

The Emerging HIV Epidemic on the Mexico-U.S. Border



AN INTERNATIONAL CASE STUDY
CHARACTERIZING THE ROLE OF
EPIDEMIOLOGY IN SURVEILLANCE AND
RESPONSE

Strathdee, S. A., C. Magis-Rodriguez, V.M. Mays, R. Jimenez, and T.L. Patterson. (2012). "The Emerging HIV Epidemic on the Mexico-US Border: An international case study characterizing the role of epidemiology in surveillance and response." *Annals of Epidemiology* **22**(6): 426-438.

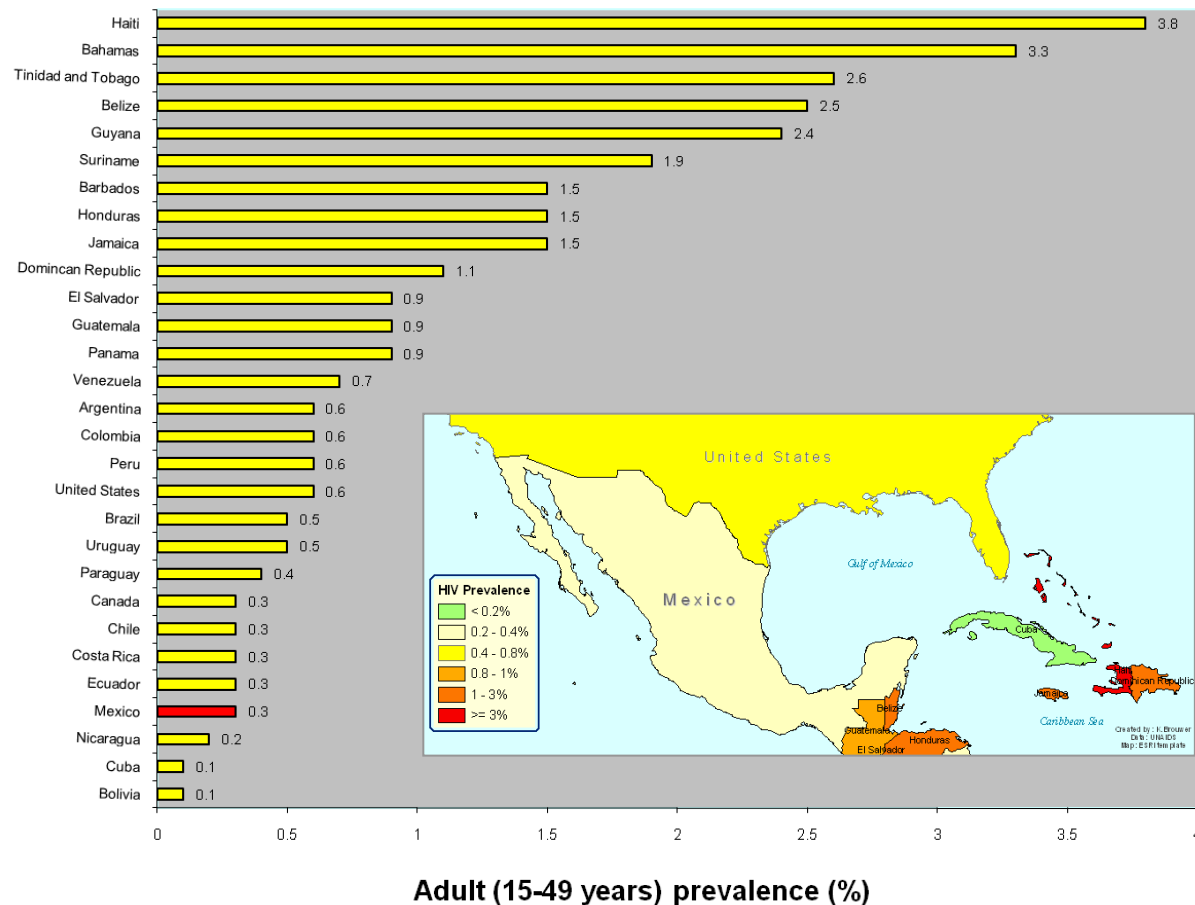
Background



- Mexico's nationwide prevalence of HIV is among the lowest in the Americas
- 2002: del Rio and Sepulveda conclude that Mexico has averted a major HIV epidemic

Background

HIV prevalence in the Americas



Background



- Using national and regional data can mask dynamic subepidemics
- Especially vulnerable populations that underuse HIV testing and treatment services
- This case will contrast Mexico's national and state-level HIV epidemic profile with two northern Mexican cities (Tijuana and Ciudad Juarez)

Conceptual Framework

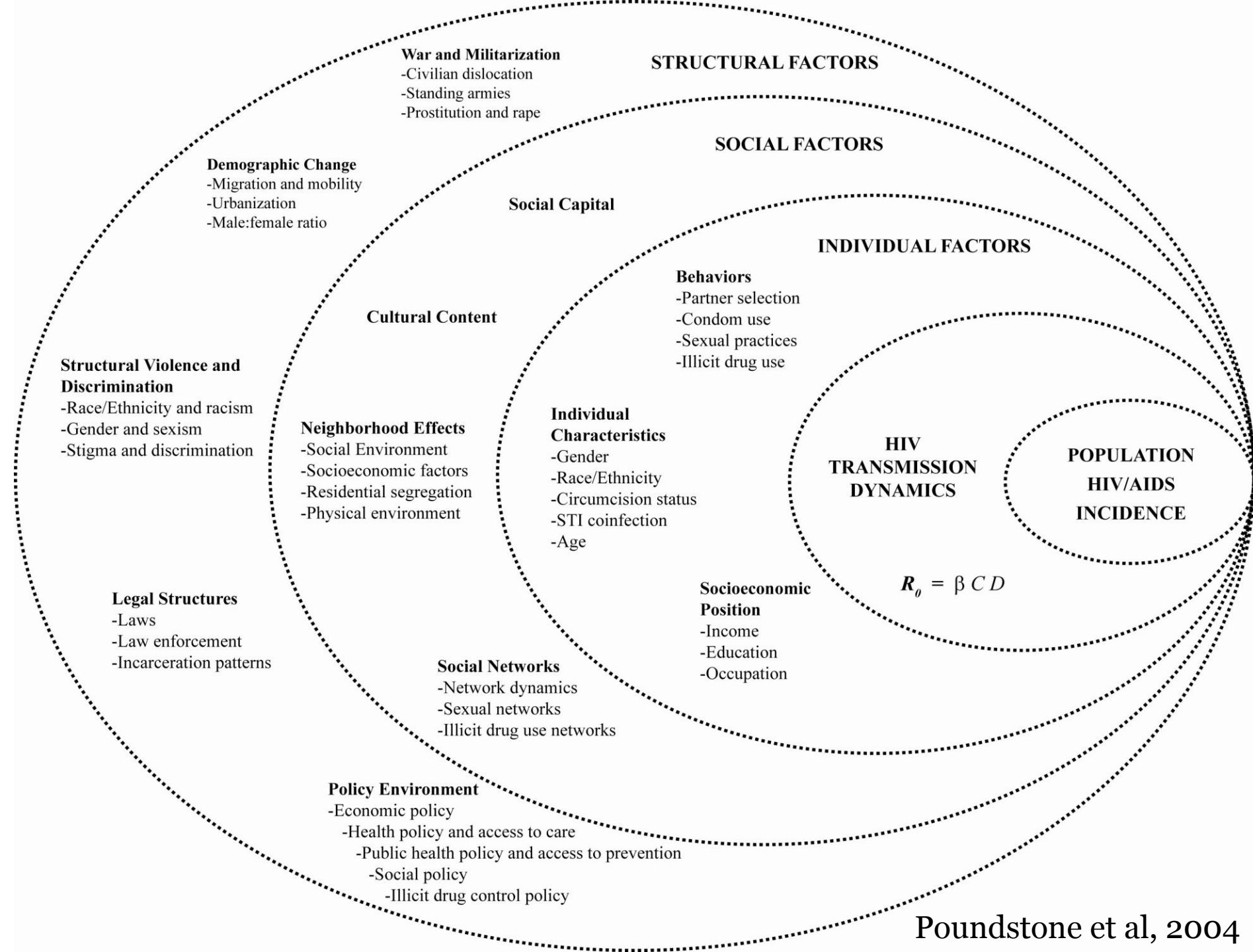


RISK ENVIRONMENTS

Conceptual Framework: Risk Environments



- **HIV risk environment:**
 - the social or physical space in which
 - the interplay of factors exogenous to the individual
 - increases their likelihood of engaging in risky behaviors
 - (Rhodes et al, Soc Sci Med 2005)
- **Can be categorized by type**
 - Physical
 - Social
 - Economic
 - Policy



Conceptual Framework: Implications



- HIV prevention is not merely of function of an individual's behavior
 - It is also a function of social, economic and policy environments
 - Behavior change is also the responsibility of governments and policy makers
- HIV infections do not occur randomly within a population, and are prone to clustering
 - Risk factors do not individually create risks for HIV infection
 - Clustering of risk factors creates vulnerability

Conceptual Framework: HIV Risk in the Mexico-U.S. Border Region

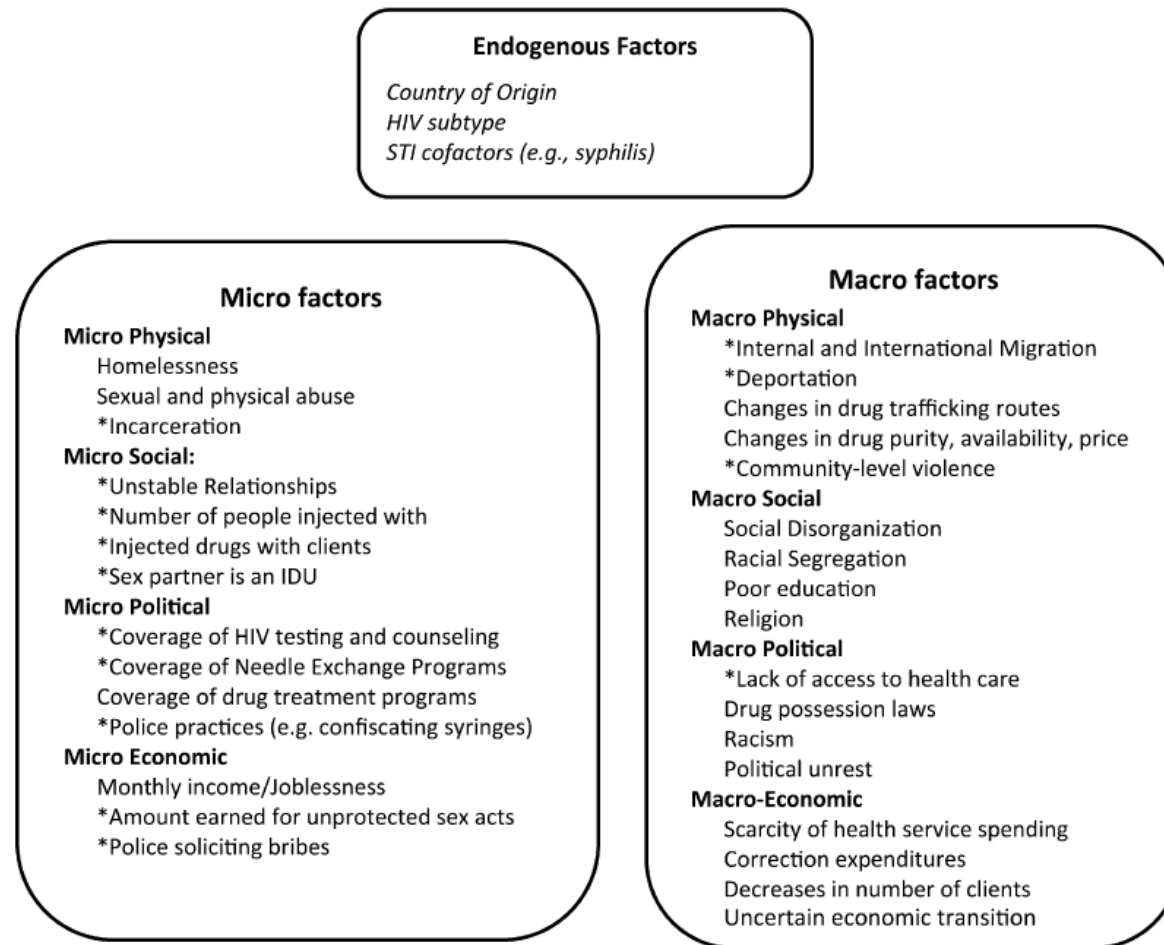


FIGURE 1. Conceptual framework depicting factors in the HIV risk environment operating in the Mexico-U.S. border region. *Factors supported by research in Mexico.

HIV Risks



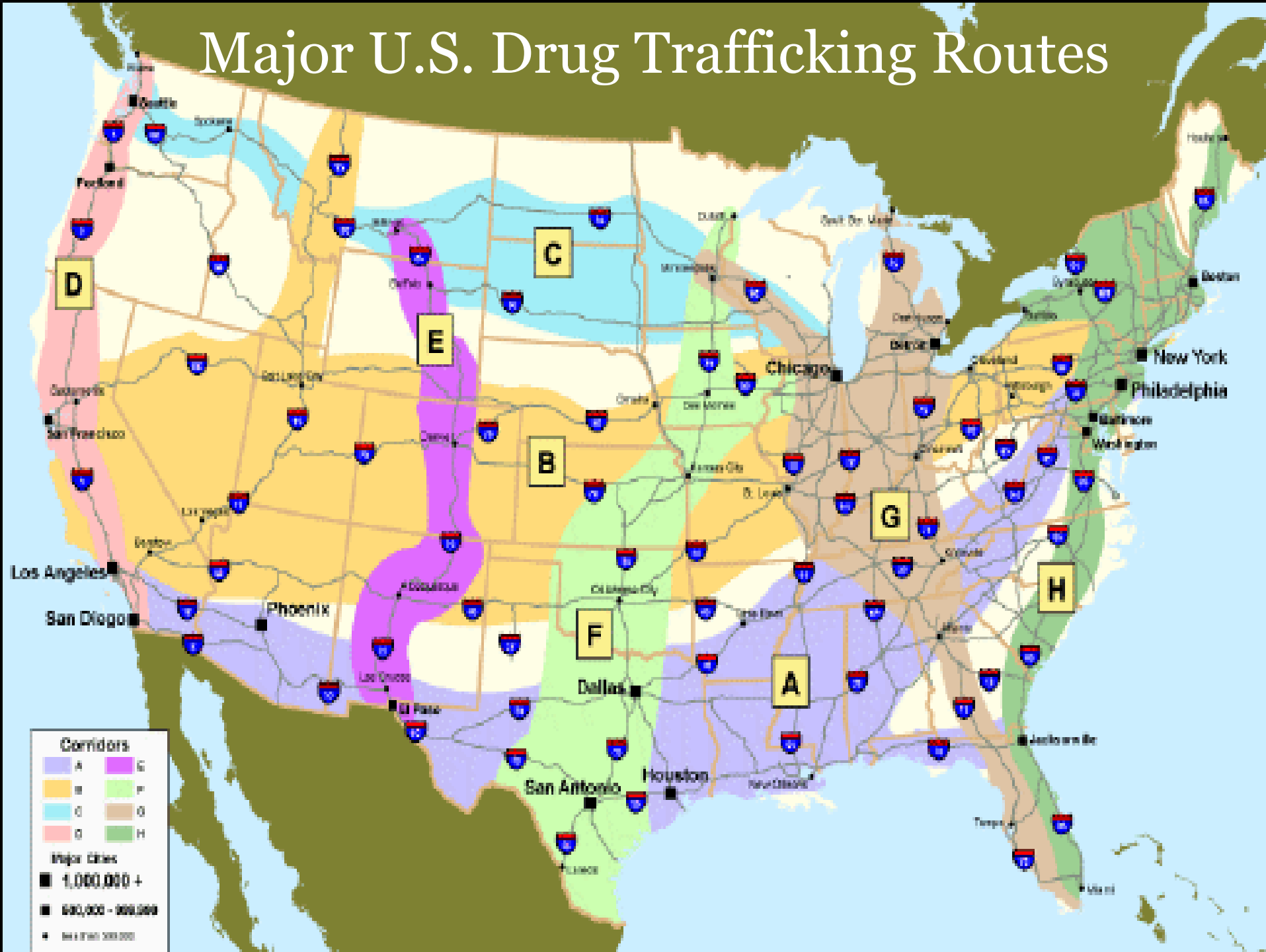
IN THE U.S. – MEXICO BORDER REGION

HIV Risk in the U.S.-Mexico Border Region



- **Place**
 - Difference in median incomes between the U.S. and Mexico is greater than any other two contiguous countries
- **Drug Trafficking and Drug Use:**
 - Illicit drug use in Mexico has increased along trafficking routes
 - 1988: 17,000 Mexicans reported using heroin in the last year
 - 1993: 30,000 Mexicans reported using heroin in the last year
 - Tijuana and Ciudad Juarez have the highest number of illicit drug users in Mexico
 - Shooting galleries are widespread in both cities

Major U.S. Drug Trafficking Routes

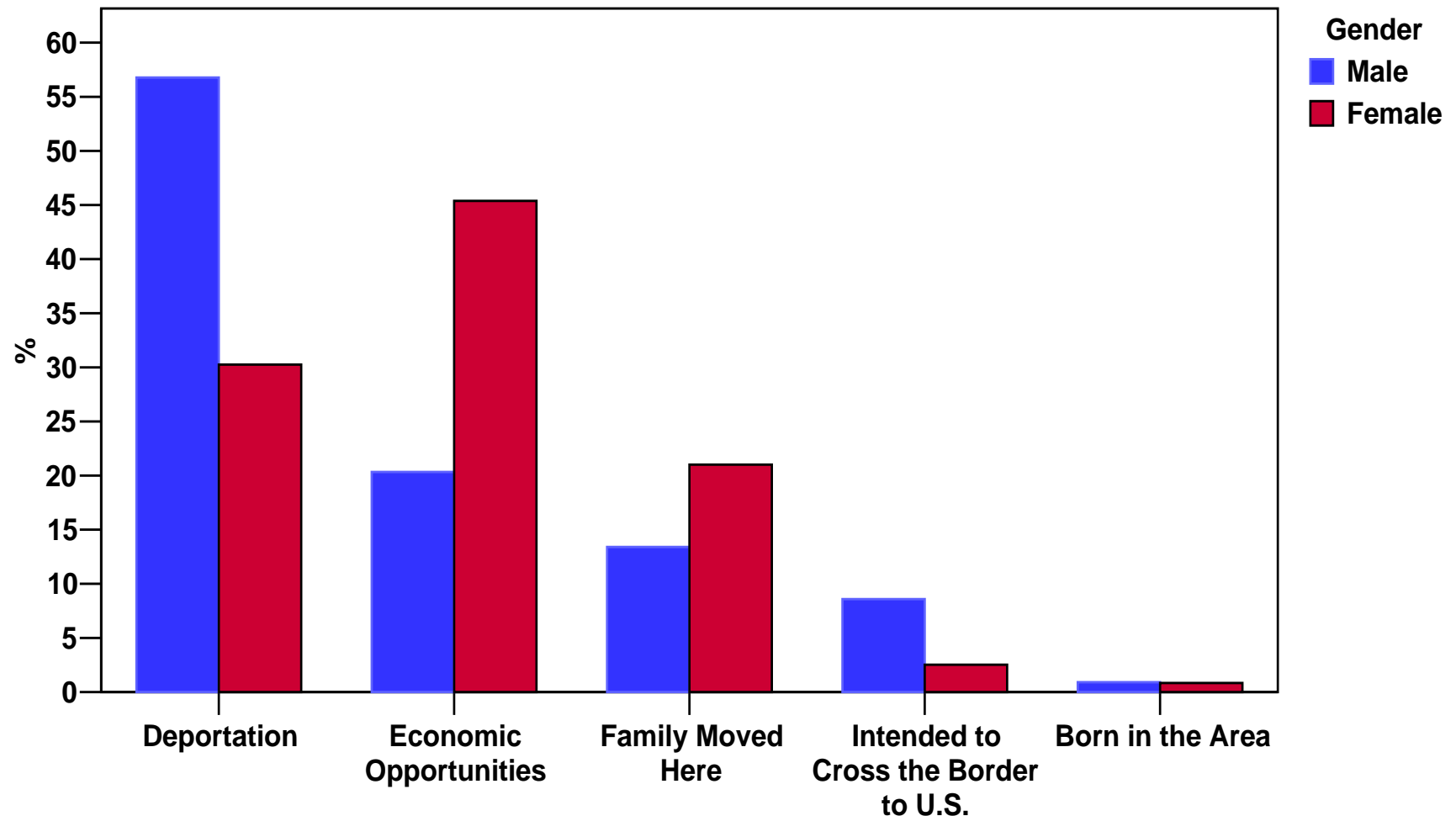


HIV Risk in the U.S.-Mexico Border Region



- Legal and Social Context of Sex Work
 - Sex work is quasi-legal in Mexico
 - Many FSWs are concentrated in *zona rojas* (red light districts)
- Migration, Cross-border Mobility, and Deportation
 - Tijuana-San Diego is the busiest land border crossing in the world
 - Tijuana and Ciudad Juarez are primary corridors for migrants and truckers
 - ✦ Truck routes have been identified as major corridors for HIV/STI transmission
 - Undocumented persons are ineligible for healthcare in the U.S.
 - Deportees from the U.S. are often left at the border with not identification, possessions, or source of income

HIV Risk in the U.S.-Mexico Border Region: Reasons for Moving to Tijuana by Gender



Note: 15 males and 7 females listed other reasons.

HIV Risk in the U.S.-Mexico Border Region



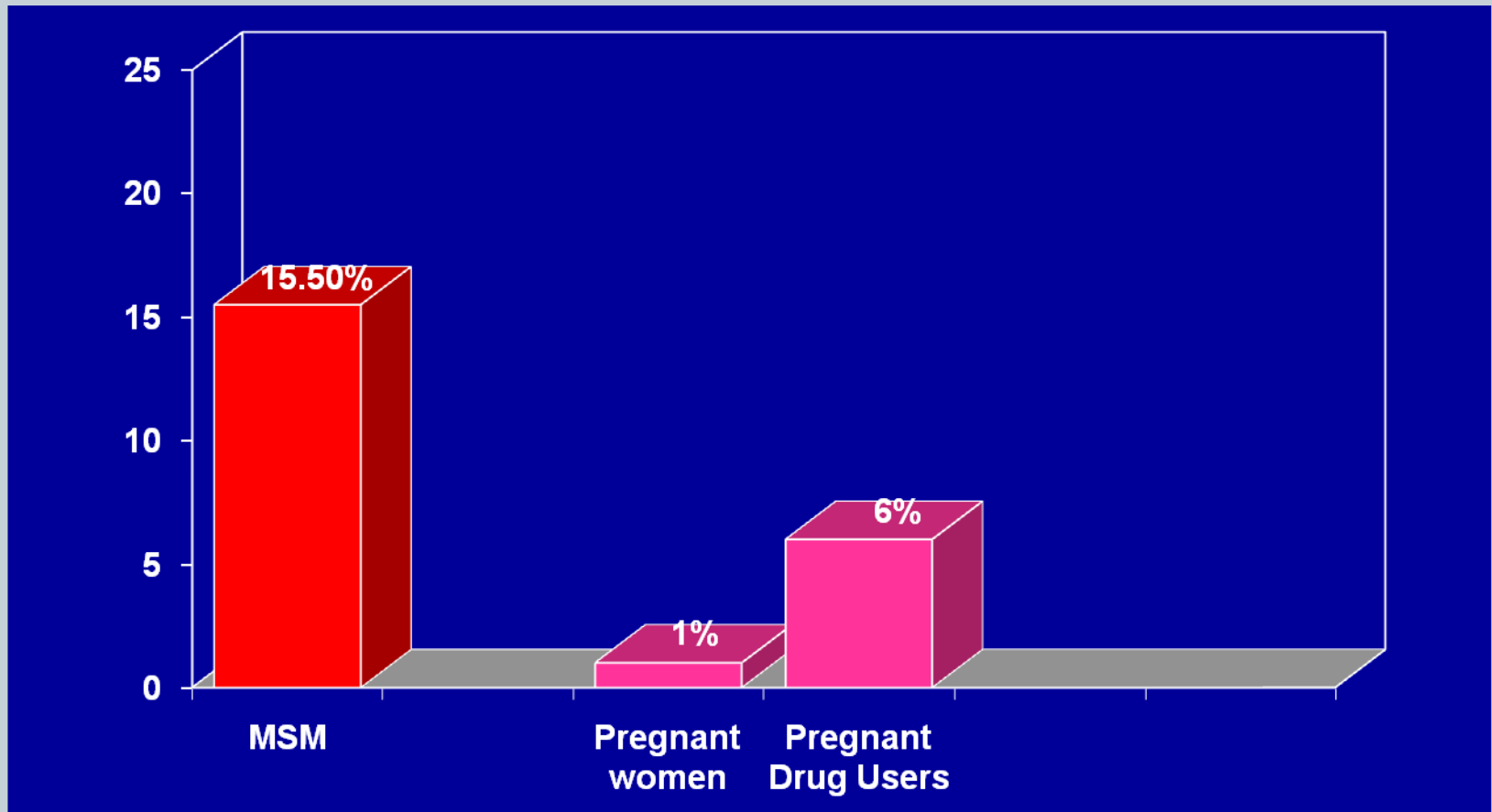
- **The Role of Religion**
 - The Catholic Church has thwarted efforts to distribute condoms
- **Access to Sterile Syringes**
 - U.S. political opposition has contributed to low adoption of needle-exchange programs in Mexico

Epidemiological Studies



**EXAMINING HIV INCIDENCE AND RISK
FACTORS IN THE U.S. – MEXICO BORDER
REGION**

Epidemiological Studies: Pregnant Women



Sources: CENSIDA, CA State Office of AIDS;
Viani et al, 2006

Epidemiological Studies: Female Sex Workers



- 12% HIV prevalence among FSWs who are also IDUs

<i>Baseline Characteristics</i>	<i>Adjusted Odds Ratio, 95% CI</i>
Injected cocaine past month	2.96 (1.29, 6.80)
Smoked, inhaled, or snorted methamphetamine past month	3.32 (1.85, 5.95)
Syphilis titer $\geq 1:8$	4.16 (2.28, 7.59)

Epidemiological Studies: Injection nous Drug Users



Factors Independently Associated with HIV infection by Gender (Strathdee et al, PLoS ONE, 2008)

Variable	Odds Ratio (Females)	Odds Ratio (Males)
Age	0.84	--
# of arrests for track marks (per 5 arrests)	--	1.1
Syphilis	4.8	6.2
# of different people usually injects with* (per 5 people)	--	1.3
Number of years lived in Tijuana (per 10 year increase)	1.9	--
Deportation	--	4.0

*Adjusted for correlation between recruiters and recruitees

All p<0.05

Factors associated with HIV among 620 FSW-IDUs in Tijuana and Cd. Juarez



Variable	AdjOR (95% CI)
Injected drugs with a client often/always	3.20 (1.40 - 6.52)
Police confiscated syringe in exchange for not arresting them*	2.40 (1.16 - 4.99)
Syphilis titers $\geq 1:8$	10.15 (4.14 - 24.88)
Obtained syringes at needle exchange program**	5.43 (2.02 - 14.58)
Attended needle exchange x syphilis titers $\geq 1:8$	0.08 (0.01- 0.70)

Epidemiological Studies: Challenging Assumptions about HIV in Mexico



1. The HIV epidemic was no longer national, but had become regional sub-epidemics
2. Much higher than expected HIV prevalence among FSWs and female IDUs was in Tijuana and Ciudad Juarez
3. There is considerable overlap between communities engaged in sex work and drug use
4. The impact of the HIV risk environment on individual-level HIV risk behaviors can't be ignored
5. The responsibility for change should rest more on the shoulders of policy makers and program planners than on individuals

Epidemiology to Policy



LEVERAGING DATA TO INFLUENCE POLICY

Epidemiology to Policy: Communication of Results



- How to generate thoughtful policy change without the U.S. or Mexico blaming each other?
- Used epidemiological data to demonstrate the bi-directional mobility of at-risk populations across the border
- Findings prepared in Spanish and English
 - Shared with municipal, state, and federal officials in Mexico before lifting the press embargo
 - Results released to press simultaneously in both countries
- Presented results and recommendations to Governor of Baja California and Mayor of San Diego in a joint meeting

Epidemiology to Policy: Communication of Results



- The press can be a double-edge sword
 - 2008 study of Male Clients of FSWs in Tijuana: US clients more likely than Mexican clients to select riskier FSWs who had infectious syphilis and were more likely to have unprotected sex for more money.
 - *San Diego Tribune* article accurately depicted the findings except for the headline: “Sex with Americans Risky for Mexican Hookers.”
 - ✦ -Fallout with the community
 - ✦ -Shows importance of cultural and gender sensitivity

Epidemiology to Policy: Outcomes from Results



- Federal and state health officials in Mexico commissioned a fleet of mobile prevention vans modeled in part after a mobile van that was used to recruit participants for epidemiologic studies
- National guidelines supporting harm reduction (CENSIDA 2005) used data to justify needle exchange program (NEP) expansion in Mexico
 - By 2010, small scale NEPs were operating in 9 states

Epidemiology to Policy: Outcomes from Results



- Identification of research questions of interest to both the U.S. and Mexico
 - Led to funding from the National Institute on Drug Abuse (NIDA), the National Institute of Mental Health focusing on social, environmental, and behavioral factors
- NIDA funds also awarded to study drug policy reform deregulating small amounts of a variety of drugs
 - New laws are designed to redirect law enforcement to drug dealers and traffickers

Epidemiology to Policy: Outcomes from Results



- 2009: Mexico received funds from the Global Fund for HIV, TB and Malaria for the first time
 - Epidemiological data demonstrated that HIV prevalence had surpassed the 5% in one risk group required for funding eligibility
- Encouraging bi-national partnerships
 - Increased funding from a variety of groups for training programs developing research skills and programmatic capacity building
 - Aimed at U.S. and Mexican students who train together side by side and learn from one another

Lessons Learned



Lessons Learned



- Reliance on HIV/AIDS surveillance data can mask emerging regional trends
- Simple epidemiologic data can generate powerful responses
 - Large-scale studies (i.e. longitudinal cohort studies) are not always necessary
 - Descriptive data (estimates of HIV prevalence, incidence, and associated risk behaviors) can sometimes be sufficient to generate important policy outcomes

Lessons Learned



- **The importance of risk environment**
 - In this case, environmental factors appeared to be more important than individual level risk factors
 - This epidemiologic data were used to shift responsibility towards governments and policy makers and away from individuals
- **Mobilizing key stakeholders is critical for generating timely policy responses**
 - Involvement of policy makers and partners from inception is critical
 - In this case, the involvement of both Mexican and American researchers, health officials, NGOs, etc were key to achieving policy change