HHS Public Access

Author manuscript

Alcohol Clin Exp Res. Author manuscript; available in PMC 2016 April 01.

Published in final edited form as:

Alcohol Clin Exp Res. 2015 April ; 39(4): 679–687. doi:10.1111/acer.12672.

CO-OCCURRENCE OF ALCOHOL, DRUG USE, DSM-5 ALCOHOL USE DISORDER AND SYMPTOMS OF DRUG USE DISORDER ON BOTH SIDES OF THE U.S.-MEXICO BORDER

Guilherme Borges[1], **Sarah Zemore**[2], **Ricardo Orozco**[1], **Cheryl J. Cherpitel**[2], **Yu Ye**[2], **Jason Bond**[2], **Jane Carlisle Maxwell**[3], and **Lynn Wallisch**[3]

[1]Dirección de Investigaciones Epidemiológicas y Psicosociales and Universidad Autónoma Metropolitana, Instituto Nacional de Psiquiatría Ramón de la Fuente (Mexico City, CP 14370, Mexico)

[2]Alcohol Research Group (Emeryville, CA, 94608, USA)

[3]University of Texas at Austin (Austin, TX, 78703, USA)

Abstract

Background—The U.S.-Mexico border displays elevated rates of hazardous alcohol and drug use. Whether the co-occurrence of alcohol and drug use and disorders is also high in the border area is unknown.

Methods—Data are from the U.S.-Mexico Study on Alcohol and Related Conditions, a cross-sectional survey of randomly selected respondents interviewed from 2011–2013. Participants included 1,690 Mexican Americans from Texas (572 in an off-border city and 1,118 from 3 border cities) and 1,293 Mexicans from Nuevo Leon and Tamaulipas (415 in an off-border city and 878 from 3 Mexican cities bordering Texas) who reported drinking in the last 12 months. Participants were interviewed regarding the prevalence of and risk factors for: a) co-occurring hazardous alcohol use (5+/4+ at least monthly) and drug use (medical and illicit), and b) co-occurring presence of a DSM-5 alcohol use disorder (AUD) and 2 symptoms (hazardous use and quit/control) of drug use disorders (DUD symptoms).

Results—Co-occurring hazardous alcohol and drug use was more common in the U.S. border cities (14.7%) than off-border (7.2%), but similar for Mexican border (1.2%) and off-border (1.4%) cities. Co-occurrence of AUD and DUD symptoms was likewise more common at the U.S. border (6.8%) than off-border (3.3%), as well as at the Mexican border (1.3%), compared to off-border (0.6%), but not statistically significant for Mexico. In models adjusting for demographics, mobility factors and exposure to the U.S. culture, border residence in both countries related to a nearly two-fold increase in prevalence ratios (PR) of co-occurring AUD and DUD symptoms (PR=1.97, 95%CI=1.36–2.85).

Conclusions—Increased rates of co-occurring alcohol and drug use disorders suggest an added negative impact on already difficult conditions of the border population.

Correspondence to: Guilherme Borges, Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñíz, Mexico, Calzada México Xochimilco No 101- Col. San Lorenzo Huipulco, México D.F., C.P. 14370 México. guibor@imp.edu.mx/guilhermelgborges@gmail.com.

Keywords

Alcohol use; drug use; U.S.-Mexico border; co-occurrence; DSM-5

INTRODUCTION

Home to about 15 million people who live in the borderland of both countries (44 U.S. counties and 94 Mexican municipalities), the U.S.-Mexico border is a dynamic economic and cultural area striving to find its identity (Pan American Health Organization, 2012). In 2012, more than 5 million trucks, 62 million personal vehicles, and 212 thousand buses crossed the southern U.S. border (Research and Innovative Technology Administration (RITA) & Bureau of Transportation Statics (BTS), 2014). This area is not just the busiest border in the world, but one where close human contact is a reality, creating a prime example of a transnational population in which mutual influences on norms for alcohol and drug use abound (Borges et al., 2012; Borges et al., 2011). Americans who cross into Mexico and Mexicans crossing to the U.S. have diverse expectations and experiences related to substance use, sometimes with life-long consequences for their alcohol and drug use (Bucardo et al., 2005; Lange et al., 2002). The border area is also distinctive from interior regions of the U.S. and Mexico in terms of exposure to stressors and other contributors to alcohol consumption, drug use and related problems. On the U.S. side, border counties have higher rates of unemployment and poverty than the rest of the country. In Mexico, border municipalities conversely show below average poverty rates when compared to the national average. Further, recently the entire border region has suffered added stresses derived from the United States' increasing border security efforts and a costly drug war in Mexico that has produced thousands of victims.

It has been suggested that higher rates of alcohol problems and alcohol use disorders (AUD) exist on the border than in the interior of both the U.S. and Mexico (Medina-Mora et al., 2002; Wallisch and Spence, 2006), but this may not be so for alcohol use and heavy alcohol use (Pan American Health Organization, 2012; Wallisch and Spence, 2006). Among U.S. youth and young adults, greater alcohol availability, low cost, and lower and under-enforced legal drinking age in Mexico have been found to be related to increased alcohol abuse (Lange et al., 2002). Survey data from Mexico have consistently found the Mexican border to have the highest rates of drug use (Medina-Mora et al., 1989), and the increase in illicit drug use over the past 10 years has been most pronounced along the northern border, showing a 24% increase between 1998 and 2002 (Hendricks, 2014). High rates of co-occurring alcohol and drug use (Degenhardt and Hall, 2003; Hakkarainen and Meyler, 2009) and disorders of use (Cherpitel et al., 2007; Goldstein et al., 2012; Vega et al., 2003) have been reported in the United States and elsewhere, and are of particular concern because they can impact the clinical course and treatment of substance use disorders (Schuckit et al., 2014; Teesson et al., 2010). Whether the co-occurrence of alcohol and drug use is also high in the U.S.-Mexico border area is unknown.

The U.S.-Mexico border has long attracted the attention of researchers interested in alcohol (Caetano et al., 2012; Caetano et al., 2013; Holck et al., 1984; Lange et al., 2002) and drug

use (Bucardo et al., 2005; Reingle et al., 2014; Volkmann et al., 2012; Wallisch, 1998), but no binational, collaborative, epidemiological study has ever been reported. According to these reports, risk factors for substance use on the border include the greater availability and lower cost of alcohol and prescription pharmaceuticals (on the Mexican side); more alcohol advertising; drug trafficking; and the stresses of poverty, high unemployment, rapid population growth, acculturation and immigration insecurity. Since differences in alcohol and drug use between Mexican immigrants and Mexican-Americans have been attributed to the immigration of healthier persons and the return of sick migrants (Aguila et al., 2013; Grant, Stinson et al., 2004), it is paramount to include in these studies the non-immigrant Mexican population, but this is rarely done (Borges et al., 2012; Borges et al., 2011). Here we present results from the recently completed U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC), a cross-sectional survey of 4,796 randomly selected Mexican and Mexican-origin individuals interviewed between 2011–2013 in metropolitan areas on both sides of the U.S.-Mexico border. Our hypothesis is that, in both the U.S. and Mexico, drinkers in border areas will have higher rates (vs. drinkers in non-border areas) of both a) co-occurring hazardous alcohol use (5+/4+ at least monthly) and drug use (medical and illicit), and b) co-occurring presence of a DSM-5 alcohol use disorder (AUD) and 2 symptoms of drug use disorder (DUD symptoms).

METHODS

The UMSARC is a cross-sectional survey that interviewed randomly selected respondents during 2011–2013 in metropolitan areas on both sides of the U.S.-Mexico border. Household face-to-face interviews of about 45 minutes in length were conducted in the U.S. by the Public Policy Research Institute (PPRI) at Texas A&M University, and in Mexico by the National Institute of Psychiatry (INP) in Mexico City. Sampling was carried out simultaneously on each side using a multistage area-probability sampling design with stratification by city,. On the U.S. side, primary sampling units (PSUs) were defined as census block groups with at least 70% Hispanic population, with blocks serving as the secondary sampling unit (SSU). In Mexico, PSUs were defined using the catalog of the census Basic Geo-statistical Areas (“Areas Geoestadísticas Básicas-AGEB”), similar to block groups in the U.S., with blocks within the AGEB serving as SSUs. On both sides, 3 households per SSU were randomly selected, with eligible residents defined as those aged 18–65 (both sides) and who were of Mexican-origin (U.S. side only). Eligible respondents were then enumerated, selecting the resident with the most recent birthday as the respondent. Each household was visited at least three times on different days of the week and hours of the day. If the randomly selected respondent was not immediately available for interview, up to three additional attempts were made to locate and interview this person. All interviewing was conducted by trained interviewers using a face-to-face, computer-assisted interview. Interviews were conducted either in Spanish or English in the U.S. and in Spanish in Mexico.

Response rate

On the U.S. side, the border sample consisted of respondents from the three Texas border metropolitan areas of Laredo (Webb County) [n=751] and McAllen/Brownsville (Cameron/

Hidalgo Counties) [n=814]; the non-border sample consisted of n=771 respondents from the metropolitan area of San Antonio (Bexar county), less than 150 miles from the Mexico border. Together, the U.S. samples reflected a combined cooperation rate of 84% (53.1% response rate). Parallel sampling was carried out in Mexico on respondents living in the respective border sister metropolitan areas (sister cities) of Nuevo Laredo (n=828) and Reynosa/Matamoros (n=821) (state of Tamaulipas) and in the non-border metropolitan area counterpart of Monterrey (state of Nuevo Leon) (n=811), also less than 150 miles from the U.S. border), reflecting a combined cooperation rate of 71.4% (63.3% response rate).

Following the definition of the American Association for Public Opinion Research (The American Association for Public Opinion Research, 2011) the cooperation rate includes only those households in which enumeration indicated that an eligible respondent was confirmed to reside, while the response rate is based on the fraction of those households in which enumeration was not conducted but that were estimated to contain eligible residents. The lower cooperation rate in Mexico compared to the U.S. was hypothesized to be a result of outbreaks of violence in the cities where data were being collected during the study period, causing potential respondents to be more fearful for their safety. Respondents in the U.S. were also told they would be offered a gift card for completing the interview, which may have further increased cooperation rates.

Weights

The approach to weighting the sample was to first calculate the weights appropriate for the cluster sample design, taking into account the particularities of the survey implementation in each country, and then modify these weights to adjust for demographic differences between the population and the sample. In both the U.S. and Mexico, data were first weighted to reflect the multistage clustered sampling design. Then a raking algorithm (Deville et al., 1993) 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 LP, 2013) *svy* commands were used for all model parameter estimation.

Instruments and variables

Interviews were conducted after informed consent was verbally obtained and a consent form was signed. IRBs from the Alcohol Research Group- Public Health Institute in the U.S. and the IRB from the INP in Mexico approved the research protocol and questionnaire.

Co-occurrence of alcohol and drug use—Hazardous alcohol use was defined as drinking 5+ drinks men /4+ drinks women on the same occasion at least monthly, among drinkers in the last 12 months. Alcohol consumption items were taken from the 2005 National Alcohol Survey (NAS-N-11), (Greenfield et al., 2006). Drug use items on frequency of illicit substance use and non-medically used prescription drug use during the last 12 months and last 30 days was drawn from the 2005 NAS (N-11) 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. Two outcome variables were created for co-occurring use: the first for the co-occurrence of hazardous alcohol use and any drug use in the last 12 months and the second for hazardous alcohol use in the last 12 months and any drug use in the last 30 days. We used 30-day drug use as an additional measure of current and possible heavier drug involvement. The contrast group (non-cases) included those with no hazardous alcohol use and no drug use, and those with only hazardous alcohol use or only drug use.

Co-occurrence of alcohol use disorder and drug use disorder symptoms— Alcohol use disorder (AUD)- An adaptation of the Alcohol Section of the Composite International Diagnostic Interview (CIDI) core (World Health Organization (WHO), 1999) was used to obtain the eleven criteria that define alcohol use disorder according to the newly released Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013). The DSM-5 generic criteria included the following symptoms: tolerance, withdrawal, more use than intended, craving for the substance, persistent desire/ unsuccessful efforts to cut down, spends excessive time in acquisition of a substance, activities given up because of use, uses despite negative effects, failure to fulfill major role obligations, recurrent use in hazardous situations and continued use despite consistent social or interpersonal problems. Lack of interview time precluded using a full and parallel version of DUD. Therefore, as a marker of DUD, we selected two items from the DSM-5 with a high prevalence of endorsement across different drugs (Hasin et al., 2012; Saha et al., 2012): recurrent use in hazardous situations and persistent desire/unsuccessful efforts to cut down (hazardous use and quit/control). Those who responded affirmatively to either hazardous use or quit/control were deemed positive for this screener. The report of these two symptoms of DUD can be interpreted here only as a marker of heavier drug involvement in our sample. An outcome variable was created, with cases being those reporting both DSM-5 AUD and DUD symptoms and non-cases being those with no DSM-5 AUD and no DUD symptoms, or those with only AUD or only DUD symptoms.

Independent variables—Our main independent variable for these analyses is a dichotomous variable representing living in a border city versus living in a non-border city. In the U.S., we merged data from the border cities of Nuevo Laredo, Brownsville and McAllen, while in Mexico we merged data from the border cities of Nuevo Laredo, Reynosa and Matamoros. San Antonio was the non-border city used for comparison in the U.S. and Monterrey the non-border city in Mexico.

Other variables known or suspected to influence the prevalence of co-occurring alcohol and drug use are included here as controls for our main models. For multiple regression models, we included demographic variables (sex, age [continuous], education [>=HS graduate and < HS graduate] and marital status [married and non-married]) and variables related to the mobility of this border population. The mobility variables included whether or not the respondent was a native of the surveyed city (and in the case of international immigrants, whether they had lived in that city since their arrival) and whether the respondent had visited the neighbor country (lifetime and last 12 months). Natives of surveyed cities could be at lower risk than internal migrants that could lack social support and have additional stresses

from moving to a new environment (Andrade et al., 2012) and those visiting the neighbor country could do so for alcohol or drug tourism (Lange et al., 2002; Volkmann et al., 2012). We also included as a control variable whether the respondent was exposed to the U.S. culture (yes/no), as a marker for acculturation, which has been associated with increased alcohol and drug use in this population (Borges et al., 2011; Reingle et al., 2014). For the U.S. respondents, those born in the U.S. were considered positive and those born in Mexico were considered the reference group. For the Mexican respondents, return migrants and those with a relative living in the U.S. were considered exposed to U.S. culture; otherwise they were negative for this variable and were the reference group.

Data Analyses

Findings for this report are based on data from the 2,983 respondents, out of the initial sample of 4,796 participants, who reported any alcohol drinking within the last 12-months (current drinkers). This includes 1,690 Mexican Americans from Texas and 1,293 Mexicans from Nuevo Leon and Tamaulipas. First, we compared key demographics, mobility variables, and the prevalence of the outcomes (co-occurrence of hazardous alcohol use and drug use and of alcohol use disorder and drug use disorder symptoms) between border and non-border cities, separately by country and for the total UMSARC sample. Significance tests for these cross-tabulations were conducted using design-based Pearson X^2 tests. Next, to estimate the associations between border proximity (on- or off-border) and each outcome, we used Generalized Linear Models (GLM) assuming log link and binomial distributions to calculate prevalence ratios (PR, the prevalence rate in the exposed divided by the prevalence rate in the unexposed) (Cummings, 2009), adjusting for sociodemographic and mobility variables and exposure to the U.S. culture. All analyses incorporated weights developed for the UMSARC, as described above. For our GLM models, we estimated standard errors and 95% confidence intervals (CIs) using the Taylor series method in STATA version 13.1 (Stata Corp LP, 2013) to adjust for the design effects and weighting (Stata Corp, 2013). As there is no evidence that a possible border effect on the outcomes would be different in the United States as compared to Mexico, we also report the joint (total) estimate that pools the estimates across country by using random-effects meta-analysis.

RESULTS

Table 1 presents the basic demographic information for the sample, broken down by country and border/off border area. In the U.S., participants from border (vs. off-border) areas were more educated, more likely to be married, less likely to be U.S.-born, and more likely to report ever being in Mexico and visiting Mexico in the prior year. In Mexico, participants from border (vs. off-border) areas were younger, less educated and more likely to be married, less likely to have been born in the surveyed city, more likely to report ever being in the U.S. and visiting the U.S. in the prior year, and more likely to be exposed to U.S. culture.

Several differences were apparent for the co-occurrence of alcohol and drug use and the co-occurrence of AUD/DUD symptoms for border and non-border cities in the U.S. (Table 2). In the U.S., border (vs. off-border) respondents reported higher rates of co-occurring 12-

month and 30-day hazardous alcohol use and drug use as well as higher co-occurrence of AUD and DUD symptoms. In Mexico, comparisons for co-occurring hazardous alcohol use and drug use and the prevalence of co-occurring AUD and DUD symptoms were not statistically different between border and non-border cities. For the merged sample, all three variables of co-occurrence are higher in the border than in non-border areas.

Multiple regression models displaying adjusted prevalence ratios for the co-occurring outcomes are presented in Table 3. Compared to off-border residents, border residents in the U.S. showed higher prevalence ratios of co-occurring hazardous alcohol use and drug use in the last 12 months, higher ratios of co-occurring hazardous alcohol use and drug use in the last 30 days and higher ratios of co-occurring AUD and DUD symptoms. On the Mexican side, border cities showed the same higher prevalence ratio of co-occurring AUD and DUD symptoms as in the US; however, the CI suggests that this ratio was not significant in Mexico. Pooled random estimates of the effect for border *vs*. non-border areas in both countries suggest that living in border cities increases the prevalence of co-occurring hazardous alcohol use and drug use in the last 30 days and co-occurring AUD and DUD symptoms about twofold.

Associations between other variables and the co-occurrence of alcohol use disorder and drug use disorder symptoms were quite similar in both countries. In Table 4 we show that, in both countries, being female, older (non-significant in Mexico), and married decreased the prevalence of co-occurring disorders, while being exposed to U.S. culture increased the prevalence. In the U.S. only, having lower educational attainment and visiting Mexico in the last 12 months were related to increased prevalence of co-occurring alcohol use disorder and drug use disorder symptoms. In the pooled model for both countries, visiting the neighbor country in the last 12 months was related to increased co-occurrence of alcohol use disorder and drug use disorder symptoms, while being female, older, and married related to decreased prevalence. In these models, being a native of the survey city and being exposed to U.S. culture showed CIs that marginally included the null.

DISCUSSION

For both the U.S. and Mexico, living on the border was associated with surprisingly similar increases (of ~1.97) in the prevalence of co-occurring disorders of use, but the effect was more robust in the U.S. than in Mexico (where the confidence intervals included the null). Also, while the U.S. data showed similar border effects on co-occurring hazardous alcohol use and drug use variables, there were no such effects on these variables in Mexico. This may imply that Mexican Americans from border cities were more prone to be affected by border proximity than Mexicans living in the Mexican border area. The border effects reported here are certainly the results of a multiplicity of factors that are not yet well understood. Table 1 shows how diverse the US border population of Mexican ancestry is: 33.4% were foreign-born, 94% reported ever going to Mexico, and 28.6% were not from the surveyed city. All of this speaks to a merging of multiple cultural influences likely to influence alcohol and drug use. We make an initial contribution to research on border comorbidity by merely documenting the existence of this border effect on co-occurring alcohol and drug use and problems. Future research could build on a large and rich literature

on border substance use (Caetano et al., 2012; Caetano et al., 2013; Canino et al., 2008; Vega et al., 1998; Vega and Sribney, 2011; Wallisch and Spence, 2006; Zemore, 2007), to test a conceptual model that integrates multiple domains of risk in which stressors, environmental risk factors, and psychological factors contribute to greater substance use and problems at the border. Testing such a model is nevertheless beyond the scope of the current manuscript. It is interesting that, while there are reports of U.S. residents travelling to Mexico for binge drinking (Lange et al., 2002), buying over-the-counter medicines such as analgesics (Hasin et al., 2013), drug injection (Wagner et al., 2011), and drug use in drug shooting galleries (Volkmann et al., 2012), we did not find evidence of Mexican residents crossing to the U.S. to take advantage of a supposedly larger availability of drugs and more liberal drug-related norms. Further analyses of reasons to cross the border for the Mexican population and for the U.S. population may shed some light on these differences. It is also possible that particular groups, such as young border residents (Caetano et al., 2012) or people with a younger age at immigration to the U.S. or away from the border (Borges et al., 2011; Reingle et al., 2014), are more affected.

Our results showing that females, older people, and married people have lower rates of co-occurrence of AUD and DUD symptoms have some support from prior research (Cherpitel et al., 2007; Goldstein et al., 2012; Grant, Dawson et al., 2004; Stinson et al., 2005), though fully adjusted models with demographics predicting comorbidity have been rarely reported (Teesson et al., 2010). While no prior research to our knowledge has addressed effects of exposure to U.S. culture on both sides of the border on comorbidity, our results are concordant with American research showing increases in the comorbidity of alcohol use disorder and drug use disorder symptoms among U.S.-born Mexican Americans compared to immigrants (Vega et al., 2003), second-generation Mexican-Americans compared to immigrants (Grant, Stinson et al., 2004; Vega et al., 1998) and those higher on acculturation (Cherpitel et al., 2007). Research in Mexico has also shown increased prevalence of substance use disorders among Mexicans with a migration history, including return migrants and families of migrants (Borges et al., 2011). Our results suggesting that co-occurrence of AUD and DUD symptoms was much higher in the U.S. (3.3% in off-border and 6.8% in border cities) than Mexico (0.6% in off-border and 1.3% in border cities) also confirm a prior finding showing that the prevalence of comorbid alcohol use disorders and drug use is much higher among Mexican Americans than Mexicans (Cherpitel et al., 2007) and is in tandem with the higher rates of dual diagnosis among the U.S. general population than among Latinos living in the U.S. (Vega et al., 2009). A study that compared alcohol and drug use in Texan border cities with similar cities in Mexico also found that rates of lifetime and past-year illicit drug use were three to five times higher in the U.S. border cities as compared with their Mexican counterparts, and while rates of alcohol use were more similar among cities on both sides, the rates of heavy drinking were lower on the U.S. than Mexican side (Wallisch, 1998).

Our results should be viewed within the scope of some limitations. First, our three sister-cities in the Texas-Tamaulipas border were selected to increase the homogeneity of the comparisons for this Mexican-American population and are not representative of other sister-cities in these States or in other States in the U.S./Mexico border, such as San Diego and Tijuana for example, or other ethnic minorities in the border; nor are the off-border

cities selected for comparison representative of the entire interior of each country. A second limitation lies in the reduced response rates. In the U.S., the response rate probably reflects a general trend towards lower participation in surveys of this kind that could be even more apparent in a population that may include persons without proper immigration status. In Mexico, while the rate was somewhat better, lack of confidence in surveys during a period of high violence and crime probably account for lower participation. Our study nevertheless included a survey design that aimed to obtain a representative sample of eight cities, and is the first binational study on this topic and the largest border/non border comparative study to date. A third limitation is that our screening measure of DUD symptoms, which included only 2 of the 11 criteria of the new DSM-5 diagnostic, may underestimate the true prevalence of DUD by yielding a large number of false-negatives. This potential underestimate is nevertheless non-differential (Rothman and Greenland, 1998) and should not affect border/non-border and U.S./Mexico comparisons. Finally, even though this study was conducted at the same time with the same methodology and questionnaire in both countries, the political, economic and security situation in Mexico was in particular turmoil during data collection. Disclosing behaviors that are illegal and highly prosecuted could be discouraged more strongly in Mexico than in the U.S. While we cannot know whether questions on alcohol and drugs were more frequently endorsed in the U.S. among Mexican Americans than in Mexico just because of these idiosyncratic and political issues, a comparison of the prevalence rates between our survey and prior surveys in the Mexican area (Rojas et al., 2009) does not suggest any bias as a result of the current state of violence in the region. For example, the rate of any alcohol use in the last 12 months on the Mexican border was 51.8% in our survey, compared to 51.1% in 3 border cities in 2005, 44.1% in the National survey of 2008, and 51.6% in the National survey of 2011 (INPRFM et al., 2012); similarly, the total prevalence of 12-month drug use in 3 border cities in 2005 was 3.5% compared to 5.4% in our survey. Thus, it seems unlikely that border/non-border comparisons within Mexico were seriously affected by the current political situation. It is also reassuring that our findings of much lower prevalence of co-occurring alcohol and drug use and problems in Mexico compared to the U.S. parallels a prior study using similar methods (Wallisch, 1998). It is possible that the border areas of both countries attract a certain number of people with a prior history of alcohol and drug use and problems who search for places to freely use alcohol or drugs (Lange et al., 2002; Volkmann et al., 2012). Also, it is possible that people of Mexican origin with prior substance use problems actively search for migration opportunities (Breslau et al., 2011). Nevertheless, findings that natives (not newcomers) from the cities where the interviews took place were most likely to report these behaviors do not favor an interpretation of selective migration of affected individuals to the border areas. While our multiple models controlled for mobility and exposure to the U.S. culture, these variables in our survey were limited. Further studies are needed on their independent role as risk factors for the co-occurrence of alcohol and drug use in the border area.

Despite these limitations, this study is the first to examine the co-occurrence of alcohol and drug use and disorders in a bi-national context. Frequent co-occurrence of alcohol and drug problems in this Mexican American population has profound implications due to the added medical, psychiatric, and social problems associated with comorbidity (Schuckit et al., 2014;

Teesson et al., 2010) and the higher rates of alcohol-related problems generally among Latino men (Hasin and Grant, 2004; Zemore et al., 2013), combined with lack of access to and use of substance abuse treatment common among Latinos generally (Chartier and aetano, 2011; Zemore et al., 2009). Mechanisms associated with this increased prevalence of problems at the border and among frequent visitors to Mexico are speculative at the moment, but these findings pave the way for further investigation by our research group into reasons for visiting and characteristics of people most likely to visit.

Acknowledgments

Sources of support: NIAAA #R01AA018365; Cheryl Cherpitel (PI)

References

Aguila E, Escarce J, Leng M, Morales L. Health status and behavioral risk factors in older adult Mexicans and Mexican immigrants to the United States. J Aging Health. 2013; 25:136–158. [PubMed: 23264441]

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5ta ed.. Washington, D.C: American Psychiatric Association; 2013.

Andrade LH, Wang YP, Andreoni S, Silveira CM, Alexandrino-Silva C, Siu ER, Nishimura R, Anthony JC, Gattaz WF, Kessler RC, Viana MC. Mental disorders in megacities: findings from the São Paulo megacity mental health survey. PloS one. 2012; 7:e31879. [PubMed: 22348135]

Borges G, Rafful C, Benjet C, Tancredi D, Saito N, Aguilar-Gaxiola S, Medina-Mora ME, Breslau J. Mexican immigration to the US and alcohol and drug use opportunities: does it make a difference in alcohol and/or drug use? Drug Alcohol Depend. 2012; 125:S4–S11. [PubMed: 22658285]

Borges G, Breslau J, Orozco R, Tancredi DJ, Anderson H, Aguilar-Gaxiola S, Medina-Mora ME. A cross-national study on Mexico-US migration, substance use and substance use disorders. Drug Alcohol Depend. 2011; 117:16–23. [PubMed: 21296509]

Breslau J, Borges G, Tancredi D, Saito N, Anderson H, Kravitz R, Hinton L, Aguilar-Gaxiola S, Medina-Mora ME. Health selection among migrants from Mexico to the U.S.: Childhood predictors of adult physical and mental health problems. Public Health Rep. 2011; 126:361–370. [PubMed: 21553665]

Bucardo J, Brouwer KC, Magis-Rodriguez C, Ramos R, Fraga M, Perez SG, Patterson TL, Strathdee SA. Historical trends in the production and consumption of illicit drugs in Mexico: implications for the prevention of blood-borne infections. Drug Alcohol Depend. 2005; 79:281–293. [PubMed: 16102372]

Caetano R, Mills B, Vaeth PA. Alcohol consumption and binge drinking among U.S.-Mexico border and non-border Mexican Americans. Alcohol Clin Exp Res. 2012; 36:677–685. [PubMed: 22017228]

Caetano R, Vaeth PA, Mills BA, Rodriguez LA. Alcohol abuse and dependence among U.S.-Mexico border and non-border Mexican Americans. Alcohol Clin Exp Res. 2013; 37:847–853. [PubMed: 23278433]

Canino G, Vega WA, Sribney WM, Warner LA, Alegría M. Social relationships, social assimilation, and substance-use disorders among adult Latinos in the US. J Drug Issues. 2008; 38:69–101. [PubMed: 20011228]

Chartier K, Caetano R. Trends in alcohol services utilization from 1991–1992 to 2001–2002: ethnic group differences in the U.S. population. Alcohol Clinical and Experimental Research. 2011; 35:1485–1497.

Cherpitel C, Robertson M, Ye Y, Borges G, Bautista CF, Lown A, Greenfield T, Bond J. Comorbidity for alcohol use disorders and drug use in mexican-origin groups: comparison of data from national alcohol surveys in the U.S. And Mexico. Subst Use Misuse. 2007; 42:1685–1703. [PubMed: 17934990]

Cummings P. Methods for estimating adjusted risk ratios. The Stata Journal. 2009; 9:175–196.

Degenhardt L, Hall W. Patterns of co-morbidity between alcohol use and other substance use in the Australian population. Drug Alcohol Rev. 2003; 22:7–13. [PubMed: 12745353]

Deville JC, Särndal CE, Sautory O. Generalized raking procedures in survey sampling. J Am Stat Assoc. 1993; 88:1013–1020.

Goldstein RB, Dawson DA, Chou SP, Grant BF. Sex differences in prevalence and comorbidity of alcohol and drug use disorders: results from wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. J Stud Alcohol Drugs. 2012; 73:938–950. [PubMed: 23036212]

Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. Drug Alcohol Depend. 2004; 74:223–234. [PubMed: 15194200]

Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Anderson K. Immigration and lifetime prevalence of DSM-IV psychiatric disorders among Mexican Americans and Non-Hispanic Whites in the United States Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiat. 2004; 61:1226–1233. [PubMed: 15583114]

Greenfield TK, Nayak MB, Bond J, Ye Y, Midanik LT. Maximum quantity consumed and alcohol related problems: assessing the most alcohol drunk with two measuresates. Alcohol Clin Exp Res. 2006; 30:1576–1582. [PubMed: 16930220]

Hakkarainen P, Meyler D. Joint use of drugs and alcohol. Eur Addict Res. 2009; 15:113–120. [PubMed: 19293569]

Hasin D, Grant BF. The co-occurrence of DSM-IV alcohol abuse in DSM-IV alcohol dependence: results of the National Epidemiologic Survey on Alcohol and Related conditions on heterogeneity that differ by population subgroup. Arch Gen Psychiat. 2004; 61:891–896. [PubMed: 15351767]

Hasin DS, Fentom MC, Beseler C, Park J, Wall M. Analyses related to the development of DSM-5 criteria for substance use related disorders: 2. Proposed DSM-5 criteria for alcohol, cannabis, cocaine and heroin disorders in 663 substance abuse patients. Drug Alcohol Depend. 2012; 1:28–37. [PubMed: 21963333]

Hasin DS, Fentom MC, Beseler C, Park J, Wall M. Mexican pharmacies: benefits and risks for border residents in the United States of America and Mexico. Rev Panam Salud Publica. 2013; 33:196–204. [PubMed: 23698139]

Hendricks, T. On the border [Internet]. San Francisco, CA: SFGate; 2007. Available from: http://www.sfgate.com/crime/article/ON-THE-BORDER-2653137.php#page-1Online at: SFGate [Accessed February 7, 2014]

Holck SE, Warren CW, Smith JC, Rochat RW. Alcohol consumption among Mexican American and Anglo women: results of a survey along the U.S.-Mexico border. J Stud Alcohol. 1984; 45:149–154. [PubMed: 6727375]

INPRFM, INSP, SSa. Encuesta Nacional de Adicciones 2011: Reporte de Alcohol. México, D.F: INPRFM; 2012.

Lange JE, Voas RB, Johnson MB. South of the border: A legal haven for underage drinking. Addiction. 2002; 97:1195–1203. [PubMed: 12199835]

Medina-Mora ME, Conyer RT, Sepúlveda J, Monrreal RO, Rascón ML, Solache G, Lazcano F, Villatoro J, Mariño MC, López EK, De la Serna J, Guiot ER. Extension del consumo de drogas en México: Encuestra Nacional de Addicciones. Resultados nacionales [Scope of the consumption of drugs in Mexico: results of the National Survey of Drug Addictions]. Salud Ment. 1989; 12:7–12.

Medina-Mora, ME.; Natera, G.; Borges, G. Observatorio Mexicano en Tabaco, Alcohol y Otras Drogas. Mexico City: CONADIC- Secretaría de Salud; 2002. Alcoholismo y abuso de bebidas alcoholicas; p. 15-25.

Pan American Health Organization. Health in the Americas 2012 Edition. Washington, DC: PAHO; 2012.

Reingle J, Caetano R, Mills BA, Vaeth PA. The role of immigration age on alcohol and drug use among border and non-border Mexican Americans. Alcohol Clin Exp Res. 2014; 38:2080–2086. [PubMed: 24846850]

Research and Innovative Technology Administration (RITA) and Bureau of Transportation Statics (BTS). Border Crossing/Entry Data: Query Detailed Statistics. 2013 Online at: RITA-BTS.

Rojas GE, Fleiz BC, Villatoro J, Gutiérrez LM, Medina-Mora ME. Tendencias del consumo de drogas de 1998 a 2005 en tres ciudades de la zona norte de México: Ciudad Juárez, Monterrey y Tijuana. Salud Ment. 2009; 32:13–19.

Rothman, KJ.; Greenland, S. Modern Epidemiology. Philadelphia, PA: Lippincott-Raven Publishers; 1998.

Saha T, Compton W, Chou S, Smith S, Ruan W, Huang B, Pickering R, Grant B. Analyses related to the development of DSM-5 criteria for substance use related disorders 1. Toward amphetamine, cocaine, and prescription drug use disorder continua using Item Response Theory. Drug Alcohol Depend. 2012; 1:38–46. [PubMed: 21963414]

Schuckit MA, Smith TL, Kalmijn JA. The Patterns of Drug and Alcohol Use and Associated Problems Over 30 Years in 397 Men. Alcohol Clin Exp Res. 2014; 38:227–234. [PubMed: 23895676]

Stata Corp. Stata 13 Survey Data Reference Manual. College Statio, TX: Stata Press; 2013.

Stata Corp LP. Stata Statistical Software (Computer program). College Statio, TX: 2013.

Stinson FS, Grant BF, Dawson DA, Ruan WJ, Huang Y, Saha T. Comorbidity between DSM-IV alcohol specific drug use disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. Drug Alcohol Depend. 2005; 80:105–116. [PubMed: 16157233]

Teesson M, Hall W, Slade T, Mills K, Grove R, Mewton L, Baillie A, Haber P. Prevalence and correlates of DSM-IV alcohol abuse and dependence in Australia: findings of the 2007 National Survey of Mental Health and Wellbeing. Addiciton. 2010; 105:2085–2094.

The American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 7th ed.. AAPOR; 2011.

Vega WA, Alderete E, Kolody B, Aguilar-Gaxiola S. Illicit drug use among Mexicans and Mexican Americans in California: the effects of gender and acculturation. Addiction. 1998; 93:1839–1850. [PubMed: 9926572]

Vega WA, Canino G, Cao Z, Alegría M. Prevalence and correlates of dual diagnoses in US Latinos. Drug Alcohol Depend. 2009; 100:32–38. [PubMed: 19028025]

Vega WA, Sribney WM. Understanding the Hispanic Health Paradox through a multi-generation lens: a focus on behavior disorders. Nebr Symp Motiv. 2011; 57:151–168. [PubMed: 21166308]

Vega WA, Sribney WM, Achara-Abrahams I. Co-occurring alcohol, drug, and other psychiatric disorders among Mexican-origin people in the United States. Am J Public Health. 2003; 93:1057–1064. [PubMed: 12835179]

Volkmann T, Shin SS, Garfein RS, Patterson TL, Pollini RA, Wagner KD, Artamanova I, Strathdee SA. Border crossing to inject drugs in Mexico among injection drug users in San Diego, California. J Immigr Minor Health. 2012; 14:281–286. [PubMed: 21442300]

Wagner KD, Pollini RA, Patterson TL, Lozada RM, Ojeda V, Brouwer KC, Vera A, Volkmann T, Strathdee SA. Cross-border drug injection relationships among injection drug users in Tijuana, Mexico. Drug Alcohol Depend. 2011; 113:236–241. [PubMed: 20889270]

Wallisch, LS. 1996 Survey of Substance Use on the Texas-Mexico Border and in Colonias. Austin, TX: Texas Commission on Alcohol and Drug Abuse; 1998.

Wallisch LS, Spence RT. Alcohol and Drug Use, Abuse, and Dependence in Urban Areas and Colonias of the Texas-Mexico Border. Hispanic J Behav Sci. 2006; 28:286–307.

World Health Organization (WHO). Composite International Diagnostic Interview (CIDI - Authorize core version 1.0). Geneva: World Heath Organization; 1999.

Zemore SE. Acculturation and alcohol among Latino adults in the United States: A comprehensive review. Alcohol Clin Exp Res. 2007; 31:1968–1990. [PubMed: 18034692]

Zemore SE, Karriker-Jaffe KJ, Mulia N. Temporal trends and changing racial/ethnic disparities in alcohol problems: Results from the 2000 to 2010 National Alcohol Surveys. J Addict Res Ther. 2013; 4

Zemore SE, Mulia N, Ye Y, Borges G, Greenfield TK. Gender, acculturation, and other barriers to alcohol treatment utilization among Latinos in three National Alcohol Surveys. J Subst Abuse Treat. 2009; 36:446–456. [PubMed: 19004599]

Table 1

Sociodemographic, mobility, and exposure to U.S. culture variables by country and border area, among current drinkers. U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC) 2011–2013.

	Border Area by Country													*Border Area (combined)*								
	United States							*Mexico*														
	Non-border		*Border*		*Test*			*Non-border*		*Border*		*Test*			*Non-border*		*Border*		*Total*		*Test*		
	n	**%**	**n**	**%**	**X^2**	**df**	**p-value**	**n**	**%**	**n**	**%**	**X^2**	**df**	**p-value**	**n**	**%**	**n**	**%**	**n**	**%**	**X^2**	**df**	**p-value**
Sex					*0.1*	*1*	*0.845*					*2.7*	*1*	*0.318*							*0.5*	*1*	*0.613*
Male	302	54.4	635	54.8				299	66.0	627	62.5				601	59.2	1,262	58.2	1,863	58.6			
Female	270	45.6	483	45.2				116	34.0	251	37.5				386	40.8	734	41.8	1,120	41.4			
Age category					*3.2*	*2*	*0.362*					*16.3*	*2*	*0.013*							*11.4*	*2*	*0.039*
18–29	189	32.3	383	31.3				143	29.9	324	35.2				332	31.3	707	33.0	1,039	32.4			
30–49	262	46.5	534	50.1				191	53.0	445	53.1				453	49.3	979	51.4	1,432	50.7			
50+	121	21.2	201	18.7				81	17.1	109	11.7				202	19.5	310	15.6	512	16.9			
Education					*53.7*	*3*	*<0.001*					*142.6*	*3*	*<0.001*							*37.3*	*3*	*<0.001*
<HS graduate	164	31.8	356	31.1				212	57.6	549	70.8				376	42.6	905	48.4	1,281	46.5			
HS graduate	125	22.2	257	18.5				66	10.4	188	17.0				191	17.2	445	17.8	636	17.6			
Some college	194	32.3	315	24.1				33	8.0	41	3.5				227	22.1	356	15.1	583	17.4			
College graduate	89	13.7	190	26.3				101	24.0	95	8.7				190	18.0	285	18.6	475	18.4			
Marital status					*34.8*	*3*	*<0.001*					*29.7*	*3*	*0.002*							*50.6*	*3*	*<0.001*
Single	165	29.9	345	29.4				158	35.2	240	26.0				323	32.1	585	27.9	908	29.3			
Married/living together	277	47.4	611	57.0				206	50.6	532	61.0				483	48.7	1,143	58.8	1,626	55.5			
Sep/div	120	20.3	145	11.9				46	13.3	90	11.3				166	17.3	235	11.6	401	13.5			
Widowed	9	2.5	17	1.7				5	0.9	14	1.7				14	1.8	31	1.7	45	1.7			
Native of survey city					*1.3*	*1*	*0.328*					*75.5*	*1*	*<0.001*							*18.6*	*1*	*<0.001*
No	169	30.9	293	28.6				74	17.8	298	35.0				243	25.4	591	31.4	834	29.5			
Yes	403	69.1	825	71.4				341	82.2	579	65.0				744	74.6	1,404	68.6	2,148	70.5			
Ever in neighbor country					*54.6*	*1*	*<0.001*					*20.6*	*1*	*0.010*							*32.0*	*1*	*<0.001*
No	105	15.3	69	6.0				294	73.2	539	63.9				399	39.7	608	31.4	1,007	34.1			
Yes	467	84.7	1,049	94.0				121	26.8	338	36.1				588	60.3	1,387	68.6	1,975	65.9			

	Border Area by Country													Border Area (combined)								
	United States							Mexico														
	Non-border		Border		Test			Non-border		Border		Test			Non-border		Border		Total		Test		
	n	%	n	%	X^2	df	p-value	n	%	n	%	X^2	df	p-value	n	%	n	%	n	%	X^2	df	p-value
In neighbor country last 12m					*170.3*	*1*	*<0.001*					*46.1*	*1*	*<0.001*							*218.5*	*1*	*<0.001*
No	503	87.4	706	61.0				362	90.0	675	78.8				865	88.5	1,381	68.8	2,246	75.2			
Yes	69	12.6	411	39.0				52	10.0	197	21.2				121	11.5	608	31.2	729	24.8			
Exposure to U.S. culture[*]					*21.9*	*1*	*0.001*					*43.5*	*1*	*<0.001*							*2.1*	*1*	*0.294*
No	109	23.9	325	33.4				389	93.7	728	84.2				498	53.4	1,053	55.6	1,551	54.9			
Yes	459	76.1	792	66.6				26	6.3	146	15.8				485	46.6	938	44.4	1,423	45.1			

df - degrees of freedom

[*] Respondents' *exposure to U.S. culture* was defined as: 1) Mexicans living in Mexico who went to the U.S. themselves (for work or studies) or who reported having a close relative in the U.S.; 2) Second and third generation Americans of Mexican origin living in the U.S.

Table 2

Prevalence of co-occurrence of 12-month hazardous alcohol use and 12-month and 30-day drug use, and co-occurrence of 12-month DSM-5 alcohol use disorders (AUD) and 12-month drug use disorders symptoms (DUD symptoms) among current drinkers, by country and border area. U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC) 2011–2013.

	Border Area by Country													*Border Area (combined)*								
	Unites States							*Mexico*														
	Non-border		*Border*		*Test*			*Non-border*		*Border*		*Test*			*Non-border*		*Border*		*Total*		*Test*		
	n	**%**	**n**	**%**	**X^2**	**df**	**p-value**	**n**	**%**	**n**	**%**	**X^2**	**df**	**p-value**	**n**	**%**	**n**	**%**	**n**	**%**	**X^2**	**df**	**p-value**
12 month hazardous alcohol use and 12 month drug use					*27.7*	*1*	*<0.001*					*0.2*	*1*	*0.710*							*25.1*	*1*	*<0.001*
No	521	92.8	963	85.3				409	98.6	860	98.8				930	95.3	1,823	91.2	2,753	92.5			
Yes	51	7.2	155	14.7				6	1.4	13	1.2				57	4.7	168	8.8	225	7.5			
12 month hazardous alcohol use and 30-day drug use					*24.7*	*1*	*<0.001*					*0.1*	*1*	*0.820*							*23.9*	*1*	*<0.001*
No	546	96.5	1,017	90.8				412	99.3	867	99.4				958	97.7	1,884	94.6	2,842	95.6			
Yes	26	3.5	101	9.2				3	0.7	6	0.6				29	2.3	107	5.4	136	4.4			
12-month DSM-5 AUD and 12-month DUD symptoms					*11.8*	*1*	*<0.001*					*2.3*	*1*	*0.181*							*14.4*	*1*	*<0.001*
No	548	96.7	1,032	93.2				412	99.4	862	98.7				960	97.8	1,894	95.6	2,854	96.3			
Yes	24	3.3	86	6.8				3	0.6	16	1.3				27	2.2	102	4.4	129	3.7			

df - degrees of freedom

Table 3

Co-occurrence of 12-month hazardous alcohol use and 12-month and 30-day drug use, and co-occurrence of 12-month DSM-5 alcohol use disorders (AUD) and 12-month drug use disorders symptoms (DUD symptoms*) among current drinkers, adjusted by demographic (age [continuous], sex, education, marital status), exposure to U.S. culture and cross border mobility variables (native of survey city, visited neighbor country last 12-months). U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC) 2011–2013.

		12 month hazardous alcohol use and 12 month drug use		*12 month hazardous alcohol use and 30-day drug use*		*12-month DSM-5 AUD and 12-month DUD symptoms*	
		PR	**95% CI**	**PR**	**95% CI**	**PR**	**95% CI**
United States	Non-Border	1.00	-	1.00	-	1.00	-
	Border	1.95	(1.37–2.76)	2.34	(1.60–3.41)	1.96	(1.33–2.90)
Mexico	Non-Border	1.00	-	1.00	-	1.00	-
	Border	0.75	(0.28–2.02)	1.10	(0.28–4.27)	1.97	(0.59–6.58)
*U.S.-Mexico pooled estimate***	Non-Border	1.00	-	1.00	-	1.00	-
	Border	1.36	(0.55–3.35)	2.15	(1.35–3.42)	1.97	(1.36–2.85)

PR - Prevalence ratios computed with a generalized linear model with a log link and binomial distribution (standard errors were corrected using the *svy* module in stata).

Reference categories: education (less than high school vs. other); marital status (married vs. not married).

* Drug use disorder symptoms are hazardous use and quit/control.

** Pooled PRs were computed by random-effects meta-analysis, pooling U.S. and Mexico estimates.

Table 4

Prevalence Ratios of the co-occurrence of 12-month DSM-5 alcohol use disorders (AUD) and 12-month drug use disorders symptoms (DUD symptoms*) among current drinkers, by demographic (age [continuous], sex, education, marital status), exposure to U.S. culture and cross border mobility variables (native of survey city, visited neighbor country last 12-months). U.S.-Mexico Study on Alcohol and Related Conditions (UMSARC) 2011–2013.

		Co-occurring 12-month DSM-5 AUD and 12-month DUD symptoms					
		United States		***Mexico***		***U.S.-Mexico pooled estimate*** **	
		PR	**95% CI**	**PR**	**95% CI**	**PR**	**95% CI**
Border Area	Non-Border	1.00	-	1.00	-	1.00	-
	Border	1.96	(1.33–2.90)	1.97	(0.59–6.58)	1.97	(1.36–2.85)
Sex	Male	1.00	-	1.00	-	1.00	-
	Female	0.19	(0.13–0.28)	0.07	(0.01–0.39)	0.16	(0.07–0.35)
Age (continuous)		0.97	(0.95–0.98)	0.98	(0.95–1.02)	0.97	(0.96–0.98)
Education	>=HS graduate	1.00	-	1.00	-	1.00	-
	< HS graduate	1.56	(1.12–2.18)	0.89	(0.38–2.10)	1.37	(0.86–2.18)
Marital status	Non married	1.00	-	1.00	-	1.00	-
	Married	0.63	(0.43–0.91)	0.29	(0.12–0.71)	0.48	(0.23–0.98)
Native of survey city	No	1.00	-	1.00	-	1.00	-
	Yes	1.47	(0.96–2.24)	1.61	(0.53–4.85)	1.49	(1.00–2.21)
In neighbor country last 12m	No	1.00	-	1.00	-	1.00	-
	Yes	1.40	(1.06–1.86)	1.00	(0.37–2.72)	1.37	(1.05–1.79)
Exposure to U.S. culture	No	1.00	-	1.00	-	1.00	-
	Yes	1.65	(1.10–2.49)	4.17	(1.71–10.18)	2.40	(0.99–5.85)

PR - Prevalence ratios computed with a generalized linear model with a log link and binomial distribution (standard errors were corrected using the *svy* module in stata).

Each column (1–3) is a full model with co-occurring 12-month DSM-5 AUD and DUD symptoms as the outcome variable and all row variables as predictors.

* Drug use disorder symptoms are hazardous use and quit/control.

** Pooled PRs were computed by random-effects meta-analysis, pooling U.S. and Mexico estimates.