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HIV Prevalence Among Central American Migrants in Transit Through Mexico to the USA, 2009–2013

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Abstract HIV prevalence was estimated among migrants in transit through Mexico. Data were collected on 9108 Central American migrants during a cross-sectional study performed in seven migrant shelters from 2009 to 2013. Considerations focused on their sociodemographic characteristics, sexual and reproductive health, and experience with violence. Based on a sample of 46.6 % of respondents who agreed to be HIV tested, prevalence of the virus among migrants came to 0.71 %, reflecting the concentrated epidemic in their countries of origin. A descriptive analysis was performed according to gender: the distribution of the epidemic peaked at 3.45 % in the transvestite, transgender and transsexual (TTT) population, but fell to less than 1 % in men and women. This gender differential is characteristic of the epidemic in Central America. Furthermore, 23.5 % of TTTs and 5.8 % of women experienced sexual violence. The predominant impact of sexual violence on TTTs and women will influence the course of the AIDS epidemic.

Keywords AIDS · HIV · Prevalence · Migrants · Central America · Mexico

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Introduction

Migratory movements have been blamed for the spread of HIV on a global scale, which is tantamount to pinpointing migrants as efficient vectors of the virus [1]. This viewpoint forms part of a historical hypothesis dating back to pre-Christian times, when infectious diseases were believed to proliferate as a result of migration [2]. This idea periodically reappears in the face of phenomena that are perceived to be social or health threats for the world as, for instance, in the case of the H1N1 epidemic and the recent outbreak of the Ebola virus [3, 4]. Globally, health policies typically react by closing borders and enforcing measures to reduce and/or control population streams from the epidemic source countries. This contributes to exacerbate the already existing stigma and discriminatory behaviors directed at migrants [5, 6]. However, evidence on the migration-HIV link is heterogeneous and highlights significant differences in the magnitude of the problem across different regions of the world.

A literature review on migration and HIV prevalence from 2000 to 2013 (searching *"migrants; prevalence; HIV"* and *"mobility; prevalence; HIV"*) identified 430 articles, 30 of which were selected for containing data on HIV prevalence. Among these, 14 dealt with migrants at destination countries: India, China, Thailand, Israel, the USA, Italy, Holland, the Netherlands and Portugal, where prevalence stretched significantly from 0.02 % among migrant workers in East China [7] to 7.3 % among African migrants in Portugal [8]. Other studies comparing HIV prevalence among domestic and foreign migrants in Nepal-India, Cameroon, South Africa, Sub-Saharan Africa and Spain reported fluctuations from 10.3 to 33.9 % [9, 10].

Research on sexually transmitted infection (STI) clinic users in the USA indicated national and foreign prevalence

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of 1.8 and 1.6 %, respectively, with 87 % of these composed of Mexican and Central American migrants [11]. Studies conducted at the Mexico-USA border with migrant farm workers deported to Mexico from USA identified the exposure of migrants to HIV risk factors, and found prevalence between 0 and 1.1 % [12, 13].

What is the status of the HIV epidemic in Mexico and Central America, both significant source areas for migrants to the USA? According to UNAIDS, the epidemic is spread mainly by sexual transmission and is concentrated within especially vulnerable groups such as men who have sex with men (MSM), transvestites/transgender/transsexuals (TTTs), and sex workers. AIDS prevalence in the general population aged 15–49 stretches from 0.1 to 0.5 % [14]. By contrast, statistics on the magnitude of irregular migrants in transit through Mexico are inconclusive [15]. Estimates published for the period 1995–2012 escalated from the late 1990s to the early 2000s and sloped thereafter. They ranged from close to 200 thousand irregular migrants in 1995 to a peak of nearly 400 thousand in 1999, and then declined, with an estimated volume for 2012 analogous to that recorded in the 1990s [16].

Regarding the association between transit migration through Mexico and AIDS, various studies on mobile populations and Central American migrants have contributed to identifying circumstances of social vulnerability among migrants which foster occasional and unprotected sexual relations, transactional sex and rape, placing these populations at risk for HIV transmission [17, 18]. Since the end of the 1990s, there is concern that migrants may constitute a group that facilitates the dynamics of HIV transmission; however, actual prevalence of AIDS among migrants crossing Mexico to enter the USA remains unknown. This poses one of the challenges faced by socioepidemiological research in attempting to study particularly vulnerable groups driven by processes of high mobility in irregular migratory conditions.

The present work is the result of a broader participative research initiated in 2002 with migrant shelters in Mexico (*Casas del Migrante*, as they are known in Spanish). These non-governmental organizations provide humanitarian services while promoting and defending the human rights of migrants. The purpose of the analysis presented here was to estimate the magnitude of the HIV epidemic among the Central American migrants in transit through Mexico to the USA.

Methods

Study Design and Sample Selection

We carried out a cross-sectional study between February 2009 and August 2013, in seven migrant shelters located in strategic points on the migratory route of migrants who enter Mexico through Guatemala on their way to the USA. These shelters are in the cities of Tecun Uman in Guatemala; Tapachula, Chiapas; Arriaga, Chiapas; Ixtepec, Oaxaca; San Luis Potosí, SLP; Saltillo, Coahuila; and Tijuana, Baja California Norte. This path is characterized by the presence of the railway line of the cargo train which provides the principal means of transportation for irregular migrants in Mexico [19].

During the study, the migrant shelters developed strategies to promote human rights among migrants, provided sexual and reproductive health care, including STI and HIV prevention, and facilitated access to primary and hospital care services for migrants suffering from illnesses, accidents and more severe injuries. One of their strategies consisted in offering migrants information on the aforementioned issues through group sessions of 10–15 participants. On completion of the sessions, all the migrants were invited to take part individually and voluntarily in a survey regarding their sexual behaviors, experienced violence (physical, sexual and psychological), sexual and reproductive health status, sociodemographic profiles, migratory backgrounds, access to health care services, and use of legal assistance and humanitarian support. Additionally, they were offered an HIV rapid test (INSTI^{TM}) which detects HIV-1 antibodies with a sensitivity level equal to or greater than 99.5 % [20]. The test requires a fingerstick blood sample.

All migrants who accepted to participate in the study were asked to provide their informed consent verbally. They were also advised of the study objectives as well as the risks and discomfort associated with fingerstick blood sampling and rapid HIV testing. The tests were administered by staff from the migrant shelters previously trained to perform the tests, interpret results and communicate diagnoses in accordance with the procedures of prior- and post-test counseling established by the Rapid HIV Testing Manual issued by Mexico's National Center for HIV/AIDS Prevention and Control (*CENSIDA* by its Spanish initials) [21]. This research project was reviewed and approved by the Ethics (Project 917/898), Research (CI 917) and Biosecurity (Project 911) Committees of the National Institute of Public Health of Mexico. The Ethics Committee approved the procedures to obtain the informed consent of participants, request their voluntary participation and ensure a confidential and private treatment of their information. All participants were given the possibility to communicate directly with the principal investigator of the project both by telephone, free of charge, and electronically, in the event they needed to acquire additional information on the project.

The procedure employed to contact and recruit participants may cause bias by potentially increasing the self-selection of migrants who perceive themselves at increased risk for HIV infection. Nonetheless, it was adopted in light

of the social vulnerability of irregular migrants. The random selection of migrants for the study could create an uncomfortable situation among migrants attending the migrant shelters. All those who chose not to participate in the study were assured that they would continue to have access to all the services offered at the shelters, without restriction.

Analysis was restricted to Central American migrants (n = 9108) attending the shelters, 46.6 % (n = 4201) of whom accepted the test (Fig. 1). All positive testers at initial sampling were administered a second rapid test to confirm their diagnosis. All twice positive testers were referred and accompanied by staff from the migrant shelters to government services specialized in HIV care. They were then evaluated, according to viral load, CD4 count and a confirmation diagnosis (Western Blot), for initiating treatment in accordance with the Official HIV-AIDS Mexican Norm [22]. Among those who accepted testing, 126 exceeded the required age limit and were excluded from analysis, thus leaving a final study sample of 4075 Central American migrants aged 15–49 years (Fig. 1).

Main Variables

The main outcome variable for this study was HIV infection status, defined through binary format (1/0) indicating HIV positive testers. Individual characteristics were grouped into three blocks: (a) sociodemographic background: current age (years), sex (men, women and TTTs), marital status (single/divorced/separated = 0), schooling (years) and had children (1/0); (b) migratory background: country of origin (Nicaragua, Honduras, Guatemala and El Salvador) and previous entry into the USA (1/0); and (c) health-related risk behaviors such as health issues experienced in the last 2 weeks (1/0), previous HIV testing (1/0), including positive cases, sexual violence (1/0), sexual intercourse during the current trip (1/0), condom use at last sexual intercourse in the trip (1/0), and age at the beginning of sexual activity (years) [23].

Statistical Analysis

Descriptive analysis included mean values and standard deviations (SD) for continuous variables and percentages for binary and categorical variables. Unadjusted linear regression models [24] were constructed to assess differences between groups in continuous variables, and a Chi square test was performed for binary and categorical variables [25]. All statistical analyses were performed using *Stata* 13.1 SE [26]. Selection bias was addressed by exploring differences between the migrants who accepted/refused to undergo HIV rapid testing. The differences are presented in the discussion section.

Results

The sociodemographic characteristics, migratory backgrounds, sexual behaviors and health status of migrants who accepted in comparison with those who declined to
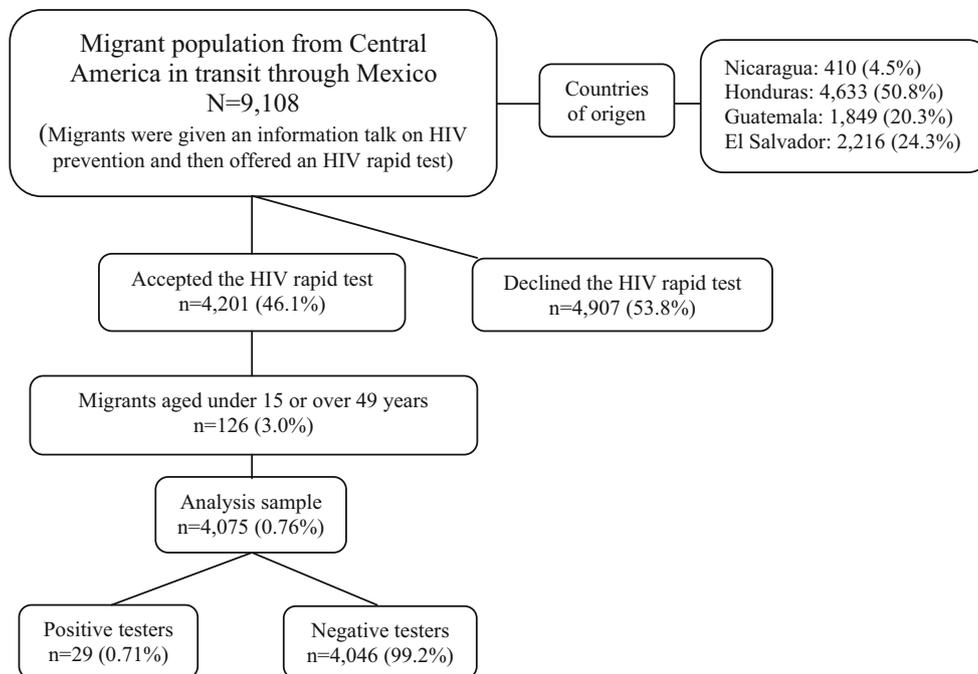
Fig. 1 Sample analysis exclusion criteria flow chart and estimated HIV$^+$ prevalence

take the HIV rapid test are described in Table 1. Those who accepted were older, mostly men, had more years of schooling (6.99 vs. 6.33), were more frequently single, and had more migratory experience (41.9 % had entered the USA before). Condom use at last sexual intercourse during the trip proved less frequent (51.2 %) among migrants who declined compared to those who accepted testing (63.6 %). Half of those who accepted (n = 4075) had been tested previously.

Among the sample analyzed, 89.8 % were men, 10.2 % women and 0.71 % identified themselves as TTTs (Table 2). The latter indicated the highest percentage of single/divorced/separated individuals. More women than men or TTTs had children, and more men (40.6 %) than women (14.4 %) had been to the USA previously. Compared to men and women, TTTs had initiated their sexual lives earlier, had experienced more sexual violence (23.5 %), had engaged in sex more often during their transit through Mexico (37.9 %), and had used a condom more frequently during their last sexual intercourse (64.7 %). No differences were observed in age, schooling or prevalence of health problems such as disease or accidents in the previous 2 weeks.

HIV prevalence among male migrants (twice rapid-test positive) was 0.71 %. It proved high among TTTs (3.45 %) but less than 1 % in men and women. Of 29 cases identified, 11 % (n = 4) had already been advised of their condition as a result of prior testing.

Discussion

The results of our research contribute to assessing the magnitude of the HIV epidemic among migrants in transit through Mexico to the USA. In terms of gender, the sample reflected the characteristic HIV distribution in the Central American region, where TTTs are the most severely affected [27].

Regarding knowledge of their serostatus and HIV prevention matters, the study demonstrates that migrants analyzed were a well-informed population. An important fraction of respondents were aware of their HIV serostatus and had coverage to access HIV testing. Of the total number of rapid-tested participants, 49.8 % had been tested previously. With no information available on access coverage for HIV testing in the general population ages 15–49 of the countries involved, the results presented here offer only an initial approach to the study of HIV-rapid-testing coverage in Central American countries.

During their transit through Mexico, the respondents engaged in unprotected sex with casual partners in circumstances of inequality. Notwithstanding, the percentage of migrants who reported having used a condom during

Table 1 Sociodemographic characteristics, sexual behaviour and migratory background, by rapid test status

	Test status		Mean or proportion differences p value
	Accepted	Declined	
N	4201	4907	
%	46.1	53.8	
	Mean ± SD or %		
Sociodemographic characteristics			
Age (years old)	28.7 ± 8.96	27.5 ± 8.47	<0.01
Sex			
Men	45.0	54.9	<0.01
Women	56.8	43.1	
TTTs	61.7	38.3	
Marital status: single/divorced/separated	61.6	58.0	<0.01
Had children	61.2	58.6	0.02
Schooling (years)	6.99 ± 3.64	6.33 ± 3.56	<0.01
Migratory background			
Country of origin			
Nicaragua	55.6	44.3	<0.01
Honduras	38.4	61.5	
Guatemala	51.2	48.7	
El Salvador	56.0	43.9	
Had been to the USA before	41.9	37.0	<0.01
Presented a health issue during the last two	29.1	30.3	0.20
Had been HIV tested before	50.4	51.8	0.15
Sexual violence[a]	1.12	1.18	0.82
Sexual behavior			
Age at the beginning of sexual activity	14.9 ± 3.72	15.3 ± 5.89	<0.01
Had sexual intercourse during this trip	15.0	14.9	0.94
Used a condom at last sexual intercourse in this trip	63.6	51.2	<0.01

[a] Denominator, accepted = 3653, decline = 3076. Sex and country of origin—raw sum: 100 %

their last sexual encounter can still be viewed as high, considering the circumstances and the significant limitations characterizing their access to health care in Mexico [28].

The study identified a series of migration-related risks which differentially affected women and TTTs. For instance, a large number of the latter reported sexual

Table 2 HIV rapid test results, sociodemographic characteristics, migratory profiles and sexual behaviour, by sex

	Sex			Mean or proportion differences p value	
	Men	Women	TTTs	Overall[1]	Men vs. women[2]
N	3629	417	29		
%	89.0	10.2	0.71		
	Mean ± SD or %				
HIV rapid test: positive[a]	0.71 (0.46; 1.04)	0.47 (0.05; 1.72)	3.45 (0.08; 17.7)	0.18	0.58
Sociodemographic characteristics					
Age	28.0 ± 7.96	28.0 ± 7.26	24.8 ± 4.64	0.33	0.53
Marital status: single/divorced/separated	62.1	55.0	93.1	<0.01	0.01
Had children	58.6	82.8	13.7	<0.01	<0.01
Schooling (years)	6.99 ± 3.63	7.03 ± 3.54	8.44 ± 3.92	0.24	0.05
Migratory background					
Country of origin					
Nicaragua	93.4	6.56	0.00	<0.01	<0.01
Honduras	87.3	11.8	0.78		
Guatemala	91.4	7.52	0.99		
El Salvador	89.0	10.6	0.30		
Had been to the USA before	43.9	17.2	37.9	<0.01	<0.01
Presented a health issue during the last 2 weeks	28.0	36.3	20.6	<0.01	<0.01
Had been HIV tested before	48.1	66.1	79.3	<0.01	<0.01
Result of HIV rapid test: positive	0.53	NCR	NCR	–	–
Sexual violence[b]	0.48	5.84	23.5	<0.01	<0.01
Sexual behaviour					
Age at the beginning of sexual activity	14.7 ± 3.64	16.0 ± 2.74	13.8 ± 2.69	<0.01	<0.01
Had sexual intercourse during this trip	14.2	20.6	37.9	<0.01	<0.01
Used a condom during last sexual intercourse in this trip	38.7	13.6	64.7	<0.01	<0.01

NCR no cases reported

[a] Values inside the brackets are 95 % confidence interval

[b] Denominator, men = 2481, women = 274, TTTs = 17. Sex and country of origin—raw sum: 100 %

[1] Difference between the three sex groups

[2] Difference test between men and women groups

violence in situations where condom use was practically impossible. It is important to highlight that no statistically significant differences were found between migrants who engaged in sex during their transit through Mexico or suffered sexual violence at some point in life and those who chose to accept or decline HIV testing under the study. This issue needs to be considered in future research regarding migration and AIDS, as the former constitute the population group at greatest risk for HIV transmission.

The decision of migrants to undergo or not an HIV rapid test calls for more in-depth research considering the limitations that this social group has to access health care services and the social stigma related to migration [6].

HIV prevalence among the migrants in the study sample reflected the concentrated epidemic in their countries of origin. This information allows us to argue that migrants in transit through Mexico to the USA do not represent an important driver of the AIDS epidemic in the region and, hence, to expose the myths around migration and its connection with the spread of HIV. However, the social vulnerability and risk facing migrants during their transit cannot be disregarded. It is important to step up preventive

measures and promote early HIV diagnosis among Central American migrants in route to the USA.

This study is subject to some limitations for HIV prevalence estimation, one of them concerning potential self-selection bias in the option to accept or decline HIV testing. All migrants received information enabling them to recognize their exposure to HIV, both in their home countries and during their travel. Our findings reveal that those who accepted/declined HIV testing as part of this study had different sociodemographic profiles and migratory backgrounds. The former were older, had more schooling, had broader migratory experience (had entered the USA previously) and had used a condom less frequently at last intercourse during the trip.

Complementary analyses were therefore conducted both to explore the relationship between prevalence and previous HIV testing, and to determine the estimation variance levels (data not shown). The results indicated that, in relative terms, prevalence was similar: 0.71 % [CI95 %: 0.46 %, 1.04 %] in our sample and 0.75 % [CI95 %: 0.57, 0.93 %] in previously tested individuals. In absolute terms, of 35 cases with previous positive test results, four came out positive under our HIV rapid test and 31 declined testing. Additionally, the migrants who refused the test resembled negative testers in certain characteristics- i.e., had children, engaged in sexual intercourse during the trip, reported an illness or accident in the last 2 weeks, and were HIV tested previously. However they were different in current age and schooling (lower among those who declined testing) and age at first sexual intercourse (higher among those who declined testing). Hence, it remains unclear whether the migrants who declined testing corresponded more to the negative or positive HIV testers. Furthermore, it was impossible to determine the direction of the bias.

The study opens up new lines of research on countries of origin to compare and assess the estimates presented here.

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