

Alcohol Consumption Trends Among Adults in the United States and, D.C. (1995-2023)

Emma Getz

Department of Public Health & Exercise Science, Appalachian State University

PH4200: Principles of Epidemiology Honors Contract Course

Dr. Shenghui Wu

November 20, 2024

## **I. Introduction / Background**

### **Case Definition**

This surveillance project focused on the topic of alcohol consumption. The term alcohol consumption is defined by the CDC Behavioral Risk Factor Surveillance System as “adults who have had at least one drink of alcohol within the past 30 days” for data reported between 1995 and 2023 (Centers for Disease Control and Prevention, 2024). Although the data used in this project focuses on only those that had at least one drink of alcohol within the past 30 days, it is important to be aware of patterns of more frequent alcohol consumption. Alcohol overconsumption patterns such as binge drinking and heavy drinking are typically major contributors to adverse health outcomes (Fernández-Solà, 2015). According to the CDC, excessive alcohol use refers to four drinking patterns that can negatively affect human health. These four categories are binge drinking (four or more drinks for women or five or more drinks for men on one occasion), heavy drinking (eight or more drinks for women or twelve or more drinks for men over one week), any alcohol consumption by individuals under the age of 21, and any alcohol consumption during pregnancy (Centers for Disease Control and Prevention, 2024). Consistent binge drinking or heavy drinking over time can lead to alcohol use disorder, which is defined as loss of control over one’s intake of alcohol and compulsive alcohol use. Alcohol use disorders are one of the most prevalent mental disorders around the world and are chronically undertreated (Carvalho et al., 2019).

## **Health Topic**

Alcohol consumption has various effects on human health, many of which are negative. Short-term effects of consuming alcohol include drowsiness, impaired judgment, impaired muscle coordination, slurred speech, apathy, unconsciousness, and even death under extreme circumstances (Hendriks, 2020). These short-term effects of alcohol consumption result in health risks such as traffic accidents, increased chances of injury, and higher tendencies of violence, all of which can lead to death (Alpert et al., 2022). This highlights the importance of addressing even short-term alcohol use in public health education and intervention efforts. Long-term effects of consuming alcohol include increased risk for pancreatitis, cardiomyopathy, stroke, hypertension, alcohol-related dementia, various cancers, and alcoholic liver diseases (Varghese & Dakhode, 2022). Consuming alcohol long-term can also lead to a myriad of social and wellness issues, such as increased risk for mental health disorders, learning problems, memory impairment, and relationship issues (Centers for Disease Control and Prevention, 2024). The wide-ranging short and long-term effects of alcohol consumption illustrate the importance of this issue in both individual and public health.

## **II. Methodology**

### **Surveillance System**

The surveillance system used in this analysis is the Behavioral Risk Factor Surveillance System, also known as the BRFSS (Centers for Disease Control and

Prevention, 2023). The BRFSS is a system initiated in 1984. It is designed and managed by the CDC to collect health data from all 50 states, D.C., and 3 U.S. territories. The specific health data collected by the BRFSS includes information about risky health behaviors, preventative care, access to healthcare, and chronic health conditions. By collecting health data at the state level, this surveillance system provides insight into health disparities and is a tool used to effectively tailor health interventions and health promotion activities (Centers for Disease Control and Prevention, 2024). The BRFSS was chosen as the surveillance system for this analysis due to the wide range of data available regarding alcohol consumption by state and the additional information available regarding the demographic distribution around alcohol consumption.

BRFSS data is collected through annual surveys, conducted during each month of the year, targeting individuals 18 years and older. State health departments use in-house interviewers and partner with phone call centers or academic institutions to administer the surveys by telephone call (Centers for Disease Control and Prevention, 2022). The survey consists of a standardized core questionnaire, with optional state-added questions and modules that can be added. The survey is administered using Random Digit Dialing (Wolter et al., 2009) on both landlines and cell phones, with individual surveys lasting about 17 minutes. The data collected includes information about health status, access to healthcare, alcohol consumption, HIV/AIDS risk, tobacco use, and more (Centers for Disease Control and Prevention, 2023).

## **Data Collection**

The data for this analysis was collected using the BRFSS prevalence & trends data tool (Centers for Disease Control and Prevention, 2023). Using this tool, data was viewed by topic. Alcohol consumption was selected for the class as well as the topic, and area maps were created containing data for all 50 states and D.C.. Area maps under the topic of alcohol consumption displayed the prevalence of “adults who have had at least one drink of alcohol within the past 30 days” by year. Maps from years 1995 - 2023 were created and analyzed. Additionally, for the most recent three years-2023, 2022, and 2021-the top 3 states with the highest prevalence each year were identified and analyzed, Bar charts were created within the BRFSS prevalence & trends tool (Centers for Disease Control and Prevention, 2023). These bar charts were used to analyze the demographics of alcohol consumption within the top 3 states per year, examining the prevalence of alcohol consumption across different demographic groups. The specific demographics analyzed included age, gender, and race/ethnicity. Age-adjusted prevalence data was used over crude prevalence data in the years after it became available in 2011. Age-adjusted prevalence data was not available for demographic data so the data reported is based on crude prevalence.

## **Study Design**

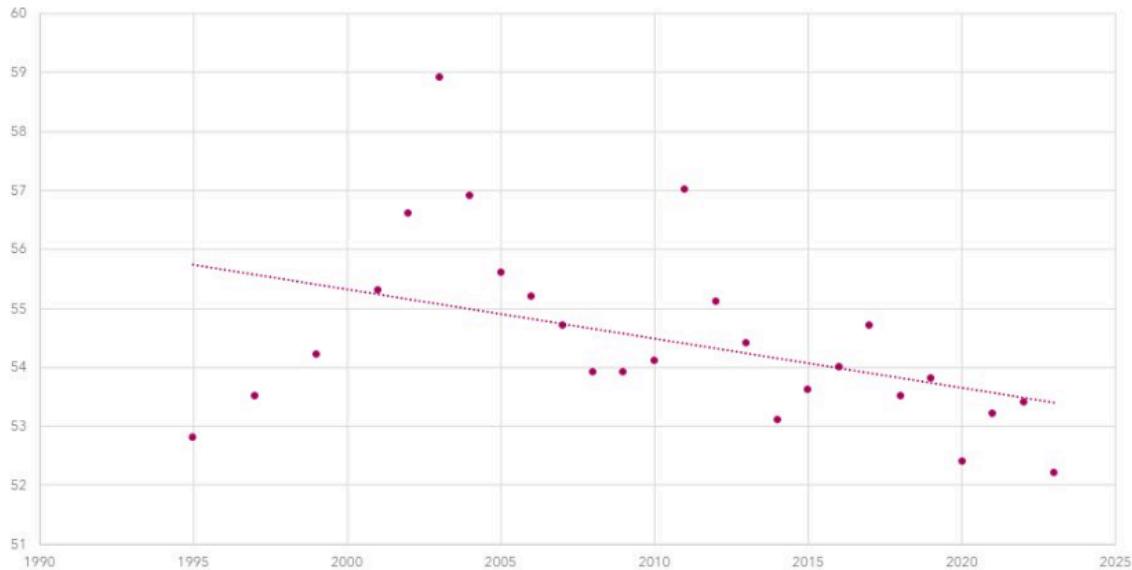
This study uses a descriptive and observational approach (Aggarwal & Ranganathan, 2019). The main goal of this analysis is to describe the distribution of alcohol consumption by region and demographics. The study design used in this analysis is cross-sectional, as data from participants in the BRFSS is collected at a

single point in time (National Cancer Institute, 2024). This design was selected because of its usefulness in showcasing both regional and demographic health trends and disparities.

### **III. Results**

#### **Time Trend**

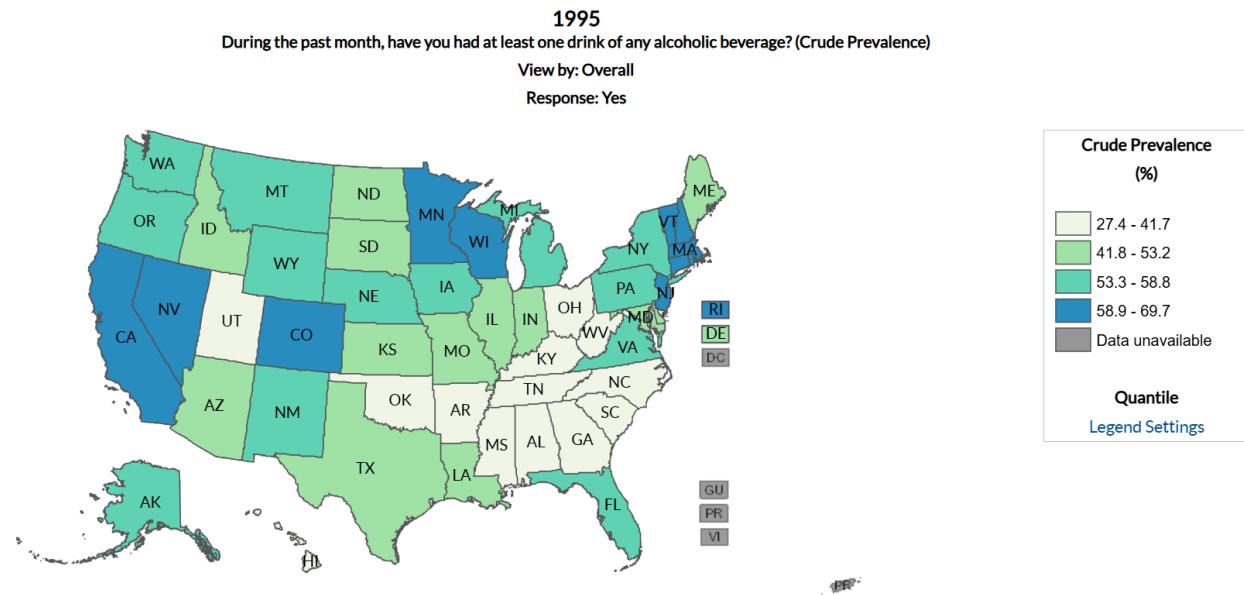
## **A D U L T   A L C O H O L   C O N S U M P T I O N   T R E N D S I N   T H E   U N I T E D   S T A T E S   A N D   D . C . 1 9 9 5 - 2 0 2 3**



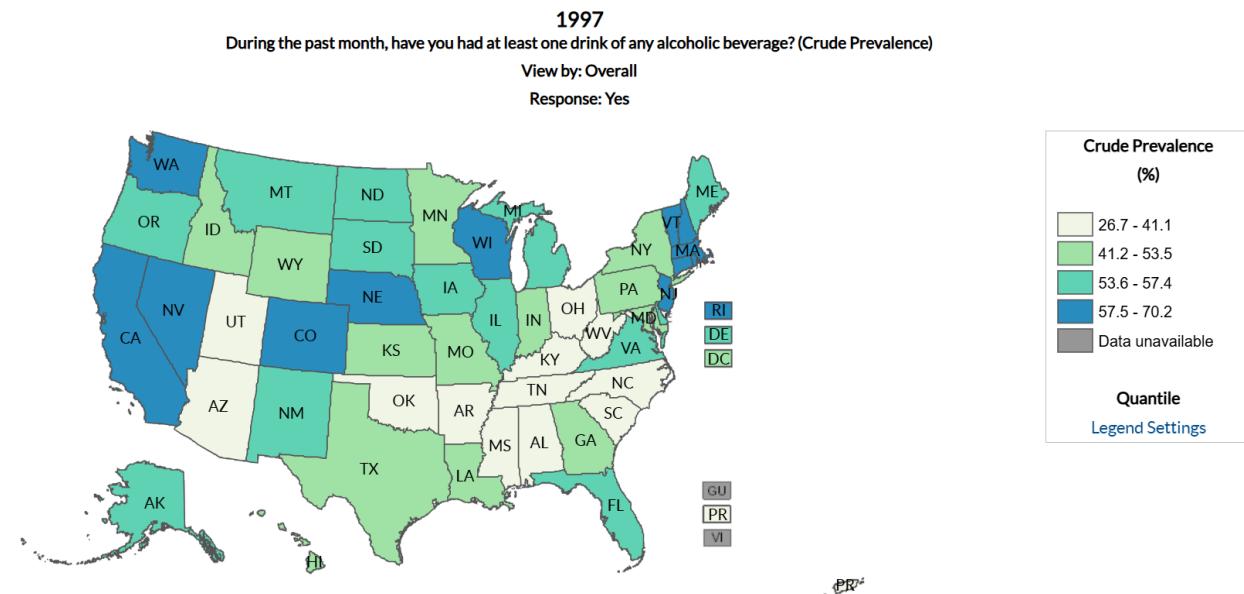
**Figure 1.** Time trend graph displaying prevalence of adult alcohol consumption in the US and D.C. from 1995 to 2023 (BRFSS; Centers for Disease Control and Prevention).

The time trend data indicates that alcohol consumption in the United States increased from 1995 to 2004, then decreased from 2004 to 2010. Since 2010, the trend has fluctuated but has shown an overall steady decline.

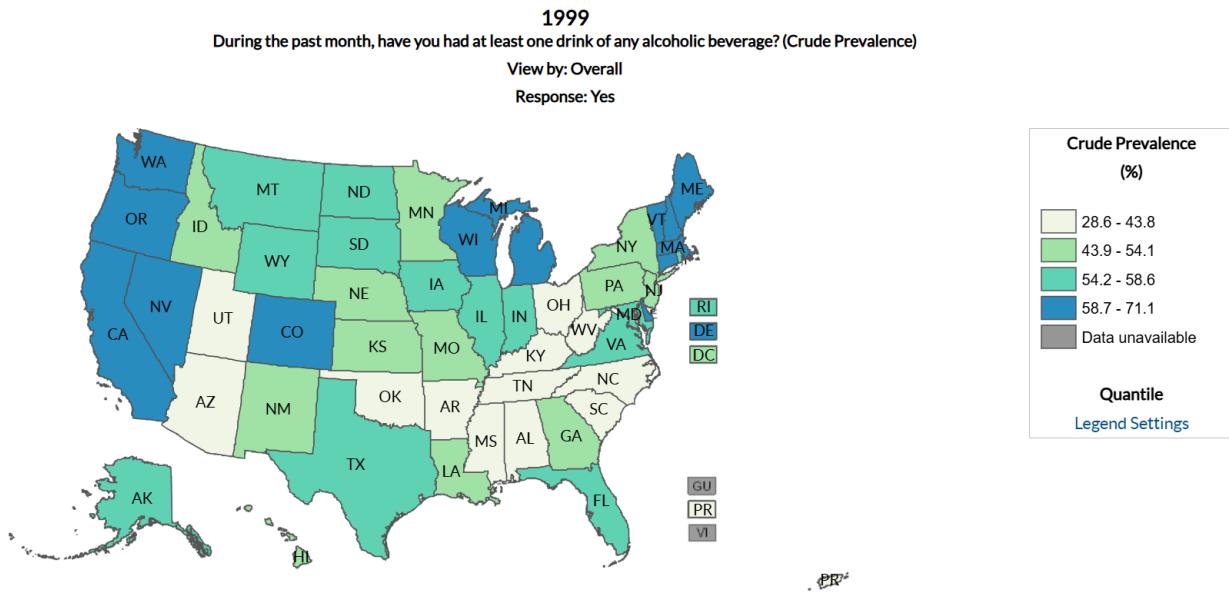
## Area Maps



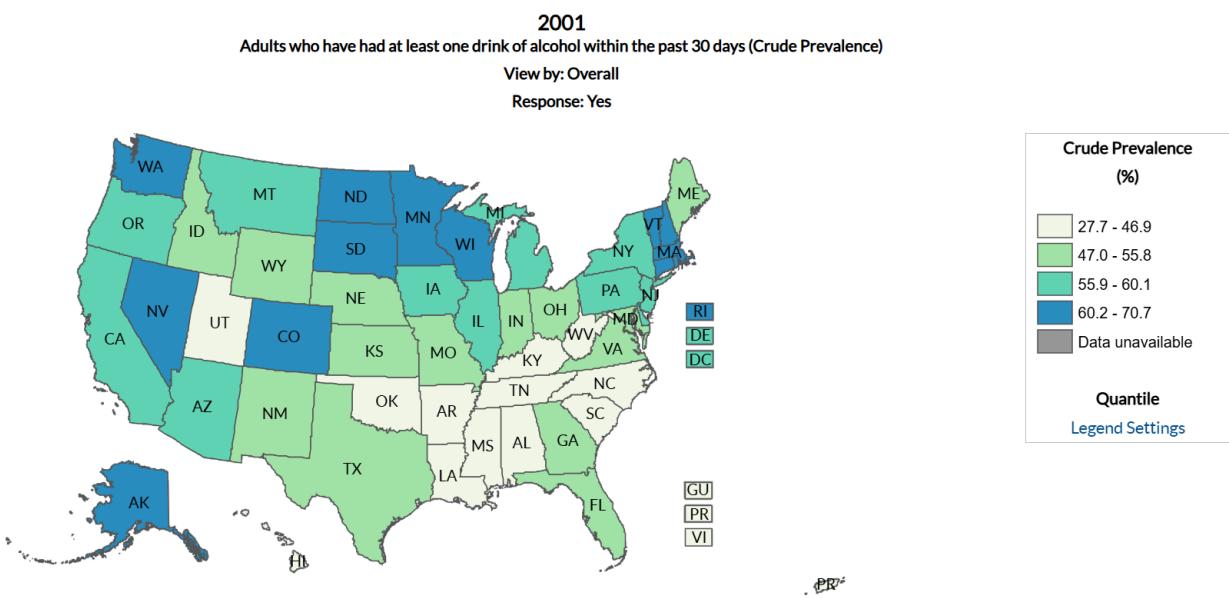
**Figure 2.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 1995 (BRFSS; Centers for Disease Control and Prevention).



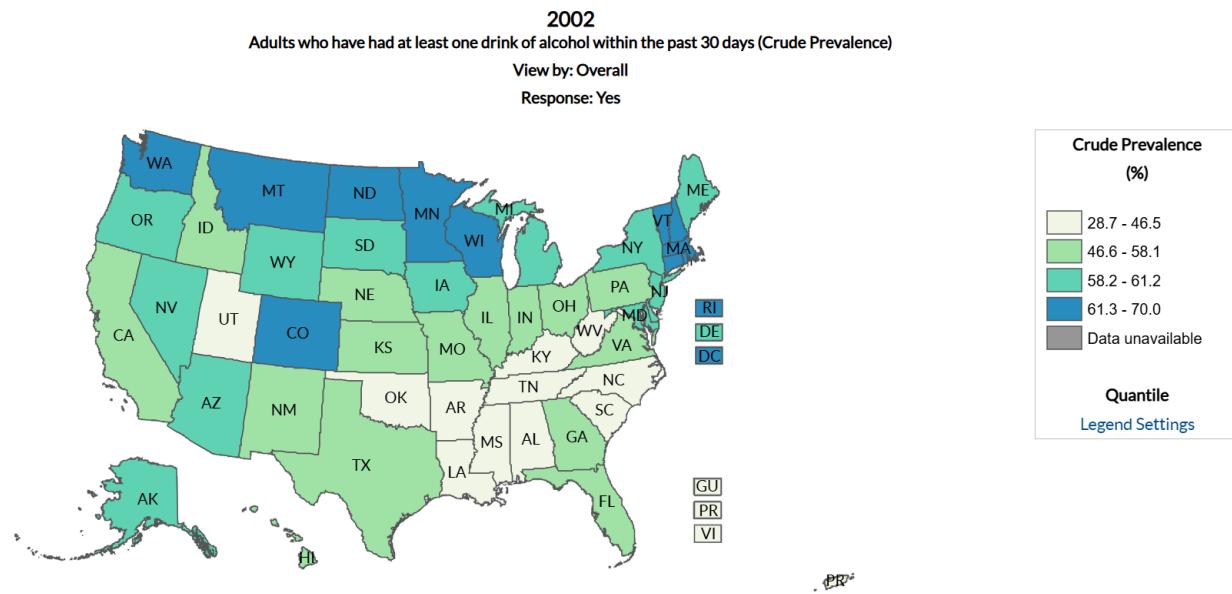
**Figure 3.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 1997 (BRFSS; Centers for Disease Control and Prevention).



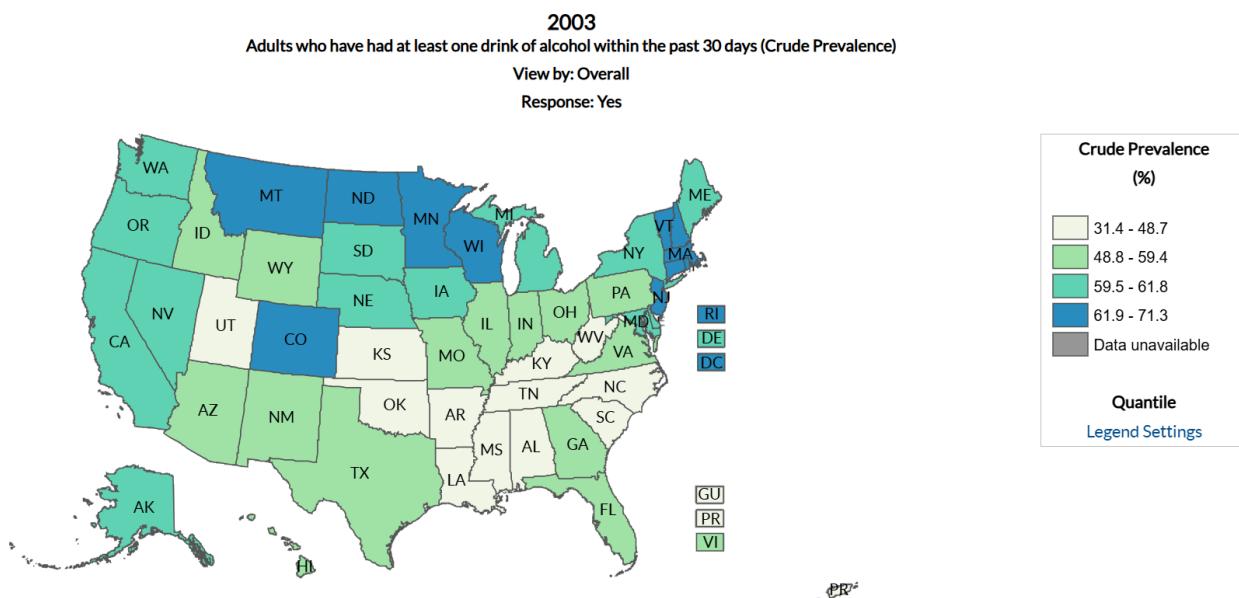
**Figure 4.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 1999 (BRFSS; Centers for Disease Control and Prevention).



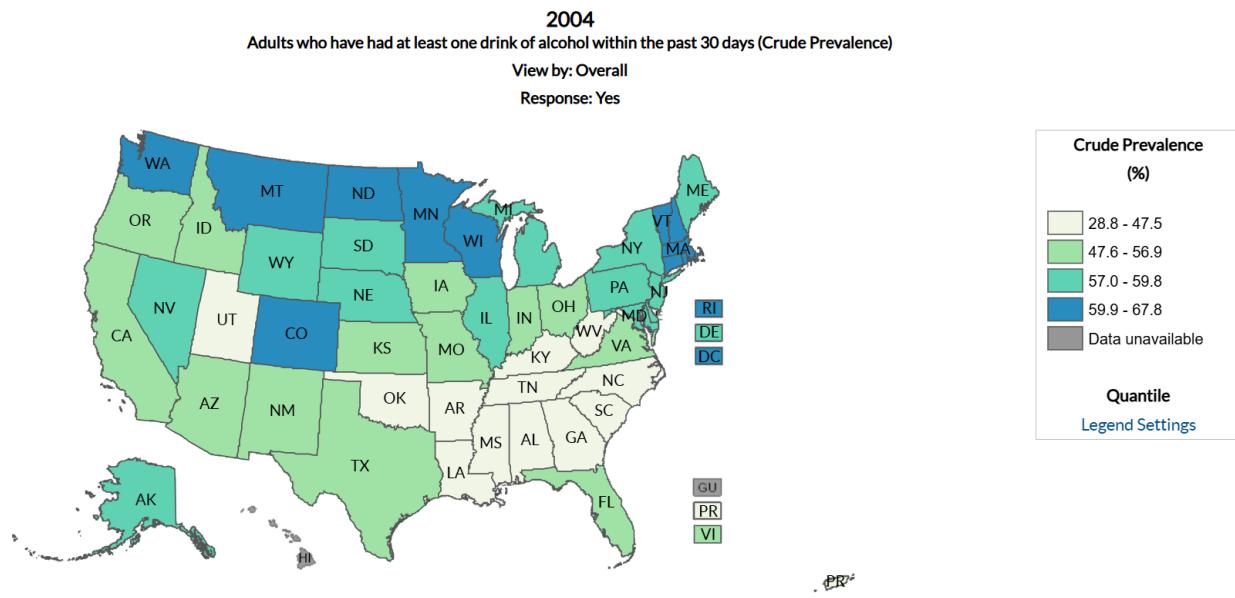
**Figure 5.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2001 (BRFSS; Centers for Disease Control and Prevention).



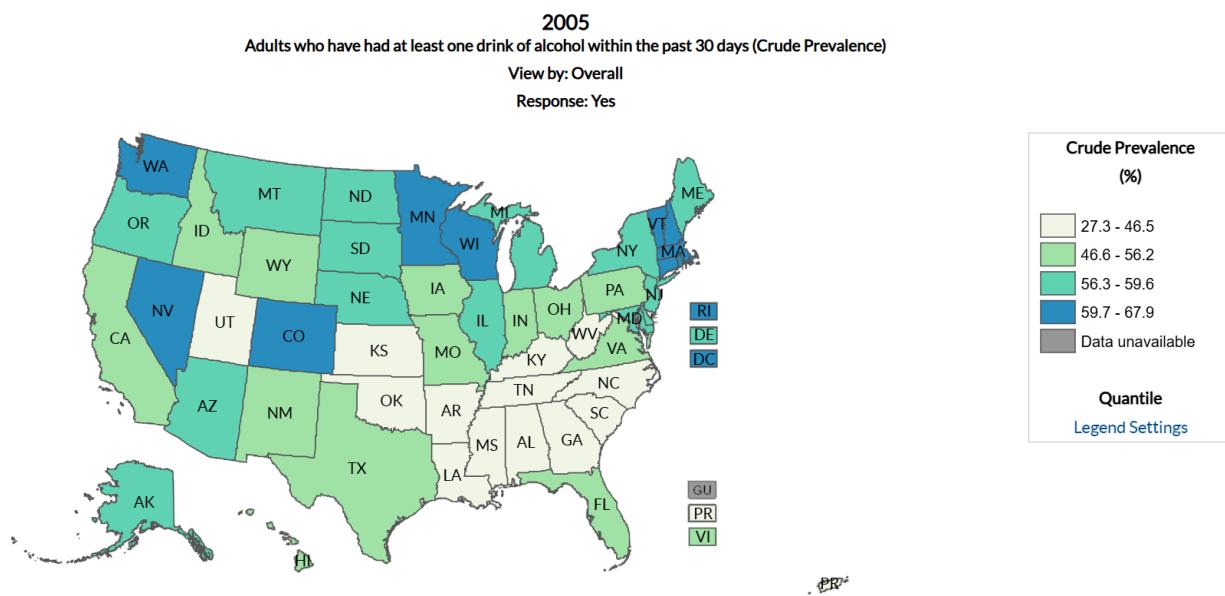
**Figure 6.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2002 (BRFSS; Centers for Disease Control and Prevention).



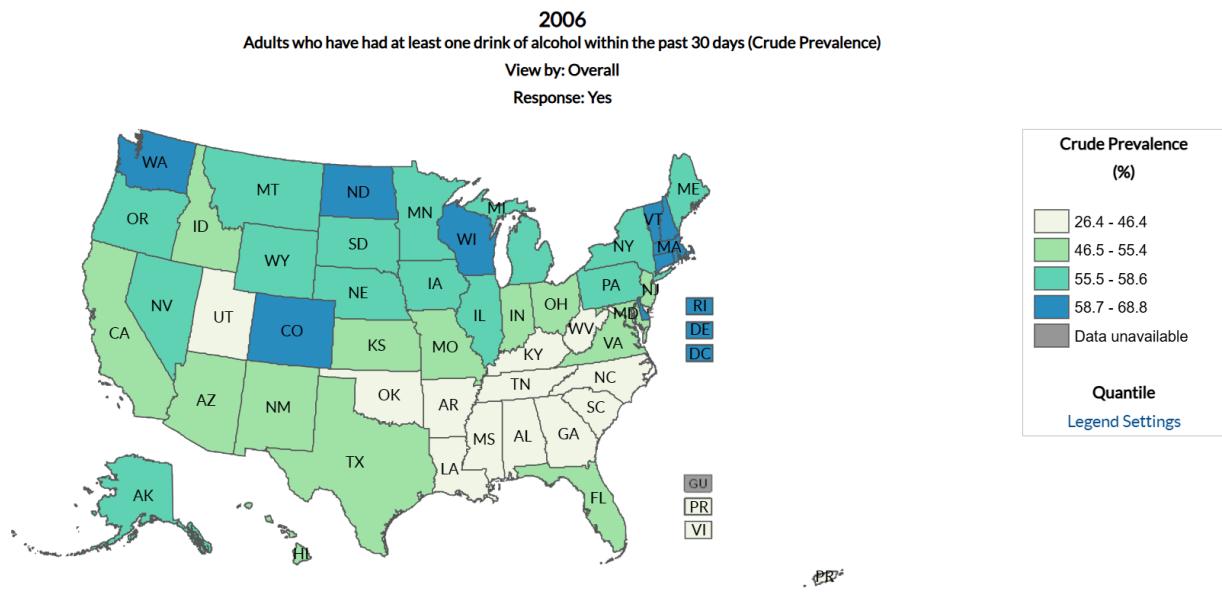
**Figure 7.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2003 (BRFSS; Centers for Disease Control and Prevention).



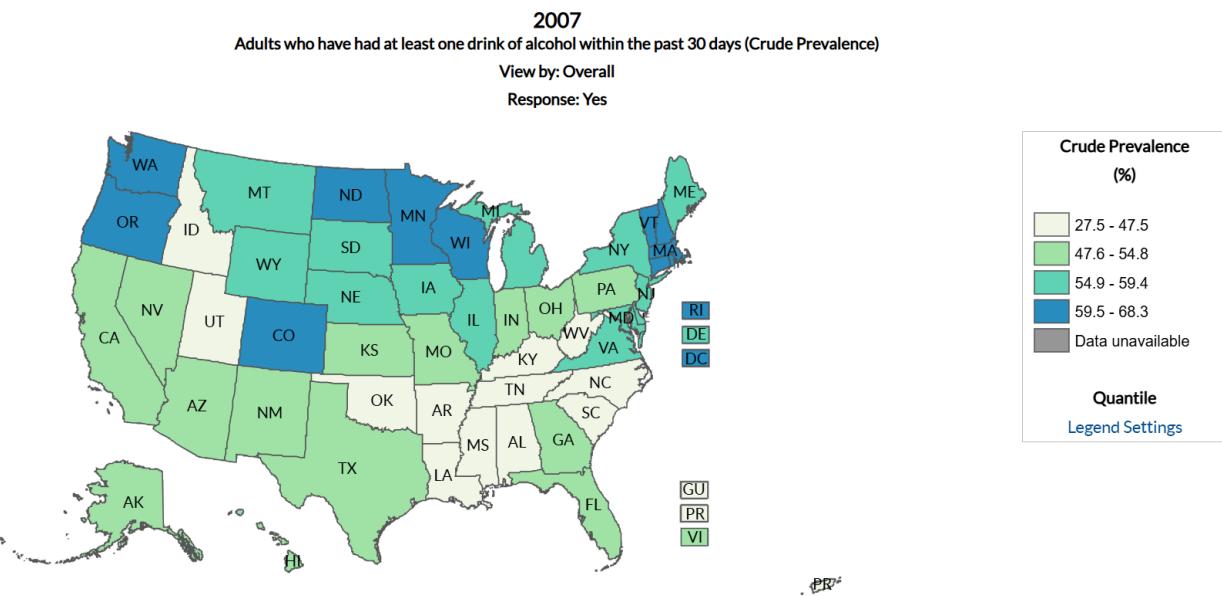
**Figure 8.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2004 (BRFSS; Centers for Disease Control and Prevention).



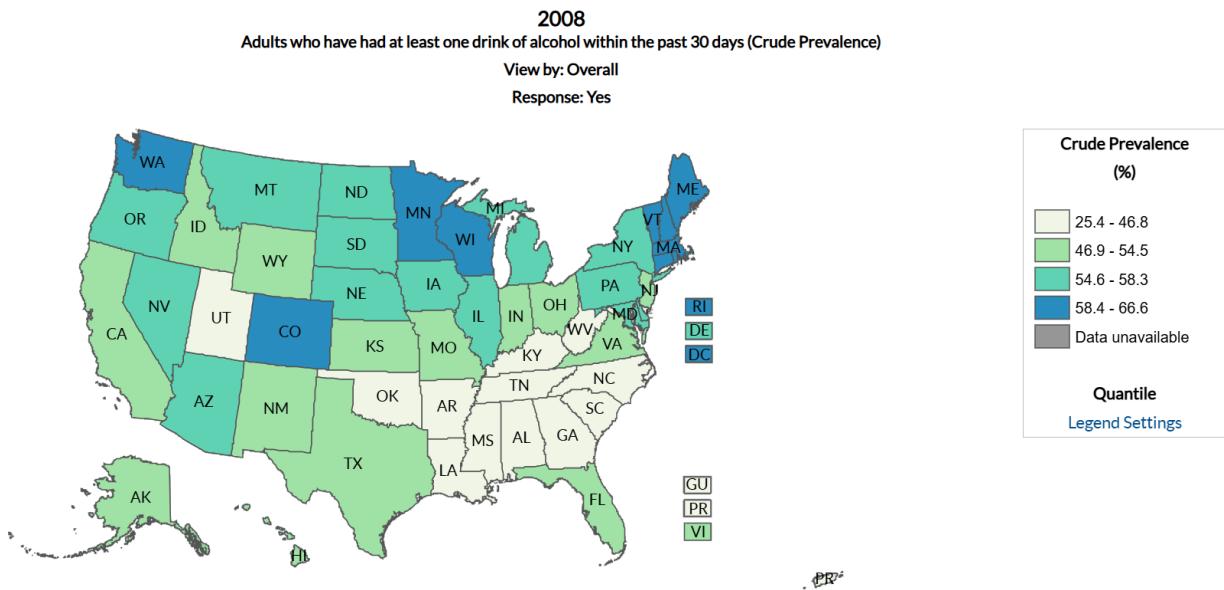
**Figure 9.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2005 (BRFSS; Centers for Disease Control and Prevention).



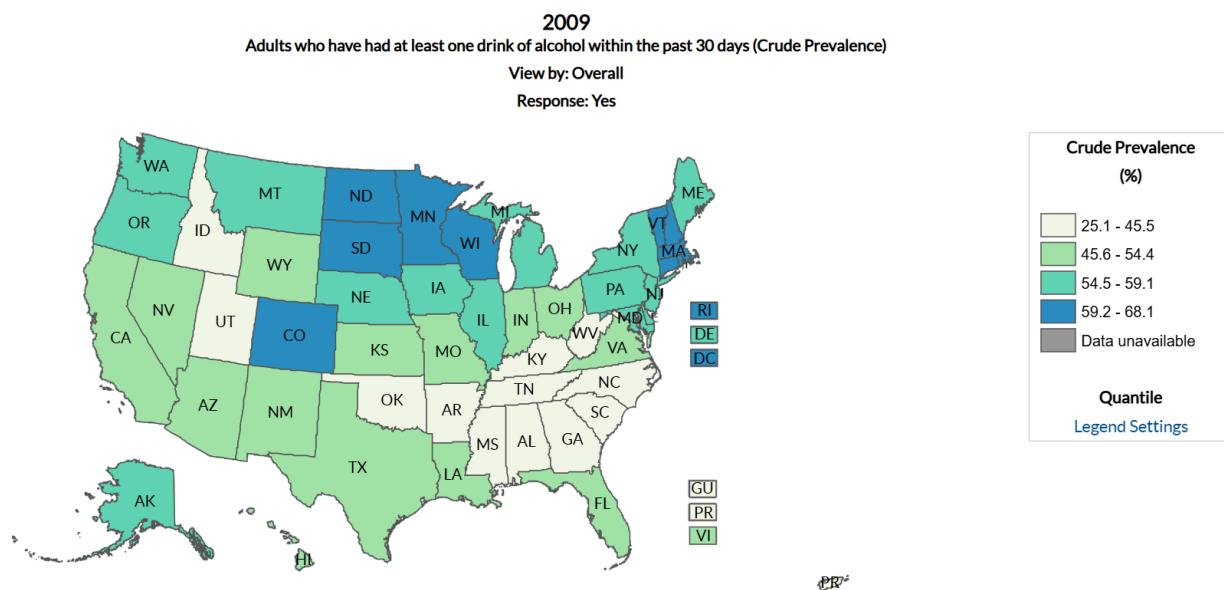
**Figure 10.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2006 (BRFSS; Centers for Disease Control and Prevention).



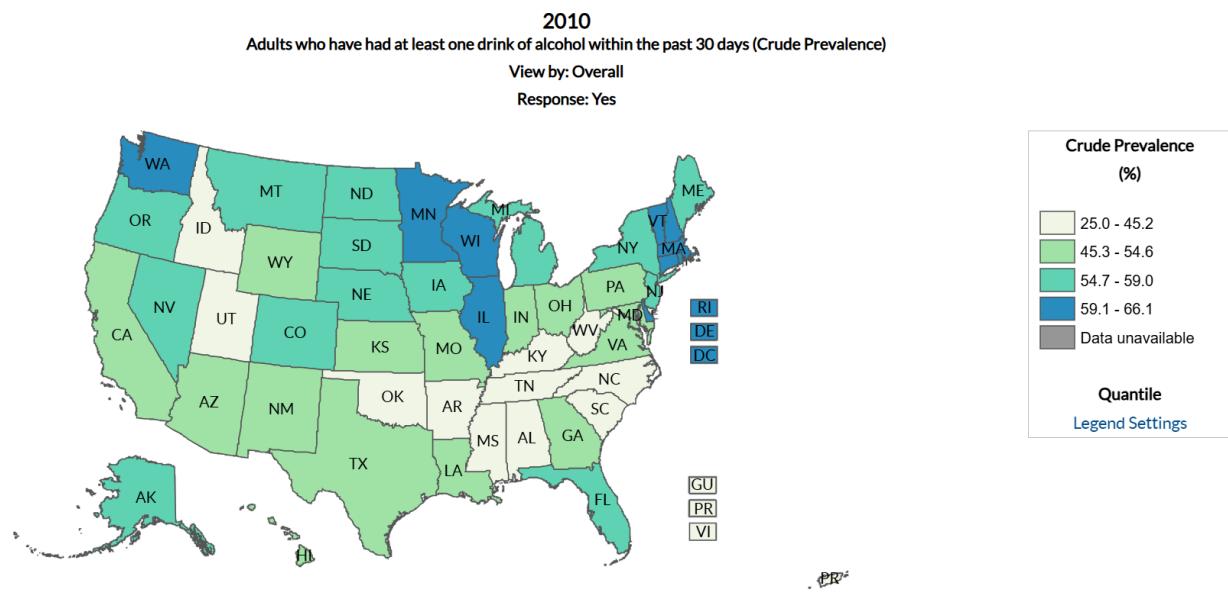
**Figure 11.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2007 (BRFSS; Centers for Disease Control and Prevention).



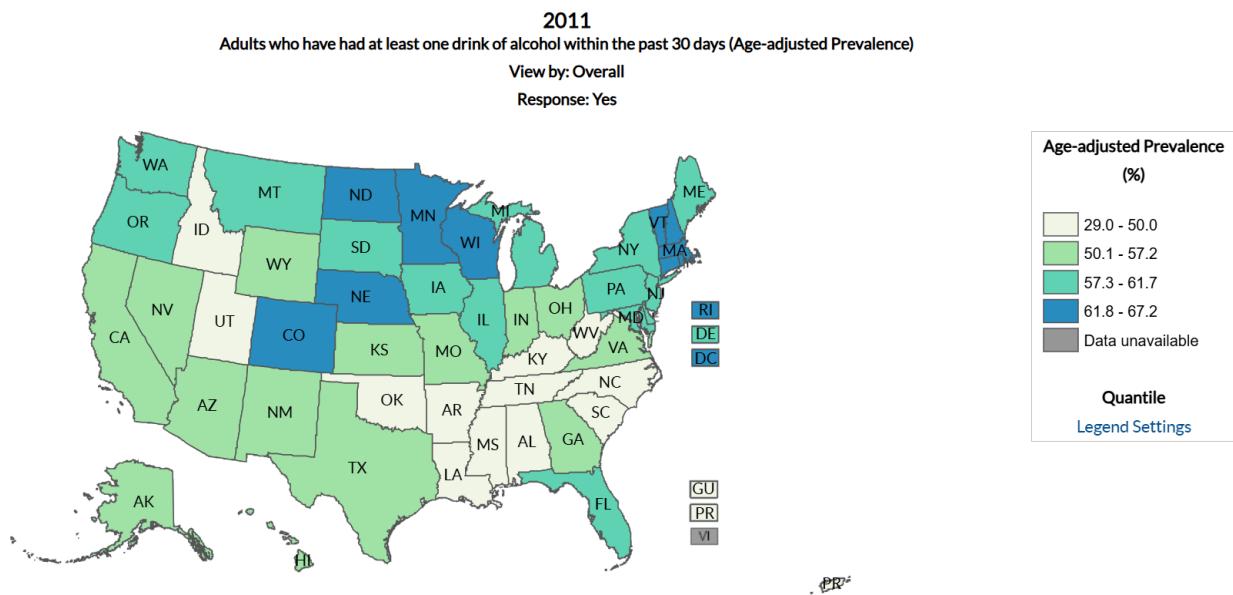
**Figure 12.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2008 (BRFSS; Centers for Disease Control and Prevention).



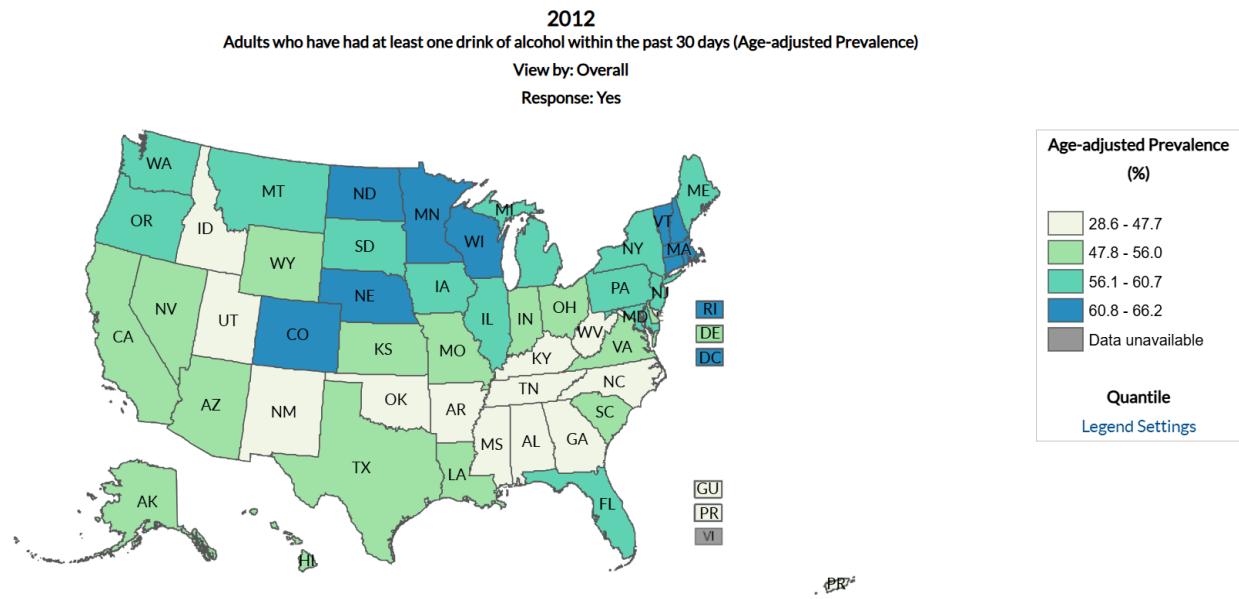
**Figure 13.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2009 (BRFSS; Centers for Disease Control and Prevention).



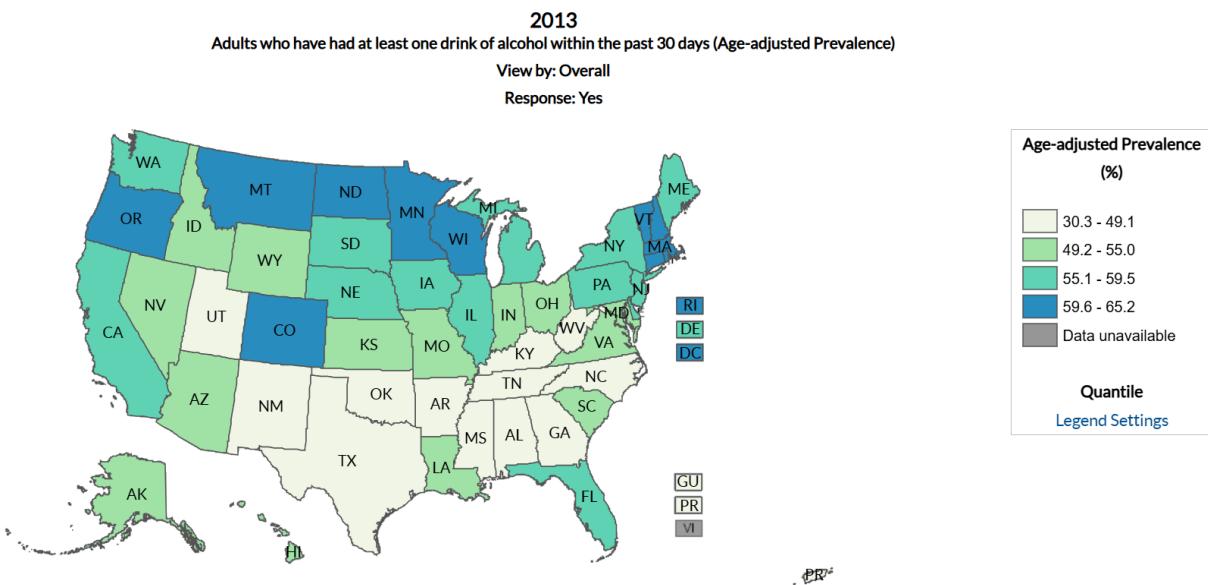
**Figure 14.** Area map displaying crude prevalence of adult alcohol consumption in the US and D.C. in 2010 (BRFSS; Centers for Disease Control and Prevention).



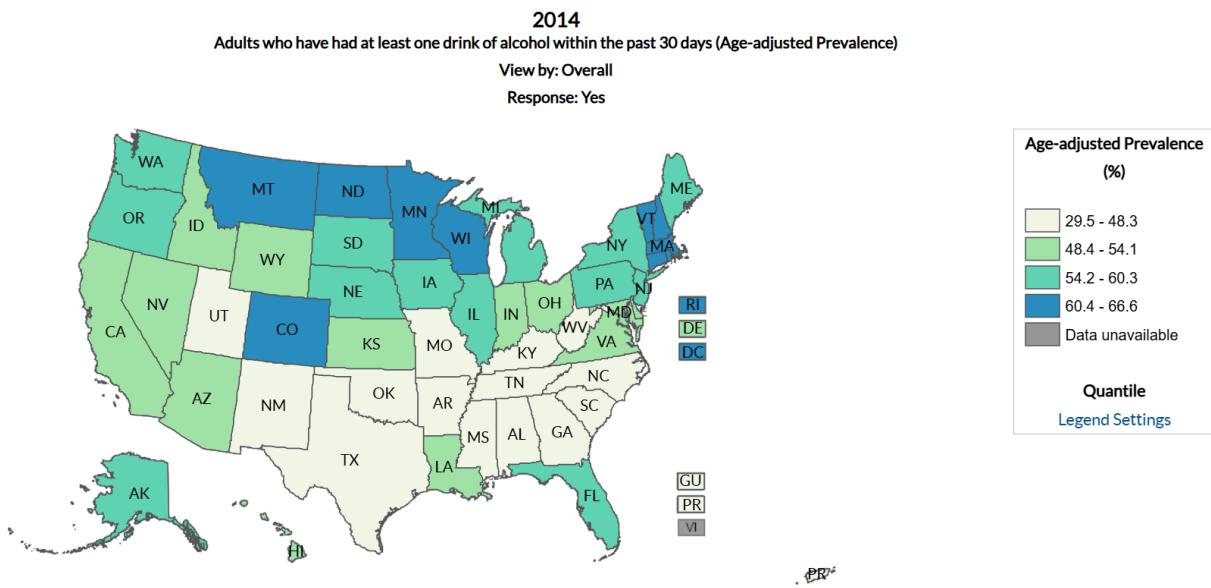
**Figure 15.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2011 (BRFSS; Centers for Disease Control and Prevention).



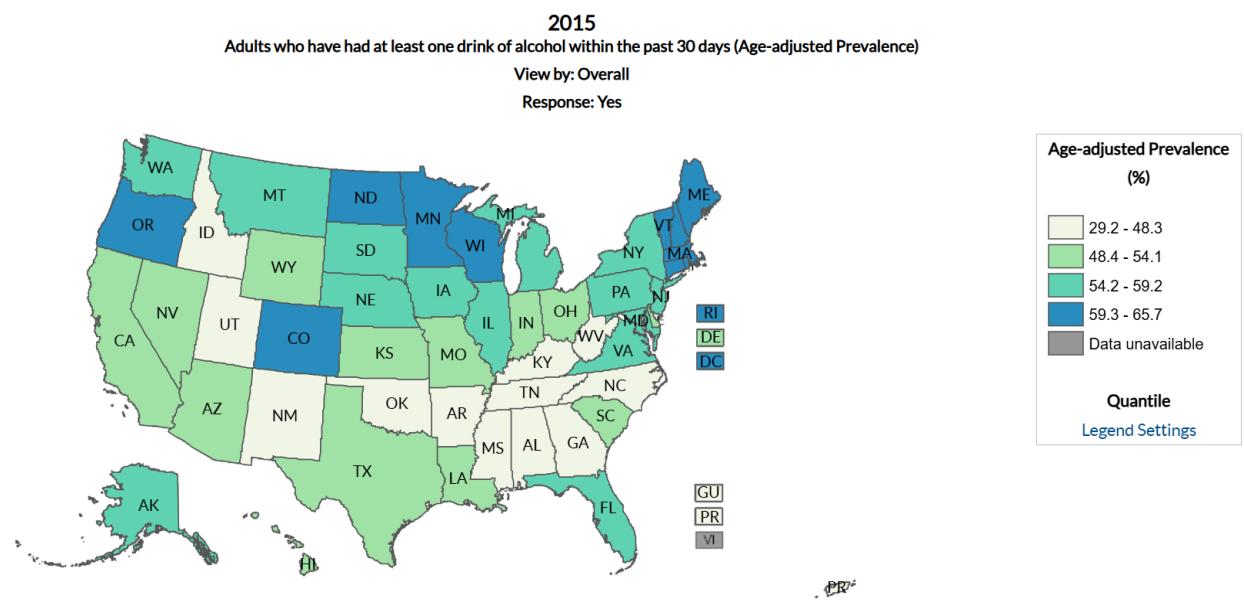
**Figure 16.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2012 (BRFSS; Centers for Disease Control and Prevention).



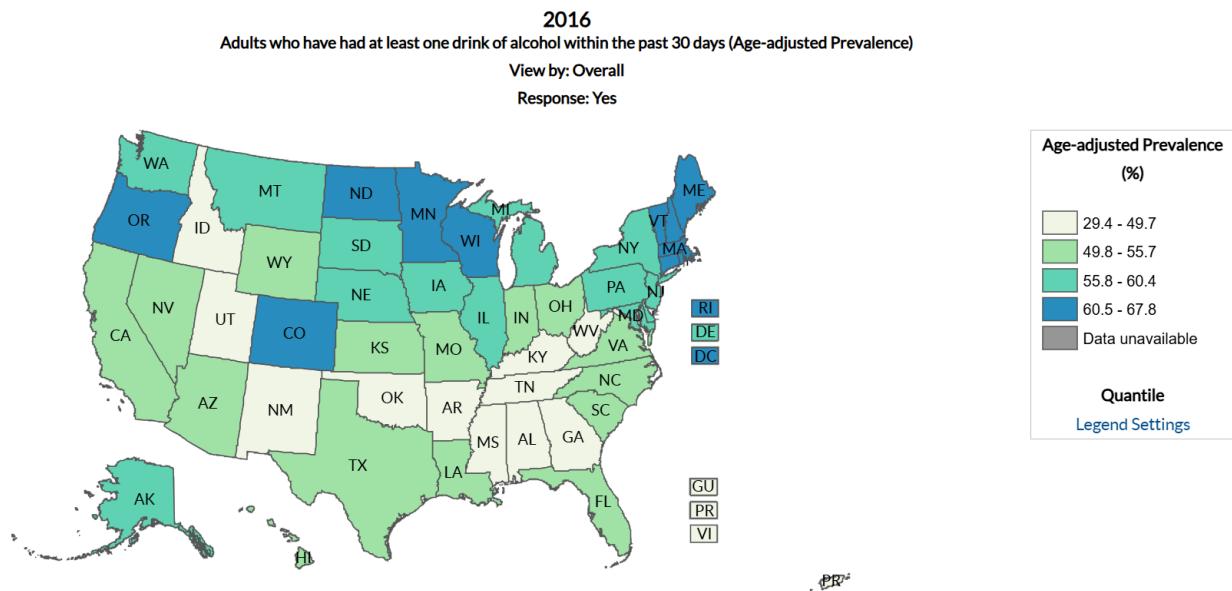
**Figure 17.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2013 (BRFSS; Centers for Disease Control and Prevention).



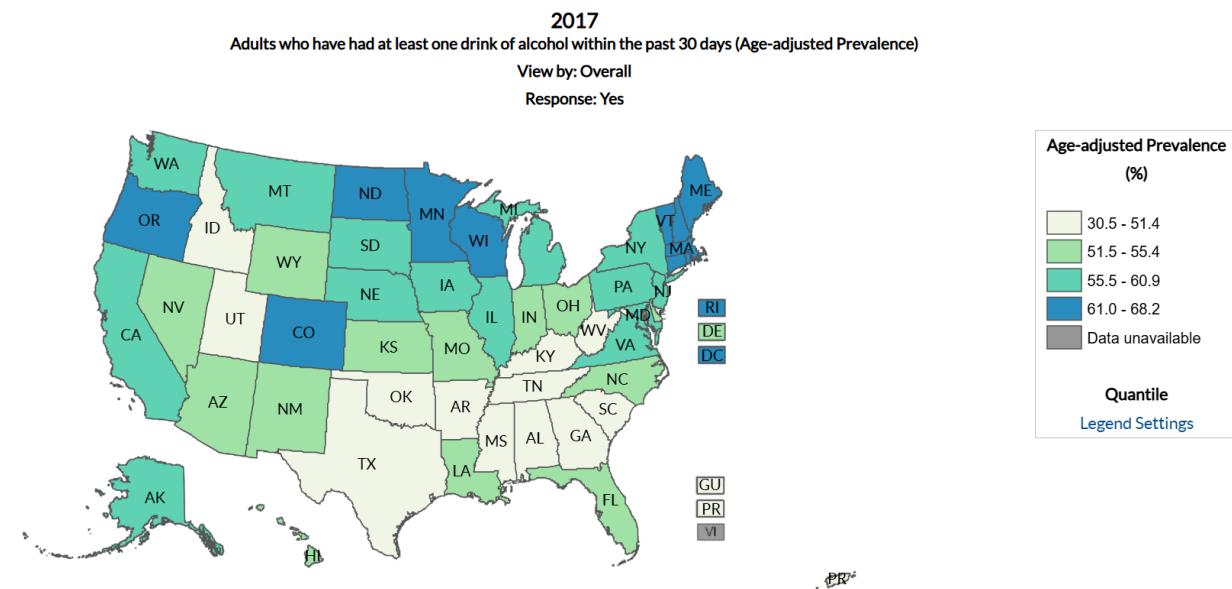
**Figure 18.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2014 (BRFSS; Centers for Disease Control and Prevention).



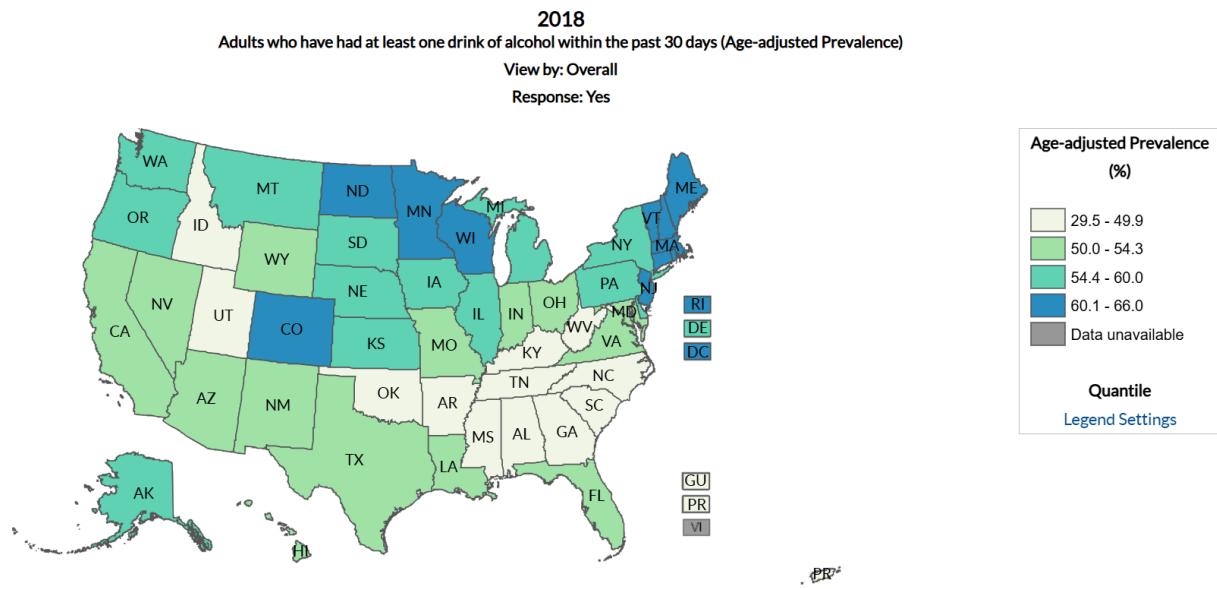
**Figure 19.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2015 (BRFSS; Centers for Disease Control and Prevention).



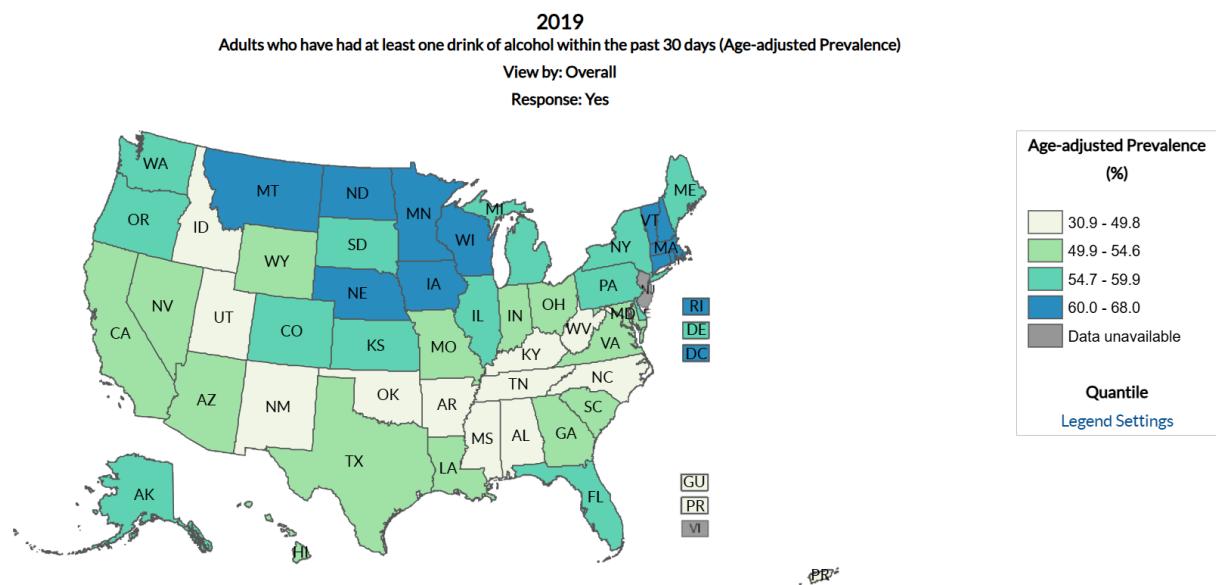
**Figure 20.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2016 (BRFSS; Centers for Disease Control and Prevention).



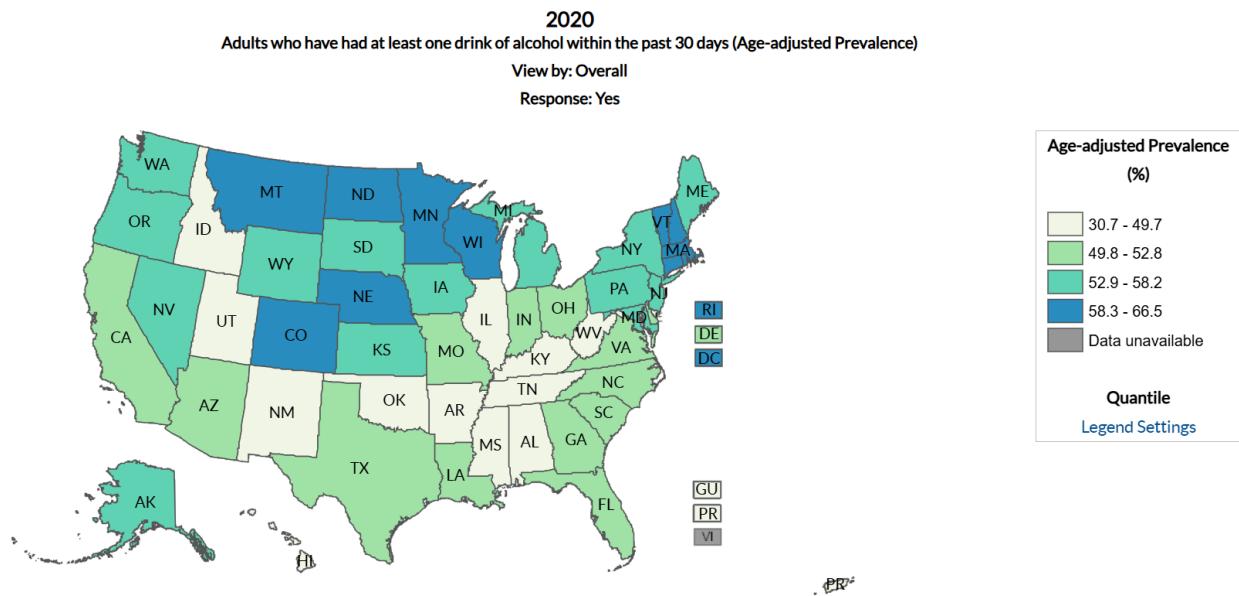
**Figure 21.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2017 (BRFSS; Centers for Disease Control and Prevention).



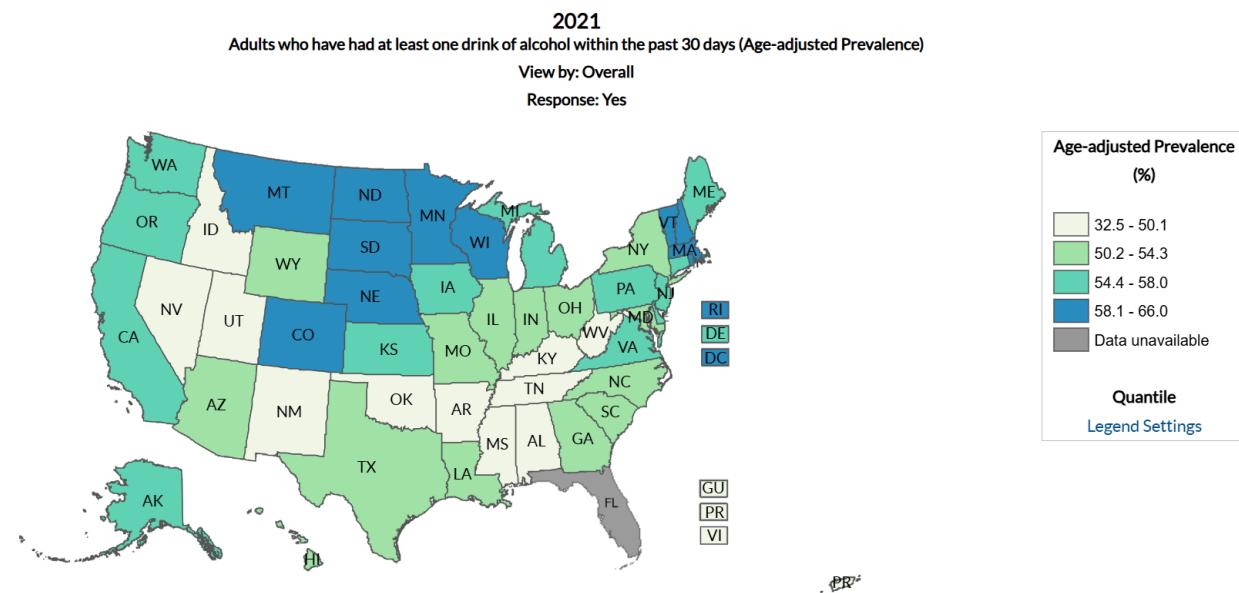
**Figure 22.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2018 (BRFSS; Centers for Disease Control and Prevention).



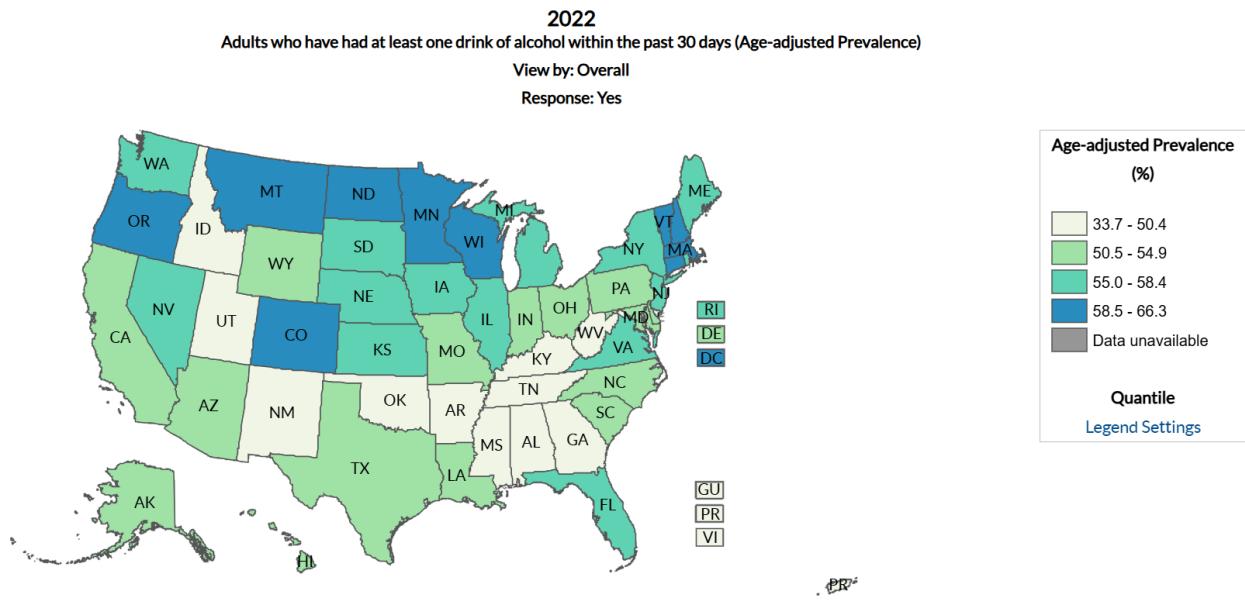
**Figure 23.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2019 (BRFSS; Centers for Disease Control and Prevention).



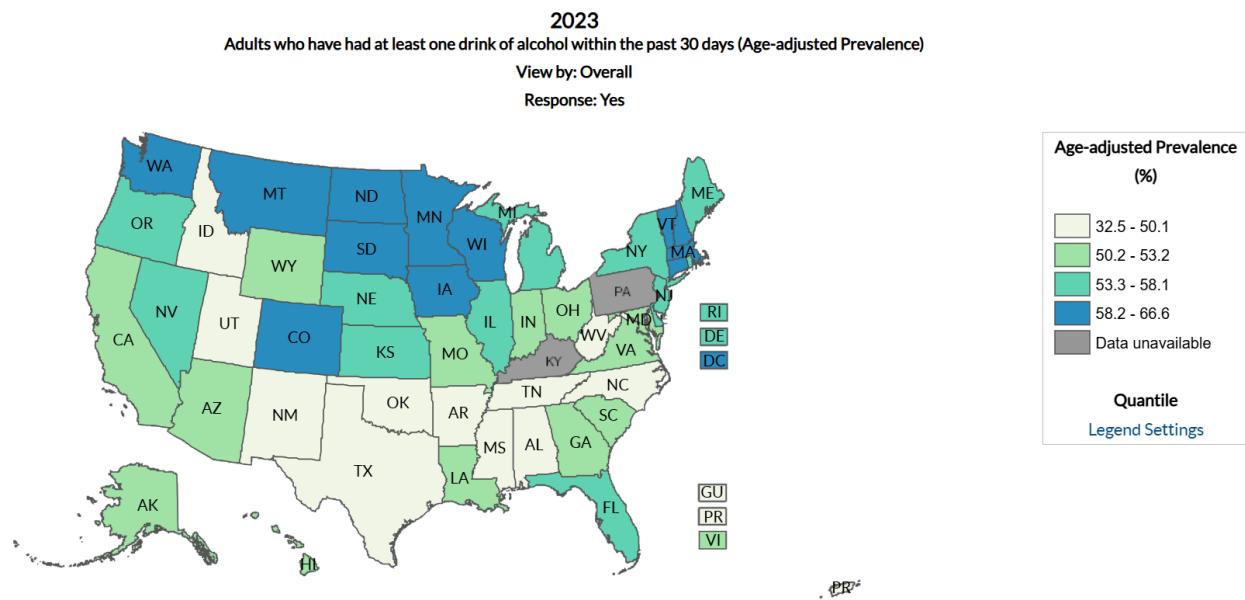
**Figure 24.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2020 (BRFSS; Centers for Disease Control and Prevention).



**Figure 25.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2021 (BRFSS; Centers for Disease Control and Prevention).



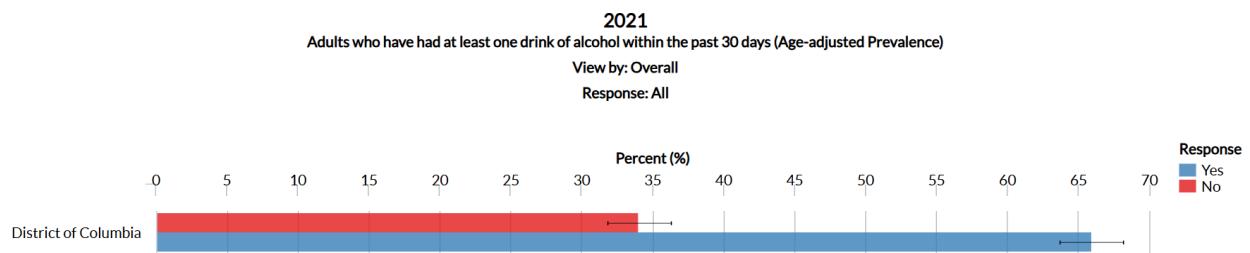
**Figure 26.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2022 (BRFSS; Centers for Disease Control and Prevention).



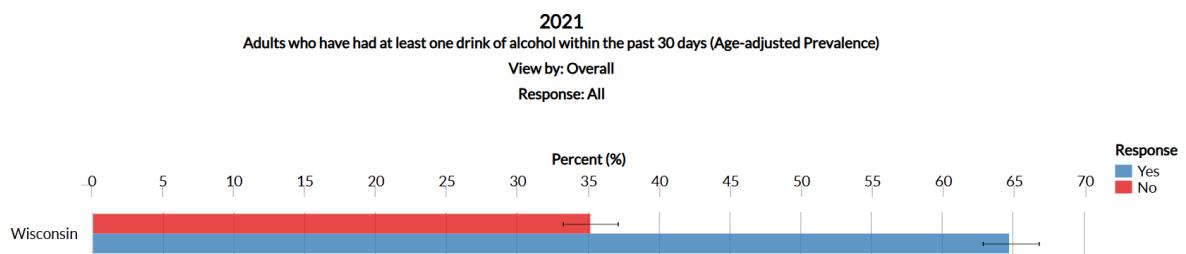
**Figure 27.** Area map displaying age-adjusted prevalence of adult alcohol consumption in the US and D.C. in 2023 (BRFSS; Centers for Disease Control and Prevention).

The area maps over the time period of 1995 to 2023 show clusters in certain regions where states in close geographical proximity share similar prevalence of alcohol consumption. There are two clusters of states that consistently exhibit high prevalence of alcohol consumption. One is in the northeast, including states such as Vermont, New Hampshire, and Massachusetts. The other is in the midwest, including states such as Wisconsin, Michigan, and North Dakota. There is one cluster of states that consistently exhibits low prevalence of alcohol consumption. This cluster is in the south, including states such as Tennessee, Alabama, and Mississippi. These area maps also show states outside of these clusters exhibiting consistently high and low prevalence rates. For example, Colorado's prevalence rates are in the highest category for every year except for 2010 and 2019. Additionally, Utah's prevalence rates are in the lowest category for every year in the analysis. These states stand out for their consistent trends, despite not being part of a cluster.

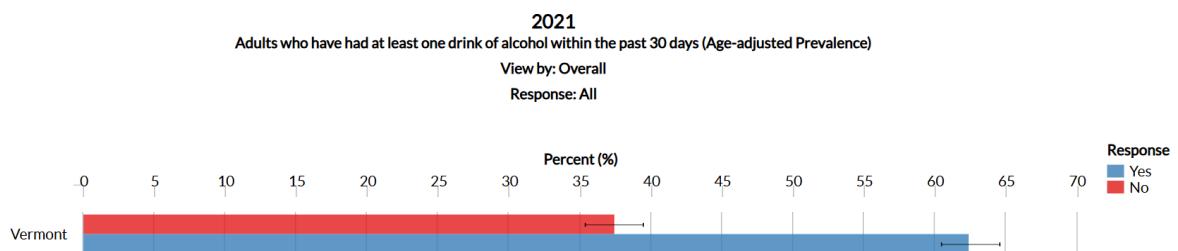
## Highest Prevalence States - 2021



**Figure 28.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in D.C. in 2021 (BRFSS; Centers for Disease Control and Prevention).



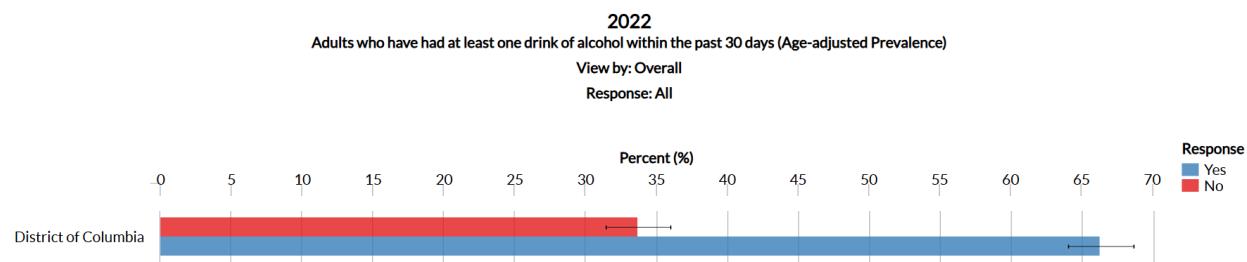
**Figure 29.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in Wisconsin in 2021 (BRFSS; Centers for Disease Control and Prevention).



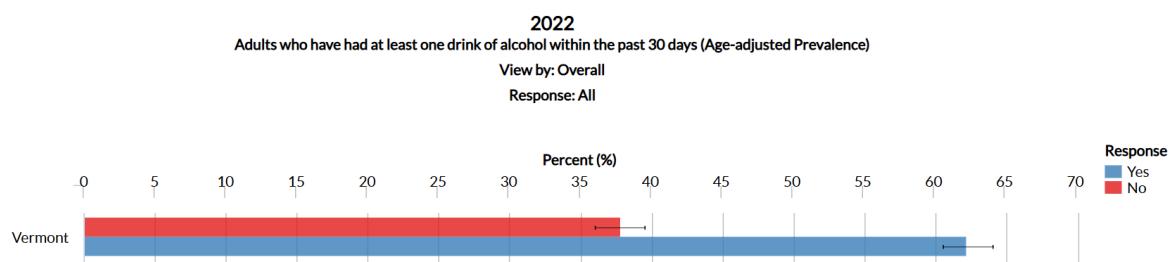
**Figure 30.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in Vermont in 2021 (BRFSS; Centers for Disease Control and Prevention).

The three states with the highest age-adjusted prevalence rates of alcohol consumption in the year 2021 were D.C., Wisconsin, and Vermont.

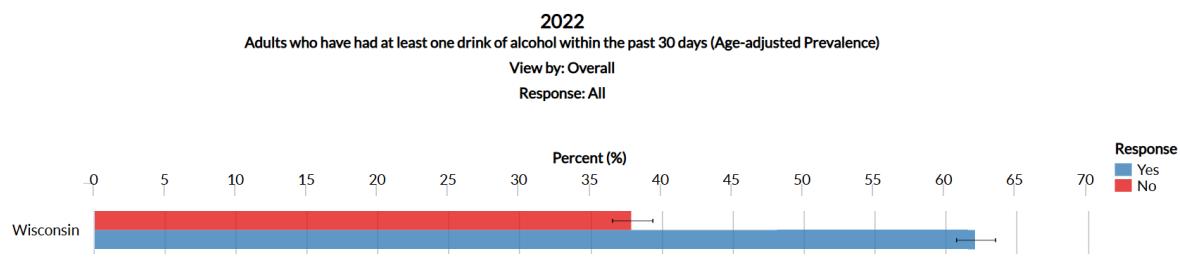
## Highest Prevalence States - 2022



**Figure 31.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in D.C. in 2022 (BRFSS; Centers for Disease Control and Prevention).



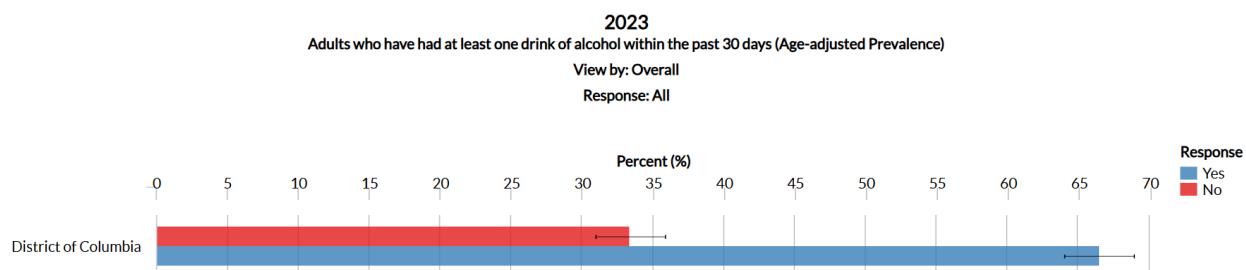
**Figure 32.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in Vermont in 2022 (BRFSS; Centers for Disease Control and Prevention).



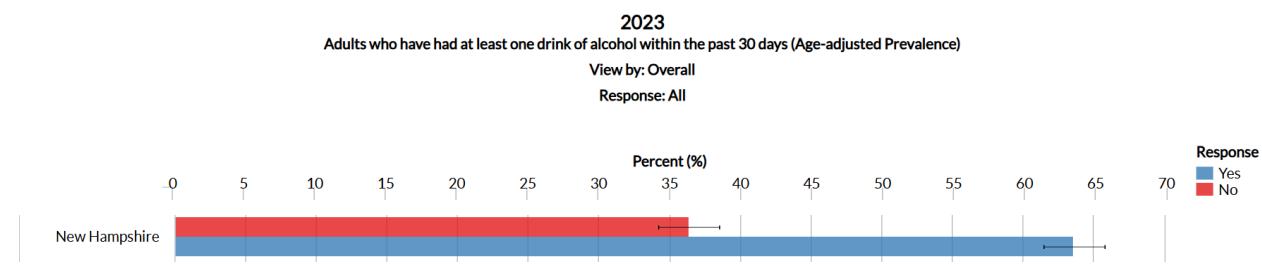
**Figure 33.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in Wisconsin in 2022 (BRFSS; Centers for Disease Control and Prevention).

The three states with the highest age-adjusted prevalence rates of alcohol consumption in the year 2022 were D.C., Vermont, and Wisconsin.

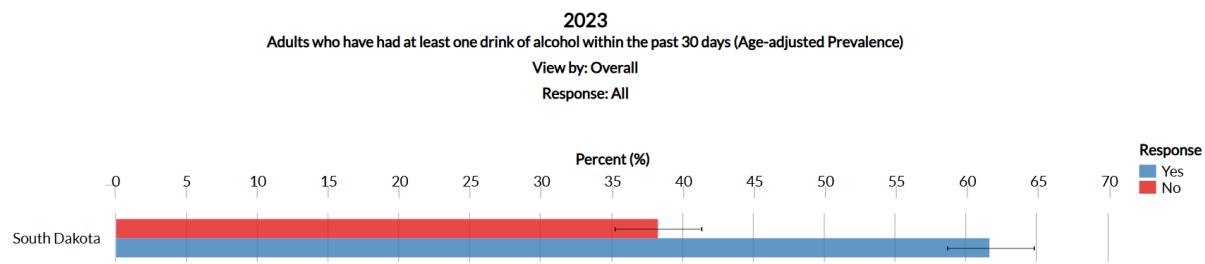
## Highest Prevalence States - 2023



**Figure 34.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in D.C. in 2023 (BRFSS; Centers for Disease Control and Prevention).



**Figure 35.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in New Hampshire in 2023 (BRFSS; Centers for Disease Control and Prevention).

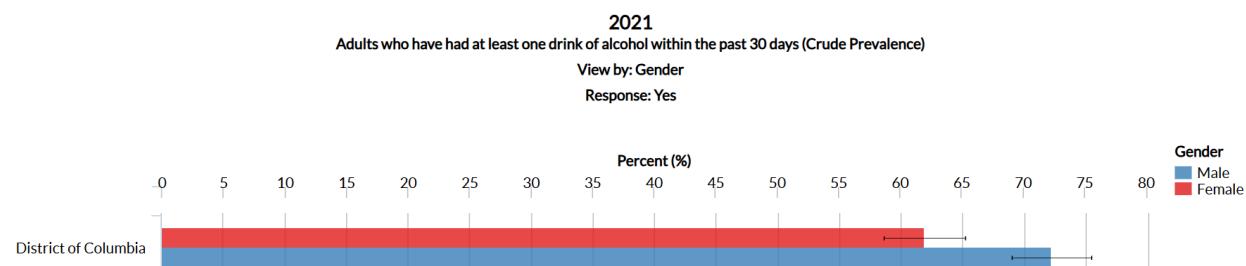


**Figure 36.** Bar graph displaying age-adjusted prevalence of adult alcohol consumption in South Dakota in 2023 (BRFSS; Centers for Disease Control and Prevention).

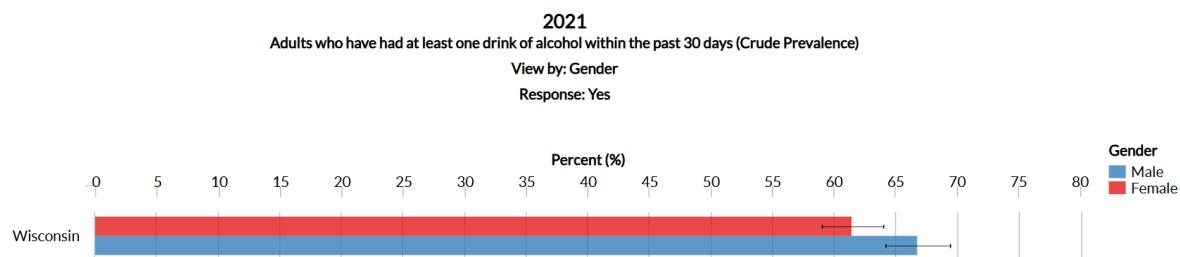
The three states with the highest age-adjusted prevalence rates of alcohol consumption in the year 2023 were D.C., New Hampshire, and South Dakota.

## Demographic Distribution of Highest Prevalence States - 2021

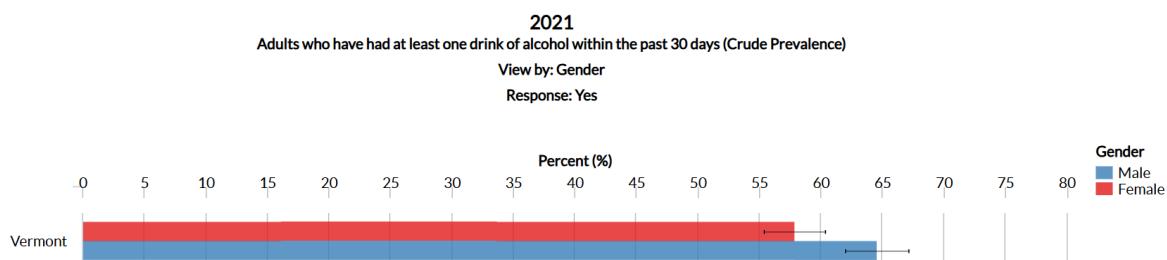
### Gender



**Figure 37.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in D.C. in 2021 (BRFSS; Centers for Disease Control and Prevention).



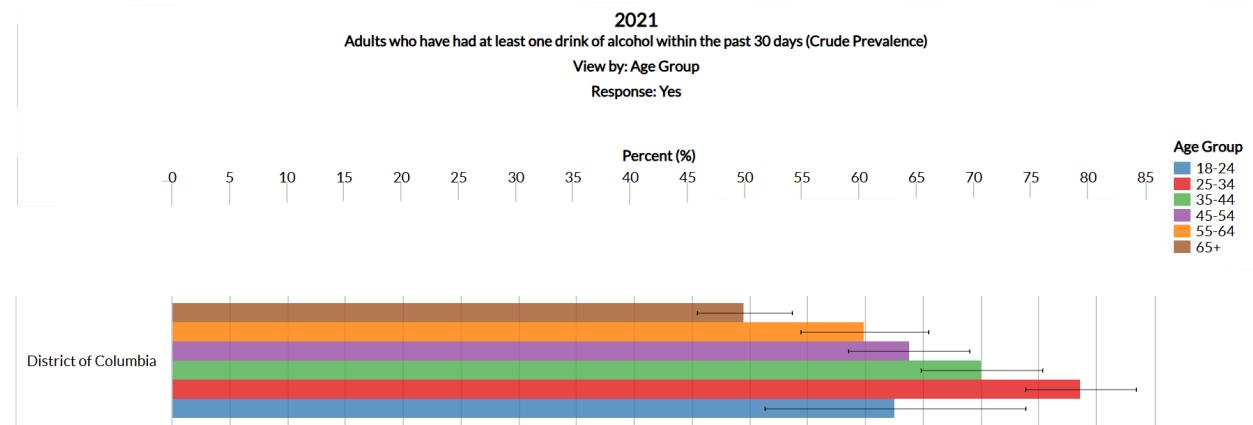
**Figure 38.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in Wisconsin in 2021 (BRFSS; Centers for Disease Control and Prevention).



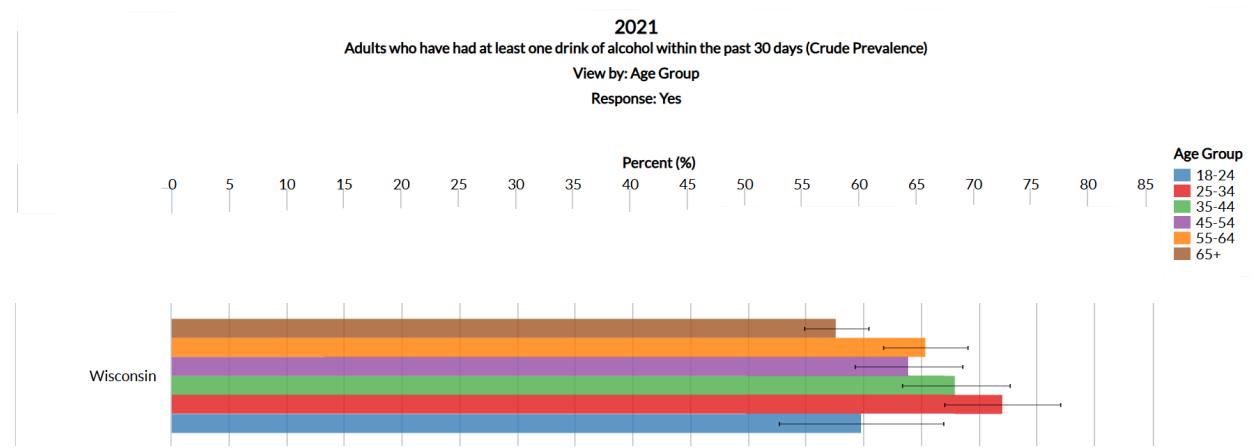
**Figure 39.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in Vermont in 2021 (BRFSS; Centers for Disease Control and Prevention).

The gender distribution in the three states with the highest prevalence of alcohol consumption in 2021 revealed that, in each state, men consumed alcohol at higher rates than women.

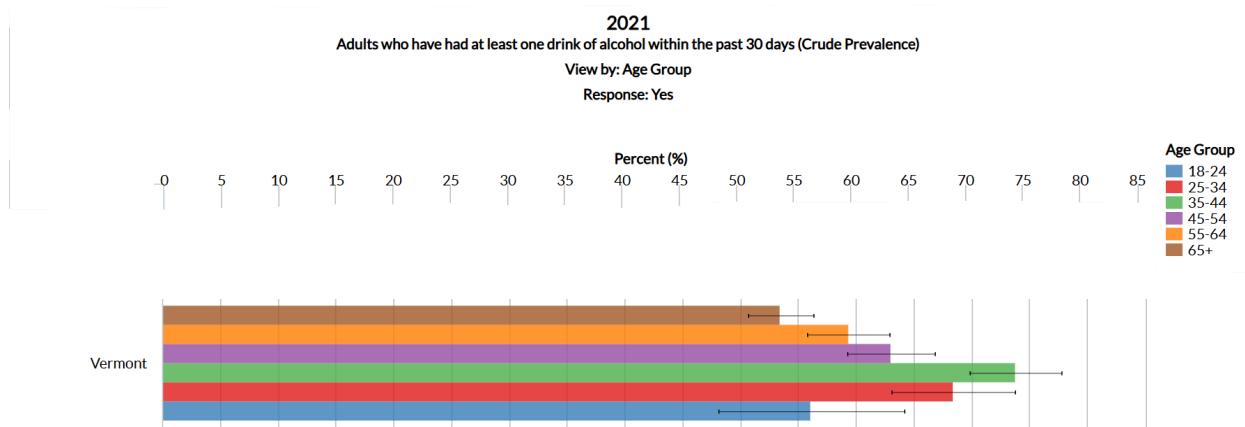
## Age Group



**Figure 40.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in D.C. in 2021 (BRFSS; Centers for Disease Control and Prevention).



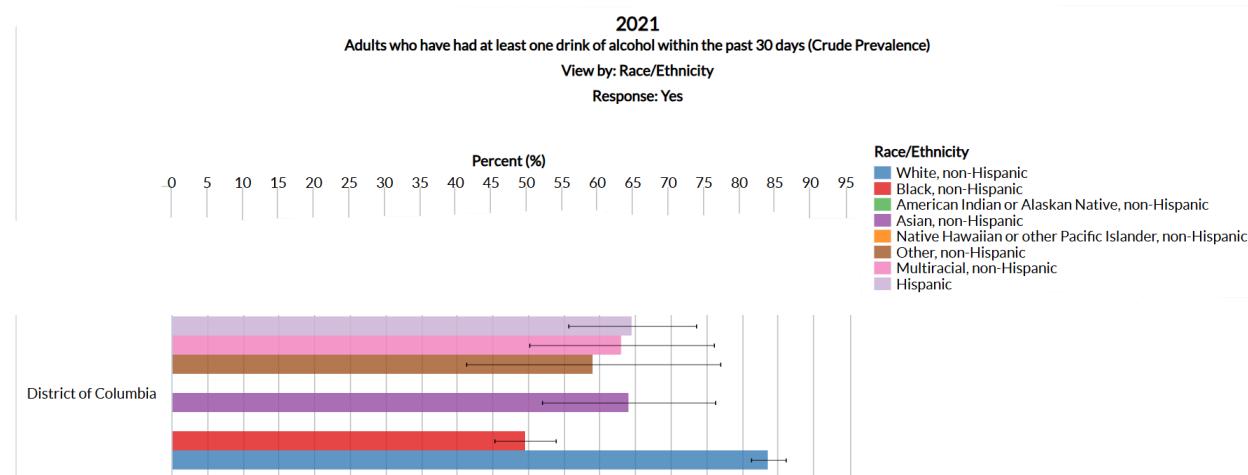
**Figure 41.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in Wisconsin in 2021 (BRFSS; Centers for Disease Control and Prevention).



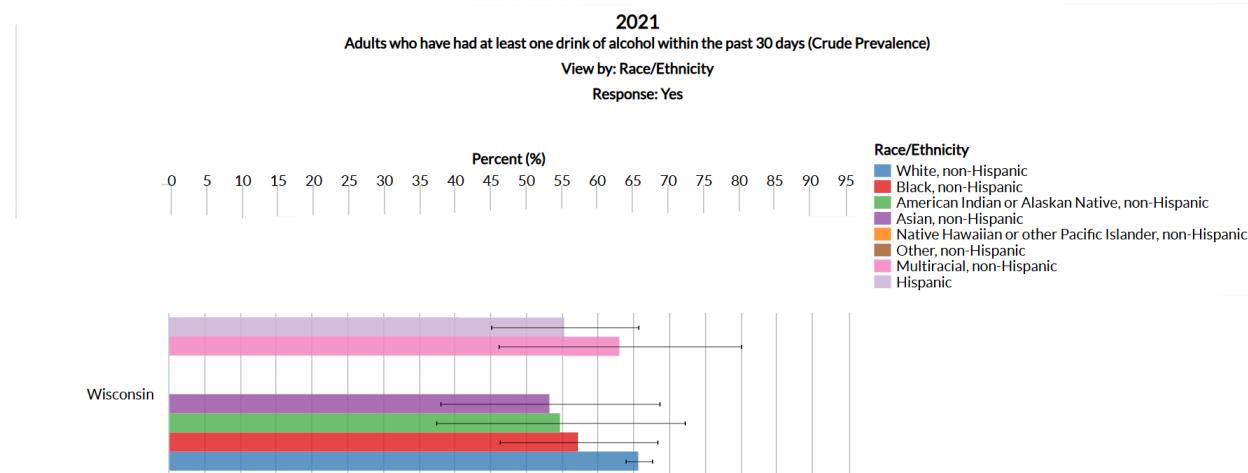
**Figure 42.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in Vermont in 2021 (BRFSS; Centers for Disease Control and Prevention).

The age group distribution in the three states with the highest prevalence of alcohol consumption in 2021 revealed that in D.C. and Wisconsin, the age group with the highest prevalence of consumption was 25-34 year olds, followed by 35-44 year olds in both states. In Vermont, the age group with the highest prevalence of consumption was 35-44 year olds, followed by 25-34 year olds.

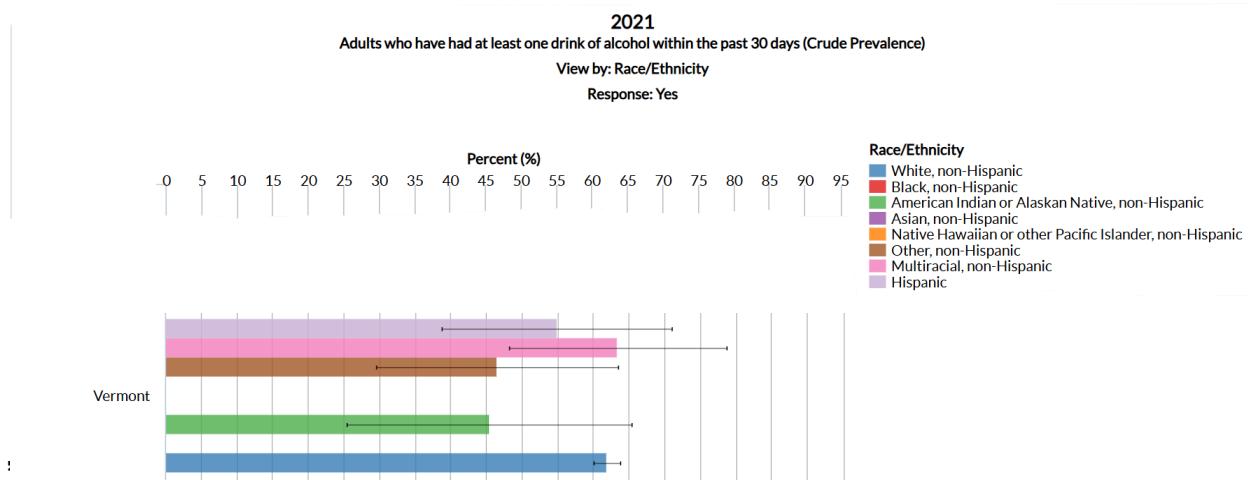
## Race/Ethnicity



**Figure 43.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in D.C. in 2021 (BRFSS; Centers for Disease Control and Prevention).



**Figure 44.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in Wisconsin in 2021 (BRFSS; Centers for Disease Control and Prevention).

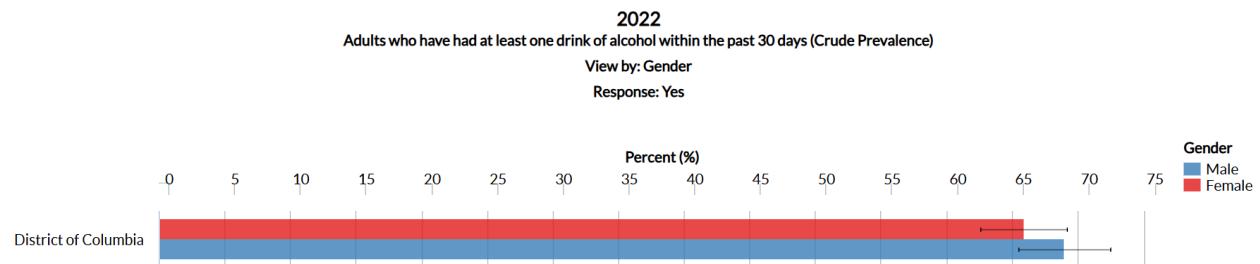


**Figure 45.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in Vermont in 2021 (BRFSS; Centers for Disease Control and Prevention).

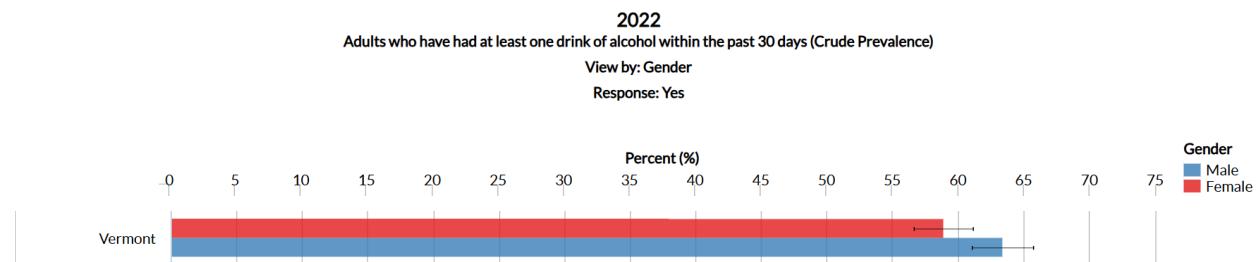
The race/ethnicity distribution in the three states with the highest prevalence of alcohol consumption in 2021 revealed that in D.C. and Wisconsin, the race/ethnicity with the highest prevalence of alcohol consumption was white/non-hispanic, followed by hispanic in D.C. and multiracial/non-hispanic in Wisconsin. In Vermont, the race/ethnicity with the highest prevalence of alcohol consumption was multiracial/non-hispanic, followed by white/non-hispanic.

## Demographic Distribution of Highest Prevalence States - 2022

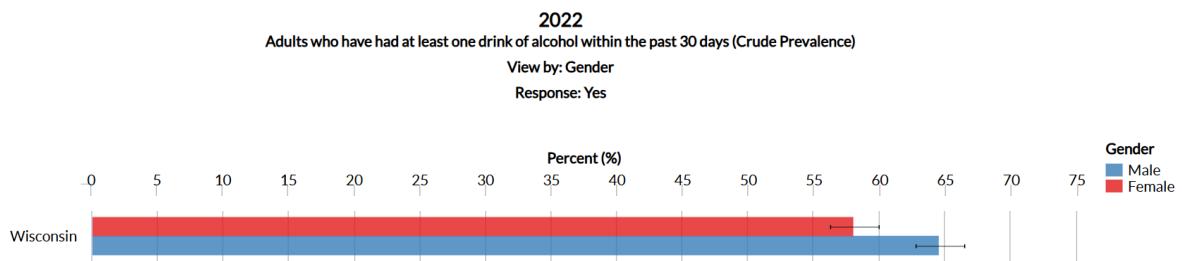
### Gender



**Figure 46.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in D.C. in 2022 (BRFSS; Centers for Disease Control and Prevention).



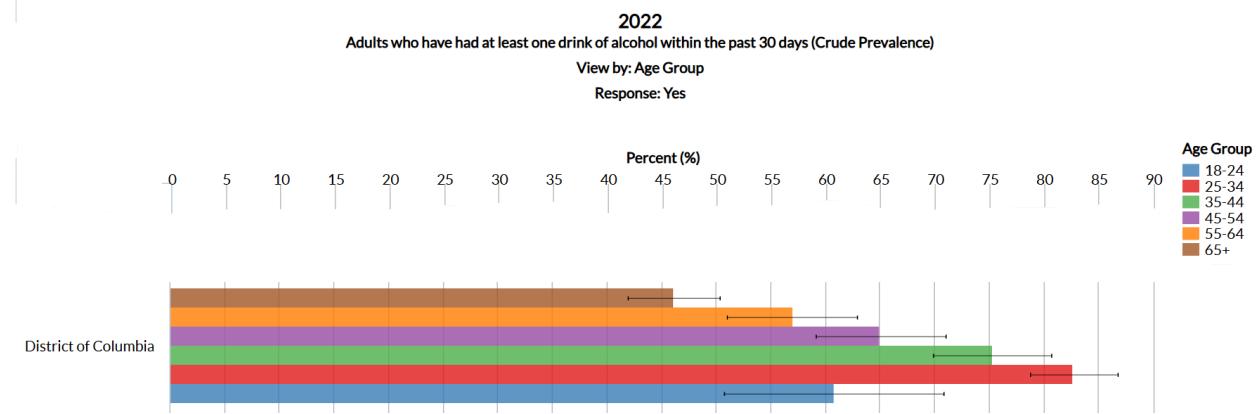
**Figure 47.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in Vermont in 2022 (BRFSS; Centers for Disease Control and Prevention).



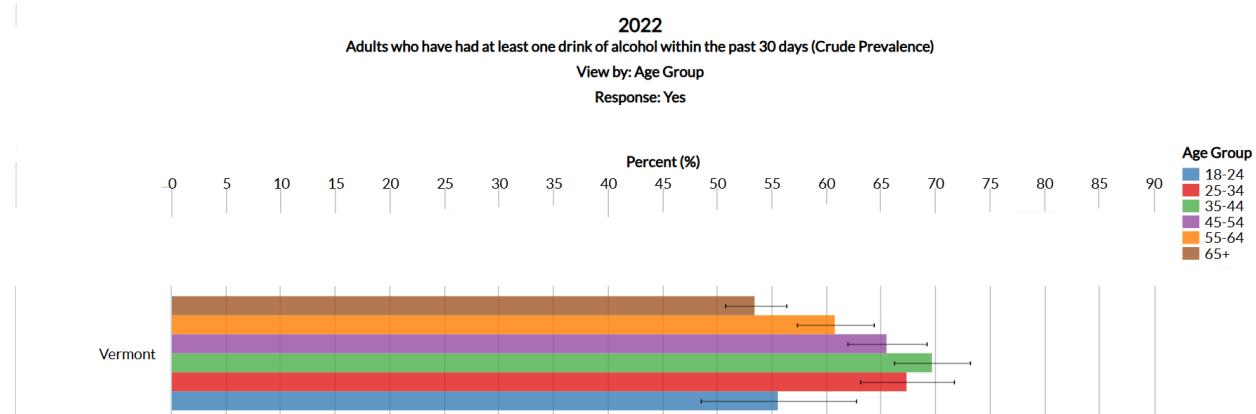
**Figure 48.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in Wisconsin in 2022 (BRFSS; Centers for Disease Control and Prevention).

The gender distribution in the three states with the highest prevalence of alcohol consumption in 2022 revealed that, in each state, men consumed alcohol at higher rates than women.

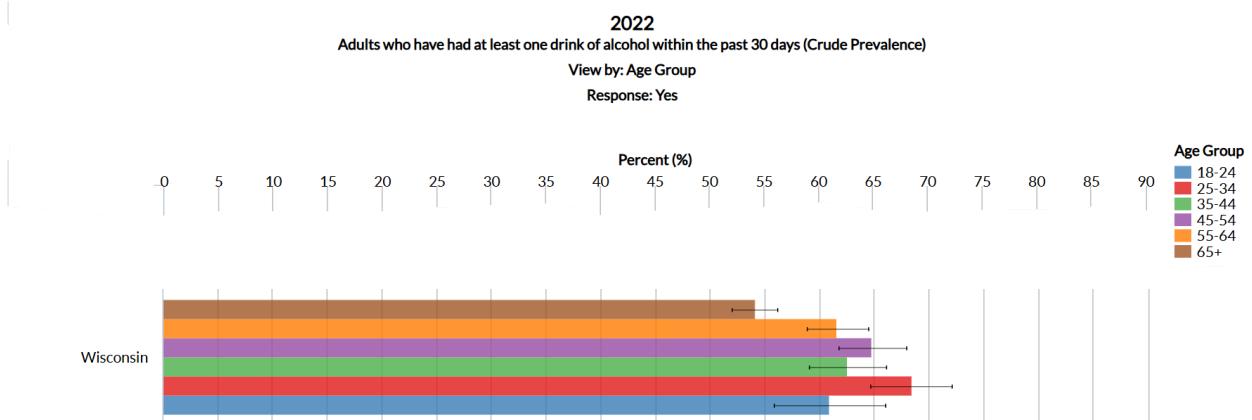
## Age Group



**Figure 49.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in D.C. in 2022 (BRFSS; Centers for Disease Control and Prevention).



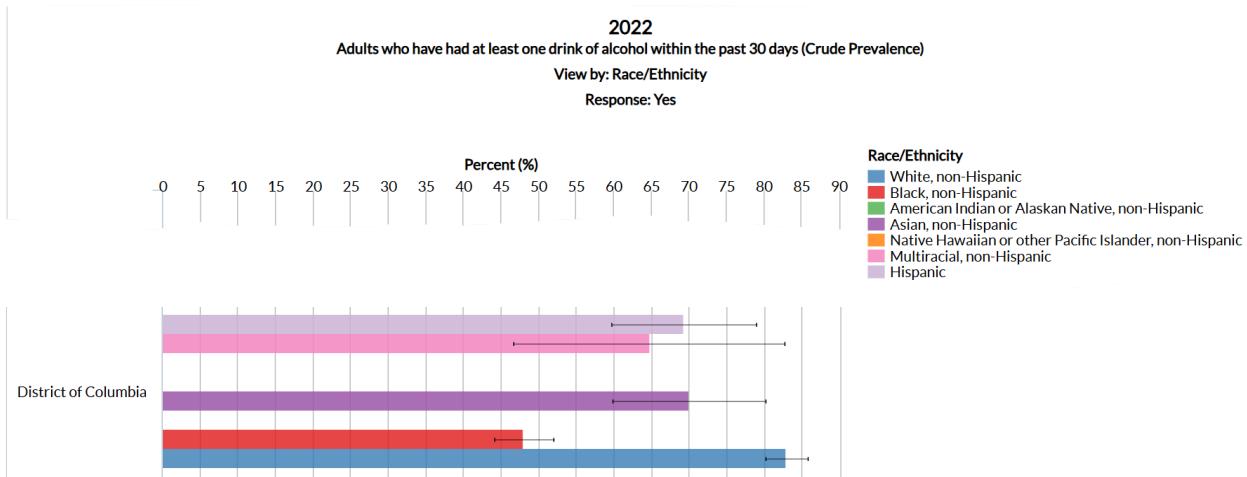
**Figure 50.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in Vermont in 2022 (BRFSS; Centers for Disease Control and Prevention).



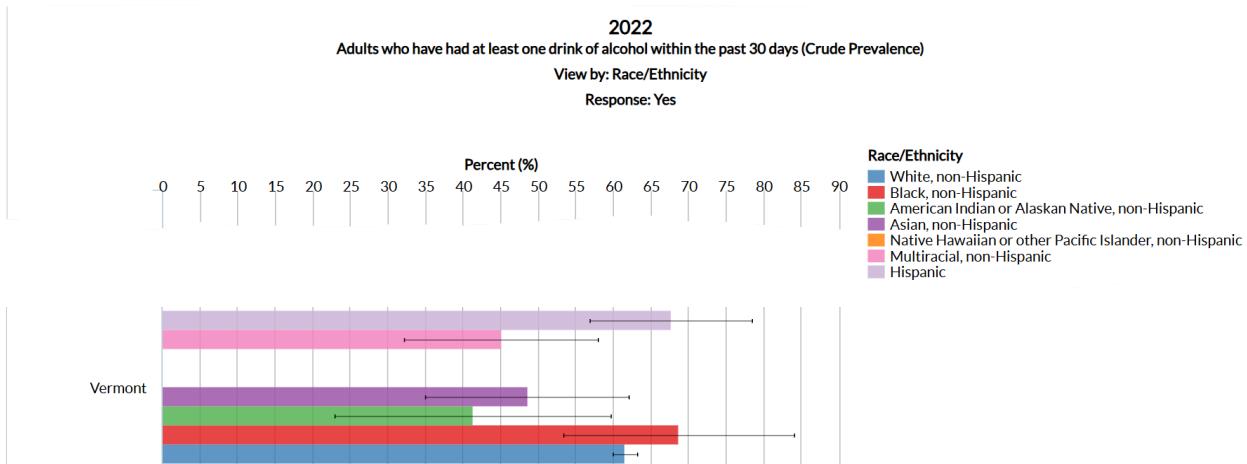
**Figure 51.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in Wisconsin in 2022 (BRFSS; Centers for Disease Control and Prevention).

The age group distribution in the three states with the highest prevalence of alcohol consumption in 2022 revealed that in D.C. and Wisconsin, the age group with the highest prevalence of consumption was 25-34 year olds, followed by 35-44 year olds in D.C. and 45-54 year olds in Wisconsin. In Vermont, the age group with the highest prevalence of consumption was 35-44 year olds, followed by 25-34 year olds.

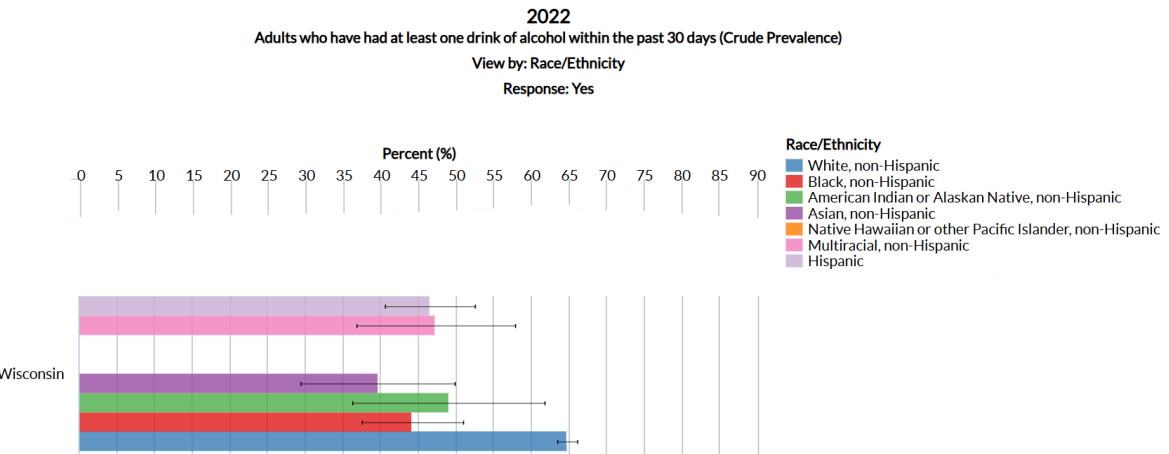
## Race/Ethnicity



**Figure 52.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in D.C. in 2022 (BRFSS; Centers for Disease Control and Prevention).



**Figure 53.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in Vermont in 2022 (BRFSS; Centers for Disease Control and Prevention).

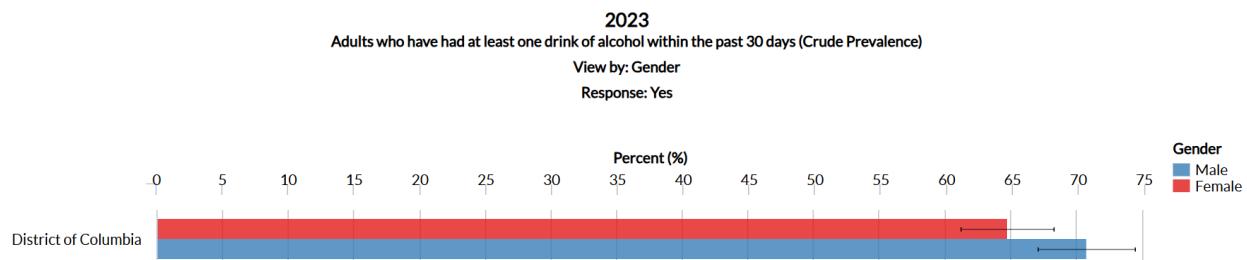


**Figure 54.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in Wisconsin in 2022 (BRFSS; Centers for Disease Control and Prevention).

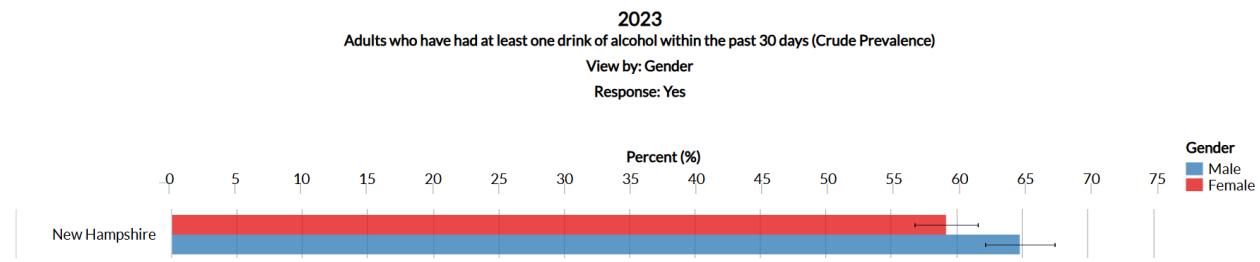
The race/ethnicity distribution in the three states with the highest prevalence of alcohol consumption in 2022 revealed that in D.C. and Wisconsin, the race/ethnicity with the highest prevalence of alcohol consumption was white/non-hispanic, followed by asian/non-hispanic in D.C. and american indian or alaskan native/non-hispanic in Wisconsin. In Vermont, the race/ethnicity with the highest prevalence of alcohol consumption was black/non-hispanic, followed by hispanic.

## Demographic Distribution of Highest Prevalence States - 2023

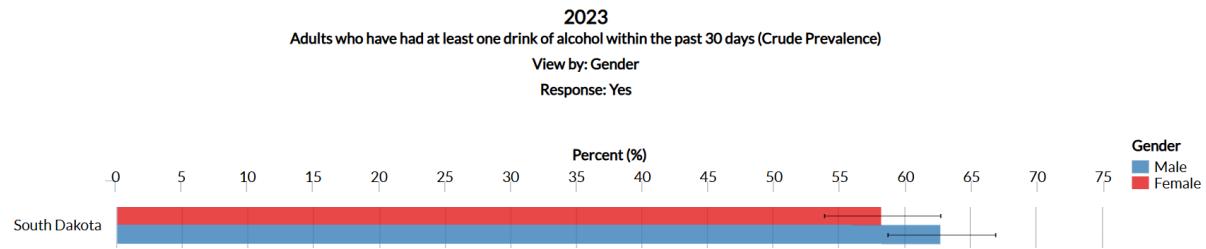
### Gender



**Figure 55.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in D.C. in 2023 (BRFSS; Centers for Disease Control and Prevention).



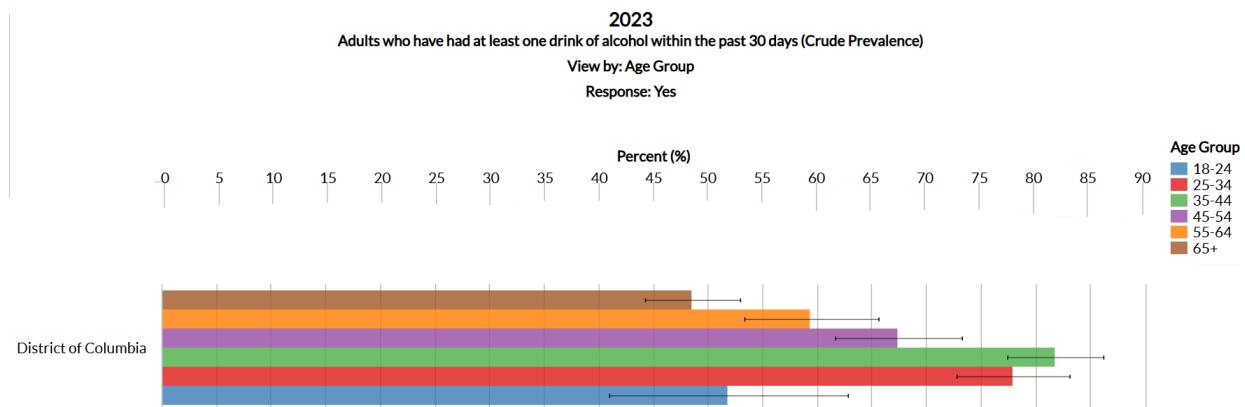
**Figure 56.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in New Hampshire in 2023 (BRFSS; Centers for Disease Control and Prevention).



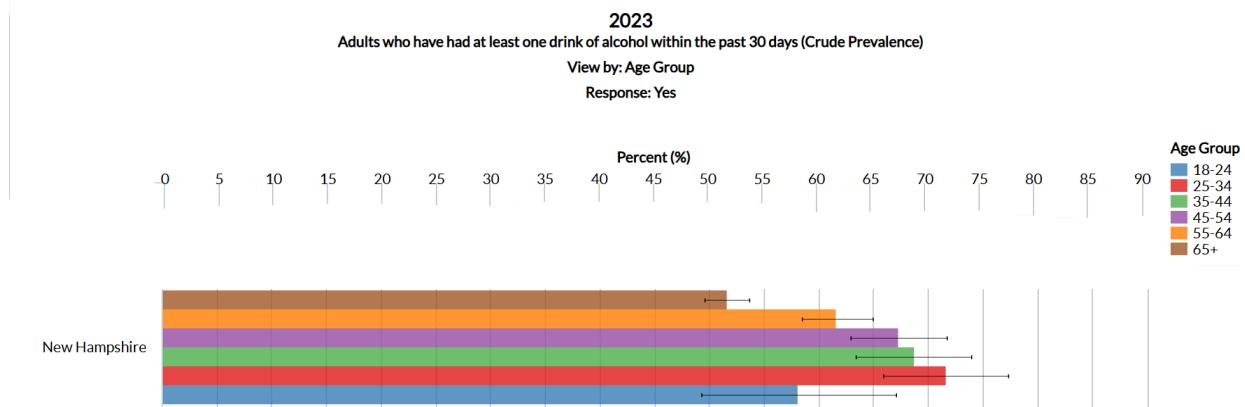
**Figure 57.** Bar graph displaying crude prevalence of adult alcohol consumption by gender in South Dakota in 2023 (BRFSS; Centers for Disease Control and Prevention).

The gender distribution in the three states with the highest prevalence of alcohol consumption in 2023 revealed that, in each state, men consumed alcohol at higher rates than women.

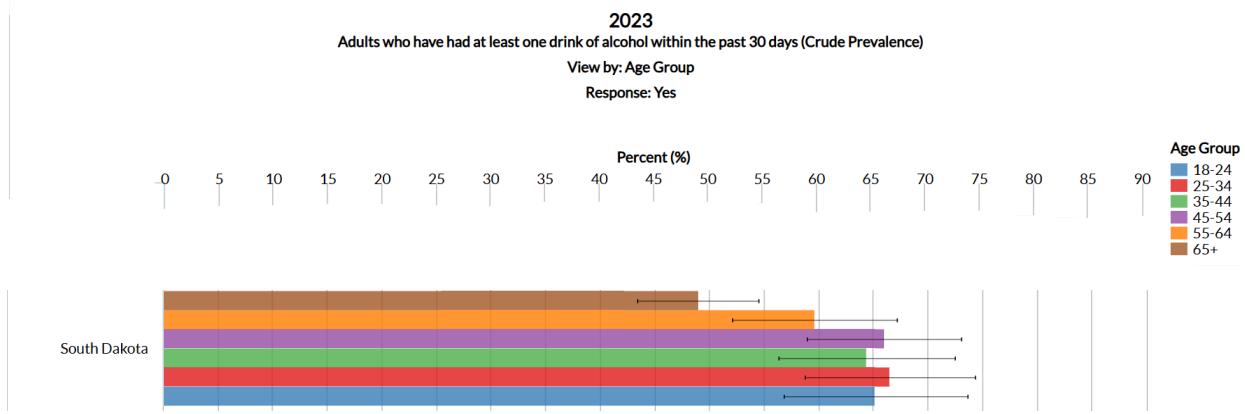
## Age Group



**Figure 58.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in D.C. in 2023 (BRFSS; Centers for Disease Control and Prevention).



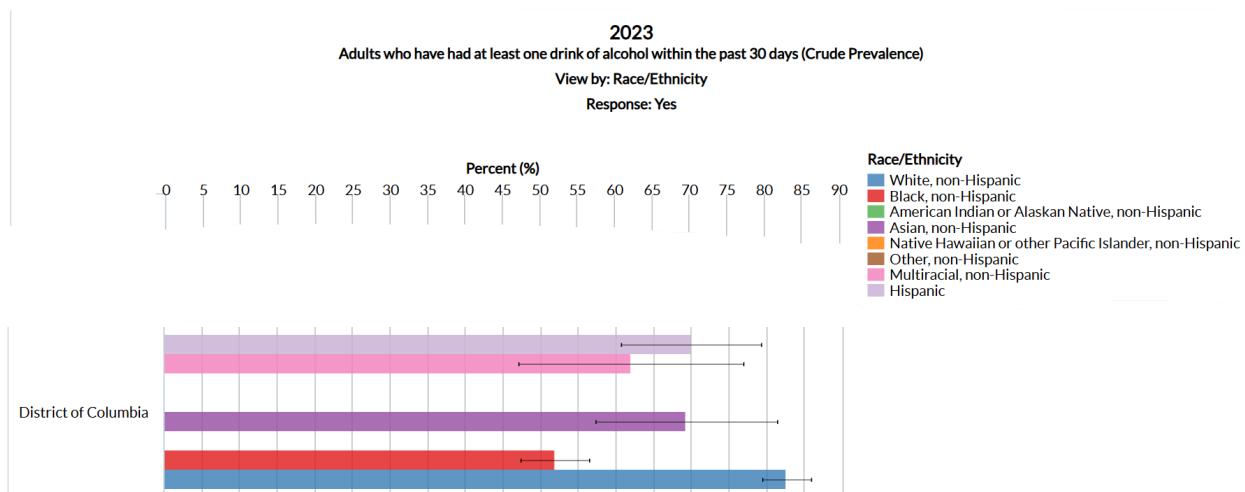
**Figure 59.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in New Hampshire in 2023 (BRFSS; Centers for Disease Control and Prevention).



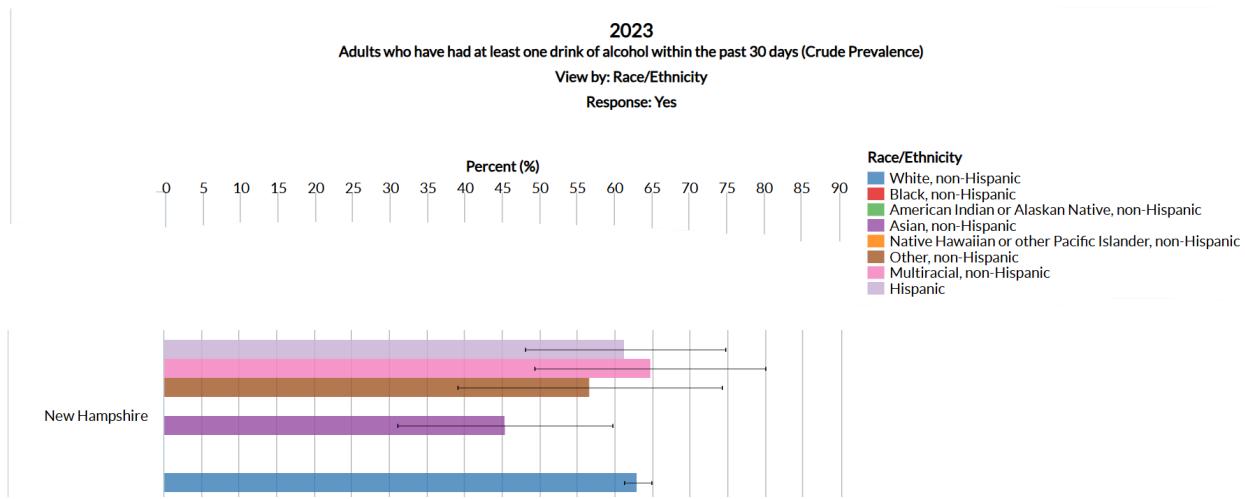
**Figure 60.** Bar graph displaying crude prevalence of adult alcohol consumption by age group in South Dakota in 2023 (BRFSS; Centers for Disease Control and Prevention).

The age group distribution in the three states with the highest prevalence of alcohol consumption in 2023 revealed that in D.C., the age group with the highest prevalence of consumption was 35-44 year olds, followed by 25-34 year olds. In New Hampshire and South Dakota, the age group with the highest prevalence of consumption was 25-34 year olds, followed by 35-44 year olds in New Hampshire and 45-54 year olds in South Dakota.

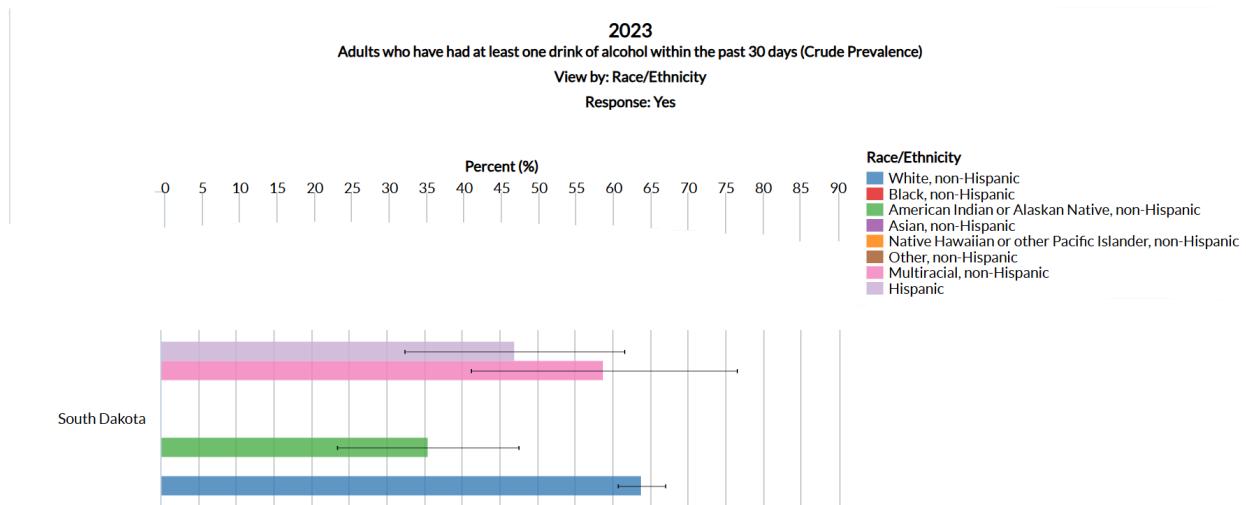
## Race/Ethnicity



**Figure 61.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in D.C. in 2023 (BRFSS; Centers for Disease Control and Prevention).



**Figure 62.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in New Hampshire in 2023 (BRFSS; Centers for Disease Control and Prevention).



**Figure 63.** Bar graph displaying crude prevalence of adult alcohol consumption by race/ethnicity in South Dakota in 2023 (BRFSS; Centers for Disease Control and Prevention).

The race/ethnicity distribution in the three states with the highest prevalence of alcohol consumption in 2023 revealed that in D.C. and South Dakota, the race/ethnicity with the highest prevalence of alcohol consumption was white/non-hispanic, followed by hispanic in D.C. and american indian or alaskan multiracial/non-hispanic in South Dakota. In New Hampshire, the race/ethnicity with the highest prevalence of alcohol consumption was multiracial/non-hispanic, followed by white/non-hispanic.

## **IV. Discussion**

### **Summary of Results**

The results show that there are regional and demographic disparities in the prevalence of adult alcohol consumption in the United States from 1995 to 2023. Regionally, the area maps showed that there are clusters of states that exist which consistently display similarly high or low prevalence rates. The clusters in the northeast and midwest display high prevalence rates throughout the time period. The cluster in the northeast contains Vermont, which is one of the top 3 states in 2021 and 2022. The cluster in the midwest contains Wisconsin, which is also one of the top three states in 2021 and 2022. The cluster in the south displays low prevalence rates throughout the time period. (Figures 2 - 27)

The bar graphs created displaying prevalence of alcohol consumption by state in years 2021, 2022, and 2023 showed that D.C. had the highest prevalence each year, Wisconsin and Vermont were both two of the three highest states during two of the three most recent years, and New Hampshire and South Dakota were two of the highest three states in one of the three most recent years (Figures 28 - 36).

The bar graphs displaying demographic data showed that overall, men have a higher prevalence of alcohol consumption than women. This finding was consistent in every graph created regarding gender (Figures 37, 38, 39, 46, 47, 48, 55, 56, and 57). The bar graphs displaying age group data showed that the age group that most commonly had the highest prevalence of alcohol consumption was 25-34 year olds,

followed by 35-44 year olds (Figures 40, 41, 42, 49, 50, 51, 58, 59, and 60). The bar graphs displaying race/ethnicity data showed that the race/ethnicity that most commonly had the highest prevalence of alcohol consumption was non-hispanic white. This group was followed by multiracial populations (Figures 43, 44, 45, 52, 53, 54, 61, 62, and 63).

## **Interpretation**

The trends in adult alcohol consumption from 1995 to 2023 reveal significant regional and demographic disparities, which have important implications for public health (Centers for Disease Control and Prevention, 2023). These findings can guide targeted interventions and policies to address alcohol-related health issues effectively. The regional trends showing high prevalence clusters in the midwest and northeast may reflect cultural norms of those areas that encourage alcohol use, emphasizing the need for localized education and prevention efforts.

The demographic trends also showed that men consume alcohol at a higher prevalence than women (Centers for Disease Control and Prevention, 2023). This could be due to social norms and existing behavior patterns of men and male groups that encourage alcohol consumption. Specifically, studies have found that factors such as biological differences between men and women, differences in alcohol-related illness susceptibility, and differences in gender-related lifestyle choices contribute to men drinking at larger rates than women (Holmila & Raitasalo, 2005). The demographic trends also show that 25-34 year olds have the highest prevalence of alcohol consumption followed by ages 35-44 (Centers for Disease Control and Prevention, 2023). This could be due to life stage factors, norms, and expectations that exist for

individuals in the earlier years of life that promote alcohol consumption. Notably, a study found that the motives young people experience that encourages them to drink are social factors, drinking as a coping strategy, and drinking for mood and well-being enhancement (Lyvers et al., 2010). Additionally, the demographic data showed that non-hispanic white populations had the highest prevalence of alcohol consumption (Centers for Disease Control and Prevention, 2023). This may be due to a combination of factors, including cultural norms, socioeconomic status, and historical patterns of alcohol use within these communities. One study related to this topic found that white individuals felt drinking motivations related to a sense of belonging, and that white individuals in college are more likely to be members or fraternities or sororities, which are associated with high levels of drinking (Straka et al., 2019). The trends in alcohol consumption reflect the influence of cultural, social, and biological factors across regions and demographics. Targeted interventions that address these specific motivators and risk factors are essential for reducing alcohol-related harm and improving public health outcomes.

### **Comparison with Other Studies**

The National Institute on Alcohol Abuse and Alcoholism reports that drinkers in the midwest were more likely to report alcohol dependence than drinkers in the south (U.S. Department of Health and Human Services, 2024). This finding aligns with the surveillance system data from this study, which also identified higher alcohol consumption prevalence in the Midwest compared to the South in the time period from 1995 to 2023. The National Institute on Alcohol Abuse and Alcoholism also found that

the rural south had the lowest percentage of residents exceeding daily drinking limits, at 17.3 percent (U.S. Department of Health and Human Services, 2024). This aligns with this study's findings, as the area maps showed southern states having consistently low prevalence of alcohol consumption for the whole time period between 1995 and 2023. Additionally, the National Institute on Alcohol Abuse and Alcoholism found that residents of the Northeast had the lowest lifetime abstinence rate of any region at 9.2 percent (U.S. Department of Health and Human Services, 2024). This also aligns with the findings of this study, as the Northeast had consistently high prevalence rates of alcohol consumption for the whole time period between 1995 and 2023.

A study published in 2016 showed that while men consume alcohol at higher rates than women, the prevalence of women consuming alcohol has been steadily increasing and the gaps between genders are getting significantly smaller. Also, it was found that men experience and cause more alcohol related injuries and deaths than women do (White, 2020). This aligns with the findings from the BRFSS, and provides more insight into how the gender distribution is changing. Another study published about alcohol use within subpopulations found that younger populations are at a particularly high risk of unintentional risk caused by drinking and alcohol use disorder (Delker et al., 2016). These findings along with the findings from the BRFSS highlight the high vulnerability of younger individuals to the negative consequences of alcohol consumption and the importance of targeting these younger age groups with interventions due to their high rates of consumption. The same study also reported that while white individuals have the highest rates of alcohol consumption, alcohol abuse and dependence are most common among Native American populations (Delker et al.,

2016). This adds important context about the distribution of the health issue to the findings from the BRFSS. Overall, there is consistently the results from the BRFSS data with data from other studies. Referencing these additional studies is important as it leads to adding context and insight to the data found in the initial study.

### **Strengths and Weaknesses**

One strength of this study is that the surveillance system used, the BRFSS, collects large amounts of data each year, resulting in a large sample size for the study and information from many individuals in every state. Additionally, a strength of this study is that the BRFSS collects a wide range of information about health, allowing for an in-depth analysis into factors such as age and gender demographics. It is also a strength that the data regarding alcohol consumption has been collected over a long period of time. Having access to data from 1995 to 2023 allows for analysis of time trends over multiple decades (Centers for Disease Control and Prevention, 2022).

A limitation of this study is that since the data is collected by telephone interview, individuals who do not have telephones are excluded from the study and the data from that subpopulation is not represented in overall trends. Another limitation of this study is the potential for non-response bias, as individuals who choose not to participate in the telephone surveys are not included in the dataset, leading to the exclusion of their health behaviors from the analysis (Centers for Disease Control and Prevention, 2022).

## **VI. Conclusion**

### **Key Findings**

This study of adult alcohol consumption trends in the U.S., from 1995 to 2023, using data from the CDC's Behavioral Risk Factor Surveillance System, shows important findings about trends of alcohol consumption and reveals significant regional and demographic disparities (Centers for Disease Control and Prevention, 2023). Overall, drinking in the U.S. rose between 1995 and 2004, then declined until 2010, and has fluctuated since then. The study highlights high prevalence clusters in the Midwest and Northeast, particularly in states like Wisconsin, Vermont, and D.C., while the South consistently shows lower rates. Demographic trends indicate that men have a higher prevalence of alcohol consumption than women. The 25-34 age group has the highest prevalence of consumption, followed by 35-44 year olds (Centers for Disease Control and Prevention, 2024). Non-Hispanic white individuals showed the highest rates of alcohol consumption by race. These findings point to the influence of social, cultural, and biological factors that affect these disparities and emphasize the need for tailored and targeted public health intervention. The information found in this study aligns with insights from other studies, suggesting that the BRFSS data is reliable in tracking alcohol consumption rates across regions and demographics.

The study's strengths include its extensive dataset, which provides a long-term view of alcohol consumption trends, but limitations such as potential bias due to the exclusion of non-telephone users and non-responses must be considered (Centers for Disease Control and Prevention, 2022). The overall findings and interpretation result in

a clear need for additional research into this topic and targeted, tailored public health intervention in high prevalence regions and demographics.

## **Public Health Implications**

The trends in alcohol consumption across the United States have significant public health implications. The time trend data showing that alcohol consumption has been fluctuating in recent years signals that there is room for intervention and improvement in alcohol consumption prevalence. The heightened prevalence of alcohol consumption in certain demographics and regions of the United States may contribute to increased burdens of alcohol-related health issues, such as infectious disease, increased diabetes risk, cancer, liver disease, cardiovascular disease, and more pressing public health issues (Rehm, 2011). Regions that experience a higher prevalence of alcohol consumption may experience strained healthcare systems and social networks. The implications of this study emphasize the need for tailored and targeted interventions to address alcohol consumption across the groups and regions experiencing the highest prevalence of consumption in the United States.

## **Recommendations**

Implementing targeted public health interventions and strategies will be essential in addressing the disparities and fluctuations of alcohol consumption trends. Suggested interventions will target regions and demographics with the highest prevalence rates of alcohol consumption. One suggested intervention is the Check Your Drinking (CYD) screener. This intervention is designed as an internet-based self evaluation tool to make

individuals aware of the severity of their drinking habits and to make them aware of the ways their drinking habits compare to individuals similar to them (Cunningham et al., 2009). This intervention showed a decrease in drinks per week in individuals who accessed the CYD tool, which is a positive indicator. Since this intervention is administered online, it would be able to be targeted towards individuals in high prevalence regions, or towards individuals of high prevalence demographics. This intervention would make individuals more aware of their drinking habits and has the potential to lower rates of alcohol consumption. Another suggested intervention is a long-term intervention for heavy drinking middle aged men (Kristenson et al., 1983). This intervention involves selecting middle-aged male participants and encouraging these participants to lower their alcohol consumption. The intervention was administered by mailed letters of encouragement and participants also were invited to monitor their liver enzymes for signs of heavy drinking throughout the intervention. This intervention was found to be successful, as heavy drinking rates were lowered in men who completed the intervention and sick absences, hospital stays, and mortality was lowered in the 6 years after the intervention (Kristenson et al., 1983). This intervention is very tailored to the male demographic and should be utilized to address the large gender disparities that have been shown in this study. By targeting men with specific intervention such as this, public health professionals can work towards decreasing the disparities between men and women's alcohol consumption prevalence. Overall, interventions should be able to be tailored to the specific groups that the study found has the highest prevalence of alcohol consumption in order to address the most pressing disparities regarding alcohol consumption in the United States.

Future research should focus on exploring additional variables and expanding on individual motivation behind alcohol consumption to enhance the understanding of alcohol consumption patterns and to understand how to effectively manage it. Additional variables to monitor include more specific regional areas such as cities and counties. Data addressing differences between these smaller regional areas would provide important insight into where public health interventions are needed the most. Another variable that should be looked into is household income. Exploring the connection between this and alcohol consumption would provide many further insights into the driving factors behind alcohol consumption. Individual motivation is extremely important to understand when it comes to the health behavior of alcohol consumption. Understanding individual motivation is crucial in understanding how to direct public health initiatives and interventions, which is crucial for the health issue of alcohol consumption.

## References

- Aggarwal, R., & Ranganathan, P. (2019). Study designs: Part 2 – descriptive studies. *Perspectives in Clinical Research*, 10(1), 34.  
[https://doi.org/10.4103/picr.picr\\_154\\_18](https://doi.org/10.4103/picr.picr_154_18)
- Alpert, H. R., Slater, M. E., Yoon, Y.-H., Chen, C. M., Winstanley, N., & Esser, M. B. (2022). Alcohol consumption and 15 causes of fatal injuries: A systematic review and meta-analysis. *American Journal of Preventive Medicine*, 63(2), 286–300.  
<https://doi.org/10.1016/j.amepre.2022.03.025>
- Andre F Carvalho, Markus Heilig, Augusto Perez, Charlotte Probst, Jürgen Rehm, Alcohol use disorders, *The Lancet*, Volume 394, Issue 10200, 2019, Pages 781-792, ISSN 0140-6736,  
[https://doi.org/10.1016/S0140-6736\(19\)31775-1](https://doi.org/10.1016/S0140-6736(19)31775-1).  
(<https://www.sciencedirect.com/science/article/pii/S0140673619317751>)
- Centers for Disease Control and Prevention. (2022, October 27). *CDC - BRFSS - BRFSS Frequently asked questions (faqs)*. Centers for Disease Control and Prevention.  
[https://www.cdc.gov/brfss/about/brfss\\_faq.htm](https://www.cdc.gov/brfss/about/brfss_faq.htm)

Centers for Disease Control and Prevention. (2023, July 19). *BRFSS prevalence & trends data: Home*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/brfss/brfssprevalence/index.html>

Centers for Disease Control and Prevention. (2024, September 11). *CDC - about BRFSS*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/brfss/about/index.htm>

Centers for Disease Control and Prevention. (n.d.-a). *Alcohol use and your health*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/alcohol/about-alcohol-use/index.html>

Centers for Disease Control and Prevention. (n.d.-b). *Alcohol use and your health*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/alcohol/about-alcohol-use/index.html>

Centers for Disease Control and Prevention. (n.d.-c). *BRFSS prevalence & trends data: Explore by topic*. Centers for Disease Control and Prevention.

[https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH\\_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&isIClasses=CLASS01&isITopic=TOPIC03&isIYear=2023&rdRnd=60159](https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&isIClasses=CLASS01&isITopic=TOPIC03&isIYear=2023&rdRnd=60159)

Centers for Disease Control and Prevention. (2023). BRFSS overview. Centers for Disease Control and Prevention.

[https://www.cdc.gov/brfss/annual\\_data/2023/pdf/Overview\\_2023-508.pdf](https://www.cdc.gov/brfss/annual_data/2023/pdf/Overview_2023-508.pdf)

Cunningham, J. A., Wild, T. C., Cordingley, J., Van Mierlo, T., & Humphreys, K. (2009). A randomized controlled trial of an internet-based intervention for alcohol abusers. *Addiction*, 104(12), 2023–2032.  
<https://doi.org/10.1111/j.1360-0443.2009.02726.x>

Delker, E., Brown, Q., & Hasin, D. S. (2016). *Alcohol consumption in demographic subpopulations: An epidemiologic overview*. Alcohol research : current reviews. <https://pmc.ncbi.nlm.nih.gov/articles/PMC4872616/>

Fernández-Solà, J. Cardiovascular risks and benefits of moderate and heavy alcohol consumption. *Nat Rev Cardiol* 12, 576–587 (2015).  
<https://doi.org/10.1038/nrcardio.2015.91>

Hendriks, H. F. J. (2020). Alcohol and human health: What is the evidence? *Annual Review of Food Science and Technology*, 11(1), 1–21.  
<https://doi.org/10.1146/annurev-food-032519-051827>

Holmila, M., & Raitasalo, K. (2005). Gender differences in drinking: Why do they still exist? *Addiction*, 100(12), 1763–1769.  
<https://doi.org/10.1111/j.1360-0443.2005.01249.x>

Kirk Wolter, Sadeq Chowdhury, Jenny Kelly, Chapter 7 - Design, Conduct, and Analysis of Random-Digit Dialing Surveys, Editor(s): C.R. Rao, Handbook of Statistics, Elsevier, Volume 29, Part A, 2009, Pages 125-154, ISSN 0169-7161, ISBN 9780444531247,  
[https://doi.org/10.1016/S0169-7161\(08\)00007-2](https://doi.org/10.1016/S0169-7161(08)00007-2).

(<https://www.sciencedirect.com/science/article/pii/S0169716108000072>)

Kristenson, H., Öhlin, H., Hultén-Nosslin, M., Trell, E., & Hood, B. (1983b). Identification and intervention of heavy drinking in middle-aged men: Results and follow-up of 24–60 months of long-term study with randomized controls. *Alcoholism: Clinical and Experimental Research*, 7(2), 203–209.

<https://doi.org/10.1111/j.1530-0277.1983.tb05441.x>

Lyvers, M., Hasking, P., Hani, R., Rhodes, M., & Trew, E. (2010). Drinking motives, drinking restraint and drinking behaviour among young adults. *Addictive Behaviors*, 35(2), 116–122.

<https://doi.org/10.1016/j.addbeh.2009.09.011>

National Cancer Institute. (n.d.). *NCI Dictionary of Cancer terms*. Comprehensive Cancer Information - NCI.

<https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cross-sectional-study>

Rehm, J. (2011). *The risks associated with alcohol use and Alcoholism*. *Alcohol research & health : the journal of the National Institute on Alcohol Abuse and Alcoholism*.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC3307043/>

Straka, B. C., Gaither, S. E., Acheson, S. K., & Swartzwelder, H. S. (2019). "mixed" drinking motivations: A comparison of majority, multiracial, and Minority College students. *Social Psychological and Personality Science*, 11(5), 676–687. <https://doi.org/10.1177/1948550619883294>

U.S. Department of Health and Human Services. (n.d.). *Alcohol use patterns among urban and rural residents: Demographic and social influences*. National Institute on Alcohol Abuse and Alcoholism. <https://arcr.niaaa.nih.gov/volume/38/1/alcohol-use-patterns-among-urban-and-rural-residents-demographic-and-social-influences>

Varghese, J., & Dakhode, S. (2022). Effects of alcohol consumption on various systems of the human body: A systematic review. *Cureus*. <https://doi.org/10.7759/cureus.30057>

White, A. (2020). Gender differences in the epidemiology of alcohol use and related harms in the United States. *Alcohol Research: Current Reviews*, 40(2). <https://doi.org/10.35946/arcr.v40.2.01>