

# HIV infection in mobile populations: the case of Mexican migrants to the United States

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## ABSTRACT

**Objective.** Previous studies have indicated varying rates of HIV infection among labor migrants to the United States of America. Most of these studies have been conducted with convenience samples of farmworkers, thus presenting limited external validity. This study sought to estimate the prevalence of HIV infection and risk factors among Mexican migrants traveling through the border region of Tijuana, Baja California, Mexico, and San Diego, California, United States. This region handles 37% of the migrant flow between Mexico and the United States and represents the natural port of entry for Mexican migrants to California.

**Methods.** From April to December 2002 a probability survey was conducted at key migrant crossing points in Tijuana. Mexican migrants, including ones with a history of illegal migration to the United States, completed an interview on HIV risk factors (n = 1 429) and an oral HIV antibody test (n = 1 041).

**Results.** Despite reporting risk factors for HIV infection, none of the migrants tested positive for HIV.

**Conclusions.** Our findings contrast with previous estimates of HIV among labor migrants in the United States that were based on nonprobability samples. Our findings also underline the need for early HIV prevention interventions targeting this population of Mexican migrants.

## Key words

HIV infections, sexually transmitted diseases, transients and migrants, risk factors, sexual behavior, Mexico, United States of America.

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Previous studies (1–3) suggest increased rates of HIV infection and related risk factors among labor migrants in the United States of America. However, existing data are outdated and based on nonprobability samples. In addition, although Mexicans represent the majority of labor migrants in the United States, most research has included only small subsamples of Mexican migrants. For instance, stud-

ies conducted in eastern areas of the United States on HIV among migrant and seasonal farmworkers included few or no migrants of Mexican origin (4–7). Most migrants in these studies were either non-Hispanic African-Americans or Haitians. In other studies, no information on the percentage of Mexican migrants within the sample was reported (1). Finally, no HIV-infected individuals were found in

research conducted with mostly Mexican migrant workers in western regions of the United States.<sup>4</sup> Epidemiological studies on HIV and migration from Mexico to the United States are hampered by the itinerant nature of migrants, their geographic spread within the country of origin and country of destination, and, in some cases, their illegal migration status in the United States. Inaccurate estimates may jeopardize the development of appropriate health and migration policies in both Mexico and the United States. The lack of reliable epidemiological data may also increase prejudices against Mexican migrants in both countries.

This piece describes the findings from a survey of HIV infection and related risk factors among Mexican migrants traveling through the border region of the cities of Tijuana, Baja California, Mexico, and San Diego, California, United States. Our survey used the methodology and infrastructure of an ongoing Mexican survey, the Survey on Migration in the Northern Border of Mexico (*Encuesta sobre Migración en la Frontera Norte de México*). Tijuana handles 37% of the total migrant flow between Mexico and the United States and 71% of the total migrant flow between Mexico and the United States in the western region of the United States-Mexico border (8).

The Survey on Migration has been conducted at key crossing sites of eight Mexican border cities since 1993. The survey uses a multistage probability sampling design that entails the screening, accurate enumeration, and recruitment of samples uniquely representative of the migrant population traveling through the United States-Mexico border region, thus allowing computation of population estimates. A detailed description of the survey methodology has been published elsewhere (9, 10).

The Survey on Migration collects information from representative samples of four key subpopulations: (1) migrants returning to Mexico from the United States, (2) migrants arriving to the Mexican border region from other, non-border Mexican regions, (3) migrants arriving to one Mexican border region (e.g., Tijuana) from another Mexican border region (e.g., Ciudad Juárez), and (4) migrants returned to Mexico by the United States Border Patrol.

From April to December 2002 the Survey on Migration was extended with a survey on HIV risk behaviors and with antibody testing in Tijuana, using survey sites at the Tijuana International Airport, four Tijuana bus stations, and the Tijuana deportation stations. (Deported Mexican migrants are usually returned by the United States Border Patrol to Mexican migration authorities stationed at the northern border of Mexico. If the migrants are free of other charges, they are then released from the Mexican deportation stations. There are two Mexican deportation stations in Tijuana.)

After completion of the migration survey, 1 606 adult Survey on Migration participants were invited to complete the additional survey on HIV and an oral HIV antibody test. Of those invited, 1 429 (89.0%) completed the questionnaire on HIV risk factors, and 1 041 (64.8%) were tested for the presence of HIV antibodies. The 1 429 were made up of 1 248 males (87.3%) and 181 females (12.7%), with a mean age of 33.2 years (standard deviation (SD) = 11.8 years). The mean number of years of education was 7.5 (SD = 4.1 years), with 5.8% of the participants reporting being illiterate. About 8.5% of the surveyed migrants reported being able to speak a Mexican Indian language, in addition to Spanish. Just short of two-thirds (66.4%) of the participants were married, and 58.6% had a history of migration to the United States. While 78.7% of the participants reported living in Mexico (the sample included migrants from all 32 states of Mexico), a substantial percentage (21.2%) reported residing in the United States. One subject reported residing in another country.

Factors related to HIV risk were assessed through self-report questions. Oral transudate samples were collected by means of the OraSure HIV-1 Oral Specimen Collection Device (OraSure Technologies, Bethlehem, Pennsylvania, United States) and sent for analysis to the Public Health Laboratory of the Health and Human Services Agency of San Diego County. Confirmatory testing using the Western Blot method was applied to positive specimens. Pretest counseling was provided prior to specimen collection, following standards from the Centers for Disease Control and Prevention of the United States.

The validity of the testing procedures, handling of biological samples, and laboratory testing were checked formally by testing two study confederates of known HIV-positive status. The confederates were two HIV-positive patients from a Tijuana HIV clinic, recruited by a physician collaborating with this study. These patients were not part of our HIV survey or the Survey on Migration. The project staff and laboratory personnel were kept blind to the confederate condition and HIV status of these two subjects. The two confederates were tested by project staff as if they were any other study participants. The results correctly identified as positive the samples obtained from the two confederates, thus supporting the validity of the study's HIV screening procedures and ability to identify HIV-positive cases.

Table 1 displays weighted prevalence estimates and standard errors of reported HIV-related lifetime risk factors and risk practices during the preceding six months, for each of the four migrant subpopulations. The lifetime rates of sexually transmitted infections (STIs) ranged from 5.3% to 8.2% among the four subpopulations.

In contrast with the prevalence rates found for STIs and other risk factors, none of the 1 041 individuals tested positive for HIV infection, with 1 040 samples resulting negative and 1 yielding indeterminate results. The prevalence rate of HIV infection among this sample of migrants was lower than 0.10% (i.e., less than 1 out of

<sup>4</sup> Ruiz JD, Da Valle L, Jungkeit M, Platak G, Mobed K, Lopez R. Seroprevalence of HIV and syphilis and assessment of risk behaviors among migrant and seasonal farmworkers in five Northern California counties. [Unpublished report]. Office of AIDS, HIV/AIDS Epidemiology Branch, California Department of Health Services; 1997.

**TABLE 1. Population estimates of the prevalence of HIV risk factors and practices by subpopulations of Mexican migrants to the United States, studied in Tijuana, Mexico, 2002**

	U.S.-Mexico <sup>a</sup> (n = 497)		South-North <sup>b</sup> (n = 485)		Border region <sup>c</sup> (n = 280)		Deported <sup>d</sup> (n = 167)	
	%	SE <sup>e</sup>	%	SE	%	SE	%	SE
History of sexually transmitted infection	7.9	1.8	5.3	1.3	8.0	2.1	8.2	3.1
History of HIV testing	37.3	3.5	28.2	2.9	26.2	3.5	35.0	5.0
Never heard of HIV	6.1	1.3	6.2	1.4	7.5	2.9	7.5	2.6
Perception of risk for HIV <sup>f</sup>								
No risk	83.1	2.4	88.8	2.0	88.2	2.7	73.9	5.3
Some risk	12.4	2.1	9.7	1.9	11.6	2.7	20.5	4.9
High risk	4.5	1.3	1.5	0.63	0.21	0.17	5.6	3.1
Vaginal, anal, or oral sex in last 6 mo	59.4	3.5	72.0	2.9	70.7	3.9	58.0	5.1
Multiple sexual partners in last 6 mo	9.6	2.3	12.5	1.9	18.8	3.5	15.3	4.1
Unprotected sex in last 6 mo <sup>g</sup>	44.5	3.6	60.4	3.2	52.9	4.2	46.0	5.2
Multiple partners and unprotected vaginal or receptive anal sex in last 6 mo <sup>h</sup>	7.0	2.2	6.2	1.3	10.7	2.6	6.3	2.5

<sup>a</sup> U.S.-Mexico = Migrants returning to Mexico from the United States.

<sup>b</sup> South-North = Migrants arriving to the Mexican border region from other, nonborder regions of Mexico.

<sup>c</sup> Border region = Migrants arriving to one Mexican border region from another Mexican border region.

<sup>d</sup> Deported = Migrants returned to Mexico by the United States Border Patrol.

<sup>e</sup> SE = standard error.

<sup>f</sup> Perception of risk for HIV is an estimate for the subsample who reported having ever heard of HIV.

<sup>g</sup> Unprotected sex in last 6 mo = estimate of unprotected vaginal and/or receptive anal sex during the last 6 months.

<sup>h</sup> Estimates of multiple sexual partners in conjunction with unprotected vaginal and/or receptive anal sex during the last 6 months.

1 040). A comparison of the risk profiles of the tested subsample who completed the HIV questionnaire (1 010 persons) vs. the nontested subsample who completed the HIV questionnaire (419 persons) indicated that the migrants tested for HIV were more likely to report multiple sexual partners during the preceding six months (14.1% vs. 8.3%,  $P < 0.01$ ). This difference suggests that the nontested subsample was at lower risk for HIV than the tested subsample and, therefore, HIV prevalence might be lower among the nontested subsample.

The lifetime rate of STIs estimated for the entire migrant population that we studied in Tijuana is comparable to the rates that previous research has found for Mexican migrants in the western region of the United States (Ruiz et al., unpublished, 1997) and for the adult population in Mexico (11). However, our estimated rate of STIs for Mexican migrants is much lower than estimations based on surveys of migrants from the eastern agricultural areas of the United States (4, 5), which included lower proportions of Mexicans.

In contrast with the prevalence of STIs and other risk factors, the prevalence of HIV infection among the pop-

ulation of Mexican migrants in the Tijuana–San Diego border region does not appear to be as high as previously suggested by studies of convenience samples of labor migrants in the eastern United States (4–7), and it may be even lower than HIV rates among the adult Mexican population (12, 13). This is plausible given that HIV rates in Mexico are higher in large urban areas and among men who have sex with men (11, 14), while Mexican migrants mostly originate from rural areas.

The contrast between the estimated prevalence of HIV risk factors and the absence of HIV infection among the migrant population we have studied represents an interesting paradox and may suggest that Mexican migrants may have some unidentified characteristics that “protect” them from higher rates of HIV infection, despite their levels of sexual risk practices. For one thing, HIV infection might not yet be endemic among the sexual partners of Mexican migrants due to yet-unknown epidemiological and cultural factors, including possible social isolation from infected people. Additional research should examine the characteristics of the migrants’ sexual network. Furthermore, future research

with probability-based samples should study whether the paradox of low HIV rates and high levels of risk factors generalizes to all Mexican migrants to the United States and not just to those traveling through the Tijuana–San Diego border region.

The presence of low rates of HIV infection within the context of HIV risk behaviors underscores the need for surveillance and early prevention interventions before HIV becomes epidemic among Mexican migrants. These findings also highlight the importance of conducting probability-based surveys to obtain a more accurate picture of HIV infection in this population.

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## RESUMEN

### La infección por VIH en poblaciones migratorias: la situación de los obreros itinerantes mexicanos en los Estados Unidos

**Objetivo.** Estudios anteriores han revelado diferentes tasas de infección por VIH en la población de obreros itinerantes que han ingresado en los Estados Unidos de América. La mayoría de esos estudios se efectuaron con muestras de trabajadores agrícolas tomadas por conveniencia, y por lo tanto su validez externa ha sido limitada. El presente estudio se realizó con el fin de calcular la prevalencia de la infección por VIH y de sus factores de riesgo en los obreros itinerantes mexicanos que se desplazan por el territorio fronterizo de Tijuana, Baja California, México y San Diego, California, Estados Unidos. Esta zona, por donde pasan 37% de los obreros itinerantes que vienen de México a los Estados Unidos, es el natural puerto de entrada de trabajadores mexicanos que van a California.

**Métodos.** De abril a diciembre de 2002 se realizó una encuesta por conveniencia en diferentes puntos clave de Tijuana por donde cruzaban la frontera los obreros itinerantes. Los obreros, entre ellos algunos con antecedentes de inmigración ilegal a los Estados Unidos, completaron una entrevista sobre los factores de riesgo de infección por VIH ( $n = 1\ 429$ ) y fueron sometidos a una prueba oral para la detección de anticuerpos contra el VIH ( $n = 1\ 041$ ).

**Resultados.** Aunque los obreros indicaron tener factores de riesgo asociados con la infección por VIH, ninguno de ellos tuvo un resultado positivo en la prueba detectora de VIH.

**Conclusiones.** Estos resultados difieren radicalmente de los obtenidos anteriormente al usar muestras no probabilísticas para calcular la tasa de infección por VIH en obreros itinerantes en los Estados Unidos. Resaltan, además, la necesidad de llevar a cabo intervenciones tempranas para prevenir la infección por VIH en obreros itinerantes mexicanos.

## Palabras clave

Infecciones por VIH, enfermedades sexualmente transmisibles, transeúntes y migrantes, factores de riesgo, conducta sexual, México, Estados Unidos.