Published in final edited form as:

J Adolesc Health. 2015 June ; 56(6): 639–645. doi:10.1016/j.jadohealth.2015.02.010.

Alcohol Use at the Cusp of Adolescence: A Prospective National Birth Cohort Study of Prevalence and Risk Factors

Jennifer L Maggs, PhD,

Human Development and Family Studies 315 HHDev East Pennsylvania State University
University Park, PA 16802, USA and Centre for Longitudinal Studies UCL Institute of Education
20 Bedford Way London WC1H 0AL, UK

Jeremy Staff, PhD,

Department of Sociology and Criminology 211 Oswald Tower Pennsylvania State University
University Park, PA 16802, USA jus25@psu.edu

Megan E. Patrick, PhD,

Institute for Social Research University of Michigan Ann Arbor, MI 48106-1248, USA
meganpat@umich.edu

Laura Wray-Lake, PhD, and

Dept of Clinical and Social Sciences in Psychology University of Rochester Rochester, NY 14627,
USA Laura.wray-lake@rochester.edu

John E. Schulenberg, PhD.

Institute for Social Research University of Michigan Ann Arbor, MI 48106-1248, USA
schulenb@umich.edu and Department of Psychology 1012 East Hall, 530 Church St University of
Michigan Ann Arbor, MI 48109-1043, USA.

Abstract

Purpose—To estimate the prevalence of alcohol use at age 10-11 years and document variation by early sociodemographic and concurrent alcohol-specific risk factors.

Methods—The Millennium Cohort Study is a prospective, nationally-representative study of live births in the United Kingdom (UK) across 12 months. A random sample of electoral wards was stratified to adequately represent UK countries, economically deprived areas, and areas with high concentrations of Asian and Black British families. 12,305 child-mother pairs provided self-report

© 2015 Published by Society of Adolescent Health and Medicine.

(Corresponding Author) jmaggs@psu.edu 815.865.2028.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conflicts of Interest: The authors have no conflicts of interest or financial relationships relevant to this article to disclose.

Implications and Contributions Statement

About 1 in 8 British 10-11-year-olds had consumed alcohol, defined as more than a few sips, though drunkenness was rare. Very early alcohol initiation was strongly associated with positive attitudes about alcohol. Physician screening and public health surveillance should increase, due to heightened risk for serious long-term health and social consequences.

data at 9 months (mother's marital status, age, education, occupational level; child gender, ethnicity, country) and age 10-11 years (adolescent alcohol use and attitudes).

Results—After adjusting for attrition and sampling design, 13.4% of 10-11 year olds had had an alcoholic drink (> few sips), 1.2% had felt drunk, and 0.6% had 5+ drinks at a time. Odds of ever drinking were higher among boys (1.47, 95% confidence interval 1.29 to 1.68) and lower among early adolescents who were Asian British (vs. White, 0.09, 0.05 to 0.17) or Black British (0.42, 0.29 to 0.62). Beyond sociodemographic differences, more positive attitudes about alcohol were associated with greater odds of drinking (1.70, 1.51 to 1.91), feeling drunk (2.96, 2.07 to 4.24), and having 5+ drinks (4.20, 2.66 to 6.61).

Conclusions—Alcohol use in the last year of primary school was identified but not common. Use varied by sociodemographic groups; early adolescents with more positive alcohol attitudes had especially high risks of early alcohol initiation. Results support calls for increased surveillance and screening for very early drinking.

Keywords

Alcohol; drunkenness; binge drinking; age of onset; prevalence; early adolescent; Millennium Cohort Study; alcohol expectancies

The younger the age when alcohol is initiated, the greater the likelihood of subsequent serious adolescent and adult health and social problems [1]. Known sequelae of early drinking include smoking, marijuana and other drug use, alcohol and drug dependence, drinking and driving, motor vehicle accidents, other injuries, academic and employment problems, and criminal and violent behavior [2] [3] [4]. Retrospective national as well as community samples of adolescents and adults suggest that initiation tends to begin around age 11 and increases rapidly through middle and high school [5] [6] [7].

However, extant understanding of the prevalence and predictors of early drinking initiation remains limited for two primary reasons. Most studies have either collected retrospective data many years after initiation or are based on convenience and community samples with unknown generalizability [6] [8]. Most national surveys of substance use focus on older adolescents or adults [9] [10] or are cross-sectional [11] [12]. Retrospective data about onset of substance use have two major limitations: (a) They suffer from forward telescoping—the tendency to report ever-older ages of initiation at later assessments—particularly among early initiators, and (b) They cannot identify early risk factors that predate drinking [1] [13] [14]. Two important exceptions are longitudinal studies of representative community samples in Pittsburgh in the United States [8] and Avon in England [15], which have documented that experience with alcohol sipping [8] and drinking [8] [15] begins in childhood for a meaningful number of pre-adolescents. To address these limitations of past work, recent authoritative reviews have called for nationally-representative samples with prospective prediction of alcohol use onset [1] [14]. Such high-quality longitudinal data on the prevalence and predictors of early drinking is essential fundamental knowledge on which to justify, build, and strategically target prevention, screening, and treatment efforts for children and early adolescents.

This paper addresses important knowledge gaps using the first nationally-representative, prospective study of elementary pupils' alcohol use. The Millennium Cohort Study is an ongoing longitudinal sample of children in the United Kingdom (UK) followed since their infancy who were recently surveyed in their final year of primary school. We utilized these data to address two aims: (a) To estimate lifetime prevalence at age 10-11 years of alcohol use, feeling drunk, and drinking 5 or more drinks, and (b) To examine the extent to which early alcohol use varies first by childhood sociodemographic characteristics (mother-reported when her child was 9 months old) and second by early adolescent alcohol attitudes (child-reported at age 10-11 years).

To more conservatively test the power of family and individual background variables in the prediction of early drinking onset, we also include three alcohol-specific risk factors—positive alcohol expectancies, negative alcohol expectancies, and perceived harm of trying 1-2 alcoholic drinks—as concurrent predictors of early alcohol use. Positive and negative alcohol expectancies develop prior to direct alcohol experience [16] [17]; are strong proximal predictors of alcohol use and problems concurrently and prospectively [18] [19] [20] [21]; are leading indicators of historic shifts in alcohol use [9]; and are frequent targets of public health and prevention efforts [22]. Based on prior research, we expected positive expectancies to be positively correlated with alcohol use, and negative expectancies and perceived harm to be negatively correlated with alcohol use.

Methods

Study Population and Survey Design

The Millennium Cohort Study (MCS) targeted infants born between September 2000 and August 2001 (England and Wales) and November 2000 and January 2002 (Scotland and Northern Ireland) who were residing in the UK at 9 months of age [23] [24]. The complex sampling design (described in detail elsewhere [23] [25]) relied on stratified random sampling to achieve representation from the four UK countries, economically deprived areas, and areas with high concentrations of Asian British (Indian, Pakistani, and Bangladeshi) and Black British (Black African, Black Caribbean, and Black other) families based on census data. At wave 1, 18,552 families including nine-month old children and parents/guardians participated. Four follow-up surveys were conducted in 2003-2004, 2006, 2008, and 2012-2013. In the most recent survey, 13,287 families were interviewed (81.4% of eligible who had not emigrated, permanently withdrawn, or deceased) [25]. Analyses here focus on data from 12,305 child-mother pairs who provided relevant data at age 9 months and during the child's last year of primary school (modal age 11 years). Individuals interviewed after the transition to secondary school (n=66) were excluded from analysis due to age and context differences including possible increased alcohol access. Analyses were weighted for data missing due to attrition. All statistical analyses used the “svy” command in Stata version 12.1 to account for the complex sampling design. Each MCS wave was overseen by the relevant Ethics Committees. At age 11, the project was overseen by the Yorkshire and Humber Research Ethics Committee and approved by review boards at the Pennsylvania State University and the University of Michigan. Parent consent was obtained before assent from early adolescents was sought.

Sociodemographic Predictors

Sample characteristics are presented in Table 1, column 1. Childhood sociodemographic predictors were gender (51.1% male); whether children had reached their 11th birthday when interviewed (66.3% yes); and the group the parent viewed their child as belonging to, classified as White British (85.3%), Asian British (Indian, Pakistani, Bangladeshi, 6.8%), Black British (Black African, Black Caribbean, Black Other, 3.3%), or Other British (4.7%) (hereafter described as ethnicity). Country of residence in infancy was also included (81.7% England, 9.1% Scotland, 5.2% Wales, 4.1% Northern Ireland).

Mother sociodemographic variables assessed when children were 9 months old were: marital status (52.8% married); educational level (28.4% had NVQ level 4 or 5, equivalent to a college degree or higher); occupational status of current or last job (43.0% had routine or manual occupations, 21.1% intermediate occupations, 26.9% higher managerial, administrative or professional occupations, and 9.1% had never been employed); and being <20 years at the time of the child's birth (9.8%).

Early Adolescent Alcohol Use

As part of a self-completion booklet completed in a private place during home interviews at modal age 11 years, children were asked, "Have you ever had an alcoholic drink? That is, more than a few sips." A drink was defined as half a pint of lager, beer or cider, one alcopop, a small glass of wine, or a measure of spirits. Each of these common serving sizes is roughly equivalent to 1.5 standard units of alcohol (or 12 g). Participants responding 'Yes' were asked, "*Have you ever drunk enough to feel drunk?*" and "Have you ever had five or more alcoholic drinks at a time?" Each was answered as yes or no. These three dichotomous measures served as our primary outcomes.

Early Adolescent Alcohol Attitudes

All early adolescents, regardless of drinking history, were asked to indicate in the self-completion booklet their agreement or disagreement with a series of statements about alcohol and its effects on a 4-point scale of Strongly Agree (coded 3), Agree (2), Disagree (1), and Strongly Disagree (0; adapted from [19]). Four items were averaged to indicate *positive expectancies* about the effects of alcohol, for example: "Drinking beer, wine, or spirits is a way to make friends with other people". Three items were averaged to indicate *negative expectancies* about the effects of alcohol, for example: "Drinking alcohol gets in the way of school work". As evidence of predictive validity, these 7 items assessed at age 10 in a US longitudinal sample predicted higher odds of alcohol abuse and dependence at age 21 [19]. Finally, to assess *perceived harm of experimenting with alcohol*, cohort members were asked, "How much do you think people risk harming themselves if they try one or two alcoholic drinks?" Due to skew in this single item indicator, the variable did not meet the assumptions of normality; thus, No Risk and Slight Risk were coded as 0 (no harm), and Some Risk or Great Risk were coded as 1 (yes harm).

Data Analysis

Prevalence of ever having had a drink, felt drunk, and had 5 or more drinks at a time were calculated for the total weighted sample and as a function of sociodemographic background as well as early adolescent alcohol attitudes. Next, logistic regression analyses were used to calculate odds ratios (ORs) with 95% confidence intervals (CIs) in models predicting the three alcohol use indicators, first by sociodemographic predictors (model 1), and then with concurrent age 10-11 alcohol attitudes included (model 2).

Results

Alcohol Use and Attitudes at Age 10-11 Years

The prevalence rates of ever drinking alcohol—more than a few sips, of feeling drunk, and of drinking 5 or more drinks at a time are presented in Table 1. Overall, 13.4% reported having had an alcoholic drink, 1.2% had consumed enough alcohol to feel drunk, and 0.6% reported having had 5 or more alcoholic drinks at a time. There was a consistent pattern of earlier initiation among boys: 15.7% boys vs. 10.9% girls had ever had a drink, 1.7% vs. 0.7% had felt drunk, and 0.8% vs. 0.3% had consumed 5 or more drinks. Age differences based on birthdates and timing of interviews suggested small though statistically non-significant differences in alcohol use; age was controlled in subsequent analyses. Lifetime prevalence of alcohol use varied by ethnicity and country, with cohort members who were White British, and who lived in England and Wales generally evidencing higher percentages, though results varied by outcome. Participants with relatively greater socioeconomic disadvantage, as indicated by the mothers' educational level, occupational status, and younger age at the child's birth, were more likely to have initiated alcohol use behaviors. Mothers who were married when their child was an infant subsequently had early adolescents who were less likely to have drunk alcohol, felt drunk, or had 5 or more drinks at a time.

Table 2 presents descriptive information for the alcohol attitudes, results of *t*-tests contrasting levels of positive and negative expectancies for those who had and had not engaged in each behavior, and results of χ^2 tests for difference in proportions of early adolescents saying that people who tried 1-2 alcoholic drinks risked some or great harm. Participants who had initiated these alcohol use behaviors indicated significantly more agreement with positive expectancies, less agreement with negative expectancies, and were less likely to view experimenting with alcohol as harmful.

Sociodemographic Predictors of Early Adolescent Alcohol Use

Next, we examined whether age 10-11 alcohol use varied by sociodemographic risk factors when entered simultaneously in logistic regression analyses (see Table 3, Model 1). In the context of all sociodemographic risk factors, boys had greater odds than girls of ever drinking and feeling drunk (ORs=1.47 and 2.07, respectively). Early adolescents with White British ethnicity were most likely to have ever had a drink. Odds were lower for participants with Asian British (91% lower), Black British (58% lower), and Other British (48% lower) ethnicity. Odds of ever having felt drunk or drank 5+ drinks did not differ by ethnicity. Compared to those living in England, participants living in Scotland or in Northern Ireland

had 30% or 73% lower odds of ever drinking, and those living in Wales/Scotland/Northern Ireland had 28%/77%/81% lower odds of having felt drunk. Participants whose mothers were married had 24%, 53%, and 56% lower odds of the three alcohol outcomes. Having a mother with degree-level qualifications predicted 77% lower odds of having had 5 or more drinks at a time, compared to having a mother without these qualifications. Finally, compared to having a mother with a routine or manual occupation, early adolescents who had a mother with an intermediate or a professional/managerial/administrative level occupation had lower odds of ever drinking (21% or 27%, respectively) and of feeling drunk (56% or 63%). Having a relatively younger mother did not predict subsequent odds of early drinking in Model 1 with all sociodemographic predictors included.

Concurrent Associations of Early Adolescent Alcohol Use and Attitudes

Final models present results of logistic regressions in which the measures assessing alcohol attitudes were included with the sociodemographic characteristics (Table 3, Model 2). Results show that the odds of drinking were significantly higher among early adolescents who endorsed more positive alcohol expectancies. For each unit greater (on a 4-point scale from Strongly Disagree to Strongly Agree) in positive alcohol expectancies, participants had 1.70 times greater odds of having had an alcoholic drink, 2.96 times greater odds of having felt drunk, and 4.20 times greater odds of having had 5 or more drinks at a time. Early adolescents who endorsed more negative alcohol expectancies had lower odds of drinking. That is, for each unit greater in negative expectancies, they had 30%, 49%, and 59% lower odds of having initiated these three behaviors, respectively. Finally, early adolescents who indicated that people who tried 1 or 2 alcoholic drinks had some or great risk of harm had 49%, 41%, and 71% lower odds of reporting these drinking behaviors.

Notably, the sociodemographic predictors evidenced very similar patterns of association before and after positive expectancies, negative expectancies, and perceived harm of trying alcohol were included as additional predictors. That is, the robust links of concurrent alcohol-specific risk factors added to, rather than accounted for, the observed variation in alcohol use by individual and maternal background characteristics. There were two exceptions: after entering alcohol attitudes in the regression models, differences between participants in England and Wales in ever feeling drunk and differences between those with married versus unmarried mothers were no longer statistically significant.

Discussion

Health, economic, and social costs of alcohol use are enormous; for example in the US estimated annual costs are over \$220 billion of which \$27 billion are due to underage drinking [26]. In Western countries, the majority of citizens initiate alcohol use between childhood and adulthood [27]. Retrospective studies suggest that early alcohol involvement may increase the likelihood of future serious problems [5] [28]. Our study answers the call of recent authoritative reviews [1] [14] for data that address past deficiencies due to non-representative samples, retrospective data, and cross-sectional designs to more accurately document how the prevalence of alcohol use varies across childhood population subgroups.

The present analyses shows that the initiation of alcohol use occurs by age 11 for 1 in 8 people in the UK, and that that alcohol use varies by early childhood sociodemographic background as well as concurrent early adolescent attitudes about alcohol. That is, approximately 13% of MCS participants in the last year of primary school (Year 5) in the UK were estimated to have initiated alcohol use, defined as having had an alcoholic drink, more than a few sips. Consistent with some studies of English and American youth at ages 10 to 14 [6] [9] [15], the initiation rate was higher among those youth whose mothers had lower educational and occupational levels. More boys than girls had initiated alcohol use, consistent with previous studies of 10-year-olds [6] [15], although studies of slightly older adolescents often find gender differences to be small or non-existent [9] [12] [27]. Initiation rates were also higher for White youth, consistent with what is found in some studies of adolescents [9] [27] [29] and adults [30] but not all [6] [31]. There is little representative data contrasting very young adolescents' alcohol use across the four countries of the UK, but the HBSC found rates of drinking at age 11 to be similar or slightly higher in Wales than in England or Scotland [11].

To our knowledge, this is the first nationally representative, prospective study on 10-11 year olds' drinking to document childhood predictors of early adolescent alcohol use, as well as concurrent associations with alcohol attitudes. A very limited amount of epidemiological information is available about very underage drinkers [6], and wording of measures has varied. For example, 53.1% of 11-year-olds in a primarily European- and African-American community in the United States sample had sipped alcohol and 2.8% had had a drink [8]. Comparisons of UK adolescents (mean age=15.9 years) in The European School Survey Project on Alcohol and Other Drugs [12] with 10th graders in the US Monitoring the Future Study [9] suggest that rates in middle adolescence are higher in the UK than the US. For example, 65% had ever been drunk by this age in the UK compared to 41% in the US. No such nationally-representative data of very young drinking with prospective prediction by sociodemographic variables is available in the US. Thus while generalizability of prevalence and of predictors to the US or other countries is unknown, this study represents an important first step toward answering calls to increase surveillance of drinking in late childhood.

Although an important level of drinking by age 10-11 years was identified, this behavior is clearly not common. The vast majority—over 86 percent—had not yet had more than a few sips of an alcoholic drink, and over 98 percent had not felt drunk or had 5 or more drinks at a time. Twice as many said they had drunk 5 or more drinks at a time (1.2%) as said they had felt drunk (0.6%), suggesting that the subjective experience of intoxication may occur in pre- and early adolescents at lower amounts of alcohol than in adults, consistent with children's smaller body mass and with estimates that blood alcohol concentrations are higher in children and young adolescents than adults after consuming similar amounts of alcohol [1]. Turning to alcohol attitudes, the observed modal responses were to disagree with all positive expectancy statements, to agree with all negative expectancies, and to believe that trying 1-2 alcoholic drinks conferred some or great risk. These findings suggest that the typical developmental progression toward increasing endorsement of positive alcohol expectancies [18] has not yet happened for most by the last year of primary school. Thus, while reports of children and young adolescents requiring hospital treatment for acute intoxication are extremely troubling and important [32], alcohol use, heavy drinking, and

positive expectancies about alcohol are very far from the norm at this age. No doubt, however, alcohol use rates are likely to rise quickly as these early adolescents move into secondary school and through adolescence [8] [9] [11] [15].

Physicians, health policy makers, prevention programmers, teachers, and parents should therefore increase efforts to screen and monitor children and early adolescents for signs of early alcohol use [33] [34]. Although the number of individuals who are drinking heavily in elementary school is very low, this non-normative, risky behavior warrants focused attention and intervention as it likely portends serious future problems [8]. Early adolescents' beliefs about the positive effects, negative effects, and potential harm of drinking alcohol predicted their alcohol use concurrently. These attitudes about alcohol—previously described as a leading edge of alcohol involvement for adolescents generally [9]—could serve as sensitive screening tools and intervention targets both for youth who have initiated alcohol use and those who may be on the verge of making this behavioral transition to alcohol use initiation. In particular, children's and young adolescents' positive expectancies and low perceived harm could alert physicians, teachers, and other adults to important shifts in the attitudes that reflect proximal indicators of potential alcohol initiation. At the same time, the relative rarity of very underage alcohol use underscores the importance of rebutting media claims that heavy drinking is widespread at this young age, because overestimating the normative nature of behaviors such as substance use becomes, in itself, a risk factor for initiation [35]. We concur with calls for increased international public health surveillance of alcohol use in the later primary years [6, 14], as is done for secondary school students [9] [10] [11].

Several important limitations of the present study should be noted. First, the question of whether these prospective associations are *causal*—that is, whether early drinking causes subsequent problems—or are simply *markers* of existing genetic, family, or personal vulnerabilities remains controversial [36] [37] [38] and awaits future research in other samples and as more waves of MCS data are collected. Second, it is likely that attitudes about drinking become more positive after experience with alcohol [39], complicating the interpretations of the attitude-behavior associations. Third, though similar to other work, the measures of alcohol were developed for this study and thus cannot be directly compared to prior research. However, the measures were similar to prior work, standard drinks were defined, and the reliability of adolescent self-reports of alcohol use using closed-ended questions has been supported [40]. Finally, whereas the nationally-representative sample of early drinking is unique, it is unknown to what extent the results would generalize to other countries.

In summary, alcohol use among 10- and 11-year olds in a nationally-representative sample in the UK was identified, but not found to be common. The minority who initiate alcohol use during primary school are an important group at heightened risk for acute and long-term problems, including injuries, academic and occupational difficulties, and substance use disorders [2] [3] [4] [14]. Predictors and correlates of very early alcohol use include major sociodemographic characteristics and alcohol-specific attitudes. Early adolescents who report that alcohol use leads to more positive and less negative effects, and who perceive that alcohol use is not harmful, are at especially high risk for early drinking and escalating

use during the adolescent years. Screening for very early alcohol use in primary health care settings may be a key component of preventing future harm [33] [34].

Acknowledgements

This research was supported primarily by the Economic and Social Research Council (UK) and National Institutes of Health (US) grant R01 AA019606. The authors gratefully acknowledge the critical reading of the manuscript by Dr. Jim McCambridge. A poster presentation of these results was presented at the June 2014 meetings of the Research Society on Alcoholism in Seattle, WA, USA.

Abbreviations

MCS Millennium Cohort Study

References

1. Donovan JE. Estimated blood alcohol concentrations for child and adolescent drinking and their implications for screening instruments. *Pediatrics*. 2009; 123:975–e981. doi: 10.1542/peds.2008-0027.
2. Ellickson PL, Tucker JS, Klein DJ. Ten-year prospective study of public health problems associated with early drinking. *Pediatrics*. 2003; 111(5):949–955. [PubMed: 12728070]
3. Grant BF, Dawson DA. Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *J Subst Abuse*. 1997; 9:103–110. [PubMed: 9494942]
4. Hingson R, Heeren T, Edwards EM. Age at drinking onset, alcohol dependence, and their relation to drug use and dependence, driving under the influence of drugs, and motor-vehicle crash involvement because of drugs. *J Stud Alcohol Drugs*. 2008; 69:192–201. [PubMed: 18299759]
5. DeWit DJ, Offord DR, Wong MM. Patterns of onset and cessation of drug use over the early part of the life course. *Health Educ Behav*. 2007; 24(6):746–758. [PubMed: 9408788]
6. Donovan JE. Really underage drinkers: The epidemiology of children's alcohol use in the United States. *Prev Sci*. 2007; 8:192–205. doi: 10.1007/s11121-007-0072-7. [PubMed: 17629790]
7. Faden VB. Trends in initiation of alcohol use in the United States, 1975–2003. *Alcohol Clin Exp Res*. 2006; 30:1011–1022. 2006 DOI: 10.1111/j.1530-0277.2006.00115.x. [PubMed: 16737460]
8. Donovan JE, Molina BSG. Types of alcohol use experience from childhood through adolescence. *J Adolesc Health*. 2013; 53:453–459. <http://dx.doi.org/10.1016/j.jadohealth.2013.03.024>. [PubMed: 23763961]
9. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975-2012. Volume I: Secondary school students. Institute for Social Research, The University of Michigan; Ann Arbor: 2013.
10. SAMHSA (Substance Abuse and Mental Health Services Administration). Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-46, HHS Publication No. (SMA) 13-4795. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2013.
11. Currie, C.; Zanotti, C.; Morgan, A., et al., editors. Health Policy for Children and Adolescents, No. 6. WHO Regional Office for Europe; Copenhagen, Denmark: Social determinants of health and well-being among young people: Health Behaviour in School-Aged Children (HBSC) study: International report from the 2009/2010 survey..
12. Hibell B, Furtormsson U, Ahlström S, Balakireva O, Bjarnason T, Koffevi A, Kraus L. The 2007 ESPAD report: Substance use among students in 35 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN). 2009
13. Parra GR, O'Neill SE, Sher K. Reliability of self-reported age of substance involvement onset. *Psychol Addict Behav*. 2003; 17:211–218. doi: 10.1037/0893-164X.17.3.211. [PubMed: 14498815]

14. Zucker RA, Donovan JE, Masten AS, et al. Early developmental processes and the continuity of risk for underage drinking and problem drinking. *Pediatrics*. 2008; 121:S252–S272. doi: 10.1542/peds.2007-2243B. [PubMed: 18381493]
15. Macleod J, Hickman M, Bowen E, et al. Parental drug use, early adversities, later childhood problems and children's use of tobacco and alcohol at age 10: Birth cohort study. *Addiction*. 2008; 103:1731–1743. doi:10.1111/j.1360-0443.2008.02301.x. [PubMed: 18705686]
16. Andrews JA, Tildesley E, Hops H, Duncan SC, Severson HH. Elementary school age children's future intentions and use of substances. *J Clin Child Adolesc*. 2008; 32:556–567.
17. Gunn RL, Smith GT. Risk factors for elementary school drinking: Pubertal status, personality, and alcohol expectancies concurrently predict fifth grade alcohol consumption. *Psychol Addict Behav*. 2010; 24:617–627. doi: 10.1037/a0020334. [PubMed: 20822192]
18. Bekman NM, Anderson KG, Trim RS, et al. Thinking and drinking: Alcohol-related cognitions across stages of adolescent alcohol involvement. *Psychol Addict Behav*. 2011; 25:415–425. doi: 10.1037/a0023302. [PubMed: 21534645]
19. Guo J, Hawkins JD, Hill KG, Abbott RD. Childhood and adolescent predictors of alcohol abuse and dependence in young adulthood. *J Stud Alcohol*. 2001; 62:754–762. [PubMed: 11838912]
20. Patrick ME, Wray-Lake L, Finlay AK, Maggs JL. The long arm of expectancies: Adolescent alcohol expectancies predict adult alcohol use. *Alcohol Alcohol*. 2010; 45:17–24. doi: 10.1093/alcalc/agg066. [PubMed: 19808940]
21. Zucker RA, Jester JM, Fitzgerald HE, et al. Predicting onset of drinking from behavior at three years of age: Influence of early child expectancies and parental alcohol involvement upon early first use. *Alcohol Clin Exp Res*. 2003; 27(Suppl. 5):174A.
22. Jones BT, Corbin W, Fromme K. A review of expectancy theory and alcohol consumption. *Addiction*. 2001; 96:57–72. doi: 10.1046/j.1360-0443.2001.961575.x. [PubMed: 11177520]
23. Dex, S.; Joshi, H., editors. *Children of the 21st century: From birth to nine months..* Policy Press; Bristol, England: 2005.
24. Plewis, I.; Ketende, S. Technical report on response. Centre for Longitudinal Studies; London: 2006.
25. Gallop, K.; Rose, N.; Wallace, E., et al. Millenium Cohort Study fifth sweep (MCS5) technical report. Ipsos Mori/Centre for Longitudinal Studies; London:
26. Bouchery EE, Harwood HJ, Sacks JJ, et al. Economic costs of excessive alcohol consumption in the U.S., 2006. *Am J Prev Med*. 2011; 41(5):516–524. doi: 10.1016/j.amepre.2011.06.045. [PubMed: 22011424]
27. Swendsen J, Burstein M, Case B, et al. Use and abuse of alcohol and illicit drugs in US adolescents: Results of the National Comorbidity Survey-Adolescent Supplement. *Arch Gen Psychiatry*. 2012; 69(4):390–398. doi:10.1001/archgenpsychiatry.2011.1503. [PubMed: 22474107]
28. Hingson R, Za W. Age of drinking onset, alcohol use disorders, frequent heavy drinking, and unintentionally injuring oneself and others after drinking. *Pediatrics*. 2009; 123(6):1477–1483. doi:10.1542/peds.2008-2176. [PubMed: 19482757]
29. Sutherland A. Is parental socio-economic status related to the initiation of substance abuse by young people in an English city? An event-history analysis. *Soc Sci Med*. 2012; 74:1053–1061. [PubMed: 22361091]
30. Hurcombe, R.; Bayley, M.; Goodman, A. *Ethnicity and alcohol: A review of the UK literature.* Joseph Rowntree Foundation; York, England: 2010.
31. Kann L, Kinchen S, Shanklin SL, et al. Youth risk behavior surveillance—United States, 2013. *MMWR*. 2014; 63(SS-4):1–170. [PubMed: 24918634]
32. Weinberg L, Wyatt JP. Children presenting to hospital with acute alcohol intoxication. *Emergen Med*. 2006; 23:774–776. doi:10.1136/emj.2005.025627.
33. Chung T, Smith GT, Donovan JE, et al. Drinking frequency as a brief screen for adolescent alcohol problems. *Pediatrics*. 2012; 129(2):205–212. doi: 10.1542/peds.2011-1828. [PubMed: 22218839]
34. American Academy of Pediatrics. Policy statement—Alcohol use by youth and adolescents: A pediatric concern. *Pediatrics*. 2010; 125(5):1078–1087. doi:10.1542/peds.2010-0438. [PubMed: 20385640]

35. Perkins HW, Haines MP, Rice R. Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *J Stud Alc.* 2003; 66:470–478.
36. Maggs, JL.; Schulenberg, J. Initiation and course of alcohol consumption among adolescents and young adults.. In: Galanter, M., editor. *Recent developments in alcoholism*. Kluwer Academic; New York: 2004. p. 29-47.
37. Maimaris W, McCambridge J. Age of first drinking and adult alcohol problems: Systematic review of prospective cohort studies. *J Epid Comm Health.* 2013; 68:268–274. doi:10.1136/jech-2013-203402.
38. Prescott CA, Kendler KS. Age at first drink and risk for alcoholism: a noncausal association. *Alcohol Clin Exp Res.* 1999; 23:101–7. [PubMed: 10029209]
39. Settles RE, Zapolski TCB, Smith GT. Longitudinal test of a developmental model of the transition to early drinking. *J Abnorm Psychol.* 2014; 123:151–151. Doi:10.1037/a0035670.
40. Lintonen T, Ahlström S, Metso L. The reliability of self-reported drinking in adolescence. *Alcohol Alcohol.* 2004; 39:362–368. 2004 <http://dx.doi.org/10.1093/alcalc/agh071>. [PubMed: 15208172]

Table 1

Sample Characteristics and Prevalence of Alcohol Use by Sociodemographic Risk Factors

		Ever Had Alcoholic Drink More Than A Few Sips	Ever Felt Drunk	Ever Had 5+ Drinks At a Time
	% of sample ^a	%	%	%
Full sample	100.0%	13.36	1.21	0.56
Gender				
Female	48.85	10.89 ⁱ	0.70 ⁱ	0.32 ⁱ
Male	51.15	15.74 ⁱⁱ	1.71 ⁱⁱ	0.80 ⁱⁱ
Age at interview				
< 11 years	33.69	12.82	1.16	0.42
11 years	66.31	13.64	1.24	0.64
Ethnicity				
White British	85.25	14.64 ⁱ	1.34	0.59
Asian British	6.83	1.51 ⁱⁱ	0.17	0.26
Black British	3.25	9.55 ⁱⁱⁱ	1.03	0.95
Mixed & Other	4.67	9.52 ^{iv}	0.55	0.27
Country of residence				
England	81.72	13.90 ⁱ	1.34 ⁱ	0.59
Wales	5.08	15.63 ^{i, ii}	1.32 ⁱ	0.74
Scotland	9.11	11.11 ⁱⁱⁱ	0.39 ⁱⁱ	0.42
Northern Ireland	4.09	4.90 ^{iv}	0.49 ^{i, ii}	0.22
Mother marital status (9 m ^b)				
No	47.16	16.46 ⁱ	1.91 ⁱ	0.94 ⁱ
Yes	52.84	10.60 ⁱⁱ	0.60 ⁱⁱ	0.23 ⁱⁱ
Mother education (9 m ^b)				
Secondary or less ^c	71.59	14.30 ⁱ	1.47 ⁱ	0.74 ⁱ
Diploma/degree or more ^d	28.41	11.03 ⁱⁱ	0.57 ⁱⁱ	0.13 ⁱⁱ
Mother occupational status (9 m ^b)				
Routine and manual	42.95	15.94 ⁱ	2.04 ⁱ	0.98 ⁱ
Intermediate occupations	21.07	12.77 ⁱⁱ	0.79 ⁱⁱ	0.26 ⁱⁱ
Prof/manag/admin	26.89	10.80 ^{iv}	0.47 ⁱⁱ	0.21 ⁱⁱ
Never employed	9.08	10.30 ^{ii, iii}	0.54 ⁱⁱ	0.41 ^{i, ii}
Mother age at child's birth				
20 years	90.22	12.87 ⁱ	1.13	0.50 ⁱ
< 20 years	9.78	17.95 ⁱⁱ	2.00	1.17 ⁱⁱ

χ^2 tests for difference in proportions across each of the three alcohol measures by sociodemographic background were conducted, followed by pairwise comparisons shown by superscript values (i to iv), where different superscript values indicate significant differences at $p < .05$.

^aNumber of unweighted observations for the overall sample=12,305. All percentages are adjusted to account for panel attrition and the complex sampling design.

^b When child was 9 months of age.

^c No qualifications through NVQ3 (A-level) qualifications, equivalent to advanced secondary school.

^d NVQ4 or higher qualifications, equivalent to post-secondary diploma/degree.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Alcohol-specific Risk Factors by Ever Having an Alcoholic Drink, Feeling Drunk, and Drinking 5+ Drinks at a Time

	Ever Had Alcoholic Drink More Than a Few Sips		Ever Felt Drunk		Ever Had Drank 5+ Drinks at a Time	
	No	Yes	No	Yes	No	Yes
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Positive expectancies ⁱ	0.77 (.62)	1.04 (.61)	0.80 (.63)	1.35 (.66)	0.81 (.63)	1.49 (.67)
Negative expectancies ⁱ	2.20 (.70)	2.01 (.67)	2.18 (.70)	1.89 (.69)	2.18 (.70)	1.73 (.67)
	%	%	%	%	%	%
Perceived harm ⁱⁱ	68.8	47.5	66.2	43.2	66.2	24.9

ⁱ Mean of 4 items, each coded 0=Strongly Disagree through 3=Strongly Agree.

ⁱⁱ Percent who rated people's risk of harming themselves if they try one or two alcoholic drinks as Some Risk or Great Risk. Mean differences were tested with *t*-tests. All no/yes comparisons were significantly different at $p < .001$.

Table 3
Logistic Regressions Predicting Alcohol Use Behaviors by Sociodemographic and Alcohol-specific Risk Factors

	Ever Drink Alcoholic Drink, More Than a Few Sips				Ever Felt Drunk				Ever Drink 5+ Drinks			
	Model 1 ^a	OR	CI	Model 2 ^b	Model 1	OR	CI	Model 2	Model 1	OR	CI	Model 2
Sociodemographic Risk Factors												
Gender												
Female (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Male	1.47 ***	1.29-1.68	1.38 ***	1.20-1.57	2.07 **	1.27-3.39	1.84 *	1.11-3.05	1.98	0.90-4.34	1.62	0.73-3.61
Age at interview												
<11 yrs (ref)	–	–	–	–	–	–	–	–	–	–	–	–
? 11 yrs	1.07	0.92-1.25	1.05	0.89-1.24	1.05	0.65-1.70	0.94	0.58-1.52	1.56	0.79-3.06	1.30	0.66-2.54
Ethnicity												
White British (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Asian British	0.09 ***	0.05-0.17	0.11 ***	0.06-0.22	0.22	0.03-1.57	0.33	0.04-2.49	0.61	0.08-4.67	1.11	0.13-9.77
Black British	0.42 ***	0.29-0.62	0.47 ***	0.32-0.70	0.74	0.24-2.23	0.89	0.32-2.49	1.68	0.42-6.74	2.27	0.74-7.02
Other British	0.52 **	0.34-0.80	0.59 *	0.38-0.91	0.43	0.06-3.16	0.54	0.07-4.03	0.42	0.11-1.69	0.61	0.16-2.33
Country of residence												
England (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Wales	0.99	0.83-1.19	1.03	0.86-1.24	0.72 **	0.39-1.31	0.77	0.42-1.43	0.73	0.33-1.63	0.85	0.38-1.90
Scotland	0.70 **	0.55-0.90	0.76 *	0.60-0.95	0.23 **	0.09-0.62	0.25 **	0.09-0.66	0.60	0.19-1.89	0.64	0.19-2.18
Northern Ireland	0.27 ***	0.19-0.39	0.32 ***	0.22-0.46	0.19 **	0.07-0.51	0.25 **	0.10-0.68	0.43	0.14-1.33	0.68	0.21-2.14
Mother marital status (9m) ^e												
Not married (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Married	0.76 ***	0.64-0.91	0.79 **	0.66-0.94	0.47 **	0.28-0.79	0.52 *	0.31-0.87	0.44 *	0.22-0.89	0.53	0.25-1.1
Mother education (9m) ^e												
Secondary or less ^f (ref)	–	–	–	–	–	–	–	–	–	–	–	–
Diploma/degree + ^g	0.87	0.74-1.03	0.83 *	0.70-1.00	0.58	0.33-1.02	0.54 *	0.30-0.97	0.23 *	0.07-0.72	0.20 **	0.07-0.63
Mother occupational status (9m) ^e												

	Ever Drink Alcoholic Drink, More Than a Few Sips				Ever Felt Drunk				Ever Drink 5+ Drinks			
	Model 1 ^a		Model 2 ^b		Model 1		Model 2		Model 1		Model 2	
	OR ^c	CI ^d	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Routine or manual (ref)	–		–		–		–		–		–	
Prof/managerial	0.73 **	0.59-0.90	0.71 **	0.58-0.88	0.37 ***	0.21-0.64	0.37 **	0.21-0.64	0.53	0.21-1.30	0.53	0.22-1.29
Intermediate	0.79 *	0.66-0.94	0.78 *	0.65-0.94	0.44 *	0.24-0.82	0.46 *	0.24-0.87	0.37	0.12-1.10	0.40	0.13-1.22
Never employed	0.86	0.59-1.23	0.83	0.56-1.21	0.30	0.09-1.02	0.29	0.08-1.02	0.22	0.03-1.76	0.22	0.03-1.71
Mother age (child birth)												
? 20 yrs (ref)	–		–		–		–		–		–	
< 20 yrs	1.20	0.89-1.63	1.17	0.85-1.60	1.11	0.53-2.34	1.06	0.49-2.29	1.27	0.52-3.13	1.16	0.42-3.18
Alcohol-specific risk factors												
Positive expectancies			1.70 ***	1.51-1.91			2.96 ***	2.07-4.24			4.20 ***	2.66-6.61
Negative expectancies			0.70 ***	0.63-0.79			0.51 ***	0.36-0.72			0.41 ***	0.27-0.61
Perceived harm			0.51 ***	0.44-0.59			0.59 *	0.38-0.92			0.29 **	0.14-0.62
Intercept	0.19 ***	0.16-0.23	0.38 ***	0.27-0.53	0.02 ***	0.01-0.03	0.04 ***	0.02-0.07	0.01 ***	0.00-0.02	0.02 ***	0.00-0.05

^aModel 1 included all sociodemographic risk factors.

^bModel 2 included all sociodemographic and alcohol-specific risk factors.

^cOR=Odds ratios.

^dCI=Confidence interval.

^eStatus of mother's last occupation, reported when child was 9 months old.

^fNo qualifications through NVQ3 (A-level), equivalent to advanced secondary school.

^gNVQ4 or higher qualifications, i.e., post-secondary diploma/degree.