

# Condom use and migration in a sample of Mexican migrants: potential for HIV/STI transmission

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## Abstract

**Objective.** To analyze the association between condom use and migration to the United States (US) in two Mexican municipalities. **Material and Methods.** A cross-sectional, non-probabilistic study of egocentric social networks was conducted in Cuauhtémoc, Colima and Tonalá, Jalisco during the months of December 2003 and January 2004, in 354 migrant subjects. Migration, sexual network, history and risk for sexually transmitted infections (STIs) characteristics were surveyed. Statistical analyses was conducted using logistic regression. **Results.** Increased migration travel to the US was significantly associated with consistent condom use for Cuauhtémoc (OR: 3.87;  $p < 0.05$ ) and Tonalá (OR: 4.12;  $p < 0.05$ ) municipalities. Other significant predictors included: age, type of sex partner, and perceived monogamy. **Conclusions.** Our data support the hypothesis that migration to the US is associated with condom use.

Key words: social networks; migration; condoms; HIV/AIDS; Mexico

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## Resumen

**Objetivo.** Analizar la asociación entre el uso del condón y la migración a Estados Unidos en dos municipios mexicanos. **Material y métodos.** Estudio transversal no probabilístico de redes sociales egocéntricas. Muestra de 354 migrantes. Cuestionario sobre prácticas y redes sexuales, historia de ITS y migración. Análisis mediante regresiones logísticas. **Resultados.** La mayor experiencia migratoria se asoció significativamente al uso consistente del condón en Tonalá (RM: 4.12;  $p < .05$ ) y Cuauhtémoc (RM: 3.87;  $p < .05$ ). Otros predictores fueron: edad, tipo de pareja y percepción de la fidelidad. **Conclusión.** Los datos apoyan la hipótesis de la asociación entre la migración y el uso del condón.

Palabras clave: redes sociales; migración; condón; VIH/SIDA; México

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Early international studies on migrant health showed that the dissemination of infectious diseases, including sexually transmitted infections (STIs) and HIV, could be intensified and accelerated by migrating populations.<sup>1</sup> In fact, in regions where HIV is endemic, population mobility is an independent risk factor for HIV.<sup>2</sup> Although this finding does not suggest that migrants are disease carriers, it does, however, suggest that migration can establish vulnerability to HIV.<sup>2-10</sup> This is especially true when migrants lack proper health care and/or are unable to meet their basic needs.

Social networks have been applied to and have increased our understanding of how the structure of groups of people can increase or protect from HIV transmission by taking into consideration within-group influences.<sup>11</sup> The basic hypothesis in social networks posits that behaviors occur within social frameworks made up of individuals, and the relationships between individuals influence the risk for disease transmission and propagation.<sup>11</sup>

The purpose of the current study was to analyze the association between condom use, within the context of sex partner networks, and variables that measure migratory experience to the United States (US), among a sample of male migrants from two Mexican municipalities with different population densities.

## Material and Methods

The data in this article come from an anonymous health behavior study conducted in Cuauhtémoc, Colima and Tonalá, Jalisco during the months of December 2003 and January 2004. These municipalities were selected on the basis of their differing rates of extensive international migration to the US and population densities typical of the migratory process<sup>12</sup> (<15000 inhabitants in Cuauhtémoc; >100000 inhabitants in Tonalá); and registered HIV/AIDS cases.

Participants completed an interviewer-administered questionnaire after being recruited through street outreach. Data on egocentric sexual networks, including various alter attributes were collected.<sup>13-18</sup> Migration and socioeconomic data were also collected. Eligibility criteria consisted of: a) males between ages 18-55; b) who reported legal or illegal residence in the US at least once during the past three years; and c) who reported at least one sex partner in the past year. A total of 354 migrants agreed to participate; the refusal rate was estimated at 20%. Procedures for the ethical treatment of subjects were followed, including written informed consent and voluntary participation. This study was approved by the research and ethics committee of the Unidad Médica Familiar # 93 of IMSS Jalisco.

Data were converted to dyadic format<sup>15,19</sup> and analyzed together and separately by municipality (chi-square; *t*-test). The associations between condom use (categorized as always and any condom use) and US migration history, adjusted for other covariates, were analyzed using logistic regression. All data analyses were conducted with the SAS statistical package.

## Results

Demographic characteristics are shown in Table I. The mean age of study subjects was 32.8 years; 55.6% were married/living with partner; 66% had middle school education or less; and 7.9% spoke an indigenous language.

Regarding migration, 75% of subjects reported having made two or more trips to the US; 50.8% of them reported having stayed one year or longer during their last US visit; 59% had authorization to cross the US border. Regarding sexual health behaviors, 45% of migrants reported always using a condom with their sex partner and 17.3% reported at least one STI symptom in the past year.

Table II shows the results of logistic regression analyses. Reporting two or more trips to the US was significantly associated with consistent condom use (OR: 3.09; *p* < 0.05). Other significant variables included: reporting two or more sex partners in the past year (OR: 2.76); sex partner who was a mistress (OR: 8.00) or a friend (OR: 3.34); and a non-monogamous partner (OR: 4.93). However, alcohol consumption prior to sexual intercourse was not significantly associated with consistent condom use. When separated by municipality, two or more trips to the US continued to be significantly associated with consistent condom use. Of interest is that age was no longer a significant predictor of consistent condom use in Cuauhtémoc (OR: 0.65; *p* > 0.05). Results of the logistic regression on any condom use were somewhat similar to those of consistent condom use.

## Discussion

We evaluated factors associated with condom use among a sample of migrant Mexican males from Cuauhtémoc, Colima and Tonalá, Jalisco. Our findings indicated that increased experience in the migratory process, measured by the number of trips made to the US, was associated with higher condom use. Consistent condom users were also single, more educated older males (≥ 35 years of age) who engaged in protective behaviors, especially when they had two or more sex partners or non-steady partners, and when their sex partner was not monogamous. Our results are confirmed by others.<sup>7,10,21</sup>

**Table I**  
**CHARACTERISTICS OF MIGRANTS IN CUAUHTÉMOC, COLIMA AND TONALÁ, JALISCO, MÉXICO, 2003-2004**

Variables	Cuahtémoc, Colima n= 205	Tonalá, Jalisco n= 149	p- value (chi-square test)
Age* (mean)	33.1 (9.1)	32.5 (13.0)	0.64
Marital Status <sup>‡</sup>			0.47
Married, w/partner	119 (58.0%)	78 (52.3%)	
Divorced, separated, widowed	7 (3.4%)	8 (5.4%)	
Single or widowed	79 (38.5%)	63 (42.3%)	
Highest Level of Education <sup>‡</sup>			0.51
None or Elementary School	61 (29.8%)	50 (33.5%)	
Middle School	73 (35.6%)	51 (34.0%)	
High School	55 (26.8%)	35 (23.5%)	
Vocational School/University/Other	16 (7.8%)	12 (8.1%)	
Speak indigenous language <sup>‡</sup>			< 0.001
Yes	25 (12.2%)	3 (2.0%)	
No	180 (87.8%)	139 (93.3%)	
Household size* (mean)			< 0.01
Number of people in the home	4.2 (1.6)	4.9 (2.1)	
Number of employed household member	1.9 (1.0)	2.4 (1.6)	
Employment status past 3 months <sup>‡</sup>			0.12
Unemployed	5 (2.4%)	11 (7.4%)	
Employed	193 (94.1%)	128 (85.9%)	
Looked for employment, Other	7 (3.4%)	10 (6.7%)	
Number of migration trips to US <sup>‡</sup>			0.15
One	42 (20.6%)	36 (25.0%)	
Two or more	162 (79.4%)	108 (75.0%)	
Length of past US stay <sup>‡</sup>			< 0.001
Less than 1 year	82 (40.6%)	84 (58.3%)	
A year or more	120 (59.4%)	60 (41.7%)	
Authorization to cross US border <sup>§</sup>			0.93
Yes	120 (58.8%)	87 (58.4%)	
No	84 (41.2%)	62 (41.6%)	
Frequency of condom use with past year sex partners <sup>§</sup>			< 0.05
Always	80 (35.7%)	78 (45.3%)	
Sometimes	34 (15.2%)	24 (14.0%)	
Rarely	5 (2.2%)	9 (5.2%)	
Never	105 (46.9%)	61 (35.5%)	
History of STI symptoms <sup>‡</sup>			0.29
None	148 (72.2%)	91 (61.1%)	
At least one symptom	27 (13.2%)	23 (15.4%)	
Missing	30 (14.6%)	35 (23.5%)	

\* Mean age with standard deviation in parenthesis

<sup>‡</sup> Frequency with percentage in parentheses

<sup>§</sup> Total exceeds sample size because individual condom use with up to 8 sex partners was asked

**Table II**  
**FACTORS ASSOCIATED WITH CONDOM USE AMONG MIGRANTS IN CUAUHTÉMOC, COLIMA AND TONALÁ, JALISCO, MÉXICO, 2003-2004, ADJUSTED ODDS RATIOS**

Variables	Always used condoms			Any condom use		
	All	Cuahtémoc*	Tonalá <sup>‡</sup>	All	Cuahtémoc*	Tonalá <sup>‡</sup>
<b>Age</b>						
≤ 34	1.00	-	-	1.00	-	-
≥ 35	4.59 <sup>§</sup>	0.65	13.91 <sup>§</sup>	1.11	0.09	10.99
<b>Education Level</b>						
None/Preschool/Elementary School	1.00	-	-	1.00	-	-
Middle School	2.22 <sup>§</sup>	0.52	5.17 <sup>§</sup>	1.94 <sup>§</sup>	1.38	1.84
High School	3.37 <sup>§</sup>	3.68 <sup>§</sup>	4.58 <sup>§</sup>	2.86 <sup>§</sup>	4.14 <sup>§</sup>	2.98
Vocational/University	4.40 <sup>§</sup>	1.14	8.79 <sup>§</sup>	0.98	0.61	1.05
<b>Marital Status</b>						
Single	1.00	-	-	1.00	-	-
Married	0.36 <sup>#</sup>	0.08 <sup>#</sup>	0.27 <sup>§</sup>	0.65	0.36 <sup>§</sup>	0.68
<b>Relationship variables</b>						
Number of sex partners in past year						
One	1.00	-	-	1.00	-	-
Two or more	2.76 <sup>#</sup>	4.92 <sup>§</sup>	1.88	1.91 <sup>§</sup>	1.62	2.16
Type of intercourse						
Vaginal	1.00	-	-	1.00	-	-
Oral	0.91	0.26	1.59	1.32	0.81	3.9
Anal	0.19 <sup>§</sup>	0.43	0.05 <sup>#</sup>	1.52	4.21 <sup>§</sup>	0.28
Type of relationship with sex partner						
Spouse/Steady partner	1.00	-	-	1.00	-	-
Mistress	8.00 <sup>§</sup>	4.00	14.17 <sup>§</sup>	2.09	0.54	>99.99
Friend	3.34 <sup>#</sup>	5.53 <sup>§</sup>	2.78 <sup>§</sup>	2.50 <sup>§</sup>	4.77 <sup>§</sup>	1.96
Place first sexual encounter occurred						
Mexico	1.00	-	-	1.00	-	-
US	1.60	1.41	1.32	1.92 <sup>§</sup>	3.00 <sup>§</sup>	1.28
Sex partner had sex w/someone else						
No	1.00	-	-	1.00	-	-
Yes	4.93 <sup>#</sup>	3.38 <sup>§</sup>	4.76 <sup>§</sup>	2.37 <sup>§</sup>	1.63	3.16 <sup>§</sup>
Drank alcohol prior to intercourse						
No	1.00	-	-	1.00	-	-
Yes	0.65	1.23	0.45	1.10	1.01	1.40
History of STIs						
None	1.00	-	-	1.00	-	-
1 or more	0.29 <sup>§</sup>	0.06 <sup>#</sup>	0.73	0.44 <sup>§</sup>	0.20 <sup>§</sup>	0.70
<b>Migration variables</b>						
Number of trips to the US						
One	1.00	-	-	1.00	-	-
Two or more	3.09 <sup>§</sup>	3.87 <sup>§</sup>	4.12 <sup>§</sup>	2.20 <sup>§</sup>	2.64	1.86
Length of past US stay						
Less than 1 year	1.00	-	-	1.00	-	-
A year or more	0.64	0.43	0.88	0.65	0.42 <sup>§</sup>	1.66

\* Dyadic sample size for Cuahtémoc= 1035

‡ Dyadic sample size for Tonalá= 799

§ p<.05

# p<.001

These results indicate there is something more to the migratory experience, in particular circular migration, that may affect condom use. Perhaps with each subsequent trip to the US, the perception of increased risk of HIV/STIs infection occurs. Or perhaps, the sporadic exposure to HIV/STIs prevention messages while in the US leads to increased consistent condom use. Future studies inquiring into migrants' exposure to HIV/STIs prevention messages may provide enlightenment.

However, an explanation as to why the length of US stay is not associated with condom use may have to do with acculturation. In the literature, length of US stay has been used as a proxy to measure acculturation.<sup>20-24</sup> Perhaps increased migratory trips to the US are indicative of lower acculturation in our sample because of their eventual return to Mexico. Future studies conducted with Mexican migrating populations should perhaps consider investigating acculturation further.

Results of our study shed light on the HIV/STIs protective behaviors of Mexican male migrants. However, it is important to keep in mind that this study has a major limitation with respect to the accuracy of self-reported sexual behaviors, in particular information provided about alter attributes, due to the effects of social desirability. Another limitation is the non-random, non-probabilistic sampling technique employed to interview participants. Therefore, there is limited generalizability of study results.

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