Illegal Alcohol Sales and Use of Alcohol Control Policies at Community Festivals

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SYNOPSIS

Objectives. The primary goals of this study were to assess the propensity for alcohol sales to underage customers and obviously intoxicated customers at community festivals, and to assess the prevalence of alcohol control policies at these events. A secondary goal was to identify server and festival characteristics and festival policies related to the likelihood of illegal alcohol sales.

Methods. We conducted pseudo-underage purchase attempts at 43 festivals and pseudo-intoxicated purchase attempts at 50 festivals to assess the likelihood of illegal sales. Research staff made observations at festivals and contacted festival planners by telephone following each event to assess which alcohol policies were implemented. We conducted backwards stepwise multivariate analyses for each purchase attempt outcome to identify policies and characteristics related to likelihood of illegal alcohol sales.

Results. Pseudo-intoxicated buyers purchased beer in 89% of 95 attempts (standard deviation [SD]=0.31) and pseudo-underage buyers were able to purchase beer in 50% of 82 attempts (SD=0.50). All festival planners reported having at least two of the 10 alcohol policies we assessed, but no festival had implemented all 10 policies. Server characteristics were not related to either purchase attempt outcome. In the multivariate analyses, having more alcohol control policies was related to a greater likelihood of illegal sales to intoxicated customers; however, having more alcohol control policies was associated with a lesser likelihood of alcohol sales to underage customers. Restricting the number of servings per person was also associated with a lesser likelihood of alcohol sales to underage customers.

Conclusions. Propensity for illegal alcohol sales at festivals is very high. Research is needed to identify interventions to prevent illegal alcohol sales at these events.

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To prevent alcohol-related problems such as traffic crashes, assaults, and unintentional injuries, states have made it illegal to sell alcohol to individuals under age 21 and to patrons who are obviously intoxicated. Although researchers have begun to assess the likelihood of illegal alcohol sales at licensed establishments (e.g., bars, restaurants, liquor stores) and the associated risks,[1–7] we identified no studies in the alcohol literature assessing propensity for illegal alcohol sales at community festivals,[8] annual local celebrations common throughout the United States. During a single year alone, we identified over 1,000 festivals occurring in one state. Given the frequency of festivals, investigation into the rate of illegal alcohol sales at these community events is necessary to determine if interventions are needed to prevent alcohol-related problems.

Studies investigating the propensity of illegal alcohol sales to both underage and obviously intoxicated individuals in licensed establishments provide background data for our research. During the early- to mid-1990s, studies found that licensed establishments sold alcohol to individuals who appeared to be under age 21, without checking age identification, at a rate ranging from 44% to 97% of purchase attempts.[1,2,5,6] When multiple purchase attempts were made at each establishment, nearly 75% of the establishments sold to young-appearing buyers at least once.[1,2] The propensity for illegal sales to obviously intoxicated customers was also high.[3,4,7,9] Sales rates to buyers who appeared obviously intoxicated ranged from 58% to 93% across studies and geographic areas.

After identifying a high propensity for illegal alcohol sales at licensed establishments, researchers developed policy recommendations and interventions to help prevent illegal sales and alcohol-related problems. To guide interventions, researchers identified characteristics of servers and establishments related to likelihood of illegal alcohol sales. For example, younger servers are more likely than older servers to sell alcohol illegally,[1,2] a finding that led to a policy recommendation to restrict the age of servers. Training programs can also promote development of establishment policies to encourage responsible beverage service. Some of these training programs have been found to prevent sales to obviously intoxicated patrons and reduce intoxication levels of customers.[10,11] Additionally, deterrence efforts, such as regular compliance checks in which underage customers attempt to purchase alcohol under the supervision of law enforcement agents, appear to reduce illegal alcohol sales to underage young adults. If an alcohol sale is made during a compliance check, penalties are applied to the server and/or the license holder.

Community interventions have also proven successful in preventing illegal sales to those under age 21. Wagenaar and associates[12] evaluated a community organizing effort in a 15-community randomized trial designed to reduce underage access to alcohol from both licensed establishments and social providers (i.e., friends, parents, siblings). Following the intervention, licensed establishments in the intervention communities were significantly more likely during purchase attempts to ask for age identification and refuse service to female buyers who appeared underage than at baseline. Across 24 communities in northern Minnesota, Perry and associates[13] found sales rates to pseudo-underage buyers decreased from 42% to 14% following an intervention that included server training and enforcement campaigns, compared to a decrease from 47% to only 35% in comparison communities. Similarly, following an intervention, which included law enforcement compliance checks, server training, and media advocacy, Grube and associates[14] observed a decrease in the sales rate to young-appearing buyers from 45% to 11% in intervention communities, compared to a decrease from 47% to only 35% in comparison communities.

In the current study, our primary goals were to assess the propensity for illegal alcohol sales to both underage and obviously intoxicated individuals at community festivals and the prevalence of festival policies and practices related to alcohol sales. In addition, although our sample size was limited, we conducted a preliminary assessment to identify characteristics of servers and festivals, and festival policies associated with the likelihood of illegal alcohol sales at these events.

METHODS

To assess propensity for illegal alcohol sales at community festivals, we conducted two distinct purchase attempts: pseudo-underage (i.e., buyers who were age 21 or older but appeared under age 21) and pseudo-intoxicated (i.e., buyers who enacted signs of obvious intoxication). To assess characteristics of community festivals and festival policies that could affect alcohol service and related problems, we conducted a telephone survey of festival planners. Through a review of extant literature on alcohol service in licensed establishments and of guides for community festivals, we identified 10 alcohol control policies that could influence alcohol sales and use at festivals. The 10 policies are listed in Table 1.

Festivals

A list of community festivals throughout the Twin Cities area (Minneapolis, St. Paul) was obtained through the State of Minnesota Department of Tourism Web site for Summer 2000 (June 1 through October 1, 2000). Additional community festivals in this area were identified through local newspapers. Festivals were excluded if they were located more than 30 miles from the University of Minnesota because of staffing and other resource limitations.

Eligible festivals (n=120) were ordered by date. Because of staffing and time limitations, a maximum of eight festivals could be attended on a given week. If more than eight festivals occurred in a given week, we randomly selected eight festivals for that week. Alcohol purchase attempts were made at one to eight festivals per week between June 3 and September 16, 2000, with a total sample of 50 festivals. Study festivals ranged in size from approximately 1,200 to 1,680,000 attendees (mean=90,095; SD=264,873) and in duration from one to 15 days (mean=3.7; SD=2.9).

Alcohol purchase attempts

All alcohol purchase attempts were conducted between 2:30 and 10:30 p.m. Both a pseudo-underage and a pseudo-intoxicated purchase attempt were conducted at each alcohol booth included in the study. Purchase attempts were made at every booth if the festival had five or fewer alcohol

Table 1. Prevalence of alcohol control policies at community festivals

Variables	*Level of variable*	*Frequency*	*Percentage*
Have security staff	Yes	44	97.8
	No	1	2.2
Restrict alcohol to specific areas	Yes	29	65.9
	No	14	31.8
	Don't know	1	2.3
Require server training	Yes	25	55.6
	No	6	13.3
	Don't know	14	31.1
Restrict number of drinks per sale per person	Yes	13	28.9
	No	24	53.3
	Don't know	8	17.7
Restrict age of server	Yes	43	96.6
	No	1	2.2
	Don't know	1	2.2
Have alcohol-free areas	Yes	27	60.0
	No	17	37.8
	Don't know	1	2.2
Prevent people from leaving with alcohol	Yes	35	77.8
	No	8	17.8
	Don't know	2	4.4
Stop sales before end of event	Yes	30	66.7
	No	13	28.9
	Don't know	2	4.4
Alcohol container size	Small	16	36.4
	Large	10	22.7
	Don't know	12	27.3
	Other	6	13.6
Have distinguishable cups for alcohol	Yes	34	81.0
	No	8	19.0
Policy index (total number of policies per festival)	1	0	0.0
	2	1	2.2
	3	2	4.4
	4	2	4.4
	5	6	13.3
	6	9	20.0
	7	11	24.4
	8	7	15.6
	9	7	15.6
	10	0	0.0

booths. If a festival had more than five booths, buyers made purchase attempts at the first five booths they encountered. Ninety-five pseudo-intoxicated purchase attempts were made at 50 festivals; 82 pseudo-underage purchase attempts were made at 43 festivals. The number of pseudo-underage purchase attempts was less than the number of pseudo-intoxicated purchase attempts because of staffing issues with pseudo-underage buyers (e.g., buyers occasionally called in sick or missed an assigned festival).

Pseudo-intoxicated. Six female and two male actors (ages ranging from 36 to 60) recruited through advertisements in local newspapers completed the pseudo-intoxicated purchase attempts. We used age 30 as a minimum to eliminate the possibility that actors were refused a drink because of appearing underage rather than appearing intoxicated. Actors auditioned for the study by performing a predetermined scenario before a panel of eight judges. The panel of judges consisted of emergency medical personnel, members of the general public, and university staff not involved in the study. Actors judged by the panel to believably enact signs of obvious intoxication were selected for the study.

To standardize the purchase stimulus, all pseudo-intoxicated buyers were carefully trained to follow a consistent protocol adapted from previous studies assessing the propensity for alcohol sales to obviously intoxicated patrons in licensed establishments.[4,7] Before making purchase attempts, buyers sprayed their clothes with alcohol. When approaching alcohol booths and when making the purchase attempt, buyers acted out signs of intoxication (e.g., staggering, acting forgetful, slurring words, dropping money). If servers asked them whether they were driving, the buyers said they were not and that a friend would be driving them home (Note: In nearly all states, including Minnesota, it is illegal to sell or serve alcohol to anyone appearing obviously intoxicated; whether they profess no plans to drive is immaterial).[15] After being served or refused a request for a beer, the buyers left the booth, continuing to act out signs of intoxication until out of the servers' sight. Buyers were then instructed to discreetly pour out any purchased beer. A second staff member was assigned to observe each purchase attempt.

Following purchase attempts, buyers and observers completed forms describing each attempt. Buyers indicated whether they were sold a beer, gender of server, perceived age of server (<31, ≥ 31), and number of minutes they waited in line (dichotomized as <1 minute, ≥ 1 minute because of a highly skewed distribution). Each buyer and observer independently noted whether the server clearly indicated that he or she noticed the apparent intoxication level of the buyer (i.e., made remarks about buyer's intoxication level; verbally expressed approval or disapproval of buyer's intoxication level; reacted negatively, gave dirty looks; reacted positively, laughed, enjoyed buyer's drunken behavior; followed buyer around; expressed concern, suggested slowing down; asked whether the buyer was driving; enlisted help of other staff to deal with buyer; offered a non-alcoholic beverage instead; explained policy about not serving intoxicated customers; said he or she wouldn't serve the buyer because of apparent intoxication; encouraged buyer to eat). Indications by the buyer and observer that the server noticed the apparent intoxication level of the buyer were correlated; however, the buyer and observer did not agree 100% of the time. Both the buyer and observer had multiple tasks to complete, and each may not have been able to clearly observe all the behaviors of the server. By combining observations of both team members, we increased the likelihood of capturing all indications that the server noticed that the buyer appeared to be intoxicated.

Pseudo-underage. Six women and one man, recruited through advertisements in local newspapers, served as pseudo-underage buyers. Buyers ranged in age from 21 to 24 years, but they were judged by an age-assessment panel to look 18 to 20 years old. Our protocol for pseudo-underage purchase attempts was adapted from a protocol used in thousands of purchase attempts in licensed establishments conducted as part of previous studies.[1,2] We instructed pseudo-underage buyers to not attempt to appear older by wearing make-up, jewelry, or facial hair. Pseudo-underage buyers approached each alcohol booth by themselves and attempted to purchase a beer. If asked for age identification, buyers indicated that they had left it in the car. If asked their age, they stated their actual birth date or age. If buyers were served beer, they left the booth and discreetly disposed of the beer out of the server's sight. If refused service, buyers quietly left the booth area. Following each purchase attempt, pseudo-underage buyers completed a short form, indicating whether they were sold alcohol, perceived age of server (<31, ≥31), gender of server, and how many minutes they waited in line (<1 minute, ≥1 minute).

Telephone survey

To assess festival characteristics and policies, we conducted a telephone survey of the individuals in charge of planning each of the 50 festivals. Project staff contacted event planners by telephone following completion of the event and asked planners to participate in the telephone survey. Festival planners from 45 of the 50 festivals (90%) agreed to complete a survey. Project staff conducted telephone surveys within four weeks of the conclusion of the event.

The survey included a number of questions about festival characteristics and policies involving alcohol sales. Questions to assess festival characteristics included the median split of festival attendance (<14,000, ≥14,000), event length (≤3 days, >3 days), and number of booths selling alcohol (1–2, >2), the type of organization that sold alcohol (licensed establishments, civic groups/event planners/other), and whether the event had any financial sponsorship by the alcohol industry (yes, no). Questions to assess the implementation of the 10 alcohol control policies included whether the festival (*1*) had security staff (yes, no), (*2*) restricted alcohol use to specific areas (yes, no, don't know), (*3*) required servers to receive responsible beverage service training (yes, no, don't know), (*4*) restricted number of drinks per sale per person (yes, no, don't know), (*5*) restricted age of the server (yes, no, don't know), (*6*) designated alcohol-free areas (yes, no, don't know), (*7*) prevented attendees from leaving the event with alcohol (yes, no, don't know), (*8*) stopped alcohol sales before the end of the event (yes, no, don't know), (*9*) used smaller sized containers for alcohol (small=10 oz. or 12 oz., large=16 oz. or 32 oz., don't know, other), and (*10*) used containers for alcoholic beverages distinguishable from non-alcoholic beverages (yes, no).

Analyses

We examined univariate distributions for both pseudo-underage and pseudo-intoxicated purchase outcomes and the set of potential predictor variables (server characteristics, festival characteristics, and alcohol policies). In addition to assessing alcohol control policies individually, we created a policy index that was a summation of the 10 policies. To create the index, for each festival we summed the number of positive ("yes") responses to questions about whether the festival implemented each of the 10 policies in this summation, "don't know" responses were collapsed with negative ("no") responses. We conducted bivariate analyses to assess whether server characteristics, festival characteristics, and festival policies were associated with pseudo-underage and pseudo-intoxicated purchase attempt outcomes. For the bivariate and multivariate analyses, we coded "don't know" as missing for the six variables where there were two or fewer "don't know" responses (having security staff, restricting alcohol to specific places, restricting age of server, having alcohol-free areas, preventing people from leaving the event with alcohol, stopping sales before the end of the event) because it was not possible to assess "don't know" as a separate category. For the remaining variables, we analyzed "don't know" responses as a separate category. Variables found to be marginally related ($p \leq 0.20$) to the two dependent variables in bivariate analyses were tested in multivariate models using backwards stepwise regression methods (variables were retained in multivariate models if $p \leq 0.20$). We used a less stringent α value because of the small sample size and the exploratory nature of the analyses. We estimated all statistical models separately for our two outcomes.

We conducted bivariate and multivariate analyses using PROC MIXED in SAS, Version 8.[16] With up to five pseudo-underage and five pseudo-intoxicated purchase attempts made at each community festival, attempts were "nested" within festival. Potential within-festival correlation must be modeled to ensure accurate parameter estimates. We used a repeated command, with a compound symmetric error covariance structure, to control for within-festival correlation when multiple purchase attempts were made at a given festival. Although designed for use with normally distributed outcomes, previous research has shown PROC MIXED to be robust to violations of normality under similar study conditions.[17]

RESULTS

Pseudo-intoxicated buyers were able to purchase alcohol in 89% (SD=0.31) of the 95 purchase attempts. Only four of the 50 festivals did not sell alcohol to the pseudo-intoxicated buyer, but note that only one purchase attempt was made at these four festivals. Buyers were able to purchase alcohol in 50% (SD=0.50) of the pseudo-underage purchase attempts. Of the 43 festivals where pseudo-underage purchase attempts were made, 14 festivals did not sell alcohol to pseudo-underage buyers. Servers at only one festival refused alcohol service to both the pseudo-underage and pseudo-intoxicated buyers.

Servers showed evidence (as observed by either the buyer or observer) that they noticed the apparent intoxication level of the pseudo-intoxicated buyers during 82% of the purchase attempts. When the servers showed evidence of recognizing the buyers' intoxication, they nevertheless served alcohol 87% of the time. When they showed no evidence of recognizing the buyers' apparent intoxication levels, they sold alcohol 100% of the time.

Among the 45 festivals that participated in the telephone survey, all festival planners reported having at least two of the 10 alcohol control policies we assessed (Table 1). None reported implementing all 10, although seven of the festivals reported implementing nine of the policies. The average number of policies implemented was 6.6. Only two policies were implemented in nearly all of the festivals: having security staff (i.e., either uniformed police officers or hired security staff) and restricting age of alcohol servers. Four policies (restricting area of alcohol consumption, limiting number of drinks per sale, having alcohol-free areas, and stopping alcohol sales early) were not implemented at nearly a third of the festivals. Almost a third of the festival planners did not know whether alcohol servers at their events were trained to serve alcohol responsibly.

Server characteristics were not associated with either of the purchase attempt outcomes in the bivariate analyses. Additionally, few festival characteristics or policies were related to either outcome. The sales rate to pseudo-underage buyers was lower at festivals that had more than two alcohol booths and at festivals that restricted the number of servings per alcohol sale per person (Table 2). Alcohol policies that could be used to directly target prevention of alcohol sales to minors—restricting alcohol consumption to specific areas and using specific methods to identify minors—were not related to likelihood of sales to underage buyers. Although only one of 10 festival policies was significantly related to the pseudo-underage sales rate when examined separately, we observed a significant inverse relationship between the policy index and the pseudo-underage sales rate. In multivariate analyses, only restricting the number of servings per customer per sale and the composite policy index remained significant in the final model predicting sales to underage customers (Table 4).

In the bivariate analyses, pseudo-intoxicated purchases were less likely at events that had financial sponsorship by the alcohol industry; however, the sales rate was still 86% at these festivals (Table 3). Sales to the intoxicated buyers were also significantly more likely when alcohol was sold in smaller containers and when a festival had more policies. In multivariate analyses, only the policy index remained in the final model—festivals with more policies had higher sales to intoxicated buyers (Table 4).

DISCUSSION

The propensity for illegal alcohol sales to both underage and obviously intoxicated customers is very high at community festivals. The sales rate to our young-appearing buyers was 50%, similar to the sales rate at licensed establishments prior to any interventions, as found in previous research.[1,2,13,14] The sales rate to pseudo-intoxicated buyers was 89%, in contrast to a 79% sales rate in licensed establishments found in a previous study.[9] Given the high likelihood of these illegal alcohol sales at community festivals, it is important that community interventions target these venues in addition to licensed establishments.

A promising approach for preventing illegal alcohol sales at licensed establishments is to implement establishment policies that set expectations for responsible alcohol service.[10,11] Such policies can be encouraged through training programs or through law enforcement efforts such as compliance checks. Of the 45 festivals that participated in the telephone survey, all had implemented at least two of these alcohol control policies; however, none of the festivals had implemented all 10 policies. Interestingly, festival planners often did not know whether certain policies were in place at their festivals. For example, nearly one third of festival planners were not sure whether alcohol servers at their events were required to be trained on how to responsibly serve alcohol. These festivals may not have server training policies, or it is possible that policies about alcohol service were implemented by the beer vendors and the festival planners did not know what the vendors required. One goal of an intervention may be to ensure that festival planners take active roles in deciding which policies are needed to ensure responsible service of alcohol at their events. Further research is needed to determine what types of interventions would increase use of these and other identified festival policies and to determine effects of implementing various policies and procedures.

Although many servers clearly noticed that the buyers appeared to be intoxicated, they still served beer to the buyers. Some of these servers—many of whom were volunteers—may need training to learn that it is illegal to serve alcohol to obviously intoxicated patrons and to gain skills for refusing service to these customers. Unlike studies assessing propensity for illegal alcohol sales at licensed establishments, neither perceived age nor gender of server were related to likelihood of either type of illegal alcohol sale at community festivals.

Most of the policies we assessed did not specifically target illegal alcohol sales to either underage or obviously intoxicated patrons, but instead were aimed to reduce overall alcohol consumption (e.g., having small sizes of alcohol containers) and alcohol-related problems (e.g., hiring security at the festivals). Our analyses showed that most policies were not related to sales to pseudo-underage or pseudo-intoxicated buyers, although our ability to assess specific relationships may have been limited by a small sample size and little variability in the sales rate to the pseudo-intoxicated buyers. The inverse relationship, however, between overall index of alcohol control policies and the pseudo-underage purchase attempts was statistically significant. In other words, festivals with more alcohol control policies in place—representing a more restrictive environment—were less likely to illegally sell alcohol to underage people. In contrast, festivals with more alcohol control policies in place were more likely to sell to intoxicated customers. Further research is needed to determine whether it is a specific combination of these alcohol policies that affect the likelihood of illegal alcohol sales or whether the policy index is associated with some other underlying factor that affects the sales rates.

Limitations

This study has at least four limitations. First, purchase attempts were conducted by individuals who appeared underage and intoxicated rather than by individuals who were actually underage or intoxicated. Both groups of buyers, however, were screened systematically by panels of eight to 10 people and selected based on the panel's perception of their age and ability to act intoxicated. In addition, 82% of

Table 2. Bivariate analyses of pseudo-underage purchase attempts

Variables	N	*Level of variable*	*Percent sold alcohol*	*Estimate*	*SE*	*t-test*	*p-value*
Server characteristic							
Gender	81	Female	43.6	−0.075	0.106	−0.71	0.493
		Male	57.1				
Perceived age	80	≥31	52.0	0.011	0.111	0.10	0.923
		<31	50.0				
Festival characteristic							
Number of people attending event	71	<14,000	50.0	−0.049	0.146	−0.33	0.737
		≥14,000	53.3				
Number of days of event	73	≤3 days	48.9	−0.150	0.152	−0.98	0.331
		>3 days	53.9				
Number of booths	81	1–2	64.7	0.194	0.136	1.42	0.162
		>2	40.4				
Time in line	81	<1 minute	52.0	0.065	0.114	0.57	0.591
		≥1 minute	46.9				
Organizations selling alcohol	73	Licensed outlets	38.9	−0.136	0.175	−0.77	0.443
		Other	54.6				
Any sponsorship by alcohol industry	73	Yes	44.7	−0.145	0.144	−1.00	0.322
		No	57.1				
Compliance checks conducted by law enforcement	24	Yes	33.3	−0.215	0.320	−0.67	0.521
		No/other	33.3				
Festival policy							
Security staff[a]	73	Yes	50.0	−0.454	0.511	−0.89	0.380
		No	100.0				
Restrict alcohol to specific areas	73	Yes	48.8	−0.111	0.148	−0.75	0.460
		No	53.3				
Require server training[b]	73	Yes	47.9	0.003	0.222	0.02	0.988
		Don't know	55.6	0.059	0.245	0.24	0.813
		No	57.1				
Restrict number of drinks per person[c]	73	Yes	28.1	−0.411	0.144	−2.86	0.007
		Don't know	71.4	0.096	0.178	0.54	0.592
		No	66.7				
Restrict age of server[a]	72	Yes	50.7	0.558	0.511	1.09	0.282
		No	0.0				
Alcohol-free areas	73	Yes	46.0	−0.172	0.144	−1.20	0.240
		No	55.6				
Prevent people from leaving with alcohol	71	Yes	46.8	−0.115	0.208	−0.56	0.583
		No	66.7				
Stop alcohol sales before end of event	67	Yes	51.0	0.010	0.165	0.00	0.952
		No	50.0				
Alcohol container size[d]	79	Don't know	45.5	−0.117	0.201	−0.58	0.565
		Other	50.0	−0.163	0.242	−0.67	0.505
		Small	50.0	−0.091	0.207	−0.44	0.665
		Large	66.7				
Cups are distinguishable	70	Yes	49.1	−0.194	0.173	−1.12	0.270
		No	66.7				
Method for age identification	73	Special method	63.6	0.074	0.149	0.50	0.622
		Other/none	45.1				
Policy index	73			−0.084	0.042	−2.00	0.052
		2	100.0				
		3	100.0				
		4	100.0				
		5	70.0				
		6	38.1				
		7	57.9				
		8	55.6				
		9	20.0				

[a]Estimates should be interpreted with caution due to skewed distribution of data: only one negative response.
[b]The overall test is not statistically significant ($F_{2,35}$=0.06, p=0.944).
[c]The overall test is statistically significant ($F_{2,35}$=5.65, p=0.008).
[d]The overall test is not statistically significant ($F_{3,33}$=0.18, p=0.909).
SE = standard error

Table 3. Bivariate analyses of pseudo-intoxicated purchase attempts

Variables	N	*Level of variable*	*Percent sold alcohol*	*Estimate*	*SE*	*t-test*	*p-value*
Server characteristic							
Gender	95	Female	86.1	−0.049	0.064	−0.77	0.458
		Male	91.5				
Perceived age	95	≥31	91.5	0.050	0.064	0.79	0.443
		<31	86.1				
Festival characteristic							
Number of people attending event	82	<14,000	90.0	0.005	0.064	−0.10	0.936
		≥4,000	90.4				
Number of days of event	84	≤3 days	90.7	0.021	0.061	0.35	0.734
		>3 days	90.0				
Number of booths	94	1–2	87.5	−0.037	0.061	−0.62	0.543
		>2	90.7				
Time in line	95	<1 minute	91.5	0.049	0.064	0.77	0.458
		≥1 minute	86.1				
Organizations selling alcohol	83	Alcohol retailers	95.0	0.069	0.064	1.08	0.286
		Other	88.9				
Any sponsorship by alcohol industry	84	Yes	86.4	−0.080	0.059	−1.36	0.179
		No	95.0				
Compliance checks conducted by law enforcement	30	Yes	95.2	0.063	0.102	0.62	0.548
		No/other	88.9				
Festival policy							
Security staff[a]	84	Yes	90.4	−0.094	0.298	−0.32	0.755
		No	100.0				
Restrict alcohol to specific areas[b]	83	Yes	94.1	—	—	—	—
		No	84.4				
Require server training[c]	84	Yes	89.3	0.049	0.116	0.42	0.676
		Don't know	95.2	0.115	0.125	0.92	0.361
		No	85.7				
Restrict number of drinks per sale per person[d]	84	Yes	88.2	−0.055	0.069	−0.79	0.431
		Don't know	87.5	−0.058	0.087	−0.67	0.505
		No	94.1				
Restrict age of server[a]	83	Yes	91.5	−0.085	0.282	−0.30	0.765
		No	100.0				
Alcohol-free areas	83	Yes	93.5	0.062	0.061	1.01	0.318
		No	86.5				
Prevent people from leaving with alcohol	82	Yes	89.9	−0.006	0.084	0.00	0.945
		No	92.3				
Stop alcohol sales before end of event	78	Yes	92.2	0.058	0.070	0.83	0.412
		No	85.2				
Alcohol container size[e]	79	Don't know	90.9	0.078	0.085	0.91	0.367
		Other	90.0	0.072	0.108	0.67	0.510
		Small	100.0	0.170	0.084	2.02	0.051
		Large	83.3				
Cups are distinguishable[b]	80	Yes	93.7	—	—	—	—
		No	76.5				
Policy index	84			0.040	0.019	2.04	0.048
		2	0.0				
		3	100.0				
		4	100.0				
		5	84.6				
		6	95.0				
		7	84.6				
		8	100.0				
		9	100.0				

[a]Estimates should be interpreted with caution due to skewed distribution of data: only one negative response.
[b]Estimates not available due to lack of convergence of model.
[c]The overall test is also not statistically significant ($F_{2,41}$=0.66, p=0.525).
[d]The overall test is also not statistically significant ($F_{2,41}$=0.39, p=0.682).
[e]The overall test is not statistically significant ($F_{3,39}$=1.36, p=0.269).
SE = standard error

Table 4. Multivariate results for both purchase attempt outcomes

Variables	N	*Level of variable*	*Estimate*	*SE*	*t-test*	*p-value*
Pseudo-underage purchase attempts						
Full model						
Number of booths	72	1–2	0.090	0.144	0.63	0.535
		>2				
Restrict number of drinks per person	72	Yes	−0.329	0.156	−2.11	0.043
		Don't know	0.125	0.185	0.67	0.507
		No				
Policy index	72	NA	−0.055	0.042	−1.32	02.00
Final model						
Restrict number of drinks per person	73	Yes	−0.372	0.142	−2.63	0.013
		Don't know	0.086	0.173	0.50	0.621
		No				
Policy index	73	NA	−0.061	0.040	−1.54	0.133
Pseudo-intoxicated purchase attempts						
Full model						
Any sponsorship by alcohol industry	79	Yes	−0.007	0.080	−0.10	0.927
		No				
Alcohol container size	79	Don't know	0.102	0.087	1.17	0.251
		Other	0.067	0.108	0.62	0.540
		Small	0.113	0.108	1.05	0.300
		Large				
Policy index	79	NA	0.036	0.025	1.43	1.61
Final model						
Policy index	84	NA	0.040	0.019	2.04	0.048

SE = standard error

NA = Not applicable

the servers provided evidence that they believed our pseudo-intoxicated buyers were actually intoxicated. Second, previous studies have found that purchase attempt outcomes may vary by individual buyers—in other words, there is a buyer effect. Given the small dataset and complexity of the data analysis models, we were unable to control for buyer effect in our analyses. Third, we relied on self-reports of festival planners for use of alcohol control policies, which would likely lead to an overestimate of the prevalence of alcohol control policies. On the other hand, we did have a large number of festival planners indicate that they did not implement many of the policies. Some policies affecting alcohol service may be implemented by the vendors without the planners' awareness. This may attenuate the observed association between reported use of policies and purchase attempt outcomes. Further research is needed to assess policies implemented at the level of the beer vendor. Finally, given that festivals included in this study were all located in one major metropolitan area, the generalizability of these results may be limited. We have no basis to believe, however, that community festivals in the study area differ systematically from community festivals located in other areas.

Conclusions

Despite limitations, this study provides an important contribution. This is the first empirical study of a relatively large sample of community festivals that provides information about the propensity for illegal alcohol sales and use of recommended alcohol control policies at these events. The risk of illegal alcohol sales to minors is high at community festivals—similar to the likelihood of sales to underage individuals at licensed establishments prior to interventions targeting these businesses.[13,14] Similarly, the propensity for alcohol sales to intoxicated customers is even higher at community festivals than the high rate observed at licensed establishments. The risk for pedestrian injury, car crashes, assaults, and other problems is exacerbated by service of alcohol to customers that already show obvious signs of intoxication. Future research is needed to confirm the epidemiological patterns observed in this study and to test interventions to prevent illegal alcohol sales at community festivals.

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