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# Factors Associated With Consistent Condom Use Among Mixtec And Zapotec Men Who Migrate

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FACTORS ASSOCIATED WITH CONSISTENT CONDOM USE AMONG  
MIXTEC AND ZAPOTEC MEN WHO MIGRATE

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FACTORS ASSOCIATED WITH CONSISTENT CONDOM USE AMONG  
MIXTEC AND ZAPOTEC MEN WHO MIGRATE

by

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THESIS

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## **ABSTRACT**

Migration has been associated with higher incidence and prevalence of illness among those who migrate when compared to the general population. One of the main concerns when referring to illness among migrant populations is HIV and other STDs. Due to several factors that present to migrant populations they have been found at higher risk for contracting these diseases. Lack of condom use has been found to be a risk factor amongst migrant populations. This study is a secondary data analysis of a previous study performed in California, Chihuahua, and Oaxaca, with Mixtec and Zapotec migrant populations. The purpose of this study was to assess the association of risk perception and attitudes towards condom use to actual condom use among this population by performing bivariate analysis. Among Mixtec and Zapotec men who migrate and have stable female partner (N=65), the proportion of participants who indicated they would use a condom if their partner suggested it, the proportion of those who believe that people who use condoms deserve respect, and the proportion of those who said that they would feel safe if their partner suggested using a condom were statistically significantly different by actual condom use ( $p\text{-values}<0.05$ ).

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## **BACKGROUND AND SIGNIFICANCE**

### **MIGRATION**

Migration is a phenomenon that is not exclusive to human beings; all animals take part in this process for the same reason: survival. At its inception, migration took place in order to survive in the face of adverse environmental conditions, for example hostile weather, food and water availability, escape predation, and scarcity of natural resources. Today, as in the past, human migration takes place for the purpose of survival. However, the “adverse conditions” confronted by contemporary migrants might be different than those of prehistoric ancestors.

This process takes place worldwide, however, the focus on migration in this paper is from Latin America to the United States, specifically from Mexico, because 58% of the total undocumented immigrants living in the U.S. are Mexican[1]. There are three main types of migration; international, internal, and residential[2]. International refers a migration from a country of origin to a destination country. Internal refers to migration within the same country. Residential is a short migration usually within the same city. Migration can be documented or undocumented, voluntary or forced, it can be influenced by “push” factors from the country of origin or “pull” factors by the destination country (usually a mixture of both), and it can be permanent or temporary[3].

Environmental, political, economic, and social climates of a country can lead to many of its residents to take the decision of migrate and not live under those unfavorable conditions[4].

The complexity of society and all of the processes that take place within create a vast pool of opportunities for the idea of “moving to a better place” to arise. These may include

political ideologies, current security situation in the country of origin, less than favorable economic situation, unemployment, etc.[4]

The political situation in a country can be one of the main reasons why people migrate. This can suggest that the collective political ideology of a country's populace is opposite to someone's beliefs and that makes the person feel obliged to seek a more accommodating idiosyncrasy. This can refer to many factors, for example the form of government, (e.g., democracy, dictatorship, monarchy) or ideology of the nation-state (e.g., socialist, capitalist, communist)[5].

Economic reasons for migration can arise from the economic state of the country as a whole or of the particular individual. These reasons refer to multiple factors, such as unemployment and low economic status. If the unemployment is a general problem in the country, the economy is aggravated, thus creating a "push" factor. If you sum the "pull" factor of better employment opportunities in a foreign country or a different city, then migration is virtually the only option in the eyes of the individual. Even if unemployment is not an issue, but rather low wages or low quality of life can be strong reason for an individual to pursue a better socioeconomic status, for them and their families. Political and economic reasons for migration, rather than being mutually exclusive, usually go hand in hand[5].

## **MIGRATION IN MEXICO**

Historically, Mexican immigrants began flowing to the U.S. during World War II with the *Bracero Program*. It contracted Mexican laborers to temporary work in the U.S. After the program ended in 1964, even with the explosion of the maquiladora industry, Mexican immigrants still continued to flow towards the U.S. in search of the "American Dream."

The 1994 North American Trade Agreement went into effect on January 1 of that year. It freed the trade and investments between Mexico, the United States and Canada. Studies agreed that this agreement would generate the largest bulk of jobs in Mexico and that this in effect would reduce the unauthorized migration, but instead the number of undocumented Mexican immigrants living in the U.S. nearly doubled from 2.5 million in 1995 to 4.5 million in 2000, and 2.2 million were admitted as legal residents[1]. A rise in migration was expected at the beginning of the agreement because Mexico's economy would need time to adjust, but the crisis of 1995 with the devaluation of the *peso*, the rise of china's economic power, and the growing family migration networks between Mexico and the U.S. exponentially incremented the migration from Mexico to the U.S.[2]. Insecurity is a recently overexposed (due to the influence of the media on the general public about their everyday situation) reason for all types of migration. It gained this new wave of media exposure due to the fairly recent insecurity situation in Mexico due to the "war against the *narco*." The "war against the *narco*" was an initiative by the current president Felipe Calderon in order to reduce or ease the power of the illegal business, but backfired and led to a massive wave of crime that "pushed" many Mexicans towards the U.S., other cities within Mexico, and even to "safer" neighborhoods within the same city, in order to avoid the situation[3]. Again this factor may have its roots embedded on the political climate of the country. Today, Mexican immigrants are migrating to the U.S. because of all previously mentioned factors. Individuals are not influenced to migrate by a single factor, and this is not only true to Mexico, the globalization movement has affected less developed countries in the same way[4]. Migration, as stated before, may have many underlying "push" and "pull" factors that ultimately lead individuals to migrate or stay put. But the process is not that simple, there are

many barriers that act against migration. The barriers are of physical, social, and environmental nature, and include foreign policy.

Foreign policy is the biggest barrier for an individual looking to migrate to a different country. Policy of the destination country regarding immigration will dictate the process the individual will undergo in order to establish residence in the foreign country. The individual has the option of migrating through legal matters, which usually is very limited, time-consuming and costly, and most of the people who want to migrate do not have the necessary qualifications for legal entry, which are only for family reunification and provision of scarce labor, and do not have time or the financial capital to go through the legal immigration process[5]. This leads with no other option than to attempt to cross borders in an undocumented manner[6].

According to the Department of Homeland Security there were 11.5 million undocumented immigrants living in the United States in 2011 and 59% of the undocumented immigrants were from Mexico (6.8 million). Undocumented immigrants account for 28% of the United States' foreign born population which was 40.2 million in 2010. There were 29 million legal immigrants living in the United States in 2010, 14.9 million were naturalized citizens, 12.4 million were legal permanent residents, and 1.7 million were legal temporary migrants. There may be certain limitations to this data because it is based on apprehensions which may not reflect the actual number of undocumented immigrants.

In 2010, 463,382 individuals attempting to cross the border in an undocumented status were apprehended by the U.S. Border Patrol[7]. According to this enforcement agency, this number represents a decrease in undocumented border crossings from the previous year. By 2011, the number had decreased to 340,252[8]. The U.S. Border Patrol doubled the number of agents from 2005 to 2011, which according to them, is one of the causes of the reduction in

number of undocumented border crossings. Another observed trend is that the number started to significantly decrease since 2007 when the recession in the U.S. began [1]. Less opportunity for employment and a higher cost of living in the U.S. is an important factor in the reduction of migrants trying to cross the border without the proper documentation, and with the 11.2 million undocumented aliens living in the U.S., the competition is rigorous[9].

Undocumented migration has the most risks and barriers associated with it. It is exponentially more dangerous than migration through legal means[10]. Physical and environmental barriers place the migrant at great risk of illness and even death. In order to cross the border avoiding the agencies in charge of enforcing the current policies regarding immigration, the migrants expose themselves to extreme physical conditions and inclement environmental situations. A study by Eschbach (2001) state the main causes of death of migrants crossing the U.S.-Mexico border are extreme heat or cold, train and auto-pedestrian accidents, drowning, suffocation, homicides, and other unknown accidents[11]. The 473 deaths of undocumented immigrants reported in 2009 are based on accounts for the bodies that are actually found; however, it is hypothesized this figure is a grossly underestimated by the available data[12].

A very important factor in migration is the social characteristics that accompany the process. It is important because most of the immigrants in the U.S. immigrate without proper documentation into the U.S. through close social ties that persist for generations, having precise routes, and processes for their main goal: crossing the border, obtaining labor, and getting money. But this factor also works against the decision of migration because males are usually the ones who migrate, many times leaving behind a wife and even children.

Aside from the individual problems or benefits that migration may provide, it also has certain effects on the society as a whole. Some of these effects may be relatively positive, for example, immigrants may stimulate the economy of the host country, by performing jobs that citizens of the country may not be willing or cannot perform, and spending money[13]. For some, it is a positive effect because they perform those jobs, others feel, that immigrants steal jobs that the citizens of the country could be performing[13].

Current “hot topics” related to migration and its negative effects include the much debated “brain drain” which relates to the emigration of technically skilled and knowledgeable persons, leaving the country of origin with a lack of highly-skilled human resources[14]. Another negative effect of migration is the opportunity for criminal activities, particularly human trafficking, which is usually for sex labor or modern slavery[15, 16]. Immigrants who become seasonal farmworkers are usually exposed to long hours of hard labor at relatively low pay rates, and extreme working conditions (for example extreme heat, sun exposure, chemical exposure through pesticides, lack of safety training and/or protection equipment) that may increase the likelihood of illness, accidents, and even death[17].

#### **MIXTEC AND ZAPOTEC POPULATIONS**

Mixtecs emigrate from “la Mixteca” which is an area that extends from west Oaxaca and part of the states of Guerrero and Puebla. This area is one of the poorest in Mexico; they lack potable water, schools, roads and any other basic services needed for survival, these conditions have pushed Mixtecs into migrating in search of better opportunities. In their search for a better quality of life they historically began to migrate into larger cities that could provide more job opportunities such as Veracruz and Mexico City. Eventually they began moving northwest where they have established “migration centers” in Jalisco, Sinaloa, Sonora, and Baja California[18].

These centers serve as aides to other migrants that are passing by in their quest to cross the border. There are around 15,000 Mixtecs established in these key cities for the Mixtec migration route. Once at the border, if they cross to the U.S., their main destination is California where there are over 700 different groups dispersed across several counties, but mainly in San Diego, Madera, and Fresno[19].

Mixtec migration is historically attributed to the downfall of livestock business during the Mexican revolution and to land erosion[20]. The catalyst of the migration of Mixtecs towards the north were, and still are, the “coyotes” that would travel from northern states to the Mixtec region to recruit farm and land workers, eventually the migration extended into the United States[21]. This is why the majority of the Mixtec migrant population still continues to work primarily in seasonal farming. The number of Mixtec workers during high season in California was estimated to be 50,000 (5% of agriculture workers in the state of California) in 1994[22]. Another study estimates that number to be between 20 and 30 thousand, this same study also found that Mixtecs worked more for less pay, and suffered other violations of their labor laws. Their way of living has been identified to be no better than in their places of origin and are constantly the target of racism and mistreatment not only in the United States, but also in Mexico[23].

Historically, Zapotecs began encounter a situation of extreme poverty, and sudden lack of productive resources do to an exponential demographic growth in the 50’s which eventually led to conflicts between different communities, leading to a massive abandonment of towns and loss of the most economically productive and contributive population (males 15 to 30). This problem occurred in over half of the 30 Oaxacan districts that are home to Zapotecs[24]. The first tendency of migration was towards large urban centers where they performed low skill industrial



labor, such as the *Valle de Mexico* and Mexico City. Some search better opportunities crossing the border into the U.S. where they perform low skill jobs in the urban sector. The main destiny of Zapotec migrants in the U.S. is Los Angeles California, where previous migrants help new ones obtain jobs in the same area as them[19]. Since most of the Zapotecs that initially migrated did so to urban areas, they (mostly) do not suffer the same living conditions as Mixtecs. The movement towards urban areas in California allowed Zapotec migrants to work in restaurants. Over time, the already established Zapotec migrants would accommodate their friends and family members in restaurant jobs. Currently, there are restaurants in California owned by Zapotec migrants. This established immigrant networks help other Zapotec immigrants by providing employment [25].

Indigenous immigrant populations arrive at the U.S. in an even more disadvantageous status than other Mexican immigrant populations due to most individuals not speaking Spanish well or at all, lower economic status, and being subject to racism from non-indigenous Mexican population and Americans[23]. There is very limited research on these indigenous Mexican populations. Traditionally, migration research focuses on the reasons, motives and history of the migration of these populations. More recent literature centers on the socioeconomical factors affecting Mixtec and Zapotec populations in the United States. There is a gap in the literature that can be narrowed by assessing behavioral factors and beliefs of these populations and the relationship to their health and general well-being.

## **MIGRATION AND HEALTH**

Migration has been studied in various disciplines, including economics, policy and health given its effects on so many aspects of an individual's lives and society. From the health

perspective, it has many different effects individually and adds to the burden of health disparities within societies, which in turn affects the health status of whole countries.

As mentioned before, the process of migration exposes individuals to many health risks both physically and mentally. Following, some studies documenting the effects of migration on physical and mental health will be addressed.

At the individual level, the burden of exposure to extreme environmental and geographical situations is the main risk during undocumented migration. But on a societal level, migrants pose a risk for everyone when they expose themselves to various health risks, for example infectious diseases. Usually migrants travel in groups and sometimes are clustered together for long periods of time, the perfect situation for an infectious disease to spread rapidly and eventually expose others that come in contact with the infected individuals, whether it may be in the U.S. or in the migrants' countries of origin[26].

Mental health problems have been associated with migration. Many undocumented immigrants have reported to feel certain sense of paranoia due to fear of deportation and depression as a result of the isolation and distance to their families, low sense of control over their lives, anxiety, hostility, culture shock, and general stress[27, 28]. Some studies have linked the mental health symptoms of migration to physical symptoms.

Stress among migrants has also been found to have an association to various chronic diseases such as type 2 diabetes mellitus, cardiovascular disease, being overweight and obese, and neoplasms. Other factors associated with these chronic diseases are acculturation, diet, food insecurity, pesticide exposure, and smoking [17, 29, 30].

Treatment of chronic diseases among migrants has its own challenges, as do infectious diseases. Chronic disease treatment involves constant and dedicated observation, treatment

adherence, and lifestyle changes in order to avoid more severe problems, and the continuity of care required for chronic diseases may be hard to maintain due to the mobility of migrants. Access to healthcare by immigrants is difficult to assess, some studies have found that Mexican and other Latino immigrants are less likely to utilize healthcare resources[31]. There is even less literature on the access to healthcare related to documentation status, which is hypothesized to be even less for undocumented immigrants when compared to documented immigrants and native populations[32]. The lower use of healthcare services may pose significant risks and effects for health amongst immigrants, such as undiagnosed or untreated chronic diseases which in turn may lower the quality of life in these populations. Infectious diseases are of public health importance due to their potential to create from small outbreaks to ones of pandemic proportions. That being said, some diseases are currently of major importance to the general public health than others.

Tuberculosis is one of the health issues among immigrants. There have been spikes in incidence in the last couple of years, particularly in foreign-born persons[33]. This disease caused by the agent *Mycobacterium tuberculosis* poses a particularly high risk for public health for various reasons. One, it is highly contagious (air-borne), by very small droplets expelled by an infected person when talking, coughing, sneezing, yelling, singing, etc. The second reason is that half of the cases in the U.S. are in foreign-born persons, if the person is of undocumented status, a couple of things may happen, they either won't seek timely medical treatment for fear of deportation[34], or in case the individual is deported, the case may get lost in the repatriation process. And the third reason that when cases are not properly and promptly assessed and closely followed, drug-resistance arises[35]. Many studies focus on examining health in terms of Mexican immigrants in general, and do not focus on specific ethnic populations, such as Mixtec and Zapotec immigrants, even though they are a relatively large portion of the immigrant

population in some areas. It is necessary to examine factors specific to Mixtec and Zapotec immigrants in order to understand the underlying mechanisms that cause health disparities in these immigrant sub-groups. Understanding such mechanisms would help in developing interventions that may ease the burden of such problems.

## **HIV/AIDS AMONG MIGRANTS WITHIN MEXICO**

HIV and STI infection risk is higher among immigrants than in the rest of the population for many reasons. Education attainment has been associated with increased risk for HIV and STIs. Most of the undocumented immigrants in the U.S. have only a few years of elementary education. That lack of education compounds with the low perceived risk perception that has been identified in some studies. Other psychological factors influence the participation in high risk activities such as paying for sex, no condom use, and multiple partners[36]. Acculturation has also been associated with increased HIV risk among Hispanics [37]. The risk also increases for the partners that stay back home, which has contributed to the ruralization of HIV/AIDS in Mexico. The risk for partners back home increases due to the nature of gender and social roles of marriage in indigenous communities[38].

Mexico occupies the 4<sup>th</sup> place in Latin America on HIV and AIDS prevalence, but there is very little research on specific indigenous groups, however, studies in other countries have proved that there is a higher prevalence amongst indigenous groups than in the rest of the population[39], and all of these are correlated to the already known high risk behaviors[40] that migrant Mixtec and Zapotec men (as do most of studied indigenous groups) engage in, which may suggest that as in those indigenous groups in other countries, the prevalence amongst Mixtec and Zapotec groups may be higher than the rest of the population.

In one particular study conducted in Mexico in 2004 in the states of Jalisco, Oaxaca, Michoacán, Estado de México, and Zacatecas, a random sample of 1500 migrants showed that HIV/AIDS prevalence among migrants is 1.1%, which is 3 times higher than in the rest of the Mexican population[41].

Other population may contribute to the risk of migrants contracting HIV. For example in a study conducted in San Diego and Tijuana with 374 MSM 18-29 years old which were contacted in places of sexual work, 18.9% of those in Tijuana were HIV positive and of those in San Diego prevalence was 35.2%, and a high proportion of the participants reported having unprotected sex with both men and women on both sides of the border[42].

There are some studies that document the vulnerability of indigenous populations in Mexico in regards to HIV[43], and the reasons for the existence of such vulnerability.

#### **HIV/AIDS AMONG MIGRANTS WITHIN THE U.S.**

A study conducted in California helped determine many of the causes that may increase the practices of risky sexual behaviors among Mexican migrants. Among the cited causes were the loneliness of the migratory process, the long distance from their stable partner, and the perception of being sexually liberal society[44]. Stress is also a big factor. It may lead to substance abuse and it is influenced by factors such as their documentation status, language barrier, job insecurity, mobility, long work hours, among other social determinants of health[45].

The rates of incidence and prevalence of HIV and AIDS amongst very specific populations is hard to determine. A study conducted in California reports an increase of Mexican born or Mexican-American AIDS cases from 36.5% in 1995 to 47.7% in 2000, where 92% of these were men, and 71.9% of the total were born in Mexico[46].

In recent years there has been a trend of comorbidity of tuberculosis and HIV in undocumented immigrants. The main affected population has been injection drug users. Sharing of needles and other paraphernalia is an associated risk for HIV transmission and the clustering is a risk for tuberculosis infection. The comorbidity of these two diseases makes it extremely hard to fight either one of the infections[47].

It is necessary to increase research on specific indigenous populations in order to gain knowledge on the particular factors that influence the incidence of HIV among those specific populations. There is some research addressing HIV incidence and prevalence among Mixtec and Zapotec populations, but every possible influential factor needs to be addressed in order to inform interventions to reduce HIV infections in these and other indigenous populations.

#### **CONDOM USE AMONG MEXICAN MIGRANTS**

Condom use among migrants has been found to be low in most HIV and STI risk behavior studies. In a survey about risk behaviors conducted in Baja California to 1041 people, dividing the sample into groups, i.e. migrants within the Mexican border region, from the U.S. to Mexico, deported, and those crossing to the U.S., When asked about having unprotected sex in the last 6 months, 44.5% of those going back to Mexico, 60.4% of those crossing to the U.S., 52.9% of those moving in the border region, and 46% of those deported responded favorably[48].

Another study conducted in Fresno and Sacramento, California among 782 Mexican migrants, amongst those who have sex exclusively with females, 53% reported having unprotected vaginal sex with a casual female partner in the last year. Among men who have sex with men (MSM) or men who have sex with men and women (MSMW), 30% reported

unprotected anal sex with male and/or female casual sex partners in the last year, and 69% of males who have sex exclusively with females reported unprotected anal sex in the last year[49].

## **HEALTHY PEOPLE 2020**

HIV prevention is one of the topics of Healthy People 2020. Several of HP2020 objectives are aligned with the objectives of the proposed study. These include:

Reduce the number of new HIV diagnoses among adolescents and adults (HIV-1); new (incident) HIV infections among adolescents and adults (HIV-2); the rate of HIV transmission among adolescents and adults (HIV-3); new AIDS cases among adolescents and adults (HIV-4); new AIDS cases among adolescent and adult heterosexuals (HIV-5); new AIDS cases among adolescent and adult men who have sex with men (HIV-6); new AIDS cases among adolescents and adults who inject drugs (HIV-7). Also to increase the proportion of adolescents and adults who have been tested for HIV in the past 12 months (HIV-14); and the proportion of sexually active persons who use condoms (HIV-17)

Additionally, the HP2020 objectives for sexually transmitted diseases include reducing the incidence and prevalence of some major STDs. These are also indirectly aligned with the proposed study given that condom use focus of the study. Objectives include:

Reducing the proportion of adolescents and young adults with *Chlamydia trachomatis* infections (STD-1); gonorrhea rates (STD-6); sustained domestic transmission of primary and secondary syphilis (STD-7); and the proportion of young adults with genital herpes due to herpes simplex type 2 (STD-10).

Addressing social determinants of health is another priority of Healthy People 2020 aligned with the proposed study. My target populations are Mixtec and Zapotec migrants. Migrants are affected by several social determinants of health, due to instability of their living

situations, many lack resources to meet daily needs such as safe housing, food; lack access to education; lack economic stability; lack access to healthcare; undergo several social norms and attitudes like discrimination, racism, distrust of government; social segregation; social insecurity; lack or deficient transportation; language barrier; and extreme working conditions. All these factors have been shown to affect the physical and mental health of people[50].



## **GOALS AND OBJECTIVES**

The main goal of this research inform future interventions that can help reduce risky sexual behaviors among Mixtec and Zapotec migrants to ultimately reduce HIV and STI incidence and prevalence among this population.

The main objective is to find the association between condom use and (1) risk perceptions for HIV and STIs and (2) attitudes towards condom use among Mixtec and Zapotec men who migrate.

## **STUDY AIMS**

Among Mixtec and Zapotec men who migrate and have a stable female partner, the aims of the study are to assess the association between current condom use in the last 6 months with their stable female partner and

1. Attitudes toward condom use.
2. Risk perceptions to HIV and STIs.

## **HYPOTHESES**

1. The proportion of those who agree with the following statements regarding attitudes toward condom use will differ by current condom use practices in the last 6 months with stable female sex partner.

- 1.1. People who carry condoms are willing to have sex with anyone.
- 1.2. People who use condoms have sex with anyone.
- 1.3. If my partner asked me to use a condom, I would accept.
- 1.4. People who use condoms deserve to be respected.
- 1.5. If my partner asked me to use a condom, I would feel safe.
- 1.6. People who carry condoms are only looking to have sex.

2. The proportions of those who agree with the following statements regarding risk perception to sexually transmitted infections and HIV/AIDS will differ by current condom use practices in the last 6 months with stable female sex partner.

- 2.1. I am at risk of contracting an STI
- 2.2. I already have an STI
- 2.3. My partner is at risk for contracting an STI
- 2.4. My partner already has an STI
- 2.5. I am at risk for contracting HIV/AIDS
- 2.6. I already have HIV/AIDS
- 2.7. My partner is at risk for contracting HIV/AIDS
- 2.8. My partner already has HIV/AIDS

2.9. A sexual encounter with a partner who has HIV/AIDS can result in a pregnancy

## **METHODS**

### **PARENT STUDY**

Ongoing IRB approved cross-sectional study on “Migration and Risk Factors for HIV and Sexually Transmitted Infections (STIs) among Mixtec and Zapotec Men who migrate within Mexico and to the U.S.” (Co-Principal Investigators were Dr. Oralia Loza, Assistant Professor; and Professor Jesús Vaca Cortes). The study is funded by the “Research Program on Migration and Health” [“Programa de Investigación en Migración y Salud” (PIMSA)] through the UC Berkley’s School of Public Health program Health Initiative of the Americas. The data was collected in three locations: Oaxaca, Oaxaca, Mexico; Chihuahua, Chihuahua, Mexico; and San Diego County, California. The purpose of this study was to compare differences among the three sites for all the measures assessed.

### **SAMPLE POPULATION**

The sample population for the parent study consists of Mixtec or Zapotec adult men who migrate, with no history of mental disorders, without being under the influence of any substance at the moment of the interview, and living in Oaxaca, Oaxaca; Chihuahua, Chihuahua; or in San Diego, California in 2011-2012.

For the purpose of this thesis, I will subset the sample population of the parent study to those participants who reported having a stable female partner.

### **SAMPLE SIZE**

The data collected for the parent study were 35 face-to-face interviews per site. One site completed 36 interviews. Hence, there is a total of 106 interviews.

After subsetting to those who reported having a stable female partner, the sample size (N) is reduced to 82.

## **STUDY DESIGN**

The parent study is a cross-sectional study with quantitative and qualitative components carried out in three different locations: Oaxaca, Oaxaca, Mexico; Chihuahua, Chihuahua, Mexico; and San Diego County, California. The study aims to compare and find the differences and similarities between the three different places in regards to demographic information, migration, health knowledge, health beliefs, health behaviors, healthcare access, risk perception, and attitudes toward condom use.

This paper is a secondary data analysis of the quantitative data collected. I used the data collected in the three different sites specified in the parent study, focusing on condom use, risk perception to HIV and STIs, and attitudes towards condom use.

## **DATA COLLECTION**

The quantitative component of the parent study consist of 35 face-to-face interviews (per site). These interviews were performed by trained interviewers on the immigrants' place of work.

## **MEASURES**

The analysis for this study included the measures collected on demographics, sexual partners, condom use, risk perception to HIV and STIs, and attitudes towards condom use.

### **Demographic Information**

Participants were asked to provide information on their ethnicity (Mixtec, Zapotec, Tarahumara, Nahuatl, Other); age (years); marital status (single, married, domestic partner,

separated, divorced, widowed); Educational level (none, elementary, middle school, high school, technical education, university).

### **Sexual Partners**

The next series of question pertained to the stable partner of the participant. First, participants were asked if they had a stable partner/women/man/boyfriend/girlfriend (yes, no). Based on their response, participants were asked the sex (male, female) and years of age of their stable partner, as well as the number of years they have been in a stable relationship with their stable partner. They were also asked if they have had sexual relations with their stable partner in the last six months and if so, the type of sex (vaginal, oral, anal).

Questions about other sexual partners were included. The participants were asked if they have had sex with other partners besides their stable partner, and if so with how many women and/or how many men.

### **Actual Condom Use**

Participants were asked the frequency (always, frequently, few times, never) of condom use with their stable and other partners (if any) in the last six months.

### **Attitudes Toward Condom Use**

The attitudes toward condom use were assessed through statements to which the participant could answer “no”, “yes” or “don’t know.” The statements were: “People who carry condoms is willing to have sex with anyone,” “people who use condoms have sex with anyone,” “If your partner asked you to use a condom, you would accept” “people who use condoms deserve to be respected,” “if your partner asked you to use a condom, you would feel safe,” and finally “people who carry condoms only wants sex.”

## **Risk Perception**

In order to assess risk perception to HIV and STIs a series of questions was asked with the format “Do you think that...?” Followed by a statement about a certain risk, all these questions had the possible answers of “no”, “yes”, or “don’t know”. The statements were the following: “that you are at risk of contracting an STI,” “that you already have an STI,” “that your partner is at risk of contracting an STI,” “that your partner already has an STI,” “that you can contract HIV/AIDS,” “that you already have HIV/AIDS,” “that your partner can contract HIV/AIDS,” “that your partner already has HIV/AIDS,” and finally “that sexual relations with a partner that has HIV/AIDS could result in a pregnancy.”

## **STATISTICAL ANALYSIS PLAN**

### **Subset Variables**

Preliminary analysis of the data showed that there is a low count of participants who reported multiple sexual partners, hence the focus was solely on those who reported having a stable female partner in the last six months. If participants responded “no” to having a stable partner, or if their stable partner was a male, they were excluded from the bivariate analysis.

### **Modified Variables**

In the bivariate analysis the measures were collapsed to a dichotomous level. In the actual condom use measures the levels were collapsed to “ever,” which consists of the “always,” “frequently” and “few times” levels, vs. “never.”

The risk perception and attitudes toward condom use question was collapsed into dichotomous levels as well, which are “yes” vs. “other” (no/don’t know).



## **Descriptive Analysis**

Descriptive statistics for all variables were performed, including sample size, means, and standard deviation for continuous variables. Sample size, frequencies, and percentages were performed for categorical variables.

## **Bivariate Analysis**

The analysis between the actual condom use (outcome variable) and any other continuous variables consisted of a two-sample t-test if the data is normally distributed, or a non-parametric Mann-Whitney U test if it's not.

When performing the analysis of actual condom use with any other categorical variable, a Pearson's chi-squared test was performed, or in case there was an expected low cell count, the Fisher's exact test was performed.

All of the analysis was conducted using the IBM SPSS 20 Statistics Software, using the database previously collected.

## **HUMAN SUBJECTS**

The parent study was approved by IRB under the title "Migration and Risk Factors for HIV and Sexually Transmitted Infections (STIs) among Mixtec and Zapotec Men who migrate within Mexico and to the U.S." (See appendix I).

The secondary analysis of this proposed project did not directly involve human subjects. CITI training has been completed and due to the nature of a secondary analysis for this study I did not collect additional data and used only a previously created database which contains no personal identifiers of any kind. I applied for IRB exemption for the secondary data analysis given that participants were not, nor will be ever contacted. IRB determined this project to be

exempt and as such I was granted the exemption letter (see appendix II). The main project on which secondary analysis is based upon, had IRB approval and the database created does not contain any personal identifiers of the subjects.

## RESULTS

Among the overall sample of 106 participants, 79.2% reported having a stable partner and 97.6% of those reported that the partner was a woman. Given the low sample size that reported not having a stable female partner, those who reported having only a male partner and those without a stable partner were excluded from the analysis, and hence the sample size was reduced to 82. The majority were Mixtec (74%), with an average age of 38 years, the majority reported being married (79%), and 68.3% reported elementary school as their highest educational level.

The average age of the female stable partner was 34 years, and the average length of the relationship was 14 years. Ninety percent reported having sex with their female stable partner in the last 6 months, of these 100% reported having vaginal sex, 10% oral sex, and 2.9% anal sex. Close to 10% reported having had sex with other person besides their female stable partner; all of them said the other sex partner was a female. The average number of other partners besides their stable partner was 2.88. Of those that reported having sex with another person, 100% reported vaginal sex, 12.5% oral sex, and 12.5% anal sex, which is a much higher than the percentage for anal sex with their stable female partner.

The assessment of condom use was performed for the participants' use with their stable partner and for other female sex partners, however, in the bivariate analysis only the actual condom use of those with female stable partners was used. In the univariate analysis 75.8% reported never having used a condom with their stable female partner. Of those with a stable female partner and with other female partner(s) 25% reported never having used a condom.

The most common risk perceptions were being at risk of having a sexually transmitted disease (27.5%), becoming infected with HIV/AIDS (30.4%), and that sexual intercourse with a partner who has HIV/AIDS can result in pregnancy (51.9%).

Results for attitudes towards condom use appear to be mixed. For example, 65% of participants stated that people who carry condoms are willing to have sex with anyone. In contrast, 76.3% responded that people who use condoms deserve respect.

TABLE 1. Univariate Descriptive Statistics of Characteristics, Overall (N=106) and Subset (N=82), of Mixtec and Zapotec Men Who Migrate

	Overall (N=106)			Subset (N=82)		
	n	Freq	%	n	Freq	%
<b>DEMOGRAPHIC INFORMATION</b>						
Ethnicity	106			82		
Mixtec		75	70.80		61	74.4
Zapotec		31	29.20		21	25.6
Age (years)	106	M=36.66	SD=13.56	82	M=38.3	SD=12.68
Marital Status	105			81		
Single		24	22.90		6	7.4
Married		66	62.90		64	79
Free Union		11	10.50		11	13.6
Separated		1	1.00		0	0
Divorced		2	1.90		0	0
Widowed		1	1.00		0	0
Education (maximum level completed)	106			82		
None		12	11.30		8	9.8
Elementary		64	60.40		56	68.3
Middle School		21	19.80		14	17.1
High School		5	4.70		3	3.7
Technical Education		2	1.90		0	0
University		2	1.90		1	1.2
<b>SEXUAL PARTNERS</b>						
Do you have a stable partner/wife/husband/girlfriend/boyfriend?	105	84	79.20	82	82	100
Your stable partner is:	84			82		

Man	2	2.40	0	0
Woman	82	97.60	82	100
What is the age of your stable partner?	83	M=34.17 SD=10.79	81	M=34.22 SD=10.69
How long have you been with him/her?	83	M=14.34 SD=10.61	81	M=14.52 SD=10.68
Have you had sex with your stable partner in the last 6 months?	83	75 90.40	81	73 90.1
Vaginal	72	71 98.60	70	70 100
Oral	72	8 11.10	70	7 10
Anal	72	3 4.20	70	2 2.9
Have you had sex with other people other than your stable partner in the last 6 months?	104	20 19.20	81	8 9.9
With how many different women?	18	M=2.28 SD=1.7	8	M=2.88 SD=1.46
Specify what type of sex you had with these female partners (Check all)				
Vaginal	18	18 100.00	8	8 100
Oral	18	5 27.80	8	1 12.5
Anal	18	3 16.70	8	1 12.5
With how many different men?	14	M=3.57 SD=12.8	8	- -
Specify what type of sex you had with these male partners (Check all)				
Receptive Oral Sex	3	3 100.00	0	0 0
Receptive Anal Sex	2	2 100.00	0	0 0
<b>ACTUAL CONDOM USE</b>				
How often did you use condom with you stable partner in the last 6 months?	67		66	
Ever	16	23.90	16	24.2
Never	51	76.10	50	75.8
How often did you use condom with your last female partner in the last 6 months?	15		8	
Ever	13	86.70	6	75
Never	2	13.30	2	25
How often did you use condom with your last male partner in the last 6 months?	2		0	
Ever	1	50.00	0	0
Never	1	50.00	0	0
<b>RISK PERCEPTIONS</b>				
Do you think ...				

You are at risk for having a sexually transmitted disease?	104	39	54.80	80	22	27.5
That you already have a sexually transmitted disease?	104	4	3.80	80	2	2.5
Your partner is at risk of contracting a sexually transmitted disease?	102	17	16.70	80	7	8.8
That your partner already has a sexually transmitted disease?	102	5	4.90	80	2	2.5
That you can become infected with HIV/AIDS?	102	38	37.30	79	24	30.4
That you already have HIV/AIDS?	103	1	1.00	80	1	1.3
Your partner can get HIV/AIDS?	101	23	22.80	79	10	12.7
Your partner already has HIV/AIDS?	102	3	2.90	80	1	1.3
That sexual intercourse with a partner who has HIV/AIDS can result in pregnancy?	102	55	53.90	79	41	51.9
<b>ATTITUDES TOWARDS CONDOM USE</b>						
People who carry condoms are willing to have sex with anyone	104	66	63.50	80	52	65
People who use condoms sleep with anyone	104	57	54.80	80	45	56.3
If your partner suggests using a condom, you would accept	104	71	68.30	80	51	63.7
People who use condoms deserve respect	104	80	76.90	80	61	76.3
If your partner suggests to use a condom, you would feel safe	103	69	67.00	79	52	65.8
People who carry condoms are just looking for sex	104	50	48.10	80	41	51.2

M and SD are Means and Standard Deviations respectively  
- No one responded

The sample size for the bivariate analysis was 65 participants. Over two-thirds (75.4%) of participants responded that they had never used a condom with their stable female partner.

There were no statistically significant differences in the proportions of any of the risk perception measures by actual condom use (refer to table 2).

Among those who use condoms the proportions of those who answered yes to the attitudes towards condoms use measures is higher than those who responded never having used condoms.

Within the measures for attitudes towards condom use three variables were found to be statistically significantly associated to actual condom use. The proportion of participants who indicated they would use a condom if their partner suggested it (p-value=0.005), the proportion of those who believe that people who use condoms deserve respect (p-value=0.007), and the proportion of those who said that they would feel safe if their partner suggested using a condom (p-value=0.038) were statistically significantly different by actual condom use.

TABLE 2. Bivariate Associations for Risk Perceptions and Attitudes towards Condom Use by Actual Condom Use (N=65) among Mixtec and Zapotec Men Who Migrate

	ACTUAL CONDOM USE			
	Ever (N=16) n (%)	Never (N=49) n (%)	p-value	
<b>RISK PERCEPTIONS</b>				
Do you think...				
you are at risk for having a sexually transmitted disease?	2 (12.5%)	17 (34.7%)	0.119	*
that you already have a sexually transmitted disease?	1 (6.2%)	1 (2.0%)	0.435	*
your partner is at risk of contracting a sexually transmitted disease?	0	6 (12.2%)	0.323	*
that your partner already has a sexually transmitted disease?	0	2 (4.1%)	1.000	*
that you can become infected with HIV/AIDS?	3 (18.8%)	16 (33.3%)	0.353	*
that you already have HIV/AIDS?	0	0	-	
your partner can get HIV/AIDS?	2 (12.5%)	7 (14.6%)	1.000	*
your partner already has HIV/AIDS?	0	1 (2.0%)	1.000	*
that sexual intercourse with a partner who has HIV/AIDS can result in pregnancy?	9 (56.2%)	26 (53.1%)	0.824	
<b>ATTITUDES TOWARDS CONDOM USE</b>				

People who carry condoms are willing to have sex with anyone	11 (68.8%)	32 (65.3%)	0.800	*
People who use condoms sleep with anyone	7 (43.8%)	31 (63.3%)	0.169	
If your partner suggests using a condom, you would accept	15 (93.8%)	27 (55.1%)	<b>0.005</b>	
People who use condoms deserve respect	16 (100%)	33 (67.3%)	<b>0.007</b>	
If your partner suggests to use a condom, you would feel safe	14 (87.5%)	29 (59.2%)	<b>0.038</b>	
People who carry condoms are just looking for sex	10 (62.5%)	24 (49.0%)	0.347	

\* Represents Fisher's Exact Test result. All other results were conducted with Pearson Chi-Square Test.

- Result not valid



## **DISCUSSION**

Some findings are consistent with literature for example the higher percentage of condom use with other partner as compared to condom use with stable partner. Also the higher percentage of higher risk behavior such as anal sex is higher with other partners than with the stable female partner.

Most measures did not show a statistically significant association, I expected to find an association between the statements that perceived a risk to HIV or STDs and actual condom use, as well as negative attitudes toward condom use to discourage actual condom use. According to the results, those participants that had previously used condoms responded favorably to feeling safe and agreeing to use condoms and if their partner would suggest it. This may indicate that the experience of having used a condom could potentially increase protective attitudes.

## **LIMITATIONS**

One limitation could be the inaccuracy of responses to due the sensitive nature of the questions. Members of the ethnic groups Zapotec and Mixtec may be hesitant to disclosing personal information about their sex practices or beliefs, as is true with many other groups. Hence, given that the participants were asked questions about their intimate personal lives, self-reporting bias may have occurred. Also, social desirability bias could have occurred if the participants felt obliged to answer what they believe is socially acceptable[51].

In addition, among participants interviewed in California, some may have been more hesitant to share accurate information if they were of undocumented status. This is speculation given that the questionnaire did not assess documentation status.

## **MPH CORE COMPETENCIES**

These competencies directly relate to the analysis and focus of this thesis project.

- **Biostatistics.** Biostatistics is the development and application of statistical reasoning and methods in addressing, analyzing and solving problems in public health; health care; and biomedical, clinical and population-based research.

This competency was addressed by performing statistical analysis to test the hypotheses for this thesis.

Also, I performed data management by participating in the cleaning of the original data, performing data entry, and database management.

- **Epidemiology.** Epidemiology is the study of patterns of disease and injury in human populations and the application of this study to the control of health problems.

This competency is addressed by assessing behavioral factors and beliefs that may influence certain preventive behaviors for HIV amongst a specific population.

- **Social and behavioral sciences.** The social and behavioral sciences in public health address the behavioral, social and cultural factors related to individual and population health and health disparities over the life course. Research and practice in this area contributes to the development, administration and evaluation of programs and policies in public health and health services to promote and sustain healthy environments and healthy lives for individuals and populations.

The variables collected in the parent study address social and behavioral factors that influence health.

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# APPENDIX I

**THE UNIVERSITY OF TEXAS AT EL PASO**  
**Office of the Vice President for Research and Sponsored Projects**  
**Institutional Review Board**  
El Paso, Texas 79968-0587  
phone: 915 747-8841 fax: 915 747-5931

DATE: April 18, 2011

TO: Oralia Loza, Ph.D.

FROM: University of Texas at El Paso IRB

STUDY TITLE: [232993-1] Risks for HIV/AIDS and Sexually Transmitted Infections (STI) among Mixtec-Zapotec men who migrate within Mexico and to the U.S.

IRB REFERENCE #: 232993-1

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: April 18, 2011

EXPIRATION DATE: April 18, 2012

REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this research study. University of Texas at El Paso IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This study has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years after termination of the project.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Athena Fester at (915) 747-8841 or [afester@utep.edu](mailto:afester@utep.edu). Please include your study title and reference number in all correspondence with this office.

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Illustration 1. IRB approval letter for the study “Migration and Risk Factors for HIV and Sexually Transmitted Infections (STIs) among Mixtec and Zapotec Men who migrate within Mexico and to the U.S.”



## APPENDIX II



**THE UNIVERSITY OF TEXAS AT EL PASO**  
Office of the Vice President for Research and Sponsored Projects  
**Institutional Review Board**  
El Paso, Texas 79968-0587  
phone: 915 747-8841 fax: 915 747-5931

**FWA No: 00001224**

DATE: April 26, 2013  
TO: Aldo Carrasco  
FROM: University of Texas at El Paso IRB  
STUDY TITLE: [457822-1] Factors associated with consistent condom use Among Mixtec and Zapotec Men who Migrate  
IRB REFERENCE #: 457822-1  
SUBMISSION TYPE: New Project  
ACTION: DETERMINATION OF EXEMPT STATUS  
DECISION DATE: April 26, 2013

Thank you for your submission of New Project materials for this research study. University of Texas at El Paso IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulation 45 CFR 46.101(b)(4).

Exempt protocols do not need to be renewed. Please note that it is the Principal Investigator's responsibility to resubmit the proposal for review if there are any modifications made to the originally submitted proposal. This review is required in order to determine if "Exemption" status remains.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact Athena Fester at (915) 747-8841 or [afester@utep.edu](mailto:afester@utep.edu). Please include your study title and reference number in all correspondence with this office.

cc:

Illustration 2. IRB approval letter for the study "Factors associated with consistent condom use among Mixtec and Zapotec men who migrate"

## **CURRICULUM VITA**

Aldo Carrasco was born in Presidio, Texas. Second son of Dr. Macario Carrasco and Dr. Trinidad Jeronimo. He completed his early education in the city of Ojinaga, Chihuahua, Mexico, in High School he moved to Chihuahua, Chihuahua, Mexico to attend the Preparatoria del Tecnológico de Monterrey Campus Chihuahua. After graduating, he entered Sul Ross State University in Alpine, Texas where he graduated *Suma cum laude* with a Bachelor of Science in biology with a minor in chemistry. After graduation he moved back to Presidio, Texas where he worked for a year as a medical assistant at the local clinic. In the fall of 2010, he moved to El Paso, Texas to pursue a Master of Public Health degree at the University of Texas in El Paso, at the same time he obtained a part time job in the Texas Department of State Health Services as a disease surveillance specialist for the Office of Border Health. In the fall of 2012, he obtained a full time job with the City of El Paso Department of Public Health as a disease surveillance specialist in the Emergency Preparedness Program.

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This thesis was typed by Aldo Carrasco.