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Trends in U.S. women's binge drinking in middle adulthood by socioeconomic status, 2006–2018

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Abstract

Background: Binge drinking causes injury and illness. Prevalence of binge drinking doubled in 2006–2018 for women in middle adulthood (ages 30s and 40s); these are the first cohorts for whom attaining higher education and income (both associated with increased alcohol use) are highly prevalent. It is unknown whether recent trends in binge drinking among US women aged 30–49 differ by socio-economic status (SES).

Methods: We examined trends in binge drinking using nationally-representative National Health Interview Surveys (2006–2018) for women age 30–49 (N=63,426), by education (< high school, high school, some college, college, >college) and family income (< 100%, 100–199%, 200–399%, and >400% of poverty line), controlling for age and race.

Results: The odds of binge drinking increased among all women approximately 7% annually from 2006–2018. The magnitude of the change increased with education; the predicted probability of binge drinking among women at lowest levels of education increased from 10% to 13% from 2006–2018 (adjusted OR [AOR] 1.02, 95% CI 0.99, 1.04), and those with the highest education from 13% to 32% (AOR 1.10, 95% CI 1.08–1.12). Women at the lowest income increased binge drinking from 12% to 16% (AOR 1.03, 95% CI 1.01–1.05) and highest income from 17% to 36% (AOR 1.09, 95% CI 1.07–1.10). Interactions between education ($F^{4}_{855} = 12.77$, p<0.001) and income ($F^{3}_{857} = 8.20$, p<0.001) with time confirmed slope differences.

Conclusions: Nationally, women at all levels of SES increased binge drinking, but increases were most pronounced among high SES women.

Keywords

Alcohol; binge drinking; women's health; substance abuse; socio-economic status

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Contributors

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1. Introduction

Alcohol use remains among the most prevalent causes of death in the United States, and excessive alcohol use contributes to an estimated 9.8% of deaths each year (Stahre et al., 2014). Among the patterns of alcohol use associated with adverse health consequences is rapid consumption of multiple drinks in a row, binge drinking, which increases risk of injury, poisoning, and violence (Brewer and Swahn, 2005; Gmel et al., 2007). Regular patterns of binge drinking over time increase the risks of cardiovascular disease, cancer, liver damage, and other morbidities (Rehm and Imtiaz, 2016). As such, understanding trends and high-risk groups for binge drinking is a centrally important public health surveillance activity.

Alcohol consumption, including binge drinking, is dynamic over time in prevalence and distribution, with increases and decreases coincident with macro-economic trends, policy changes, and social norms (Dee, 2001; Keyes et al., 2012; Ruhm, 1995). In the US, alcohol use declined for several decades after a peak in the early 1980s, but since 2005, alcohol use and binge drinking have increased among US adults (Keyes and Miech, 2013). These increases are almost exclusively among women; one meta-analyses of large-scale surveys estimated that the past-year prevalence of binge drinking has been increasing at a rate of 0.6% per year among women, with no increase at all among men, though this study did not examine age-by-sex changes (Grucza et al., 2018). Further, accumulating evidence indicates that increases are concentrated among women in middle adulthood (~30–49) (Keyes et al., 2019); indeed, while historically, younger adults (i.e., ages 18–29) have had higher risks of binge drinking than other age groups, trends over time across multiple national surveys (e.g., Monitoring the Future [MTF], National Survey on Drug Use and Health [NSDUH], National Health Interview Surveys [NHIS], National Health and Nutrition Examination Survey [NHANES] and the Behavioral Risk Factor Surveillance System [BRFSS]) suggest that binge drinking has been decreasing among these younger age groups for over a decade (Grucza et al., 2018; Keyes et al., 2019; Martin et al., 2017; McKetta and Keyes, 2019). Recent estimates using the National Health Interview Surveys (NHIS) showed that among women in middle adulthood (ages 30–44), binge drinking nearly doubled, rising from 20% to 36% between 2006 and 2018 (McKetta and Keyes, 2019).

Reasons underlying the increases in risky drinking among US women in middle adulthood remain speculative, and heterogeneity in trends across other demographic factors may illuminate potential hypotheses. For example, alcohol consumption generally increases with college attendance and occupational prestige, especially for women (Ames and Rebhun, 1996). The women in middle adulthood in the past two decades were born in the 1960s-1980s—these women grew up and entered education and training immediately after the women's rights movements in the 1960s, and are among the first cohorts of women attaining higher education and entering higher-prestige careers at high percentages compared to previous generations (Bailey and DiPrete, 2016). These cohorts also represent the beginning of the delay in childbearing and marriage observed nationally in recent decades (Isen and Stevenson, 2010). Thus, given both that educational attainment is associated with increased alcohol consumption, national shifts in women's educational attainment may be a key component of national changes in women's binge drinking patterns. However, while the

prevalence of high educational attainment has changed over time, there remains substantial variation in role status among women; we would expect that if the increase among women in higher education in more recent cohorts is related to increases in drinking, that the increase in prevalence should be highly concentrated in these groups of women with high educational attainment.

The present study used nationally-representative survey data to estimate the extent to which changes in alcohol use and binge drinking among US women aged 30–49 differs by two indicators of socio-economic status (SES), educational attainment and family income, in order to further illuminate the changing demographics and risk profile of women who are engaging in binge drinking in recent years.

2. Methods

2.1. Design, data source, and participants

We examined annual trends in binge drinking and abstaining from 2006–2018 using sequential waves of the National Health Interview Surveys (NHIS), an annual, cross-sectional, US-representative survey of the non-institutionalized residents (total sample adult N=318,989) (Centers for Disease Control and Prevention and National Center for Health Statistics, 2018), administered at the household level face-to-face. We used publicly available, de-identified data that was exempt from human subjects review. Eligible respondents were sample women ages 30–49 (N=70,558). As a sensitivity analysis, we also examined these trends in men (N=58,880); results are shown in the Supplement.

2.2. Measures

2.2.1. Alcohol use outcomes—Alcohol use outcomes were ascertained using self-report of past-year alcohol use. Our first outcome of interest was binge drinking; from 2006 to 2013, past-year binge drinking was defined as endorsing 5+ drinks in a day; from 2014 onward, the question was amended for women to 4+ drinks in a day, consistent with national guidelines (NIAAA, 2016). Though previous analyses with these data have confirmed that the measurement change did not impact overall results (McKetta and Keyes, 2019), lowering the cutpoint for binge drinking could lead to higher estimates of prevalence across time after the measurement became more sensitive. Therefore, to confirm robustness of results, we both examined trends in past-year alcohol abstention and examined changes in binge drinking trends before and after the change, described in further detail in the Supplement.

2.2.2. Stratification and control variables—We examined drinking outcomes according to two different measures of SES: education and family income. NHIS transformed family income reports into percentages relative to the federal poverty line (FPL) for a given family size. We therefore examined trends within four different income levels: less than 100% of the FPL, corresponding to less than $25,100 for a family of 4 people in 2018; 100% – 199% of the FPL; 200%–399% of the FPL; and 400% of the FPL or higher, corresponding to $100,400 for a family of 4 in 2018 (US Department of Health and Human Services, 2018). Respondents' education attainment was reported continuously through grade 12, and subsequently coded categorically for education beyond high school. We re-

categorized educational attainment into five categories: less than high school, high school or equivalent (i.e., GED completion), some college or a completed associate's degree, college degree, and master's-level degree or higher. As a sensitivity analysis, we examined trends within levels of education beyond college degree in three smaller categories: master's-level degree, doctoral degree, professional degree (i.e., JD, MD, MBA); these results are shown in the Supplement.

As control variables, we adjusted for age and race (categorized as White, Black, or other race), to ensure that any observed trends are not attributable to distributional changes in these demographic features during the study period. As a sensitivity analysis, we further adjusted for additional covariates that influence alcohol consumption patterns (i.e., employment, marriage status, parenthood status, BMI, smoking status, disability status) to confirm that the observed trends persisted above and beyond distributional changes in these covariates; these are shown in the Supplement. Though racial group membership is a cause of disparities in both health and SES, we chose to use race as a control variable rather than further stratify by race, as tests of race x year interaction in adjusted models showed no evidence that the trends in binge drinking varied by race ($F^{1}_{856} = 0.03$, p=0.97).

2.3. Analyses

We estimated time trends in binge drinking with survey-weighted logistic regression within subgroups defined by SES. Singleton sampling clusters were centered so as not to minimize contribution to the overall variance. We estimated an odds ratio (OR) for the effect of survey year on the risk of binge drinking (vs. not binge drinking) and abstaining from drinking (vs. not) for all strata. We modeled time linearly for both outcomes after evaluating time parameters of linear, quadratic, and cubic models for significance. We examined interaction terms for SES with year in marginal logistic models using F-tests. Predicted probabilities were generated from interaction models and charted to visually show trends over time for different strata. For models with covariate adjustment, predicted probabilities were computed for individual respondents and then averaged within strata defined by SES and year to account for variability in age and race. Analyses and figures were produced using R.

Main models were analyzed using complete case analysis. In our sample of 70,558 eligible NHIS respondents, 7,132 (10%) had missing data. Of the respondents with missing data, 82% were missing income, 5% were missing education, and 21% were missing past-year binge drinking status. We used NHIS income imputation files (n=5 imputed data sets (Schenker et al., 2006)), in combination with multiple imputation of missing education and alcohol data using fully conditional specification; we imputed 10 datasets for each imputed income data set (n=5; 50 total imputed datasets in pooled analysis). We imputed using all model covariates as predictors of missing and combined OR estimates using Rubin's Rules (Campion and Rubin, 1989). Because of computational barriers to performing post-estimation model comparisons with imputed data sets (i.e., generating model-based predicted probabilities or calculating an F–statistic for interaction test (Meng and Rubin, 1992)) we present the complete case analysis as the main results, and include imputed estimates as supplementary analyses. For a further description of patterns of binge drinking according to missingness, and missingness over time, please see the Supplement.

3. Results

Figure 1 shows the changing prevalence of the highest levels of education (master's degree or higher) and family income (>400% of the FPL) among women in the analytic sample (N=63,426). From 2006 to 2018, the percentage of sample women with a master's degree or higher doubled, from 9.1% to 18.3%. Women with family incomes greater that 400% of the FPL made up 33.8% of sample women in 2006, and 39.9% by 2018. Supplemental Table 1 shows the distribution of covariates, for men and women, stratified by drinking and outcome for all years 2006–2018.

Table 1 shows the estimated odds ratios for drinking outcomes given an increase in year in the 2006–2018 time period, both for unstratified models and for those stratified by education and income. Among all women in the analytic sample, binge drinking increased every year (adjusted OR [AOR] 1.07, 95% CI 1.06–1.07). We observed heterogeneity in trends in binge drinking according to both education and income levels. Figure 2 shows both the unadjusted and adjusted trends in binge drinking based on predicted probabilities from two-way interaction models between year and education. Among women with less than high school education, binge drinking increased did not meaningfully increase: the model-based predicted probability of binge drinking in 2006 was 10%, and 13% in 2018, adjusting for covariates (adjusted OR [AOR] 1.02, 95% CI 0.99, 1.04). However, among women at all other education levels, binge drinking increased in this time period, demonstrating a monotonic slope with education, with women at higher levels of education evidencing the sharpest increases in binge drinking during this time period. Among women with high school or equivalent education, binge drinking increased from a predicted 15% to 22% (AOR 1.04, 95% CI 1.02–1.05; among those with some college or an associate's degree, binge drinking increased from a predicted 16% to 26% (OR 1.05, 95% CI 1.04–1.06; among those with a college degree, binge drinking increased from a predicted 14% to 34% (AOR 1.10, 95% CI 1.08–1.11); and among those with a master's-level degree or higher, binge drinking increased from a predicted 13% to 32% (AOR 1.10, 95% CI 1.08–1.12). Results from sensitivity analyses showing trends within various levels of higher education (master's, professional, and doctoral degree) are shown in Appendix A (Supplemental Table A1, Supplemental Figure A1). Two-way tests for education x year ($F^{4}_{855} = 12.77$, $p<0.001$) confirmed that these trends have different slopes.

Figure 3 shows both the unadjusted and adjusted trends in binge drinking based on predicted probabilities from two-way interaction models between year and family income. Similar to trends in education, trends in binge drinking increased monotonically with higher income. Among women with family incomes less than 100% of the FPL, the model-based probability of binge drinking increased from 11% to 16% from 2006 to 2018 (AOR 1.03, 95% CI 1.01–1.05); among those between 100% to 199% of the FPL, binge drinking increased from 12% to 18% (AOR 1.04, 95% CI 1.02–1.06); among those between 200%–399% of the FPL, binge drinking increased from 14% to 25% (AOR 1.06, 95% CI 1.05–1.07); among those at the highest income level, 400% of the FPL or higher, binge drinking increased from 17% to 36% (AOR 1.09, 95% CI 1.07–1.10). Two-way tests for income x year ($F^{3}_{857} = 8.20$, $p<0.001$) confirmed that trends have different slopes.

3.1 Sensitivity analyses

Binge drinking trends with multivariable adjustment for other predictors of binge drinking are shown in Supplemental Table 2; these were nearly identical in magnitude and direction to the main findings presented here.

While our study question pertained specifically to trends in women, we additionally examined trends in past-year binge drinking from 2006–2018 among men in the NHIS ages 30–49 (N=58,880) as a sensitivity analysis. Doing so allowed us to confirm that the observed trends were specific to women. SES-stratified binge drinking trends among men are shown in Appendix B in the Supplement (Supplemental Table B1, Supplemental Figures B1 and B2). While men's binge drinking trends also showed the highest increases among those with the highest SES levels, the increases were not as pronounced as women. Tests of interaction between SES measures, gender, and time showed that the slopes of men's trends in binge drinking were different from women's when stratified by education, but not income.

Sensitivity analyses examining trends in abstinence and tests of binge drinking trends before and after measurement change are shown in Appendix C in the Supplement. Imputed estimates are shown in Appendix D (Supplemental Table D1), which also includes an analysis of non-response. None of the sensitivity analyses changed the results or interpretation of the main study findings.

4. Discussion

Increases in binge drinking, and decreases in alcohol abstention, among women in their 30s and 40s are most pronounced among those with the highest levels of education and income. The odds of binge drinking increased by 10% each year from 2006 to 2018 among women with the highest level of education (master's degree of higher), compared to women with a high school education or equivalent, among whom the odds of binge drinking increased by 2% annually, which was not distinguishable from the null. The slope of the increase in binge drinking was monotonic by education; more highly educated women increased their drinking at higher rates relative to women with less education. However, the increases in slope were negligible past college education, suggesting that college completion is a meaningful threshold for the increase in drinking trends. Similar to trends in drinking by education, women at the highest family income levels--400% of FPL or higher, corresponding to $100,400 for a family of four—increased the odds of binge drinking by 9% each year, relative to women at the lowest family income levels (less than 100% of the FPL) who increased the odds of binge drinking by 3% each year.

Given the literature that increases in binge drinking in the US have been concentrated among women in middle adulthood, these results further explicate that increases are concentrated among those women in the highest levels of education and income. While similar monotonic trends were observed in the male subsample, the increases over time were more dramatic for women, who evidenced increasing the odds of binge drinking at a higher rate than men in all strata of SES.

While lower SES is consistently associated with a greater concentration of adverse health behaviors and poor health outcomes, the relationship between SES and alcohol is more complex. While people in lower socioeconomic positions are more likely to experience mortality and morbidity related to alcohol use disorders, people in higher socio-economic positions are in fact more likely to report alcohol consumption and binge drinking (Cerdá et al., 2011; Dawson et al., 2015; Grant et al., 2017, 2015; Grucza et al., 2018; Kanny et al., 2018; Saha et al., 2018; White et al., 2015). This pattern of findings is hypothesized to be due to a combination of more hazardous drinking among those in lower SES positions, combined with fewer health resources. Therefore, the socio-economic patterning of prevalence of women's binge drinking (i.e., higher odds of past-year binge drinking among those with higher education or income) follows well-established patterns consistent with previous alcohol epidemiology research.

However, the increase in alcohol consumption across historical time among women compared with men is relatively unprecedented in recent decades, and inconsistent with trends in alcohol-related mortality. Indeed, increases in alcohol use are hypothesized to be one of the contributing causes to increased mortality among White, non-college educated Americans that contributed to decreases in the US life expectancy (Case and Deaton, 2017, 2015), which would suggest that we would expect increases in alcohol use to be concentrated in the US among men with lower SES. Our results are not consistent with this research. Binge drinking is one alcohol use pattern among a spectrum of consumption behaviors, ranging from total abstinence to alcohol use disorder; therefore, examination of other outcomes in future studies may provide more insight into how alcohol consumption trends relate to national trends in mortality.

The reasons that high socio-economic status women are increasing binge drinking, more so than men and more so than lower socio-economic status women, remain speculative at this stage. Women are increasingly pursuing higher education and entering the workforce in higher-income sectors (Bobilev et al., 2019; Okahana and Zhou, 2018), both of which are associated with increased drinking. College has long been identified as a risk factor for high risk drinking, as it is a transitional life period associated with less parental supervision, greater concentration of peers, and more access to alcohol (White and Hingson, 2013). We corroborated this relationship with our finding that increases are concentrated among highly educated women, but that beyond college education the increases reach an apparent threshold. The steepest slopes were among those with either a college degree or a master's level degree or higher. College appears to be a critical time in which drinking patterns are established and may then extend to adulthood. As discussed above, high-income is associated with greater alcohol consumption throughout the life course (Keyes and Hasin, 2008), with mechanisms including greater purchasing power for alcohol, and the lack of stigma associated with heavy drinking compared with other kinds of drug use. Alcohol industry product development and marketing have taken notice, and target higher socio-economic status women given their presumably higher disposable incomes (Johnston, 2011). Further, women are delaying and foregoing marriage and child rearing (Isen and Stevenson, 2010), two additional life transitions that are associated with decreased alcohol use and have been hypothesized explanations for shifting binge drinking trends (Leonard and Eiden, 2007). Previous analyses indicate that increases in binge drinking among middle-aged

women are observed among both women rearing children and among those without children, however, indicating that shifts in parenthood are not driving observed increases (McKetta and Keyes, 2019). Rather, the present research provides support for the hypothesis that shifts in women's economic positions, rather that family decisions, are contributing to these trends. Indeed, if women's shifts into higher education and higher income are driving these national trends, we would expect to see particularly steep increases among the higher income and higher education subgroups, as we observed in these analyses. Of note, however, there are no subgroups of women between 30–49 years old in the US who have decreased binge drinking in the past decade.

The trends in alcohol consumption among women currently in middle adulthood are inverse of the current trends among younger generations of women, i.e., those born in the 1990s. In contrast to women in middle age, both adolescent and young adult (e.g., ages 18–25) women and men are generally declining drinking (Johnston et al., 2019), although available analyses indicate that non-college attending young-adult women are increasing drinking (White et al., 2015). These differing patterns of alcohol use trends across generations underscore the importance of considering age and birth cohort in all analyses of alcohol use across time. Our results are in line with multiple data sources indicating that women born in the 1970s and early 1980s are the group at highest risk for increases in consumption (Kerr et al., 2013).

The implications of these findings are not to encourage women to forego education and employment to reduce their drinking risk. Further, the implications are not that interventions should not be targeted to low socioeconomic status women: everyone who drinks too much should be given resources to reduce consumption. Rather, these results underscore that the long-held epidemiological patterns of high-risk drinking as concentrated among men, and often misunderstood notions that high-risk drinking is concentrated among low socio-economic status groups, are changing. Women are increasingly becoming strong market participators in alcohol purchasing and consumption, and as such, clinicians should take seriously calls to briefly screen for high-risk drinking and refer to treatment all individuals seen in care (Agerwala and McCance-Katz, 2012), regardless of background or social status.

These results do have implications for the future burden of heavy drinking for health systems. The potential consequences of excessive alcohol use are numerous, including not only injury but also increased risk of numerous cancers, liver damage, and cardiovascular morbidity (Gmel et al., 2007; Gupta et al., 2010; Mathurin and Deltenre, 2009). Indeed, the science is increasingly clear that there is no safe dose of alcohol for health (Wood et al., 2018). Cancers associated with excessive alcohol use, including breast and colorectal cancer, have increased among women under 50 (Ward et al., 2019); the rise in alcohol use may be a determinant underlying these increases. Public health strategies to reduce alcohol consumption are effective, and given the high prevalence of alcohol use, have the potential to have strong impact.

Limitations of the study should be noted. The operational definition of binge drinking changed in NHIS during the course of the analytic period, from 5+ drinks to 4+ drinks in 2014. In sensitivity analyses examining measurement change, we observed an increased probability of binge drinking after the binge drinking threshold became more sensitive.

However, the slope remained consistent across change, indicating that the trends persisted regardless of measurement variance, and measurement change is unlikely to have created differential trends by SES. Thus, though this measurement change does suggest that earlier estimates may have underestimated the prevalence of binge drinking among women, it does not sufficiently account for the changing slopes since 2014, nor the disparate slopes by education or income. Additionally, less pronounced parallel trends were observed with an alternative measure of alcohol consumption, alcohol abstention; these mirrored the trends in binge drinking, with those in higher SES categories reducing abstention commensurate with their increased odds of binge drinking. These additional analyses provide support indicating that the trends were not a spurious function of a change in measurement sensitivity. All measures are based on self-report, and are thus measured with some error. Respondents were instructed regarding standard drink sizes across beverage types, though some degree of error is inevitable. To the extent that we can assume that these errors would be invariant across surveys, however, we can conclude that the trends are robust to self-report measurement errors.

While we had the ability to examine trends across four meaningful income thresholds, dramatic heterogeneity exists within these categories, particularly among those at 400% of the FPL or higher. In 2018, the median family income for a family of 4 was $71,900 (Semega et al., 2019; US Department of Housing and Human Development, 2018), but the distribution of income is highly skewed, and the dynamics of income growth have been unequal for decades. For those living below the median salary, the average individual income stagnated since 1980; yet those the at top 50 percentage of income earners experienced income increases between 40% and 600% of 1980 levels, with the highest increases concentrated among the highest earners (Piketty et al., 2018). In recent years, 45% of the dollar value of national incomes are concentrated within the top 10% of earners, and 20% is concentrated within the top 1% of earners (Piketty et al., 2018). National surveys often do not contain sufficient income granularity to examine health trends within these highly heterogeneous, higher-income groups, though these income differences are highly relevant to socio-economic status in the US. In a related vein, though we examined income and education in the present study, socio-economic status is a broad construct that includes multiple dimensions that are difficult to capture in basic information on income and education. Further analysis of these data across axes including occupation, prestige, wealth, and other indicators of status will be undertaken to elucidate these trends even further.

5. Conclusions

Alcohol use remains a leading cause of death and disability in the United States, and these deaths are preventable. Shifting drinking norms among younger adults who have decreased alcohol consumption are encouraging, but as cohorts in middle adulthood continue to increase binge drinking, physicians and policymakers need to remain informed about the shifting landscape of risk in order to best target prevention. These trends are concerning for their impact on both acute and chronic illnesses, and for patients individually as well as health systems; however, high quality screening and outpatient services are available and effective. That the women increasing binge drinking are not those considered traditionally

"high risk" is a caution that all patients should be considered at risk and ought to be evaluated and referred to appropriate care without judgment or stigma.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Between 2006–2018, US women ages 30–49 increased past-year binge drinking
- Socio-economic status modified trends in binge drinking among women
- Increases were most pronounced among higher education and higher income women

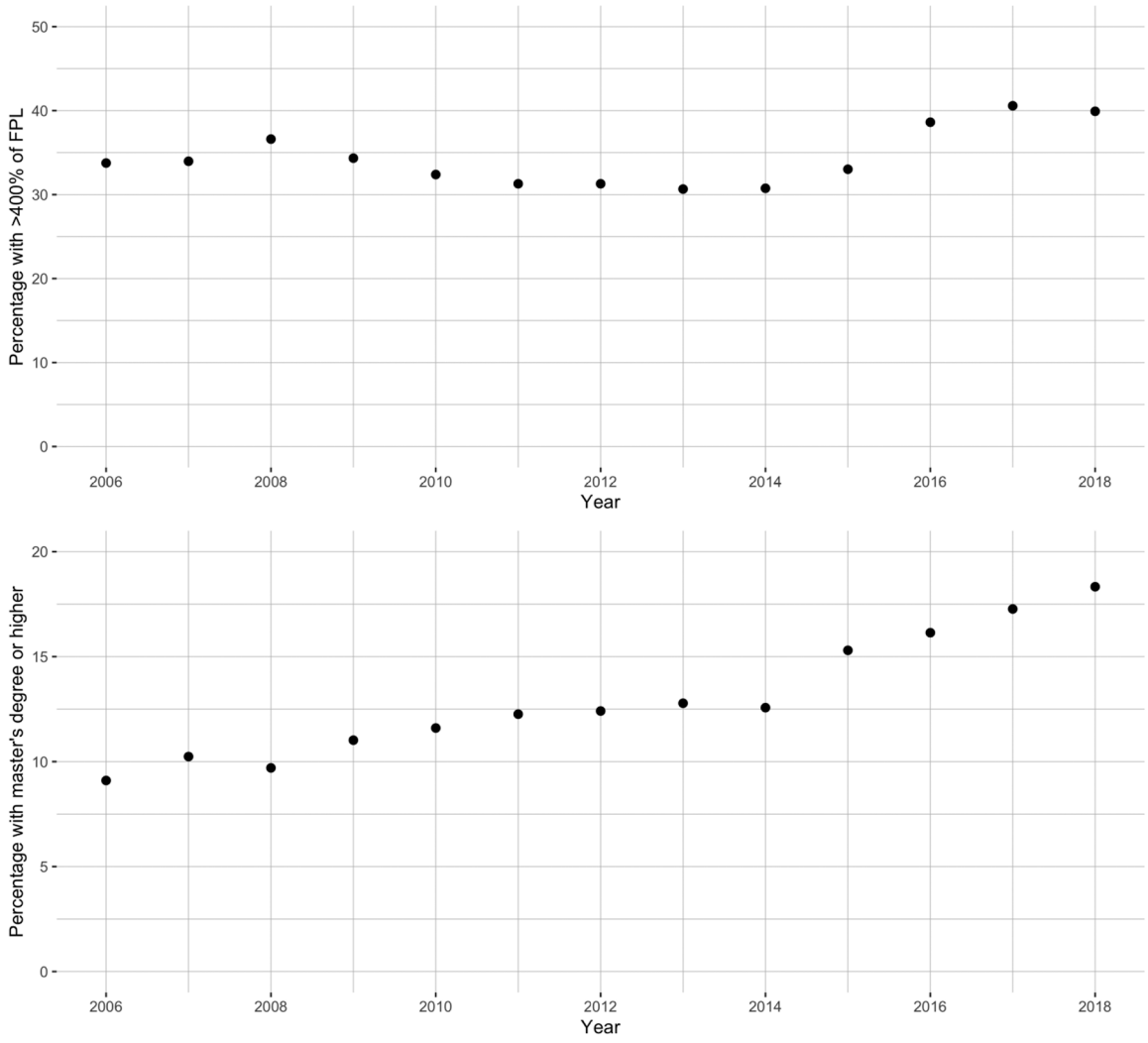

Figure 1:
Percentage of sample with higher income and higher education, NHIS women age 30–49, 2006–2018

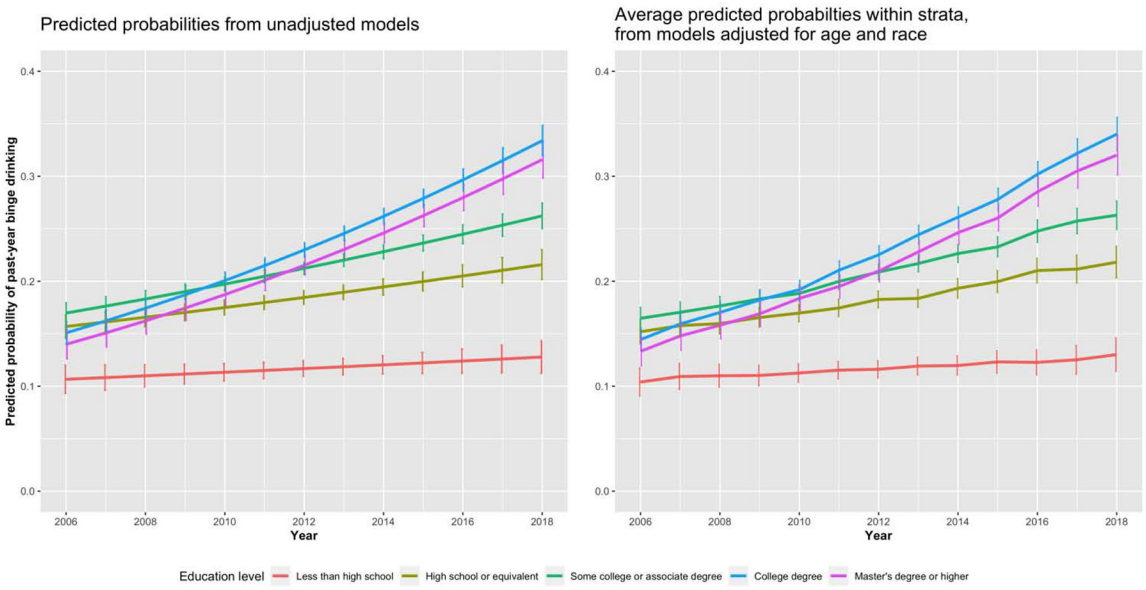

Figure 2:

Predicted probabilities of past-year binge drinking by education status, NHIS sample women age 30–49, 2006–2018

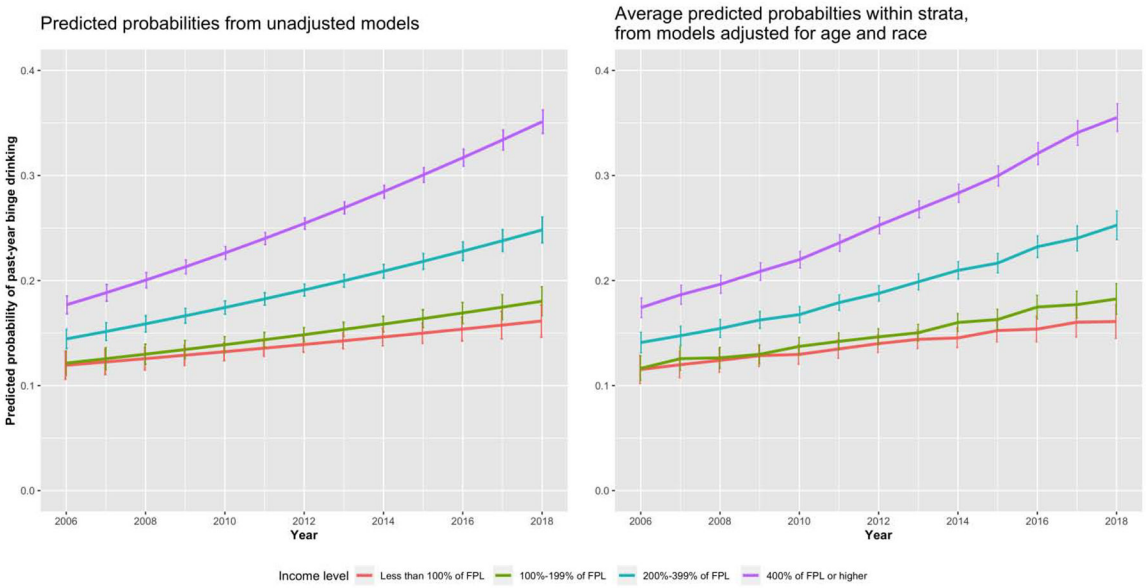

Figure 3:
Predicted probabilities of past-year binge drinking by poverty status, NHIS sample women age 30–49, 2006–2018

Table 1:

Changes in drinking outcomes as a function of time, women in the NHIS ages 30–49, 2006–2018

Variable	Stratum included in model	Unadjusted odds ratio for binge drinking, one-year increase OR (95% CI)	Adjusted odds ratio for binge drinking, one-year increase AOR (95% CI)*
All women in sample (N=63,426)		1.06 (1.05, 1.07)	1.07 (1.06, 1.07)
Education	Less than high school (N=8,328)	1.02 (0.99, 1.04)	1.02 (0.99, 1.04)
	High school or equivalent (N=13,030)	1.03 (1.02, 1.05)	1.04 (1.02, 1.05)
	Some college or associate degree (N=19,898)	1.05 (1.03, 1.06)	1.05 (1.04, 1.06)
	College degree (N=13,812)	1.09 (1.07, 1.11)	1.10 (1.08, 1.11)
	Master's degree or higher (N=8,358)	1.09 (1.07, 1.11)	1.10 (1.08, 1.12)
Education x year interaction		$F^{4}_{858} = 12.36$, p<0.001	$F^{4}_{855} = 12.77$, p<0.001
Family Income	Less than 100% of FPL (N=11,683)	1.03 (1.01, 1.05)	1.03 (1.01, 1.05)
	100%−199% of FPL (N=12,201)	1.04 (1.02, 1.06)	1.04 (1.02, 1.06)
	200%−399% of FPL (N=17,726)	1.06 (1.04, 1.07)	1.06 (1.05, 1.07)
	400% of FPL or higher (N=21,816)	1.08 (1.07, 1.09)	1.09 (1.07, 1.10)
Family income x year interaction		$F^{3}_{860} = 8.06$, p<0.001	$F^{3}_{857} = 8.20$, p<0.001

*Adjusted for race (White, Black, or other race) and age. Estimates are survey-weighted.