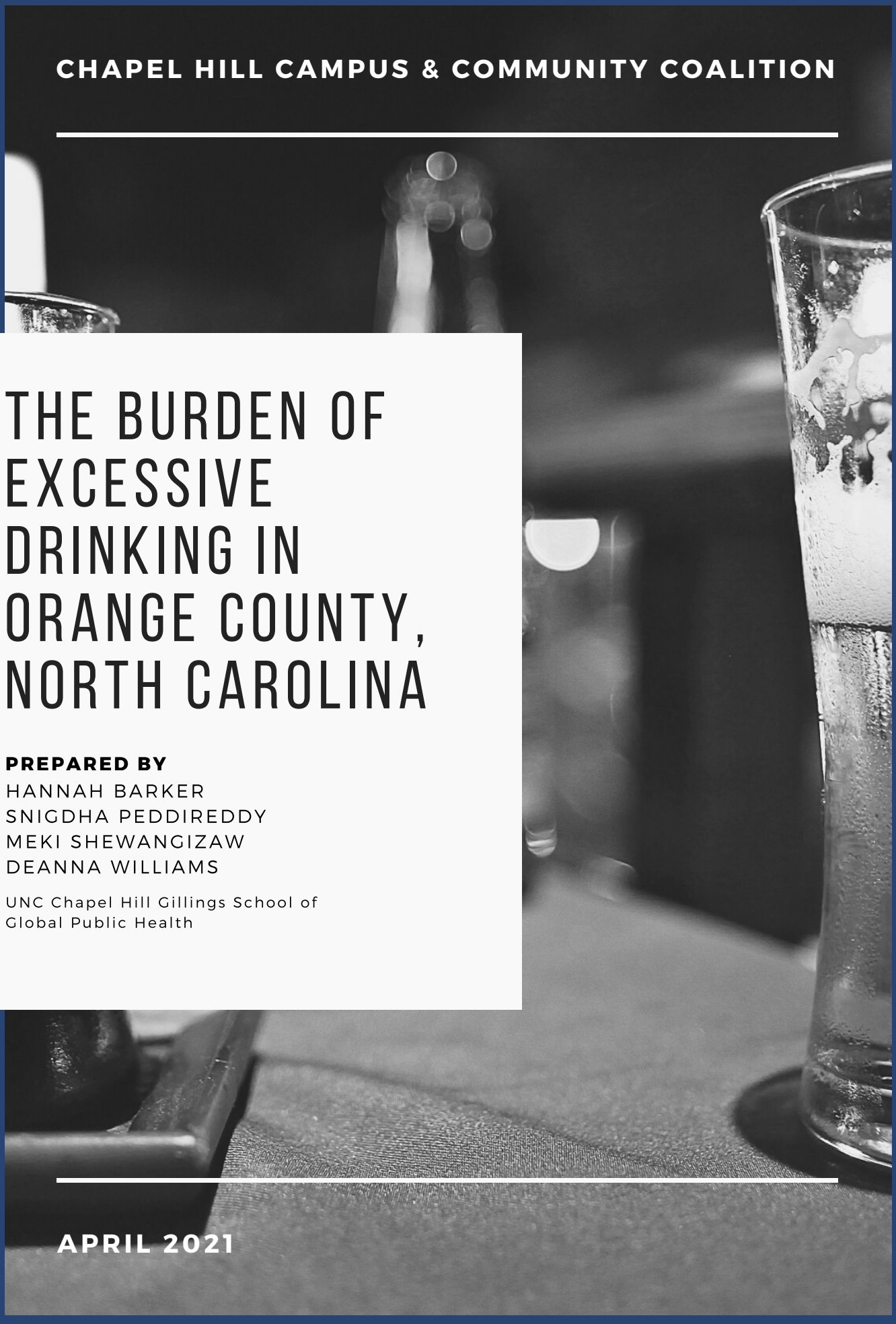
CHAPEL HILL CAMPUS & COMMUNITY COALITION



THE BURDEN OF EXCESSIVE DRINKING IN ORANGE COUNTY, NORTH CAROLINA

PREPARED BY

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LETTER FROM THE DIRECTOR

This was the most ambitious research project that the CCC has undertaken to date, and I want to express my overwhelming gratitude for the immense amount of work contributed by the student team—Hannah Barker, Snigdha Peddireddy, Meki Shewangizaw, and Deanna Williams—by their faculty advisor, Dr. Pamela Trangenstein, and by the team at UNC's Gillings School of Global Public Health who offer this Capstone program as an incredible benefit to community organizations like ours. This project was a huge undertaking, and it's going to require some effort to take it all in—I encourage you to stick with it.

I hope as you read the students' work, you weigh the data they present against all the assumptions we bring about alcohol's role in our society. This study challenges us to envision an Orange County in which alcohol is not a leading cause of death in our community. As you take in the data, imagine what it would look like if we did not lose millions of dollars a year in productivity costs because of alcohol.

Imagine that world and know that the CCC is working to create it. As you know, our strategies are based on research and promising practices from across the country and are designed to prevent the types of harms our study revealed. By continuing to lean into this hard work, we can prevent some of the harms and costs the study uncovered.

It is also our hope that other groups across the county can use this study to advance their conversations about behavioral health, the justice system, or health disparities. These are avoidable harms and avoidable costs, but there is good news: the solutions have been researched and are there for us to use. We are working on a lot of them and can also do more. We just need to continue finding the collective will to make change happen for our community. Remember, as our vision states, we envision a community–University, Downtown district, and neighborhoods–that can thrive socially and economically while promoting health and wellbeing for all.

Go team,

Elinor Landess

EXECUTIVE SUMMARY

PROJECT AIMS

Harms attributable to excessive drinking (e.g., injuries, illness, deaths, crimes) impact not only the drinker but the wider community. We conducted a cost-of-illness analysis to **explore the harms and costs attributable to excessive drinking in Orange County, North Carolina in 2017**. We also determined who shoulders the majority of these costs.

HOW MANY HARMS WERE ATTRIBUTABLE TO EXCESSIVE DRINKING IN 2017?

234 emergency room visits

38 deaths*

237 hospitalizations

1,360 crimes

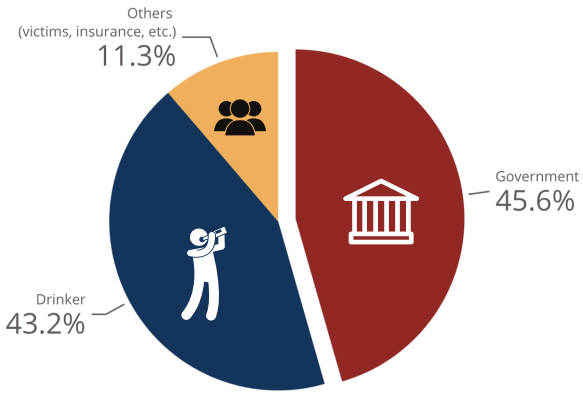
504 motor vehicle crashes

793 admissions for alcohol use disorder treatment

***Excessive drinking is a leading cause of death in Orange County.**

EXCESSIVE DRINKING COST ORANGE COUNTY $111.8 MILLION IN 2017

WHO PAYS MORE?



IMPLICATIONS

Our findings demonstrate a **significant and preventable economic impact related to excessive drinking** in Orange County. **Implementation of evidence-based prevention strategies and policies** could reduce the negative impacts of excessive drinking and consequently the costs of excessive drinking.

BACKGROUND



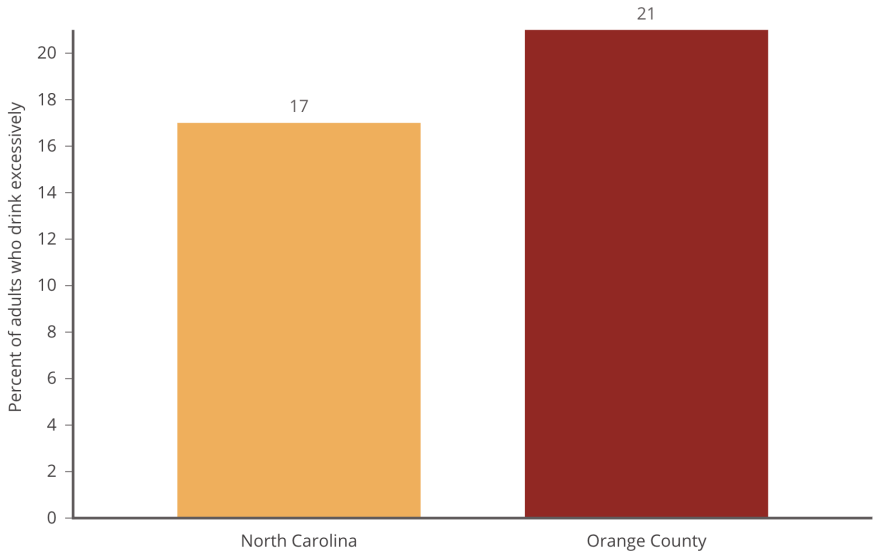
ALCOHOL CONSUMPTION AND RELATED HARMS IN ORANGE COUNTY

In 2016, 21% of adults in Orange County drank excessively, compared to 17% in North Carolina overall (RWJF, 2019). Drinking among high school students is also of concern: in 2015, 32% of high school students in Orange County reported drinking in the last 30 days (Orange County Health Department, 2015). These data indicate that excessive alcohol use is prevalent in Orange County across age groups. The North Carolina Department of Health and Human Services estimated that alcohol was linked to 29 fatal road traffic crashes, 26 suicides, and 37 total deaths in Orange County per year between 2015-2019 (NCDHHS). However, these estimates were not calculated using local data. **At the local level, there is a lack of comprehensive data on the consequences of excessive alcohol consumption, which limits the actions that decision-makers can take to prevent harms attributable to excessive drinking.**

DEFINING EXCESSIVE DRINKING

Excessive alcohol use, as defined by the Centers for Disease Control and Prevention, **includes binge drinking, heavy drinking, and any alcohol use by pregnant women or anyone younger than 21 years of age**. Binge drinking is defined as when a man drinks 5 or more drinks or when a woman drinks 4 or more drinks within a two-hour window. Heavy drinking involves consuming 15 or more drinks per week for a man or 8 or more drinks per week for a woman (Centers for Disease Control and Prevention, 2020).

Prevalence of excessive drinking in North Carolina compared to Orange County

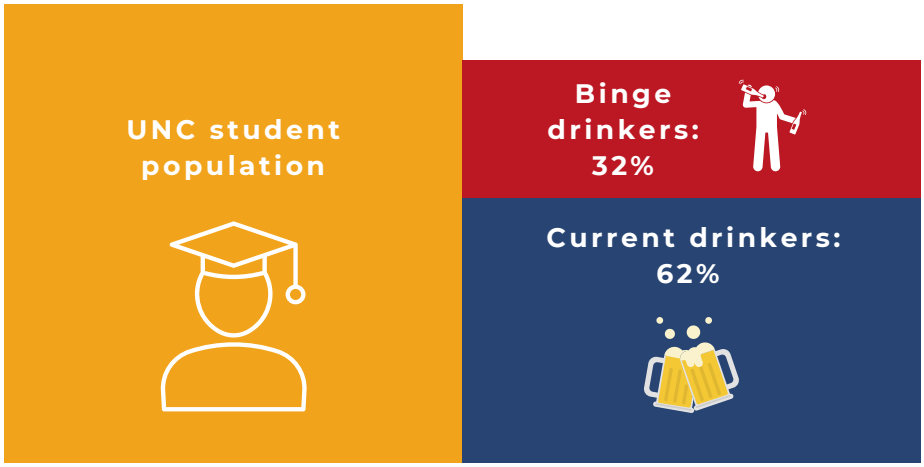


DRINKING BEHAVIORS AMONG UNC CHAPEL HILL STUDENTS

High-risk drinking among college students can affect the health and wellbeing of students, their peers, faculty, and community members. Students who attend college are more likely to excessively drink and experience alcohol intoxication compared to their peers who do not attend college. A 2017 national survey found that 35% of college students reported being drunk in the past month (compared to 29.9% of non-college peers), and 32.9% participated in excessive drinking in the past two weeks (compared to 28.1% of their non-college peers) (Schulenberg et al., 2017).

Students who participate in excessive drinking experience a variety of negative consequences including illness and death from unintentional injuries, traffic-related deaths and injuries, physical or sexual assault, disrupted studying, and impaired sleep (Hingson, Zha & Weitzman, 2009; Nelson et al., 2009; Perkins, 2002; Rhodes et al., 2006). Alcohol use among UNC students is similar to national statistics. **In 2017, about 62% of UNC students reported drinking alcohol in the past 30 days and about 32% participated in binge drinking in the past two weeks** (NCHA, 2017).

Excessive drinking can affect a student's academic performance. In 2018, 47% of UNC students reported having a poor performance on a project or test due to alcohol or substance use (Core Institute, 2018).



Nationally, students who binge drink spend less time on school work and are more likely to drop out of college (White & Hingson, 2013). There is also a negative correlation between the number of blackouts a student experiences and their grade point average (GPA) (White & Hingson, 2013).

Drinking can negatively impact people other than the drinker, often referred to as secondary effects or alcohol-related harm to others, which can range from minor nuisances to serious violations. For college students, this includes having to take care of another student who is drunk; having their studies or sleep interrupted; getting into arguments; being hit, pushed or assaulted; and experiencing unwanted sexual contact (Kapner, 2008).

47% OF UNC STUDENTS REPORTED POOR PERFORMANCE ON A PROJECT OR TEST DUE TO ALCOHOL OR SUBSTANCE USE

Alcohol plays a significant role in sexual assault on college campuses. UNC was one of the 33 universities that participated in the Association of American Universities' 2019 survey focused on sexual assault and misconduct. The survey found that a significant proportion of victims (65% of women, 63.3% of men, 48.1% of transgender, genderqueer, nonbinary or otherwise gender nonconforming or TGQN persons) who experienced unwanted sexual penetration reported that the offender drank alcohol before the incident (Cantor et al., 2019). These percentages increase for victims of unwanted sexual touching (66.7% of women, 68.3% of men, and 63% of TGQN) (Cantor et al., 2019).

Alcohol-related harms to others extend to community members who live close to UNC campus. Two neighborhoods in particular, Cameron-McCauley Historic District and the Northside Historic District, are within walking distance to the campus and have had a negative history with excessive student drinking. Residents have listed vandalism, property damage, urination, vomiting, noise disturbances, and public drunkenness among related consequences. In addition, residents expressed concerns about the negative effects of their children witnessing UNC students drink (CCC, 2019). Members of the community also cited negative experiences when addressing students directly with alcohol-related issues. **One Northside resident called the police anonymously for a alcohol-related noise disturbance because they feared students would retaliate against them: "When we call the cops for noise disturbances…we always call anonymously, because we fear retribution from the students."**



ALCOHOL POLICY LANDSCAPE IN ORANGE COUNTY

Alcohol policy change is an effective tool in reducing the negative impacts of high-risk drinking among UNC students and residents in the surrounding areas. **There are strategies that have been proven to reduce excessive drinking among college students, including limiting the availability and affordability of alcohol, limiting the marketing of alcoholic beverages, enforcing alcohol law and policies, and promoting alcohol-free events** (The Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention, 2002). UNC's Alcohol Policy encourages healthy and responsible behavior through education, prevention, intervention, accountability, and recovery (UNC, 2016). Prevention policies in place include banning the promotion of alcoholic beverages on campus. The Town of Chapel Hill also bans serving alcoholic beverages during town-sponsored events unless approved by the council (Town of Chapel Hill, 2021).

ROLE OF THE CHAPEL HILL CAMPUS & COMMUNITY COALITION

The CCC was formed in 2013 with the purpose of reducing the negative impacts of high-risk drinking. It represents members from the Town of Chapel Hill, UNC-Chapel Hill, the Orange County Health Department, and the Orange County ABC Board in a collaborative effort to address the complexity of high-risk drinking in the Orange County area. **The CCC aims to reduce alcohol-related harms through the utilization of shared power, data-driven strategies, and collaborative partnerships.**

Data from 2019-20 shows binge drinking is on the rise among UNC students, along with increased at-home partying with parental supervision among high school-aged students in Chapel Hill (NCHA, 2013-2020; CHCCS YRBS, 2013-2019). To bolster support for evidence-based alcohol policies, the CCC has continuously invested in research and projects dedicated to assessing the local alcohol landscape and avenues for increased safety and education. These efforts have emerged from robust participation and investment in CCC activities involving stakeholders ranging from local business owners to UNC administrative offices to local law enforcement officials. Some of the CCC's previous efforts include the UNC Social Norms Campaign, B the Bee, promoting positive alcohol-related choices; development of the CCC Alcohol Resource Guide offering best practices for alcohol-related businesses; and the Town of Chapel Hill Party Registration for UNC students living off campus ("Chapel Hill Campus & Community Coalition," n.d.). More substantial efforts include CHPD revising its compliance check policy to match national best practice and UNC revising its campus alcohol policy in 2016 for the first time since 1997 to approach alcohol issues on campus using a public health rather than solely legal approach.

GOALS AND BENEFITS OF COST-OF-ILLNESS ANALYSES

Without a complete picture of the burden of excessive alcohol use from relevant, comprehensive, and precise local data, it is difficult to make data-driven decisions about how to most appropriately mitigate alcohol-attributable harms. **We can apply cost-of-illness analysis methods to alcohol data to provide a standardized way to collect and analyze alcohol-attributable harms and cost data** (Bouchery et al. 2013; Sacks et al. 2015).

The benefits of cost-of-illness analyses, specifically in the context of excessive alcohol use, include putting an objective price tag on alcohol's harms that can be compared to costs resulting from other risk behaviors (e.g., tobacco use, consumption of sugar-sweetened beverages) if those estimates exist. This will allow decision-makers to prioritize the issues that warrant action, given funding and other resource constraints.

Importantly, this type of analysis can help the CCC garner more support for its goals in Chapel Hill. Results will also highlight which community stakeholders bear the brunt of alcohol-attributable harms, necessitating their engagement in CCC activities.

PREVIOUS WORK

We based the present Orange County analysis on methods outlined by previous studies. In 2013, The Lewin Group, contracted by the Centers for Disease Control and Prevention, released a report that followed Public Health Service guidelines for cost-of-illness analyses (Hodgson and Meiners, 1982) to detail the costs of excessive alcohol consumption at the national level (Bouchery et al., 2013). Other researchers then updated these estimates and modeled costs by state (Sacks et al. 2015; Sacks et al., 2013). More recently, researchers based at UNC Chapel Hill looked at costs at more local levels - North Carolina (Gora Combs et al., 2021) and Baltimore, Maryland (Trangenstein and Jernigan, 2020).

PROJECT AIMS

OUR GOAL IS TO CALCULATE THE HARMS AND COSTS ATTRITUBATLE TO EXCESSIVE DRINKING IN ORANGE COUNTY IN 2017.

The goal of the present project, a cost-of-illness analysis, is to **calculate the harms and costs attributable to excessive alcohol consumption in 2017.** We sorted the estimated costs into five different categories — costs paid by the drinker, persons other than the drinker, private and other insurance, government, and any others. Allocating costs allows CCC to **identify which groups bear the heaviest burden of each alcohol-attributable cost**. This project aligns with the 2020 CCC Action Plan by building support for key policy proposals (e.g., establishing a social host ordinance and maintaining limits on when and where alcohol is served on campus and in the surrounding community).

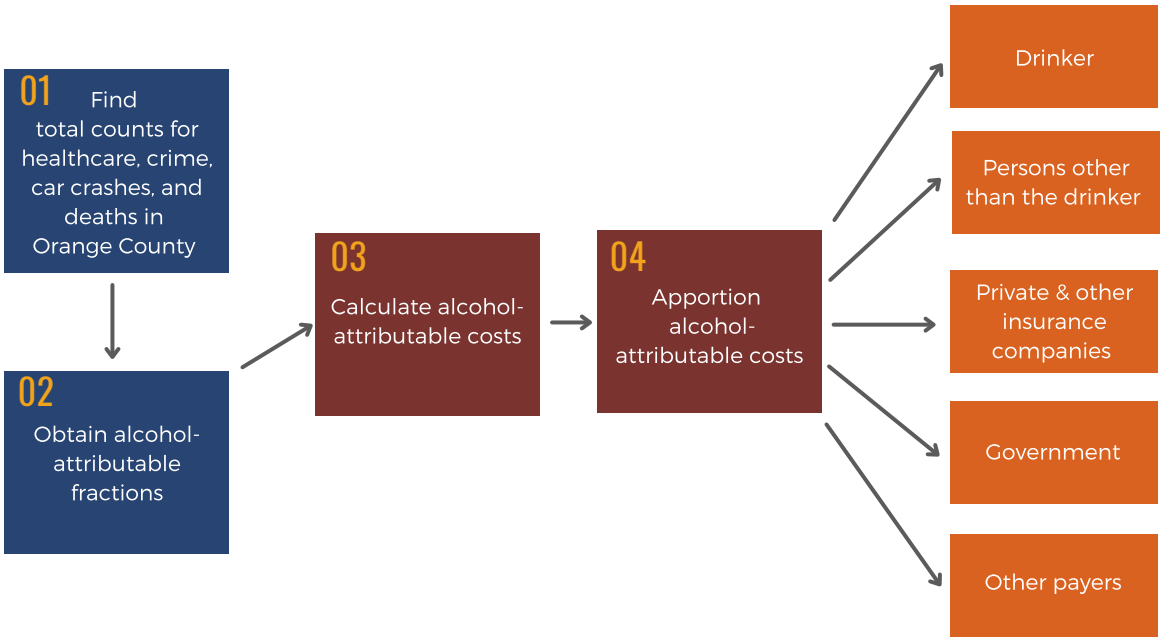
The impact of this study is intended to reach beyond the CCC to **draw attention to important alcohol-attributable issues in the county and offer evidence to support public health initiatives focused on reducing the negative impacts of excessive drinking**. Results of this analysis will help contextualize CCC's mission and further refine the Action Plan and strategic goals over the next decade and beyond.

HOW DID WE DO IT?

OVERVIEW

To begin, we gathered local data from multiple sources and placed them in four categories: healthcare, crime, car crashes, and deaths. We used alcohol-attributable fractions (detailed in the "Calculating Alcohol-Attributable Outcomes and Costs" section) to see how many outcomes in each category were attributable to excessive drinking. Next, we calculated the costs of these harms by multiplying alcohol-attributable counts by the average cost associated with individual harms.

In cases where we were unable to find counts or average costs, we scaled down costs from national- or state-level data. We then added individual cost components together to generate the total cost of excessive drinking in Orange County. Lastly, using methods outlined by the previous studies mentioned above, we apportioned these costs into five categories: costs paid by 1) the drinker, 2) persons other than the drinker, 3) private and other insurance, 4) government and 5) other payers (e.g., third-party payers).



DATA SOURCES

We utilized numerous local data sources to identify the following counts in Orange County in 2017:



We obtained healthcare, productivity, and other cost data from local data sources or scaled the costs using findings from national- and state-level analyses (Bouchery et al., 2013; Gora Combs et al., 2021). Table 1 provides information on each type of data, where we obtained the data, and rationales for including each component in the analysis.

CALCULATING ALCOHOL-ATTRIBUTABLE OUTCOMES AND COSTS

We used alcohol-attributable fractions (AAFs) estimated by the CDC to calculate the number of alcohol-attributable outcomes in each of our data sources. **An AAF describes the proportion of a certain health outcome that is attributable to excessive drinking.**

EXAMPLES OF AAFs



The AAF for alcohol use disorder is 100% because it is caused entirely by excessive drinking.

A less obvious example of AAFs can be applied to fall deaths. The CDC estimates that 32% of fall deaths are due to excessive drinking (CDC, 2019).

To apply AAFs in a cost analysis, **we first tabulated the total health outcome of interest and then multiplied this number by its AAF to find how many counts are attributable to excessive drinking**. Using falls as an example, if there were three reported fall deaths in 2017, we would multiply this number by its AAF (32%) to conclude that approximately one of the three fall deaths were attributable to excessive drinking.

APPLYING AAFs

Example: Fall Deaths



Total Fall Deaths | **AAF for Fall Deaths** | **Alcohol-Attributable Fall Deaths**

We multiplied these alcohol-attributable harms by average cost to calculate alcohol-attributable costs, which were sorted into three categories: healthcare costs, labor and productivity losses, and other costs to society.

In cases where we were unable to find average costs at the local level, we scaled down national- or state-level costs using the population of Orange County in 2017. **As a last step, we allocated costs to the drinker, persons other than the drinker, private insurance, the government, and other payers.** We based this step on methods outlined by previous cost analyses.

As one example, hospitalization costs were allocated based on 2017 National Health Expenditure data. In 2017, Medicare and Medicaid (i.e., the government) paid 44.5% of hospitalization costs, private insurance paid 36.1%, out-of-pocket payers (i.e., drinkers) paid 3.0%, and others paid 16.4%. We multiplied our total hospitalization cost by each of these percentages to determine which payer paid how much at the Orange County level. This distribution allows us to determine who is most burdened by alcohol-attributable costs.

APPORTIONING COSTS

Example: Cost of Alcohol-Attributable Hospitalizations*

*Multipliers obtained from 2017 National Health Expenditure Assessment data.

Total: $2.9 million

x44.5% x36.1% x3.0% x16.4%

Government: $1.3 million

Private insurance: $1.0 million

Drinkers: $0.09 million

Others: $0.5 million

DIGGING DEEPER: POPULATION-ATTRIBUTABLE FRACTIONS

Population-attributable fractions (PAFs) are the proportion of diseases, injuries, and deaths that would not occur without the presence of a certain risk factor (WHO). In our case, the population-attributable fractions (or alcohol-attributable fractions) represent the harms that would not occur without excessive drinking. Quantifying these harms is important for prevention and intervention policies, so we can highlight the public health impact of excessive drinking on the community as a whole (WHO).

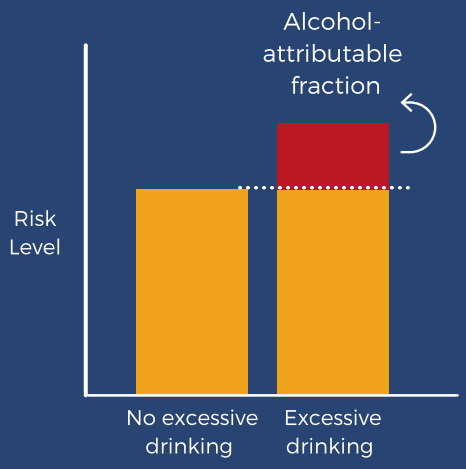


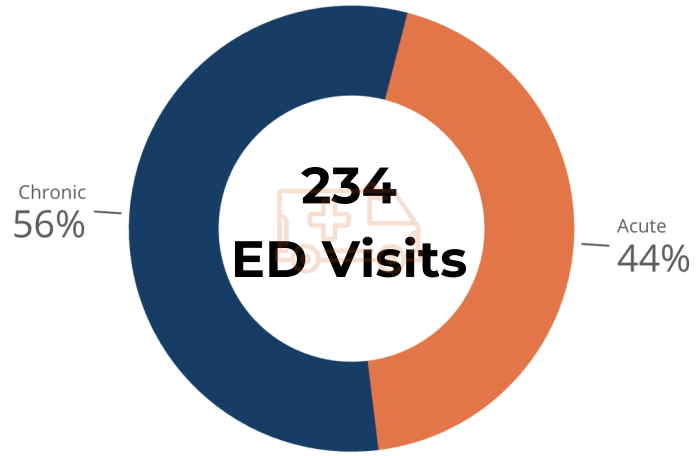
Table 1. Important data sources and rationale for including each component

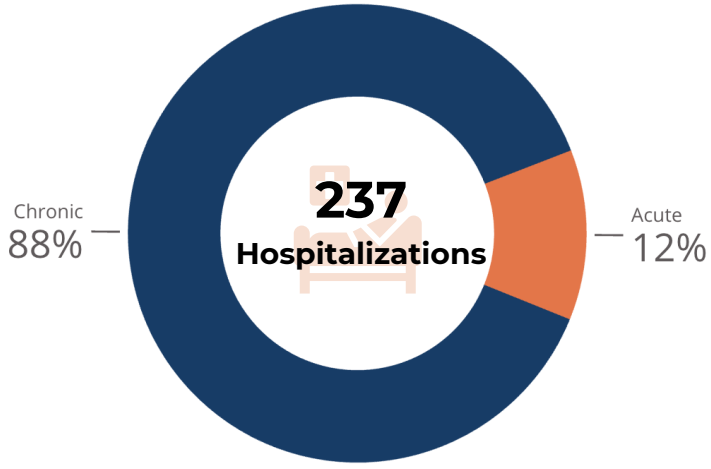
Data type	Data source	How we used the data	Rationale
Emergency department visits and in-patient hospitalizations	Healthcare Cost and Utilization Project (HCUP)	Determined the number of patients who visited the emergency department or were hospitalized due to alcohol-attributable causes	Excessive drinking can lead to acute (e.g., injuries) and chronic health effects (e.g., cancer, heart disease) that require hospital visits (WHO, 2018).
Emergency Medical Service transports	Orange County EMS	Estimated the number of EMS transports attributable to excessive drinking	
Deaths	NC State Center for Health Statistics	Estimated the number of deaths that were attributable to excessive alcohol consumption	Excessive drinking is responsible for about 8 deaths each day in North Carolina (CDC, 2019).
Crimes	Chapel Hill PD, UNC PD, Hillsborough PD, Carrboro PD, Orange County Sheriff's Office	Estimated the number of crimes attributable to excessive alcohol consumption	Excessive drinking is linked to violent, property, and other types of crime. (WHO, 2018)
Incarcerations	North Carolina Department of Public Safety	Estimated how many people were incarcerated due to crimes attributable to excessive drinking and the average length of stay per crime	
Alcohol use treatment visits	Freedom House Recovery Center	Identified the number of admissions and average cost of alcohol treatment	14.1 million adults above the age of 18 had an Alcohol Use Disorder in 2019 (National Institute on Alcohol Abuse and Alcoholism, 2020)
Motor vehicle crashes	Highway Safety Research Center	Estimated the number of fatal and nonfatal car crashes that were attributable to excessive drinking	Excessive drinking can increase the risk of motor vehicle crashes (WHO,2018)

WHAT DID WE FIND?

EMERGENCY DEPARTMENT VISITS AND HOSPITALIZATIONS

In 2017, there were 6,214 **emergency department (ED) visits** in Orange County for alcohol-related conditions. Of these visits, we estimated that **234 (3.8%) were attributable to excessive drinking** – 130 were due to chronic conditions, and 104 were due to acute conditions. That same year, there were 4,129 **hospitalizations** for alcohol-related conditions, and we calculated that **237 (5.7%) of these were caused by excessive drinking**. Of those 237 hospitalizations, 208 were due to chronic conditions, and 29 were due to acute conditions.



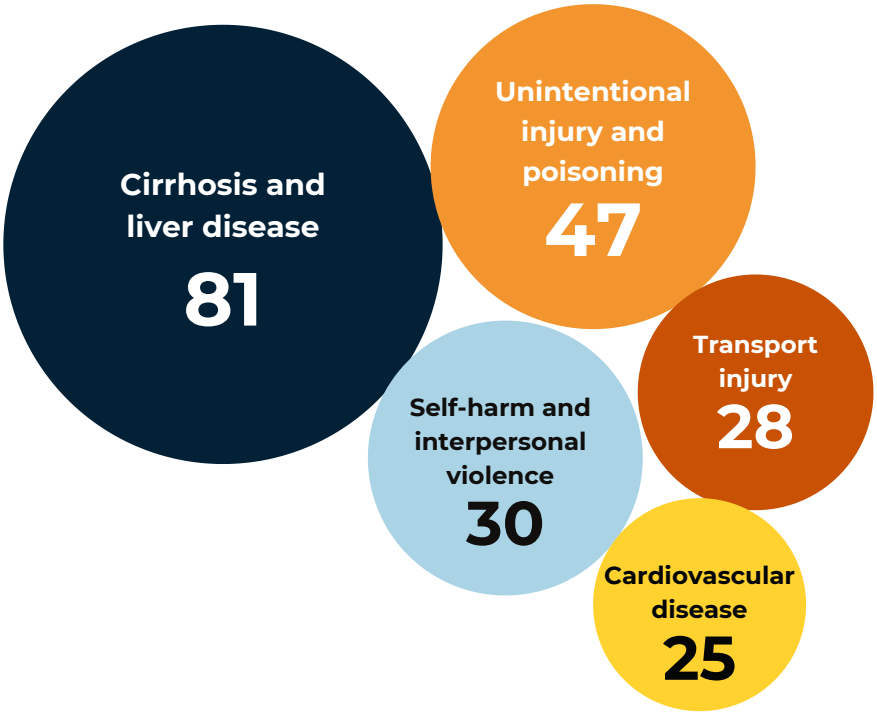


Most of the alcohol-attributable emergency department and hospitalization visits involved alcoholic liver disease or liver cirrhosis. Other leading emergency department visits attributable to excessive drinking included acute outcomes such as unintentional injuries, poisoning, self-harm and interpersonal violence, and motor vehicle crashes. Unintentional injuries included falls and occupational and machine injuries. Several emergency department visits also included cardiovascular diseases, such as hypertension and stroke.

Hospitalizations caused by excessive drinking primarily involved chronic conditions, such as digestive system and cardiovascular diseases. Unintentional injuries and poisonings were also leading causes of alcohol-attributable hospitalizations.

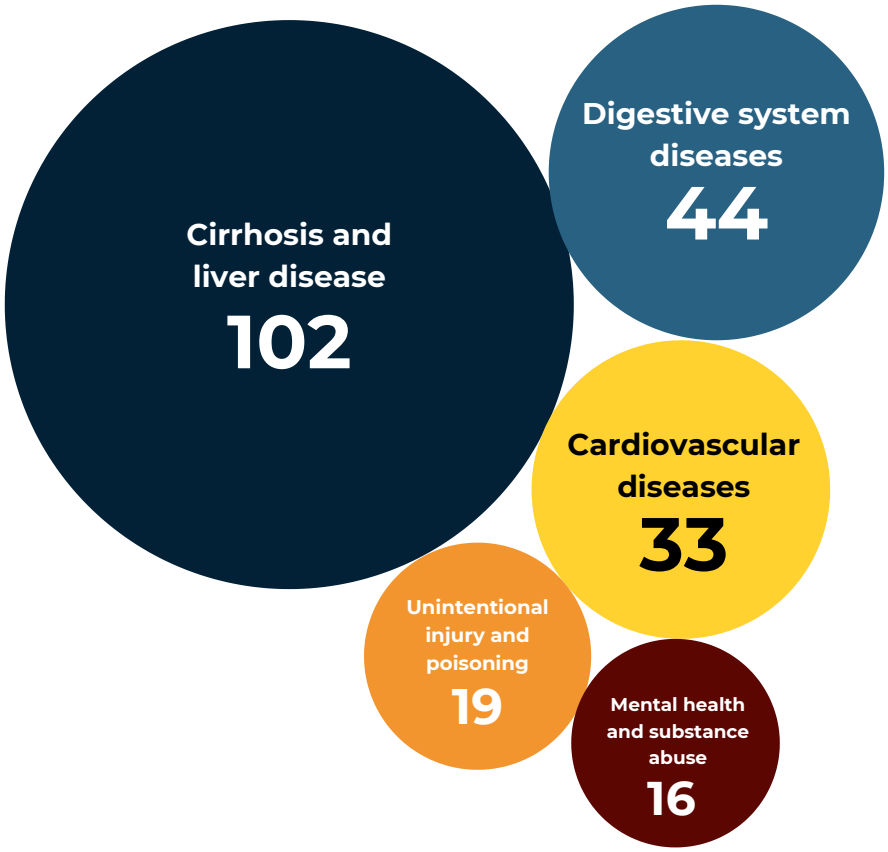
Specific alcohol-attributable ED visits and hospitalization diagnoses included in this study are available in the appendix.

Alcohol-Attributable ED Visit Diagnoses*



*We excluded diagnoses with fewer than 16 people from this figure due to HCUP Data Use Agreement restrictions.

Alcohol-Attributable Hospitalization Diagnoses*

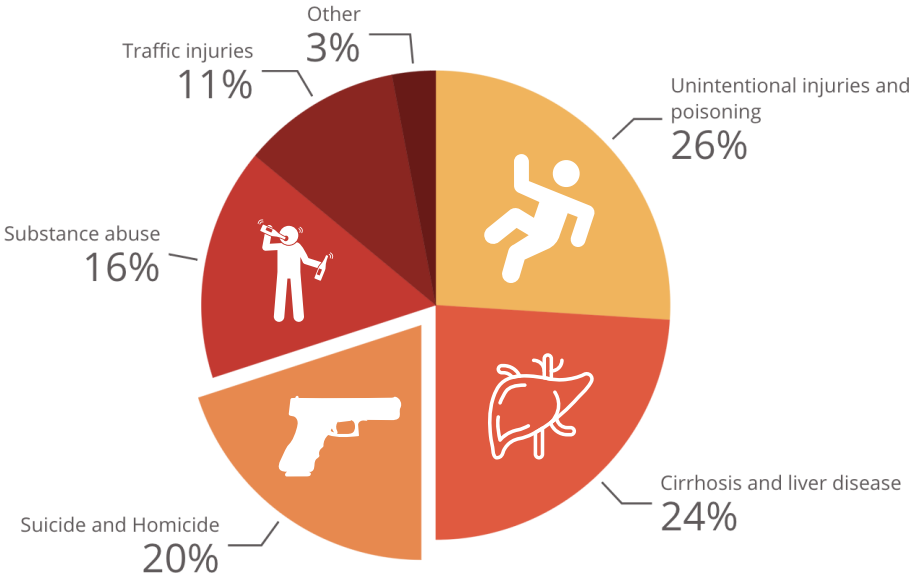


*We excluded diagnoses with fewer than 16 people from this figure due to HCUP Data Use Agreement restrictions.

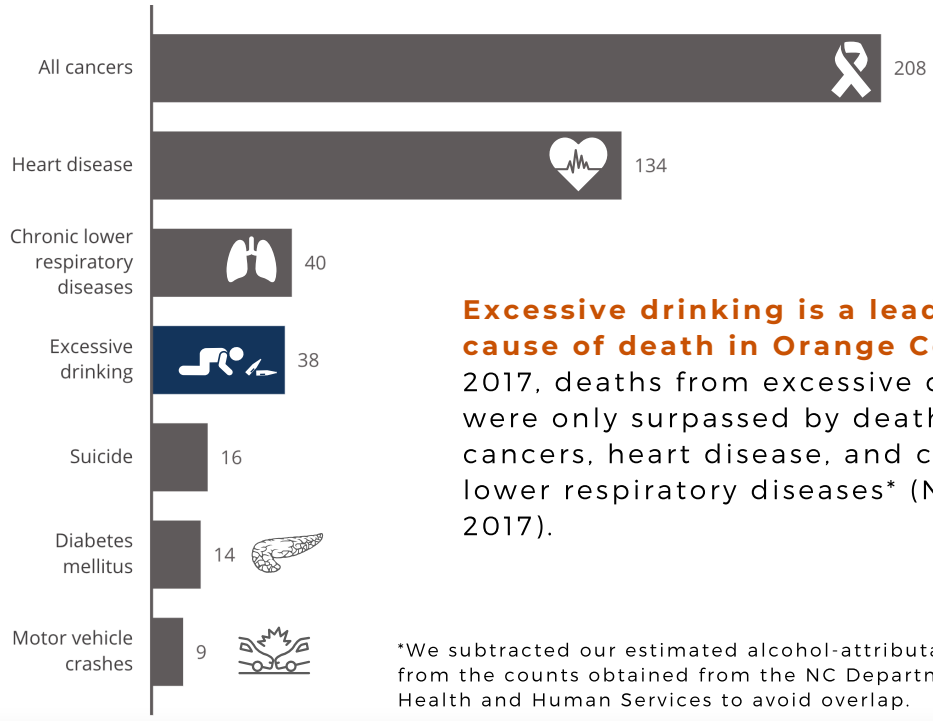
DEATHS

In 2017, of the 239 total deaths in Orange County among people older than 15, **38 (15.9%) were attributable to excessive alcohol consumption**. The largest proportion of these deaths (25.7%) involved unintentional injuries, such as falls, poisoning not due to alcohol, and drowning. These deaths were followed closely by deaths due to liver cirrhosis and alcoholic liver disease (24.5%) and suicide and homicide (19.9%). A smaller portion of deaths was attributable to alcohol abuse and alcohol use disorder (15.7%) and traffic injuries (10.8%). Notably, additional calculations indicated that 7 of the 38 alcohol-attributable deaths were people other than the drinker.

Alcohol-Attributable Deaths



Importantly, deaths due to suicide and homicide disproportionately affect young people. This could mean that Orange County is losing people to entirely preventable causes at an age when they would make the most positive economic impact in their community.

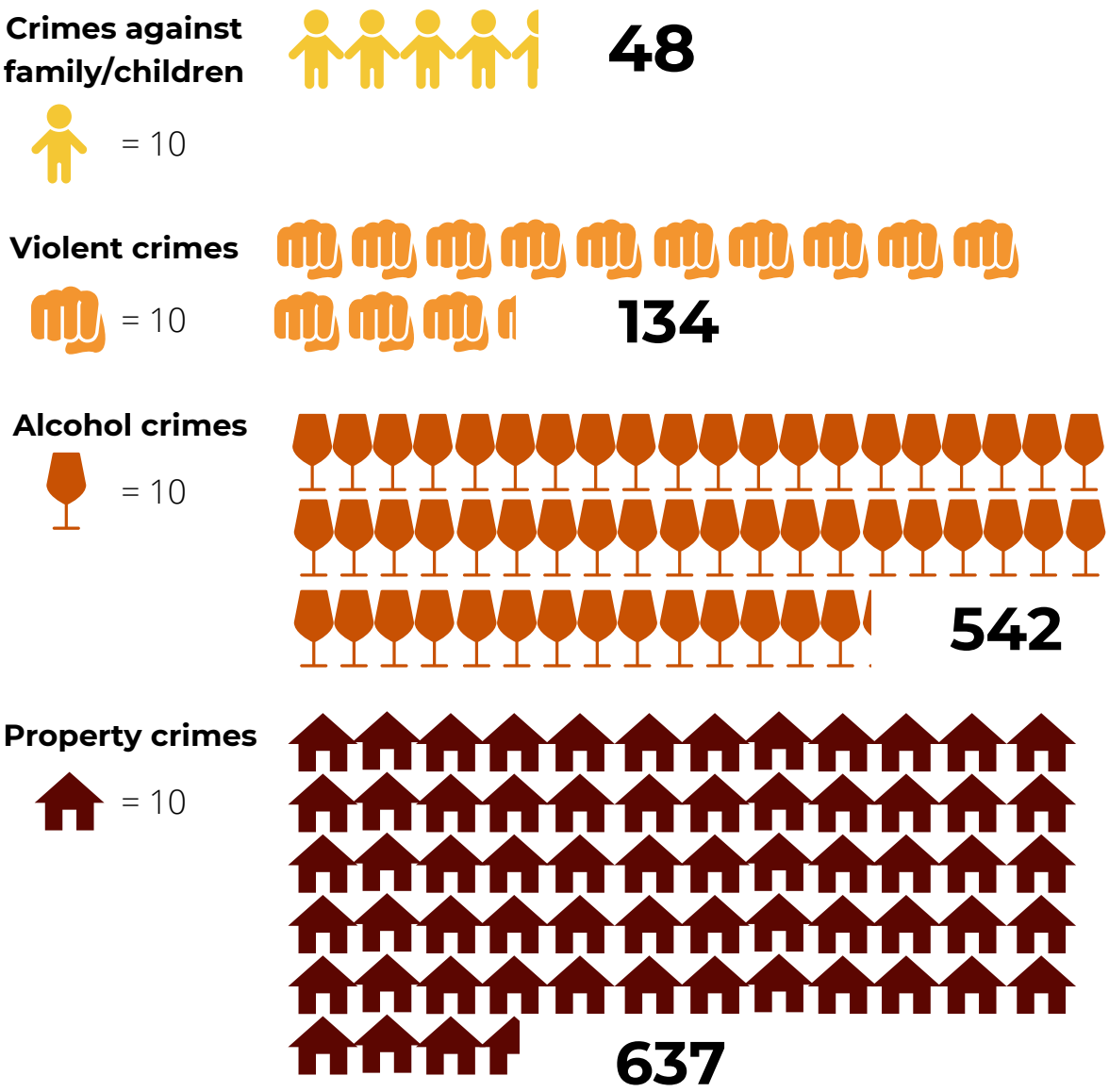


Excessive drinking is a leading cause of death in Orange County. In 2017, deaths from excessive drinking were only surpassed by deaths due to cancers, heart disease, and chronic lower respiratory diseases* (NCDHHS, 2017).

*We subtracted our estimated alcohol-attributable deaths from the counts obtained from the NC Department of Health and Human Services to avoid overlap.

CRIMES

In 2017, there were 1,360 total alcohol-attributable crimes committed in Orange County. The largest category of alcohol-attributable crimes comprised property crimes, such as burglary, larceny, and vandalism, for a total of 636 crimes (46.8%). There were 542 alcohol crimes (39.9%), including driving under the influence. There were approximately 134 alcohol-attributable violent crimes (9.9%), including homicide, forcible rape, and aggravated assault. Lastly, we estimated 48 crimes against family/children (3.5%), including child maltreatment.



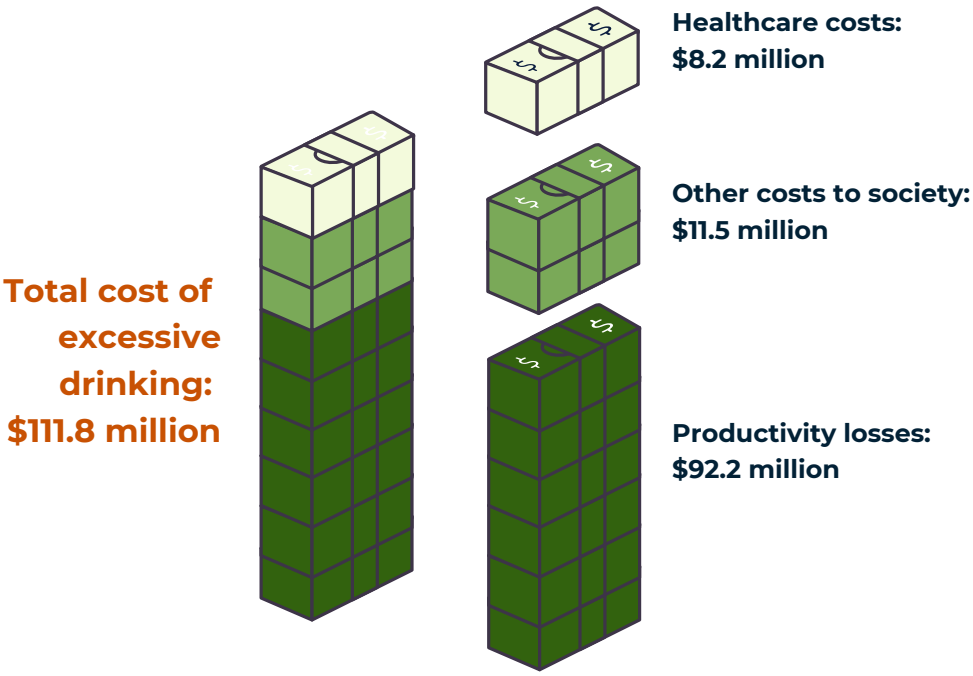
MOTOR VEHICLE CRASHES

There were 504 alcohol-attributable motor vehicle crashes in Orange County in 2017, with approximately 94 (18.7%) of them resulting in minor to critical injury. We estimated that 4 crashes (0.8%) were fatal.

COSTS

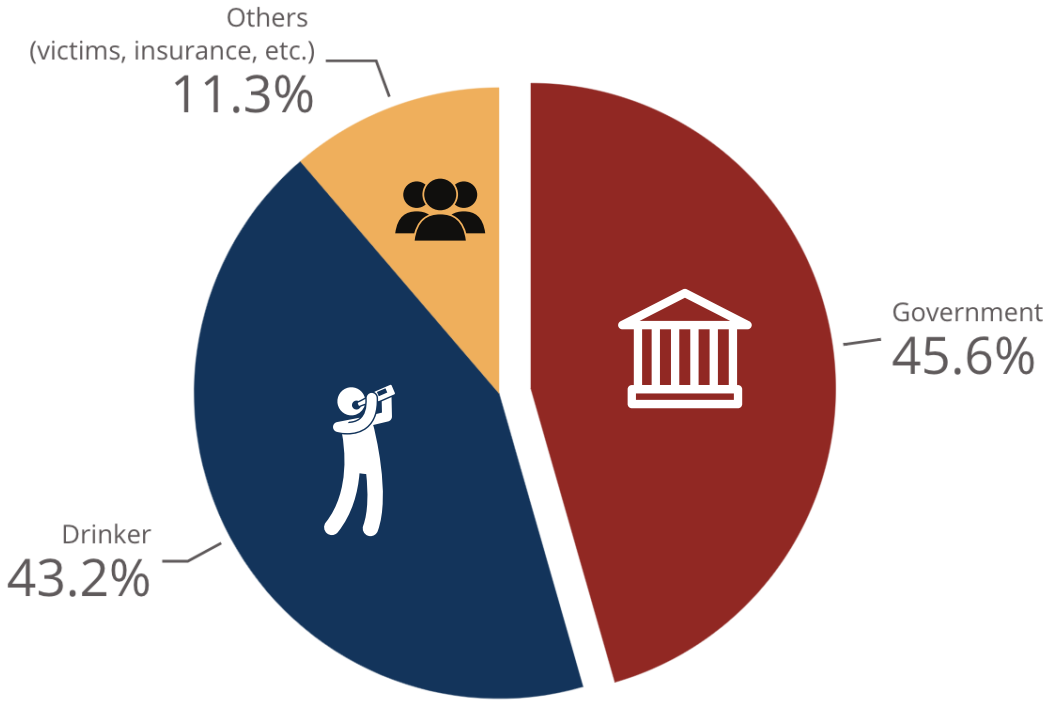
Excessive drinking in Orange County cost a total of $111.8 million in 2017. The highest proportion of these costs ($92.2 million, or 82.4% of the total costs) involved productivity losses related to excessive drinking and its harms. These losses involve those related to impaired productivity at work and while in the hospital or receiving treatment, absenteeism, premature death, and incarceration for alcohol-attributable crimes. Costs related to people not working or not working as efficiently due to alcohol consumption substantially impact businesses that rely on the labor of Orange County residents.

Other costs to society like correctional costs and costs related to motor vehicle crashes amounted to $11.5 million. Healthcare costs, including costs related to alcohol-attributable emergency department visits and hospitalizations, alcohol use disorder treatment, and others, were $8.2 million. A more detailed breakdown of these costs can be found in the appendix. Of note, these findings are preliminary and individual cost components are subject to change with future analyses.



WHO PAYS MORE FOR EXCESSIVE DRINKING?

In total, the government paid more for excessive drinking - $50.9 million, or 45.6% of the total costs - than any other payer. Drinkers themselves paid $48.3 million (43.2%) and other payers, including victims, private insurance companies, and others, shouldered $12.6 million (11.3%). We can conclude that a majority of the costs of excessive drinking are borne by payers other than the drinker.





WHAT ARE THE IMPLICATIONS FOR THE CCC AND ORANGE COUNTY?

KEY TAKEAWAYS

Excessive drinking in Orange County contributes to economic, health, criminal justice, and social consequences. Economically, one of the most significant findings of this study is the overall substantial cost of excessive alcohol use in 2017. Total costs amounted to approximately **$111.8 million**, and the majority **(56.8%)** of the costs were paid by entities other than the drinker, including the government, victims of alcohol-attributable crimes, and other payers. The cost burden is borne by the government, and consequently, by taxpayers.

Other standout results include the **high prevalence of alcohol-attributable property crimes, chronic illnesses, and unintentional injuries.** These results demonstrate that excessive drinking has detrimental effects in many areas, not just obvious ones like car crashes, DUIs, or alcohol poisoning. When thinking about the consequences of excessive drinking, people often picture alcohol poisoning, injuries, and interpersonal violence as leading causes of hospitalizations. Chronic illnesses and their long-term impacts are important to keep in mind when considering potential harms attributable to excessive drinking.

Excessive drinking touches every aspect of society, from healthcare to productivity. The impact of excessive drinking affects all who live and spend time in Orange County through productivity losses, crime, injuries and illness, and increased spending on healthcare. All of these aspects are part of the narrative of harms attributable to excessive drinking in Orange County. These harms could be mitigated using evidence-based alcohol control policies, some of which are described later in this section. The implications of our findings are aligned with the CCC's guiding principles (detailed on the next page).

IMPLICATIONS FOR THE CCC

Our findings may help bring attention to the harms that excessive drinking can have and provide support for ongoing efforts to reduce alcohol harms by providing citable evidence. The most effective ways to prevent alcohol-attributable crimes, injuries, and illnesses are very different; therefore, we cannot rely on any one strategy to mitigate these harms. The diverse members of the CCC can utilize their unique roles and strengths to enact complementary yet effective prevention strategies that will begin to reduce or eliminate these harms. It can be easy to write off alcohol-related harm since alcohol is so embedded in our culture. However, this study demonstrates that **we must pay attention to the impact of alcohol on our community and take into account potential harms as we make policy decisions.**

The study lends credibility to the importance of the burden of excessive drinking in Orange County and the real, widespread implications of excessive drinking in terms of illness, injuries, deaths, crimes, and costs. Our methods and findings will provide a benchmark for future research and public health efforts to prevent the consequences of excessive drinking in Orange County. Finally, these findings may allow the CCC to engage additional stakeholders or deepen engagement with existing members, including healthcare providers and administrators, in efforts to reduce the burden of drinking. Productivity losses due to excessive drinking may also encourage stakeholders in the business community to engage in this work.

THE CCC'S GUIDING PRINCIPLES

- **Evidence-based, public health approach**
- **Active deterrence**
- **Focus on high-risk drinking**
- **Consistent accountability**
- **Cultural and environmental change**
- **Town/gown collaboration**
- **Fully informed community**
- **Centralized effort**

STRENGTHS AND LIMITATIONS

The study has a few notable limitations. To begin, we relied on AAFs, which are estimates. The CDC measures some AAFs through causes that are completely attributable to alcohol, like alcohol psychosis and alcoholic liver disease, and measures other AAFs using estimates from systematic reviews of the scientific literature.

Additionally, the AAFs we used for this study are specific to the state of North Carolina. Orange County is not necessarily representative of the state as a whole, so using North Carolina AAFs for our calculations may provide less accurate findings than if we had county-specific AAFs. If county-specific AAFs were available, we may expect some of our counts to be different, as the median socioeconomic status of Orange County residents is higher than that of residents statewide.

Interested in learning more about AAFs?

Click here for the Alcohol-Related Disease Impact (ARDI) methods:

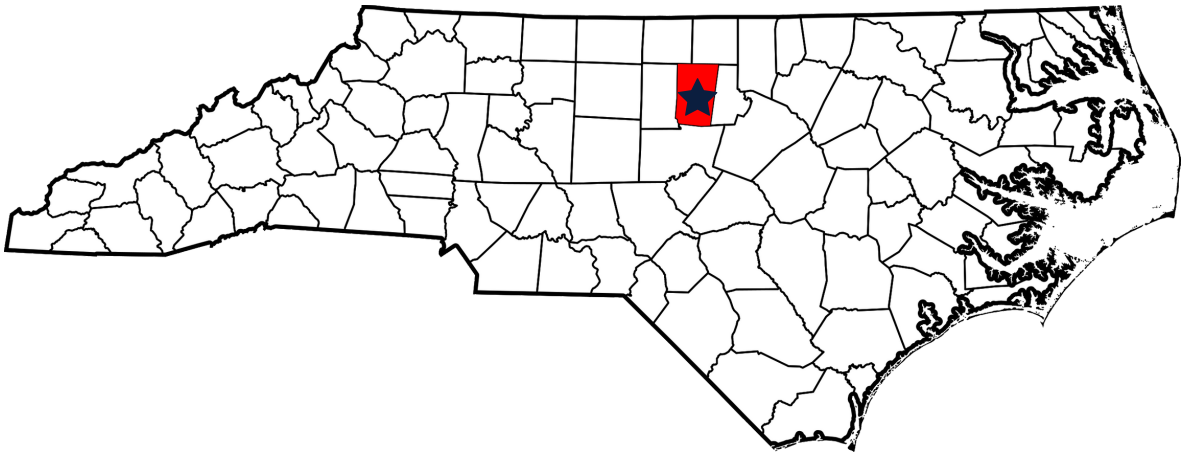
CDC

One last limitation of the study was the use of approximate costs by scaling down some cost components from the state level. Scaling data could affect the accuracy of those specific components, resulting in over- or under-estimates of costs. Wherever possible, the study erred on the side of conservative estimates. The total cost of excessive drinking for Orange County should be interpreted as an estimate as well.

These analyses do not account for intangible losses like pain and suffering related to excessive drinking and its harms. We must also consider these intangible losses when evaluating the impact of excessive drinking.

One of the strengths of this study design is the conservative nature of our estimates. **Our costs are conservative and most likely underestimate the burden of excessive drinking in Orange County.** In some instances, we did not include certain costs that were not available. For example, for alcohol use disorder treatment costs, we only had access to average out-of-pocket payments, not charges billed to Medicare, Medicaid, private insurance companies, or other payers. For incarceration calculations, analyses focused on those incarcerated in prisons and excluded those who were incarcerated in jails, thus not factoring in both the costs related to jailing and lost productivity while jailed. Incarceration-related costs also did not include costs paid to public prosecutors and defense attorneys.

Furthermore, our analysis utilized local-level data and integrated diverse data sources from several sectors. **Our methods used a consistent approach to standardize heterogeneous data sources based on previously-established processes that researchers have used at the national and local levels.**



Overall, the harms resulting from excessive drinking are preventable and can be mitigated. The efforts of the CCC, supported by the findings of this study, can reduce the negative impacts of excessive drinking in Orange County, North Carolina.

RECOMMENDATIONS

Our findings demonstrate a significant and preventable economic impact related to excessive drinking in Orange County. Implementation of evidence-based prevention strategies and policies could reduce the negative impacts of excessive drinking and consequently the costs of excessive drinking. The CCC has developed the 2020 CCC Action Plan, which includes a diverse set of strategies designed to reduce the health, social, and economic costs of excessive drinking in the community. These strategies are collaborative, evidence-based, and high-risk focused, and hope to change the landscape of alcohol harms over the course of three years and beyond. The plan focuses on changing conditions in the environment to promote a healthier culture overall.

The following evidence-based strategies to reduce alcohol use and related harms in collegiate communities, along with many others, are named in the Action Plan:

ADDITIONAL RESOURCES

To identify effective alcohol interventions for higher education settings, see NIAAA's College Alcohol Intervention Matrix, CollegeAIM.

For broader resources, see the U.S. DHHS Healthy People 2030 webpage on Drug and Alcohol Use Evidence-Based Resources.

- **Enhance visible enforcement of alcohol-related laws**
- **Begin collecting Place of Last Drink data for alcohol-related law enforcement responses in the Town of Chapel Hill**
- **Maintain limits on alcohol use at specific places/events**
- **Adopt a social host ordinance in the Town of Chapel Hill**
- **Commit to maintaining alcohol marketing bans on campus**

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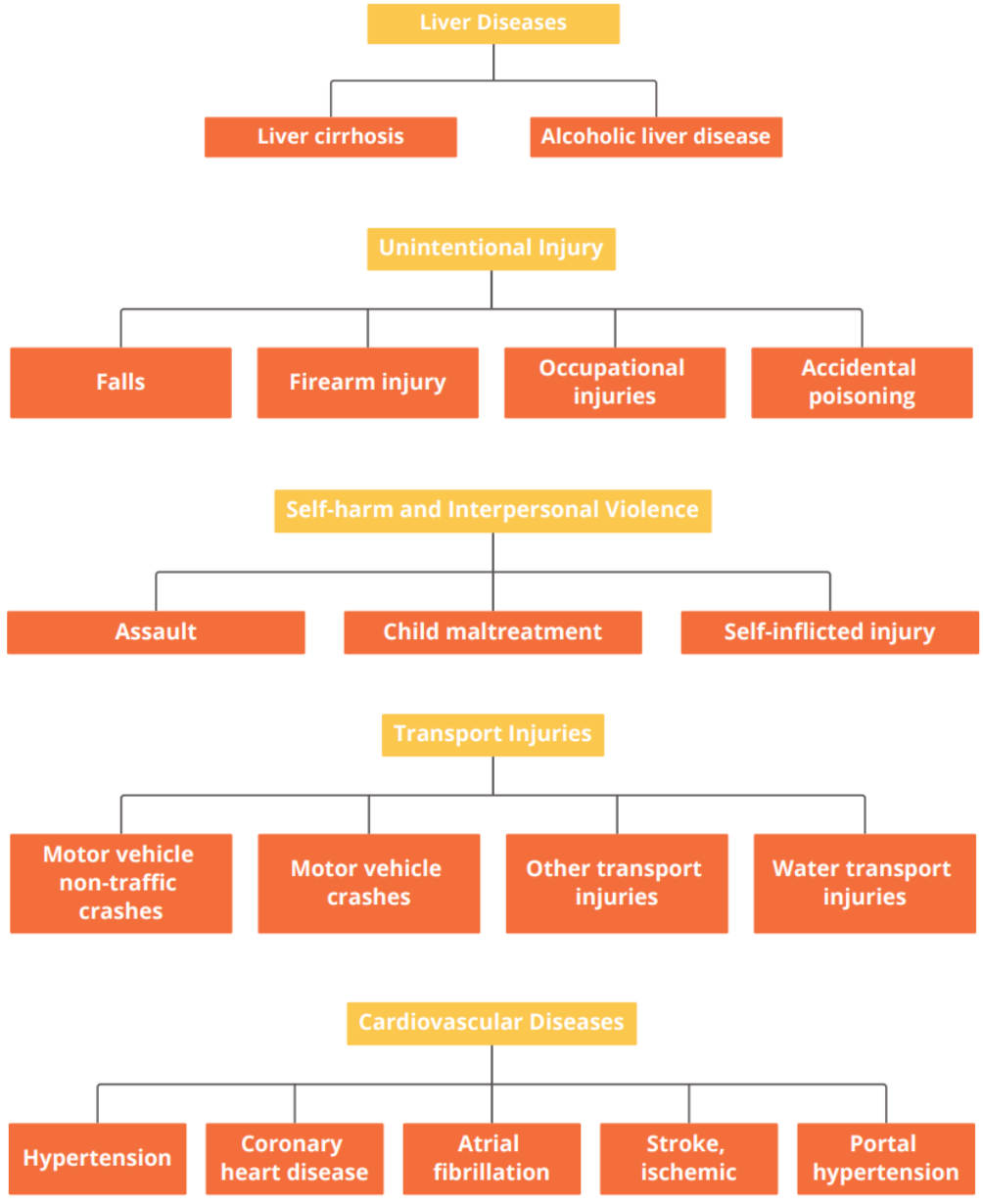
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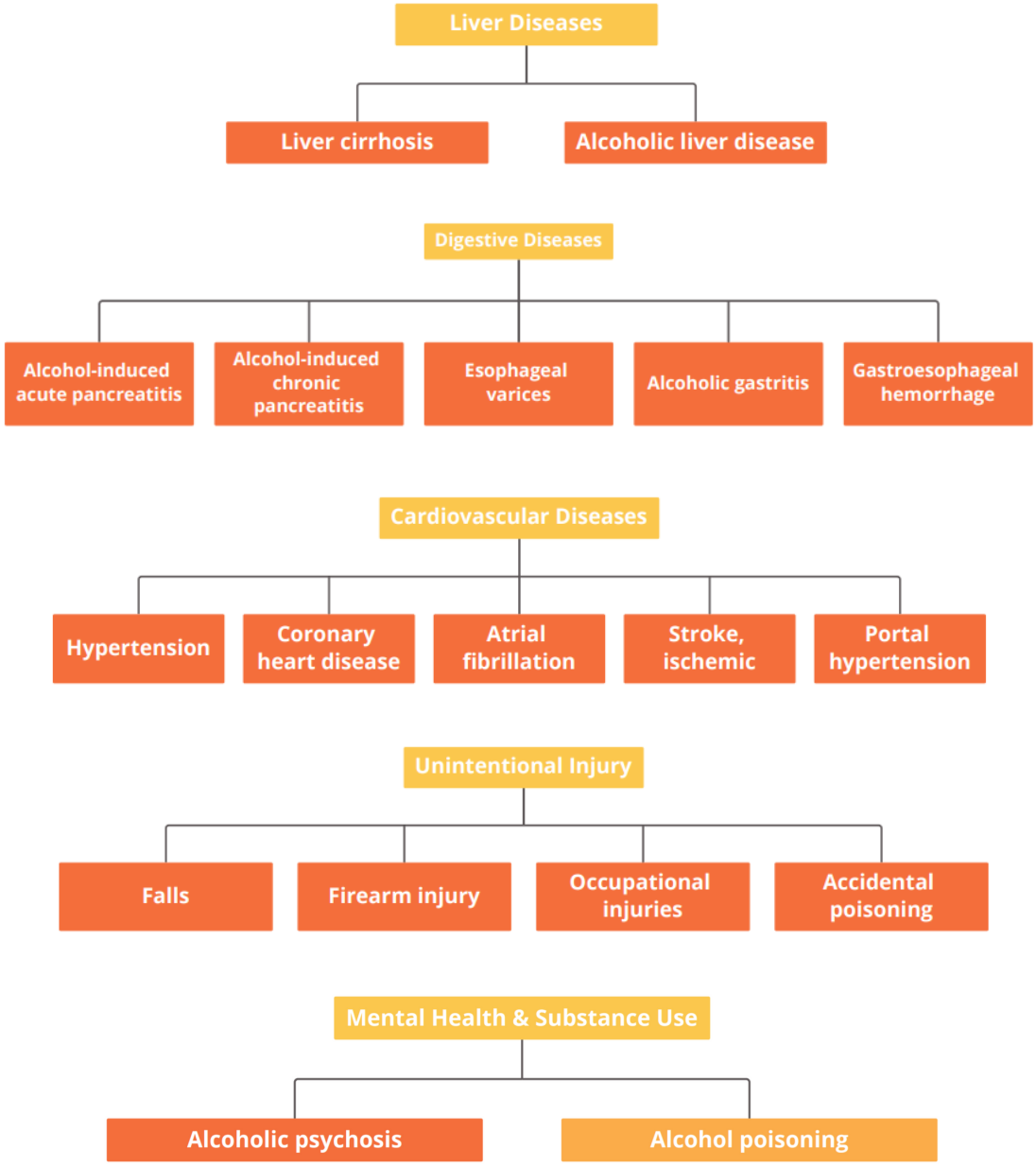
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APPENDIX

ALCOHOL-ATTRIBUTABLE EMERGENCY DEPARTMENT DIAGNOSES



ALCOHOL-ATTRIBUTABLE HOSPITALIZATION DIAGNOSES



INDIVIDUAL COST COMPONENTS AND ALLOCATION OF COSTS

Cost category	Costs to drinker	Costs to others				Cost to government	Total costs
		Victims	Private and other Insurance	Others	Total		
Summary							
Health care	$418,183	$177,711	$2,488,154	$1,066,871	$3,732,735	$4,009,013	$8,159,931
Productivity losses	$46,994,932	$3,312,089	$1,064,304	$1,955,354	$6,331,747	$38,848,726	$92,175,405
Other	$896,457	$303,385	$1,743,368	$514,277	$2,561,030	$8,025,666	$11,483,154
Total	**$48,309,572**	**$3,793,185**	**$5,295,826**	**$3,536,502**	**$12,625,512**	**$50,883,405**	**$111,818,490**
Health care							
Specialty care for Abuse/Dependence	$9,968		$119,948	$54,492	$174,440	$147,859	$332,267
Hospitalization (Non-Federal Hospitals)	$87,100		$1,048,099	$476,145	$1,524,244	$1,291,978	$2,903,322
Federal hospitals				$167,416	$167,416		$167,416
Ambulatory Care	$49,897	$7,456	$286,063	$119,601	$413,120	$236,404	$699,421
Nursing Home	$158,651		$58,645	$69,140	$127,785	$330,883	$617,319
Drugs/Services	$107,770		$309,839	$31,906	$341,745	$259,499	$709,014
Crime victims		$169,538			$169,538		$169,538
EMS transports	$4,797	$717	$27,504	$11,499	$39,721	$22,730	$67,248
Prevention & Researchf					$0	$653,574	$653,574
Trainingg				$13,061	$13,061	$9,933	$22,994
Health Insurance Administration			$638,054	$123,612	$761,666	$1,056,152.26	$1,817,818
Total	**$418,183**	**$177,711**	**$2,488,154**	**$1,066,871**	**$3,732,735**	**$4,009,013**	**$8,159,931**
Labor and productivity costs							
Impaired Productivity at Work	$22,862,959				$0	$17,388,729	$40,251,688
Impaired Productivity at Home	$1,660,977				$0	$1,263,279	$2,924,256
Absenteeism				$1,955,354	$1,955,354		$1,955,354
Impaired Productivity in Specialty Care	$486,854				$0	$370,283	$857,137
Impaired Productivity while in Hospital	$111,657	$16,684			$16,684	$97,611	$225,953
Mortality	$20,096,736	$3,002,961	$1,064,304		$4,067,265	$18,378,254	$42,542,255
Incarceration of Perpetrators	$1,775,749				$0	$1,350,569	$3,126,318
Crime Victims		$292,444			$292,444		$292,444
Total	**$46,994,932**	**$3,312,089**	**$1,064,304**	**$1,955,354**	**$6,331,747**	**$38,848,726**	**$92,175,405**
Other effects on society							
Crime Victim Property Damage		$303,385			$303,385		$303,385
Criminal Justice – Corrections					$0	$5,277,280	$5,277,280
Criminal Justice - Alcohol Related Crimes					$0	$539,167	$539,167
Criminal Justice - Violent and Property Crimes					$0	$1,963,401	$1,963,401
Criminal Justice - Private Legal	$165,472				$0		$165,472
Motor Vehicle Crashes	$730,985		$1,743,368	$514,277	$2,257,645	$245,818	$3,234,449
Total	**$896,457**	**$303,385**	**$1,743,368**	**$514,277**	**$2,561,030**	**$8,025,666**	**$11,483,154**
Grand Total	**$48,309,572.01**	**$3,793,184.62**	**$5,295,825.80**	**$3,536,501.96**	**$12,625,512.38**	**$50,883,405.15**	**$111,818,489.54**


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