Intoxication and Binge and High-Intensity Drinking Among US Young Adults in Their Mid-Twenties

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Abstract

Background—Alcohol use is a key risk factor for young adult mortality and disease, but limited research has focused on high-risk alcohol use among individuals moving from early young adulthood into building and maintaining an initial structure of adult life. This study estimated the prevalence of a range of alcohol use behaviors among US young adults aged 25/26, examined evidence for historical change in prevalence rates, and estimated associations between alcohol use and key demographic, substance use, and adult social role characteristics.

Methods—Data were obtained from 3,542 individuals selected for follow-up from the nationally-representative 12th grade student Monitoring the Future study. Respondents self-reported alcohol use behaviors at age 25/26 during calendar years 2005–2014.

Results—Two-fifths (39.9%) of young adults aged 25/26 reported being intoxicated at least once in the past 30 days; 25.6% reported usually experiencing a sustained high of 3 or more hours when drinking alcohol. Past two-week binge drinking (5+ drinks in a row) was reported by 36.3% of respondents. Past two-week high-intensity drinking (10+ drinks in a row) was reported by 12.4%. These age 25/26 alcohol use prevalence rates remained stable over the ten years of data examined, in contrast to significant declines over historical time in alcohol prevalence rates among these same individuals at age 18. High-risk drinking was particularly associated with being male, White, unmarried, employed, a non-parent, and an alcohol user before finishing high school.

Conclusions—Among US young adults in their mid-twenties, alcohol use was highly normative and frequently included participation in high-risk drinking behaviors. High-risk alcohol use prevention approaches developed specifically to reach young adults in their mid-twenties are needed, as well as efforts to increase proactive clinician screening to identify young adults participating in high-risk alcohol use.

Keywords

Alcohol consumption; young adult; binge drinking; high-intensity drinking; alcoholic intoxication

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INTRODUCTION

Alcohol use is the third leading global risk factor for disease, and the leading worldwide risk factor for mortality and disease for individuals aged 15–49.[1] Within the US, annual alcohol-attributable deaths (AADs) due to excessive alcohol use claim more than 87,000 lives.[2] Individuals aged 20–34 bear the largest share of AADs due to acute causes such as traffic accidents,[2] and the annual prevalence of alcohol use disorders is highest among young adults aged 18–29.[3] Both acute and long-term risks to the public and to individual users rise exponentially as the amount of alcohol consumed increases.[4, 5] Importantly, the average number of drinks consumed during a binge episode among US young adults aged 18–24 was 9.5.[6] A growing number of researchers are calling for increased attention to the issue of very high-risk drinking, such as consumption 10+ or even 15+ drinks on a single occasion.[4, 5] Annual and 30-day alcohol use prevalence increase through late adolescence and early young adulthood, peak in the 20s, and then decrease to some degree thereafter.[7–9] Binge drinking (5+ drinks in a row) generally peaks in the early 20s.[8–10] Perhaps not surprisingly, a great deal of alcohol use research has focused on the early 20s, when individuals transition from adolescence to initial early adulthood and reach lifetime peaks in binge drinking. A substantive body of research has examined drinking behaviors and consequences among college students, in particular. [11–14]

Levinson[15] identified a second major transition in young adulthood, when individuals move from initial early adulthood into building and maintaining the initial structure of adult life (roughly ages 22–28). According to Levinson, the two major tasks of this developmental period are to simultaneously (1) expand and explore options available for structure in regards to relationships, occupation, and geographical location, and (2) choose among available options to create an initial, stable adult life.[16] Similarly, Erikson[17] asserts that young adults' primary task is developing intimacy. High-risk alcohol use during the second major transition in young adulthood may compromise an individual's ability to successfully navigate these key developmental tasks. Adolescent and early young adult drinking has been associated with impaired brain function and development,[18] and research now confirms that brain development—especially that of the frontal lobe, which is involved in executive functions such as decision making, planning, and impulse control—continues throughout the 20s.[19, 20] Yet, little is known about high-risk alcohol use during the second transition in young adulthood.

Research indicates that several alcohol use behaviors—including annual use, binge drinking, and high-intensity drinking (10+ drinks in a row)—have significantly decreased in prevalence across historical time during late adolescence (age 18).[21, 22] The degree to which such decreases have persisted into the mid-twenties is not fully known. Studies have found that in conjunction with the decreasing rate of binge drinking at age 18 over time, there has been a co-occurring increase in the acceleration rate of binge drinking through the early years of young adulthood (i.e., 21/22) and slower deceleration rate thereafter.[23, 24] Similar research on other high-risk drinking behaviors has been unavailable. The likelihood of discussing alcohol use with a doctor or other health professional has been shown to decrease sharply after age 24,[25] but empirical studies of high-risk alcohol use among this group have not been available to indicate if such decreased clinician communication overall is

warranted, or which subgroups may be at highest risk. More detailed information on high-risk alcohol use behaviors—including consuming large quantities of alcohol and drinking to intoxication—among individuals undergoing the second major transition in young adulthood is needed.

Population studies on binge drinking are available that combine prevalence rates across young adults aged 26–34[26] and 25–34.[10, 25, 27–29] Rates of binge drinking, high-intensity drinking, and intoxication (reporting being drunk or very high from drinking in the past 30 days) have also been released that combine rates across young adults aged 19–28.[8] These studies indicate that high-risk alcohol use remains prevalent during young adulthood overall, but the age range is too broad to provide estimates specifically for individuals undergoing the second major young adulthood transition. Published estimates of intoxication and binge drinking among more discrete young adult age groups have been limited to single-year estimates only.[8] The current paper contributes to the literature by examining a range of high-risk alcohol use behaviors (intoxication, binge drinking, high-intensity drinking, and length of time usually stay drunk) among young adults aged 25/26, historical change in these behaviors, and associations with key demographic and social role characteristics.

Several demographic and social role characteristics are known to be associated with high-risk alcohol use, but the extent to which these remain strong indicators of behavior in the mid-twenties is unknown. Adult high-risk drinking behaviors are particularly prevalent among males[10, 27, 28] and the unemployed.[10] Adult high-risk drinking behaviors are also associated with race/ethnicity, education level, and annual family income, but association directions vary based on the specific drinking behavior examined.[10, 27, 28] Among individuals aged 19–32, social roles of being a full-time college student, single, and a non-parent are associated with increased binge drinking.[30] Age of alcohol use initiation and co-occurring use of substances other than alcohol also are likely to be strong correlates of high-risk alcohol use during the mid-twenties. Alcohol-related problems throughout adulthood are associated with early (prior to age 15) alcohol initiation.[31] For college students, high-risk alcohol behaviors are more likely among those who also use cigarettes, marijuana, and illicit drugs.[9, 32, 33] Prevention and screening efforts to reduce high-risk drinking (and associated harms) among individuals undergoing the second major transition of young adulthood will have the best likelihood to succeed if informed by clear data on populations most at risk.

The current study focuses on high-risk alcohol use among US young adults aged 25–26. Three research questions guided analyses: (1) What are the prevalence rates of 30-day intoxication, usually experiencing a sustained high of 3+ hours, past 2-week binge drinking (5+ drinks in a row), and past 2-week high-intensity drinking (10+ drinks in a row)? (2) Have prevalence rates changed over historical time, and is there evidence that the decreasing levels of alcohol use observed among adolescents have persisted as the same individuals enter their mid-twenties? (3) Does prevalence vary based on key demographics, substance use, and adult social roles?

METHODS

Data, Setting, and Study Population

The study utilizes data from Monitoring the Future (MTF), a national cohort-sequential study. Detailed methodology, including informed consent procedures, is provided elsewhere.[8, 34] Briefly, a nationally representative sample of approximately 15,000 12th graders (modal age 18; hereafter referred to as age 18) from about 130 schools has been surveyed annually since 1975 yielding sequential cohorts. Students complete self-administered surveys, typically during a normal class period. A representative random sub-sample of about 2,400 seniors is selected from each annual sample for longitudinal follow-up; substance users are over-sampled (analyses include weights accounting for sampling procedures). Respondents are randomly divided with half surveyed in odd-numbered years (starting at modal age 19) and half in even-numbered years (starting at modal age 20). Follow-up questionnaires are mailed in the spring with a modest monetary incentive of $20–$25. Approval was obtained from the Institutional Review Board for this study.

Due to our interest in high-risk alcohol behavior measures added to the MTF study in 2005, the current analyses utilize items asked from 2005 onwards on two of the six questionnaire forms (distributed randomly) used for data collection. Thus, the current sample was limited to 12th-grade cohorts from 1997–2007 who provided data at modal age 25/26 (hereafter referred to as age 25/26) during calendar years 2005–2014 (see Supplemental Table 1). The average age 18 response rate for these cohorts was 82.5%. A total of 8,074 individuals from the 1997–2007 cohorts responded to the relevant questionnaire forms at age 18 and were selected for longitudinal participation as described above. Of these, 3,609 individuals (44.7%) responded at age 25/26 in calendar years 2005–2014. Data on at least one alcohol use outcome included in the current analyses were available for 98.1% of responding individuals, yielding a total analytical sample of 3,542 respondents (43.9% of the eligible sample). Adjustments for attrition are discussed in the Analysis section below.

Measures

Alcohol use—Six alcohol use behaviors were used in these analyses: *Past 12-month use* (1=any; 0=none); *Past 30-day use* (1=any; 0=none); *Intoxication in past 30 days* (1=ever drunk or very high from drinking; 0=never); *Sustained high* (1=usually stay drunk or high for three or more hours; 0=two or fewer hours or usually don't get high); *Binge drinking* (1=5+ drinks in a row the past two weeks; 0=never); and *High-intensity drinking* (1=10+ drinks in a row in the last two weeks; 0=never). (See Supplemental Table 2 for complete wording of alcohol use measures.)

Demographics and alcohol initiation (age 18)—Gender was coded as male or female. Self-identified race/ethnicity was coded as White, Black, Hispanic, or Other. Parental education indicated whether at least one parent had graduated from college. Alcohol initiation (first trying more than just a few sips of alcohol) was coded as before high school (grade 8 or below), during high school (grades 9–12), or high school abstainer (reporting no lifetime drinking when surveyed at age 18).

Concurrent substance use and social roles (age 25/26)—Separate measures were coded for any past 30-day cigarette use, past 30-day marijuana use, and past 12-month use of illicit drugs other than marijuana (LSD, other psychedelics, cocaine, amphetamines, barbiturates, tranquilizers, heroin, other narcotics). Marital status (not married vs. married), parental status (no children vs. any children), employment status (no paid vs. paid employment), and college degree status (graduated from a 4-year college vs. not) were used to assess social roles at age 25/26.

Analysis

Descriptive and regression analyses were conducted using SAS 13.2. Bivariate and multivariable models were estimated using PROC LOGISTIC. Historical trend analyses were modeled using Joinpoint 4.0.1.[35, 36] All analyses were weighted using attrition weights, calculated as the inverse of the probability of participation at age 25/26 based on the following covariates measured at age 18: gender, race/ethnicity, college plans, high school grades, number of parents in the home, religiosity, parental education, alcohol use, cigarette use, marijuana use, region, cohort, and sampling weight correcting for over-sampling of age 18 substance users. Previous research has indicated that while the effects of attrition within the MTF panel data are statistically significant, they are small in magnitude.[24] Supplemental Table 3 provides a comparison of the total possible age 18 sample selected for follow-up with the analytic sample used in these analyses weighted using the attrition weights. Missing data on covariates were modeled with missing data indicators.

RESULTS

Sample Characteristics

Table 1 provides descriptive statistics. The sample reflected national gender and racial/ethnic distributions. Age 25/26 social role prevalence measures indicated approximately one quarter were married (26.7%) and/or had children (25.9%), slightly less than half had graduated from a 4-year college (43.6%), and most had some type of paid employment (83.7%).

Research Question (RQ) 1: Age 25/26 Alcohol Use Prevalence

Any past 12-month or 30-day alcohol use was normative (88.3% and 74.7%, respectively; see Table 1). Two-fifths (39.9%) reported being intoxicated at least once in the past 30 days. Slightly more than one-quarter (25.6%) reported usually experiencing a sustained high when drinking alcohol. In the past 2 weeks, binge drinking (5+ drinks) was reported by more than one-third (36.3%) of respondents, and high-intensity drinking (10+ drinks) was reported by 12.4% of respondents. Additional cross tabulations enabling a more nuanced understanding of alcohol use among these young adults showed that among individuals reporting any past 30-day alcohol use, approximately half reported getting intoxicated (54.6%) and/or binge drinking (48.5%). Among respondents reporting binge drinking, half (49.3%) usually experienced a sustained high and more than one-third (36.8%) reported high-intensity drinking.

RQ 2: Historical Trends in Age 25/26 Alcohol Use

Prevalence rates of all age 25/26 alcohol use outcomes included in the current analyses (past 12-month and 30-day alcohol use, intoxication, sustained high, binge drinking, and high-intensity drinking) remained statistically unchanged from 2005 through 2014 (see Figure 1 and Table 2). Such stability was in contrast to the significant declines across historical time in past 12-month and 30-day alcohol use, and binge drinking reported by the same individuals at age 18 (Table 2). (High-intensity drinking [added in 2005] was not available from the majority of these individuals at age 18, so no comparison could be made for that indicator.)

FIGURE 1 Historical trends in the prevalence of selected alcohol use behaviors at age 25/26 among eleven cohorts of US high school seniors. *Notes.* Age 25/26 data collected in calendar years 2005–2014. Intoxication defined as ever drunk or very high from drinking in past 30 days. Binge drinking defined as having 5 or more drinks in a row on at least one occasion in the past two weeks. Sustained high defined as usually stay drunk or high for 3 or more hours when drinking. High-intensity drinking defined as having 10 or more drinks in a row on at least one occasion in the past two weeks.

RQ 3: Demographic, Substance Use, and Social Role Associations with Age 25/26 Alcohol Use

Table 3 presents unadjusted cell percentages of each independent variable category reporting the four examined age 25/26 high-risk alcohol use outcomes: intoxication, sustained high, binge drinking, and high-intensity drinking. Full multivariable logistic regression results are also reported.

Gender—No significant gender differences were observed for sustained high. In contrast, males were significantly more likely than females to report intoxication, binge drinking, and high-intensity drinking.

Race/ethnicity—White respondents were significantly more likely than Black respondents to report intoxication, sustained high, and binge drinking. Whites and Hispanics reported statistically similar rates of intoxication, sustained high, and binge drinking. Whites were more likely than respondents who did not identify as either Black or Hispanic to report intoxication and binge drinking. For high-intensity drinking, all non-White respondents were collapsed into a single group due to very low reported prevalence; Whites had greater odds of consuming 10+ drinks.

Parent education—Higher parental education was not significantly associated with sustained high, binge drinking, or high-intensity drinking, but was associated with higher odds of intoxication.

Alcohol use initiation—The odds of intoxication, sustained high, and binge drinking were statistically similar when comparing those who first used alcohol during versus prior to high school (i.e., grades 9–12 vs. 8 or below). Compared to those who first drank alcohol during high school, those who first used prior to high school had significantly higher odds of

reporting high-intensity drinking. High school abstainers had significantly lower odds of all high-risk alcohol use outcomes than individuals who first used alcohol during high school.

Age 25/26 substance use—Past 12-month use of illicit drugs other than marijuana or past 30-day cigarette or marijuana use was associated with significantly higher odds of all high-risk alcohol use outcomes.

Social roles—Being married was associated with significantly lower odds of all high-risk alcohol use outcomes. Having children was associated with lower odds of all outcomes other than sustained high. Having paid work was associated only with higher odds of binge or high-intensity drinking. Having graduated from a 4-year college was associated with significantly higher odds of intoxication, binge, and high-intensity drinking.

DISCUSSION

Among US young adults undergoing the transition from the initial stages of early adulthood into building and maintaining an initial structure of adult life, alcohol use was normative. More than one-third reported intoxication and/or binge drinking, approximately one-quarter reported sustained high, and more than one in ten reported high-intensity drinking. Thus, among the three-quarters of the sample who reported past 30-day alcohol use, roughly one-half reported binge drinking in the past two weeks. Of those reporting any binge drinking, more than one-third reported engaging in high-intensity drinking. Half of all binge drinkers reported usually experiencing a sustained high whenever they drank alcohol. These results support calls for increased attention to the issue of high-intensity drinking.[4, 5] The observed alcohol use prevalence rates at age 25/26 remained statistically stable across the cohorts examined, in contrast to significant decreases in several use measures observed over historical time among these respondents during late adolescence. Characteristics associated with particularly high-risk drinking included being male, White, unmarried, employed, a non-parent, and an alcohol user before finishing high school

Individuals aged 25/26 are in a unique period of young adulthood. The initial transition out of adolescence is completed, but they are not yet fully established in adulthood. Many of those pursuing post-secondary education have completed a certificate, associate's or bachelor's degree[37, 38] but have not yet fully established employment paths. A growing number are moving toward marriage and/or parenthood (with approximately one-quarter of the current sample in at least one of those roles). By the end of adulthood, about half will marry, and about three-quarters will have children.[39, 40] It is a period of significant change and transition that, based on the findings of the current study, is frequently accompanied by high-risk alcohol use behaviors that are associated with acute and long-term risks. Similar to published findings for young adults overall,[30] high-risk alcohol use behaviors were especially likely for those who were not married, were not parents, had at least some paid employment, and had graduated from a 4-year college.

The prevalence levels of all alcohol use behaviors at age 25/26 were stable over the decade examined (2005–2014). Such stability is in contrast to significant declines in alcohol use observed among these same individuals when they were high school seniors. In other words,

the decreasing levels of alcohol use over time observed when these respondents were age 18 (1997–2007) have not persisted to age 25/26 (2005–2014). These findings are in line with prior research showing a decreasing rate of alcohol use at age 18,[9, 22, 23] followed by an acceleration in the rate of drinking (at least binge drinking) in early young adulthood.[23, 24] The current study demonstrates historically stable levels of use at age of 25/26. Concerted advocacy, intervention, and policy efforts have helped lower adolescent alcohol consumption.[41, 42] These reductions in alcohol use—including high-risk use—have not persisted to the second major transition in young adulthood. Historical variation in social role acquisition (delayed marriage, parenthood, and employment) has been associated with increased acceleration in alcohol use in early young adulthood.[24] However, there have also been other important shifts over time, including an industry effort to reinforce drinking as a social norm and meet desires for new, innovative packaging and flavor profiles.[43] There also has been dramatic growth in the exposure of young adults to alcohol marketing and other alcohol-related content on social media,[44] which may affect both perceived social norms of alcohol use as well as individual use intentions.[45] Both broad population-based and targeted media efforts are needed to counteract the social "culture of intoxication" that encourages high-risk alcohol use.[44, 46]

In the face of high-risk alcohol use that has been stable across time, the highest rates of AUD in adulthood,[3] and decreases in discussing alcohol use with health professionals,[25] improved screening and intervention programs for young adults in their mid-twenties also clearly are needed. Alcohol-related consequences include significant short- and long-term health risks to individual users[47] as well as risks to the public including interpersonal violence, vandalism, motor vehicle crashes, and fetal alcohol syndrome.[48, 49] The US Preventive Services Task Force[50] recommends that clinicians screen all adults aged 18 and older for both risky or hazardous alcohol use as well as AUDs. Young adults often do not self-identify as having alcohol problems, and thus proactive screening is needed.[51] Given that the Affordable Care Act now extends coverage for individuals covered under a parent's policy until they turn 26, there may be an increased opportunity for primary care clinicians to proactively screen young adults into their mid-twenties. In addition, there is a call for clinicians to become more actively involved in screening in a range of locations, including hospital emergency rooms and workplaces.[51]

To help inform prevention and screening efforts among young adults in their mid-twenties, this study provides information on demographic, substance use, and adult social role characteristics associated with high-risk alcohol use. Similar to previous research on gender differences in alcohol use,[10, 27, 28, 52] men were more likely to report most high-risk alcohol use behaviors. However, we did not find significant differences between men and women on sustained high. Observed racial/ethnic differences in age 25/26 alcohol use were similar to research reporting on binge drinking among adults overall,[26–28] in that Whites and Hispanics had similar rates of most alcohol use outcomes, while Blacks reported significantly lower rates for most outcomes. In prior studies, parental education showed a complex relationship with high-risk drinking behaviors. Among high school seniors, associations with higher parental education moved from significantly *higher* odds of binge drinking, to no association with high-intensity drinking, to *lower* odds of having 15+ drinks in a row.[21] Among early young adults, higher parental education was found to be associated

with significantly higher odds of binge drinking on 12 or more occasions per year in bivariate models, but after including covariates, only those with the highest levels of parental education (postgraduate studies) continued to have higher odds.[53] In the current study, higher parental education was significantly associated only with increased odds of intoxication at age 25/26. Thus, parental education does not appear to be a consistent predictor of a range of high-risk drinking behaviors during the mid-twenties, but some associations do persist.

The current study's findings related to alcohol initiation and other substance use also are important. Initiating alcohol use prior to high school (vs. during) was associated with increased risk for high-intensity drinking, as shown in previous research.[31] Yet, initiation during high school (vs. being a high school abstainer) was also associated with increased risk for all alcohol outcomes examined. Delaying alcohol use initiation until after high school may be protective against all forms of alcohol use, including high-risk use behaviors, at age 25/26. The current study's findings extend prior research among college students[9, 32, 33] indicating that the risk of high-risk alcohol use behaviors at age 25/26 is higher for individuals reporting concurrent use of cigarettes, marijuana, or illicit drugs.

Limitations

These findings must be considered within their limitations. The sample was based on 12th-grade students; as a result, high school drop-outs were not included (those who drop out of high school may have a lower prevalence of high-risk drinking behaviors, but a higher frequency of participation if any use is reported[26–28]). In addition, attrition between ages 18 and 25/26 raises the possibility of bias in prevalence estimates of age 25/26 high-risk alcohol use. Sensitivity analyses (not shown) examined baseline characteristics associated with attrition. Respondents lost to follow-up were more likely to be male; Black or Hispanic (vs. White); in a home where no parent had a college education; to have initiated alcohol use prior to finishing high school; and to have been members of more recent cohorts. Given that the current study found few differences in high-risk alcohol use by either parental education or cohort, attrition associated with these characteristics is not likely to substantively affect the reported results. Greater attrition among Blacks (with lower alcohol use rates compared to Whites) may somewhat increase prevalence estimates. However, greater attrition among males and those initiating alcohol use prior to finishing high school (groups with high alcohol use) and Hispanics (with alcohol use rates equivalent to Whites) may lead to under-estimates of overall age 25/26 high-risk drinking. While use of attrition weights resulted in recapturing baseline sample distributions, the actual prevalence of high-risk drinking among age 25/26 young adults may be underestimated to some degree. A further limitation is that binge and high-intensity drinking were assessed with the same items for men and women, rather than gender-specific cut-offs that help to account for differences in body size and alcohol metabolism. There is also a need for future research examining associations between high-risk alcohol use among this population and comorbidities (such as ADHD and other mental health issues) and additional social roles (such as military personnel). These limitations notwithstanding, the current analyses provide previously missing data on a range of high-risk alcohol behaviors in a national sample of young adults undergoing the second major transition in young adulthood.

Conclusions

Among US young adults aged 25/26, alcohol use was normative and included significant participation in high-risk drinking. The decreasing levels of alcohol use observed among this sample at age 18 did not persist when these same individuals entered their mid-twenties. Intervention approaches developed specifically to reach young adults in their mid-twenties clearly are needed that counteract social norms encouraging intoxication, as well as efforts to increase proactive screening by clinicians to identify individuals engaged in high-risk drinking behaviors.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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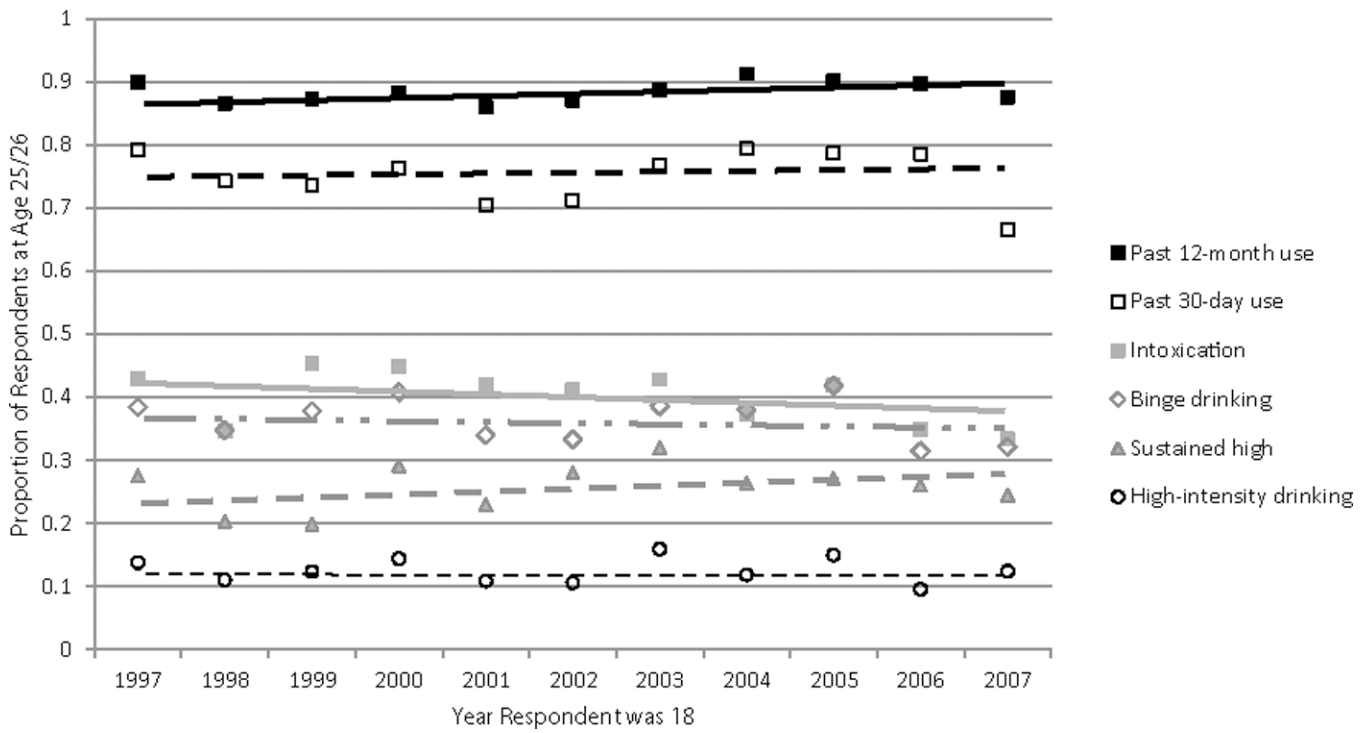
Figure 1.
Historical trends in the prevalence of selected alcohol use behaviors at age 25/26 among 11 cohorts of US high school seniors. Age 25/26 data collected in calendar years 2005–2014. Intoxication defined as ever drunk or very high from drinking in past 30 days. Binge drinking defined as having 5 or more drinks in a row on at least 1 occasion in the past 2 weeks. Sustained high defined as usually stay drunk or high for 3 or more hours when drinking. High-intensity drinking defined as having 10 or more drinks in a row on at least 1 occasion in the past 2 weeks.

Table 1

Descriptive Statistics

	Proportion	SD
Alcohol use outcomes measured at age 25/26		
Any past 12-month use	0.883	0.321
Any past 30-day use	0.747	0.435
Intoxication[a]	0.399	0.490
Sustained high[b]	0.256	0.437
Binge drinking[c]	0.363	0.481
High-intensity drinking[d]	0.124	0.330
Demographics measured at age 18		
Male	0.459	0.498
Race/ethnicity		
White	0.667	0.471
Black	0.111	0.314
Hispanic	0.113	0.317
Other	0.087	0.282
Missing	0.022	0.147
Parental education		
Less than college degree	0.458	0.498
College degree	0.496	0.500
Missing	0.047	0.212
Initiation of alcohol use		
High school abstainer	0.195	0.397
During high school	0.456	0.498
Before high school	0.239	0.426
Missing	0.109	0.312
Concurrent substance use and social roles measured at age 25/26		
Past 12-month use of illicit drugs other than marijuana		
None	0.796	0.403
Any	0.168	0.374
Missing	0.035	0.185
Parental status		
No children	0.736	0.441
Any children	0.259	0.438
Missing	0.005	0.072
Past 30-day cigarette use		
None	0.746	0.435
Any	0.238	0.426
Missing	0.016	0.126
College degree status (4-year college)		
Had not graduated	0.543	0.498
Had graduated	0.436	0.496
Missing	0.020	0.141
Past 30-day marijuana use		
None	0.837	0.369
Any	0.150	0.357
Missing	0.013	0.111
Employment status		
No paid employment	0.147	0.354
Any paid employment	0.837	0.369
Missing	0.016	0.125
Marital status		

	Proportion	SD	Proportion	SD
Not married	0.727	0.446		
Married	0.267	0.442		
Missing	0.006	0.078		

Note. Total N (unweighted) = 3,542. For specific outcomes, unweighted *n* is as follows: 12-month use 3,521; 30-day use 3,526; intoxication 1,755; sustained high 1,736; binge drinking 3,501; high-intensity drinking 1,739. Missing data on non-outcome measures modeled using missing data indicators as shown.

[a] Ever drunk or very high from drinking in past 30 days

[b] Usually stay drunk or high for 3 or more hours when drinking.

[c] Having 5 or more drinks in a row on at least one occasion in the past two weeks.

[d] Having 10 or more drinks in a row on at least one occasion in the past two weeks.

Table 2

Comparative Historical Trends in Selected Alcohol Use Behaviors at Ages 18 and 25/26 among 11 Cohorts (1997–2007) of US High School Seniors

	Age 18			Age 25/26		
	Slope	**SE**	**p**	**Slope**	**SE**	**p**
Past 12-month alcohol use	−0.008	0.003	0.034	0.003	0.002	0.122
Past 30-day alcohol use	−0.010	0.004	0.021	0.002	0.004	0.532
Intoxication[a]	−0.006	0.005	0.232	−0.005	0.004	0.284
Sustained high[b]	−0.001	0.004	0.775	0.006	0.004	0.151
Binge drinking[c]	−0.011	0.004	0.020	−0.002	0.004	0.588
High-intensity drinking[d]	--	--	--	−0.001	0.002	0.635

Note. Age 18 data collected during calendar years 1997–2007. Age 25/26 data collected during calendar years 2005–2014.

[a] Ever drunk or very high from drinking in past 30 days

[b] Usually stay drunk or high for 3 or more hours when drinking.

[c] Having 5 or more drinks in a row on at least one occasion in the past two weeks.

[d] Having 10 or more drinks in a row on at least one occasion in the past two weeks. This measure was first asked in 2005; thus, historical trends for this measure at age 18 are not available.

Table 3

Demographic, Substance Use, and Social Role Associations with Perceived Alcohol Intoxication, Binge and High-Intensity Drinking among US Young Adults aged 25/26

	Intoxication[a]		Sustained high[b]		Binge drinking[c]		High-intensity drinking[d]	
	%[e]	AOR[f] (95% CI[g]) p	%	AOR (95% CI) p	%	AOR (95% CI) p	%	AOR (95% CI) p
Demographics measured at age 18								
Gender								
Female	34.2	(ref)	25.8	(ref)	27.0	(ref)	6.3	(ref)
Male	46.9	1.54 (1.31–1.82) <.001	25.4	0.89 (0.75–1.06) 0.196	47.4	2.50 (2.23–2.81) <.001	19.5	4.02 (3.12–5.19) <.001
Race/ethnicity								
White	44.1	(ref)	26.8	(ref)	40.1	(ref)	14.0	1.50 (1.13–1.98) 0.005
Black	22.0	0.35 (0.26–0.49) <.001	20.0	0.73 (0.54–0.99) 0.045	19.7	0.42 (0.34–0.52) <.001	--	
Hispanic	34.8	1.03 (0.79–1.34) 0.834	25.7	1.00 (0.76–1.31) 0.979	34.3	0.90 (0.75–1.09) 0.273	--	
Other	33.5	0.53 (0.39–0.73) <.001	23.1	0.83 (0.61–1.11) 0.203	30.0	0.58 (0.47–0.71) <.001	--	
B/H/O[h]	--		--		--		8.5	(ref)
Parental education								
Less than college degree	34.1	(ref)	26.0	(ref)	34.6	(ref)	10.7	(ref)
College degree	46.6	1.37 (1.15–1.63) <.001	24.2	0.86 (0.71–1.03) 0.099	38.3	0.95 (0.84–1.08) 0.441	13.3	1.11 (0.86–1.44) 0.411
Initiation of alcohol use								
During high school	45.2	(ref)	27.8	(ref)	41.0	(ref)	13.4	(ref)
Before high school	49.9	1.17 (0.94–1.44) 0.163	32.4	1.22 (1.00–1.48) 0.050	45.2	1.10 (0.96–1.27) 0.181	18.1	1.33 (1.03–1.71) 0.029
High school abstainer	20.8	0.40 (0.32–0.51) <.001	10.9	0.43 (0.32–0.57) <.001	17.1	0.37 (0.31–0.44) <.001	4.3	0.40 (0.26–0.63) <.001
Concurrent substance use and social roles measured at age 25/26								
Past 12-month use of illicit drugs other than marijuana								
None	33.9	(ref)	19.8	(ref)	30.5	(ref)	8.7	(ref)
Any	72.7	2.27 (1.77–2.92) <.001	51.9	3.04 (2.46–3.74) <.001	61.5	2.03 (1.73–2.38) <.001	28.7	2.52 (1.92–3.31) <.001
Past 30-day cigarette use								
None	33.2	(ref)	20.7	(ref)	29.3	(ref)	7.7	(ref)
Any	62.1	2.61 (2.12–3.20) <.001	41.2	1.88 (1.54–2.29) <.001	58.6	2.59 (2.25–2.97) <.001	27.0	2.96 (2.29–3.83) <.001
Past 30-day marijuana use								
None	34.3	(ref)	22.5	(ref)	31.3	(ref)	9.5	(ref)

	Intoxication[a]		Sustained high[b]		Binge drinking[c]		High-intensity drinking[d]	
	%[e]	AOR[f] (95% CI[g]) p	%	AOR (95% CI) p	%	AOR (95% CI) p	%	AOR (95% CI) p
Any	72.8	3.12 (2.37–4.09) <.001	44.5	1.39 (1.11–1.75) 0.004	61.8	1.98 (1.67–2.34) <.001	27.8	1.72 (1.29–2.29) <.001
Marital status								
Not married	45.8	(ref)	29.0	(ref)	40.8	(ref)	14.5	(ref)
Married	26.1	0.51 (0.42–0.63) <.001	15.2	0.56 (0.45–0.71) <.001	24.0	0.59 (0.51–0.68) <.001	6.2	0.68 (0.48–0.96) 0.027
Parental status								
No children	44.8	(ref)	27.7	(ref)	40.2	(ref)	14.7	(ref)
Any children	26.2	0.70 (0.55–0.88) 0.002	19.6	0.79 (0.62–1.00) 0.051	25.4	0.70 (0.60–0.82) <.001	5.7	0.43 (0.30–0.62) <.001
Employment								
No paid employment	32.5	(ref)	24.1	(ref)	26.2	(ref)	6.2	(ref)
Any paid employment	41.2	1.22 (0.96–1.55) 0.112	26.0	1.05 (0.82–1.35) 0.680	38.2	1.56 (1.31–1.85) <.001	13.8	3.02 (1.97–4.65) <.001
Graduated from 4-year college								
No	36.4	(ref)	25.7	(ref)	35.0	(ref)	11.8	(ref)
Yes	44.7	1.66 (1.38–1.99) <.001	26.0	1.20 (0.99–1.46) 0.062	38.4	1.43 (1.26–1.63) <.001	12.9	1.31 (1.01–1.71) 0.044

Note. Missing data on non-outcome measures modeled using missing data indicators. Adjusted odds ratios for missing data indicators not shown. Unweighted *n* intoxication 1,755; sustained high 1,736; binge drinking 3,501; high-intensity drinking 1,739.

[a]Ever drunk or very high from drinking in past 30 days

[b]Usually stay drunk or high for 3 or more hours when drinking.

[c]Having 5 or more drinks in a row on at least one occasion in the past two weeks.

[d]Having 10 or more drinks in a row on at least one occasion in the past two weeks.

[e]Unadjusted percentage of cases in each specified covariate category that reported the specific outcome.

[f]AOR = Adjusted odds ratio obtained from models simultaneously including all listed covariates as well as cohort using categorical groupings of 1997–1998, 1999–2001, 2002–2004, and 2005–2007.

[g]CI = Confidence interval.

[h]Combined estimates for Blacks, Hispanics, and other.