

# HIV Seroprevalence and Risk Exposure Categories among Clients Attending Sexually Transmitted Disease Clinics, Miami-Dade County, Florida, 1990-1999

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## Abstract

*The purposes of this study were to: (1) estimate the prevalence of HIV in sexually transmitted disease (STD) clinic populations; (2) assess risk exposure categories associated with HIV seropositivity; (3) monitor trends; and (4) supply data to inform and evaluate HIV prevention programs. Blood specimens were obtained from clients having routine serology at their initial visit for a new disease episode. Four clinics in Miami-Dade County participated in the 1990-1999 unlinked (blinded) seroprevalence survey. Specimens routinely collected for other purposes were stripped of identifiers and tested for antibodies to HIV-1. Demographic and risk information was gathered before testing. Tests results and data collection forms were forwarded to the Miami-Dade County Health Department (MDCHD), where they were scanned and entered into a database. We analyzed data from 41,354 specimens in relation to demographics, selected STDs, and HIV risk exposure categories. Overall HIV seroprevalence was 7.5% with a significantly higher infection rate for men (8.3%) compared to women (6%). Among those reporting heterosexual contact as their only risk, the infection rate (4.9%) was 13 times the estimated national HIV infection rate (0.36%). HIV rates declined over nine years (from 10.8% to 5.8%) with significant downward trends observed for men and women; and for whites, blacks, and Hispanics. We found a significantly higher HIV rate for ulcerative STDs (9.4%) compared with non-ulcerative STDs (6.2%) for both males and females. Higher HIV rates were also found among those diagnosed with multiple STDs (15.4%) compared to those in either the ulcerative or non-ulcerative STD category. In conclusion, we strongly emphasize the need for assessing HIV infection in STD patients, and STD infections in HIV-infected patients.*

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## Introduction

Since the beginning of the AIDS epidemic, the incidence of HIV/AIDS has been strongly associated (Fleming & Wasserheit, 1999) with the co-occurrence of other sexually transmitted diseases (STDs). There are an estimated 19 million new cases of STDs (Weinstock, Berman, & Cates, 2004) and 40,000 new HIV infections (Centers for Disease Control and Prevention [CDC], 2002) each year in the United States. The CDC (2004) estimates that 850,000-950,000 Americans are currently infected with HIV.

The presence of STDs increases the likelihood of non-infected persons acquiring HIV infection through sexual contact and of HIV-infected persons transmitting HIV to sexual partners (CDC, 1998). Furthermore, sub-populations at increased risk for HIV transmission typically have higher rates of STDs (e.g., men who have sex with men (MSM) exhibit elevated rates of bacterial and other STDs) (CDC, 2002a). According to the Miami-Dade County Health Department (MDCHD, 2005), male-to-male sexual contact represented 53% of reported HIV cases among men in the year 2004.

In 1987, the CDC conducted an extensive review of the available information on HIV prevalence rates in the U.S., and realized that the lack of standardized information by demographic subgroups

and geographic areas made those rates difficult to interpret. During 1988-1989 the CDC in collaboration with state and local health departments, implemented a national serosurveillance system for HIV infection. This surveillance system was part of the CDC family of HIV seroprevalence surveys. It used a standardized survey and HIV serologic testing procedures in several metropolitan areas throughout the U.S. (Pappaioanou, Dondero, Petersen, Onorato, Sanchez, & Currant, 1990). The present study analyzes HIV seroprevalence data for nine years of the CDC survey (CDC, 1990) conducted by the Miami-Dade County Health Department (MDCHD) for the period 1990-1999. Data collected from four public STD clinics located in Miami-Dade County were examined in relation to client demographics, selected STDs, and self-reported HIV risk exposure categories.

## Methods

The objectives of the STD Clinic Survey were to: estimate the prevalence of HIV in STD clinic populations; assess risk exposure categories associated with HIV seropositivity in these groups; monitor trends in infection levels and risk exposure categories over time; and supply data to inform and evaluate HIV prevention programs (CDC, 1990).

### *Survey Sites*

In Miami, four STD clinics were selected based on meeting the following criteria: providing STD services, client caseload greater than 25 per day, client diversity, currently conducting HIV/AIDS health education/risk reduction and offering HIV testing to all patients seeking STD services, and expressed willingness to participate and conduct annual surveys (CDC, 1990). The predominant racial/ethnic composition of the zip code where the clinics were located is: Clinic 1, Hispanic; Clinic 2, white non-Hispanic; Clinic 3, black non-Hispanic; and Clinic 4, Hispanic.

### *Participants*

Clients were eligible for inclusion in the survey at their initial visit for a new disease episode if they had not visited the clinic since initiation of the annual survey and had blood drawn for routine purposes. Clients were excluded from the survey if they were: (1) returning for follow-up visits for previously-diagnosed disease episodes in the survey period or (2) attending the STD clinics solely for reasons of HIV testing and counseling, or only for evaluation or treatment of HIV infection. A client could be included in the survey if he/she presented for treatment of a STD and also had AIDS or HIV infection (CDC, 1990).

### *Unlinked Surveys*

Methodological studies have demonstrated that participation rates for linked (confidential) surveys are generally lower for persons who know--or strongly suspect--that they are HIV infected, thereby causing the observed infection rate to be biased downward. "Unlinked" (blinded) surveys were devised to minimize this source of bias in the estimation of HIV seroprevalence. Individuals were not informed that their sera would be analyzed for the presence of HIV. Rather, sera that were collected for routine diagnostic tests were tested for HIV antibodies after personal identifiers were removed and replaced with a unique survey number. Neither the HIV test results, nor the information obtained from medical records could be linked to specific persons; hence, the term "unlinked" (CDC, 1990).

### *Data Analysis*

For each eligible client, information routinely gathered during the initial visit was used to complete the data collection form. This form consisted of three parts: (1) A laboratory report form containing the survey number and response grids for serologic test results (enzyme-linked immunosorbent assay, immunofluorescent assay, and Western blot); (2) A set of peel-off labels, each with the unique survey number used to code serologic specimens; and (3) A "Sexually Transmitted Disease Clinic Seroprevalence Survey" form to record date, sex, age, race/ethnicity, risk exposure, reason for clinic visit, HIV test history, and STD diagnosis (CDC, 1990).

The data collection form was designed to be read by an electronic mark-sense scanner located at the MDCHD AIDS Program Office. Attached to the data collection form was a strip of labels bearing the same unique identification code as on the form itself. These labels were affixed to the blood collection tubes and laboratory results were reported using the identification code (CDC, 1990). Laboratory results and data collection forms were regularly forwarded to the MDCHD, where they were scanned and entered into a database. Data were then sent monthly to the Florida Department of Health Bureau of HIV/AIDS, for editing, analysis, and transmittal to the CDC.

Chi-square tests were performed to examine differences in proportions, differences in HIV seroprevalence rates, and linear time trends using Epi-Info 2000 Version 1.1 software (Dean, 1999).

## **Results**

From January 1990 through December 1999, 41,354 unlinked serologic specimens were tested for HIV and 3,100 (7.5%) of these were HIV seropositive.

### *Race / Ethnicity*

Among the 41,354 specimens analyzed, 25,919 (62.7%) were from black non-Hispanic clients, 11,307 (27.3%) were from Hispanic clients, 3,939 (9.5%) were from white non-Hispanic clinic attendees, and 189 (0.5%) were not classified by race/ethnicity. This racial distribution is representative of the STD clinic clientele, but diverges from the Miami-Dade County population distribution at the time of study: approximately 12% black non-Hispanic, 52% Hispanic, 30% white non-Hispanic, and 6% other race. Overall, similar HIV seroprevalence rates were found for specimens from white non-Hispanics (7.7%) and black non-Hispanics (8.0%). The white non-Hispanic rate was significantly higher than the rate for Hispanics (6.3%,  $p=0.001$ ). However, when analyzed by site, site 1 and site 2 presented significantly higher HIV seroprevalence rates for black non-Hispanics than for whites ( $p<0.0001$ ). In site 3, we found a higher seroprevalence rate for white non-Hispanics than for black non-Hispanics ( $p=0.008$ ). No significant differences in HIV rates were found by race/ethnicity in site 4.

### *Gender*

HIV seroprevalence for 27,333 specimens from men (8.3%) was significantly higher than the corresponding rate for specimens from 14,021 women (6%,  $p<0.0001$ ). This gender disparity was found for white non-Hispanics and Hispanics, but not for black non-Hispanics. White non-Hispanic males reported the highest seroprevalence rate (9.6%), when compared with Hispanic males (8.1%,  $p=0.016$ ), and black non-Hispanic males (8.2%,  $p=0.01$ ). For specimens from women, a highly significant ( $p<0.0001$ ) rate difference was observed when comparing those from black women

(7.7%) to those from white non-Hispanic women (3.7%) and Hispanic women (2.7%). When analyzed by site, statistically significant differences were found in sites 1 and 2 when comparing black non-Hispanic to white non-Hispanic and Hispanic men and women. In site 3, white men presented a higher HIV rate than black non-Hispanic ( $p=0.0009$ ) men. In site 4, black non-Hispanics had the highest HIV seroprevalence rate among women. No other significant differences were noted.

#### Age

The highest HIV rate was observed for the age range 40-44 (13%). This rate was significantly higher than for those <15 (3.7%,  $p<0.0001$ ), 15-19 (1.7%), 20-24 (3.1%), 25-29 (7.3%), and  $\geq 45$  (9%) ( $p<0.0001$  for all comparisons). Significantly higher seroprevalence was observed for males compared with females in these age groups: 35-39 ( $p=0.001$ ), 40-44 ( $p<0.0001$ ), and  $\geq 45$  ( $p<0.0001$ ). In the age group 40-44, the rate for males (15%) was almost twice the rate for females (8.1%). In persons 45 and older, the rate for males (10.8%) was almost three times the rate for females (4%).

When we analyzed the data by site, we also found the highest HIV rate in the 40-44 age group at sites 1 and 2. These were significantly higher than all age ranges, excluding the 35-39 age group. The highest HIV seroprevalence rate in site 3 was found in two age categories: 35-39 and 40-44 years old (9.3%). These were significantly higher than age ranges: 15-19, 20-24, and 25-29. Site 4 presented the highest HIV rate in the age category 35-39 (14.3%) a rate significantly higher than in the 15-19, 20-24, and  $\geq 45$  age groups. Significantly higher seroprevalence was observed for males compared with females in these age groups: 25-29 ( $p=0.01$ ), 35-39 ( $p=0.035$ ), 40-44, and  $\geq 45$  ( $p<0.0001$ ) at site 1. Findings were similar for the age group 45 and older at site 2; and for the age ranges 20-24, 40-44, and 45 and older at site 3. Significantly higher HIV rates were also found for males compared to females in the age groups 25-29, 30-34, 35-39, and  $\geq 45$  at site 4.

All episodes were grouped into six sexually transmitted disease (STD) diagnosis categories. The first two categories included "ulcerative STDs" and "non-ulcerative STDs." The next two categories were "STD contact" (includes all episodes when the client reported sexual contact with a person known to have an STD, was epi-treated, but reported no personal diagnosis of STD), and "no info/unknown." The last two categories were "other" (includes any other STD diagnosis not included above), and "multiple STDs" (includes each visit or episode when the client was diagnosed with two or more specific or presumptive STDs).

We found a significantly higher HIV rate for ulcerative STDs (9.4%) compared with non-ulcerative

STDs (6.2%,  $p<0.0001$ ) for both males and females. Higher HIV rates ( $p<0.0001$ ) were found in the multiple STD category (15.4%) compared to the ulcerative and non-ulcerative categories. Again, this difference was significant for both males and females. The multiple STD category was associated with the highest seroprevalence rates for all age groups except <15 years (ulcerative category had the highest HIV rate).

Among all the HIV-seropositive episodes for women, we found that 34 (97%) of the genital ulcers, 28 (88%) of STD contacts only, 124 (83%) of the vaginal infections, 127 (88%) of the cases of syphilis, and 103 (85%) of the multiple STD diagnoses were reported among black-non-Hispanic women. With respect to diagnoses, black non-Hispanic men accounted for 226 (57%) of gonorrhea, 96 (60%) of non-gonococcal urethritis (NGU), 201 (62%) of syphilis, and 130 (58%) of the multiple STD diagnoses.

All episodes were grouped into nine HIV risk exposure categories. According to CDC guidelines, the category "sexual contact/unknown risk" included the following risk exposure subcategories: heterosexual, received money/drugs for sex, gave money/drugs for sex, and smoked crack cocaine since 1978. For comparison and analytical purposes we treated "heterosexual contact only" as a separate category.

Among the 3,100 HIV-seropositive episodes, 1511 (48.7%) were classified as heterosexual contact only, 618 (19.9%) were men who reported sex with men and sex with men and women (MSM/Bisexual), and 532 (17.1%) were classified as sexual contact/unknown risk. The remaining episodes included: 310 (10%) heterosexual partners of persons with a known risk for HIV, 109 (3.5%) injection drug users (IDUs), 20 (0.6%) MSM/Bisexual/IDUs, and 8 (0.2%) recipients of blood or blood products.

Heterosexual contact was the most commonly reported exposure. Among 27,333 men, 19,374 (70.8%) reported heterosexual contact only, while a significantly higher proportion of women reported this exposure (11,530 of 14,021, 82.2%,  $p<0.0001$ ). HIV seroprevalence rates for these 19,374 men (5.1%) and 11,530 women (4.5%) also were significantly different ( $p=0.018$ ). Whereas these rates exceed the 1997 estimated HIV infection rate in the adult/adolescent population of Miami-Dade County (25,600 HIV seropositive/2.0 million=1.3%), they serve as baseline seroprevalence rates for comparing infection rates for all other identified risk exposure categories.

**Table 1. HIV Seroprevalence among STD clinic clients by site, gender and race/ethnicity  
Miami/Dade County, Florida, 1990-1999**

		SITE 1			SITE 2			SITE 3			SITE 4			ALL SITES		
		Number	HIV+	Rate	Number	HIV+	Rate	Number	HIV+	Rate	Number	HIV+	Rate	Number	HIV+	Rate
<b>White</b>	Male	807	59	7.31	264	8	3.03	494	44	8.9	1117	147	13.16	2682	258	9.61
	Female	401	17	4.23	155	8	5.16	250	8	3.2	451	14	3.1	1257	47	3.73
	Subtotal	1208	76	6.29	419	16	3.81	744	52	6.98	1568	161	10.26	3939	305	7.74
<b>Black</b>	Male	8311	798	9.6	2343	212	9.04	5628	300	5.33	693	74	10.67	16975	1384	8.15
	Female	4526	448	9.89	978	107	10.94	3096	118	3.81	344	20	5.81	8944	693	7.74
	Subtotal	12837	1246	9.7	3321	319	9.6	8724	418	4.79	1037	94	9.06	25919	2077	8.01
<b>Hispanic</b>	Male	4510	370	8.2	951	37	3.89	734	48	6.53	1349	157	11.63	7544	612	8.11
	Female	2628	67	2.54	234	11	4.7	369	8	2.16	532	16	3	3763	102	2.71
	Subtotal	7138	437	6.12	1185	48	4	1103	56	5.07	1881	173	9.19	11307	714	6.31
<b>Other</b>	Male	93	3	3.22	7	1	14.28	15	0	0	17	0	0	132	4	3.03
	Female	34	0	0	1	0	0	11	0	0	11	0	0	57	0	0
	Subtotal	127	3	2.36	8	1	12.5	26	0	0	28	0	0	189	4	2.12
<b>All races</b>	Male	13721	1230	8.96	3565	258	7.23	6871	392	5.7	3176	378	11.9	27333	2258	8.26
	Female	7589	532	7.01	1368	126	9.21	3726	134	3.59	1338	50	3.73	14021	842	6
	Total	21310	1762	8.26	4933	384	7.78	10597	526	4.96	4514	428	9.48	41354	3100	7.49

**Table 2. HIV Seroprevalence among STD Clinic Clients by Selected Sexual Transmitted Diseases and Gender  
Miami/Dade County, Florida, 1990-1999**

	<b>Males</b>			<b>Females</b>			<b>Total</b>		
	Number	HIV+	Rate/100	Number	HIV+	Rate/100	Number	HIV+	Rate/100
<b>Ulcerative STDs</b>									
Syphilis	2260	324	14.3	1412	146	10.3	3672	470	12.8
Genital Ulcers/Herpes	6184	470	7.6	509	35	6.9	6693	505	7.5
Genital Warts	102	6	5.9	47	4	8.5	149	10	6.7
Sub-total	8546	800	9.4	1968	185	9.4	10514	985	9.4
<b>Non-ulcerative STDs</b>									
Gonorrhea	5033	397	7.9	1195	64	5.4	6228	461	7.4
NGU/cervicitis/chlamydia	2486	161	6.5	949	43	4.5	3435	204	5.9
PID	0	0	0.0	3407	150	4.4	3407	150	4.4
Penile/vaginal discharge	238	15	0.0	136	10	7.4	374	25	6.7
Sub-total	7757	573	7.4	5687	267	4.7	13444	840	6.2
<b>Other STDs</b>	3952	315	8.0	2333	154	6.6	6285	469	7.5
<b>STD Contact</b>	1822	113	6.2	938	32	3.4	2760	145	5.3
<b>No Info/Unknown</b>	3933	233	5.9	2178	83	3.8	6111	316	5.2
<b>Multiple STDs</b>	1323	224	16.9	917	121	13.2	2240	345	15.4
<b>Total</b>	27333	2258	8.3	14021	842	6.0	41354	3100	7.5

**Table 3. HIV Seroprevalence among STD Clinic Clients by Risk Exposure Categories and Gender  
Miami/Dade County, Florida, 1990-1999**

	Male			Female			Total		
	Number	HIV+	Rate	Number	HIV+	Rate	Number	HIV+	Rate
MSM/Bisexual	2,217	618	27.9	0	0	0.0	2,217	618	27.9
IDU	316	70	22.2	178	39	21.9	494	109	22.1
MSM/Bisexual/IDU	52	20	38.5	0	0	0.0	52	20	38.5
Heterosexual, partner at risk HIV	1,431	165	11.5	1,091	136	12.5	2,522	301	11.9
Blood Recipient*	68	4	5.9	48	4	8.3	116	8	6.9
Hemophilia*	2	0	0.0	0	0	0.0	2	0	0.0
Sexual contact/unknown risk	3,851	390	10.1	1,132	142	12.5	4,983	532	10.7
Undetermined*	22	1	4.5	42	0	0.0	64	1	1.6
Heterosexual contact only	19,374	990	5.1	11,530	521	4.5	30,904	1,511	4.9
<b>Total</b>	<b>27,333</b>	<b>2,258</b>	<b>8.3</b>	<b>14,021</b>	<b>842</b>	<b>6.0</b>	<b>41,354</b>	<b>3,100</b>	<b>7.50</b>

\* No significant P value for comparison of the risk specific seroprevalence rate to the baseline heterosexual contact risk-only rate

For both sexes combined, and excluding blood recipient, hemophilia, and the undetermined category, highly significant elevations of HIV seroprevalence above the heterosexual-contact-only baseline rate were found for each of the exposure categories. Moreover, statistically significant differences between men and women were found for all of the risk exposure categories for which seropositivity rates were available for both sexes, with the exception of the IDU category ( $p=0.95$ ).

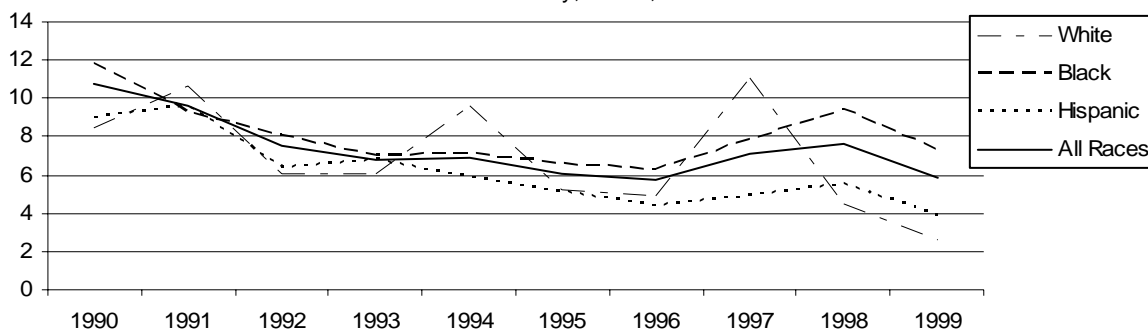
A significantly higher proportion of men reported sexual contact/unknown risk (19.8% for men, 9.8% for women,  $p<0.0001$ ), whereas a significantly higher proportion of women reported heterosexual partner at risk for HIV (9.5% for women, 7.4% for men,  $p<0.0001$ ).

When compared by race, black non-Hispanics had significantly ( $p<0.0001$ ) higher HIV rates for three of eight risks assessed on the behavioral survey

compared with clients of all other race/ethnicities. These risks included gay/bisexual male, IDU, and sexual contact/unknown risk. Compared with all other races, significantly ( $p<0.0001$ ) higher proportions of black non-Hispanics reported engaging in four behavioral risks: gay/bisexual, IDU, heterosexual partner at risk of HIV, and sexual contact/unknown risk.

A highly significant decline in HIV infection rates was observed across the nine full-year annual cycles of data collection (see Figure 1), from 10.83% in 1990 to 5.79% in 1999 ( $p<0.0001$ ). This significant decrease in seroprevalence was found for both men ( $p<0.0001$ ) and women ( $p<0.0001$ ) as well as for white non-Hispanics, black non-Hispanics, and Hispanics ( $p<0.0001$ ). Significant downward time trends were also found among the three race/ethnicity groups when analyzed by gender, except for white non-Hispanic females ( $p=0.692$ ).

Figure 1. HIV Seroprevalence among STD clinic clients by race/ethnicity and year.  
Miami/Dade County, Florida, 1990-1999



The proportion of Hispanics included in the survey increased from 23% in 1990 to 27% in 1999 ( $p < 0.0001$ ). A significant downward time trend was observed for black non-Hispanics, with their proportion decreasing from 68% in 1990 to 63% in 1999 ( $p < 0.0001$ ). The proportion of white non-Hispanics included also showed a downward time trend, decreasing from 9% in 1990 to 4% in 1999. With respect to risk exposure categories, significant downward trends were observed for the proportion of IDU only. However, a significant downward trend in HIV seroprevalence was found for the risk exposure categories gay/bisexual, and sexual contact/unknown risk ( $p < 0.001$ ).

### Discussion

In this study, the standardized national protocol facilitates estimation of HIV seroprevalence among clients attending sexually transmitted disease clinics. However, data from this survey have several limitations. First, the data was collected from patients at increased risk for HIV who chose to seek medical care at the STD clinic serving this population, and whose initial visit during an annual survey cycle included blood collection for routine serologic tests. Therefore, the patients attending these clinics are not representative of all persons with STDs (e.g., those seen by a private physician, those asymptomatic, etc.) and their seroprevalence data serve as indicators rather than representative estimates of HIV infection in Miami's STD-infected persons. Second, changing patterns of attendance in STD clinics are a potential source of bias. For example, HIV-positive patients may be more likely to seek health care in other medical settings, and thus, their loss from the STD clinic population could give a false decreasing prevalence. As counterpoints to potential sources of bias, the unlinked (blinded) survey design, the criteria used for the selection of the four STD clinics, and the high number of participants strengthen the validity of the results.

#### *HIV Seroprevalence and Risk Exposure Category*

This study corroborates the results of previous and similar studies. Our study found that HIV infection rates were higher among those STD clients who reported behaviors already associated with increased risk for HIV infection. Among those reporting heterosexual contact only, the HIV seroprevalence rate (4.9%) was almost four times the estimated HIV rate for the Miami-Dade County adult/adolescent population (1.3%), and about 13 times the national HIV infection rate of 0.36% (Karon, Rosenberg, McQuillan, Khare, Gwinn, & Petersen, 1996).

For STD clinic clients reporting one or more specified risk exposures, HIV seroprevalence rates were significantly higher than the baseline rate for

heterosexual contact only clients. In particular, gay/bisexual male, IDU, heterosexual partner at risk for HIV, and sexual contact/unknown risk were each associated with highly significant elevations of HIV seropositivity rates above the baseline heterosexual rate.

A distinguishing finding of the Miami STD clinic survey was that there were almost no differences in seroprevalence noted between men and women for risk exposure categories when seropositivity rates were available for both genders. The only exceptions were the sexual contact/unknown risk category, where the rate for females was statistically higher than the rate for males, and the heterosexual contact only category where the rate for males was higher than the rate for females. Interestingly, the proportion of women in the sexual contact/unknown category was statistically lower than that for men.

Significantly higher rates of HIV infection were found for black non-Hispanics than for Hispanics and white non-Hispanics in the following risk exposure categories: gay/bisexual male, IDU, and sexual contact/unknown risk. Because the majority of HIV-infected clients reported heterosexual contact only, further discussion of heterosexual transmission of HIV among STD patients is warranted. Heterosexual sex is a prevalent behavior and a significantly higher proportion of HIV seronegatives (71.9%) reported heterosexual contact only compared with seropositives (38.1%,  $p < 0.001$ ). Comparisons presented in Table 3 indicate that all specified sexual and substance use risk exposures added significant increments to HIV seroprevalence above the heterosexual contact only. Finally, the high prevalence of sexually transmitted diseases among the STD clinic clients who reported heterosexual contact only enhances sexual transmission of HIV.

#### *HIV Seroprevalence and Type of STD*

Consistent with the concern that STDs facilitate the transmission of HIV, we hypothesized that STD clinic clients with non-ulcerative STDs would have lower HIV seropositivity rates than clients with ulcerative or multiple STDs. The study results corroborated these expectations. Overall and by gender, we found a statistically significant difference between the higher seroprevalence rate found in the multiple STD category and the lower seroprevalence rates of the ulcerative and non-ulcerative STDs categories.

A particular characteristic of Miami's STD clinic population was the overrepresentation of HIV seropositive episodes among black non-Hispanic women in several STD diagnosis categories (vaginal infections caused by trichomonas, syphilis and genital ulcers). This is important because of the asymptomatic nature of many STDs, particularly in the absence of

regular STD screening. This could result in significant secondary morbidity (cancer, infertility, ectopic pregnancy, spontaneous abortions, stillbirth, low birth-weight for infants) and higher likelihood of acquiring or transmitting HIV.

STD prevention and control in public health settings has focused on surveillance, screening, partner notification, and treatment. Nevertheless, it is advisable to put in practice interventions that *prevent* STDs from occurring since many are not symptomatic and not curable. Involvement of the private sector is urgent. According to the CDC only 5% of those individuals who reported having been treated for a STD sought care in a publicly funded STD clinic (Brackbill, Sternberg, & Fishbein, 1999). Increasing the number of professional experts in the field of behavioral and social sciences at the state and local level would also be beneficial. If we are to design and implement effective public health strategies to prevent and control STDs we need to understand their mode of transmission and the attached behavioral and cultural attitudes. Finally, the amount of economic resources allocated to STD research and prevention should be increased. The costs of the major STDs - not including HIV infection - and their complications add at least \$10 billion to the nation's health care costs each year (Cason, Orrock, Tesoriero, Lazzarini, & Sumartojo, 2002).

#### *Time Trends: Decreasing HIV Seroprevalence Over Time*

A significant decrease in HIV seroprevalence was observed over the nine-year survey period from 10.83% in 1990 to 5.79% in 1999. Decreasing trends have also been observed at the national level (CDC, 2001). Seeking to understand this drop in seroprevalence, we noted two significant demographic shifts toward lower-risk clinic clients: a decreasing proportion of black non-Hispanic clients, and increasing proportion of Hispanic and white non-Hispanic clients.

The progression of the HIV epidemic and availability of HIV health services may have led to some selective "removal" of those at highest risk: because they died from HIV disease, or entered HIV treatment trials and/or received medical care elsewhere.

#### *Recommendations for STD Clinics and Local Health Departments*

STD clinics are useful settings for evaluating HIV prevention programs because they provide services to patients at increased risk for HIV. They are also an excellent venue for delivering prevention messages and conducting STD screening (Backmann, Grimley, Waithaka, Desmond, Saag, & Hook, 2005).

We strongly agree with the CDC's Advisory Committee on HIV and STD Prevention, in that: (1) early detection and treatment of curable STDs must be an integral part of comprehensive HIV prevention programs; (2) in areas where STDs that facilitate HIV

transmission are prevalent, screening and treatment programs should be expanded; and (3) HIV and STD prevention programs, together with the private and public sector, should take joint responsibility for implementing these strategies (CDC, 1998).

Finally, we believe that a strengthened collaboration between the HIV and STD programs is of vital importance. In this regard, the CDC's HIV/STD Collaboration Workshop has given some useful recommendations: (1) Share funding and personnel between STD and HIV; (2) cross-training of staff in HIV and STD; (3) HIV counseling, testing, and partner notification made available through the STD program; and (4) providing referrals to HIV counseling and testing at local STD clinics (CDC, 1998a).

#### *Public Health Implications*

All patients with a STD diagnosis should be questioned about risk factors for HIV infection. Whether or not risk factors for HIV are elicited, STD patients should be urged to have an HIV test performed because a person with an STD is at increased *risk* of HIV infection. Ulcerative STDs facilitate entry for HIV, and non-ulcerative STDs increase the concentration of targeting CD4 cells in genital secretions. Similarly, a person with an STD *and* HIV infection may be more infectious. An HIV-infected patient with another STD is more likely to shed HIV in their genital secretions than someone who is infected only with HIV.

Therefore, early diagnosis and treatment of STDs can reduce both susceptibility to HIV infection, and infectiousness among those already HIV infected. Furthermore, confirming a diagnosis of HIV/AIDS establishes eligibility for certain social, medical, and economic benefits for the patient.

#### **Conclusion**

Among patients treated in Miami-Dade County STD clinics during the survey period, 7.5% were infected with HIV. For STD clinic patients reporting heterosexual contact as the only behavioral risk, 1 in 20 were HIV infected, while for those clients reporting specific sexual or drug use risks for HIV, the likelihood of HIV infection increased to 1 in 5. We emphasize the need for assessing HIV infection in STD patients, and STD infections in HIV-infected patients.

#### **References**

- Bachman L.H., Grimley D.M., Waithaka Y., Desmond R., Saag M.S., & Hook E.W., III. (2005). Sexually transmitted disease/HIV transmission risk behaviors and sexually transmitted disease prevalence among HIV-positive men receiving continuing care. *Sexually Transmitted Disease*, 32(1), 20-26.
- Brackbill R.M., Sternberg M.R., & Fishbein M. (1999). Where do people go for treatment of sexually transmitted diseases? *Family Planning*

*Perspective*, 31(1), 10-15.

Cason C., Orrock N., Schmitt K., Tesoriero J., Lazzarini Z., & Sumartojo E. (2002). The impact of laws on HIV and STD prevention. *Journal of Law, Medicine, & Ethics*, 30(3 Suppl), 139-45.

Centers for Disease Control and Prevention. (1990). Division of HIV/AIDS. HIV Seroepidemiology Branch. *Appendix A: Protocol for Estimating HIV Seroprevalence and Assessing Risk Behaviors in Clients Attending Sexually Transmitted Disease Clinics*.

Centers for Disease Control and Prevention. (1998). HIV Prevention Through Early Detection and Treatment of Other Sexually Transmitted Diseases. 47(RR12), 1-24.

Online:

<http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00054174.htm> [Accessed: October 22, 2004].

Center for Disease Control and Prevention. (1998a). HIV/STD Collaboration Workshop: Issues in Policy Development and Practice Summary Report. May 14-15.

Centers for Disease Control and Prevention. (2001). HIV Prevalence Trends in Selected Populations in the United States. Results from National Serosurveillance, 1993-1997, 8-14.

Centers for Disease Control and Prevention. (2002). HIV/AIDS Update: A Glance at the HIV Epidemic.

Online:

<http://www.cdc.gov/nchstp/od/news/At-a-Glance.pdf> [Accessed: October 22, 2004].

Centers for Disease Control and Prevention. (2002a). Sexually Transmitted Diseases Treatment Guidelines. *Morbidity and Mortality Weekly Report*, 47(RR12), 1-24.

Online:

<http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00054174.htm> [Accessed: October 22, 2004].

Centers for Disease Control and Prevention. (2004). Diagnosis of HIV/AIDS-32 States, 2000-2003. *Morbidity and Mortality Weekly Report*, 53(47), 1106-1110.

Online:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5347a3.htm> [Accessed: March 23, 2005].

Dean A.G. (1999). Epi Info and Epi Map, Version 1.1: current status and plans for Epi Info 2000. *Journal of Public Health Management and Practice*, 5(4): 54-57.

Fleming D.T., & Wasserheit J.N. (1999). From epidemiology to public health policy and practice:

the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sexually Transmitted Infections*, 75(1), 3-17.

Karon J.M., Rosenberg P.S., Mc Quillan G., Khare M., Gwinn M., & Petersen L.R. (1996). Prevalence of HIV Infection in the United States. *Journal of the American Medical Association*, 276(2): 126-131.

Miami-Dade County Health Department. (2005). HIV/AIDS Program. Surveillance Unit. HIV/AIDS Surveillance: Monthly Surveillance Report Online:

<http://www.dadehealth.org/hiv/HIVmonthlyrep04.asp> [Accessed: March 23, 2005].

Pappaioanou M., Dondero T.J., Petersen L.R., Onorato I.M., Sanchez C.D., & Curran J.W. (1990). The family of HIV seroprevalence surveys: Objectives, methods, and uses of sentinel surveillance for HIV in the United States. *Public Health Reports*, March-April, 105 (2):113-119.

Weinstock H., Berman S., Cates W., (2004). Sexually transmitted diseases among American youth: Incidence and prevalence estimates, 2000. *Perspectives on Sexual and Reproductive Health*, 36(1): 6-10.

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