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THE EFFECT OF CROSS-BORDER MOBILITY ON ALCOHOL AND DRUG USE AMONG MEXICAN-AMERICAN RESIDENTS LIVING AT THE U.S–MEXICO BORDER

Cheryl J. Cherpitel, Dr.PH,
Alcohol Research Group, Emeryville, CA 94608

Yu Ye, MA,
Alcohol Research Group, Emeryville, CA 94608

Sarah E. Zemore, PhD,
Alcohol Research Group, Emeryville, CA 94608

Jason Bond, PhD, and
Alcohol Research Group, Emeryville, CA 94608

Guilherme Borges, DSc
National Institute of Psychiatry, Autonomous Metropolitan University of Mexico, Mexico City, Mexico

Abstract

Introduction—Little epidemiological evidence exists on alcohol or other substance use and related problems along the U.S.-Mexico border, although the border has been the focus of recent media attention related to the escalating drug/violence “epidemic”. The purpose of this study was to analyze the association of variables related to crossing the border (cross-border mobility) with three substance use outcomes reported for the last year: 1) heavy drinking (5+ drinks per day for men or 4+ for women), 2) alcohol use disorder (AUD), and 3) co-occurring heavy drinking and drug use (any use of illicit and/or non-medically prescribed drugs).

Methods—Household surveys were conducted, using area probability sampling of 1,565 Mexican-Americans residents, aged 18–65, living at the Texas-Mexico border in the metropolitan areas of Laredo and McAllen/Brownsville.

Corresponding Author: Cheryl J. Cherpitel, Alcohol Research Group, 6475 Christie Avenue, Suite 400, Emeryville, CA 94608, 1 510 597-3453, Fax1 510 985-6459, ccherpitel@arg.org.

Contributors

Drs. Cherpitel, Zemore and borges designed the study and wrote the protocol, managed the literature searches and summaries of previous related work. Dr. Cherpitel wrote the first draft of the manuscript. Mr. Ye and Dr. Bond undertook the statistical analysis and collaborated on writing. All authors contributed to and have approved the final manuscript.

Conflict of Interest

No conflict declared

Results—Among those 18–29, more frequent crossing of the border was significantly predictive of AUD (OR=1.61, p<0.01) and co-occurring heavy drinking and drug use (OR=1.70, p<0.01). Staying more than one full day was predictive of AUD (OR = 3.07, p<0.001) and crossing to obtain over-the-counter or prescription drugs ("drug tourism") or for nightlife/drinking were predictive of heavy drinking (ORs = 4.14, p<0.001; 3.92, p<0.01, respectively), AUD (ORs = 7.56, p<0.001; 7.68, p<0.01, respectively) and co-occurring heavy drinking and drug use (ORs = 8.53, p<0.01; 4.96, p<0.01, respectively). Among those 30–65, staying more than a full day and crossing for pharmaceutical reasons were predictive of heavy drinking (OR = 2.54, p<0.001; 2.61, p<0.05, respectively) and co-occurring heavy drinking and drug use (OR = 3.31, p<0.001; 4.86, p<0.01, respectively), while none of the mobility variables were predictive of AUD in this age group.

Conclusions—Cross-border mobility may play an important role in substance use and problems, especially among those 18–29. Findings also highlight the importance of "drug tourism" in substance use across the age spectrum.

INTRODUCTION

Individuals of Mexican origin constitute the largest subgroup of Hispanics in the U.S. (70%), with over half of these Mexican-Americans living in the four states (California, Arizona, New Mexico, Texas) bordering Mexico (Bureau of Transportation Statistics, 2011; Romellón and Vazquez, 2007). The U.S.–Mexican border stretches approximately 2,000 miles (from the Pacific Ocean to the Gulf of Mexico) and is defined on the U.S. side by the 25 counties touching the border across these four states (Driessen and de Cosío, 1995). About 90% of those living on both sides of the border are concentrated in 12 bi-national metropolitan areas, including nine sister-city pairs, and Texas, with 16 border counties and six of these sister-cities, contains the highest concentration of Mexican-Americans living at the border in the U.S.

The U.S. border is characterized by economic interdependence with Mexico, and areas on both sides, including sister cities pairs, are major points of commerce and increased trans-border movement (Ward, 1999). Border residents are able to enter a designated zone with fewer legal restrictions than those which apply to secondary checkpoints further away from the border (Martínez, 1994), facilitating movement back and forth across the border (cross-border mobility) and allowing individuals to shop, visit, and conduct business or work, as well as to obtain medical services and pharmaceuticals (Richardson, 1999). More than 800,000 people crisscross the border legally everyday (United States–Mexico Border Health Commission, 2005), and of these the vast majority are residents of the border area and make frequent crossings.

The border has become an area of recent media attention due to high rates of drug-related violence including homicide, smuggling and kidnappings (Archibold, 2009; Hendricks, 2007; Rhee, 2009; Swarns, 2006), as well as increasing policy and legal tension, as heightened security measures mandate increased border protection. While characteristics of border life, including high mobility of the population on both sides, have been associated with various stressors, little is known about the role played by border proximity and cross-

border mobility on substance use and problems. One study conducted in Texas in 2002–03 found that while volume of consumption among Mexican-Americans living at the border was no greater than that for those living off the border, problems of abuse and dependence were higher, with 23% reporting one or more episodes of binge drinking during the previous month, 7% reporting heavy drinking, and 12% reporting symptoms of alcohol dependence (Wallisch and Spence, 2006; Caetano et al., 2008). Comparison of these data with an earlier 1996 survey in Texas found that past-year alcohol use disorders had doubled at border sites during this period (Wallisch and Spence, 2006). This same study also found life-time and past-year drug use and problems increased significantly, paralleling the rise in alcohol use and problems during this same time. Another study comparing Mexican-Americans living at the border with those residing in several non-border metropolitan areas throughout the U.S. found no overall difference in volume of consumption, binge drinking (Caetano et al., 2012) or alcohol-related problems (Vaeth et al., 2012) between border and non-border locations, although young adults aged 18–29 on the border reported higher rates for all outcomes than their non-border counterparts (Caetano et al., 2013b).

Recent analysis of data from the U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC), which compared the association of border proximity with alcohol use disorders (AUD) among Mexican-American adults living at the Texas-Mexico border with those living in a non-border location, found the prevalence of AUD was greater among those living at the border at the same average monthly volume and number of heavy drinking days (Cherpitel et al., 2015). Co-occurring hazardous alcohol and drug use was also more common among those living at the border than those not (Borges et al., in press).

Those residing at the border may be especially vulnerable to harmful alcohol and drug use and related problems, due to the effects of alcohol advertising, under-enforced drinking age, and greater availability of alcohol at low cost in Mexico. For example, Mexican bars cater to young people, facilitating heavy drinking by advertising inexpensive alcohol in large quantities, and public drunkenness is accepted in bars and near border crossings, where the volume of foot and vehicle traffic prohibits citations for public drunkenness, underage drinking, or drinking and driving (Lange and Voas, 2000). A study of those crossing the border from Tijuana between midnight and 4 a.m. on weekend nights found most were Mexican-American (76%) pedestrians returning from a bar or restaurant, half reported an intention to get drunk, and more than 30% had blood alcohol concentrations (BACs) of .08 or greater (Lange et al., 1999). A similar study of crossings from Juarez to El Paso found 64% of the pedestrian crossers were Mexican-American, and 36% of all pedestrian crossers had a BAC of .08 or above (Lange and Voas, 2000). A general population survey of border residents found among Mexican-Americans, over 50% reported visiting bars in Tijuana at least once in the last year (Lange et al., 2002), with rates greater than for non-Mexican-Americans. Another study of Mexican-American border residents found those who reported drinking in Mexico reported significantly more drinks per week, and were more likely to binge drink and to report problems related to drinking compared to those not drinking in Mexico (Caetano et al., 2013a).

Additionally, enhanced access to pharmaceutical drugs in Mexico (many of which are not available in the U.S.), has also been a major reason for crossing the border to Mexico.

Known as “Drug tourism”, U.S. custom laws allow pharmaceuticals purchased in Mexico to be brought into the U.S. if accompanied by a Mexican prescription (Valdez and Sifaneck, 1997), enabling cheap and easy access to a variety of drugs for recreational purposes.

Potential stresses related to the drug/violence “epidemic” at the U.S.-Mexico border, coupled with a high volume of border crossings (for a number of reasons including drinking and “drug tourism”) among those living at the border, may result in problematic substance use, but epidemiological research on alcohol and drug use and related problems among these individuals is sparse. Reported here are findings from UMSARC on the association of cross-border mobility with substance use. We hypothesize that frequency of crossing the border, length of stay, and crossing for pharmaceutical reasons or for nightlife/drinking will be positively predictive of heavy drinking, alcohol use disorder, and co-occurring heavy drinking and drug use. Findings here will help elucidate the manner in which cross-border mobility may be related to substance use and problems at the border, predisposing individuals to harmful substance use. Because Texas includes almost two-thirds of all U.S. border counties, findings here are expected to increase our understanding of alcohol and drug use patterns and problems within the border context, potential treatment needs in this population, and factors which can impact the clinical course of substance use and substance use treatment among these individuals (Schuckit et al., 2014).

METHODS

Household Survey Sample

Area probability sampling with face-to-face interviewing was carried out on Mexican-American respondents between the ages of 18 and 65, living in the three Texas border metropolitan areas of Laredo (Webb County) (n=751) and McAllen/Brownsville (Cameron/Hidalgo Counties) (n=814). Those interviewed across the combined border sites reflect a cooperation rate of 85.1%, based on households in which enumeration indicated that an eligible respondent (i.e., a Mexican-American adult in appropriate age range) was confirmed to reside, and a response rate of 53.4%, based on the fraction of those households in which enumeration was not conducted that were estimated to contain eligible residents, both using version 4 of the American Association for Public Opinion Research (AAPOR) (The American Association for Public Opinion Research, 2011).

Metropolitan areas were selected because they comprise a large proportion of Mexican-American individuals living in the Texas border counties; about 75% is Mexican-American (United States Census Bureau, 2007). The *Laredo* metropolitan area, located midway along the Texas-Mexico border, is a major commercial and retail link between Mexico and Texas (Wallisch and Spence, 2006). The *McAllen* and *Brownsville* metropolitan areas, located along the eastern side of the Texas-Mexico border, lie in the southernmost part of the Rio Grande river valley.

Fieldwork Data Collection

Interviews of about 45 minutes in length were conducted in the respondent’s own home by the Public Policy Research Institute (PPRI) at Texas A&M University. Using multistage

area-probability sampling (with stratification by city), primary sampling units (PSU), defined as census block groups with at least 70% Hispanic population, were identified, with census blocks serving as the secondary sampling unit (SSU). Three households per SSU were randomly selected and screened for the presence of a Mexican-origin resident between the ages of 18 and 65. Eligible residents were then enumerated, and the one with the most recent birthday selected as the respondent.

Following informed consent, interviews were conducted by extensively trained interviewers recruited from the local community (e.g., schoolteachers, health workers, graduate students, local residents) and supervised by PPRI. Respondents were given the choice of being interviewed in either English or Spanish, and offered a $25 gift card as a token of appreciation for their time for completing the interview.

Instruments

The interview was obtained using a Computer Assisted Personal Interviewing (CAPI) system in the respondents' own homes.

Cross-border mobility—Respondents were asked whether or not they had crossed the border in the past 12 months and, if so, the usual frequency of visits (coded as none, 1–2, and 3 or more). Respondents were then asked the main reason for crossing in the past 12 months (coded as shopping, health or medical care, over-the-counter or prescription drugs, nightlife/drinking, visiting family or friends, work/study/other), and their primary motivation for doing so was used to create mutually exclusive categories which were used to predict, along with frequency and length of visits, substance use outcomes.

Heavy alcohol use—Heavy alcohol use was defined as drinking 5+ drinks/day for men and 4+ drinks/day for women at least monthly in the last 12 months. Alcohol consumption items were taken from the 2005 National Alcohol Survey (NAS-N-11) (Greenfield et al., 2006), which included measurements of quantity, frequency and volume of alcohol consumption.

Drug Use—Drug use was measured by the frequency of illicit substance use and non-medically used prescription drugs during the last 12 months, drawn from items used in the 2005 NAS (Greenfield et al., 2006) and the Mexican National Addiction Survey ("Encuesta Nacional de Adicciones-ENA") (Medina-Mora et al., 1989). Prescription drugs included pain relievers, sedatives, stimulants and other prescription drugs. Illicit drugs included marijuana, cocaine/crack, heroin/opium, methamphetamines, hallucinogens and other recreational drugs. A separate variable was created for the co-occurrence of heavy drinking and drug use (any illicit or non-medically prescribed drug) during the last 12 months.

Alcohol use disorder—Alcohol use disorder (AUD) was measured from the 11 diagnostic criteria for a Diagnostic and Statistical Manual, 5th revision (DSM-5) diagnosis (American Psychiatric Association, 2013), using an adaptation of the Alcohol Section of the Composite International Diagnostic Interview (CIDI) core (World Health Organization, 1993). DSM-5 collapses the DSM-IV alcohol abuse and dependence criteria into a single, unidimensional construct, dropping the criterion on legal problems and adding the criterion

on craving from the ICD-10 (World Health Organization, 1992), with a score of ≥2 positive for AUD (Hasin et al., 2013).

Data Analysis

Odds ratios (ORs) were estimated for the total sample and for those aged 18–29 and 30+ predicting heavy drinking, AUD, and co-occurrence of heavy drinking and any use of illicit or non-medically prescribed drugs by cross-border mobility during the last year, controlling for gender, education, income, employment and marital status. These age categories were chosen because of the number of respondents in the total sample, and because younger adults aged 18–29 have been found more likely to be frequent heavy drinkers and report more alcohol-related problems than those older (Caetano et al, 2013). The data were weighted reflecting the probability of selection into the sample and adjusting for demographic differences between the population and the sample. A raking algorithm (Deville et al., 1993; Izrael et al., 2004) approach was used to iteratively adjust the sampling weights to match Census marginal distributions of education and the combined gender by age distribution, separately within each site. To adjust for design effects inherent in multistage clustered sampling, Stata's (Stata Corp., 2013) *svy* commands were used for all model parameter estimation.

RESULTS

Table 1 shows demographic characteristics and the prevalence of heavy drinking, DSM-5 AUD and co-occurrence of heavy drinking and drug use for the total sample and for those aged 18–29 (younger) and those 30+ (older). In the total sample, 19.5% were heavy drinkers, 17.3% reported 2 or more criteria for AUD, and 10.5% were positive for co-occurrence of heavy drinking and drug use, with all three substance use variables more prevalent among those aged 18–29 than those older.

Table 2 shows cross-border mobility characteristics for the total sample and by age group. The majority (60.1%) reported not crossing the border during the last year, with those younger more likely not to have crossed (66.9%) than those older (57.3%). Among those crossing, most reported crossing 3 or more times during the last year in both age groups, but not staying for more than a day at a time. The majority in both age groups reported crossing to visit family or friends, and those older were more likely to cross for health or medical care reasons, or for obtaining over-the-counter or prescription drugs than those younger, but were less likely to cross for nightlife/drinking.

Those usually spending more than a day in Mexico had a higher prevalence on these substance use variables than those not crossing or those spending less time. The prevalence of all three substance use variables was greater for those crossing to obtain over-the-counter or prescription drugs or for nightlife/drinking compared to those crossing for other reasons, and this was especially evident among those 18–29, where well over half of those crossing for either of these two reasons were positive for heavy drinking, AUD, or co-occurrence of heavy drinking and drug use.

Table 3 shows ORs for cross-border mobility predicting heavy drinking, AUD, and co-occurring heavy drinking and drug use for the total sample and by age group. Crossing the border 3 or more times in the last year was predictive of both AUD and co-occurring heavy drinking and drug use for those 18–29, while staying more than a day was predictive of AUD in this age group, and of heavy drinking and co-occurring heavy drinking and drug use among those older. Both crossing the border to obtain over-the-counter or prescription drugs and for nightlife/drinking were predictive of all three substance use variables for those 18–29, while crossing for pharmaceutical reasons were predictive of both heavy drinking and co-occurrence of heavy drinking and drug use among those older.

DISCUSSION

Prior research has suggested that individuals crossing the border to Mexico may be especially vulnerable to substance use and related problems; we hypothesized that frequency of crossing the border, length of stay, and reasons for crossing (for obtaining pharmaceuticals or for nightlife/drinking) would be positively predictive of heavy drinking, alcohol use disorder, and co-occurring heavy drinking and drug use. Findings here support this hypothesis, but results were found to vary by age. Among those 18–29, crossing for pharmaceutical reasons or for nightlife/drinking were predictive of all three substance use variables, while greater frequency of crossing and longer visits were also predictive of AUD and greater frequency of visits was predictive of co-occurrence of heavy drinking and drug use. Among those older, longer visits and crossing for pharmaceutical reasons were predictive of both heavy drinking and co-occurrence of heavy drinking and drug use. A prior study of Mexican-Americans residing at the border found those who reported drinking in Mexico were more likely to be heavy drinkers and reported more alcohol-related problems than those not drinking in Mexico (Caetano et al., 2013); however, more frequent, heavy drinkers would be more likely to drink, regardless of the country they were in, and that study did not elicit information on the reason(s) for going to Mexico.

While reasons for crossing appear to play an important part in reporting substance use and problems, exposure in relation to frequency of crossing and time spent in Mexico also appear to be important, especially for those over 30, and would likely not be related to obtaining pharmaceuticals. This is an area deserving more attention.

Surprisingly, while crossing for pharmaceutical reasons or for nightlife/drinking were significant predictors of substance use outcomes, the number of those crossing for either of these reasons was quite small. Only 17 reported crossing for nightlife/drinking which was evenly distributed between the two age groups, and only 11 of those 18–29 crossed for pharmaceutical reasons. One possible explanation for these small numbers is that only the main reason for crossing was recorded, and many of those who reported crossing primarily to visit family and friends may also obtain pharmaceuticals on these trips, or go to bars or nightclubs with their family and friends.

Certainly reasons for crossing the border to Mexico may have important regional public health implications spanning both sides. In the sample here, crossing for nightlife/drinking was a significant predictor for all three substance use outcomes among those 18–29. Cheap

and easy access to alcohol encourages heavy drinking and creates a situation where thousands of young people cross the border in an evening to drink (Lange and Voas, 2000), many of whom return to parked vehicles on the U.S. side to drive home (Lange, et al., 1999; Lange and Voas 2000). The volume of returning vehicles from Mexico prohibits citations for drinking and driving (Lange and Voas 2000). A prior study of those returning to El Paso, Texas from Mexico found an 89% reduction in positive BAC following implementation of a 2 a.m. bar closing policy (replacing the 5 a.m. closing) (Voas et al., 2002), suggesting the efficacy of limiting alcohol availability with environmental control measures. Successful strategies such as this is an area in need of additional research in the border context.

Crossing the border to obtain over-the-counter or prescription drugs was also a significant predictor of heavy drinking and co-occurrence of heavy drinking and drug use in the entire sample. “Drug tourism” has long been a major reason for crossing the border (Valdez and Sifaneck, 1997). Given that the present study was cross-sectional in design, however, it is not possible to determine whether those with harmful substance use patterns and related problems may tend to cross the border for reasons related to their substance use, or whether crossing the border due to the enhanced availability of alcohol or pharmaceuticals, for example, results in increased substance use and problems for these individuals. Future research is necessary to elucidate the manner in which cross border mobility may explain alcohol and drug use and problems.

Limitations

While a strength of the study is that Texas includes almost two-thirds of all U.S. border counties, facilitating our understanding of substance use and problems and cross-border mobility in a broader border context on the U.S. side, focusing on a single state limits potential heterogeneity in geographic, cultural and sociopolitical factors which may have affected study findings. Additionally, the study included only metropolitan areas and findings may differ for rural areas, including the colonias, which are unincorporated areas along the border consisting of substandard housing in which the majority of residents were born in Mexico.

The 18–29 year old group included those aged 18–21, among whom crossing to Mexico to drink and heavy drinking leading to drunkenness is common, and this may be reflected in findings among those 18–29 here. A prior study at the border found higher rates of heavy drinking (Caetano et al., 2012), alcohol-related consequences (Vaeth et al., 2012) and alcohol use disorders in this age group compared to their non-border counterparts (Caetano et al., 2013b).

As noted above, reasons for crossing were limited to the main reason for each respondent, and may have influenced findings for those crossing for multiple reasons. The main reason reported may have been the reason respondents believed was most important, or the reason for which they crossed most frequently, and for a better understanding of this phenomena, future research should consider all reasons for crossing with associated frequency and length of stay.

Unfortunately, while questions were asked regarding DSM-5 diagnostic criteria for alcohol use disorders, we were not able to include questions related to a DSM drug use disorder, but were limited to those reflecting the prevalence of use of illicit substances and non-medically used prescription drugs in certain categories, and this, too, is an area for future research. Crossing the border for pharmaceutical reasons was the strongest predictor of co-occurring heavy drinking and drug use among both those 18–29 and those older, suggesting the importance of substance use treatment aimed not only at alcohol but at co-morbid alcohol and drug use as well.

Study findings here suggest that variables related to cross-border mobility may be risk factors for alcohol and drug use at the border and play an important role in substance use and related problems. These findings also highlight the importance of “drug tourism” in substance use across the age spectrum and findings here are important for informing intervention and prevention strategies within the border context. Studies on the Mexican side of the border have found those migrating to the U.S. and returning to Mexico were more likely to report alcohol use disorders than non-migrating Mexicans (Borges et al., 2007), suggesting that cross-border mobility in both directions is important to consider in developing the most appropriate prevention and treatment approaches for border residents on both sides.

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Highlights

- The study supplies the first data on the relationship of alcohol and drug use and problems and cross-border mobility from the U.S. to Mexico
- Frequency of crossing, length of stay and reasons for crossing were all found to be related to substance use and problems.
- Relationships between substance use and mobility varied by age.
- “Drug tourism” was found to be an important predictor of substance use and problems across the age spectrum.

Table 1

Distribution of demographics and drinking/drug use characteristics

	Total sample (n=1565)	Age 18–29 (n=506)	Age 30–65 (n=1059)
Gender male (%)	46.8	50.3	45.4
Age (mean)	38.4	22.8	44.7
Education (%)			
Less than HS grad	36.5	22.9	42.0
HS grad	18.2	23.3	16.1
Some college	22.8	40.1	15.8
College grad	22.5	13.6	26.1
Marital status (%)			
Never married	27.0	64.3	11.9
Married/living with partner	56.9	29.8	67.9
Separate/Divorced/Widowed	16.0	5.9	20.2
Employment status (%)			
Working full time	44.2	33.1	48.7
Part time/seasonal worker	22.1	30.1	18.8
Home making	8.7	5.4	10.0
Others	25.0	31.1	22.5
Household income (%)			
Less than $15,000	27.3	23.4	28.9
$15,000–$29,999	26.6	25.4	27.1
$30,000–$59,999	24.8	28.7	23.2
At least $60,000	14.4	9.9	16.2
Missing	6.9	12.7	4.6
Heavy drinking [1] (%)	19.5	21.7	18.6
2+ DSM-5 (%)	17.3	27.2	13.3
Co-use [2] (%)	10.5	14.8	8.7

[1] Heavy drinking is at least 5+ for men and 4+ for women monthly during last 12 months

[2] Co-use is defined as both heavy drinking (see [1] above) and any drug use (illicit drug or non-medically prescription drug use) last 12 month

Table 2

12-month cross-border mobility - number and usual duration of visits and main reason of crossing, for total sample and by age groups

	Total sample					Age 18–29					Age 30–65				
# of visits last year	**n**	**%**	**% HD[1]**	**% DSM-5**	**% Co-use[2]**	**n**	**%**	**% HD[1]**	**% DSM-5**	**% Co-use[2]**	**n**	**%**	**% HD[1]**	**% DSM-5**	**% Co-use[2]**
Not in past 12m	971	60.1	19.4	18.0	10.3	337	66.9	20.4	24.5	12.9	634	57.3	18.9	14.9	9.0
1–2 times	142	8.2	15.1	18.7	7.1	43	8.4	20.4	32.5	11.3	99	8.1	12.8	12.8	5.4
≥3 times	441	31.8	20.8	15.5	11.6	124	24.7	25.8	33.2	21.1	317	34.6	19.4	10.3	8.8
Usual length of visits	n	%	% HD[1]	% DSM-5	% Co-use[2]	n	%	% HD[1]	% DSM-5	% Co-use[2]	n	%	% HD[1]	% DSM-5	% Co-use[2]
Not in past 12m	971	59.8	19.4	18.0	10.3	337	66.8	20.4	24.5	12.9	634	56.9	18.9	14.9	9.0
One full day or less	451	30.4	17.9	14.2	8.9	127	25.3	24.6	28.3	19.1	324	32.4	15.7	9.8	5.7
> one full day	142	9.9	24.7	22.3	16.2	42	8.0	23.0	47.2	16.6	100	10.6	25.2	14.7	16.1
Main reason for border crossing	n	%	% HD[1]	% DSM-5	% Co-use[2]	n	%	% HD[1]	% DSM-5	% Co-use[2]	n	%	% HD[1]	% DSM-5	% Co-use[2]
Not in past 12m	971	59.8	19.4	18.0	10.3	337	66.8	20.4	24.5	12.9	634	56.9	18.9	14.9	9.0
Shopping	64	3.8	19.7	18.8	13.7	17	3.2	26.9	13.6	13.6	47	4.1	17.5	20.4	13.8
Healthcare/medical care	108	8.0	11.3	12.9	6.0	21	4.8	12.0	28.1	6.3	87	9.3	11.1	9.8	6.0
Over counter or Prescrip. Drugs	42	2.8	38.8	26.5	32.4	11	1.9	64.0	77.6	64.0	31	3.1	32.4	13.6	24.5
Nightlife i.e. drinking	17	1.0	42.9	65.6	28.3	9	1.8	54.5	78.8	54.5	8	0.7	30.3	51.3	0
Visit family or friends	317	21.9	19.9	13.7	8.7	101	19.8	20.0	29.2	15.4	216	22.7	19.8	8.2	6.4
Work/Study/Others	45	2.7	12.4	13.9	7.1	10	1.7	25.1	24.3	7.7	35	3.1	9.5	11.5	7.0

[1] Heavy drinking is at least 5+ for men and 4+ for women monthly during last 12 months

[2] Co-use is defined as both heavy drinking (see [1] above) and any drug use (illicit drug or non-medically prescription drug use) last 12 month

Table 3

Odds Ratios (ORs) predicting heavy drinking, DSM-5 AUD and co-use, by 12-month cross border characteristics, controlling for gender, age, education, income, employment and marital status

	Total sample			Age 18–29			Age 30–65		
# of visits last year	**Predict HD**	**Predict DSM-5**	**Predict co-use**	**Predict HD**	**Predict DSM-5**	**Predict co-use**	**Predict HD**	**Predict DSM-5**	**Predict co-use**
Not in past 12m	ref	ref	ref	ref	ref	ref	ref	ref	ref
1–2 times	0.76	1.13	0.67	0.79	1.46	0.67	0.72	1.08	0.65
≥3 times	1.29	1.02	1.33	1.31	1.61**	1.70**	1.29	0.80	1.14
Usual length of visits	Predict HD	Predict DSM-5	Predict co-use	Predict HD	Predict DSM-5	Predict co-use	Predict HD	Predict DSM-5	Predict co-use
Not in past 12m	ref	ref	ref	ref	ref	ref	ref	ref	ref
One full day or less	0.97	0.87	0.91	1.14	122	1.43	0.91	0.73	0.64*
> one full day	2.01**	1.85**	2.34**	1.17	3.07***	1.21	2.54**	1.51	3.31***
Main reason of border crossing	Predict HD	Predict DSM-5	Predict co-use	Predict HD	Predict DSM-5	Predict co-use	Predict HD	Predict DSM-5	Predict co-use
Not in past 12m	ref	ref	ref	ref	ref	Ref	ref	ref	ref
Shopping	1.36	1.42	2.10	1.65	0.51	1.20	1.13	2.04	2.55
Healthcare/medical care	0.57	0.94	0.60	0.42	1.41	0.37	0.60	0.76	0.61
Over counter or Prescript. drugs	2.84**	1.94**	5.33***	4.14**	7.56***	8.53**	2.61*	1.12	4.86**
Nightlife i.e. drinking	1.82	4.14***	1.66	3.92**	7.68**	4.96**	0.95	2.64	N/A1
Visiting family or friends	1.29	0.86	0.96	0.97	1.35	1.17	1.52	0.67	0.82
Work/Study/Others	0.48*	0.75	0.61	0.82	0.76	0.26	0.37*	0.68	0.70

1 All people for the category reported negative for the outcome

* p<0.05,

** p<0.01,

*** p<0.001