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ALCOHOL CONTENT VARIATION OF BAR AND RESTAURANT DRINKS IN NORTHERN CALIFORNIA

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Abstract

Objective—To estimate the average of, and sources of variation in, the alcohol content of drinks served on-premise in 10 Northern California counties.

Methods—Focus groups of bartenders were conducted to evaluate potential sources of drink alcohol content variation. In the main study, 80 establishments were visited by a team of research personnel who purchased and measured the volume of particular beer, wine and spirits drinks. Brand or analysis of a sample of the drink was used to determine the alcohol concentration by volume.

Results—The average wine drink was found to be 43% larger than a standard drink with no difference between red and white wine. The average draught beer was 22% larger than the standard. Spirits drinks differed by type with the average shot being equal to one standard drink while mixed drinks were 42% larger. Variation in alcohol content was particularly wide for wine and mixed spirits drinks. No significant differences in mean drink alcohol content were seen by county for beer or spirits but one county was lower than two others for wine.

Conclusions—On premise drinks typically contained more alcohol than the standard drink with the exception of shots and bottled beers. Wine and mixed spirits drinks were the largest with nearly 1.5 times the alcohol of a standard drink on average. Consumers should be made aware of these substantial differences and key sources of variation in drink alcohol content and research studies should utilize this information in the interpretation of reported numbers of drinks.

INTRODUCTION

The alcohol content of drinks consumed in the US and around the world is increasingly recognized as an important issue for alcohol measurement to improve the accuracy and precision of epidemiologic studies (Stockwell et al., 2002). Awareness of drink alcohol content variation, particularly aspects related to larger amounts are also relevant to alcoholic beverage labeling, server training, consumer education regarding safe drinking limits, and interventions (Witbrodt et al., 2007), particularly those that help drinkers become aware of their actual intake. Although most studies continue to assume that all “drinks” contain the same amount of alcohol, it is increasingly clear that drink alcohol content varies by beverage type and a variety of individual factors (Kerr et al., 2005). A recent study of alcoholic drinks consumed at home, directly measured by respondents from simulated drink pours in their own glassware, found that spirits drinks were the largest and most variable with a mean alcohol content of 0.89 fluid ounces (26ml) while beer drinks were the smallest and least variable with a mean content of 0.56 ounces (17ml) (Kerr et al., 2005). In the US, a standard drink is now generally considered to contain 0.6 fluid ounces (18 ml or 14 grams) of ethanol (National Institute on Alcohol Abuse and Alcoholism, 2007). This corresponds to 12 ounces (355 ml) of 5 percent alcohol by volume (%ABV) beer, 1.5 ounces (44ml) of 40 %ABV spirits, or 5 ounces (148 ml) of 12 %ABV wine. In practice, both the serving size and the %ABV of the alcoholic beverage brand vary widely. This is true for both home pours as described in our previous work (Kerr et al., 2005) and, we hypothesized, for drinks served in bars and restaurants. Unlike some other countries, and excepting Utah where spirits pours are required to be 1.5ozs (44ml), the US has no laws regulating the amounts of on-premise alcohol pours or requiring disclosure of pour sizes. With the notable exception of bottled beer, the typical on-premise purchasing experience is made without knowledge of either pour size or a specific drink's %ABV.

The importance of capturing drink alcohol content variation in survey research has long been recognized (Wilson, 1981) but is still often ignored. Recent research in the US has aimed to describe the overall markets and types of beverages available for spirits (Kerr et al., 2006a), wine (Kerr et al., 2006b), and beer (Kerr et al., 2004) and to evaluate the perception of drinkers regarding standard drinks and their ability to pour them (White et al., 2005; White et al., 2003). Neither awareness of standard drinks nor pouring abilities have been found to have a high level of accuracy, even among bartenders, based on one recent study (Wansink and van Ittersum, 2005). To date no US studies have conducted drink measurements for on-premise locations but the issue has been addressed in other countries. A Dutch study where home drinks were measured chose not to measure on-premise drinks because there was a high level of standardization of drink pours in that country, although there was variation in alcohol content by beverage type with a range from 8 to 14ml of ethanol (Lemmens, 1994). An Australian study estimated drink pours in bars in one city but relied on servers who were aware of the measurement who researchers asked to pour simulated wine drinks (using water) in the bar's glassware (Banwell, 1999). Results indicated an average wine pour of 180 ml, which would contain about double the Australian standard drink defined as 10 grams of ethanol. A Spanish study took a different approach and employed a broader sampling design visiting three establishments in each of 24 cities across the country (Gual et al., 1999). In this study the most common drinks served in each bar were determined through observation, after which the server was asked to prepare one of each popular drink, while the researchers measured each ingredient. Spirits drinks were found to be especially large averaging 20.5 grams of ethanol with a wide variation, while wine and beer drinks were smaller and less variable at means of 11.4 and 9.1 grams respectively. Once again, bartenders were aware of the measurements being made. Changes in on-premise serve size have recently been studied by the British Office for National Statistics, who noted that larger servings of wine and higher strength beer have become common and therefore should count as more than one unit of alcohol in the three national surveys they conduct (Goddard, 2007). The application of this new methodology resulted in an increase in estimated average weekly consumption of alcohol by one third in the General Household Survey.

Even these few examples illustrate the potential importance of accurate drink alcohol content estimation for survey research, epidemiology and any other medical or social research involving alcohol self-report (Greenfield and Kerr, 2008). Information on the sources of drink ethanol content variation is also of vital importance to consumers who are trying to limit their alcohol intake for heath or other reasons and for education and interventions designed to prevent alcohol problems where an accurate assessment of the individual's drinking patterns and quantities can be an important part of the message. In 2006 about a quarter of all beer and spirits and 22.5% of wine was sold for on-premise consumption in the US (Adams Beverage Group, 2007). The present study is the first systematic assessment of on-premise drink alcohol content in the US and uses direct measurement techniques on purchased drinks. This approach goes directly to key information desired in contrast to approaches using simulated drink pours, self-report or pouring exercises, and so avoids server reactivity as bartenders were unaware that the drinks would be measured. The information obtained is especially needed in the US where, in general, no laws or customs require the disclosure of alcoholic beverage serving sizes and where most drinkers are likely to be unaware that their drinks may be larger than the standard drinks suggested in healthy drinking limits or used in blood alcohol content calculation charts related to Blood Alcohol Content (BAC) thresholds legally defining driving while intoxicated (DWI).

METHODS

Focus Groups and Preliminary Bar Visits

Two focus groups of bartenders were conducted in a professional setting with videotaped sessions to aid in the design of the main study and to identify sources of variation in drink pours that could not be addressed in the subsequent empirical bar drink study. Sixteen bartenders of varying ethnicity, age and gender were recruited through an internet posting and were paid $100 to participate. Following an informed consent procedure and completion of a brief bartending experience questionnaire, two group leaders, including the first author, followed a predetermined semi-structured inquiry format to elicit free responses in two groups of about eight participants. Topics of discussion included typical drink pours, pouring methods, management expectations, instructions and compliance techniques related to drink pours, changes observed in drink pours over time, and identification of other factors that may contribute to on-premise drink alcohol content variation.

For the main study, the National Institutes of Health and the Institutional Review Board of the Public Health Institute ruled that, absent interviews with personnel, physical measurements of a purchased alcoholic drink were exempt from informed consent requirements since they did not involve humans. The California Department of Alcoholic Beverage Control (ABC) determined that removal of small samples of alcohol from the premises for analysis did not constitute transportation of a drink off premise and were therefore lawful. Preliminary bar visits were carried out in fifteen bars and restaurants to develop and identify any potential problems with the planned data collection protocols and to determine which specific drinks were popular and should be emphasized during the main study. We ordered a wide variety of drinks and made multiple visits to several of these establishments on different days and times to assess possible within establishment variation.

Sampling

A total of 80 drinking establishments in 21 towns were visited throughout 10 Northern California counties. The towns and counties were selected using a multi-stage sampling scheme with stratification by county. The 10 contiguous Northern California counties covered in the main study were San Francisco, Alameda, Contra Costa, Solano, Napa, Sonoma, Marin, Yolo, Sacramento and San Joaquin. In each county, two cities or towns were randomly selected through population-weighted sampling. In counties where one city contained a large portion of the population, we pre-selected the largest city as one of the two destinations before randomly selecting the second. In San Francisco County, which includes only the city, two neighborhoods were selected. Within each chosen town, four licensed drinking establishments were randomly selected from a list obtained from the State ABC agency. Two of the selected towns did not have enough drinking establishments, so establishments from an adjacent town were included. Three establishments with a full liquor license (which can sell any beverage type) and one establishment with a license to sell only wine and beer were selected in each town.

Data Collection

Bar visits in the main study began in March 2007 and were completed in May 2007. Due to logistical and personnel considerations, bar visits were made from 4 to 10 p.m. on week nights. A team of three or four research personnel visited the four establishments in a particular town on the same night. In three cases the randomly selected bars were not visited, as the research team felt they were unsafe or unsuitable for data collection. In these cases a pre-selected alternative establishment was visited. The research team changed over the course of the study involving a total of nine trained individuals in their twenties and thirties and was diversified in terms of gender and ethnicity. One or both of two study coordinators was involved in each trip. To avoid reactivity, bartenders or servers were not informed about the team's drink measurement activity. They simply ordered drinks as if they were normal customers and left a customary 15 percent tip. Since the subject of the research was the drinks purchased rather than the bartender, no informed consent was required as determined by the Public Health Institute IRB. The research team ordered a draught beer, glasses of red and white wine, a shot of straight spirits, a rum and coke, a margarita, and in some cases, a gin and tonic, a martini or other mixed drink. Bottled beers were not purchased, since the %ABV and volume of bottled beers are known. The selection of mixed drinks was based on the most popular usual spirits drinks reported in the Alcohol Research Group's 2005 National Alcohol Survey, the bartender focus group and preliminary bar visit study data. Altogether 480 beverages were purchased and measured in the main study.

Upon entry to the drinking establishment, the research team sought out a relatively private table. Drinks were purchased at the bar in many cases or from a server. Measurements took place either at the table or in the bathroom to achieve greater privacy. The team discreetly measured the liquid volume of each drink using graduated cylinders and beakers. Samples for later analysis were taken of each mixed drink and some wines using a standard medicine dropper bottle. During or immediately following the visit, details of the establishment's environment, including the type of establishment, clientele, food options, beverage and entertainment options, and crowd and noise level were recorded along with observed demographic characteristics of the bartender or server. For each drink, the volume, price, brand or %ABV, and specific drink type were recorded. Photographs of each drink were taken to determine glass shape and size and fill levels. The research team did not consume any of the alcoholic beverages. Drinks were either poured out in the bathroom or left on the table.

Each drink sample was analyzed for %ABV using the Analox AM3 Alcohol Analyzer within 36 hours of each visit. The Analox Analyzer determines %ABV by using an oxygen-sensitive electrode to measures the rate of oxygen exchange between enzyme reagent (alcohol oxygen oxidoreductase) and alcohol samples. The measured rate of oxygen uptake is directly proportional to alcohol concentrations. The AM3 was calibrated with known alcohol standards for specific drink types. To ensure reliability and accuracy each sample was run three times and the results were averaged. Drink alcohol content was calculated as the drink volume multiplied by the measured or producer-reported %ABV. To account for the multi-level stratified sampling design of the study, we conducted analyses using Stata 10 (Stata Corporation, 2007). The data were organized by drink record with a primary sampling unit of the establishment, secondary sampling unit of the city or town and stratification by county. Incorporating the survey design, Adjusted Wald tests were used to determine whether differences in group means were significant at the 95% confidence level.

RESULTS

A total of 20 visits to 80 drinking establishments were made during March, April, and May of 2007 throughout 10 Northern California counties. A total of 480 drinks were purchased and measured and 337 drink samples were analyzed. Bars (41.8%) and restaurants (39.8%) made up the preponderance of drinking establishments visited. The establishments visited had an approximately equal proportion of male (46.1%) and female (47.2%) bartenders as perceived by study personnel with the remainder including both genders. No significant differences by perceived gender in mean drink alcohol content were found. The majority of bartenders and servers appeared to be white (72.7%) and over the age of 30 (61.1%).

Table 1 indicates the number of drinks purchased and the mean alcohol content of beer, wine and spirits drinks in each county. The within-beverage mean was larger than the US standard drink (0.6oz or 18ml of alcohol) in all cases. Across the broad beverage categories, the largest mean drink alcohol content was for wine at 0.86 oz, 43.3% larger than the standard drink and significantly larger than the means for spirits and beer. Spirits were found to have the second highest alcohol content, 0.79 oz., 31.7% larger than the standard, and draft beer was found to have the lowest of the three types at 0.73 oz., 21.7% larger than the standard. There was limited variability across each beverage type by county. Contra Costa and Solano counties both had large mean alcohol content for wine drinks at 0.91oz (26.9ml), which was significantly larger than the Alameda county average of 0.75oz (22.2ml). There were no statistically significant differences in mean alcohol content across counties for beer or spirits.

The mean alcohol content, drink volume, and %ABV for beer, wine, spirits and selected subtypes within each category are presented in Table 2. Very little difference was found across major types of beer and wine drinks. Red and white wine drinks were found to have identical mean alcohol contents. Pour size was slightly larger and %ABV was slightly lower for white wine, but these differences were not significant. Beer drinks were classified as pints, the most common type, and all others. Although a pint (the most common drink size served in Northern California in glassware) is technically 16 ounces (474ml), differences in glass size and especially in fill levels and foam result in an average pour of 14 ounces (414ml). Other beers included both larger and smaller sizes. The concentration of beer purchased as pints was found to be significantly higher than other sizes due to the pint being a common serving size for the increasingly popular craft beers, which were ordered in many cases and often have higher % ABV's than regular or light beers. Among spirits drinks, shots were clearly differentiated from mixed drinks and had significantly lower mean alcohol content. The mean pour size for shots was 1.51 ounces (45ml), almost exactly the standard pour for 40 %ABV (or "80 proof") spirits, as most of the spirits brands now are. This stands out as the only drink subtype to conform to the standard pour. This finding confirmed the reports of bartenders in the focus groups, 50% of whom reported standard pours of 1.5 ounces (44ml) for shots they poured.

Mixed drinks were much stronger overall with an average alcohol content of 0.85 ounces (25ml). Interestingly, mixed drinks were about equal to wine drinks not only in their mean alcohol content but in their average pour size and %ABV as well. Four of the most popular mixed drinks in the US that were purchased for this study are also presented in Table 2 to illustrate the variation across specific types of popular drinks. The margarita was found to have the lowest mean %ABV but was served in relatively large volumes resulting in an alcohol content of 0.86 ounces (25ml). The rum and coke also had a lower %ABV and had a smaller serving size than the margarita, resulting in a mean alcohol content of 0.73 (22ml) ounces. The gin and tonic was served at a size similar to the rum and coke but at a higher %ABV, resulting in an alcohol content of 0.79 (23ml). The strongest of these mixed drinks, at over 22 %ABV, was the martini, which was found to contain 160% of the alcohol in a standard drink on average.

The distributions of individual drink types' alcohol content results for wine, beer and spirits (both shots and mixed drinks) are displayed in Figure 1. The vertical dark line in each graph indicates the standard drink. Clearly, most alcoholic beverages served on-premise contain more alcohol than the standard. The alcohol contents for beers ranged from 0.46 to 1.2 ounces (14 to 36ml), or from three quarters of a standard drink to two of these drinks. Wine alcohol content was almost always (98%) larger than the standard drink and 42% of wine drinks had an alcohol content equal to or greater than one-and-a-half standard drinks. Spirits drinks had a wider range of alcohol contents from 0.3 to as much as 2.0 ounces (9 to 59ml). As noted above, spirits alcohol content was clearly differentiated between shots and mixed drinks, as seen in the lower right panel of Figure 1. Shots were both smaller and less variable than mixed drinks with most shots falling between 0.4 and 0.7 ounces (12 to 21ml) of alcohol. The majority of participating bartenders in the focus groups indicated that more alcohol was typically poured in mixed drinks as compared to shots.

The pairwise correlation of drink alcohol content between specific drink types within establishments illuminates the extent to which pour sizes for one drink are associated with pours of another drink type. Red and white wine drinks were highly correlated (0.56) with each other but neither of these was significantly correlated with draught beer. Among spirits drinks, generally high but varying correlations were found. The similarly made mixed drinks--rum and coke and gin and tonic--had the highest correlation (0.69) and gin and tonic was also highly related to shot size (0.51). Significant but modest correlations of between 0.33 and 0.40 were found between other combinations of shots, margaritas, rum and cokes and gin and tonics. Draught beer alcohol content was not significantly correlated with any of the mixed drinks but was slightly positively related to shots (0.28). Red wine was not significantly correlated with any spirits drinks but white wine alcohol content was modestly positively related to gin and tonic (0.38) and rum and coke (0.35).

DISCUSSION

This study is the first we know of to directly measure the alcohol content of beer, wine, and spirits beverages served on-premise in the US. Based on limited resources, the area of study, though geographically diverse and including rural and urban counties, had to be restricted to an area in Northern California. Importantly, however, results clearly indicate that the majority of bartender poured drinks contain more alcohol than the commonly assumed standard drink (0.6 ounces or 18ml of alcohol). Another important caveat regarding beer is that bottled or canned beers, which comprise over 90% of the beer sold in the US (Beer Institute, 2007) were not measured. These beers are commonly sold in bars and restaurants and typically contain between 0.5 ounces (15ml) (for light beers) and 0.6 ounces (18ml) (for regular beers) of alcohol in a 12 ounce (355ml) bottle (Kerr et al., 2004). Results indicating a larger serving size for draught beers, 0.73 ounces (22ml) of alcohol from a pour size of about 14 ounces (414ml), identify draught beer as a source of higher alcohol content drinks. Differentiating draft beers from other beers will yield useful information in surveys and this difference should be recognized by consumers monitoring their alcohol intake. Our results for wine and spirits drinks should reflect normal pouring practices for the Northern California study area. Results indicate that mixed spirits drinks and wine drinks are, on average, nearly identical in both pour size (about 6.2 fluid ounces) and %ABV (about 14%), resulting in drinks that are nearly 50% larger than the US standard.

Shots of straight spirits were found to contain less alcohol than mixed drinks with a mean content equal to a standard drink and relatively little variation in pour size. Given the potential role of shots in accelerating the rate of drinking, this is a positive finding. It also demonstrates that bartenders can and do consistently pour standard drinks when using a measuring device, the shot glass, and could do so for other drinks if they intended to do so. Results indicating that the alcohol content of shots had moderate to high correlations with that of mixed drinks is important for the design of future research studies. A shot of a particular brand is relatively easy to measure, as it does not involve pouring off ice or analysis of a drink sample when brand of spirits is recorded. The use of shot alcohol content as an indicator of spirits drink size could mean that studies where only one beer, one wine and one shot of spirits are measured would give a reasonable view of an establishments alcohol servings in general (at least in this study area). However, it would be prudent to confirm this by combining such a protocol with the more detailed sampling strategy employed in this study.

The study has limitations that should be considered in the interpretation of results. As already mentioned, the sample was limited to 10 California counties and the relationship between drink pouring practices between this area and other areas of the US is currently unknown. Major wine producing regions are included and Northern California may be considered a sophisticated wine market, both of which could affect the types of wines served as well as glass and pour size. The study did not include packaged beers, which (excepting malt liquor not typically sold on-premise) are known to contain less alcohol. However, the present findings should accurately represent servings of draught beers. Measurement may not have been perfectly accurate in all cases, particularly for foamy beers, but as training was provided and great care was taken, the level of accuracy by practiced study personnel is likely as high as can reasonably be achieved in a field setting. In three cases (4% of 80 bars visited) the randomly selected bar was deemed unsuitable or potentially dangerous and the team instead visited another randomly pre-selected bar in the same town. The research team members were first-time visitors to each establishment and in some cases felt that they clearly appeared to be demographically out of place. This situation is unavoidable in this type of study and the results indicating large drink pours may be conservative as compared to the experience of dedicated drinkers who may seek out and return to specifically generous venues.

Consumers of on-premise alcoholic beverages and those trying to educate, research or prevent alcohol-related problems among these drinkers should be aware of the variable and, on average, large drink alcohol contents served in the US. This study found that all wine drinks, mixed spirits drinks and draught beer drinks were 22 to 43% larger than the US standard drink, on average, with many instances of much larger amounts. These large serve sizes are not necessarily problematic if drinkers are aware of them and limit their consumption accordingly, however, this is likely often not the case. Heavier drinkers may be more likely to choose higher alcohol content drink types and establishments and may employ strategies to obtain larger drinks. Results indicating that straight shots are typically served at the standard pour size are encouraging because this illustrates that tight control over drink pours is possible and is, in fact, occurring for a particular drink type. Another factor offsetting this ‘good news’ is that shots may also supplement or be taken in addition to other drinks.

Findings indicating that beer, wine and spirits drink pours are large and highly variable demonstrate the need for regulations requiring standardized drink pours or the disclosure of drink beverage pour size or alcohol content in on-premise establishments. Given the variety of mixed drink types, and the %ABV ranges of wine and beer brands, neither of these regulations would be easy to achieve or implement. Marked fill-levels on glassware, as common in Europe, might address pour sizes but would not fully standardize the alcohol content of drinks. In the absence of such laws, the education of consumers regarding serving practices is essential and may be much more practical. Research studies should also incorporate estimates of serving amounts, such as those presented here, in their interpretation of reported drinks consumed. In order to be able to adjust for home drink sizes (Kerr et al., 2005) and bartender poured drinks, researchers should ask about both beverage type and context of drinking because, based on our work, drink alcohol content in the US is now known to vary along these dimensions. Given the geographic limitations of this initial on-premise study, it will be important to design studies to sample other locations within the US, and to expand such studies to other countries where bar pours are not highly regulated or standardized.

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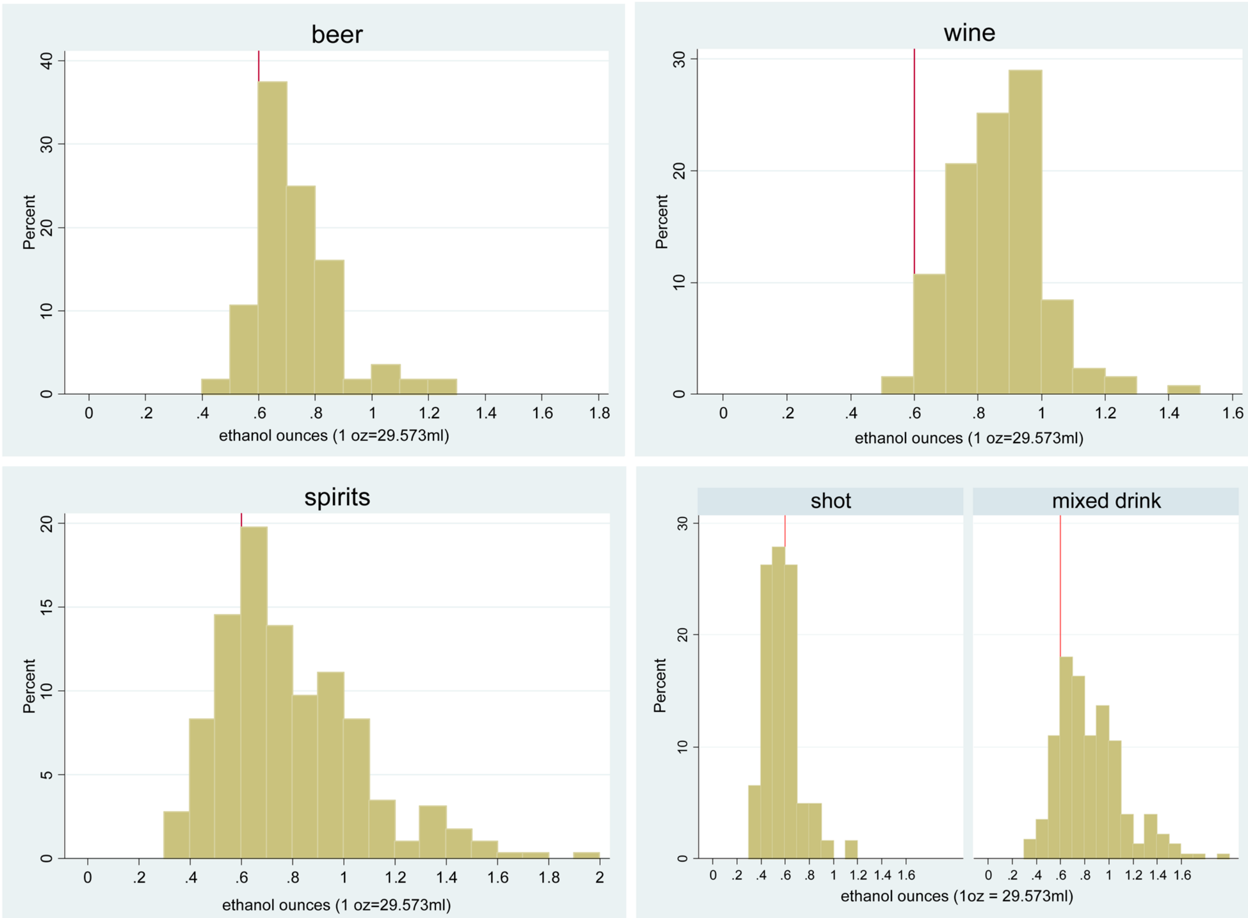

Figure 1. Histograms depicting the distribution of drink alcohol content by beverage category and for spirits subtypes of shots and mixed drinks

Vertical line indicates standard drink alcohol content (0.6oz or 18ml)

Table 1

Mean drink alcohol content in fluid ounces (1oz=29.6ml) by beverage type and county in the main study

	Number of drinks purchased	Mean Ethanol Ounces (S.E.)		
		Beer (n=56)	Wine (n=131)	Spirits (n=288)
All	480	0.73 (0.02)	0.86[a] (0.02)	0.79 (0.02)
Alameda	50	0.94 (0.24)	0.75 [b] (0.02)	0.92 (0.15)
Contra Costa	45	0.65 (0.06)	0.91 [b] (0.01)	0.80 (0.02)
Solano	48	0.71 (0.06)	0.91 [b] (0.04)	0.80 (0.06)
Yolo	42	0.67 (0.03)	0.83 (0.03)	0.70 (0.05)
Sacramento	44	0.71 (0.06)	0.90 (0.02)	0.69 (0.04)
San Joaquin	47	0.80 (0.08)	0.81 (0.02)	0.70 (0.06)
Marin	50	0.87 (0.07)	0.90 (0.04)	0.81 (0.08)
Napa	48	0.68 (0.06)	0.78 (0.04)	0.79 (0.04)
San Francisco	54	0.71 (0.02)	0.89 (0.10)	0.73 (0.01)
Sonoma	52	0.75 (0.03)	0.89 (0.03)	0.87 (0.04)

[a]Indicates wine has larger mean alcohol content than both beer and spirits (t-test; $p \leq 0.05$)

[b]Indicates significantly lower wine mean alcohol content for Alameda versus Contra Costa and Solano counties (t-test; $p \leq 0.05$)

Table 2

Mean drink alcohol content in fluid ounces (1oz=29.6ml), serving volume in ounces and alcohol concentration by volume for each beverage type and subtype

	N	Ethanol Ounces (95% CI)	Volume Ounces (95% CI)	%ABV (95% CI)
Wine	**131**	**0.86 [a] (0.83, 0.90)**	**6.18 (5.95, 6.41)**	**13.99% (13.72, 14.25)**
Red wine	63	0.87 (0.82, 0.92)	6.12 (5.82, 6.41)	14.19% (13.90, 14.48)
White wine	64	0.87 (0.84, 0.90)	6.30 (6.11, 6.50)	13.80% (13.40, 14.19)
Beer	**56**	**0.73 [a] (0.69, 0.78)**	**14.10 (13.50, 14.70)**	**5.20% (4.97, 5.42)**
Pint	41	0.74 (0.71, 0.78)	14.05 (13.76, 14.33)	5.30% [c] (5.04, 5.58)
Other	14	0.71 (0.57, 0.85)	14.56 (12.39, 16.72)	4.86% [c] (4.49, 5.22)
Spirits	**288**	**0.79 [a] (0.74, 0.84)**	**5.28 (5.06, 5.50)**	**19.47% (18.90, 20.02)**
Shots	61	0.58 [b] (0.53, 0.63)	1.51 [b] (1.32, 1.70)	39.22% [b] (38.42, 40.03)
Mixed Drinks	227	0.85 [b] (0.79, 0.90)	6.29 [b] (6.02, 6.56)	14.16 [b] (13.57, 14.74)
Gin & Tonic	45	0.79 (0.71, 0.88)	6.00 (5.54, 6.48)	13.26% (12.37, 14.15)
Margarita	60	0.86 (0.79, 0.93)	7.54 (7.15, 7.94)	11.55% (10.58, 12.53)
Martini	43	0.96 (0.86, 1.06)	4.30 (3.97, 4.63)	22.34% (21.32, 23.36)
Rum & Coke	59	0.73 (0.67, 0.78)	6.29 (5.96, 6.61)	11.59% (10.75, 12.43)

[a]Indicates wine has larger mean alcohol content than both beer and spirits (t-test; $p \leq 0.05$)

[b]Indicates significant difference in mean value between shots and mixed drinks for a given measure (t-test; $p \leq 0.05$)

[c]Indicates significant difference in beer mean %ABV (t-test; $p \leq 0.05$)