4-20-2024

Assessing Socioeconomic Patterns of Excessive Alcohol Consumption in Ohio: A County-Level Analysis

Tate Barney

Dev Patel

Assessing Socioeconomic Patterns of Excessive Alcohol Consumption in Ohio: A County-Level Analysis

Tate Barney, Dev Patel

Wright State University Boonshoft School of Medicine

Scholarship in Medicine Final Report (April 20, 2024)

Abstract

Background: Excessive alcohol consumption poses significant public health challenges, with complex socioeconomic factors influencing drinking behaviors. Understanding the relationship between socioeconomic determinants and excessive drinking patterns at the state and county levels is crucial for informing targeted interventions.

Objective: To investigate the associations between excessive drinking (binge or heavy drinking) and socioeconomic factors, including median household income, mental health provider availability, health insurance coverage, educational attainment, and unemployment rates across counties in Ohio.

Methods: We analyzed data from the 2023 County Health Rankings for 88 counties in Ohio. Spearman correlations were used to assess associations between excessive drinking and socioeconomic variables. Paired t-tests examined changes in excessive drinking from 2016 to 2022. Linear regression determined predictors of excessive drinking in 2022.

Results: Excessive drinking showed a moderate positive correlation with median household income ($\rho=0.435$, $p<0.001$) and high school completion ($\rho=0.407$, $p<0.001$), and a moderate

negative correlation with being uninsured (ρ=-0.403, $p<0.001$) and unemployment rates (ρ=-0.371, $p<0.001$). No significant association with mental health provider availability. Excessive drinking increased from 17.4% in 2016 to 19.0% in 2022 ($p<0.001$). Unemployment was the strongest predictor in the regression model.

Key Words: alcohol consumption, socioeconomic factors, income, education, unemployment, health insurance, Ohio counties

Introduction

Binge drinking is an epidemic in the United States and across the world, posing a significant public health burden. In the United States, binge drinking is reported in 1 in 6 adults, and at least 25% reported binge drinking weekly.[1] Excessive alcohol consumption—which can include heavy drinking, binge drinking, repeated binge drinking, and the quantity of drinks consumed in a single binge episode—is associated with various negative health consequences, including an increased risk of over 200 diseases and injuries, and premature mortality, accounting for over 5.3% of deaths globally.[2,3,4] Furthermore, binge drinking also carries substantial economic costs, including healthcare expenditures, lost productivity, and costs associated with property damage and criminal justice involvement.[5] Most recent national estimates from 2010 indicate that the national cost of excessive alcohol use was $249 billion.[5] It also imposes immense social costs, disrupting relationships, families, and communities.[6] Addressing this issue from a public health perspective is crucial.

The primary objective of this study is to examine the socioeconomic patterns and influences related to excessive alcohol consumption within the state of Ohio. The study aims to elucidate the complex interplay between various socioeconomic factors related to binge drinking

including household income, unemployment, insurance coverage, healthcare provider availability, and education level, and their collective impact on binge drinking behaviors among adults in Ohio counties. These factors are recognized as key social determinants of health outcomes, including substance abuse disorders.[2] By exploring these relationships, the study seeks to inform targeted interventions and policies to mitigate the growing public health burden of alcohol misuse in the state. Theoretical frameworks, such as social causation and social selection, attempt to explain the links between socioeconomic status and health behaviors like excessive drinking.[7] For instance, individuals, especially young and middle-aged adults, that binge drink tend to choose partners or friends who approve of their binge drinking.[7]

The current gap in knowledge is how factors such as household income, unemployment, insurance, healthcare provider availability, and education level collectively affect binge drinking. We aim to identify the most prominent factors that can play a role in binge drinking and how these can open further conversations on how binge drinking can be addressed in Ohio. Psychological factors, such as stress, coping mechanisms (self-medication hypothesis), and mental health concerns such as anxiety and depression, could mediate the relationship between socioeconomic disadvantage and problematic drinking.[8] Additionally, social and cultural norms surrounding alcohol consumption across different socioeconomic groups, as well as environmental factors like alcohol availability, marketing practices, and neighborhood characteristics, may influence drinking behaviors.[9]

Previous data nationally have shown a positive relationship between income and the prevalence of binge drinking.[10,11] One study found a pro-cyclical relationship where in developed countries like the United States, heavier drinkers consumed less during recession-like economies, while light drinkers drank more. This same phenomenon did not hold true in undeveloped

countries.[12] This phenomenon in developed countries needs further exploration to understand the driving factors between drinking and income. There is also a question of why this phenomenon is reversed in developing countries. We wanted to examine if national trends that correlated binge drinking positively with income were relatable to the state of Ohio.

We also wanted to look at education level and how it relates to binge drinking. There are studies that show data for young adult binge drinking and the activities of college students during subsequent years after high school. Predictors of heavy drinking during the first year in college were being white, living on campus, previous drinking history, lower parental expectations, and having peers who drink.[13] Four-year college students and those who do not live with their parents are more likely to engage in binge drinking than their peers.[14] There is also data surrounding parental education and social factors that determine binge drinking among college-aged students.[15] However, these data only discuss students in college after high school, leaving a gap in the research regarding the educational factor involved in binge drinking among the general adult population, which we aimed to address in the context of Ohio.

The Affordable Care Act (ACA) led to vast improvements in the amount of healthcare coverage offered in the United States.[16] While more people were able to keep their parent's insurance coverage for longer, data suggested that the mandate also increased risky drinking and did not lead to any significant increases in preventative care utilization.[17] Additional studies nationally found that insurance coverage was not associated with binge drinking rates.[18] We wanted to assess the relationship between insurance coverage and binge drinking in Ohio, given the information we have obtained from prior research. Furthermore, since alcohol use has been associated with greater severity of anxiety and depression and diminished emotional responses as compared to non-binge drinkers[19], we also wanted to explore the potential link between the

availability of mental health providers and binge drinking rates in Ohio. Another study looked at alcohol use disorder and major depression. The disorders appeared to be linked in a causal manner, including that alcohol use disorder influences major depression from neurophysiological and metabolic changes resulting from exposure to alcohol.[20]

Evidence-based interventions and policies aimed at reducing binge drinking, particularly those targeting socioeconomically disadvantaged populations, exist but face challenges and limitations.[21] Current approaches underscore the importance and need for further research and strategies tailored to a specific population, whether it be geographical or cultural or racial. It is crucial to examine socioeconomic patterns of binge drinking at the state and county levels, as national averages may obscure regional variations and nuances. Examining state-specific data can provide insights tailored to the context of Ohio, informing targeted interventions and policies within the state.

Research Questions

The following research questions guided our investigation into the socioeconomic factors associated with excessive alcohol consumption in Ohio counties:

RQ1. What is the correlation between median household income and the proportion of adults who report binge or heavy drinking across counties in Ohio?

RQ2. What is the correlation between the availability of mental health providers and the prevalence of binge or heavy drinking among adults in different counties in Ohio?

RQ3. What is the correlation between healthcare coverage (insured vs uninsured) and the percentage of adults who report binge or heavy drinking in various counties in Ohio?

RQ4. What is the correlation between adults who complete high school and binge drink across counties of Ohio?

RQ5. What is the correlation between unemployment rates and the percentage of adults who report binge or heavy drinking across counties in Ohio?

RQ6. What is the difference in binge drinking in Ohio in 2016 compared to 2022?

RQ7. How do high school completion, insurance, unemployment, and mental health providers predict the variance in binge drinking in Ohio in 2022?

Methods

Data Collection

We collected our data from the 2023 National County Health Rankings[22]. The County Health Rankings is a collaborative project between the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation that uses data from various national sources, including the Behavioral Risk Factor Surveillance System (BRFSS), to evaluate population health and health-related factors at the county level across the United States. The rankings are based on a model that incorporates weighted scores for health outcomes and health factors, allowing for direct comparisons between counties within each state. The County Health Rankings defines "binge/excessive drinking" as a woman consuming more than four alcoholic drinks during a single occasion or a man consuming more than five alcoholic drinks during a single occasion. Additionally, the dataset excludes individuals under 18 years of age and those residing in institutional settings.

The rankings include data from the Behavioral Risk Factor Surveillance System (BRFSS) to evaluate health behaviors from all states and counties with data that have been standardized. The analysis included all 88 counties in Ohio that had sufficient data available, with no exclusion criteria applied. Areas with insufficient data were excluded. We looked at the

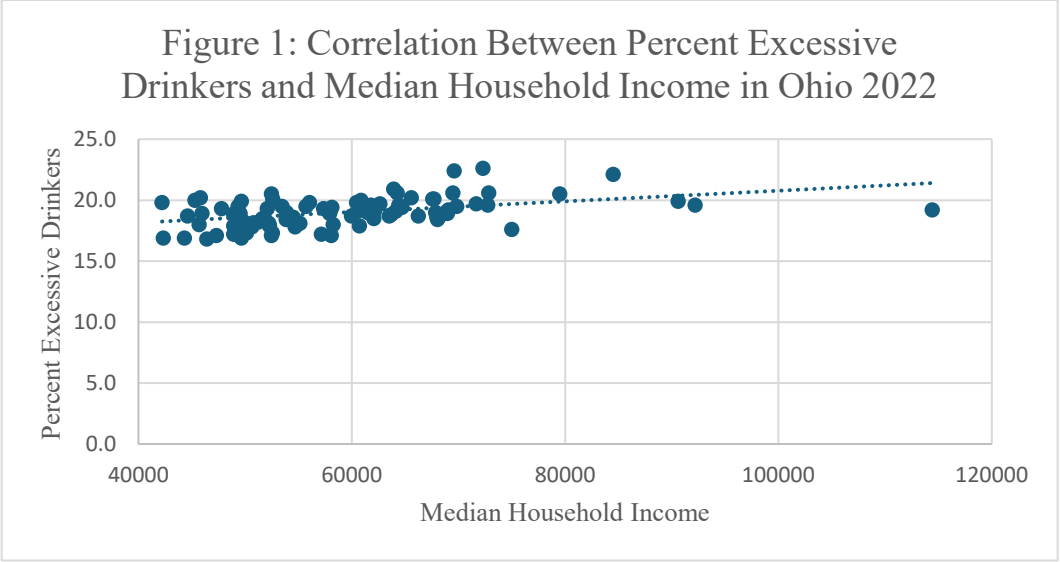
years 2016 and 2022 to focus on binge drinking and its effects in Ohio. Notably, "Excessive Drinking," a focal measure, was defined as the percentage of people who reported binge or heavy drinking within the previous 30 days and was evaluated using statistical modeling. Study variables included median household income, mental health provider availability, uninsured, adults who have completed high school, unemployment rates, and binge drinking in 2016 vs. 2022 in Ohio.

Data Analysis

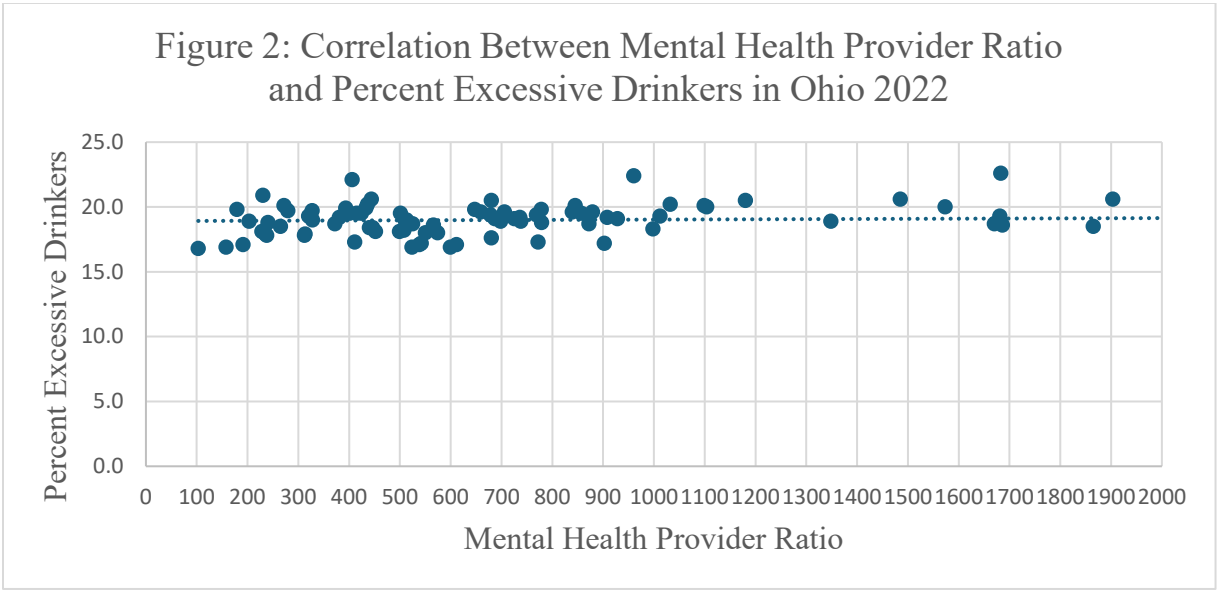
We used Spearman correlations to determine an association between binge drinking and median household incomes, mental health provider availability, uninsured individuals, adults who completed high school, and unemployment rates in Ohio. To determine if there was a difference in binge drinking in 2016 and 2022 in Ohio, we performed a paired t-test. We also performed a regression to assess how high school completion, insurance, unemployment, and mental health provider availability predict variance in binge drinking in Ohio in 2022.

Results

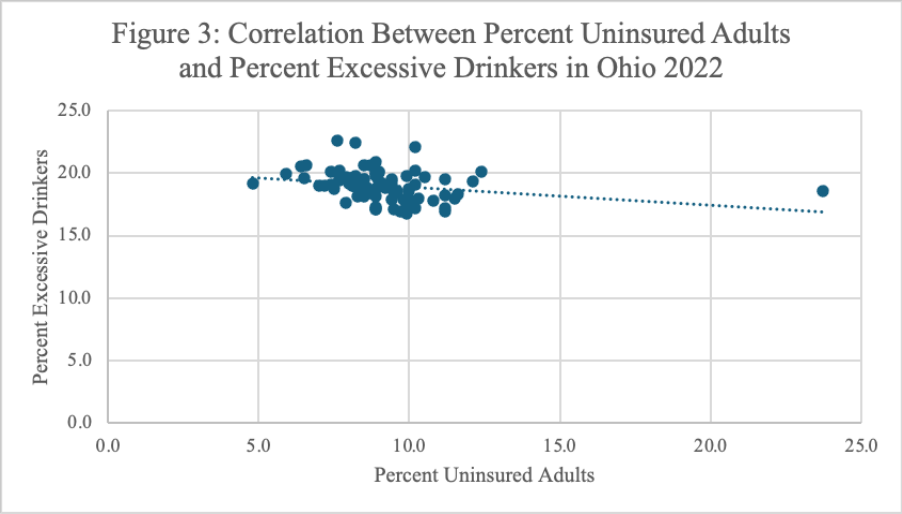
When examining how the percent of excessive drinking correlates with the percent of median household income in Ohio in 2022 (RQ1), a Spearman correlation showed a moderate but statistically significant positive correlation ($\rho = .435$, $p < .001$), indicating that as the percent of excessive drinking increased, the percent median household income also increased (Figure 1).



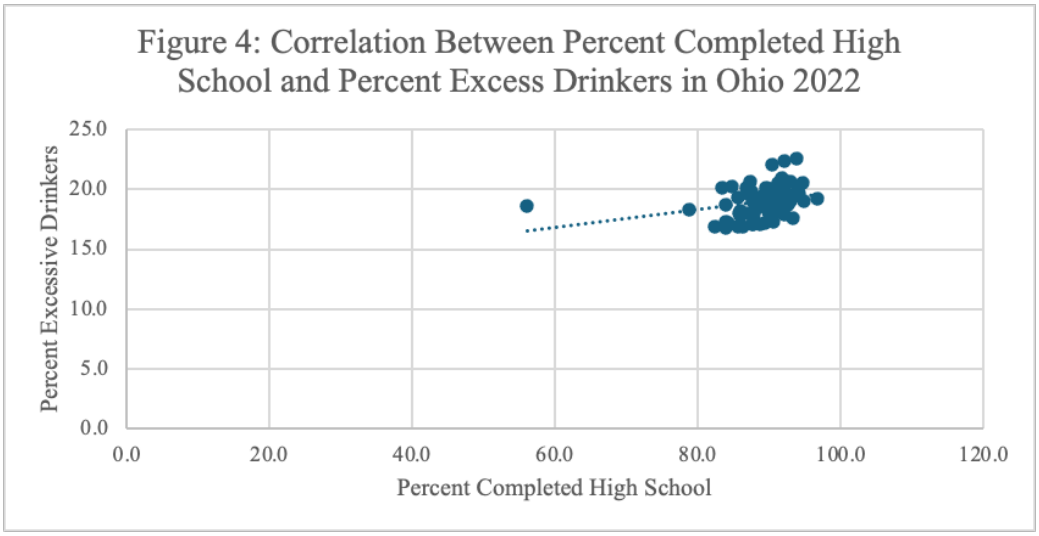
When assessing how the percent of excessive drinking correlates with the percent of mental health provider ratios in Ohio in 2022 (RQ2), a Spearman correlation showed a small positive correlation ($\rho = .222$), but it was not statistically significant ($p < .038$), suggesting that while the percent of excessive drinking increased as the percent mental health provider ratio increased, this relationship may have been due to chance (Figure 2).



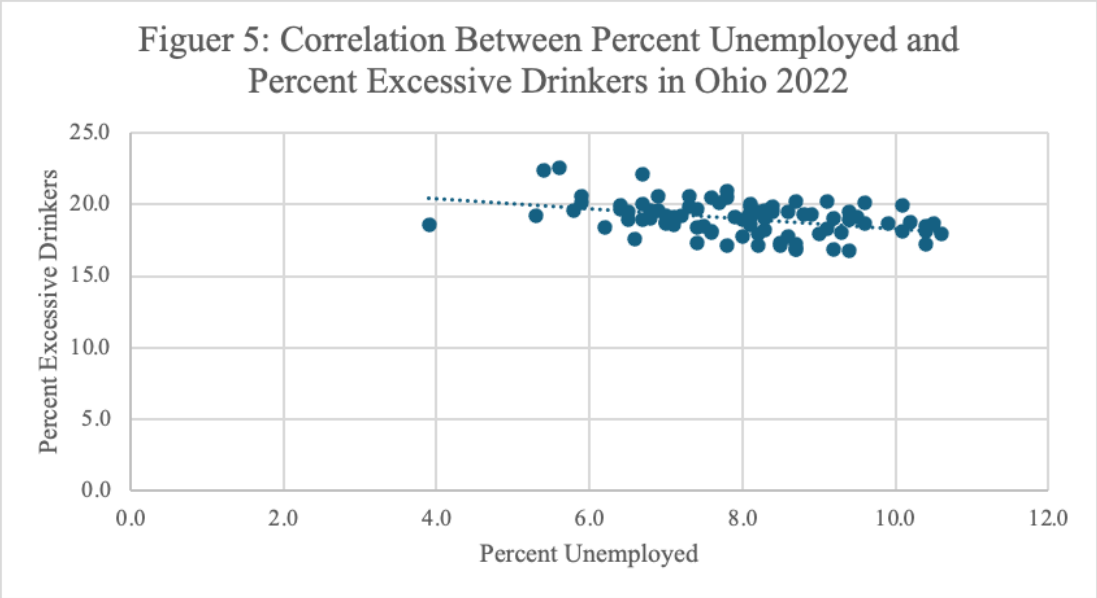
When considering how the percent of excessive drinking correlates with the percent of uninsured adults in Ohio in 2022 (RQ3), a Spearman correlation showed a moderate but statistically significant negative correlation ($\rho = -.403$, $p < .001$), indicating that as the percent of excessive drinking increased, the percent of uninsured adults decreased (Figure 3).



When examining how the percent of excessive drinking correlates with the percent who completed high school in Ohio in 2022 (RQ4), a Spearman correlation showed a moderate but statistically significant positive correlation ($\rho = .407$, $p < .001$), suggesting that as the percent of excessive drinking increased, the percent who completed high school also increased (Figure 4).



When exploring how the percent of excessive drinking correlates with the percent unemployed in Ohio in 2022 (RQ5), a Spearman correlation showed a moderate but statistically significant negative correlation ($\rho = -.371$, $p < .001$), indicating that as the percent of excessive drinking increased, the percent unemployed decreased (Figure 5).



When examining the percent excessive drinking in Ohio counties in 2016 and 2022 (RQ6), we discovered that the percent significantly increased from 17.355% in 2016 to 19.008% in 2022 ($t = 14.135$, $p < .001$) (Table 1).

Table 1: Percentage of Excessive Drinking in Ohio counties in 2016 and 2022

Yr.	n	Mean	SD
2016	88	17.355%	1.1763%
2022	88	19.088%[a]	1.1926%

Abbreviations: Yr., Year; n, Sample Size; SD, Standard Deviation.

[a]Statistically significant difference between 2022 and 2016 values ($p < .001$)

Our final research question (RQ7) examined how high school completion, insurance, unemployment, and mental health providers predict the variance in binge drinking in Ohio in 2022. A stepwise linear regression predicted that the best-fitting model was significant ($F = 15.642$, $p < .001$), accounting for 15.4% of the variance in percent excessive drinking. Unemployment contributed the most to the model ($B = -.346$, $t = -3.995$, $p < .001$), with higher unemployment associated with lower binge drinking rates. Percent completed high school did not significantly contribute to the model.

Discussion

The positive association between income and binge drinking prevalence in Ohio aligns with general national trends in alcohol consumption in developed countries like the United States. Individuals with higher disposable income may live in a sociocultural environment that enables increased alcohol purchasing and normalizes heavy drinking.[23] However, more in-depth qualitative research is needed to fully understand the specific drivers behind why higher socioeconomic status relates to riskier drinking patterns.

Surprisingly, there was no significant correlation between mental health provider availability and county-level binge drinking rates. This suggests that simply having more providers may not directly impact alcohol misuse. Other factors such as mental health awareness among consumers, quality and accessibility of treatment services, or other socio-cultural influences on seeking help could play a bigger role and warrant further investigation.

Ohio counties with lower uninsured rates had higher binge drinking prevalence, consistent with research on the Affordable Care Act's impacts.[16] While increased insurance coverage did not necessarily reduce alcohol misuse, the negative correlation indicates potential socioeconomic factors, as those with insurance likely have more resources enabling riskier

drinking.[16,17] It would be valuable to examine the interplay between insurance status, income levels, and drinking behaviors to tease apart these socioeconomic influences.

Counties with higher rates of high school completion exhibited more binge drinking among the general adult population. This contradicted previous studies that focused on college students.[14] The discrepancy suggests either a potential flaw in the way data was gathered, unmeasured social influences, or a difference in the drinking patterns between students and overall adults, which could be explored further through additional research.

There was a negative association between county unemployment levels and binge drinking, mirroring previous findings from studies conducted in developed nations.[24] As noted earlier, reduced disposable income may decrease alcohol purchasing ability, especially among those most impacted by job insecurity. However, it is also possible that excessive drinking could contribute to job loss, suggesting a potential bidirectional relationship that should be examined through longitudinal studies.[25]

While the correlational findings provide insights into socioeconomic patterns of drinking in Ohio, the clinical and practical implications should also be considered. Binge drinking increased significantly statewide from 2016 to 2022, reflecting growing public health concerns nationally. Such a statewide increase in drinking prevalence in Ohio from 2016 to 2022 aligns with broader societal trends observed during the COVID-19 pandemic.[26] The widespread disruptions, social isolation, and psychological distress likely exacerbated alcohol misuse as a coping mechanism.[27] Pandemic-related stressors such as economic hardship, illness uncertainties, and potential increases in intimate partner violence have been linked to higher rates of alcohol consumption in other studies.[28,29,30] While our study did not directly investigate pandemic-specific factors, the pronounced rise in excessive drinking between 2016 and 2022

may have been intensified by the unique challenges posed by COVID-19. Disruptions to employment, social support networks, and household dynamics could have disproportionately impacted socioeconomically disadvantaged populations, exacerbating pre-existing vulnerabilities to alcohol misuse.[31] This is of note because our study demonstrated that from 2016 to 2022 the binge drinking rate in Ohio increased nearly 1.7%, but further investigation would be needed to establish connections between this number increasing and the pandemic.

The study has several important limitations to consider. Analyzing at the county level may obscure influences at microlevels like the individual and community levels. Future research should aim to incorporate individual-level data and examine potential neighborhood or community-level factors that could impact drinking behaviors. Furthermore, since County Health Rankings rely on self-reported survey data to measure excessive drinking, it has inherent flaws. People often underreport heavy drinking due to forgetting, wanting to give a socially desirable response, or not responding at all. The use of more objective measures, such as collateral reports, could provide a more accurate assessment of drinking patterns. The definition of excessive drinking for women also changed in 2006, artificially inflating recent prevalence compared to earlier years. This methodological change should be carefully considered when interpreting trends over time.

Furthermore, the measure also does not account for youth drinking prevalence, which could provide valuable insights into geographical patterns of alcohol misuse among adolescents and young adults. Incorporating data on underage drinking and examining its potential links to socioeconomic factors could offer a more comprehensive understanding of the issue across different age groups. While not the prospect of this study, other potential confounding factors like race, gender, urban/rural differences, and co-occurring substance use were not accounted for.

These variables may moderate or mediate the observed relationships and should be included in future studies to gain a more nuanced understanding. Future studies should aim to include these variables and explore potential moderating or mediating effects on the observed relationships between socioeconomic factors and binge drinking. The cross-sectional data also cannot determine if socioeconomic factors cause excessive drinking or vice versa. Longitudinal designs and more advanced statistical techniques could help elucidate the causal pathways and potential relationships between these variables over time.

The results emphasize the need to create policies and community programs that reduce socioeconomic inequalities which contribute to alcohol misuse problems in Ohio. Specific approaches should focus on improving factors like financial stability, education levels, and access to quality healthcare—factors that can protect against excessive drinking. Such interventions could not only help curb problematic drinking but also address broader issues of socioeconomic disadvantage.

To gain a deeper understanding of the context surrounding the findings, we also need more research studies to better understand the social and cultural contexts behind the relationships identified in this study, such as qualitative studies that can capture factors we did not measure. Ethnographic research, focus groups, and in-depth interviews could shed light on the lived experiences, norms, and belief systems that shape drinking behaviors across different socioeconomic strata. Addressing the socioeconomic roots of the issue through comprehensive strategies will be key to combating this growing public health challenge. Interdisciplinary collaborations among researchers, policymakers, healthcare providers, and community stakeholders will be essential in developing and implementing effective, sustainable solutions.

We could also adjust the scope of our research to include alcohol consumption and its impacts from a global health standpoint. Several studies have looked worldwide at the alcohol-attributable burden of disease. One study discovered that worldwide from 2000-2016 there were over 3 million alcohol attributable deaths, and that alcohol use was a major risk factor for nutritional, perinatal, maternal, communicable diseases, non-communicable diseases, and injury related deaths. The alcohol related burden of disease was found to be the highest in eastern Europe, Africa, and middle to low-income countries.[32] This contradicted our data from Ohio counties in that we found the higher median household income was and the lower unemployment was, the more individuals binge drank. A way to combat these risks in countries where alcohol consumption is more prevalent include policy changes surrounding alcohol use and further educating the population regarding the risk factors associated with its consumption.

Conclusion

The study shows the complicated connections between different socioeconomic factors and how common binge drinking is in Ohio. Some of the findings match what has been seen in other developed countries, but other results suggest there may be unique complexities in Ohio's situation. As alcohol misuse problems keep increasing, it will be crucial to understand and deal with these socioeconomic contexts through multi-faceted approaches to tackle hazardous drinking habits and their impacts on public health. Continued research efforts, coupled with evidence-based policies and community-driven initiatives, will be vital in mitigating the burden of excessive drinking and promoting overall well-being across all segments of Ohio's population.

References

1. Bohm MK, Liu Y, Esser MB, et al. Binge Drinking Among Adults, by Select Characteristics and State – United States, 2018. *MMWR Morb Mortal Wkly Rep*. 2021;70:1441-1446. doi:10.15585/mmwr.mm7041a2
2. Morris H, Larsen J, Catterall E, Moss AC, Dombrowski SU. Peer pressure and alcohol consumption in adults living in the UK: a systematic qualitative review. *BMC Public Health.* 2020;20(1):1-13. doi:10.1186/s12889-020-09060-2
3. World Health Organization Management of Substance Abuse Unit. *Global status report on alcohol and health*. Geneva: World Health Organization; 2018.
4. GBD 2016 Alcohol Collaborators. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2018. doi:10.1016/S0140-6736(18)31310-2
5. Sacks JJ, Gonzales KR, Bouchery EE, Tomedi LE, Brewer RD. 2010 national and state costs of excessive alcohol consumption. *Am J Prev Med*. 2015;49(5):e73-e79. doi:10.1016/j.amepre.2015.05.031
6. Jones SC, Andrews K, Francis K. Combining Social Norms and Social Marketing to Address Underage Drinking: Development and Process Evaluation of a Whole-of-Community Intervention. *PLoS ONE*. 2017;12(1):e0169872. doi:10.1371/journal.pone.0169872
7. Moos RH, Brennan PL, Schutte KK, Moos BS. Social and Financial Resources and High-Risk Alcohol Consumption Among Older Adults. *Alcoholism: Clinical & Experimental Research*. 2010;34(4):646-654. doi:10.1111/j.1530-0277.2009.01133.x

8. Fang L, Lung Y. The Moderating Role of Social Support in the Relationship between Poor Mental Health and Excessive Alcohol Consumption: A Gender-Specific Analysis. *Substance Use & Misuse*. 2022;57(3):409-417. doi:10.1080/10826084.2021.2019770
9. Schultz PW. Secret Agents of Influence: Leveraging Social Norms for Good. *Current Directions in Psychological Science*. 2022;31(5):443-450. doi:10.1177/09637214221109572
10. Fauci V, Squeri R, Spataro P, Genovese C, Laudani N, Alessi V. Young people, young adults and binge drinking. *J Prev Med Hyg*. 2019;60(4):E376-E385. doi:10.15167/2421-4248/jpmh2019.60.4.1309
11. Keyes KM, Hasin DS. Socio-economic status and problem alcohol use: the positive relationship between income and the DSM-IV alcohol abuse diagnosis. *Addiction*. 2008;103(7):1120-1130. doi:10.1111/j.1360-0443.2008.02218.x
12. Pacula RL. Substance use and recessions: What can be learned from economic analyses of alcohol? *Int J Drug Policy*. 2011;22(5):326-334. doi:10.1016/j.drugpo.2011.07.008
13. Simons-Morton B, Haynie D, Liu D, Chaurasia A, Li K, Hingson R. The Effect of Residence, School Status, Work Status, and Social Influence on the Prevalence of Alcohol Use Among Emerging Adults. *J Stud Alcohol Drugs*. 2016;77(1):121-132. doi:10.15288/jsad.2016.77.121
14. Patrick ME, Terry-McElrath YM. High-intensity drinking by underage young adults in the United States. *Addiction*. 2017;112(1):82-93. doi:10.1111/add.13556
15. Luk JW, Haynie DL, Vaca FE, Li K, Hingson R, Simons-Morton BG. Close Friends' Drinking and Personal Income as Mediators of Extreme Drinking: A Prospective Investigation. *J Stud Alcohol Drugs*. 2019;80(6):669-678. doi:10.15288/jsad.2019.80.669

16. Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D. Early Effects of the Affordable Care Act on Health Care Access, Risky Health Behaviors, and Self-Assessed Health. *South Econ J.* 2017;84(3):660-691.
17. Barbaresco S, Courtemanche CJ, Qi Y. Impacts of the Affordable Care Act dependent coverage provision on health-related outcomes of young adults. *J Health Econ.* 2015;40:54-68. doi:10.1016/j.jhealeco.2014.12.004
18. Azagba S, Shan L, Wolfson M, Hall M, Chaloupka F. Problem drinking as intentional risky behavior: Examining the association between state health insurance coverage and excessive alcohol consumption. *Prev Med Rep.* 2021;24:101556. doi:10.1016/j.pmedr.2021.101556
19. Lannoy S, Duka T, Carbia C, et al. Emotional processes in binge drinking: A systematic review and perspective. *Clin Psychol Rev*. 2021;84:101971. doi:10.1016/j.cpr.2021.101971
20. Boden JM, Fergusson DM. Alcohol and depression. *Addiction*. 2011;106(5):906-914. doi:10.1111/j.1360-0443.2010.03351.x
21. Rinkoff PB. Prevalence, pattern, and a leader's intervention--The impact of alcohol abuse in police and public safety organizations. *J Community Safety Well-Being*. 2023;8:S46-S49. doi:10.35502/jcswb.299
22. County Health Rankings & Roadmaps. How healthy is your county?: *County Health Rankings*. Accessed January 20, 2024. https://www.countyhealthrankings.org/
23. Pedersen W, Bakken A, von Soest T. Neighborhood or School? Influences on Alcohol Consumption and Heavy Episodic Drinking Among Urban Adolescents. *J Youth Adolesc*. 2018;47(10):2073-2087. doi:10.1007/s10964-017-0787-0
24. Egan KK, Jørgensen MB, Christensen AI, et al. Association between alcohol, socioeconomic position and labour market participation: A prospective cohort study of transitions between

work and unemployment. *Scand J Public Health*. 2021;49(2):197-205. doi:10.1177/1403494820911802

25. Mangot-Sala L, Smidt N, Liefbroer AC. Disentangling the association between alcohol consumption and employment status: causation, selection or confounding*? Eur J Public Health*. 2022;32(6):926-932. doi:10.1093/eurpub/ckac141
26. Colton KC, Godleski SA, Baschnagel JS, Houston RJ, DeHarder SM. Alcohol use during the COVID-19 pandemic: gender, parenthood, intimate partner violence, and stress. *AIMS Public Health.* 2023;10(2):360-377. doi:10.3934/publichealth.2023027
27. Wardell JD, Kempe T, Rapinda KK, et al. Drinking to cope during COVID-19 pandemic: The role of external and internal factors in coping motive pathways to alcohol use, solitary drinking, and alcohol problems. *Alcohol Clin Exp Res*. 2020;44:2073
28. Boserup B, McKenney M, Elkbuli A. Alarming trends in US domestic violence during the COVID-19 pandemic. *Am J Emerg Med*. 2020;38:2753-2755. doi:10.1016/j.ajem.2020.04.077
29. Piquero AR, Jennings WG, Jemison E, et al. Domestic violence during the COVID-19 pandemic-Evidence from a systematic review and meta-analysis. *J Crim Justice*. 2021;74:101806. doi:10.1016/j.jcrimjus.2021.101806
30. Gosangi B, Park H, Thomas R, et al. Exacerbation of physical intimate partner violence during COVID-19 pandemic. *Radiology*. 2021;298:E38-E45. doi:10.1148/radiol.2020202866
31. Grossman ER, Benjamin-Neelon SE, Sonnenschein S. Alcohol consumption during the COVID-19 pandemic: a cross-sectional survey of US adults*. Int J Environ Res Public Health.* 2020;17(24):9189. doi:10.3390/ijerph17249189

32. Shield K, Manthey J, Rylett M, et al. National, regional, and global burdens of disease from 2000 to 2016 attributable to alcohol use: a comparative risk assessment study. The Lancet Public Health. 2020;5(1):e51-e61. doi:10.1016/s2468-2667(19)30231-2