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Comparing prevalence and correlates of sexuality-related stigmas among men who have sex with men in the United States versus Mexico, AMIS-2018

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By

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Bachelor of Arts
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Abstract

Comparing prevalence and correlates of sexuality-related stigmas among men who have sex with men in the United States versus Mexico, AMIS-2018

By Emma Butturini

Introduction
Stigma is a fundamental cause of health disparities and sexuality-related stigma, especially, drives poor health outcomes among sexual minority populations. Studies have shown that experiencing sexual behavior stigma is associated with increased risk behaviors for HIV transmission and creates barriers to accessing sexual health services. Variation in sexual minorities' stigma experiences in different countries is rooted in the unique sociopolitical context, although it has been difficult to empirically compare these experiences previously due to a lack of consistent stigma measurement metrics. This analysis sought to describe and compare the prevalence of sexuality-related stigma between the United States (US) and Mexico among men who have sex with men (MSM).

Methods
Data was obtained from the 2018 American Men's Internet Survey, conducted separately in the US and Mexico. Log-binomial regression was used to examine the association between variables of interest and 13 stigma items. Bivariate analyses were conducted on the entire study sample, and used to perform country-specific analyses. Crude and adjusted multivariate models were used to compare the prevalence of stigma in the US versus Mexico.

Results
Overall, the highest prevalence stigma items were family gossip (47%), verbal harassment (47%), and family exclusion (27%). Family exclusion and gossip, friend rejection, fear of seeking healthcare, healthcare avoidance, fear being in public, physical harm, and rape were reported more commonly among US MSM. Healthcare worker gossip, police refusal to protect, verbal harassment, and blackmail were more common among Mexican MSM. Adjusted prevalence ratios (aPR) for all stigma items were statistically significant, but measures of association were typically small with the exception of family exclusion (aPR = 0.67), healthcare worker gossip (aPR = 1.94), police refusing to protect (aPR = 1.89), and blackmail (aPR = 1.66).

Discussion
In this analysis, sexuality-related stigma was common amongst MSM regardless of country. These findings indicate that despite the existence of protective policies for LGBTQ people in both countries, variation in enforcement and adoption of these policies have fostered sociopolitical landscapes that are damaging to the health of MSM. The ubiquity of these experiences indicates the need for intersectional, context-specific stigma mitigation interventions to reduce the harms caused by structural stigma.

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Introduction

Stigmatization is a complex social process operating at internalized, interpersonal, and structural levels[1]. Stigma has been characterized as a fundamental cause of health inequalities because it maintains a strong association with such inequalities over time and place. Additionally, stigma perpetuates inequities by influencing multiple risk factors and health outcomes simultaneously while constraining access to beneficial resources[2]. Sexuality-related stigma, in particular, has repeatedly been shown to act as a major driver of sexual minority health and related inequalities in health outcomes[3]. Hegemonic heteronormativity shapes structural stigma toward sexual minorities[4]. Furthermore, sexual minorities, including men who have sex with men (MSM), often face compounding stigmas related to their racial and ethnic identities, which exacerbate their experience of social inequities and health disparities.

Studies have found that sexual minority individuals who experience externally-mediated stigma have higher odds of experiencing physical health issues. The minority stress model asserts that the cumulative effects of anxiety and stress stemming from experiences of stigma lead to adverse health outcomes for sexual minorities[5]. Several studies have also linked instances of sexuality-based stigma and discrimination to increased occurrence of risk behaviors for HIV transmission, including illicit drug use, substance use preceding sexual encounters, and lower rates of condom use[6,7]. In an extension of minority stress theory, it is hypothesized that enactment of various high risk behaviors for HIV is a mechanism for coping with excess levels of stress and anxiety[8]. Living in community and national contexts with a high prevalence of sexuality stigma

without adequate social support mechanisms also leads to increased internalized homophobia, which further exacerbates stress levels[7].

In addition to damaging one's mental health and wellbeing, experience of sexuality-related stigma creates significant barriers in MSM's ability to access HIV prevention, testing, and care services, worsening overall health outcomes[3]. Fear or anticipation of future stigma has been shown to decrease engagement with general primary care and preventative health services for MSM, particularly in rural areas that are perceived as less welcoming to lesbian, gay, bisexual, and transgender populations (LGBTQ)[9]. An added layer of complexity in the impact of stigma upon MSM's health is the weight of stigma associated with HIV/AIDS, which can then lead to avoidance of participation in prevention activities or gaps in individual adherence to treatment regimens[10,11].

There is significant variation in the extent of structural stigma present across different countries, rooted in their specific sociopolitical environments. Although a growing number of countries globally have displayed significant progress in working toward equality for sexual minority populations in recent years, societal stigmas still persist[3]. In the United States, while overall public attitudes toward and acceptance of LGBTQ people have drastically improved over the last ten years[12], stigma and discrimination are still commonly experienced by MSM[13]. Black and Latino MSM in the United States have been shown to experience greater sexuality-related stigma compared to White MSM, in addition to discrimination based on their racial/ethnic identity[14]. Mexico has exhibited a similarly complex and inconsistent journey toward acceptance. In 2016, the Supreme

Court ruled to legalize same-sex marriage; however, religious and cultural norms surrounding masculinity contribute to persistent stigmatization of same-sex sexual practices[15,16]. Stigma can serve as an influential driver of HIV epidemics, especially within low and middle income countries, so it is vital to better characterize factors that exacerbate and mitigate its effects to improve sexual health for key populations[4].

Previous research on this topic has primarily focused on the downstream health effects of sexuality-related stigma and subsequent engagement with healthcare and HIV prevention services. A variety of stigma and discrimination scales have been used to describe the prevalence and effects of different forms of stigma in relation to HIV testing and risk behaviors, primarily amongst younger MSM[4,17]. However, the type and frequency of stigma experienced by younger versus older MSM, and MSM living in urban versus rural areas, is less well-characterized. Prior studies have primarily dealt with urban populations due to a general lack of data on rural LGBTQ populations[9]. While the negative health impacts of such stigmas have been well-documented in the literature, little work has focused on exploring the mechanistic relationships influencing the experience of sexuality-related stigma, and the level of stigma experienced, amongst MSM in different contexts.

Identifying and characterizing correlates of stigma is vital to better understanding the barriers to achieving equitable health outcomes and engaging in HIV prevention and treatment services that MSM face. Systematically examining factors associated with sexuality-related stigma, especially within specific regional and country contexts, is

necessary for creating informed stigma reduction strategies and improving the effectiveness of future public health interventions[18]. Conducting analysis at the country-level can also provide a proxy for the macro-level social, cultural and political environment that shapes the differing types and intensity of stigma individuals' experience[19]. This analysis seeks to describe the prevalence of sexuality-related stigma in the US and Mexico, compare the prevalence of stigma experiences in these two countries, and describe the prevalence of stigma across key social and demographic factors, such as age, race, urbanicity, education, and region.

Methods

AMIS

The American Men's Internet Survey (AMIS) is a cross-sectional, web-based survey that has been administered annually since 2013. The survey was established as a way to create a web-based surveillance system for monitoring HIV-related risk behaviors and other health behavior related trends among MSM[20]. In 2016, AMIS was expanded to Mexico and adapted to create a new survey. While there is a large degree of overlap in the questions on both surveys, there are some differences in the particular questions asked and response options provided for equivalent questions due to tailoring based on health needs and research interests specific to the Mexican context.

To be eligible to participate in the US-AMIS survey, individuals had to be at least 15 years old, identify as male, report that they had oral or anal sex with a man at least once in the past, and be residents of the United States. In the US survey, all participants were

asked if they identified as Hispanic/Latino, American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, or White, and could choose all groups that apply. A consolidated race/ethnicity variable was used for this analysis which has been employed in prior analyses of AMIS data[21]. Participants were grouped into one of four categories: Hispanic, non-Hispanic Black, non-Hispanic white, or non-Hispanic other, which included those identifying as multiracial, Asian, and Native American/Hawaiian. Population density was determined in the dataset via county and zip code information along with the National Center for Health Statistics (NCHS) categorization scheme. The US region (Northeast, South, Midwest, West) in which participants reside was also determined based on zip code information.

The Mexico AMIS dataset did not contain information on race/ethnicity or population density. Location information for participants was recorded as state-level zip codes. While Mexico does not have an official equivalent of federal regions, for the purposes of this analysis, participants were grouped into regions based on their state of residence according to Table 1[22].

Dataset Creation

To facilitate comparisons across the two datasets, the US data were restricted to participants that were at least 18 years old, which was a requirement for participation in the Mexico survey. For both settings, participants were grouped based on their reported age in years as follows: "18-24", "25-29", "30-39", and "> 40". Variable names and coding schemes in the Mexico dataset were updated to match those used in the US

dataset for corresponding questions in order to standardize names and ensure consistency in coding in preparation for merging the two datasets. In the US dataset, the stigma questions and select categorical variables included response options to indicate the recency of certain experiences, (e.g., "yes, in the last 6 months" and "yes, but not in the last 6 months"). Because the Mexico dataset did not collect information regarding the timing of experiences, these responses were collapsed into a single "Yes" category for all applicable variables in the US dataset. There were discrepancies in the coding of the variable for highest education level completed due to differences in the structure of the educational system in both countries, so a new variable was created that group participants by whether they had completed "less than secondary/high school", "finished secondary/high school", or completed "more than secondary/high school" to ensure consistency in comparisons. After data cleaning and variable standardization was completed for the individual country datasets, a combined dataset was created, including the sexual behavior stigma items and other relevant demographic variables.

Participants in both surveys were asked multiple questions about specific groups to which they have disclosed their same-sex behaviors, so for the purposes of this analysis disclosure status was collapsed into a single, categorical variable based on responses to this set of questions. Participants were grouped into mutually exclusive disclosure categories as follows: "disclosed to no one", "disclosed to family/friends", "disclosed to healthcare providers/co-workers", or "disclosed to both groups". For the majority of questions in the survey, participants were given the option to respond, "Don't know" or "I prefer not to answer", so for model simplicity these answer options were treated as

missing in the main analyses. Due to potential social desirability bias and the traumatic nature of stigmatizing experiences, some participants may have chosen not to report certain instances of stigma that they have experienced, therefore the prevalence of "I prefer not to answer" responses for the stigma items will be examined in the Limitations. Further examination of missingness in model variables will also be presented in Limitations.

Sexual Behavior Stigma

Sexual behavior stigma was assessed using the same 13 categories in the US and Mexico AMIS-2018 surveys (Table 1). For questions concerning physical harm and rape, responses were classified as a "yes," if participants responded they believed these experiences were related to the fact that they engage in same-sex behaviors.

Statistical Analysis

Descriptive statistics were used to describe the distribution of relevant demographic factors and sexual stigma items within each study population, as well as compare the distribution of these factors across the two populations. Bivariate analyses employed log-binomial regression to produce crude prevalence ratios (cPR) and 95% confidence intervals and examine the association between stigma items and variables of interest, such as: age group, disclosure status, education level, and community tolerance. Country-specific sub-analyses were conducted to examine the association between stigma items and variables that were unique to the US or Mexico datasets. Within-country bivariate analyses included region, urbanicity and race/ethnicity for the US population and a

regional analysis of the Mexico sample. For the US regional sub-analysis, because less than 1% of participants (n=8) reported living in US dependent areas, these individuals were not included due to potential instability of subsequent estimates.

Crude and adjusted multivariate log-binomial models were used to test for the association between country of residence (US or Mexico) and each of the stigma items in AMIS-2018, with US MSM serving as the reference group. Adjusted models controlled for potential confounders, including age, disclosure status, and education level. Significance was determined at alpha = 0.05. Similar methods were used in prior papers (Stahlman et al., 2016) to compare the prevalence of stigma, as assessed in the AMIS questionnaire, across different countries[21].

Results

Sample Demographics

In the pooled AMIS-2018 US and Mexico data (Table 3), there were 25,286 survey participants, including 15,889 (63%) from Mexico and 9,397 (37%) from the US. The median age of the combined survey cohorts was 27 years (IQR: 22-35). 80% of participants completed more than secondary school education and 81% of participants had disclosed same sex practices to both friends/family and healthcare workers/employers.

Among the US participants (Table 3a), the median age was 29 years. Participants were evenly distributed across regions with 16% (1532/9397) from the Northeast, 22%

(2032/9397) from the Midwest, 38% (3604/9397) from the South, 24% (2221/9397) from the West, and 0.1% (8/9397) from US dependent areas. The population density of where participants reside was also relatively evenly distributed: 37% (3477/9388) urban, 20% (1907/9388) suburban, 33% (3080/9388) medium/small metro area, and 10% (924/9388) rural. The racial and ethnic distribution of participants was 72% (6618/9397) non-Hispanic white, 15% (1423/9397) Hispanic, 6% (525/9397) non-Hispanic Black, and 7% (671/9397) Other. The majority (5388/5850, 92%) had completed more than secondary school education, whereas 7% (423/5850) completed secondary school, and 1% (39/5850) completed less than secondary school. Most participants (4597/5440, 85%) also reported that they had disclosed their same-sex practices to friends or family and to healthcare providers or people in their workplace.

Among participants from Mexico (Table 3b), the median age was 26 years. The regional distribution of participants was as follows: 15% (2426/15568) from the North, 13% (2100/15568) from the South, 48% (7597/15568) from the Center, and 22% (3445/15568) from the Bajio region. The majority (11668/15618, 75%) had completed more than secondary school education, 23% (3550/15568) completed secondary school, and 3% (400/15568) completed less than secondary school. Most participants (12389/15642, 79%) also reported that they had disclosed their same-sex practices to friends or family and to healthcare providers or people in their workplace.

Sexual Behavior Stigma in AMIS-2018

The overall and country-specific prevalence of stigma items in AMIS-2018 is detailed in Table 4 and Figure 1. The highest prevalence forms of stigma experienced were family gossip (47%), verbal harassment (47%), and family exclusion (27%). Bivariate analyses of the combined survey data (Table 5) found the 25-29, 30-39 and over 40 age groups were more likely to experience poor healthcare, police refusing to protect them, and healthcare worker gossip than those 18-24 years. However, MSM in the three older age groups were significantly less likely to avoid healthcare compared to MSM aged 18-24. The over 30 age groups were also more likely to experience friend rejection and physical harm, but less likely to experience family gossip, fear of seeking healthcare or being afraid to be in public than the youngest age group. Individuals who reported that most people living in their area were tolerant of gay and bisexual people were significantly less likely (between 8% and 34%) to experience all types of stigma compared to those reporting their community was neutral, except for physical harm which was not significantly different. Similarly, those reporting their community was not tolerant were significantly more likely to experience all types of stigma compared to those living in neutral communities. Compared to those who completed less than secondary education, those who completed secondary or obtained a higher level of education were more likely to report family exclusion, friend rejection, fear of seeking healthcare, avoiding healthcare, healthcare worker gossip, and fear of being in public but were less likely to report experiencing verbal harassment.

In the United States, some regional differences were identified in the experience of sexuality-related stigma (Table 6, Figure 2). Compared to MSM in the Northeast, MSM

from the Midwest were 14% more likely to experience family exclusion (95% CI: 1.03,

1.26), 15% more likely to experience family gossip (95% CI: 1.07, 1.24), 16% more

likely to report fear of seeking healthcare (95% CI: 1.04, 1.30), and 19% more likely to

report avoiding healthcare (95% CI: 1.05, 1.36). MSM from the South were more 17%

more likely to report family exclusion (95% CI: 1.06, 1.28), 15% more likely to

experience family gossip (95% CI: 1.07, 1.23), 11% more likely to report being afraid to

seek healthcare (95% CI: 1.01, 1.23), and 15% more likely to report avoidance of

healthcare (95% CI: 1.02, 1.29). There was no difference in the stigma experience of

MSM from the Northeast and West US, except MSM from the West were 12% more

likely to report family gossip (95% CI: 1.04, 1.21). The prevalence of stigma was similar

overall across race/ethnicity in the US, except for a few items (Table 7, Figure 3). Black

MSM were 22% less likely to report family exclusion (95% CI: 0.67, 0.91), 22% less

likely to experience friend rejection (95% CI: 0.66, 0.93), 34% less likely to report fear of

being in public (95% CI: 0.57, 0.77), 28% less likely to experience verbal harassment

(95% CI: 0.63, 0.81), and 24% less likely to experience physical harm (95% CI: 0.60,

0.97) than white MSM. Hispanic MSM were 17% less likely to experience friend

rejection (95% CI: 0.75, 0.93) and 15% less likely to experience verbal harassment (95%

CI: 0.79, 0.91) than white MSM, but were 8% more likely to experience family gossip

(95% CI: 1.02, 1.15) and 15% more likely to avoid healthcare (95% CI: 1.04, 1.28).

MSM categorized as other were 42% more likely than white MSM to experience police

refusing to protect them (95% CI: 1.11, 1.82) and 11% more likely to report being scared

to be in public (95% CI: 1.003, 1.22). Analysis of the association between differing levels

of urbanicity and prevalence of stigma for US MSM are shown in Table 8 and Figure 4.

MSM living in suburban areas were 11% less likely to experience family exclusion (95% CI: 0.82, 0.97), 12% less likely to experience family gossip (95% CI: 0.83, 0.94), 26% less likely to report poor healthcare (95% CI: 0.61, 0.90), 21% less likely to report police refusing to protect them (95% CI: 0.64, 0.97), 14% less likely to be scared to be in public (95% CI: 0.79, 0.92), and 12% less likely to experience verbal harassment (95% CI: 0.82, 0.93) but were 21% more likely to experience blackmail (95% CI: 1.04, 1.41) compared to urban MSM. MSM from small/medium metro areas were also 18% more likely to experience blackmail (95% CI: 1.03, 1.34), and 15% less likely to report poor healthcare (95% CI: 0.73, 0.997), 10% less likely to report fear being in public (95% CI: 0.85, 0.96), and 11% less likely to experience verbal harassment (95% CI: 0.84, 0.94). compared to urban MSM. Those living in rural areas were 15% more likely than urban MSM to report friend rejection (95% CI: 1.02, 1.29), 24% more likely to be afraid to seek healthcare (95% CI: 1.11, 1.38), 22% more likely to report avoidance of healthcare (95% CI: 1.07, 1.39), and 39% more likely to experience blackmail (95% CI: 1.16, 1.67) but 21% less likely to be scared to be in public (95% CI: 0.71, 0.88).

In bivariate analysis of the AMIS Mexico data (Table 9, Figure 5), MSM from the South were 18% more likely to be afraid to seek healthcare (95% CI: 1.07, 1.30), 32% more likely to report receiving poor healthcare (95% CI: 1.08, 1.63), and 14% more likely to be blackmailed (95% CI: 1.01, 1.28) than MSM in the North. MSM from the Bajio region were 11% more likely than those from the North to experience friend rejection (95% CI: 1.01, 1.23), 33% more likely to experience poor healthcare (95% CI: 1.10, 1.60), 20% more likely to be scared to be in public (95% CI: 1.09, 1.32), and 9% more likely to

experience verbal harassment (95% CI: 1.03, 1.15). Participants from Central Mexico were 54% more likely to report receiving poor healthcare (95% CI: 1.30, 1.81), 16% more likely report police refusing to protect them (95% CI: 1.04, 1.29), 31% more likely to be afraid to be in public (95%: 1.20, 1.42), 7% more likely to experience verbal harassment (95% CI: 1.02, 1.13), and 14% more likely to experience physical harm (95% CI: 1.02, 1.27) than those from the North.

Comparison of Stigma Prevalence Across United States and Mexico

Overall, the prevalence of reported sexuality-related stigma was similar or higher among US AMIS-2018 participants compared to respondents from Mexico (Table 4). The highest prevalence sexual behavior stigmas for the US were family gossip (49%), verbal harassment (45%), and scared to be in public (36%). For Mexican respondents, the highest prevalence forms of stigma experienced verbal harassment (48%), family gossip (46%), and being scared to be in public (25%). The least common types of stigma experienced for the US and Mexico, respectively, were healthcare worker gossip (4%) and rape (7%). Based on crude prevalence ratios, MSM from Mexico were significantly less likely to report experiencing family exclusion: 0.70 (95% CI: 0.67, 0.73), family gossip: 0.93 (95% CI: 0.91, 0.96), friend rejection: 0.79 (95% CI: 0.76, 0.83), being afraid to seek healthcare: 0.83 (95% CI: 0.80, 0.87), avoidance of healthcare: 0.74 (95% CI: 0.71, 0.78), being scared to be in public: 0.70 (95% CI: 0.67, 0.72), and rape: 0.85 (95% CI: 0.78, 0.93). However, Mexican MSM were more likely than US MSM to experience healthcare worker gossip: 1.92 (95% CI: 1.72, 2.14), police refusing to protect

them: 2.23 (95% CI: 2.06, 2.42), verbal harassment: 1.08 (95% CI: 1.05, 1.11), and blackmail: 1.37 (95% CI: 1.29, 1.46).

Multivariable Adjusted Associations of United States/Mexico With Sexual Behavior Stigma Items

Models were adjusted for age, disclosure status with family/friends and healthcare providers/co-workers, and education level. The adjusted prevalence ratios show that Mexico AMIS respondents continued to report being more likely to experience healthcare worker gossip: 1.94 (95% CI: 1.66, 2.25), police refusing to protect them: 1.89 (95% CI: 1.69, 2.11) and blackmail: 1.66 (95% CI: 1.49, 1.84), while Mexican MSM were less likely to report family exclusion: 0.67 (95% CI: 0.63, 0.71), family gossip: 0.86 (95% CI: 0.82, 0.89), friend rejection: 0.85 (95% CI: 0.79, 0.91), being afraid to seek healthcare: 0.92 (95% CI: 0.86, 0.99), avoidance of healthcare: 0.83 (95% CI: 0.77, 0.91), being afraid to be in public: 0.61 (95% CI: 0.58, 0.65), verbal harassment: 0.94 (95% CI: 0.90, 0.98), and rape 0.71 (95% CI: 0.62, 0.81) (Table 10). After adjustment, Mexican MSM were also less likely to report physical harm: 0.86 (95% CI: 0.79, 0.94) and receiving poor healthcare: 0.89 (95% CI: 0.79, 0.996).

Discussion

Key Findings

Overall, a high prevalence of sexuality-related stigma was observed in this analysis, with a similar pattern of experiences in both countries and across all settings within each country. In both country contexts, the most common types of stigma experienced were

family gossip and verbal harassment, while the least common types experienced were rape and receiving poor healthcare. Before controlling for known confounders, MSM from the US were significantly more likely to report experiencing seven of the stigma items in the survey (family exclusion, family gossip, afraid to seek healthcare, avoidance of healthcare, fear being in public, and rape), while MSM from Mexico were significantly more likely to report experiencing four of the stigma items (healthcare worker gossip, police refusing to protect them, verbal harassment and blackmail). After controlling for age, disclosure status, and education level, there were significant differences in reported experiences between MSM in the US and Mexico across all of the stigma items that were assessed. Adjusted prevalence ratios showed US MSM were more likely to report experiencing ten of the stigma items (family exclusion, friend rejection, afraid to seek healthcare, avoidance of healthcare, fear being in public, verbal harassment, physical harm and rape), while Mexican MSM were more likely to experience three of the stigma items (healthcare worker gossip, police refusing to protect them, and blackmail).

Interpretation of Findings

Although many of the observed statistically significant differences in this analysis were small in effect, there were several stigma items associated with large effect sizes, including family exclusion, blackmail, police refusal to protect, and healthcare worker gossip, that may present opportunities for introducing impactful stigma mitigation strategies. Pervasive stigma not only poses a threat to the mental and emotional well-being of sexual minority populations, but can also negatively shape interactions with the healthcare system and an individual's care seeking behaviors, which can have cascading

impacts upon health outcomes[23]. Stress related to experiences of sexuality stigma has been shown to be associated with HIV risk behaviors and hesitancy toward engaging in prevention activities[23,24]. Studies have shown MSM who have reported exposure to instances of enacted stigma are more likely to report depressive symptoms[25], and those living in stigmatizing or non-tolerant environments score higher on measurements of internalized homophobia[26].

While there were few significant differences in the stigma experience of MSM across different regions of Mexico, there were two, predominant regional differences. MSM in central Mexico were more likely to report poor healthcare and being scared to be in public, which may be influenced by a history of violent hate crimes against sexual minorities, particularly in the federal district of Mexico City, within this region[27]. MSM in southern Mexico were also more likely to be afraid to seek healthcare, which could be due to state differences in LGBTQ protection laws and prior stigmatizing experiences influencing willingness to discuss LGBTQ health issues with providers[28].

For the United States, the stigma reported by MSM appeared to be similar across regions and race/ethnicity, which is consistent with results from previous AMIS studies, and provides further support for the persistence and widespread nature of these experiences among American MSM[21]. Contrary to prior studies which have relied upon the assumption that sexual minority individuals of color are at greater risk of stigma and discrimination, Black and Hispanic MSM in the US were statistically less likely to report family exclusion, friend rejection and verbal harassment. Black MSM were also less

likely to report being scared to be in public or physical harm, compared to white MSM. As some papers posit, this association may be due to non-white MSM's experiences of racism or ethnic discrimination resulting in the development of coping strategies that facilitate resilience in the face of sexuality-related stigma[29]. In accordance with prominence models of discrimination, it is also possible that Black and Hispanic MSM reported a lower prevalence of sexuality-related stigma because stigma related to their racial/ethnic identity is predominant in their lived experience so the combination of additional forms of stigma does not significantly worsen the overall effects[30]. There was greater variation in the frequency of reported stigma items for US MSM based on urbanicity. While statistical differences between the urbanicity categories were noted across ten of the stigma items, the 95% confidence intervals for many of the crude prevalence ratios were close to the null, therefore they may not actually represent meaningful differences in the stigma experiences of MSM living in varying population densities. MSM living in rural areas were more likely to report being afraid to seek healthcare, avoidance of healthcare, and blackmail compared to MSM in more urban areas, as shown in prior AMIS studies[21]. These findings are also supported by other studies which have found LGBTQ individuals in rural areas report more instances of discrimination, less social support, and less access to LGBTQ-sensitive healthcare[9,31]. Those living in rural areas were also significantly less likely to report being scared to be in public or verbal harassment. Although this seems contrary to the studies discussed previously, the anonymity of living in high population density areas may enable perpetrators of harassment and discrimination to do so more openly without consequences, whereas living in smaller, more connected communities might dissuade

some from engaging in public acts of harassment. This result may also be partially explained by the fact that rural MSM were less likely to have disclosed to friends/family and healthcare providers/co-workers so this population may be less out in public settings, thus skewing the observed association.

In the overall analysis, after adjustment for confounders, the estimated measures of association with the largest effect sizes were healthcare worker gossip, police refusal to protect, and blackmail. The heightened prevalence of these particular stigma items amongst Mexican MSM may be reflective of differences in the landscape of social and legal protections for LGBTQ people. Although Mexico has some of the most progressive legislation in Latin America regarding legal protections and anti-discrimination policies, effective implementation of these laws varies throughout the country and areas where enforcement lapses can foster an environment that promotes further discrimination[32]. Therefore, structural interventions should be implemented to improve the consistency of enforcement of protection mechanisms for sexual minorities. Furthermore, there should be increased efforts to implement training among healthcare providers to increase sensitivity and competency in providing care to LGBTQ populations.

On the other hand, the stigma items found to be statistically significantly less common among Mexican MSM compared to US MSM, were family exclusion, avoiding healthcare, scared to be in public, and rape. Mexican MSM may be less prone to issues regarding family exclusion due to the central role of the family in Latino culture and emphasis on the interconnectedness of extended familial relationships[33]. Also, while the

majority of MSM in both countries had disclosed to family, disclosure to family members was less common among Mexican MSM in the survey. The fact that US MSM were more likely to report avoiding healthcare may be due to the fact that a larger proportion of US MSM had disclosed same-sex behavior as compared to Mexican MSM. Although there are noted psychological benefits to disclosing one's sexuality to others, in terms of reduced anxiety and improved self-esteem, doing so can also result in becoming a target of further stigma and discrimination[34], and such negative experiences could cause individuals to avoid these settings in the future. The heightened level of reported fear of being in public among US respondents may be linked to heightened levels of fear and safety concerns that have been documented in US LGBTQ populations in the wake of the 2016 Pulse Nightclub shooting[35]. The higher prevalence of stigma experiences across a majority of the survey items among US MSM could also be reflective of social environments fostered by the lack of nondiscrimination protections in most states due to the decentralized nature of the US policymaking process, whereas Mexico has had formal policy banning all discrimination related to sexuality since 2003[32,36]. Given these findings, structural interventions are needed to reduce stigma in healthcare and public settings, as well as consistent legal protections of LGBTQ people throughout the US to eliminate overall social and health disparities.

Limitations

Limitations of this analysis include a lack of representativeness across several demographic factors in both the US and Mexico study populations. The overall study population was primarily younger MSM (below 30 years of age), more highly educated,

and more "out" (have disclosed same sex behaviors to both family/friends and healthcare

providers/co-workers). The skewed demographics of respondents may limit the

generalizability of these findings to other MSM populations in the US and Mexico.

Selection bias may be impacting the US AMIS-2018 survey results due to an

underrepresentation of Black MSM and individuals living in rural areas which constitute

13% and 19% of the overall US population, respectively[37,38]. Also, the AMIS-Mexico

survey did not collect location information below the state level and did not collect any

information regarding race/ethnicity or indigenous status. Race is socially constructed

and context dependent so although race/ethnicity[39] could not be directly compared across

the two countries, collecting data on perceptions of race in different countries would

provide salient information about the intersection of marginalized identities and LGBTQ

discrimination.

The prevalence of missing values was relatively similar (0% - 3%) across all but one of

the stigma items for both countries. Out of the all the US respondents that answered

"yes," to the question about whether they had ever been forced to have sex, 24% did not

answer the following question about whether or not they believed the experience had

been related to the fact that they have sex with men. This suggests that the analysis of

reported experience of rape among US MSM may be influenced by information bias.

Furthermore, 38% of US participants also did not provide information regarding their

highest level of education attained; this high level of missing information limits

conclusions that can be drawn regarding the relationship between education status and

stigma experience in the US. Generally speaking, MSM from the US and Mexico

answered stigma items as "Prefer Not to Answer" (0% - 1%) or "Don't Know" (0% - 10%) with similar frequencies. However, the Mexico survey included an additional, alternate response option of "Not Applicable" that was not incorporated in the US survey which was used with varying frequency (0% - 10%) and may affect interpretation of non-responses to the stigma items.

Although all but two of the stigma types were statistically different in the crude models, and after adjusting for confounders, all stigma types were statistically different across the two countries, many of the associated 95% confidence intervals closely bordered the null. This may in part be due to the fact that log-binomial regression can overestimate the precision of confidence intervals. Prevalence ratios with statistically significant confidence intervals close to the null should be interpreted with caution as they likely do not represent meaningful differences in the stigma experience between the two settings.

Conclusions

Overall, sexuality-related stigma is a common experience among MSM in healthcare, interpersonal, and public settings in both the US and Mexico. Despite the existence of non-discrimination policies at national levels, variation in enforcement and gaps in adoption of policies at lower levels of government have contributed to uneven progress in the sociopolitical landscapes that are damaging to the physical and mental health of MSM, and sexual and gender minorities more generally. More research is needed in this area to further characterize the stigma experience of MSM, especially among those who hold multiple marginalized identities, to better understand how the mechanisms of

stigmatization operate and are perpetuated in different contexts to design more effective

structural interventions. The experience of sexuality-related stigma is influenced by a

myriad of other sociodemographic factors; therefore, response efforts require an

intersectional, context-specific approach to make a meaningful impact on subsequent

health disparities and poor health outcomes among MSM, globally.

Tables and Figures

Table 1. Breakdown of Mexican region definitions by states

Region	States
North	Baja California
	Baja California Sur
	Sonora
	Chihuahua
	Coahuila
	Nuevo León
	Tamaulipas
Bajio	Durango
	Nayarit
	Jalisco
	Colima
	Michoacán
	Zacatecas
	Aguascalientes
	San Luis Potosí
	Guanajuato
	Querétaro
Center	Hidalgo
	México
	Federal District
	Morelos
	Tlaxcala
	Puebla
	Veracruz
South	Guerrero
	Oaxaca
	Chiapas
	Tabasco
	Campeche
	Yucatán
	Quintana Roo

Table 2. Sexual behavior stigma items (Yes/No)

1. Have you ever felt excluded from family activities because you have sex with men?
2. Have you ever felt that family members have made discriminatory remarks or gossiped about you because you have sex with men?
3. Have you ever felt rejected by your friends because you have sex with men?
4. Have you ever felt afraid to go to health care services because you worry someone may learn you have sex with men?
5. Have you ever avoided going to health care services because you worry someone may learn you have sex with men?
6. Have you ever felt that you were not treated well in a health center because someone knew that you have sex with men?
7. Have you ever heard health care providers gossiping about you (talking about you) because you have sex with men?
8. Have you ever felt that the police refused to protect you because you have sex with men?
9. Have you ever felt scared to be in public places because you have sex with men?
10. Have you ever been verbally harassed and felt it was because you have sex with men?
11. Have you ever been blackmailed by someone because you have sex with men?
12. A) Has someone ever physically hurt you (pushed, shoved, slapped, hit, kicked, choked or otherwise physically hurt you)?
    (B) Do you believe any of these experiences of physical violence was/were related to the fact that you have sex with men?
13. (A) Have you ever been forced to have sex when you did not want to? (By forced, I mean physically forced, coerced to have sex, or penetrated with an object, when you did not want to).
    (B) Do you believe any of these experiences of sexual violence were related to the fact that you have sex with men?

Table 3. Characteristics of 2018 participants in the American Men's Internet Survey

	All Participants - 25286 N(%)	US - 9397 (37%) N(%)	Mexico - 15889 (63%) N(%)
Age at Time of Survey			
Mean (SD)	30.54(11.8)	34.65(15.3)	28.11(8.1)
Median	27	29	26
18-24	9777(39)	3500(37)	6277(40)
25-29	5473(22)	1308(14)	4165(26)
30-39	4515(21)	1503(16)	3912(25)
40+	4621(18)	3086(33)	1535(10)
Education			
More than secondary school/high school	17056(80)	5388(92)	11668(75)
Secondary school/high school	3973(19)	423(7)	3550(23)
Less than secondary school	439(2)	39(1)	400 (3)
Disclosure Status			
Disclosed to no one	774(4)	7(0.1)	767(5)
Disclosed to family/friends	2458(12)	827(15)	1631(10)
Disclosed to health care worker/employer	864(4)	9(0.2)	855(6)
Disclosed to both	16986(81)	4597(85)	12389(79)

Table 3a. Characteristics of US AMIS-2018 participants

	N(%)
Race/Ethnicity	
Non-Hispanic Black	525(6)
Hispanic	1423(15)
Non-Hispanic white	6618(72)
Other, multiple, unknown	671(7)
Urbanicity	
Urban	3477(37)
Suburban	1907(20)
Medium/small metro	3080(33)
Rural	924(10)
Region	
Northeast	1532(16)
Midwest	2032(22)
South	3604(38)
West	2221(24)
US Dependent Areas	8(0.1)

Table 3b. Characteristics Mexico AMIS-2018 participants

	N(%)
Region	
North	2426(15)
South	2100(13)
Center	7597(48)
Bajio	3445(22)

Table 4. Crude prevalence and correlates of sexuality-related stigma among AMIS 2018 survey

Stigma	Country	n/N(%)	Prevalence Ratio (95% CI)	P-Value
Family exclusion	Overall	6193/22769 (27)		
	US	2890/8640 (34)	Reference	--
	Mexico	3303/14129 (23)	0.70 (0.67,0.73)	<0.001
Family gossip	Overall	10478/22320 (47)		
	US	4023/8206 (49)	Reference	--
	Mexico	6455/14114 (46)	0.93 (0.91, 0.96)	<0.001
Friend rejection	Overall	5346(23)		
	US	2292/8804 (26)	Reference	--
	Mexico	3054/14280(21)	0.79 (0.76,0.83)	<0.001
Afraid to seek health	Overall	6071/24414(25)		
	US	2559/9205(28)	Reference	--
	Mexico	3512/15209(23)	0.83 (0.80,0.87)	<0.001
Poor health care	Overall	2071/23298(9)		
	US	776/8904(9)	Reference	--
	Mexico	1295/14394(9)	1.03(0.95,1.12)	0.46
Avoided health care	Overall	4459/24402(18)		
	US	1989/9143(22)	Reference	--
	Mexico	2470/15259(16)	0.74(0.71,0.78)	<0.001
Health care worker gossip	Overall	1610/23429(7)		
	US	393/8962(4)	Reference	--
	Mexico	1217/14467(8)	1.92(1.72,2.14)	<0.001
Police refused to protect	Overall	2982/22457(13)		
	US	675/8872(8)	Reference	--
	Mexico	2307/13585(17)	2.23(2.06,2.42)	<0.001
Scared to be in public	Overall	7053/24035(29)		
	US	3293/9109(36)	Reference	--
	Mexico	3760/14926(25)	0.70 (0.67,0.72)	<0.001
Verbally harassed	Overall	11318/24187(47)		
	US	4054/9113(45)	Reference	--
	Mexico	7264/15074(48)	1.08(1.05,1.11)	<0.001
Blackmailed	Overall	3831/24376(16)		
	US	1162/9119(13)	Reference	--
	Mexico	2669/15257(18)	1.37(1.29,1.46)	<0.001
Physically hurt	Overall	3682/25286(15)		
	US	1419/9397(15)	Reference	--
	Mexico	2263/15889(14)	0.94(0.89,1.00)	0.06
Raped	Overall	1833/25286(7)		
	US	750/9397(8)	Reference	--
	Mexico	1083/15889(7)	0.85(0.78,0.93)	<0.001

Table 5. Bivariate analyses of age, disclosure status, education level, and community tolerance with stigma types, cPR (95% CI)

Stigma Type	Age Category (Reference = 18-24)			Disclosure (Reference = disclosed to none)			Education level (Reference = < secondary)		Community Tolerance (Reference = neutral)	
	25-29	30-39	40+	Disclosed to Friends/ Family	Disclosed to HCP/ Work	Disclosed to Both	Secondary	> Secondary	Tolerant	Not Tolerant
Family exclusion	0.97(0.95, 1.00)	0.96(0.91, 1.02)	0.96(0.91, 1.02)	0.65(0.59, 0.72)	0.82(0.73, 0.93)	0.84(0.80, 0.88)	1.11(1.05, 1.17)	1.22(1.09, 1.36)	0.79(0.75, 0.83)	1.5(1.43, 1.6)
Family gossip	0.99(0.97, 1.01)	0.92(0.89, 0.96)	0.92(0.89. 0.96)	0.83(0.78, 0.89)	0.93(0.85, 1.01)	1.06(1.02, 1.10)	0.99(0.96, 1.02)	0.98(0.92, 1.04)	0.86(0.83, 0.89)	1.3(1.25, 1.35)
Friend rejection	0.98(0.95, 1.01)	1.09(1.03, 1.16)	1.09(1.03, 1.16)	0.96(0.88, 1.05)	0.97(0.85, 1.11)	0.86(0.81, 0.91)	1.12(1.05, 1.18)	1.24(1.10, 1.40)	0.70(0.66, 0.74)	1.59(1.49, 1.68)
Afraid to seek health	0.97(0.94, 0.998)	0.91(0.86, 0.97)	0.91(0.86, 0.97)	1.23(1.15, 1.32)	0.69(0.60, 0.79)	0.69(0.65, 0.72)	1.10(1.04, 1.17)	1.22(1.09, 1.36)	0.68(0.65, 0.71)	1.38(1.31, 1.46)
Poor health care	1.27(1.20, 1.35)	1.93(1.72, 2.15)	1.93(1.72, 2.15)	0.63(0.52, 0.77)	2.02(1.69, 2.41)	1.01(0.91, 1.12)	1.30(1.17, 1.45)	1.69(1.37, 2.10)	0.78(0.70, 0.86)	1.82(1.63, 2.04)
Avoided health care	0.96(0.93, 0.99)	0.89(0.82, 0.95)	0.89(0.82, 0.95)	1.16(1.07, 1.26)	0.64(0.54, 0.75)	0.59(0.55, 0.63)	1.08(1.01, 1.15)	1.16(1.01, 1.32)	0.66(0.62, 0.70)	1.4(1.31, 1.50)
Healthcare worker gossip	1.25(1.17, 1.33)	1.73(1.52, 1.96)	1.73(1.52, 1.96)	0.99(0.80, 1.22)	2.14(1.72, 2.67)	1.21(1.06, 1.38)	1.27(1.13, 1.43)	1.62(1.28, 2.05)	0.73(0.65, 0.82)	1.88(1.65, 2.13)
Police refused to protect	1.21(1.15, 1.26)	1.48(1.36, 1.62)	1.48(1.36, 1.62)	0.99(0.84, 1.17)	2.36(2.00, 2.80)	1.68(1.52, 1.86)	1.01(0.94, 1.09)	1.03(0.89, 1.20)	0.81(0.74, 0.88)	1.67(1.52, 1.83)
Scared to be in public	0.98(0.96, 1.01)	0.88(0.84, 0.93)	0.88(0.84, 0.93)	0.78(0.72, 0.84)	0.69(0.60, 0.78)	0.89(0.85, 0.93)	1.09(1.03, 1.14)	1.18(1.07, 1.30)	0.85(0.81, 0.89)	1.56(1.48, 1.65)
Verbally harassed	1.02(1.00, 1.04)	1.00(0.96, 1.03)	1.00(0.96, 1.03)	0.84(0.78, 0.89)	1.20(1.11, 1.30)	1.22(1.17, 1.26)	0.96(0.94, 0.99)	0.93(0.88, 0.99)	0.92(0.89, 0.95)	1.31(1.26, 1.36)
Blackmailed	0.98(0.94, 1.02)	0.92(0.85, 0.99)	0.92(0.85, 0.99)	1.13(1.01, 1.27)	1.48(1.27, 1.72)	1.12(1.04, 1.21)	0.94(0.88, 1.01)	0.89(0.78, 1.01)	0.73(0.68, 0.78)	1.51(1.40, 1.64)
Physically hurt	1.04(1.00, 1.09)	1.16(1.08, 1.26)	1.16(1.08, 1.26)	0.59(0.51, 0.69)	1.14(0.96, 1.36)	1.16(1.07, 1.26)	1.01(0.94, 1.08)	1.02(0.89, 1.17)	0.96(0.90, 1.04)	1.75(1.61, 1.91)
Raped	1.05(0.99, 1.11)	0.99(0.88, 1.12)	0.99(0.88, 1.12)	0.90(0.74, 1.10)	1.48(1.16, 1.88)	1.29(1.14, 1.46)	0.93(0.84, 1.02)	0.86(0.70, 1.05)	0.89(0.80, 0.98)	1.46(1.29, 1.66)

Table 6. Prevalence of sexual behavior stigma among MSM in US AMIS-2018 by region

Stigma	Region	n/N(%)	cPR (95% CI)	P-value
Family exclusion	Northeast	424/1403(30)	Reference	--
	Midwest	637/1847(35)	1.14(1.03,1.26)	0.01
	South	1168/3315(35)	1.17(1.06,1.280	0.001
	West	659/2069(32)	1.05(0.95,1.17)	0.31
Family gossip	Northeast	585/1336(44)	Reference	--
	Midwest	893/1769(51)	1.15(1.07,1.24)	<0.001
	South	1576/3134(50)	1.15(1.07,1.23)	<0.001
	West	965/1961(49)	1.12(1.04,1.21)	0.003
Friend rejection	Northeast	351/1433(25)	Reference	--
	Midwest	487/1912(26)	1.04(0.92,1.17)	0.52
	South	912/3378(27)	1.10(0.99,1.23)	0.07
	West	541/2073(26)	1.07(0.95,1.20)	0.29
Afraid to seek health	Northeast	381/1494(26)	Reference	--
	Midwest	589/1983(30)	1.16(1.04,1.30)	0.01
	South	1004/3542(28)	1.11(1.01,1.23)	0.04
	West	580/2178(27)	1.04(0.93,1.17)	0.45
Poor health care	Northeast	131/1454(9)	Reference	--
	Midwest	148/1921(8)	0.86(0.68,1.07)	0.17
	South	312/3428(9)	1.01(0.83,1.23)	0.92
	West	185/2093(9)	0.98(0.79,1.21)	0.86
Avoided health care	Northeast	294/1493(20)	Reference	--
	Midwest	464/1972(24)	1.19(1.05,1.36)	0.01
	South	794/3513(23)	1.15(1.02,1.29)	0.02
	West	434/2157(20)	1.02(0.89,1.17)	0.75
Health care worker gossip	Northeast	61/1468(4)	Reference	--
	Midwest	89/1946(5)	1.10(0.80,1.51)	0.56
	South	163/3441(5)	1.14(0.85,1.52)	0.37
	West	80/2099(4)	0.92(0.66,1.27)	0.6
Police refused to protect	Northeast	105/1436(7)	Reference	--
	Midwest	149/1926(8)	1.06(0.83,1.35)	0.65
	South	263/3425(8)	1.05(0.84,1.31)	0.66
	West	158/2078(8)	1.04(0.82,1.32)	0.75
Scared to be in public	Northeast	538/1483(36)	Reference	--
	Midwest	694/1967(35)	0.97(0.89,1.06)	0.55
	South	1234/3499(35)	0.97(0.90,1.05)	0.49
	West	823/2153(38)	1.05(0.97,1.15)	0.23
Verbally harassed	Northeast	661/1492(44)	Reference	--
	Midwest	895/1970(45)	1.03(0.95,1.11)	0.51
	South	1527/3502(44)	0.98(0.92,1.05)	0.65
	West	967/2142(45)	1.02(0.95,1.10)	0.62
Blackmailed	Northeast	183/1498(12)	Reference	--
	Midwest	277/1964(14)	1.15(0.97,1.37)	0.11
	South	469/3495(13)	1.10(0.94,1.29)	0.25
	West	232/2155(11)	0.88(0.73,1.06)	0.17
Physically hurt	Northeast	230/1532(15)	Reference	--
	Midwest	296/2032(15)	0.97(0.83,1.14)	0.71
	South	536/3604(15)	0.99(0.86,1.14)	0.9
	West	356/2221(16)	1.07(0.92,1.24)	0.4
Raped	Northeast	122/1532(8)	Reference	--
	Midwest	177/2032(9)	1.09(0.88,1.36)	0.43
	South	253/3604(7)	0.88(0.72,1.08)	0.23
	West	198/2221(9)	1.12(0.90,1.39)	0.31

Table 7. Prevalence of sexual behavior stigma among MSM in US AMIS-2018 by race/ethnicity

Stigma	Race/ethnicity	n/N(%)	cPR (95% CI)	P-value
Family exclusion	White	2098/6127 (34)	Reference	--
	Hispanic	407/1287 (32)	0.93(0.85,1.01)	0.09
	Black	127/479 (27)	0.78(0.67,0.91)	0.001
	Other	218/605 (36)	1.06(0.95,1.18)	0.33
Family gossip	White	2800/5809(48)	Reference	--
	Hispanic	638/1223(52)	1.08(1.02,1.15)	0.01
	Black	229/456(50)	1.04(0.95,1.14)	0.42
	Other	289/591(49)	1.01(0.93,1.10)	0.78
Friend rejection	White	1675/6201(27)	Reference	--
	Hispanic	303/1336(23)	0.83(0.75,0.93)	<0.001
	Black	105/494(21)	0.78(0.66,0.93)	0.01
	Other	160/628(26)	0.94(0.82,1.08)	0.37
Afraid to seek health	White	1779/6498(27)	Reference	--
	Hispanic	408/1394(29)	1.06(0.97,1.16)	0.19
	Black	129/509(25)	0.92(0.79,1.07)	0.29
	Other	191/652(29)	1.06(0.94,1.21)	0.33
Poor health care	White	572/6292(9)	Reference	--
	Hispanic	111/1341(8)	0.91(0.75,1.10)	0.34
	Black	32/492(7)	0.71(0.51,1.01)	0.06
	Other	47/636(7)	0.81(0.61,1.08)	0.15
Avoided health care	White	1370/6452(21)	Reference	--
	Hispanic	341/1388(25)	1.15(1.04,1.28)	0.01
	Black	100/504(20)	0.93(0.78,1.12)	0.44
	Other	141/651(22)	1.02(0.87,1.18)	0.84
Health care worker gossip	White	267/6335(4)	Reference	--
	Hispanic	62/1344(5)	1.08(0.82,1.41)	0.6
	Black	21/502(4)	0.98(0.63,1.51)	0.91
	Other	32/636(5)	1.17(0.82,1.68)	0.38
Police refused to protect	White	438/6277(7)	Reference	--
	Hispanic	111/1330(8)	1.17(0.96,1.43)	0.12
	Black	42/495(9)	1.19(0.88,1.61)	0.26
	Other	64/630(10)	1.42(1.11,1.82)	0.01
Scared to be in public	White	2346/6426(37)	Reference	--
	Hispanic	501/1375(36)	1.0(0.92,1.08)	0.92
	Black	123/508(24)	0.66(0.57,0.77)	<0.001
	Other	264/652(41)	1.11(1.003,1.22)	0.04
Verbally harassed	White	2990/6423(47)	Reference	--
	Hispanic	544/1377(40)	0.85(0.79,0.91)	<0.001
	Black	170/509(33)	0.72(0.63,0.81)	<0.001
	Other	284/653(44)	0.94(0.85,1.02)	0.15
Blackmailed	White	797/6429(12)	Reference	--
	Hispanic	186/1378(14)	1.08(0.93,1.25)	0.31
	Black	70/509(14)	1.10(0.88,1.38)	0.41
	Other	84/652(13)	1.03(0.84,1.27)	0.77
Physically hurt	White	1005/6618(15)	Reference	--
	Hispanic	217/1423(15)	1.00(0.87,1.14)	1
	Black	61/525(12)	0.76(0.60,0.97)	0.03
	Other	107/671(16)	1.05(0.87,1.25)	0.63
Raped	White	507/6618(8)	Reference	--
	Hispanic	123/1423(9)	1.12(0.92,1.35)	0.25
	Black	39/525(7)	0.96(0.70,1.31)	0.79
	Other	63/671(9)	1.21(0.95,1.55)	0.13

Table 8. Prevalence of sexual behavior stigma among MSM in US AMIS-2018 by urbanicity

Stigma	Urbanicity	n/N(%)	cPR (95% CI)	P-value
Family exclusion	Urban	1101/3210(34)	Reference	--
	Suburban	536/1749(31)	0.89(0.82,0.97)	0.01
	Small/medium metro	952/2827(34)	0.98(0.92,1.05)	0.62
	Rural	299/847(35)	1.03(0.93,1.14)	0.58
Family gossip	Urban	1535/3036(51)	Reference	--
	Suburban	743/1662(45)	0.88(0.83,0.94)	<0.001
	Small/medium metro	1323/2697(49)	0.97(0.92,1.02)	0.24
	Rural	417/804(52)	1.02(0.95,1.11)	0.52
Friend rejection	Urban	835/3266(26)	Reference	--
	Suburban	449/1789(25)	0.98(0.89,1.09)	0.74
	Small/medium metro	757/2887(26)	1.03(0.94,1.12)	0.53
	Rural	250/853(29)	1.15(1.02,1.29)	0.02
Afraid to seek health	Urban	905/3412(27)	Reference	--
	Suburban	483/1866(26)	0.97(0.88,1.07)	0.56
	Small/medium metro	869/3020(29)	1.08(1.00,1.17)	0.05
	Rural	296/898(33)	1.24(1.11,1.38)	<0.001
Poor health care	Urban	326/3302(10)	Reference	--
	Suburban	131/1797(7)	0.74(0.61,0.90)	0.002
	Small/medium metro	245/2922(8)	0.85(0.73,0.997)	0.046
	Rural	74/874(8)	0.86(0.68,1.09)	0.22
Avoided health care	Urban	711/3391(21)	Reference	--
	Suburban	376/1854(20)	0.97(0.86,1.08)	0.54
	Small/medium metro	670/2994(22)	1.07(0.97,1.17)	0.18
	Rural	229/895(26)	1.22(1.07,1.39)	0.003
Health care worker gossip	Urban	149/3315(5)	Reference	--
	Suburban	76/1822(4)	0.93(0.71,1.22)	0.6
	Small/medium metro	123/2939(4)	0.93(0.74,1.18)	0.56
	Rural	45/877(5)	1.14(0.83,1.58)	0.42
Police refused to protect	Urban	278/3284(9)	Reference	--
	Suburban	119/1794(7)	0.79(0.64,0.97)	0.02
	Small/medium metro	215/2903(7)	0.88(0.74,1.04)	0.13
	Rural	63/883(7)	0.84(0.65,1.10)	0.21
Scared to be in public	Urban	1326/3374(40)	Reference	--
	Suburban	620/1844(34)	0.86(0.79,0.92)	<0.001
	Small/medium metro	1064/2990(36)	0.90(0.85,0.96)	0.002
	Rural	279/893(31)	0.79(0.71,0.88)	<0.001
Verbally harassed	Urban	1617/3369(48)	Reference	--
	Suburban	776/1847(42)	0.88(0.82,0.93)	<0.001
	Small/medium metro	1277/2989(43)	0.89(0.84,0.94)	<0.001
	Rural	380/900(42)	0.88(0.81,0.96)	0.002
Blackmailed	Urban	377/3372(11)	Reference	--
	Suburban	251/1854(14)	1.21(1.04,1.41)	0.01
	Small/medium metro	394/2993(13)	1.18(1.03,1.34)	0.02
	Rural	139/892(16)	1.39(1.16,1.67)	<0.001
Physically hurt	Urban	540/3477(16)	Reference	--
	Suburban	262/1907(14)	0.89(0.77,1.01)	0.08
	Small/medium metro	476/3080(16)	1.0(0.89,1.12)	0.94
	Rural	140/924(15)	0.98(0.82,1.16)	0.78
Raped	Urban	307/3477(9)	Reference	--
	Suburban	141/1907(7)	0.84(0.69,1.02)	0.07
	Small/medium metro	236/3080(8)	0.87(0.74,1.02)	0.09
	Rural	66/924(7)	0.81(0.63,1.05)	0.11

Table 9. Prevalence of sexual behavior stigma among MSM in Mexico AMIS-2018 by region

Stigma	Region	n/N(%)	cPR (95% CI)	P-value
Family exclusion	North	496/2138(23)	Reference	--
	South	381/1875(20)	0.89(0.79,1.00)	0.05
	Center	1655/6785(24)	1.07(0.98,1.17)	0.11
	Bajio	716/3050(24)	1.03(0.94,1.14)	0.54
Family gossip	North	950/2141(44)	Reference	--
	South	813/1875(43)	0.98(0.91,1.05)	0.49
	Center	3162/6776(47)	1.05(1.00,1.11)	0.06
	Bajio	1404/3040(46)	1.04(0.98,1.10)	0.19
Friend rejection	North	461/2239(21)	Reference	--
	South	384/1956(20)	0.98(0.87,1.10)	0.74
	Center	1448/7119(20)	1.02(0.93,1.11)	0.73
	Bajio	714/3208(22)	1.11(1.005,1.23)	0.04
Afraid to seek health	North	528/2325(23)	Reference	--
	South	535/2016(27)	1.18(1.07,1.30)	0.001
	Center	1608/7265(22)	0.98(0.91,1.07)	0.7
	Bajio	777/3297(24)	1.05(0.95,1.15)	0.33
Poor health care	North	144/2217(7)	Reference	--
	South	166/1910(9)	1.32(1.08,1.63)	0.01
	Center	696/6901(10)	1.54(1.30,1.81)	<0.001
	Bajio	269/3087(9)	1.33(1.10,1.60)	0.003
Avoided health care	North	391/2337(17)	Reference	--
	South	373/2011(19)	1.13(0.99,1.28)	0.06
	Center	1103/7300(15)	0.92(0.83,1.01)	0.09
	Bajio	558/3303(17)	1.02(0.91,1.15)	0.67
Health care worker gossip	North	173/2220(8)	Reference	--
	South	147/1904(8)	0.97(0.79,1.20)	0.8
	Center	603/6912(9)	1.10(0.94,1.28)	0.22
	Bajio	268/3140(9)	1.08(0.90,1.28)	0.41
Police refused to protect	North	328/2097(16)	Reference	--
	South	307/1811(17)	1.08(0.94,1.24)	0.28
	Center	1173/6454(18)	1.16(1.04,1.29)	0.007
	Bajio	454/2946(15)	0.98(0.86,1.11)	0.76
Scared to be in public	North	498/2266(22)	Reference	--
	South	408/1955(21)	0.99(0.88,1.10)	0.8
	Center	1986/7171(28)	1.31(1.20,1.42)	<0.001
	Bajio	822/3232(25)	1.20(1.09,1.32)	<0.001
Verbally harassed	North	1075/2301(47)	Reference	--
	South	884/1981(45)	0.97(0.91,1.04)	0.39
	Center	3563/7234(49)	1.07(1.02,1.13)	0.004
	Bajio	1622/3256(50)	1.09(1.03,1.15)	0.003
Blackmailed	North	416/2324(18)	Reference	--
	South	396/2005(20)	1.14(1.01,1.28)	0.04
	Center	1228/7312(17)	0.97(0.88,1.07)	0.5
	Bajio	588/3309(18)	1.02(0.92,1.14)	0.69
Physically hurt	North	322/2426(13)	Reference	--
	South	242/2100(12)	0.86(0.74,1.01)	0.06
	Center	1153/7597(15)	1.14(1.02,1.27)	0.02
	Bajio	502/3445(15)	1.09(0.97,1.24)	0.16
Raped	North	183/2426(8)	Reference	--
	South	149/2100(7)	0.96(0.78,1.18)	0.7
	Center	485/7597(6)	0.86(0.74,1.01)	0.07
	Bajio	246/3445(7)	0.97(0.81,1.16)	0.71

Table 10. Adjusted prevalence and correlates of sexuality-related stigma among AMIS-2018 survey

Stigma	Country	n/N(%)	aPrevalence Ratio (95% CI)	P-Value
Family exclusion	Overall	6193/22769 (27)		
	US	2890/8640 (34)	Reference	--
	Mexico	3303/14129 (23)	0.67(0.63,0.71)	<0.001
Family gossip	Overall	10478/22320 (47)		
	US	4023/8206 (49)	Reference	--
	Mexico	6455/14114 (46)	0.86(0.82,0.89)	<0.001
Friend rejection	Overall	5346(23)		
	US	2292/8804 (26)	Reference	--
	Mexico	3054/14280(20.1)	0.85(0.79,0.91)	<0.001
Afraid to seek health	Overall	6071/24414(25)		
	US	2559/9205(28)	Reference	--
	Mexico	3512/15209(23)	0.92 (0.86, 0.99)	0.02
Poor health care	Overall	2071/23298(9)		
	US	776/8904(9)	Reference	--
	Mexico	1295/14394(9)	0.89(0.79,0.996)	0.04
Avoided health care	Overall	4459/24402(18)		
	US	1989/9143(22)	Reference	--
	Mexico	2470/15259(16)	0.83(0.77,0.91)	<0.001
Health care worker gossip	Overall	1610/23429(7)		
	US	393/8962(4)	Reference	--
	Mexico	1217/14467(8)	1.94(1.66,2.25)	<0.001
Police refused to protect	Overall	2982/22457(13)		
	US	675/8872(8)	Reference	--
	Mexico	2307/13585(17)	1.89(1.69,2.11)	<0.001
Scared to be in public	Overall	7053/24035(29)		
	US	3293/9109(36)	Reference	--
	Mexico	3760/14926(25)	0.61(0.58,0.65)	<0.001
Verbally harassed	Overall	11318/24187(47)		
	US	4054/9113(45)	Reference	--
	Mexico	7264/15074(48)	0.94(0.90,0.98)	0.003
Blackmailed	Overall	3831/24376(16)		
	US	1162/9119(13)	Reference	--
	Mexico	2669/15257(18)	1.66(1.49,1.84)	<0.001
Physically hurt	Overall	3682/25286(15)		
	US	1419/9397(15)	Reference	--
	Mexico	2263/15889(14)	0.86(0.79,0.94)	<0.001
Raped	Overall	1833/25286(7)		
	US	750/9397(8)	Reference	--
	Mexico	1083/15889(7)	0.71(0.62,0.81)	<0.001

Models adjusted for age, disclosure, and education level.

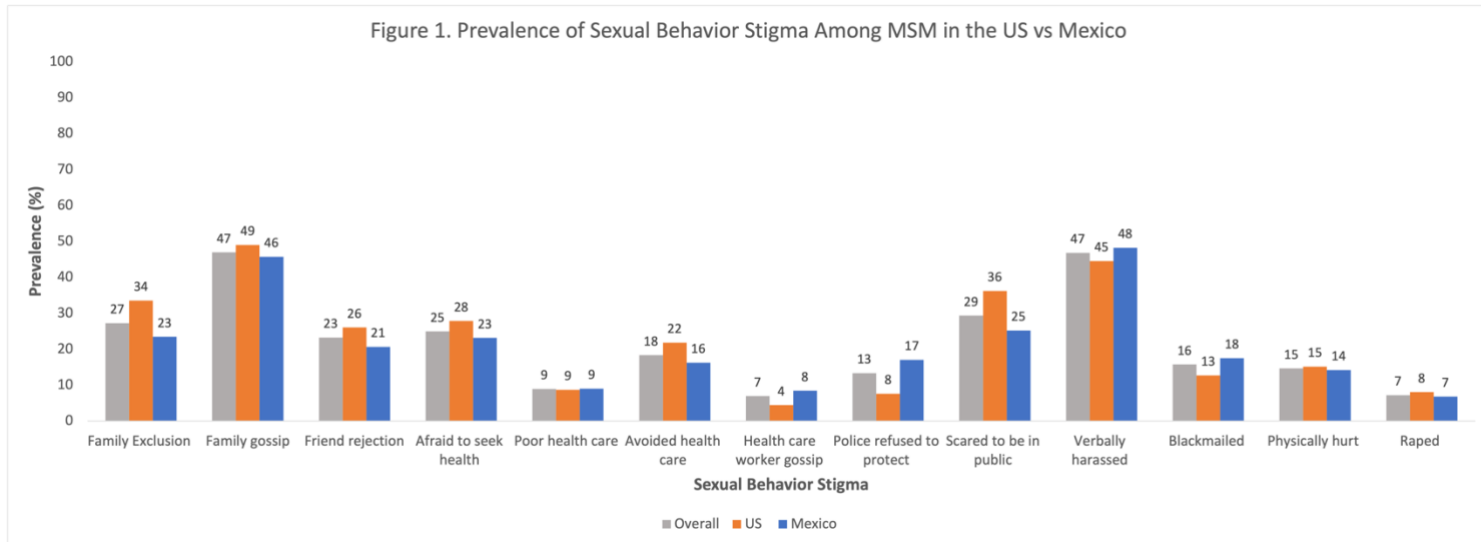Figure 1. Prevalence of Sexual Behavior Stigma Among MSM in the US vs Mexico

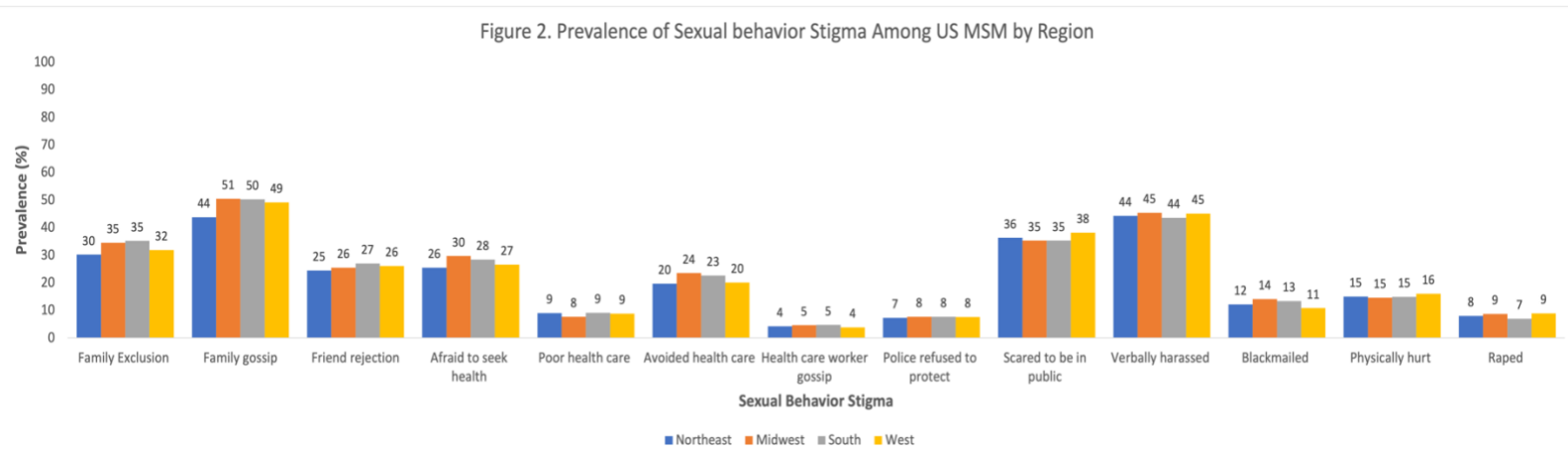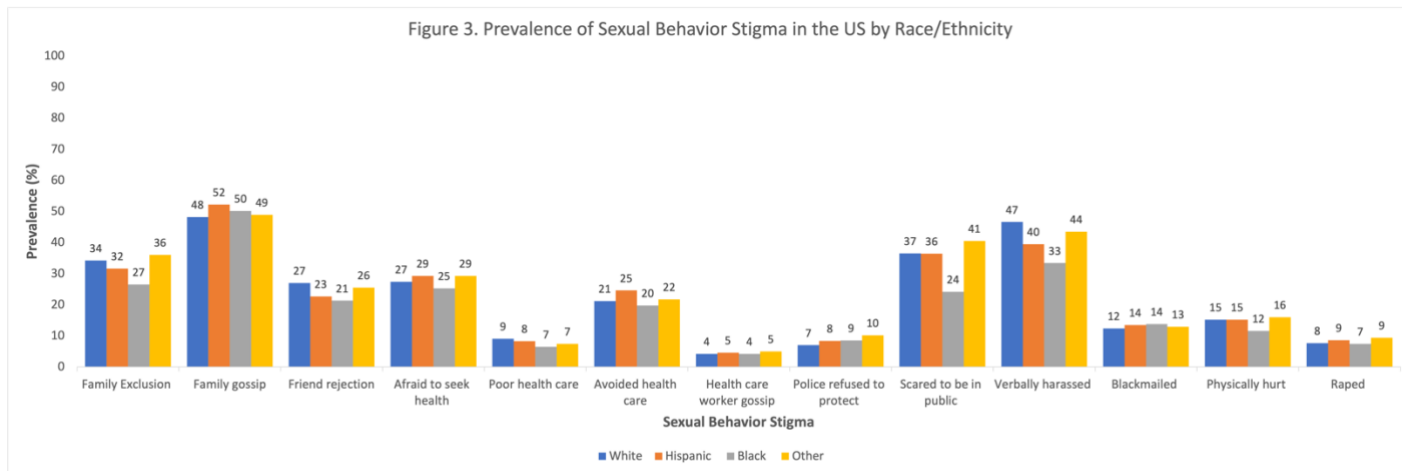Figure 2. Prevalence of Sexual behavior Stigma Among US MSM by Region

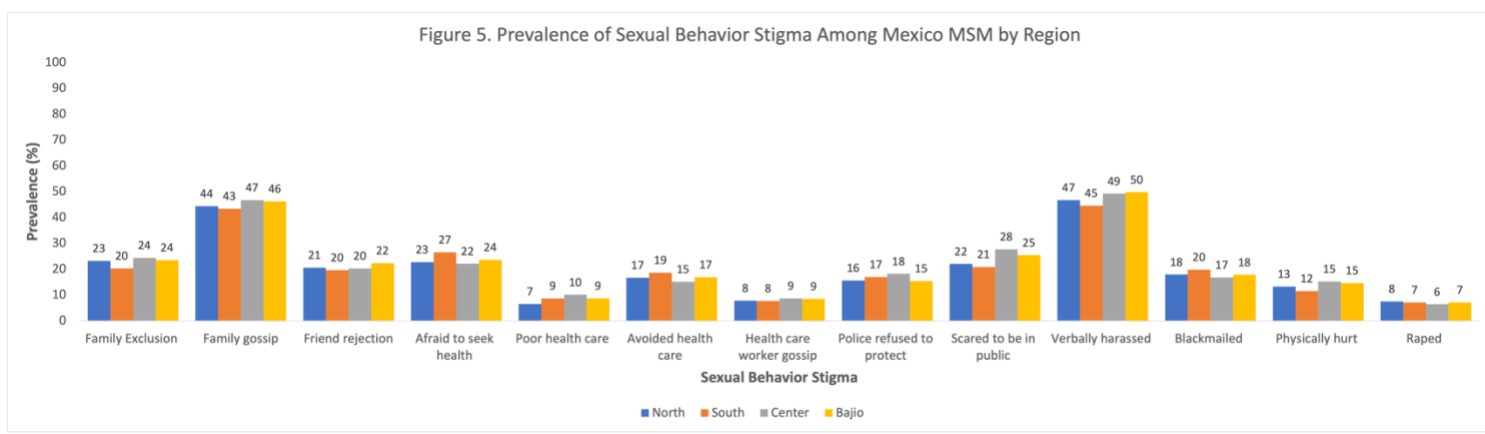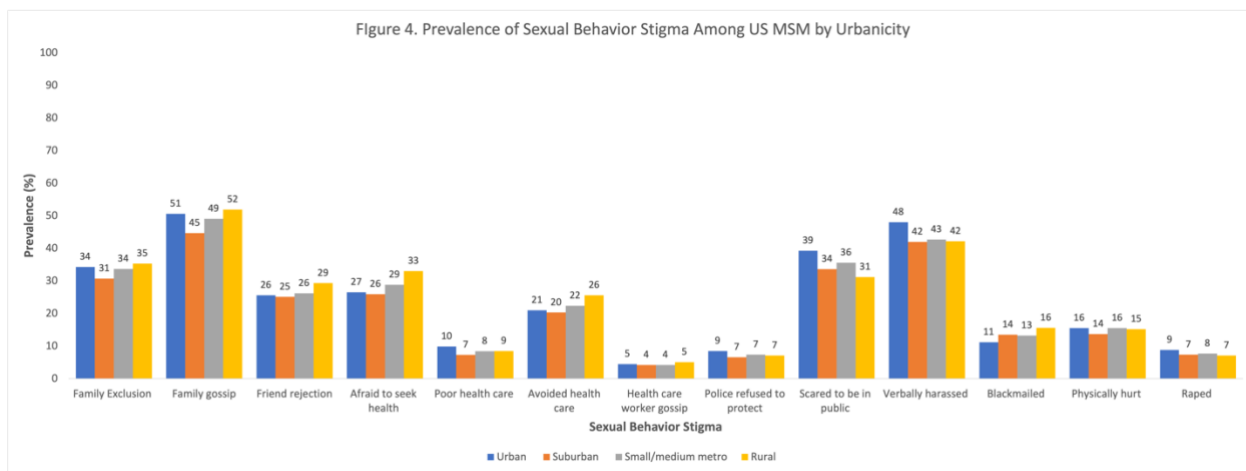Figure 3. Prevalence of Sexual Behavior Stigma in the US by Race/Ethnicity

Figure 4. Prevalence of Sexual Behavior Stigma Among US MSM by Urbanicity

Figure 5. Prevalence of Sexual Behavior Stigma Among Mexico MSM by Region

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