

## ORIGINAL ARTICLE

## Prevalence of youth access to alcohol or a gun in the home

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**Objectives:** To estimate the national prevalence of youth access to alcohol, a gun, or both alcohol and a gun, in their home and to describe the demographic characteristics associated with access to either alcohol or a gun.

**Methods:** Cross sectional data from the 1995 in-home survey of the National Longitudinal Study of Adolescent Health, which used a nationally representative randomly selected school based sample (n=18 924) of adolescents in grades 7-12, were analyzed. The current analyses were restricted to those adolescents 12-18 years of age (n=18 454). Crude logistic regression analyses was used to determine the demographic characteristics associated with access to alcohol or a gun in the home.

**Results:** Overall, 28.7% of US adolescents reported having easy access to alcohol in the home. Availability of alcohol was associated with race/ethnicity, mother's education, family structure, and welfare status. Similarly, 24.3% of US adolescents reported easy access to a gun in the home. Availability of a gun in the home was associated with gender, race/ethnicity, mother's education, family structure, and welfare status. Among those that reported that a gun was available in their home, most reported availability of a shotgun (63.0%) followed by a rifle (61.3%), handgun (57.3%), and other gun (16.4%). Ten per cent of adolescents reported availability of both alcohol and a gun in their home.

**Conclusions:** One quarter of US adolescents reported easy access to either alcohol or a gun in their home. Given the risks associated with the misuse of alcohol and guns among adolescents, efforts to increase public awareness of the availability of alcohol and guns in the home are needed.

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The three leading causes of death in 1998 for youth between ages 12 and 18 were unintentional injuries, homicides, and suicides.<sup>1</sup> Many of these deaths involved alcohol or firearms. For example, in 1999, more than one third (35.1%) of motor vehicle crashes involving youth ages 15-20 were attributed to alcohol use.<sup>2</sup> Alcohol consumption has also been linked to violence,<sup>3-5</sup> violence related injury,<sup>6</sup> and suicide<sup>7</sup> among youth. It is well documented that most homicides and suicides among youth involve firearms (80.9% and 59.8%, respectively).<sup>1</sup>

Findings from national surveys show that the majority of adolescents (88%) perceive alcohol to be available to them<sup>8</sup> and about one third of adolescents perceive guns to be available.<sup>9</sup> Currently, little is known about the availability of alcohol or guns to adolescents in their homes, although some reports suggest that the home may be a source of either alcohol<sup>10</sup> or guns.<sup>11</sup> One study found that 66% of guns used in suicide attempts and unintentional injuries among children and adolescents were stored in the home of the victim.<sup>12</sup>

In this paper we report the availability of alcohol and/or a gun in the home for a nationally representative sample of US adolescents in grades 7 through 12. The associations between demographic characteristics and access to alcohol or a gun are also presented.

## METHODS

Data used for the analyses were collected as part of the National Longitudinal Study of Adolescent Health (Add Health) conducted by the Carolina Population Center at the University of North Carolina at Chapel Hill. Details regarding the survey methodology are described elsewhere.<sup>13</sup> In brief, this survey used a multistage stratified cluster design resulting in a nationally representative sample of US adolescents selected from 80 high schools and 52 middle schools, both public and private. Incorporating systematic sampling methods and implicit stratification into the Add Health study

design ensured that this sample was representative of US schools with respect to region of country, urbanicity, school type, ethnicity, and school size. Following local Institutional Review Board approval of the study and receipt of parental consent, each eligible student was asked to complete an in-school survey. The participation rate was 75.6%. All students at each school were then stratified by grade and gender. Within each stratum investigators randomly selected students to be included in a second and much more detailed interview. The selected students were asked to complete a 90 minute in-home interview. In addition, one of the student's parents or care givers also completed a separate in-home questionnaire. Eighty per cent of students selected in this second stage completed an interview sometime between April and December 1995 (n=18 924). About 85% of the parents or care givers (most often the biological mother) completed a parent questionnaire during the same time period. The current analysis presents findings based on the in-home interviews and is limited to those adolescents between 12 and 18 years of age (n=18 454).

## Measures

The interviews asked all student participants, "Is alcohol easily available to you in your home?" They also asked "Is a gun easily available to you in your home?" Respondents answered "yes" or "no". Students with access to a gun were asked, "What kind of gun is available?" Respondents could indicate all categories that applied: handgun, shotgun, rifle, or other. We created four mutually exclusive categories of students: those with access to alcohol only, those with access to a gun only, those with access to both alcohol and a gun, and those with access to neither alcohol nor a gun.

Demographic information collected included: gender, age, race/ethnicity, family structure, mother's education, and the family's economic situation. Race and ethnicity were combined and coded as follows: (1) Hispanic, (2) non-Hispanic

**Table 1** Demographic characteristics of adolescents reporting easy availability of alcohol or a gun in the home

Measures	No	Weighted population (%)	Reporting availability of alcohol		Reporting availability of a gun	
			%	OR (95% CI)	%	OR (95% CI)
Total	18454	100.00	28.7		24.3	
Gender						
Female	9448	49.5	28.7	1.00	18.0	1.00
Male	9006	50.5	28.7	1.00 (0.91 to 1.11)	30.6	2.01 (1.79 to 2.25)
Age (years)						
12–14	5023	34.6	26.4	1.00	22.0	1.00
15–16	7022	34.4	30.1	1.20 (1.03 to 1.40)	24.2	1.13 (0.93 to 1.32)
17–18	6409	31.1	29.7	1.17 (1.00 to 1.38)	27.1	1.32 (1.04 to 1.69)
Race/ethnicity						
Non-Hispanic African American	3907	15.6	20.6	1.00	14.0	1.00
Non-Hispanic white	9757	67.3	31.0	1.73 (1.46 to 2.05)	29.9	2.62 (2.03 to 3.38)
Non-Hispanic other	1606	5.3	33.3	1.92 (1.45 to 2.56)	13.1	0.92 (0.65 to 1.31)
Hispanic	3084	11.8	24.6	1.25 (1.03 to 1.53)	10.8	0.75 (0.56 to 0.99)
Missing	100					
Mother's education						
< High school	3222	17.2	21.3	1.00	17.5	1.00
High school/GED Diploma*	5352	32.8	26.3	1.32 (1.15 to 1.51)	26.6	1.71 (1.40 to 2.08)
Post high school	5030	28.3	29.3	1.53 (1.31 to 1.79)	26.9	1.73 (1.42 to 2.11)
College degree	4337	21.7	36.9	2.17 (1.81 to 2.58)	22.6	1.37 (1.09 to 1.73)
Missing	513					
Family structure						
Single parent	5484	28.8	24.2	1.00	17.0	1.00
Two biological parents	9523	53.8	30.8	1.40 (1.26 to 1.56)	28.6	1.95 (1.70 to 2.24)
Two parents	2380	11.7	30.9	1.41 (1.19 to 1.67)	24.0	1.54 (1.31 to 1.82)
Other	1067	5.7	26.7	1.14 (0.95 to 1.38)	21.8	1.36 (1.08 to 1.71)
Receive welfare						
Yes	1964	11.0	21.7	1.00	14.1	1.00
No	15942	89.0	29.5	1.51 (1.28 to 1.78)	25.6	2.10 (1.70 to 2.59)
Missing	548					

CI, confidence interval; OR, odds ratio. \*GED (General Educational Development), High School Equivalency Diploma.

white, (3) non-Hispanic African-American, and (4) non-Hispanic other (Native American, Asian, or Pacific Islander).

### Analytic methods

Prevalence estimates were obtained for the availability of alcohol and/or a gun in the home. Crude logistic regression

analyses determined the association between each of the demographic characteristics and the availability of either alcohol or a gun. We used the SUDAAN statistical software package for all statistical analyses in order to accommodate the complex sampling design and to provide accurate standard errors for the weighted analyses.<sup>14</sup>

**Table 2** Percent reporting easy availability in the home of alcohol only, a gun only, both alcohol and a gun, or neither alcohol nor a gun, by demographic characteristics; values are per cent (95% CI)

Measures	Availability of alcohol only	Availability of a gun only	Availability of alcohol and a gun	Availability of neither alcohol nor a gun
Total	18.5 (16.8 to 20.2)	14.1 (12.5 to 15.8)	10.2 (9.0 to 11.3)	57.2 (54.9 to 59.5)
Gender				
Females	20.8 (18.8 to 22.7)	10.1 (8.8 to 11.5)	7.9 (6.8 to 8.9)	61.2 (58.9 to 63.5)
Males	16.3 (14.4 to 18.2)	18.1 (15.9 to 20.3)	12.4 (10.8 to 14.0)	53.2 (50.3 to 56.2)
Age (years)				
12–14	17.7 (15.2 to 20.2)	13.3 (10.8 to 15.8)	8.6 (7.1 to 10.1)	60.4 (57.1 to 63.7)
15–16	19.5 (17.2 to 21.7)	13.6 (11.6 to 15.5)	10.6 (9.3 to 11.9)	56.3 (53.7 to 59.0)
17–18	18.3 (16.2 to 20.3)	15.8 (13.2 to 18.3)	11.4 (9.7 to 13.0)	54.6 (51.6 to 57.6)
Race/ethnicity				
Non-Hispanic African American	14.1 (12.1 to 16.2)	7.5 (5.8 to 9.2)	6.5 (5.2 to 7.8)	71.9 (68.6 to 75.2)
Non-Hispanic white	18.9 (16.7 to 21.0)	17.9 (15.8 to 19.9)	12.1 (10.6 to 13.5)	51.2 (48.8 to 53.6)
Non-Hispanic other	26.6 (22.2 to 31.1)	6.0 (4.0 to 8.1)	6.8 (4.7 to 8.8)	60.6 (55.4 to 65.7)
Hispanic	18.8 (16.2 to 21.3)	5.1 (3.7 to 6.5)	5.8 (4.4 to 7.1)	70.4 (67.4 to 73.4)
Mother's education				
< High school	14.4 (12.5 to 16.2)	10.6 (8.5 to 12.8)	6.9 (5.4 to 8.5)	68.1 (64.9 to 71.3)
High school/GED Diploma*	15.8 (13.9 to 17.7)	16.2 (14.1 to 18.3)	10.5 (9.0 to 11.9)	57.5 (54.7 to 60.4)
Post high school	18.1 (16.4 to 19.8)	15.7 (13.8 to 17.6)	11.1 (9.5 to 12.8)	55.1 (52.4 to 57.7)
College degree	26.4 (22.9 to 30.0)	12.1 (9.6 to 14.5)	10.5 (8.8 to 12.2)	51.0 (48.1 to 54.0)
Family structure				
Single parent	17.3 (15.5 to 19.0)	10.0 (8.6 to 11.4)	6.9 (5.8 to 7.9)	65.9 (63.3 to 68.5)
Two biological parents	19.3 (17.0 to 21.6)	17.1 (15.0 to 19.2)	11.5 (10.0 to 13.0)	52.1 (49.7 to 54.5)
Two parents	19.4 (17.3 to 21.5)	12.5 (10.2 to 14.8)	11.5 (9.4 to 13.6)	56.6 (52.9 to 60.2)
Other	15.2 (12.7 to 17.8)	10.3 (7.8 to 12.8)	11.5 (8.7 to 14.3)	63.0 (58.4 to 67.5)
Receive welfare				
Yes	17.1 (14.6 to 19.7)	9.6 (7.3 to 11.8)	4.5 (3.3 to 5.8)	68.8 (65.6 to 72.0)
No	18.7 (16.9 to 20.6)	14.9 (13.1 to 16.6)	10.7 (9.5 to 11.9)	55.7 (53.5 to 58.0)

CI, confidence interval. \*GED (General Educational Development), High School Equivalency Diploma.

## RESULTS

Overall, 28.7% of US adolescents reported easy availability of alcohol in the home. Availability of alcohol in the home was associated with age, race/ethnicity, mother's education, family structure, and welfare status (see table 1).

Nearly one quarter (24.3%) of adolescents reported easy access to a gun in the home. Availability of a gun in the home was associated with gender, race/ethnicity, mother's education, family structure, and welfare status (see table 1). Among those who reported that a gun was available in their home, most reported availability of a shotgun (63.0%) followed by a rifle (61.3%), handgun (57.3%), and other gun (16.4%).

More than half (57.2%) of the adolescents reported that neither alcohol nor a gun was easily available to them, 18.5% reported availability of alcohol only, 14.1% reported availability of a gun only and 10.2% reported availability of both alcohol and a gun in the home (see table 2).

## DISCUSSION

Overall, 28.7% of US adolescents reported easy availability of alcohol in the home, 24.3% reported availability of a gun in the home, and 10.2% reported availability of both alcohol and a gun in the home. Our findings regarding the availability of alcohol or a gun are much lower than estimates from previous studies.<sup>8,9</sup> These differences likely reflect the fact that our findings are limited to availability in the home.

Our study is the first to examine adolescents' perceptions of in-home availability to alcohol or guns in a nationally representative sample. Of particular interest are the findings indicating that adolescents who are white, who live with two parents, who are not receiving welfare, and who have mothers that had attained a high school degree or higher, were more likely to report access to alcohol and guns. These findings are not surprising given the demographic characteristics of adults who drink alcohol<sup>15</sup> or have a gun in their home.<sup>16</sup> Accordingly, the demographic characteristics of adolescents who reported access to alcohol or a gun simply reflect those demographic characteristics of adults who are alcohol users or gun owners.

It is also intriguing to note that the prevalence of in-home availability of a gun or alcohol is comparable (24.3% and 28.7%, respectively). This finding is contrary to the perception that it is more common for adolescents to find alcohol, rather than guns, easily available to them in their homes. Moreover, our findings show that one in 10 adolescents (10.2%) report in-home availability of both alcohol and guns. This finding is troubling given the link between alcohol use, guns, and suicides. For example, suicide victims who used a firearm were found to be five times more likely to have been drinking alcohol before their death than were suicide victims who used different methods.<sup>7</sup>

The study involves three limitations. First, the study does not corroborate data from participants' self reports with any other sources of information. Second, it is unknown how adolescents interpreted the question "Is alcohol (a gun) easily available to you in your home?" The study did not obtain any information about how the alcohol (or gun) was stored or who owned it. Third, we were not able to determine whether the availability of alcohol or a gun in the home is related to their use. However, it is likely that easy access to these items in the home facilitates their misuse.

Results from other studies have linked availability of alcohol or a gun in the home and its use. One study found that 27% of alcohol users in ninth grade reported their homes as the source of the alcohol consumed during their last drinking occasion.<sup>10</sup> Likewise, findings from a retrospective case series of injuries among children and adolescents in King County, Washington, determined that 84% of the guns used in suicides and suicide attempts and 42% of the guns involved in unintentional injuries were stored in the victim's home.<sup>12</sup>

## Key points

- About one in four US adolescents report having easy access to alcohol or a gun in the home.
- About one in 10 US adolescents report having easy access to alcohol and a gun in the home.
- Easy access to alcohol and guns are more common among adolescents who are white, who live with two parents, who do not receive welfare, and who have a mother that had attained at least a high school degree.
- Given the risks associated with the misuse of alcohol and guns among adolescents, efforts to increase public awareness of the availability of alcohol and guns in the home are needed.

Our findings highlight three important issues. First, the home is an important and underestimated source of both alcohol and guns among adolescents. Second, prevention efforts that seek to decrease access and misuse of alcohol and guns need to target white middle class families who are traditionally not considered high risk. Third, the relatively large number of adolescents (2.1 million) living in households with access to both alcohol and guns, as well as the combined injury risk when both alcohol and guns are present, justify prevention programs focusing on increasing safe storage practices of alcohol and guns simultaneously rather than either alone.

## IMPLICATIONS FOR PREVENTION

Research shows that current prevention and intervention strategies focusing on traditional parent education, even those delivered by physicians, are relatively ineffective at removing guns from homes with children, or at changing the firearm storage practices by parents.<sup>17-19</sup> Similarly, despite laws prohibiting youth under age 21 to purchase alcohol, or for adults over 21 to provide alcohol to minors, adolescents continuously report that alcohol is very easy to obtain.<sup>8</sup> Therefore, media campaigns may be a productive and innovative way to inform the public of the risks associated with the misuse of alcohol and guns among adolescents while also pointing out that a substantial number of adolescents, one in four, find alcohol or a gun easily available to them in their home.

Prevention programs are already using the media to inform the community, parents, and older siblings regarding the laws prohibiting sales of alcohol to minors, legal enforcement efforts, the potential penalties associated with providing alcohol to minors, and also the negative consequences of alcohol use.<sup>20</sup> It is unclear if similar strategies have been used with respect to increasing safe gun storage practices. However, a media campaign may be a particularly productive strategy to improve safe gun storage practices since it could target married women with children who tend to be unaware that guns in their homes may be stored in an unsafe manner.<sup>21</sup> In addition, a media campaign can highlight that access to alcohol and guns are more common in intact middle class families while emphasizing that the risks associated with the misuse of alcohol and guns not only pertain to an adolescent living in a particular household but also to that of friends, siblings, parents, and others who may visit the home. Raising public awareness of these issues, and making parents discuss them, will be necessary in order to increase safe storage practices of alcohol and guns.

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## LACUNAE

### Iranian road deaths

In the deadliest day of road accidents in Iran, 122 people died, and 1855 were injured yesterday in more than 900 different accidents, state run Tehran television reported. The broadcast said that such a high number of traffic casualties was unprecedented in this country. About 350 ambulances recovered casualties from the 933 accidents across the country, it said. Iran has one of the highest rates of road accidents in the world, with more than 200 000 accidents and about 15 000 deaths each year. Specialists blame old and unsafe vehicles, disregard for regulations, and inadequate emergency services. Few details were made available on specific accidents (this is the exact text published in the *Boston Globe* on 26 March 2002, contributed by Anara Guard).

### Dog mauling convictions

A San Francisco couple were found guilty in March of the death of a neighbour, who was fatally mauled by the couple's dog in their apartment building in 2001. One person was found guilty of second degree murder, involuntary manslaughter, and owning a mischievous animal that killed a 33 year old (fit) woman who lived down the hall from her in the San Francisco apartment building. She faces a 15 year prison sentence. Another person, who was not present at the time of the attacks, was convicted of involuntary manslaughter and owning a mischievous animal. He could go to prison for up to four years. The guilty verdict, which came after five weeks of trial in Los Angeles Superior Court, represented the first time in California history that someone was convicted of second degree murder for the actions of a pet (contributed by Ian Scott).