HIV/AIDS Patients Who Move to Urban Florida Counties Following a Diagnosis of HIV: Predictors and Implications for HIV Prevention

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ABSTRACT *We characterized patients at publicly funded HIV/AIDS patient treatment sites who moved (“migrated”) post-diagnosis of HIV to five urban Florida counties, by geographic, demographic, socioeconomic and risk variables. Each patient who came for services at the sites in a 2–3 week sampling period was asked to complete a brief, self-administered questionnaire. We compared migrant with non-migrant patients to disclose characteristics predictive of migration and help plan for continuity of HIV care, future funding, and HIV prevention. Overall, 25% (range by site, 20%–38%) of the 1,286 patients in the study migrated to the counties from a non-contiguous Florida county, another state, or another country. In a multivariate model comparing interstate migrants with non-migrants, white and Hispanic race/ethnicity, age 9–29 years at first HIV diagnosis compared with older age, increasing education, highest current income and exposure category (men having sex with men and injection drug users) were independently associated with migration (all $p < 0.05$). In a similar model for international migrants, the independently associated variables included Hispanic ethnicity, education, and younger age at first HIV diagnosis. Although migrating can bring benefits to a patient such as improved access to health care or a new employment opportunity, it is stressful because it can result in changes in a person’s social network, employment, and health care providers. Thus, moving could create unique patient needs concerning medication adherence, risk-taking, and other psychosocial needs. Given the high percentage of migrants in these urban Florida county clinics, these needs should be further examined and addressed.*

KEYWORDS AIDS, AIDS Drug Assistance Program, HIV, Migration, Urban areas.

INTRODUCTION

Urban areas of the United States have assumed a heavy burden of care for persons living with HIV/AIDS (PLWHAs). This burden may be increased to the extent there is movement (“migration”) of PLWHAs to a given area. Migration has played a significant role in fueling the HIV pandemic by facilitating the dissemination of the HIV virus across borders.¹ An HIV/AIDS diagnosis and migration, whether intrastate, interstate or international, are both major life events. Although there may be benefits

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from moving, such as improved access to health care or proximity to family, a PLWHA who migrates may no longer be near his or her family and social network, suffer physical and psychological stress, and have significant moving-related costs to pay.² Further, migration breaks established relationships with health care and social service providers and may lead to migrants postponing needed health care.² These disruptions can lead to a patient not obtaining or not taking needed medication, or increasing high risk behavior, thereby facilitating HIV transmission in the receiving communities. In addition, migrants initially often have greater needs for public services than established residents.²

Florida, a state with nearly 18 million residents (2004 mid-year estimate [Florida Department of Health, Office of Vital Statistics, unpublished data, 2006]) and 67 counties, had 78,739 PLWHAs through 2004, of whom 45,140 were persons living with AIDS.³ Florida had the second largest number of AIDS cases reported July 2004 – June 2005.⁴ With 607,000 net migrants from other U.S. states, Florida had the largest number of net state-to-state migrants in the country from 1995 to 2000.⁵ Further, according to the 2004 American Community Survey, of Florida residents born in the United States, only 41.2% were born in the state of Florida, the third lowest percentage in the country,⁶ and 17.9% of the population was foreign born, the 6th highest in the United States.⁷

Although we were unable to locate a recent study of the level of migration among PLWHAs who were accessing HIV care, a national study conducted in 1996 found that a substantial proportion (17%) of PLWHAs had migrated after their HIV/AIDS diagnosis.⁸ There have been no published reports that we could locate that assessed immigration post-HIV diagnosis from another country to an American metropolitan area.

We describe here the level of in-migration, including international in-migration, among patients attending publicly funded HIV/AIDS service sites in five urban Florida counties during 2004. We further compare the demographic characteristics and HIV risk profiles of migrating and non-migrating patients in the interest of planning community prevention efforts, continuity of care, and future funding.

METHODS

In 2004, we administered a brief, structured survey (available in English, Spanish and Creole) to a sample of HIV/AIDS patients aged 18 years and over in publicly funded clinic settings in five urban Florida counties: Broward (central city, Ft. Lauderdale), Duval (Jacksonville), Hillsborough (Tampa), Miami-Dade (Miami) and Pinellas (St. Petersburg). Each patient who came for services at the sites in a 2–3 week sampling period was asked to complete a self-administered questionnaire until the quota for each clinic was reached. The survey sites were AIDS Drug Assistance Programs (ADAP) and Ryan White HIV/AIDS patient care clinics. Surveys were completed voluntarily and anonymously for a token incentive, a ballpoint pen. The survey elicited data about demographics, socioeconomic status (SES), HIV exposure category, and year/place of HIV diagnosis.

The U.S. Bureau of Census defines migration as any change in residence.⁹ However, because moving to a neighboring county usually does not require a change in job, social network or health care providers, we defined a migrant as a survey respondent whose residence at the time of first HIV-positive test was in a non-contiguous Florida county, another state, or another country.

Using the Florida Department of Health HIV/AIDS Reporting System database, which routinely includes demographic and behavioral variables on reported cases, we compared these characteristics of sampled patients with those of all reported PLWHAs in the five counties combined. We constructed separate multivariate models, respectively, for interstate migrants vs. non-migrants and international migrants vs. non-migrants, using backwards stepwise logistic regression. Multivariate analysis of those migrating from other, non-contiguous Florida counties was not conducted because the number of such respondents was small ($N = 51$), and 92% of them had moved a distance of no more than two counties. We entered all variables into the multivariate models for which the p -values were <0.05 in the univariate analysis, except number of years HIV positive (highly correlated with age at first HIV diagnosis, as a calculated variable) and gender (highly correlated with exposure category, i.e., all men who have sex with men [MSM] are males). By examining the year and place of first HIV-positive test and considering when and if HIV reporting was implemented in the place of first HIV-positive test, we were able to determine the maximum number of respondents who might have been reported with HIV from a jurisdiction outside the five counties where they were currently receiving HIV/AIDS services. Data analysis was done using SPSS Version 11.5 (Chicago, IL) and Epi Info 2000 Version 1.1.2 (Atlanta, GA). The research was exempted from Institutional Review Board consideration.

RESULTS

Participation rates tended to be high ($\geq 90\%$ in four counties and 65% in the fifth, where an unrelated survey was simultaneously conducted and apparently competed for patients' attention). Overall, 1,461 patients were asked to complete and submit a survey, of whom 1,286 (88%) did so. These 1,286 patients represented 10.7% of 12,029 patients enrolled at the sites. Characteristics of the respondents by migration status are shown in Table 1. The last two columns compare all respondents with all reported PLWHAs in the five counties combined. Though the sample was not population-based, there was a similar representation of respondents and PLWHAs by gender and age, but less so by race/ethnicity and mode of exposure. This pattern of representation was similar in each of the five counties (data not shown).

Of the 1,286 respondents, 25% (range by clinic, 20%–38%) moved to one of the five counties following an HIV diagnosis: 4% from another Florida county (range, 1%–11%), 15% from another state (range, 10%–24%), and 6% from another country (range, 1%–10%). Of the 188 patients who moved from another state, more than half came from New York ($N = 55$), California (36), and Georgia (20). The remainder came from other states in the Northeast (28), the South (21), the Midwest (20), and the West (8). Of the 76 patients who moved from another country, one-half came from Venezuela (19), Argentina (11), and Haiti (8). Other common foreign places of origin were Colombia (6), Puerto Rico (5) and Brazil (4).

Table 2 reports the results of the univariate and multivariate analyses. In the multivariate model for interstate migrants, white and Hispanic race/ethnicity, younger age at time of HIV-diagnosis, higher education, higher income, and MSM and IDU modes of exposure were independently associated with migrating from another state to one of the study sites. When exposure category (which included MSM, all of whom were males) was omitted from this model, male gender was independently associated with interstate migration (data not shown).

TABLE 1. Characteristics of HIV-infected respondents by migration status (N = 1,286) and characteristics of all persons living with HIV/AIDS reported from the 5 study counties (N = 44,138)

	Respondents who migrated from						Respondents who did not migrate		Total respondents		5-county PLWHAs	
	Another FL county*		Another state		Another country		Number	Percent	Number	Percent	Number	Percent
	Number	Percent	Number	Percent	Number	Percent						
Gender												
Female	19	37%	29	15%	15	20%	327	34%	390	30%	13,474	31%
Male	31	61%	157	84%	61	80%	634	65%	883	69%	30,664	69%
Transgender	1	2%	2	1%	0	0%	8	1%	11	1%	NA	NA
Total	51	100%	188	100%	76	100%	969	100%	1,284	100%	44,138	100%
Race/ethnicity												
Black, non-Hispanic	21	41%	31	17%	7	9%	442	46%	361	28%	11,705	27%
White, non-Hispanic	24	47%	96	51%	12	16%	229	24%	501	39%	22,149	50%
Hispanic	5	10%	53	28%	52	68%	256	27%	366	29%	9,711	22%
Other	1	2%	7	4%	5	7%	36	4%	49	4%	573	1%
Total	51	100%	187	100%	76	100%	963	100%	1,277	100%	44,138	100%
Age at first HIV-positive test												
50+	4	9%	6	4%	2	3%	66	8%	78	7%	NA	NA
30–49	26	59%	92	54%	30	48%	485	62%	633	60%	NA	NA
9–29	14	32%	71	42%	31	49%	233	30%	349	33%	NA	NA
Total	44	100%	169	100%	63	100%	784	100%	1,060	100%	NA	NA
Current age												
50+	13	28%	35	20%	12	17%	179	20%	239	20%	11,034	25%
30–49	31	66%	129	72%	51	72%	617	68%	828	69%	29,207	66%
18–29	3	6%	15	8%	8	11%	105	12%	131	11%	3,897	9%
Total	47	100%	179	100%	71	100%	901	100%	1,198	100%	44,138	100%

TABLE 2. Univariate and multivariate analyses of factors associated with migration of HIV-infected patients to five Florida urban counties from another state or another country

	Univariate analysis				Multivariate interstate model*			Univariate analysis				Multivariate international model*		
	Migrated from another state	Did not migrate	Unadjusted OR	95% CI	Adjusted OR	95% CI	Migrated from another country	Did not migrate	Unadjusted OR	95% CI	Adjusted OR	95% CI	Adjusted OR	95% CI
Gender														
Female	29	327	1.00	Referent			15	327	1.00	Referent				
Male	157	634	2.79	1.81–4.34			61	634	2.10	1.14–3.92				
Transgender	2	8	2.82	0.28–15.01			0	8	–	–				
Race/ethnicity														
Black, non-Hispanic	31	442	1.00	Referent	1.00	Referent	7	442	1.00	Referent	1.00	Referent		
White, non-Hispanic	96	229	5.98	3.79–9.46	3.98	2.31–6.85	12	229	3.31	1.19–9.43	1.07	0.36–3.15		
Hispanic	53	256	2.95	1.80–4.85	2.23	1.26–3.94	52	256	12.83	5.67–33.87	4.54	1.89–10.88		
Other	7	36	2.77	1.03–7.18	1.87	0.63–5.60	5	36	8.77	2.07–33.67	4.83	1.27–18.42		
Age at first HIV-positive test														
30+	98	551	1.00	Referent	1.00	Referent	32	551	1.00	Referent	1.00	Referent		
9–29	71	233	1.71	1.20–2.45	1.55	1.06–2.27	31	233	2.29	1.32–3.96	2.39	1.35–4.22		
No. years positive														
0–4	46	287	1.00	Referent			9	287	1.00	Referent				
5–9	43	273	0.98	0.61–1.57			30	273	3.50	1.56–8.10				
10–19	80	214	2.33	1.53–3.56			27	214	4.02	1.77–9.42				

Education	25	304	1.00	Referent	1.00	Referent	6	304	1.00	Referent	1.00	Referent
Some high school or less												
High school graduate	57	298	2.33	1.38–3.94	1.84	1.02–3.31	16	298	2.72	0.99–8.59	3.21	1.02–10.12
Some college	53	177	3.64	2.13–6.27	2.1	1.13–3.92	13	177	3.72	1.29–12.13	2.68	0.78–9.20
College graduate	37	92	4.89	2.70–8.88	2.44	1.22–4.87	18	92	9.91	3.61–31.21	6.45	1.92–21.66
Graduate school	16	92	2.11	1.03–4.33	1.37	0.61–3.08	23	92	12.67	4.79–38.91	8.18	2.54–26.35
or degree												
Current annual income												
<\$5,000	44	318	1.00	Referent	1.00	Referent	20	318	1.00	Referent	Income not significant	
\$5,000–9,999	29	246	0.85	0.50–1.44	0.94	0.54–1.65	23	246	1.49	0.77–2.89	in univariate analysis,	
\$10,000–19,999	60	253	1.71	1.10–2.67	1.60	0.98–2.61	19	253	1.19	0.60–2.39	so not entered	
\$20,000+	49	85	4.17	2.53–6.87	2.86	1.64–4.98	11	85	2.06	0.88–4.72	in the model.	
Mode of exposure												
Heterosexual	52	485	1.00	Referent	1.00	Referent	21	485	1.00	Referent	1.00	Referent
Male sex with male (MSM)	108	317	3.18	2.18–4.63	1.66	1.05–2.62	41	317	2.99	1.68–5.34	1.35	0.69–2.66
Injection drug use (IDU)	19	42	4.22	2.18–8.11	4.11	1.95–8.68	2	42	1.10	0.12–14.76	1.62	0.33–8.03
MSM/IDU	3	5	5.60	0.84–29.54	5.42	0.95–31.08	2	5	9.24	0.82–59.94	4.11	0.36–46.5
Other	1	11	0.85	0.02–6.05	0.45	0.05–3.98	1	11	2.10	0.05–15.72	0.9	0.09–8.68
Not sure	7	90	0.73	0.27–1.67	0.60	0.24–1.52	8	90	2.05	0.81–5.07	1.18	0.43–3.24

OR, odds ratio; CI, confidence interval.
*Gender and number of years positive were not entered in either model, as they were highly correlated, respectively, with exposure category (MSM) and age at HIV diagnosis (see text).

In the multivariate model comparing international migrants with non-migrants and omitting gender, Hispanic or other race/ethnicity, college graduate and higher education, and younger age at first HIV diagnosis were independently associated with international migration (Table 2). When exposure category was omitted, gender was not associated with migration from another country.

Based on the date of testing HIV-positive and the date that HIV reporting was implemented in the place of origin, as many as 66 (5.2%) of the 1,286 respondents could have been reported with HIV from another Florida county (includes contiguous counties). As many as 59 (4.5%) could have been reported from other states (data not shown).

DISCUSSION

In this study we found that in-migration to the studied urban areas was common, reported by 25% of clients, and that there were several sociodemographic and risk-characteristics associated with interstate and international migration. These findings are important for at least three major reasons. First, the patterns of migration identified by our study provide information regarding predictive characteristics of migration among HIV/AIDS patients, at least among those using publicly funded services in five Florida metropolitan areas. Second, the identified magnitude of in-migration and behavioral risk-characteristics of migrants can be used for planning secondary HIV prevention interventions as well as services for PLWHA. Third, we have identified no other studies reporting characteristics of those migrating to the United States who were previously diagnosed with HIV outside the country. In addition, though patient out-migration could not be determined, to the extent that our measured amount of post-HIV in-migration reflects net in-migration, there could be misallocation of federal funds for HIV prevention and care services in the future. Currently, the federal funding formula is based on the number of persons living with AIDS according to residence at time of AIDS diagnosis, but eventually may be based on diagnoses of those living with HIV or AIDS.¹⁰

The magnitude of in-migration (25%) was higher than that (17%) reported in a study using the HIV Cost and Services Utilization Study cohort, a nationally representative probability sample, which defined migration in the same way by excluding migration to contiguous counties but did not consider international immigration.⁸ If we do not consider international immigration, the magnitude of in-migration found in our study (19%) is similar. Other studies reporting state-to-state migration between diagnosis and death have reported substantially lower rates (5.3%–5.4%) than the interstate migration found in our study (15%).^{11,12} The differences could be due to the use of death certificates in the other studies to determine migration; temporal changes; and the current study being limited to Florida, the state with the largest net in-migration between 1995 and 2000 in the United States.⁵ However, an early (1989) study in Florida that also used surveillance and death certificate data found that only 5.3% of total AIDS cases were in-migrants from other states.¹³ A diagnosis of AIDS, as opposed to HIV, may signal loss of migration options due to impaired health.

Our finding in the interstate multivariate model of non-Hispanic white race/ethnicity being associated with migration has been reported by others,^{8,11,13} and Hispanics were also found to be more likely to move than non-Hispanic blacks in

one other study.⁸ That higher education is associated with long-distance moving in the general population, supports the results of the current study.¹⁴ Younger age at the time of diagnosis being associated with migration was also found by another study.¹¹ As with our study, several others reported that men living with HIV/AIDS were more likely than women to migrate.^{8,11–13} Others have also reported the HIV mode of exposures of MSM and IDU to be associated with migration for their entire study group⁸ or for at least the southern region of the United States.¹¹

In the international multivariate model, the finding that Hispanic ethnicity was associated with migration was expected, given that 73% of Florida's foreign-born population is from Latin America.¹⁵ That higher education and younger age at diagnosis were associated with international migration may be related, respectively, to a better capability to navigate immigration processes and access to health care, and to younger PLWHAs tending to be healthier.

There are a number of limitations of our data. First, our sample was clinic-based, not population-based, and excluded those in private care or not receiving care at all. Although our sample was similar to all PLWHAs in the five counties regarding the distribution by gender and age, non-Hispanic blacks and IDUs were underrepresented. The under-representation of IDUs could be related to a lack of willingness to acknowledge an IDU risk in the survey due to stigma associated with the behavior. Second, we cannot assess net in-migration to the study counties, as out-migration could not be determined. A third limitation is that we did not inquire about the reasons for migrating from other places. Possible reasons for migration are numerous and could include better access to specialists knowledgeable about HIV care, being near better HIV-related medical and social services, better social support, living in a community with shared culture, to flee discrimination, be near family and friends, better occupational or educational opportunities, access to experimental drug protocols, relationship/partner moves, and access to Medicaid and other financial assistance.^{2,8,16} Regardless of the reasons, an understanding of the characteristics of the migrants assists with planning HIV prevention programs and HIV-related services.

Migration has important implications for the control of HIV and provision of services in the receiving community. A migrant who is seeking out social networks or under additional stress due to the move may increase risk behavior and increase the transmission of HIV. Further, these new migrants will need services and may need extra services initially until they become acclimated. Migration also limits the relevance of surveillance data, which are based on place of diagnosis. This may impair targeting of local HIV education and prevention programs. Our findings suggest that migration is common and there are certain characteristics that are associated with migration. This study needs to be replicated in other PLWHA populations in order to better understand their needs and better plan prevention programs and services.

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