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Mexico's Evolving HIV Epidemic

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This year marks the first time the International AIDS Conference will be held in a Latin American country, with Mexico as its host. Accordingly, it is timely to revisit Mexico's status as a country thought to have averted a major human immunodeficiency virus (HIV) epidemic, in contrast to some nearby countries (eg, the United States and Honduras). An estimated 180 000 HIV-positive individuals were living in Mexico in 2006, which translates to a prevalence of 0.3%.[1] Yet with a pandemic that may shift rapidly, national HIV prevalence can mask considerable heterogeneity at the state level. In Mexico, a dynamic HIV subepidemic on its northern border with the United States now threatens its designation as a country of low prevalence and high risk.

Among Mexico's 32 states, Baja California—abutting California in the United States—has consistently had the highest cumulative AIDS incidence, second only to the federal district (ie, Mexico City).[1] Tijuana, a city of 1.5 million people adjacent to San Diego, California, is situated on a major drug trafficking route. Approximately 90% of methamphetamine and 30% of heroin entering the United States are produced or manufactured in Mexico.[2] Like many other Mexico-US border cities (eg, Nuevo Laredo and Ciudad Juarez), Tijuana also has a thriving *zona roja* [red-light zone], attracting thousands of sex tourists each year.[3]

The co-occurrence of the drug and sex trades may be contributing to increasing rates of HIV and sexually transmitted infections (STIs) in some cities along the Mexican-US border.[2-7] Prevalence of HIV was 6% in 924 female sex workers (FSWs) recruited for an intervention study between January 2004 and January 2006 in Tijuana and Ciudad Juarez (bordering El Paso, Texas)[4]; among the 368 FSWs who were followed up in the control group, HIV incidence was 2.01 per 100 person-years.[5] Although HIV prevalence among 1052 injection drug users (IDUs) recruited in Tijuana via respondent-driven sampling from 2006 to 2007 was lower at 3%,[6] HIV incidence among 618 IDUs who returned for follow-up was 2.18 per 100 person-years.[7] Prevalence of HIV was 12% among FSWs who inject drugs in these cities, among whom nearly half had at least 1 active STI.[2] In 2006, the rate of acquired syphilis was 12.6 per 100 000 in Baja California,[1] twice that of the United States. In a large study of pregnant women in Tijuana, HIV prevalence was 1% and among those who used drugs was 6%[8]; all HIV cases were previously unidentified and linked to drug use. As many as 1 in 125 individuals aged 15 to 49 years in Tijuana was infected with HIV in 2005,[8] suggesting that the city's HIV epidemic had already increased from a low level to a more concentrated prevalence.

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Tijuana's HIV epidemic may influence its neighbors to the north and south. Because of the substantial median income gap between Mexico and the United States, strong migratory forces from Mexico's interior have led Tijuana to experience one of the highest population growth rates in Latin America. Tijuana and San Diego share the busiest land-border crossing in the world, with 45.9 million northbound legal border crossings in 2006 alone. Considerable bidirectional mobility exists among high-risk populations at this international border crossing. Nearly half of men having sex with men (MSM) in Tijuana and three-quarters of MSM in San Diego report having male sex partners from across the border.[9] In 2005, one-fifth of IDUs in Tijuana had traveled to the United States in the previous year.[10] Of 924 FSWs studied in Tijuana, 69% report being patronized by US clients; those who are report greater tendencies to inject drugs, have high syphilis titers, and engage in unprotected sex for higher pay.[3]

While the role of mobility in Mexico's evolving HIV epidemic remains unclear, a review on this topic reported that 40.6% of Mexican male international migrants report having sex with sex workers, 35.3% report sex with nonregular and commercial partners, and 9% to 20% inject drugs, vitamins, or antibiotics.[11] Because two-thirds of Tijuana's inhabitants originate from outside Baja California, migrants may be infected with HIV when they return home. In the southern states of Michoacan and Zacatecas, 20.6% and 20.5%, respectively, of AIDS cases reported by the end of 2000 were among individuals who had resided in the United States.[11]

Bisexuality is an important risk factor in Mexico's HIV epidemic.[11-13] In a study of MSM in 4 Mexican cities (ie, Acapulco, Netzahualcoyotl, Monterrey, and Tampico), 42% reported having sex with women in the previous 6 months[13]; a percentage identical to that in Tijuana.[9] Of male IDUs studied in Tijuana, 28% reported having sex with other males.[6] Social stigma surrounding bisexuality and homosexuality may be contributing to a feminization of Mexico's HIV epidemic, a consequence of bisexual men infecting their wives, or other women.[12] The proportion of women among reported AIDS cases diagnosed in 2006 was 20.7% compared with 16.0% for cumulative cases reported from 1983-2006,[1] and increasing numbers of Mexican women report unprotected sex with their husbands as their sole risk factor.[12] The ratio of male to female HIV cases appears narrower in Tijuana, at approximately 3:1.[8]

Unless HIV prevention is scaled up immediately, Tijuana's HIV epidemic could become increasingly generalized. Recent Tijuana studies demonstrated that 46% of MSM[9] and 41% of IDUs[6] have ever had an HIV test, indicating the need to expand voluntary testing and counseling to these and other high-risk groups (eg, FSWs and migrants). In response, the Federal Ministry of Health, through the Centro Nacional para la Prevención y Control del SIDA, Mexico City, Mexico, and state health officials, implemented mobile clinics (*condonetas*) in Tijuana and several other Mexican cities to deliver condoms, rapid HIV testing kits, educational materials, and syringe exchange to high-risk neighborhoods. Equipped with loudspeakers on their roofs, video screens on their bumpers, and emblazoned with brightly colored condom caricatures, *condonetas* take HIV prevention to the streets, challenging the sexual silence of this otherwise conservative country.

Nongovernmental organizations, witnessing an emerging HIV epidemic unfold, have responded enthusiastically. In 2006, 119 million free condoms were distributed with aid from federal health authorities. In 2007, nationwide routine HIV screening was integrated into prenatal care to identify HIV infections earlier and offer antiretroviral therapy (ART) to mother and child. Until recently, the only needle exchange program (NEP) in Mexico was operated by a nongovernmental organization in Ciudad Juarez. However, NEPs are now operating in at least 6 Mexican states and NEP attendance increased from 20% to 59% among Tijuana IDUs from 2006-2007.[7]

These important steps need to be amplified and sustained, but other challenges remain at the national level. Efforts to integrate HIV and STI diagnosis and treatment are needed, given the high prevalence of syphilis that has been closely linked to HIV transmission among FSWs and IDUs.[4,6] While ART is provided free to medically eligible individuals in Mexico through government-sponsored health care, structural barriers hamper ART rollout, such as a health care system that struggles to meet the demand, an inability to negotiate ART price discounts due to factors that may include NAFTA, unacceptably high rates of prescribing inappropriate antiretroviral regimens,[14] and inefficiencies in delivery of voluntary testing and counseling.[15] A federally sponsored program to improve ART clinical decision making is under way.

What can other countries learn from Mexico's experience? First, even when an HIV epidemic is avoided early, vigilant epidemiological and behavioral surveillance needs to be closely coordinated with prevention and treatment, matched at the appropriate scale[14,15] to ensure that outbreaks are contained. Second, migration and mobility need to be recognized as critical drivers of HIV vulnerability,[6,9-12] suggesting that HIV interventions should incorporate sexual geographies that shape individual and network-level risks.[12] Third, border regions may represent especially high-risk locations deserving of heightened HIV surveillance in the context of binational cooperation.

In light of increased HIV prevalence and incidence and high levels of bidirectional mobility, Tijuana's HIV epidemic profile may represent what lies ahead for Mexico and possibly Central America. Effective HIV and STI prevention, diagnosis, and treatment will need to involve a shared responsibility between bordering countries. A multipronged plan is urgently required that increases access to and uptake of voluntary testing and counseling, expands preventive HIV and STI interventions for high-risk groups, and provides consistent, medically appropriate ART to prevent the spread of HIV infection through the Americas.

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