Factors Associated with Delayed Initiation of HIV Medical Care Among Infected Persons Attending a Southern HIV/AIDS Clinic

Christopher S. Krawczyk, PHD, **Ellen Funkhouser, MS, DRPH**, **J. Michael Kilby, MD**, **Richard A. Kaslow, MD, MPH**, **Amita K. Bey, MPH**, and **Sten H. Vermund, MD, PHD**
From the University of Alabama at Birmingham Schools of Public Health and Medicine, Birmingham, AL

Abstract

Background—Despite the proven benefits conferred by early human immunodeficiency virus (HIV) diagnosis and presentation to care, delays in HIV medical care are common; these delays are not fully understood, especially in the southern United States.

Methods—We evaluated the extent of, and characteristics associated with, delayed presentation to HIV care among 1,209 patients at an HIV/AIDS Outpatient Clinic in Birmingham, Alabama between 1996 and 2005.

Results—Two out of five (41.2%) patients first engaged care only after they had progressed to CDC-defined AIDS. Among these, 53.6% were diagnosed with HIV in the year preceding entry to care. Recent presentation (2002 – 2005), male sex, age ≥25, Medicare or Medicaid insurance coverage, and presentation within six months of HIV diagnosis were independently associated with initiating care after progression to AIDS.

Conclusions—A high proportion of patients entered clinical care after experiencing substantial disease progression. Interventions that effectively improve the timing of HIV diagnosis and presentation to care are needed.

Keywords

HIV; AIDS; health care; access; Alabama; delay

Key Points

- Nearly half of all subjects (41.2%) first engaged with an HIV medical provider after they had already progressed to CDC-defined AIDS.

- Among these, 53.6% had received their initial HIV diagnosis in the year preceding entry to care, indicating substantial HIV diagnostic delay in our patient population.

- Characteristics associated with delayed presentation to care included presentation in the most recent time period (2002 to 2005), male sex, age ≥ 25 years old, and Medicare or Medicaid insurance coverage.

Reprint requests to Christopher S. Krawczyk, PhD, Office of AIDS, California Department of Health Services, MS 7700, PO Box 997426, Sacramento, CA 95899-7426. CKrawczy@dhs.ca.gov.
Christopher S. Krawczyk, PhD, is now affiliated with the California Department of Health Services, Office of AIDS. Sten H. Vermund, MD, PhD, is now affiliated with Vanderbilt University School of Medicine.

Diagnosis and presentation to appropriate medical care during the early stages of human immunodeficiency virus (HIV) infection have substantial clinical and public health benefits. Decreased HIV-related morbidity and mortality results from the timely initiation of antiretroviral therapy (ART)[1–6] and opportunistic infection (OI) prophylaxis.[1,5] ART may decrease the likelihood of further HIV transmission by reducing circulating levels of HIV RNA. [7–16] Treatment of other sexually transmitted diseases (STD) and coinfections[17–22] may also decrease the likelihood of further HIV transmission. In addition, care providers can help promote safer behaviors among their HIV-infected clients.[23–29]

Despite the benefits of early HIV diagnosis and presentation to care, a large proportion of HIV-infected Americans delay HIV testing and therefore remain unaware of their HIV status. The Centers for Disease Control and Prevention (CDC) estimated in 2000 that one-third of an estimated 800,000 to 900,000 HIV-infected persons in the US were unaware of their infection. [30,31] Even among persons with suspected recent exposure, testing may be delayed for months or years.[32,33] As a result, diagnosis during late stages of disease is common; 30 to 40% of persons learn about their HIV status after their condition has already clinically progressed to AIDS, such that they receive both the HIV and AIDS diagnoses concurrently.[34–40] Once individuals learn that they are infected with HIV, substantial risks remain that they will fail to arrange for follow-up with appropriate clinical care providers. As many as 25% of infected persons delay care for up to five years after first testing positive.[28,41,42] Delays of more than one, two, and five years were noted in 39%, 32%, and 18%, respectively, among infected patients in Massachusetts and Rhode Island.[42] Several studies have reported that 56 to 81% of patients present for initial care with CD4+ cell counts already below 500/µL, and 23 to 30% with counts < 200/µL.[36,42] Based on viral load set points[43] and rates of CD4+cell depletion[44–46] extrapolated from natural history data of untreated HIV disease subjects, approximately 50% of persons presenting to care with CD4+ counts <200 cells/µL have already been infected for a decade or more.[40,47]

Prior research to assess predictors of delayed HIV diagnosis and presentation to medical care in the United States has been published from large urban centers, primarily on the East and West coasts. Predictors of delayed presentation to HIV medical care identified by these studies may not be generalized to the South where a larger proportion of infected persons are women, African-American, uninsured or publicly insured, impoverished, and residing in rural communities. The tendency for multiple barriers to exist among individual HIV-infected Southerners and their relative impact are also not fully understood. We report here on the frequency and extent of delayed presentation to HIV medical care and characteristics associated with these delays at a large Birmingham, Alabama HIV/AIDS outpatient clinic that serves both urban and rural Alabama.

Methods

Study Population

The University of Alabama at Birmingham (UAB) 1917 Outpatient Clinic is an infectious disease clinic providing primary medical, dental, and palliative care, as well as psychosocial, research protocols, and ancillary services to HIV-infected persons. Upon presentation to care, demographic, clinical, and patient tracking information is obtained and entered into an electronic database including risk factors for HIV-infection, HIV-related symptoms and diseases, prior ART use or OI prophylaxis, and former or current non-HIV related medical conditions. All information is self-reported and, when available, verified by patient medical records received from prior care sources. Information from each visit to the 1917 Outpatient Clinic is added to the database including CD4+ cell counts and viral load quantification.

HIV-infected persons with no reported history of prior HIV medical care and who initiated primary care at the 1917 Outpatient Clinic between January 1, 1996, and January 24, 2005, were considered eligible for these analyses. Among 2,656 persons, excluded were 622 (23.4%) patients with a history of prior HIV medical care elsewhere, defined as those with prior ART or OI prophylaxis histories, and 825 (31.1%) who were being seen for nonprimary HIV medical care reasons only (eg, dental clinic, research protocols, addiction counseling). Information regarding prior HIV medical care in which ART or OI prophylaxis was not prescribed was not consistently available. The final sample included 1,209 eligible patients. The UAB Institutional Review Board (IRB) reviewed and approved the current study.

Outcome and Factors of Interest

The outcome of interest was delayed presentation to HIV medical care, defined as persons presenting for initial care at the 1917 Outpatient Clinic with CDC-defined AIDS according to the 1993 expanded AIDS-surveillance case definition; specifically, persons presenting with a CD4+ cell count <200 cells/μL and/or with an AIDS-defining disease.[48] Persons presenting for initial medical care before the onset of CDC-defined AIDS were considered nondelayers. Characteristics of interest included race/ethnicity, sex, age, insurance status, HIV risk exposure group, time since HIV diagnosis, area of residence, distance to clinic in miles, pregnancy at baseline among females, and history of other STDs, diabetes, cardiovascular diseases, non-HIV-related cancer, or mental illness, and year of presentation to care. Year of presentation to care was pertinent to the assessment of time-related trends.

Analyses

Differences between delayers and nondelayers were compared for epidemiologically relevant categorical and continuous variables using chi-square and t tests, respectively. To account for the cross-sectional study design, crude and adjusted prevalence ratios (PR) and 95% confidence intervals (95% CI) were obtained using multivariable regression techniques, specifically PROC GENMOD regression procedures for binomially distributed variables (SAS Institute, Inc., SAS Version 9.0, Cary, NC). Based upon crude analyses, categories for several variables were collapsed in adjusted analyses. The final model included characteristics significantly associated with delayed presentation to care, as well as nonsignificant characteristics identified as predictors in prior studies elsewhere. Due to the common concern for results to differ within demographic subgroups, we evaluated the consistency of overall results by stratifying on race/ethnicity (white/non-Hispanic, black/non-Hispanic), sex, and age (< 25, ≥ 25 yr). To increase statistical efficiency, stratified analysis models were restricted to significant predictors identified using backward elimination procedures.

Results

The average age at initial presentation to care among 1,209 patients was 37.0 years (SD ± 9.5; range: 19 to 68); 75% were men. By race/ethnicity, 48.6% were black/non-Hispanic and 46.3% were white/non-Hispanic (hereafter referred to as blacks and whites), with blacks accounting for 42.0% of men and 69.1% of women. Overall, 498 (41.2%) patients presented for initial care with CDC-defined AIDS; among these, 267 (53.6%) had been diagnosed with HIV in the year preceding their entry to care. The median delay from HIV diagnosis to presentation for care was 91.5 days. Log viral load was higher among delayed presenters than nondelayed presenters to care (4.7 versus 3.8 copies/mL, respectively; $P < 0.001$). Male sex, age 25 years or older, insured by Medicare or Medicaid, presentation within six months or more than five years after HIV diagnosis, and history of diabetes were each associated with delayed presentation to care in bivariate analyses (Table 1). Stratified bivariate analyses indicated differences between whites and blacks in the nature and/or magnitude of the associations of

several of these variables, most notably year of presentation to care, gender, age, time since HIV diagnosis, and history of diabetes.

No statistically significant time-related trends were observed in multivariable regression analyses. Log viral load was not included in regression analyses to avoid multicol-linearity and instability in the parameter estimates. In addition, history of other STDs, cardiovascular diseases, and non-HIV-related cancer were not significantly associated with delayed presentation and therefore were excluded from the final model. Presenting between 2002 and 2005 ($PR = 1.3$), male sex ($PR = 1.7$), age >25 years (25–34 yr $PR = 2.3$; 35–44 yr $PR = 2.5$; ≥45 yr $PR = 2.1$), insured by Medicare or Medicaid ($PR = 1.8$), and presentation within six months of HIV diagnosis ($PR = 1.3$) were each independently associated with delayed presentation to care (See Table 2 for referent groups and 95% confidence intervals) A history of mental illness was associated with a decreased likelihood of delayed care ($PR = 0.7$) Findings did not differ when non-significant predictors were excluded from our multivariate models.

Stratified analyses indicated differences by demographic characteristics. Among whites, a trend with increasing age, presentation within six months of initial diagnosis, or presentation more than five years after HIV diagnosis were each associated with delayed presentation to care, while among blacks, recent presentation to care and male sex were associated with delayed care (Table 3). Among women, a history of mental illness was associated with reduced likelihood of delayed care, while among men, history of diabetes was associated with delayed presentation to care (Table 4). Among those younger than 25, black race/ethnicity and recent presentation to care were associated with increased likelihood of delayed presentation to care, while among those age 25 years or older, history of mental illness was associated with reduced likelihood of delayed care (Table 5).

Discussion

We found that 41.2% of persons presented to our clinic for initial medical care having already progressed to CDC-defined AIDS. Among those presenting to care with CDC-defined AIDS, 267 (53.6%) had been diagnosed with HIV in the year preceding their entry to care, which points to the critically important need to identify infected persons much earlier in the course of their disease. CDC-defined AIDS at presentation to care was particularly common among persons presenting in more recent years – after 2002, men, persons aged 25 or older, patients with Medicare or Medicaid insurance, and those presenting within six months of their first HIV-positive test. Although we observed no overall differences by race in time to presentation to care, younger blacks were four times more likely to delay care than younger whites.

The proportions of persons who delayed care for more than one year (34.1%) or more than five years (17.7%) following their initial HIV diagnosis were similar to results reported in Boston and Providence, Rhode Island.[42] Patients presenting to initial medical care with CDC-defined AIDS tended to cluster into two mutually exclusive groups: those presenting soon after a recent HIV diagnosis and those first diagnosed with HIV many years earlier who failed to initiate care for a prolonged period. Among both of these groups, the onset of HIV-related symptoms or illness likely prompted individuals to receive care. However, those in the latter group had an opportunity to access and establish medical care before advanced disease progression. Thus, a distinctly different set of characteristics may be associated with delayed presentation to care for each of these two groups. Studies specifically designed to identify these distinct differences are needed to confirm and further understand these differences not only within the South but throughout the United States. The observed magnitude of clinical AIDS among those accessing care within six months of initial HIV testing suggests that substantial diagnostic delay occurred in our patient population, with approximately 50% of these HIV and AIDS patients being infected for a decade or more before being diagnosed.[40,47] Interventions that promote increased

HIV test-seeking behavior and knowledge of serostatus, such as those described in the CDC *Serostatus Approach to Fighting the HIV Epidemic* (SAFE) initiative,[49] may yield substantial public health and clinical benefits in our patient population and possibly throughout the South.

Our observations that delayed presentation occurred disproportionately among men and persons living in poverty, as indicated by public insurance, are consistent with findings from other studies in other geographic regions of the United States.[40,50–54] The absence of racial differences and delayed presentation to care in our study contrasts with the increased delays reported by others among African-Americans.[55–60] This discrepancy may be due to selection bias in our study. Despite the relative heterogeneity of the 1917 Outpatient Clinic patient population, a large proportion of HIV-infected African Americans and infected persons who relied on public funding have received primary HIV medical care at another large, publicly funded Birmingham clinic. As a result, our measures of association for African-Americans may be biased toward finding no difference due to a subset of high risk persons being seen at the other HIV clinic. Younger blacks were four times more likely to delay care than younger whites. This disparity may reflect behavior of young black men who have sex with men (MSM), but our sample size did not allow age and race interactions to be assessed for independence from other contributing factors.

Few prior studies were large enough to assess the role of other chronic conditions, like diabetes, overall and among subgroups. We postulated that an existing connection to the medical community as a result of a pre-existing condition would reduce delays in being diagnosed and accessing care. What we observed were clear gender-related differences. Among women, pregnancy and a history of mental illness were associated with reduced likelihood of presenting with CDC-defined AIDS; that tendency seemed to confirm our hypothesis. However, diabetic men experienced delayed presentation to HIV care; that observation was opposite to our prior hypothesis. Although these results may have resulted by chance from multiple data comparisons, the association between diabetes and delayed care in men merits further investigation for several reasons. Blood monitoring by medical providers is a standard component of diabetic medical care and disease management. HIV-positive persons receiving diabetic medical care might therefore be expected to have more opportunities for HIV testing, and through their established connection to the medical community, an increased likelihood of successfully accessing HIV care. However, symptoms associated with HIV, such as weight loss, pneumonia, and thrush, are conditions that may be categorized as diabetic complications. Medical providers of diabetic patients may be more likely to consider these as diabetic complications and not recognize the need for HIV testing. Alternatively, our results may simply be another reflection that men are less connected to the medical care system. This observation is supported by the tendency for women in our population with other medical conditions to be less likely to present with CDC-defined AIDS. Studies specifically designed to assess other medical conditions, in particular diabetes, and their influence on timely HIV diagnosis and presentation to medical care are needed to confirm that the current results did not occur by chance alone.

In our study, persons aged 25 or older were more likely than younger individuals to present to care with CDC-defined AIDS. That finding contrasts with the belief that persons of younger age are at increased risk of delayed diagnosis[52,61] and delayed medical care.[62] Our results may simply reflect more recent seroconversion and less progression to clinical AIDS among persons younger than 25. Our analyses stratified by age indicated that young men and young African-Americans may experience increased delays accessing HIV care when compared with their young female and young white counterparts. Prior studies have reported inconsistent results with regard to the effect of age on delayed HIV care.[39,40,51,54,63] The inconsistencies of age-related assessments may indicate true study population differences, or they may raise questions about internal validity. The more pronounced age effect we observed among women than men

may be consistent with prior results from elsewhere. One possible explanation is that for these women, the primary risk factors are attributable to their male sexual partners, and therefore are not necessarily modifiable, or even identifiable, by the women at risk. Alternatively, women, particularly those with children,[41,53,64] may defer their own medical needs.[32,41,52,65,66]

Our study had several limitations that could have influenced the findings. Selection bias may have distorted our assessments of race/ethnicity, insurance, and HIV risk exposure group. The cross-sectional study design limited our ability to assess temporal relationships and to adjust for time. In regard to the latter, spurious conclusions could result by varying stages of the epidemic within subpopulations, for example, whites versus blacks and men versus women. Misclassification was also possible. Although 23.4% of persons were excluded for having prior ART or OI prophylaxis, some patients with other forms of prior HIV medical care may have been included and our estimate of persons presenting to care with CDC-defined AIDS may be inflated. Similarly, recall bias and socially desirable reporting may have occurred with self-reported variables. Missing data for education, income, tobacco use, and alcohol use limited our ability to assess these variables. The current analysis was also limited to clinical and demographic variables. Other potential predictors, such as the effects of disclosing HIV status, social support, HIV knowledge and awareness, and religious affiliation, could not be assessed. We were also unable to account for rate of disease progression. Because delayed presentation to care was defined using clinical measures, a disproportionate prevalence of rapid progressors could have introduced information bias. Finally, multiple comparisons across our data may have led to chance associations, particularly in the results of stratified analyses.

Certain valuable aspects of the current study are worth highlighting. Despite the disproportionate burden of the HIV/AIDS epidemic in the southern United States, particularly recently, this is one of very few studies that have focused on delayed HIV medical care in our region. Our study population provided sufficient power to assess several characteristics that smaller studies could not assess, and to detect associations that were not uniformly distributed among epidemiologically important subgroups. In the face of multiple barriers to HIV diagnosis and care in individual HIV-infected Southerners, the ability to identify these relationships is essential and raises the encouraging prospect of further informative work in this setting.

Conclusions

Southern medical care providers and the research and public health communities would benefit from more deliberate attention to delayed HIV diagnosis and medical care. Most needed are interventions that effectively increase HIV risk awareness and the availability of HIV testing and HIV medical care, particularly among men. Recent FDA approval of rapid HIV testing strategies yielding results within the same hour[67] could certainly increase the proportion of persons receiving an early diagnosis[68]; however, the utility of these testing procedures depends upon their local availability and accessibility, and on individual awareness of these types of tests. Making HIV testing a routine part of medical care, as described in the CDCs *Advancing HIV Prevention* initiative,[67] could also increase knowledge of serostatus among infected persons. The benefits conferred by routinely recommended testing are dependent on access to general medical care and may vary among subgroups, particularly by gender. Finally, US federal legislation may help address poverty-related barriers. As of 2000, all Ryan White Care Act grantees have been required to respond to an "unmet need" defined as "HIV positive individuals that are aware of their status and not receiving regular medical care."[69] The Early Treatment for HIV Act (ETHA), which is still pending as of early 2005 (Bill number S. 311; status confirmed on October 3, 2005 at http://thomas.loc.gov), is intended to provide the option for states to cover low-income HIV-infected persons before developing disability.[70] Southern states may disproportionately benefit from ETHA compared with other regions of the country,

given the high prevalence of state-based Medicaid and AIDS Drug Assistance Program (ADAP) restrictions.[71]

Acknowledgments

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Table 1

Comparison of patient characteristics at presentation to care, by status of CDC-defined AIDS: Birmingham, AL, 1996–2005[a]

Characteristic	n	Patients presenting to care with CDC-defined AIDS		
		All n (%)[b]	White n (%)[c]	Black n (%)[c]
Sample	1209	498 (41.2)	226	250
Mean log viral load (± SD)	4.2 (1.2)	4.7 (1.2)	4.6 (1.3)	4.8 (1.1)
P value[d]		<0.001	<0.001	<0.001
Race/Ethnicity	1209			
White/non-Hispanic	560	226 (40.4)	226	–
Black/non-Hispanic	588	250 (42.5)	–	250
Other	20	7 (35.0)	–	–
Unspecified	41	15 (36.6)	–	–
P value[d]		0.7		
Year				
1996–1998	489	198 (40.5)	110 (43.8)	83 (36.4)
1999–2001	380	154 (40.5)	62 (36.1)	79 (43.9)
2002–2005	337	146 (43.3)	54 (39.7)	88 (49.2)
P value[d]		0.7	0.3	0.03
Gender				
Male	904	397 (43.9)	200 (41.4)	182 (47.9)
Female	301	100 (33.2)	26 (33.8)	68 (32.7)
P value[d]		0.001	0.2	<0.001
Age, years				
< 25	102	24 (23.5)	5 (15.6)	19 (29.7)
25–34	401	166 (41.4)	64 (35.4)	95 (45.9)
35–44	466	207 (44.4)	102 (42.9)	96 (47.5)
≥ 45	240	101 (42.1)	55 (50.5)	40 (34.8)
P value[d]		0.002	0.002	0.02
Insurance status				
Private	455	178 (39.1)	95 (40.3)	74 (37.8)
Medicare or Medicaid	336	167 (49.7)	68 (51.9)	92 (49.7)
Ryan White Care Act	185	70 (37.8)	29 (33.7)	36 (41.4)
Private & public[e]	106	46 (43.4)	18 (36.0)	27 (51.9)
None or unspecified	124	37 (29.8)	16 (28.6)	21 (31.8)
P value[d]		0.002	0.02	0.03
Risk exposure group				
Heterosexual	329	131 (39.8)	37 (45.1)	86 (38.4)
MSM	432	200 (46.3)	117 (43.2)	75 (52.8)
IDU	72	31 (43.1)	15 (44.1)	16 (44.4)
MSM & IDU	27	11 (40.7)	9 (39.1)	1 (33.3)
Other or unspecified	349	125 (35.8)	46 (33.6)	62 (37.8)

Characteristic	n	Patients presenting to care with CDC-defined AIDS		
		All n (%)[b]	White n (%)[c]	Black n (%)[c]
P value[d]		0.1	0.09	0.1
Time since HIV diagnosis				
0–6 months	584	254 (43.5)	121 (45.5)	123 (41.7)
7–12 months	44	13 (29.6)	4 (19.1)	9 (47.4)
> 1–2 years	66	22 (33.3)	9 (34.6)	13 (34.2)
> 2–5 years	130	54 (41.5)	24 (36.9)	26 (44.8)
> 5 years	214	102 (47.7)	52 (49.5)	46 (49.5)
Unspecified	171	53 (31.0)	16 (20.8)	33 (38.8)
P value[d]		0.006	<0.001	0.6
Area of Residence				
Alabama MSA	836	342 (40.9)	136 (39.8)	191 (42.4)
Alabama non-MSA	312	135 (43.3)	78 (44.3)	53 (43.1)
Out of state	57	21 (36.8)	12 (30.8)	6 (40.0)
P value[d]		0.6	0.3	0.9
Distance to clinic (miles)				
≤ 5 miles	541	228 (42.1)	81 (42.2)	140 (42.7)
6–19	139	68 (48.9)	34 (50.0)	32 (49.2)
20–49	112	43 (38.4)	24 (34.8)	16 (43.2)
50–99	204	70 (34.3)	40 (35.4)	27 (34.6)
≥ 100	204	85 (41.7)	45 (39.8)	33 (42.9)
P value[d]		0.09	0.3	0.5
Pregnancy (among females)	26	5 (19.2)	1 (25.0)	4 (20.0)
No	270	93 (34.4)	25 (34.3)	62 (33.9)
P value[d]		0.1	1.0	0.3
History of other STDs	251	106 (42.2)	47 (39.5)	54 (45.8)
No	958	392 (40.9)	179 (40.6)	196 (41.7)
P value[d]		0.7	0.8	0.4
History of diabetes	34	20 (58.8)	7 (70.0)	13 (56.5)
No	1175	478 (40.7)	219 (39.8)	237 (42.0)
P value[d]		0.03	0.09	0.2
History of CVD	158	66 (41.8)	31 (49.2)	33 (39.8)
No	1051	432 (41.1)	195 (39.2)	217 (43.0)
P value[d]		0.9	0.1	0.6
History of cancer	20	6 (30.0)	3 (21.4)	3 (50.0)
No	1189	492 (41.4)	223 (40.8)	247 (42.4)
P value[d]		0.3	0.1	0.7
History of mental illness	145	55 (37.9)	33 (39.8)	21 (36.2)
No	1064	443 (41.6)	193 (40.5)	229 (43.2)
P value[d]		0.4	0.9	0.3

Characteristic	n	Patients presenting to care with CDC-defined AIDS		
		All n (%)[b]	White n (%)[c]	Black n (%)[c]

[a] Patients with missing information included: Gender (n=4), insurance status (n=3), area of residence (n=4), distance to clinic (n=7), and pregnancy (n=5).

[b] Row percent where denominator is the row value given under "n."

[c] Row percent where denominator is the number of white/black patients with row characteristic.

[d] Comparison of characteristic levels for a difference between delayed and nondelayed presenters to HIV medical care.

[e] Private insurance and Medicare, Medicaid, or Ryan White Care Act.

CDC, Centers for Disease Control and Prevention; AIDS, acquired immunodeficiency syndrome; MSM, men who have sex with men; IDU, intravenous drug user; MSA, metropolitan statistical area; STDs, sexually transmitted diseases; CVD, cardiovascular disease.

Table 2

Crude and adjusted associations of delayed presentation to initial HIV medical care: Birmingham, AL, 1996–2005

Characteristic	Crude PR	Adjusted[a] PR	Adjusted[a] 95% CI
Year (vs. 1996–1998)			
1999–2001	1.0	1.0	(0.7,1.3)
2002–2005	1.1	**1.3**	**(1.0,1.8)**
Race/Ethnicity (vs. white/non-Hispanic)			
Black/non-Hispanic	1.1	1.1	(0.9,1.5)
Other or unspecified	0.9	0.9	(0.5,1.7)
Male sex (vs. female)	1.3	**1.7**	**(1.2,2.3)**
Age, years (vs. <25)			
25–34	1.8	**2.3**	**(1.4,3.8)**
35–44	1.9	**2.5**	**(1.5,4.1)**
≥ 45	1.8	**2.1**	**(1.2,3.6)**
Insurance status (vs. private)			
Medicare or Medicaid	1.3	**1.8**	**(1.3,2.4)**
Other or unspecified[b]	0.9	1.0	(0.7,1.3)
Risk exposure group (vs. heterosexual)			
MSM	1.2	1.2	(0.8,1.7)
Other or unspecified[c]	0.9	1.0	(0.7,1.4)
Time since HIV diagnosis (vs. 7–60 months)			
0–6 months	1.2	**1.3**	**(1.0,1.9)**
> 5 years	1.3	1.4	(0.9,2.1)
Unspecified	0.8	0.7	(0.5,1.2)
Area of Residence (vs. Alabama MSA)			
Alabama non-MSA	1.1	1.2	(0.8,1.7)
Out of state	0.9	1.1	(0.6,2.2)
Distance to clinic, miles (vs. ≤ 5)			
6–19	1.2	1.3	(0.8,2.0)
20–99	0.9	0.8	(0.5,1.3)
≥ 100	0.9	0.8	(0.6,1.1)
Pregnancy, among females (vs. no)	0.6	0.4	(0.1,1.1)
History of diabetes (vs. no)	1.4	1.8	(0.9,3.7)
History of mental illness (vs. no)	0.9	**0.7**	**(0.5,1.0)**

Numbers in bold represent P value < 0.05.

[a]Model adjusted for all variables listed in Table 2.

[b]Includes Ryan White Care Act, combined private and public, none, and unspecified.

[c]Includes IDU, IDU and MSM, other, and unspecified.

PR, prevalence ratio; CI, confidence interval; MSM, men who have sex with men; IDU, intravenous drug user; MSA, metropolitan statistical area.

Table 3

Adjusted associations of delayed presentation to initial HIV medical care, stratified by race/ethnicity: Birmingham, AL, 1996–2005[a]

Characteristic	White/non-Hispanic (n = 560)		Black/non-Hispanic (n = 588)	
	PR	95% CI	PR	95% CI
Year (vs. 1996–1998)				
1999–2001	0.7	(0.4, 1.0)	1.2	(0.8, 1.8)
2002–2005	0.9	(0.5, 1.4)	2.0	(1.3, 3.1)
Male sex (vs. female)	1.3	(0.8, 2.3)	2.2	(1.5, 3.2)
Age, years (vs. < 25)				
25–34	2.8	(1.0, 7.6)	2.2	(1.2, 4.1)
35–44	3.7	(1.4, 10.3)	2.1	(1.1, 3.9)
≥ 45	4.9	(1.7, 14.1)	1.1	(0.5, 2.1)
Time since HIV diagnosis (vs. 7–60 mos)				
0–6 months	1.8	(1.1, 3.0)	1.1	(0.7, 1.8)
> 5 years	1.8	(1.0, 3.3)	1.2	(0.7, 2.1)
Unspecified	0.6	(0.3, 1.2)	0.8	(0.4, 1.4)

[a] Model adjusted for variables listed and insurance status and history of diabetes.

PR, prevalence ratio; CI, CI, confidence interval; mos, months.

Table 4

Adjusted associations of delayed presentation to initial HIV medical care, stratified by sex: Birmingham, AL, 1996–2005[a]

Characteristic	Male (n = 904)		Female (n = 301)	
	PR	95% CI	PR	95% CI
Age ≥ 25 (vs. < 25)	2.0	(1.1, 3.5)	3.6	(1.3, 9.9)
Time since HIV diagnosis (vs. 7–60 mos)				
0–6 months	1.4	(0.9, 2.0)	1.4	(0.7, 2.8)
> 5 years	1.2	(0.8, 1.8)	2.8	(1.2, 6.7)
Unspecified	0.8	(0.5, 1.2)	0.6	(0.2, 1.8)
History of diabetes (vs. no)	2.8	(1.1, 7.6)	0.9	(0.2, 3.0)
History of mental illness (vs. no)	0.8	(0.5, 1.3)	0.4	(0.2, 0.8)

[a]Model adjusted for variables listed and year presented to HIV care, insurance status, and distance to clinic.

PR, prevalence ratio; CI, confidence interval; mos, months

Table 5

Adjusted associations of delayed presentation to initial HIV medical care, stratified by age: Birmingham, AL, 1996–2005[a]

Characteristic	< 25 years of age (n = 102)		≥ 25 years of age (n = 1107)	
	PR	95% CI	PR	95% CI
Year (vs. 1996–1998)				
1999–2001	0.6	(0.1, 3.0)	1.0	(0.7,1.3)
2002–2005	3.5	(1.0,12.8)	1.2	(0.9,1.6)
Race/ethnicity (vs. white/non-Hispanic)				
Black/non-Hispanic	4.3	(1.1,16.4)	1.1	(0.9,1.5)
Other or unspecified	0.0	(0.0, ∞)	0.9	(0.5,1.7)
Male sex (vs. female)	4.5	(1.2,16.0)	1.7	(1.2,2.3)
History of mental illness (vs. no)	2.5	(0.4,13.9)	0.7	(0.5,1.0)

[a]Model adjusted for variables listed and insurance status, time since HIV diagnosis, and history of diabetes.

PR, prevalence ratio; CI, confidence interval.