classification of Diseases, Version 10 (<http://www.cdc.gov/nchs/icd9.htm>).

¹² Data were not available for 2007 at the time of the estimation.

in 2007. We used Miller and colleagues' (2006) percentages of alcohol-involved (7%) and alcohol-attributable (60%) non-fatal cases, yielding an estimate of 46 non-fatal cases of burns.

Unit cost estimates were obtained from Miller and colleagues (2000) and included medical costs and other resources, productivity loss, and QALYs lost (\$4,105,098 per fatal case and \$138,465 per non-fatal case).

*Suicide*¹³

To estimate the number of fatal cases, we used the number of deaths from suicide in 2007 for individuals aged 20 or younger from the Florida Department of Health (CHARTS). This yielded a total of 109 cases. We then applied Miller and colleagues' (2006) fractions of alcohol-involved cases (9.1%) and alcohol-attributable cases (72%), resulting in 7 fatal suicide cases.

We used the 2007 number of hospitalizations resulting from self-inflicted injuries from the Inpatient Hospital Discharge Data issued by the Florida Department of Health.¹⁴ Similar to the previous categories, we limited the incidence to the population under the age of 21 by assuming a uniform distribution of cases among the population aged 15 to 24. The number of estimated non-fatal cases of suicide was 1,221 in 2007. We applied Miller and colleagues' (2006) fractions of alcohol-involved cases (9.1%) and alcohol-attributable cases (72%), thus estimating 80 non-fatal suicide attempts.

Unit costs per suicide and suicide attempt for Florida were provided by the 2008 Florida Suicide Prevention Fact Sheet from the Suicide Prevention Resource Center. They included average medical costs and average work loss costs per case. We added monetized QALYs lost from Miller

¹³ For the classification of non-fatal suicides, see the International Classification of Diseases, Version 9, Clinical Modification. For the classification of fatal suicides, see the International Classification of Diseases, Version 10 (<http://www.cdc.gov/nchs/icd9.htm>).

¹⁴ We used the number of hospitalizations instead of emergency department visits for this cost category to be consistent with the corresponding unit cost estimate, which was a "cost for hospitalized attempts of suicide."

and colleagues (2000). The unit cost per fatal suicide case was \$5.9 million whereas the unit cost per non-fatal suicide attempt was \$152,733.

*Alcohol poisonings*¹⁵

To estimate the number of fatal cases of alcohol poisoning in 2007, we used the number of deaths from poisoning of individuals aged 20 or younger from the Florida Department of Health (CHARTS), a total of 132 fatal cases. Following a report from the CDC (2004), we assumed that 10% of all poisoning deaths involved alcohol consumption. The report provided the number of total poisoning deaths for Florida and, among these, the number of cases attributable to alcohol. We used these data to approximate the percentage of poisoning deaths from alcohol (10%) and applied this estimate to the number of underage cases, resulting in 13 fatal cases of alcohol poisoning.

For non-fatal cases, we used 2006 figures on emergency department visits resulting from non-fatal poisoning injuries from the Outpatient Emergency Department Discharge Data issued by the Florida Department of Health.¹⁶ To limit the incidence to the population under the age of 21, we assumed a uniform distribution of cases among the population aged 15 to 24. Again, we assumed that 10% of cases were attributable to alcohol, resulting in 588 cases of non-fatal alcohol poisoning.

The unit cost estimates (a total of \$4.1 million per fatal case and \$145,374 per non-fatal case) were based on Miller and Lestina (1997). The unit cost per non-fatal case includes emergency transport, hospital, physician, rehabilitation, prescription, insurance claim processing, and other medical expenses. The unit cost per fatal case includes coroner's costs and burial expenses. We also added monetized QALYs losses from Miller and colleagues (2000).

¹⁵ For the classification of non-fatal poisonings, see the International Classification of Diseases, Version 9, Clinical Modification. For the classification of fatal poisonings, see the International Classification of Diseases, Version 10 (<http://www.cdc.gov/nchs/icd9.htm>).

¹⁶ 2007 data were unavailable at the time of the estimation.

4. Results

The total estimated cost of underage drinking in the state of Florida in 2007 was \$3.073 billion (Table 1). This state-wide total translates into a cost of \$165 per Florida resident, \$627 per youth under the age of 21, and \$1,818 per youth 14-20 years of age (Table 2). These costs were the result of approximately 180 youth deaths and 71,602 injuries and other events directly attributable to underage alcohol use.

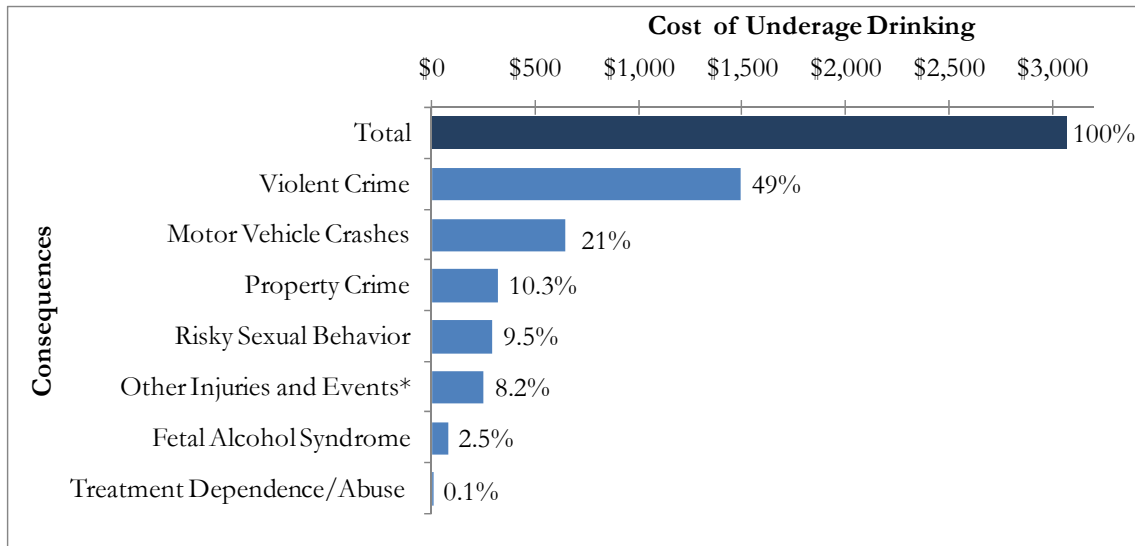
**Table 2. Economic Costs of Underage
Drinking in Florida per Florida Resident, by Region**
(in 2007 dollars)

	Total Cost <i>(millions of US\$)</i>	Cost Per Person <i>(in US\$)</i>	Cost Per Youth under 21 <i>(in US\$)</i>	Cost per Youth 14-20 <i>(in US\$)</i>
Total	3,073	165	627	1,818
Northwest	222	133	483	1,285
Northeast	458	181	664	1,820
Central	713	155	606	1,767
Suncoast	719	169	679	2,021
Southern	476	187	667	1,959
Southeast	482	157	602	1,826

Source: Population data is for 2007 from the Florida Office of Economic & Demographic Research.

Figure 1 presents the costs of underage drinking and percentages of the total by category. Consistent with previous state and national estimates (PIRE, 2006; Miller et al., 2006), alcohol-attributable violent crime (i.e., murder, rape/sexual assault, aggravated assault, and robbery) was responsible for the greatest share of total cost to society, accounting for 49% of the total underage drinking cost.

Figure 1. Economic Costs of Underage Drinking in Florida, by Category
(in 2007 millions of dollars)



* Other injuries and events include poisoning, drowning, burns, and suicide.

Note: Percentages refer to each category's contribution to total cost.

Traffic accidents comprised the next largest component of total underage drinking cost at \$642.7 million (21% of total cost). The costs of traffic accidents include medical and emergency services, lost productivity, insurance, administration, workplace and legal costs, travel delay, property damage, and QALY loss. Alcohol-attributable property and other crime costs, which include motor vehicle theft, household burglary, and larceny/theft, were estimated at \$316.3 million.

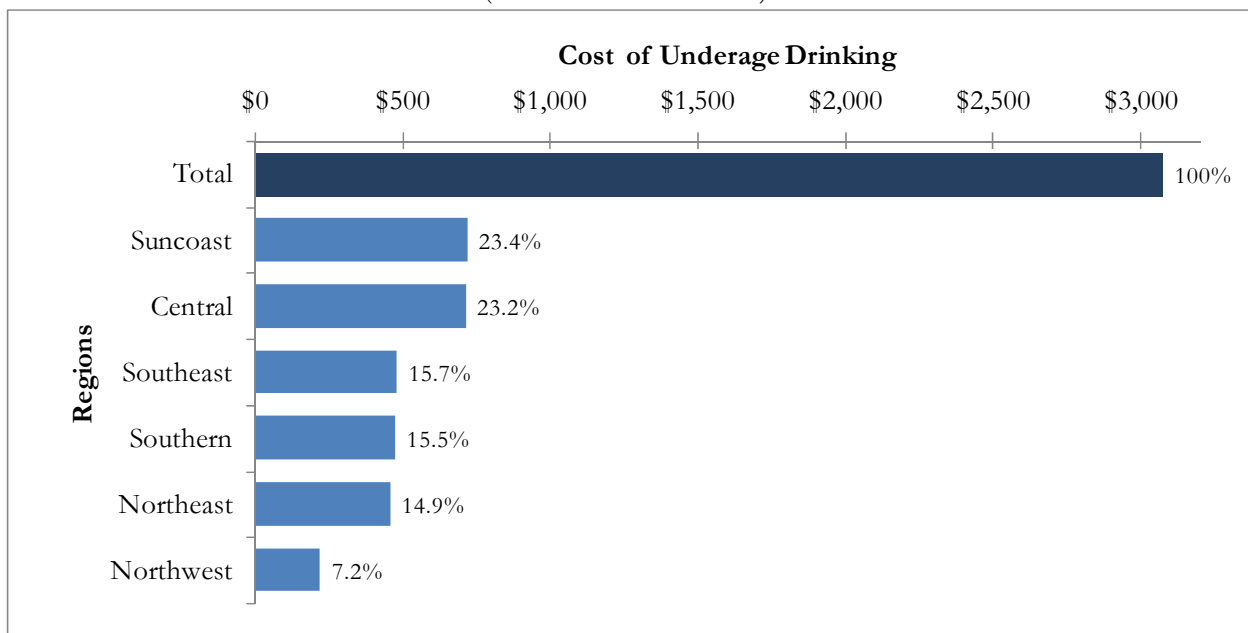
Alcohol-attributable risky sexual behavior costs were estimated at \$291.1 million. Costs from fetal alcohol syndrome were \$75.4 million, including medical costs (medical treatment, special education, and residential care for persons with mental retardation), and reduced productivity. In addition, underage drinking resulted in costs from suicides and suicide attempts of \$48.3 million and from alcohol abuse and dependence treatment of approximately \$2.8 million. Finally, medical costs, productivity losses, and costs associated with QALYs lost related to other injuries (drowning, burns and fire-related injuries, and poisonings) summed up to \$202.5 million.

County and Regional Estimates

The geographical distribution of the costs of underage drinking provides information on the areas in the state in which the consequences are most highly concentrated. Six counties accounted for more than half of the total estimated cost in the state: Miami-Dade, Broward, Orange, Palm Beach, Hillsborough, and Duval. Hillsborough County had the highest cost for motor vehicle crashes in Florida (\$52.3 million) and Dade County had the highest property crime (\$55.8 million), violent crime (\$275.4 million), and risky sexual activity (\$38.7 million) costs, making it the county with the highest overall cost for underage drinking (consult Table 1 for more details).

Figure 2 presents the total cost of underage drinking by region. Counties located in the Suncoast and Central regions of the state generated the largest share of the total statewide cost. Costs per youth under the age of 21 and per youth between the ages of 14 and 20 are highest in the Suncoast region, averaging \$679 and \$2,021 per youth, respectively (see Table 1). The counties located in the Suncoast region are Charlotte, Collier, Desoto, Glades, Hendry, Hillsborough, Lee, Manatee, Pasco, Pinellas, and Sarasota.

Figure 2. Economic Costs of Underage Drinking in Florida, by Region
(in 2007 millions of dollars)



Notes: Percentages refer to each region's contribution to total cost. The percentages do not add to one hundred since treatment costs for abuse and dependence are not calculated at the regional level. The specific counties included in each region of the Florida Department of Children and Families are as follows. **Central:** Brevard, Citrus, Hardee, Hernando, Highlands, Indian River, Lake, Marion, Martin, Okeechobee, Orange, Osceola, Polk, Saint

Lucie, Seminole, Sumter; **Northeast:** Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Lafayette, Levy, Madison, Nassau, Putnam, Saint Johns, Suwannee, Taylor, Union, Volusia; **Northwest:** Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Okaloosa, Santa Rosa, Wakulla, Walton, Washington; **Southern:** Dade, Monroe; **Suncoast:** Charlotte, Collier, Desoto, Glades, Hendry, Hillsborough, Lee, Manatee, Pasco, Pinellas, Sarasota; **Southeast:** Broward, Palm Beach.

Tangible and Intangible Costs

Our results also disaggregate costs into tangible and intangible components. The tangible costs include medical and other direct expenses as well as productivity losses. The intangible costs include the monetized reduction in QALYs and the value of a statistical life. For property and violent crime, intangible costs also include the value of pain and suffering associated with being the victim of crime.

Table 3 summarizes tangible and intangible costs, by category. Intangible costs represented approximately 68% of the total state-wide cost of underage drinking. Property and violent crime and motor vehicle crashes accounted for a large share (81%) of total tangible cost, while violent crime was associated with the largest share of total intangible cost, mainly due to the considerable pain and suffering resulting from these crimes. More detailed calculations for tangible and intangible costs of underage drinking by county and category are presented in Table A1.

Table 3. Tangible and Intangible Economic Costs of Underage Drinking in Florida, by Category
(in 2007 millions of dollars)¹

	Tangible	Intangible	Total²
Total	1,021	2,127	3,148
Motor vehicle crashes	264	379	643
Fetal alcohol syndrome	75	..	75
Risky sexual behavior	91	200	291
Property crime	293	26	319
Violent crime	272	1,295	1,567
Treatment dependence/abuse	2.8	..	2.8
Other injuries and events ³	24	227	251

1. Tangible costs include medical and other direct costs, and productivity (lost work). For property and violent crime, intangible costs include the value of pain and suffering associated with being the victim of crime as well as the risk of homicide. For the other categories, intangible costs include the reduction in quality-adjusted life years (QALYs).

2. The total presented in this table (\$3.148 billion) is not equal to the total presented in the rest of the study (\$3.073) since the aggregate unit cost estimates for violent and property offenses do not equal the sum of tangible and intangible costs. Different

methods were used to calculate the cost associated with risk of homicide for some offenses, thus both tangible and intangible costs contain this component. In order to calculate aggregate crime costs, the tangible risk of homicide cost was first subtracted from total tangible costs and then the remaining amount was added to intangible crime costs (Rajkumar and French, 1997; McCollister, French, and Fang, 2009).

3. Other injuries and events include poisoning, drowning, burns and suicide.

5. Discussion

This study provides the most current estimates of the economic impact of underage drinking in the state of Florida. We estimated that underage drinking in Florida results in a total cost of \$3.073 billion, with most of the costs attributable to crime and traffic crashes. Our results show that the total cost of underage drinking is not evenly distributed among the various counties and regions in the state. Considering the overall cost per youth under the age of 21 (\$627) and per youth between the ages of 14 and 20 (\$1,818) puts into perspective the severity and extent of this problem.

As mentioned above, only a few other studies have estimated the economic costs of underage drinking. Among these, Miller and colleagues (2006) estimated the cost of underage drinking per U.S. resident between the ages of 14 and 20 at an average of \$2,210. The only previous estimate of the economic costs of underage drinking in Florida was conducted by the Pacific Institute for Research and Evaluation (PIRE, 2006). PIRE (2006) found that the total societal cost of underage drinking in Florida amounted to \$3,913.6 million (converted to 2007 dollars using the US CPI). The difference between these findings and our estimates can be attributed to various factors, including different incidence statistics across years and, in certain cases in our study, more recently available unit cost estimates. In addition, we have opted to use a more conservative method of estimation whenever assumptions had to be made. Finally, and most importantly, our study uses Florida-specific incidence data, whereas PIRE (2006) used various methodologies to break down national estimates to the state level.

Research Limitations

The estimates developed in this study are not without limitations. First, as previously mentioned, we estimated only acute costs attributable to underage drinking. There are many chronic health related problems later in life that can be attributed to chronic alcohol consumption and early onset of drinking, which are excluded from our analyses. Second, in addition to the consequences analyzed in this study, additional alcohol-attributable problems are known to occur, but were not included due to the lack of reliable data. For example, we do not account for the costs of injuries of children due to alcohol consumption by an underage caretaker (e.g., drowning of a child that was under the supervision of a babysitter under the age of 21 that consumed alcohol). We included only those problems for which the relationship with alcohol consumption is established for youth. Third, our estimates did not include considerable costs incurred to avoid or diminish the negative consequences associated with underage drinking, such as the installation of alarm systems to avoid being a victim of crime or avoiding high-crime neighborhoods.

Perhaps the most significant limitation pertains to the availability of reliable and defensible data on alcohol-attributable fractions. The majority of the alcohol-involved and alcohol-attributable fractions were derived from Miller and colleagues (2006) and, as these authors point out, the fractions are not youth specific. Most of the unit costs estimates are not state specific either. Some unit costs, obtained from the available literature, are not recent and could, for example, be overestimating the results in areas where innovation and efficiency have lowered medical costs. Finally, our estimates do not indicate who actually bears the various costs of underage drinking (e.g., government or taxpayers, private insurance companies, drinker's household, the victims of alcohol-related events). As mentioned in the introduction, Harwood and colleagues (1999) estimated the economic cost of drinking in the U.S. in 1992 and found that 45% of the total cost was incurred by the alcohol abusers and their households; approximately 39% by the government; 10% by private

insurers; and 6% by crime victims. In summary, the precision and depth of these estimates could be dramatically improved in all areas with better data and fewer simplifying assumptions.

Policy Implications

Policies and programs that successfully target underage drinking have the potential to generate significant savings to state government, taxpayers, businesses, schools, and other segments of society by reducing many of the negative consequences associated with underage drinking. The results of this study can help policy makers identify problem areas and better evaluate the future economic impact of programs and interventions that promote reduced alcohol use, driving safety, and crime prevention among Florida's youth.

Our findings show that alcohol-attributable criminal activity and traffic crashes result in the greatest losses to the citizens of Florida. Programs targeting crime prevention and driving safety in addition to alcohol-use prevention among Florida youth therefore have the greatest opportunity to reduce the overall cost associated with underage drinking. Counties located in the Central and Suncoast regions of the state generated the largest share of total statewide cost. Cost per Florida resident, however, is higher in the Southern (\$187) and Northeast (\$181) regions of the state, with the Suncoast region having the highest cost per youth under the age of 21 (\$679) and per youth between the ages of 14 and 20 (\$2,021).

6. Conclusion and Recommendations for Future Research

The results of this study quantify the magnitude of the consequences associated with underage drinking in Florida. Total and component-specific costs of underage drinking in the state are substantial, with approximately 180 deaths and over 70,000 injuries attributable to underage alcohol use in 2007. The county specific and regional burden is not uniform across the state, however, pointing to areas where the problem is more serious.

These estimates can help policymakers identify problem areas and design and evaluate state programs to address the problem of underage drinking and its consequences. Ideally, these estimates should be updated every 3-5 years to maintain a current perspective on the impact of underage drinking in Florida.

There are several areas on which future research should focus to improve current estimates of the costs of underage drinking in Florida and other states: (i) developing state and age-group specific alcohol-involved and attributable fraction estimates; (ii) updating unit cost estimates for fatal and non-fatal consequences in the various categories, estimating state-specific values, and disaggregating them more explicitly into tangible and intangible components; (iii) improving the estimates for loss of QALYs by type of injury and age group; (iv) further disaggregating the estimates by the groups that incur the costs; (v) systematizing the collection of data from the various incidence sources so that the estimates can be frequently and easily updated. These improvements will facilitate better research in the future and ultimately more precise and reliable cost estimates for program and policy evaluation.

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<http://www.doh.state.fl.us/workforce/InjuryPrevention/InjuryData.html>

Treatment Episode Data Set - TEDS, SAMHSA, 2007.

Table 1. Economic Costs of Underage Drinking in Florida, by Category and County (in thousands of 2007 dollars; total in millions of dollars)

County	Motor vehicle crashes	Drowning	Burns	FAS	Risky sexual behavior	Poisoning	Suicide	Property crime	Violent crime	Treatment abuse/dep.	TOTAL (in millions) ¹	% of total ²
FLORIDA	642,653	130,139	6,877	75,445	291,120	65,474	48,332	316,275	1,494,147	2,849	3,073	100
Alachua	7,486	1,984	7.9	900	3,875	973	64	4,560	18,453	..	38.3	1.2
Baker	1,600	0.0	12.4	128	395	31	783	136	2,208	..	5.3	0.2
Bay	11,977	1,017	10.7	758	2,619	581	786	2,882	10,745	..	31.4	1.0
Bradford	2,003	4.3	3.8	113	454	20	3.2	283	1,431	..	4.3	0.1
Brevard	20,485	5,000	22.5	1,797	8,617	726	2,575	7,837	41,282	..	88.3	2.9
Broward	45,091	11,057	59.9	7,462	27,796	8,004	3,260	29,161	126,841	..	258.7	8.4
Calhoun	778	0.0	1.0	55	225	15	0.0	54	691	..	1.8	0.1
Charlotte	5,166	8.7	7.2	374	2,535	896	466	2,012	9,317	..	20.8	0.7
Citrus	4,878	1,003	16.2	358	2,172	468	99	1,159	4,764	..	14.9	0.5
Clay	5,342	1,002	757.3	754	2,828	143	450	1,947	9,111	..	22.3	0.7
Collier	7,816	4,972	7.7	1,337	5,191	558	533	2,573	17,227	..	40.2	1.3
Columbia	4,391	996	9.6	281	1,010	464	13	1,136	3,777	..	12.1	0.4
Dade	48,908	20,944	1,546.1	10,781	38,723	2,776	5,740	55,766	275,433	..	460.6	15.0
Desoto	1,574	0.0	3.3	159	527	37	28	473	3,775	..	6.6	0.2
Dixie	971	0.0	2.3	58	248	12	8.5	198	1,609	..	3.1	0.1
Duval	36,046	6,022	800.7	4,343	13,981	751	2,567	20,802	121,726	..	207.0	6.7
Escambia	21,226	4,991	27.1	1,393	4,882	287	485	5,391	27,102	..	65.8	2.1
Flagler	3,244	22	9.4	281	1,400	462	16	1,030	3,974	..	10.4	0.3
Franklin	1,380	995	0.0	40	186	11	5.3	109	233	..	3.0	0.1
Gadsden	2,255	4.3	2.8	243	770	16	3.2	552	3,260	..	7.1	0.2
Gilchrist	822	0.0	0.9	62	265	8.0	3.2	78	242	..	1.5	0.0
Glades	691	0.0	0.5	29	173	1.9	0.0	139	310	..	1.3	0.0
Gulf	1,199	993	1.4	43	264	12	0.0	131	697	..	3.3	0.1
Hamilton	594	2.6	7.9	59	230	5.7	5.3	109	347	..	1.4	0.0
Hardee	1,181	0.0	4.9	162	433	26	13	408	2,452	..	4.7	0.2
Hendry	2,142	0.0	1.9	243	619	49	10	625	5,229	..	8.9	0.3
Hernando	5,787	8.7	752.7	510	2,498	2,180	460	2,300	5,266	..	19.8	0.6
Highlands	2,501	1,990	8.9	343	1,530	468	403	1,232	5,866	..	14.3	0.5
Hillsborough	52,289	6,052	48.2	5,614	18,496	6,096	2,419	21,167	92,907	..	205.1	6.7
Holmes	550	0.0	1.7	73	307	36	6.4	93	1,447	..	2.5	0.1
Indian River	5,271	2,990	9.6	450	2,151	79	35	1,708	4,110	..	16.8	0.5
Jackson	2,328	6.9	4.9	191	795	47	3.2	442	5,238	..	9.1	0.3
Jefferson	1,058	0.0	1.7	53	228	3.8	0.0	71	1,449	..	2.9	0.1

County	Motor vehicle crashes	Drowning	Burns	FAS	Risky sexual behavior	Poisoning	Suicide	Property crime	Violent crime	Treatment abuse/dep.	TOTAL (in millions) ¹	% of total ²
Lafayette	26	0.0	0.5	32	129	1.9	6.4	26	116	..	0.3	0.01
Lake	9,568	1,004	16	1,100	4,396	975	845	3,327	12,453	..	33.7	1.10
Lee	20,825	2,037	24	2,345	9,341	1,636	1,577	9,637	46,459	..	93.9	3.05
Leon	10,178	5.2	764	1,044	4,316	173	75	4,676	17,411	..	38.6	1.26
Levy	2,459	0.0	6.3	154	620	30	8.5	447	1,604	..	5.3	0.17
Liberty	621	0.0	1.7	36	122	16	0.0	0.0	0.0	..	0.8	0.03
Madison	1,330	0.0	2.8	85	314	20	0.0	250	1,189	..	3.2	0.10
Manatee	13,962	1,021	9.1	1,297	4,926	1,022	2,016	6,148	31,244	..	61.6	2.01
Marion	11,116	24	24	1,155	5,023	1,097	1,247	3,815	21,460	..	45.0	1.46
Martin	5,465	0.0	9.1	434	2,261	1,288	811	1,734	5,320	..	17.3	0.56
Monroe	5,533	997	3.5	247	1,273	470	408	1,519	4,965	..	15.4	0.50
Nassau	4,577	1,002	5.4	259	1,078	56	22	711	7,571	..	15.3	0.50
Okaloosa	7,824	2,009	10	892	3,063	586	45	2,386	6,892	..	23.7	0.77
Okeechobee	2,702	990	5.2	199	610	45	399	443	2,088	..	7.5	0.24
Orange	36,114	3,996	20	5,410	17,132	2,889	3,801	24,878	136,622	..	230.9	7.51
Osceola	9,772	1,003	18	1,264	4,034	944	58	4,545	18,786	..	40.4	1.32
Palm Beach	39,620	11,941	42	4,999	20,353	6,036	4,594	23,699	111,754	..	223.0	7.26
Pasco	20,005	2,994	41	1,667	6,722	4,000	1,442	6,663	22,037	..	65.6	2.13
Pinellas	31,684	6,010	43	3,007	14,975	5,876	2,700	16,536	80,155	..	161.0	5.24
Polk	20,113	5,983	58	2,644	8,959	1,223	2,103	9,445	36,061	..	86.6	2.82
Putnam	4,074	2.6	1,494	342	1,178	473	801	1,588	10,282	..	20.2	0.66
Saint Johns	7,510	4.3	4.0	578	2,649	502	419	2,159	6,608	..	20.4	0.66
Saint Lucie	6,096	4,000	10	1,091	4,116	1,394	455	3,465	16,794	..	37.4	1.22
Santa Rosa	6,638	2,003	13	590	2,223	1,817	472	911	4,563	..	19.2	0.63
Sarasota	12,818	2,996	16	1,016	6,016	3,447	883	6,080	21,137	..	54.4	1.77
Seminole	10,807	2,011	12	1,544	6,660	1,355	138	4,802	20,912	..	48.2	1.57
Sumter	2,380	0.0	8.0	167	1,326	32	10	503	3,136	..	7.6	0.25
Suwannee	1,540	2,976	5.8	161	618	47	390	389	3,193	..	9.3	0.30
Taylor	1,854	0.0	6.8	84	347	12	3.2	202	1,921	..	4.4	0.14
Union	471	0.0	4.0	55	243	10	19	71	429	..	1.3	0.04
Volusia	19,971	3,061	35	1,694	7,970	1,263	1,324	7,749	29,625	..	72.7	2.37
Wakulla	995	0.0	4.2	95	451	16	6.4	278	1,168	..	3.0	0.10
Walton	3,847	2.6	1.9	209	885	455	6.4	499	920	..	6.8	0.22
Washington	1,129	0.0	4.9	85	371	23	6.4	127	757	..	2.5	0.08

1. Total estimates at the county level exclude alcohol dependence and abuse treatment costs.

2. The percentages by county do not add up to 100% since the alcohol dependence and abuse treatment costs are not available.

Table A1. Tangible and Intangible Economic Costs of Underage Drinking in Florida, by County and Category^{1,2}
(in thousands of 2007 dollars)

	Motor vehicle crashes			Drownings			Burns			Fetal alcohol syndrome			Risky sexual behavior		
	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>
Florida	263,752	378,901	642,653	1,361	128,778	130,139	285	6,592	6,877	75,445	..	75,445	90,721	200,399	291,120
Alachua	2,992	4,494	7,486	14	1,969	1,984	2.2	5.6	7.9	900	..	900	1,208	2,668	3,875
Baker	660	940	1,600	0.0	0.0	0.0	3.5	8.9	12	128	..	128	123	272	395
Bay	4,953	7,024	11,977	16	1,001	1,017	3.0	7.6	11	758	..	758	816	1,803	2,619
Bradford	786	1,217	2,003	1.6	2.8	4.3	1.1	2.7	3.8	113	..	113	141	312	454
Brevard	8,109	12,376	20,485	50	4,950	5,000	6.4	16	23	1,797	..	1,797	2,685	5,931	8,617
Broward	18,419	26,672	45,091	131	10,926	11,057	17	43	60	7,462	..	7,462	8,662	19,134	27,796
Calhoun	335	442	778	0.0	0.0	0.0	0.3	0.7	1.0	55	..	55	70	155	225
Charlotte	2,152	3,014	5,166	3.1	5.6	8.7	2.0	5.1	7.2	374	..	374	790	1,745	2,535
Citrus	2,016	2,862	4,878	11	992	1,003	4.6	12	16	358	..	358	677	1,495	2,172
Clay	2,203	3,139	5,342	11	991	1,002	6.3	751	757	754	..	754	881	1,946	2,828
Collier	3,212	4,604	7,816	40	4,932	4,972	2.2	5.5	7.7	1,337	..	1,337	1,618	3,573	5,191
Columbia	1,722	2,669	4,391	8.5	987	996	2.7	6.9	10	281	..	281	315	695	1,010
Dade	20,094	28,814	48,908	192	20,752	20,944	22	1,524	1,546	10,781	..	10,781	12,067	26,656	38,723
Desoto	647	926	1,574	0.0	0.0	0.0	0.9	2.4	3.3	159	..	159	164	362	527
Dixie	363	608	971	0.0	0.0	0.0	0.6	1.6	2.3	58	..	58	77	171	248
Duval	14,531	21,515	36,046	69	5,954	6,022	19	782	801	4,343	..	4,343	4,357	9,624	13,981
Escambia	8,810	12,416	21,226	47	4,944	4,991	8	19	27	1,393	..	1,393	1,521	3,361	4,882
Flagler	1,309	1,936	3,244	7.8	14	22	2.7	6.7	9.4	281	..	281	436	964	1,400
Franklin	620	760	1,380	8.2	987	995	0.0	0.0	0.0	40	..	40	58	128	186
Gadsden	969	1,286	2,255	1.6	2.8	4.3	0.8	2.0	2.8	243	..	243	240	530	770
Gilchrist	324	498	822	0.0	0.0	0.0	0.2	0.6	0.9	62	..	62	83	183	265
Glades	263	429	691	0.0	0.0	0.0	0.1	0.4	0.5	29	..	29	54	119	173
Gulf	439	761	1,199	7.6	985	993	0.4	1.0	1.4	43	..	43	82	181	264
Hamilton	249	346	594	0.9	1.7	2.6	2.2	5.6	7.9	59	..	59	72	158	230
Hardee	462	719	1,181	0.0	0.0	0.0	1.4	3.5	4.9	162	..	162	135	298	433
Hendry	884	1,258	2,142	0.0	0.0	0.0	0.5	1.4	1.9	243	..	243	193	426	619
Hernando	2,413	3,374	5,787	3.1	5.6	8.7	5.0	748	753	510	..	510	778	1,719	2,498
Highlands	1,021	1,479	2,501	16	1,973	1,990	2.5	6.4	8.9	343	..	343	477	1,053	1,530
Hillsborough	21,914	30,375	52,289	79	5,973	6,052	14	34	48	5,614	..	5,614	5,764	12,732	18,496
Holmes	260	290	550	0.0	0.0	0.0	0.5	1.2	1.7	73	..	73	96	211	307
Indian River	2,202	3,069	5,271	27	2,963	2,990	2.7	6.9	10	450	..	450	670	1,481	2,151
Jackson	876	1,452	2,328	2.5	4.4	6.9	1.4	3.5	4.9	191	..	191	248	547	795
Jefferson	436	622	1,058	0.0	0.0	0.0	0.5	1.2	1.7	53	..	53	71	157	228

	Motor vehicle crashes			Drownings			Burns			Fetal alcohol syndrome			Risky sexual behavior		
	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>	<i>Tan.</i>	<i>Intan.</i>	<i>Total</i>
Lafayette	12	14	26	0	0	0	0.1	0.4	0.5	32	..	32	40	89	129
Lake	3,816	5,752	9,568	12	993	1,004	4.6	11.5	16	1,100	..	1,100	1,370	3,026	4,396
Lee	8,589	12,236	20,825	34	2,004	2,037	6.9	17.2	24	2,345	..	2,345	2,911	6,430	9,341
Leon	4,455	5,723	10,178	1.9	3.3	5.2	8.3	755.8	764	1,044	..	1,044	1,345	2,971	4,316
Levy	938	1,521	2,459	0.0	0.0	0.0	1.8	4.5	6.3	154	..	154	193	427	620
Liberty	261	359	621	0.0	0.0	0.0	0.5	1.2	1.7	36	..	36	38	84	122
Madison	500	830	1,330	0.0	0.0	0.0	0.8	2.0	2.8	85	..	85	98	216	314
Manatee	5,763	8,199	13,962	18	1,003	1,021	2.6	6.5	9.1	1,297	..	1,297	1,535	3,391	4,926
Marion	4,451	6,665	11,116	8.7	16	24	6.8	17.1	24	1,155	..	1,155	1,565	3,457	5,023
Martin	2,229	3,235	5,465	0.0	0.0	0.0	2.6	6.5	9.1	434	..	434	705	1,556	2,261
Monroe	2,325	3,208	5,533	9.1	988	997	1.0	2.5	3.5	247	..	247	397	877	1,273
Nassau	1,714	2,863	4,577	11	991	1,002	1.5	3.9	5.4	259	..	259	336	742	1,078
Okaloosa	3,248	4,576	7,824	23	1,985	2,009	3.0	7.5	10	892	..	892	954	2,108	3,063
Okeechobee	1,085	1,618	2,702	6.7	984	990	1.5	3.7	5.2	199	..	199	190	420	610
Orange	14,627	21,487	36,114	39	3,957	3,996	5.6	14.1	20	5,410	..	5,410	5,339	11,793	17,132
Osceola	3,785	5,988	9,772	11	992	1,003	5.1	12.7	18	1,264	..	1,264	1,257	2,777	4,034
Palm Beach	16,379	23,242	39,620	100	11,841	11,941	12.0	29.9	42	4,999	..	4,999	6,343	14,010	20,353
Pasco	8,170	11,836	20,005	28	2,966	2,994	11.7	29.2	41	1,667	..	1,667	2,095	4,627	6,722
Pinellas	13,684	18,000	31,684	64	5,946	6,010	12.2	30.4	43	3,007	..	3,007	4,667	10,308	14,975
Polk	8,125	11,988	20,113	54	5,928	5,983	16.5	41.3	58	2,644	..	2,644	2,792	6,167	8,959
Putnam	1,669	2,406	4,074	0.9	1.7	2.6	6.7	1,487.0	1,494	342	..	342	367	811	1,178
Saint Johns	3,099	4,411	7,510	1.6	2.8	4.3	1.1	2.9	4.0	578	..	578	826	1,824	2,649
Saint Lucie	2,432	3,664	6,096	40	3,960	4,000	2.9	7.4	10	1,091	..	1,091	1,283	2,833	4,116
Santa Rosa	2,656	3,982	6,638	21	1,982	2,003	3.8	9.5	13	590	..	590	693	1,530	2,223
Sarasota	5,254	7,563	12,818	29	2,967	2,996	4.7	11.7	16	1,016	..	1,016	1,875	4,142	6,016
Seminole	4,433	6,374	10,807	24	1,987	2,011	3.5	8.9	12	1,544	..	1,544	2,075	4,585	6,660
Sumter	901	1,480	2,380	0	0	0	2.3	5.7	8.0	167	..	167	413	913	1,326
Suwannee	599	940	1,540	22	2,954	2,976	1.6	4.1	5.8	161	..	161	193	425	618
Taylor	748	1,106	1,854	0.0	0.0	0.0	1.9	4.9	6.8	84	..	84	108	239	347
Union	223	249	471	0.0	0.0	0.0	1.1	2.9	4.0	55	..	55	76	168	243
Volusia	8,441	11,530	19,971	52	3,009	3,061	10.0	25.1	35	1,694	..	1,694	2,484	5,487	7,970
Wakulla	470	525	995	0.0	0.0	0.0	1.2	3.0	4.2	95	..	95	141	311	451
Walton	1,593	2,254	3,847	0.9	1.7	2.6	0.5	1.4	1.9	209	..	209	276	609	885
Washington	437	691	1,129	0.0	0.0	0.0	1.4	3.5	4.9	85	..	85	116	255	371

	Poisoning			Suicide			Property crime			Violent crime			Treatment		
	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total
Florida	7,783	57,691	65,474	14,159	34,174	48,332	292,882	25,699	318,581	271,772	1,295,219	1,566,991	2,849	..	2,849
Alachua	105	868	973	16	48	64	4,223	371	4,594	3,635	15,473	19,108	..	..	..
Baker	21	10	31	234	549	783	126	11	137	358	1,996	2,354	..	..	..
Bay	117	464	581	235	552	786	2,669	234	2,903	1,977	9,272	11,249	..	..	..
Bradford	13	6.3	20	0.8	2.4	3.2	262	23	285	266	1,231	1,496	..	..	..
Brevard	215	511	726	758	1,817	2,575	7,257	637	7,894	7,552	35,705	43,257	..	..	..
Broward	712	7,292	8,004	948	2,312	3,260	27,004	2,370	29,374	22,966	110,151	133,118	..	..	..
Calhoun	10	4.8	15	0.0	0.0	0.0	50	4.4	55	110	628	738	..	..	..
Charlotte	53	843	896	135	330	466	1,863	163	2,026	1,606	8,243	9,849	..	..	..
Citrus	40	428	468	25	75	99	1,074	94	1,168	860	4,141	5,001	..	..	..
Clay	97	46	143	131	318	450	1,803	158	1,961	1,704	7,810	9,514	..	..	..
Collier	101	457	558	152	381	533	2,383	209	2,592	3,057	15,076	18,133	..	..	..
Columbia	37	427	464	3.2	10	13	1,052	92	1,144	724	3,205	3,929	..	..	..
Dade	773	2,003	2,776	1,683	4,057	5,740	51,641	4,531	56,172	49,871	239,190	289,061	..	..	..
Desoto	25	12	37	6.9	21	28	438	38	476	652	3,336	3,989	..	..	..
Dixie	8.0	3.8	12	2.1	6.4	8.5	184	16	200	268	1,442	1,710	..	..	..
Duval	510	242	751	756	1,810	2,567	19,263	1,690	20,954	21,180	107,325	128,505	..	..	..
Escambia	194	92	287	140	345	485	4,992	438	5,430	4,994	23,374	28,368	..	..	..
Flagler	36	426	462	4.0	12	16	954	84	1,038	694	3,498	4,193	..	..	..
Franklin	7.7	3.7	11	1.3	4.0	5.3	101	8.8	109	49	189	239	..	..	..
Gadsden	11	5.1	16	0.8	2.4	3.2	511	45	556	651	2,718	3,369	..	..	..
Gilchrist	5.4	2.6	8.0	0.8	2.4	3.2	73	6.4	79	51	197	248	..	..	..
Glades	1.3	0.6	1.9	0.0	0.0	0.0	129	11	140	65	252	318	..	..	..
Gulf	8.0	3.8	12	0.0	0.0	0.0	121	11	132	147	567	714	..	..	..
Hamilton	3.9	1.8	5.7	1.3	4.0	5.3	101	8.8	110	73	283	356	..	..	..
Hardee	18	8.4	26	3.2	10	13	378	33	411	409	2,194	2,603	..	..	..
Hendry	33	16	49	2.4	7.2	9.6	579	51	629	887	4,652	5,539	..	..	..
Hernando	91	2,089	2,180	134	326	460	2,130	187	2,316	1,073	4,349	5,421	..	..	..
Highlands	40	428	468	120	283	403	1,141	100	1,241	1,021	5,170	6,192	..	..	..
Hillsborough	527	5,568	6,096	700	1,719	2,419	19,602	1,720	21,322	17,174	80,021	97,195	..	..	..
Holmes	24	11	36	1.6	4.8	6.4	86	7.6	94	234	1,310	1,544	..	..	..
Indian River	54	25	79	8.7	26	35	1,582	139	1,721	794	3,475	4,269	..	..	..
Jackson	32	15	47	0.8	2.4	3.2	409	36	445	889	4,660	5,550	..	..	..
Jefferson	2.6	1.2	3.8	0.0	0.0	0.0	66	5.8	72	269	1,245	1,514	..	..	..

	Poisoning			Suicide			Property crime			Violent crime			Treatment		
	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total	Tan.	Intan.	Total
Lafayette	1.3	0.6	1.9	1.6	4.8	6.4	24	2	26	24	95	119	..	..	..
Lake	106	868	975	249	596	845	3,081	270	3,351	2,443	10,460	12,903	..	..	..
Lee	277	1,359	1,636	451	1,126	1,577	8,924	783	9,707	8,109	40,915	49,024	..	..	..
Leon	117	56	173	19	56	75	4,330	380	4,710	3,487	14,492	17,979	..	..	..
Levy	21	10	30	2.1	6.4	8.5	414	36	450	337	1,304	1,642	..	..	..
Liberty	11	5.0	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..	..	..
Madison	14	6.5	20	0.0	0.0	0.0	231	20	252	250	967	1,217	..	..	..
Manatee	138	884	1,022	600	1,417	2,016	5,693	500	6,193	5,794	26,875	32,670	..	..	..
Marion	189	908	1,097	369	878	1,247	3,533	310	3,843	4,019	18,385	22,404	..	..	..
Martin	41	1,247	1,288	241	570	811	1,606	141	1,747	1,013	4,527	5,540	..	..	..
Monroe	41	429	470	121	287	408	1,406	123	1,530	903	4,304	5,207	..	..	..
Nassau	38	18	56	5.6	17	22	658	58	716	1,522	6,290	7,812	..	..	..
Okaloosa	120	466	586	11	34	45	2,210	194	2,404	1,308	5,871	7,179	..	..	..
Okeechobee	31	15	45	119	280	399	410	36	446	404	1,764	2,168	..	..	..
Orange	295	2,594	2,889	1,122	2,679	3,801	23,038	2,022	25,060	25,024	118,105	143,129	..	..	..
Osceola	85	859	944	14	43	58	4,209	369	4,578	3,386	16,344	19,730	..	..	..
Palm Beach	487	5,549	6,036	1,358	3,235	4,594	21,946	1,926	23,872	20,111	97,282	117,393	..	..	..
Pasco	216	3,784	4,000	417	1,025	1,442	6,170	541	6,712	3,999	19,121	23,119	..	..	..
Pinellas	379	5,498	5,876	789	1,911	2,700	15,313	1,344	16,657	14,845	68,984	83,829	..	..	..
Polk	275	948	1,223	621	1,482	2,103	8,746	767	9,514	6,488	31,392	37,881	..	..	..
Putnam	43	430	473	239	563	801	1,471	129	1,600	1,809	9,028	10,837	..	..	..
Saint Johns	63	439	502	124	295	419	2,000	175	2,175	1,249	5,640	6,889	..	..	..
Saint Lucie	113	1,281	1,394	133	322	455	3,209	282	3,490	3,108	14,458	17,566	..	..	..
Santa Rosa	123	1,695	1,817	137	335	472	844	74	918	818	3,978	4,796	..	..	..
Sarasota	118	3,329	3,447	259	624	883	5,630	494	6,124	3,703	18,589	22,292	..	..	..
Seminole	87	1,269	1,355	34	104	138	4,447	390	4,837	3,691	18,340	22,031	..	..	..
Sumter	22	10	32	2	7	10	466	41	507	553	2,750	3,303	..	..	..
Suwannee	32	15	47	117	273	390	360	32	392	565	2,797	3,362	..	..	..
Taylor	8.0	3.8	12	0.8	2.4	3.2	187	16	204	404	1,562	1,967	..	..	..
Union	6.7	3.2	10	4.8	14	19	65	5.7	71	90	349	439	..	..	..
Volusia	302	961	1,263	388	936	1,324	7,176	630	7,805	5,524	25,425	30,949	..	..	..
Wakulla	11	5.2	16	1.6	4.8	6.4	258	23	280	210	1,016	1,227	..	..	..
Walton	31	424	455	1.6	4.8	6.4	462	41	502	194	748	941	..	..	..
Washington	15	7.3	23	1.6	4.8	6.4	118	10	128	124	683	806	..	..	..

1. Tangible costs include medical and other direct costs, and productivity (lost work). Intangible costs include Quality-adjusted life years.
2. The totals presented in this table for violent and property crime do not equal the total in the rest of the study since the aggregate unit cost estimates for violent and property offenses do not equal the sum of tangible and intangible costs. Different methods were used to calculate the cost associated with risk of homicide for some offenses, thus both tangible and intangible costs contain this component. In order to calculate aggregate crime costs, the tangible risk of homicide cost was first subtracted from total tangible costs and then the remaining amount was added to intangible crime costs.