HIV Risk Behaviors and Testing History in Historically Black College and University Settings

Peter E. Thomas, PhD, MPH[a]
Andrew C. Voetsch, PhD[a]
Binwei Song, MS[a]
Denyce Calloway, PhD[b]
Carolyn Goode, PhD[b]
Lynette Mundey, MD[b]
Joanne Nobles, RN, MPH[c]
Kaye Sly, PhD[d]
Michelle R. Smith, PhD, MPH[e]
Brenda Williams, RN, MSN[f]
Mattie Shiloh, RN, MSN[f]
Kevin Patterson, AA[d]
Sybil Ward, AA[e]
Patrick S. Sullivan, DVM, PhD[a]
James D. Heffelfinger, MD, MPH[a]

SYNOPSIS

Objectives. From 2001 through 2005, African Americans accounted for the largest percentage of new cases of human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) in all age categories, especially among people aged 13 to 24 years. Although students attending historically black colleges and universities (HBCUs) report many of the behaviors that promote HIV transmission, their risk behaviors and HIV testing practices have not been well-characterized. We compared the demographic and behavioral characteristics of people who have been previously tested for HIV with those of people tested for the first time in this demonstration project to increase HIV testing at HBCUs.

Methods. The Centers for Disease Control and Prevention and collaborating partners conducted rapid HIV testing and behavioral surveys at HBCUs in Arkansas, Georgia, Mississippi, and Washington, D.C., from January 2005 to April 2007. We recruited a convenience sample of students and community members at different campus venues including student health centers, dormitories, and student activity centers.

Results. Our analysis included 5,291 people, 42% of whom reported they had never been tested for HIV. People who had been tested in the past were more likely to be older, believe they were at high risk for infection, have visited a health-care facility, and report behaviors that increased their risk of HIV infection.

Conclusion. Respondents who believed they were at increased risk for HIV infection or reported behaviors that increased their risk for infection were more likely to have been tested for HIV. Future research should compare actual vs. perceived risk for HIV infection and contrast how each impacts HIV testing.

[a]Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA

[b]Howard University, Washington, DC

[c]Fort Valley State University, Fort Valley, GA

[d]Jackson State University, Jackson, MS

[e]Jefferson Comprehensive Care, Inc., Pine Bluff, AR

[f]Albany State University, Albany, GA

Address correspondence to: Peter E. Thomas, PhD, MPH, Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 1600 Clifton Rd. NE, MS-E46, Atlanta, GA 30333; tel. 404-639-6266; fax 404-639-8640; e-mail <pbt7@cdc.gov>.

The human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) epidemic has been a public health crisis for the African American community for two decades. In the United States, black people are disproportionately affected by HIV compared with other racial/ethnic groups. From 2001 through 2005, African Americans accounted for 50% of the 184,170 new HIV/AIDS diagnoses reported to the Centers for Disease Control and Prevention (CDC), but comprised only 13% of the U.S. population.[1] African Americans accounted for the largest percentage of new HIV/AIDS cases in all age categories, especially among people aged 13 to 24 years (61%) during these years. From 2001 through 2005, 56% of HIV/AIDS cases were reported from the South, of which 54% were among black people.

Young black people living in the South are a population at increased risk for HIV infection. Recent public health investigations have identified transmission of HIV infection among black male college students and other young black men in North Carolina.[2,3] Previous studies have also documented that black college students report many of the behaviors that promote HIV transmission, including having sex with multiple partners, having unprotected sexual intercourse, and using drugs or alcohol during sex.[4–7] Despite these behaviors, many black college students believe they are at low risk for HIV infection.[4,8] The risk behaviors and HIV testing practices of students attending historically black colleges and universities (HBCUs), most of which are located in the South, have not been well-characterized.

Testing for HIV can serve as a bridge for providing earlier treatment and encouraging behavior change among people already infected with HIV or at risk for HIV infection.[9,10] Although as a group black people are more likely to have been tested for HIV than people from other racial/ethnic groups, many report that they have never been tested for HIV.[11,12] Recent studies on HIV testing among black college students and black people in the rural South, however, have reported a willingness to be tested for HIV.[13,14]

In 2003, CDC launched the Advancing HIV Prevention (AHP) initiative to implement new models for diagnosing HIV infections outside medical settings.[15] In 2004, as part of the AHP initiative, CDC funded four sites to conduct a demonstration project to implement rapid HIV testing and administer behavioral surveys in seven HBCU settings. In this exploratory analysis, we describe the people who completed the survey and compare the demographic and behavioral characteristics of people who had been previously tested for HIV with those of people who were tested for the first time during this project.

METHODS

CDC and collaborating partners conducted rapid HIV testing and behavioral surveys at seven HBCUs in four locations (Arkansas, Georgia, Mississippi, and Washington, D.C.) from January 2005 to April 2007. Local project staffs were responsible for recruiting people for testing, providing HIV counseling and testing, and linking newly diagnosed HIV-positive individuals to appropriate medical, social, and prevention services. Staff recruited participants using convenience-sampling methods with the assistance of student peer leaders on all participating HBCU campuses. Students and nonstudents were eligible to participate if they were HIV-negative or did not know their HIV status, met the age requirements for consent in the state in which testing was offered, and were able to provide informed consent.

Testing and behavioral surveys were conducted in a variety of campus venues, including student health centers, dormitories, student activity centers, and gymnasiums. Because there were considerable differences across the campuses and the student populations, different methods were used to select venues for testing and times during which tests were offered. All four sites used peer educators and project staff to identify venues and HIV testing opportunities that would be innovative and most accessible to people in the HBCU communities. In Arkansas, Jefferson Comprehensive Care System, Inc., coordinated project activities at three HBCUs (Arkansas Baptist College and Philander Smith College, both in Little Rock, and the University of Arkansas at Pine Bluff). Testing and surveys were conducted with students on selected days each week in both clinical and nonclinical settings on the campuses in Arkansas. In Georgia, testing and surveys were conducted at the student health centers at Albany State University in Albany and Fort Valley State University in Fort Valley during regular clinic hours on specific weekdays and were also offered at limited times at a faith-based organization in Albany. In Mississippi, testing and surveys were conducted at Jackson State University in Jackson four days a week in a nonclinical setting in an academic building on campus. In Washington, testing and surveys were conducted at the Howard University student health center daily by appointment or on a walk-in basis, as well as on selected days or nights each week at other settings on the Howard University campus. On all campuses,

testing and surveys were conducted at or during large campus social or academic events, including Greek week, academic registration, health screenings for members of sports teams at the beginning of academic semesters, health fairs, spring flings, and some special events that were organized to promote increased HIV testing in HBCU settings.

Participants were asked to complete a self-administered 10-minute survey before HIV counseling and testing were initiated. Participants who refused HIV testing were asked to complete the same self-administered survey. Small nonmonetary incentives (less than $5 in value) were offered to participants who completed the surveys. The survey collected information about demographic characteristics, social and sexual behaviors, attitudes and beliefs about HIV, and HIV testing history. Surveys were completed on paper forms, and data from the surveys were later entered into a QDS™ database[16] at project sites and transferred securely to CDC.

In three locations (Arkansas, Georgia, and Washington), HIV testing was conducted using OraQuick Advance® Rapid HIV-1/2 Antibody Tests (OraSure Technologies, Bethlehem, Pennsylvania) with oral mucosal transudate specimens or finger-stick whole-blood specimens. In Mississippi, preliminary testing was conducted using Uni-Gold™ Recombigen® HIV (Trinity Biotech, Jamestown, New York) rapid HIV tests with finger-stick whole-blood specimens. All people who were tested received pre- and posttest counseling, which included risk-reduction counseling. Negative rapid test results were considered to be conclusive. Reactive rapid tests were considered to be preliminary positive, and people who had reactive tests were asked to provide a whole-blood or oral fluid specimen for confirmatory testing by Western blot. At all locations, people who had confirmed positive HIV test results were provided further HIV risk-reduction counseling, offered partner counseling and referral services, and referred to follow-up health-care and prevention services.

Data were analyzed using SAS version 9.1[17] at CDC. Bivariate analyses were conducted to describe characteristics of clients who participated and to identify variables associated with having been tested for HIV in the past. Analysis was limited to respondents who answered the outcome question, "When were you most recently tested for HIV, if ever?"

This project was determined to be a public health program activity by CDC; therefore, review by CDC's Institutional Review Board was not required. However, the human subjects committees at the participating HBCUs approved the project. Staff obtained written consent from participants who were tested for HIV and provided them with pre- and posttest counseling.

RESULTS

Of 8,521 people tested for HIV, 14 (0.2%) were newly diagnosed with HIV infection. Of those tested, 6,574 (77%) completed a survey and 5,232 (61%) responded to the outcome question. In addition, 89 people who where not tested for HIV completed a survey, of whom 59 (66%) responded to the question about their most recent HIV test. In total, 5,291 respondents were included in the analysis (Table 1). The median age of respondents was 20 years (range: 14 to 84 years), two-thirds of respondents were female, and 88% of respondents self-identified as heterosexual. Of all respondents, 4,192 (79%) were either full- or part-time students. When asked what kind of health-care facilities they had visited during the last year, 58% indicated they had visited the student health center, 46% had visited a private physician's office, and 23% had not visited any health-care provider.

Overall, 83% of respondents reported at least one sex partner, 48% reported having more than one sex partner in the preceding 12 months, and 14% of male respondents reported having sex with other males during the past year (Table 2). The most commonly reported high-risk sexual behaviors were not using a condom during the last act of vaginal or anal sexual intercourse (36%), having sex with a person of unknown HIV status in the past year (17%), and having sex while high on drugs or drunk in the past year (11%) (Table 2). Less commonly reported sexual behaviors during the last 12 months included having sex with someone the respondent did not previously know (4%), having unprotected receptive anal sex (3%), and exchanging sex for money, drugs, or goods (2%). Approximately 8% of respondents reported being diagnosed with at least one sexually transmitted disease (STD) within the past 12 months. Overall, 50% of respondents reported at least one high-risk sexual behavior. However, 49% of respondents reported believing they were at low risk of becoming infected with HIV, and almost 20% thought they were at no risk for infection. Less than 4% of respondents believed they were at high risk for infection.

Among female respondents, 10% reported having sex during the past year with a man who has sex with other men, and 16% reported having vaginal sex with a man without using a condom during the past year. Compared with females, males were more likely to report having more sexual partners ($p<0.01$), sex

Table 1. Demographic and behavioral characteristics of people surveyed at seven historically black colleges and universities by location where surveys were conducted, January 2005–April 2007[a]

	Arkansas (n=1,016)		*Georgia (n=1,027)*		*Mississippi (n=1,266)*		*Washington, D.C. (n=1,982)*		*Total (n=5,291)*	
	Number	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*
Age (in years)—median (range)	20	(16–68)	20	(14–84)	21	(16–70)	20	(16–54)	20	(14–84)
14–18	200	(19.7)	283	(27.4)	211	(16.7)	490	(24.8)	1,184	(22.4)
19–20	370	(36.4)	321	(31.3)	393	(31.0)	684	(34.5)	1,768	(33.4)
21–22	215	(21.2)	155	(15.1)	281	(22.2)	351	(17.7)	1,002	(18.9)
23–24	74	(7.3)	61	(5.9)	146	(11.5)	170	(8.6)	451	(8.5)
25–29	63	(6.2)	41	(4.0)	123	(9.7)	185	(9.3)	412	(7.8)
30+	82	(9.1)	141	(13.7)	84	(6.7)	38	(1.9)	345	(6.5)
Missing[b]	12	(1.2)	25	(2.4)	28	(2.2)	64	(3.2)	129	(2.4)
Sex										
Male	391	(38.5)	290	(28.2)	436	(34.4)	671	(33.9)	1,788	(33.8)
Female	623	(61.3)	737	(71.8)	829	(65.5)	1310	(66.1)	3,499	(66.1)
Other[c]	2	(0.2)	0	(0.0)	1	(0.1)	1	(0.1)	4	(0.1)
Race/ethnicity										
Hispanic	10	(1.0)	4	(0.4)	9	(0.7)	18	(0.9)	41	(2.2)
Black/African American	985	(97.0)	969	(94.4)	1,213	(95.8)	1,889	(95.3)	5,056	(95.6)
Other races	17	(1.7)	41	(4.0)	31	(2.5)	38	(1.9)	127	(2.4)
Missing[b]	4	(0.4)	13	(1.3)	13	(1.0)	37	(1.9)	67	(1.3)
Currently committed to one partner	396	(39.0)	492	(47.9)	561	(44.3)	869	(43.9)	2,318	(49.3)
Sexual orientation										
Heterosexual	903	(88.9)	950	(92.5)	1,072	(84.7)	1,731	(87.3)	4,656	(88.0)
Bisexual	19	(1.9)	10	(1.0)	72	(5.7)	42	(2.1)	143	(2.7)
Homosexual/gay/lesbian	25	(2.5)	22	(2.1)	52	(4.1)	37	(1.9)	137	(2.6)
Missing[b]	69	(6.7)	45	(4.4)	70	(5.5)	171	(8.6)	356	(6.7)
Academic year										
Not a student	33	(3.3)	34	(3.3)	39	(3.1)	9	(0.5)	115	(2.2)
Student	590	(58.1)	612	(59.6)	1,158	(91.5)	1,832	(92.4)	4,192	(79.2)
0–1 year	294	(49.8)	317	(51.8)	544	(46.9)	824	(44.9)	1,979	(47.2)
2–3 years	226	(38.3)	218	(35.6)	434	(37.5)	755	(41.2)	1,633	(39.0)
4–5 years	49	(8.3)	66	(10.8)	158	(13.6)	204	(10.2)	477	(11.4)
6 years or more	10	(1.7)	2	(0.3)	22	(1.9)	46	(2.5)	80	(1.9)
Unknown (student status)[b]	11	(1.9)	9	(1.5)	9	(1.5)	3	(0.2)	23	(0.6)
Missing[b]	393	(38.7)	381	(37.1)	69	(5.5)	141	(7.1)	984	(79.2)

continued on p. 119

Table 1 (continued). Demographic and behavioral characteristics of people surveyed at seven historically black colleges and universities by location where surveys were conducted, January 2005–April 2007[a]

	Arkansas (n=1,016)		*Georgia (n=1,027)*		*Mississippi (n=1,266)*		*Washington, D.C. (n=1,982)*		*Total (n=5,291)*	
	Number	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*
Residence										
On campus	564	(55.5)	508	(49.5)	612	(48.3)	1,342	(67.8)	3,026	(57.2)
Off campus	417	(41.0)	466	(45.4)	633	(50.0)	618	(31.2)	2,134	(40.4)
Missing[b]	35	(3.4)	53	(5.2)	21	(1.7)	20	(1.0)	129	(2.4)
Visit to a health-care provider in the past 12 months										
Yes	817	(80.4)	864	(84.1)	925	(73.1)	1,474	(74.4)	4,080	(77.1)
Student health center	491	(60.1)	437	(50.5)	451	(48.7)	988	(67.1)	2,367	(58.0)
Local hospital	223	(27.2)	218	(25.2)	326	(35.2)	412	(27.9)	1,179	(28.9)
Private doctor	227	(27.7)	469	(54.2)	447	(48.3)	751	(50.9)	1,894	(46.4)
Local health department	98	(12.0)	173	(20.0)	236	(25.5)	162	(10.9)	669	(16.4)
Emergency department	109	(13.3)	155	(20.0)	296	(32.0)	285	(19.3)	845	(20.7)
Faith-based organization	39	(3.8)	33	(3.2)	50	(4.0)	87	(4.4)	209	(4.0)
No reported visit to a health-care provider	199	(19.6)	163	(15.8)	341	(26.94)	508	(24.6)	1,210	(22.9)

[a]Surveys conducted in Arkansas were administered at the University of Arkansas in Pine Bluff, and Philander Smith College and Arkansas Baptist College, both in Little Rock; surveys conducted in Georgia were administered at Albany State University in Albany and Fort Valley State University in Fort Valley; surveys conducted in Mississippi were administered at Jackson State University in Jackson; and surveys conducted in Washington, D.C., were administered at Howard University.

[b]"Missing" combines responses of "don't know," "refused," and "not applicable."

[c]"Other" includes responses of "transgender," "don't know," "refused," and "not applicable."

Table 2. Sexual behaviors and perceptions of risk for HIV infection among people surveyed at seven historically black colleges and universities, by sex, January 2005–April 2007

	Men (n=1,788)		*Women (n=3,499)*		*Total (n=5,287)*	
	Number	*(percent)*	*Number*	*(percent)*	*Number*	*(percent)*
Sexual behavior in the past 12 months						
Sex with person who uses injection drugs	7	(0.4)	6	(0.2)	13	(0.2)
Sex with person who is HIV-positive	14	(0.8)	9	(0.2)	23	(0.4)
Sex with person of unknown HIV status	327	(18.3)	570	(16.3)	897	(17.0)
Sex while high, on drugs, or drunk[a]	280	(15.6)	309	(8.8)	589	(11.1)
Sex with unknown person[a]	150	(8.4)	71	(2.0)	221	(4.2)
Receptive unprotected anal intercourse	73	(4.1)	108	(3.1)	181	(3.4)
Sex with man who has sex with men[b]	N/A	N/A	364	(10.4)	364	(6.9)
Vaginal sex with a man with no condom[b]	N/A	N/A	550	(15.7)	550	(10.4)
Purchasing or providing sex for a fee	51	(2.9)	32	(0.9)	83	(1.6)
No condom use during last intercourse	561	(31.4)	1,309	(37.4)	1,870	(35.4)
Male-male sex	240	(13.8)	N/A	N/A	240	(4.5)
Any sexually transmitted disease[a]	77	(4.3)	326	(9.4)	403	(7.6)
At least one sexual behavior	956	(53.5)	1,771	(50.6)	2,727	(51.6)
Number of sex partners in the past 12 months[a]						
No partners	113	(6.3)	275	(7.9)	388	(7.3)
1 partner	432	(24.2)	1,411	(40.3)	1,843	(34.9)
2–5 partners	870	(48.7)	1,434	(41.0)	2,304	(43.6)
6–10 partners	112	(6.3)	91	(2.6)	204	(3.8)
11 or more partners	40	(2.2)	15	(0.4)	55	(1.0)
Missing[c]	221	(12.3)	273	(7.8)	493	(9.3)
Perception of HIV risk						
High[a]	85	(4.8)	109	(3.1)	194	(3.7)
Medium	162	(9.1)	340	(9.7)	502	(9.5)
Low	850	(47.5)	1,728	(49.4)	2,578	(48.8)
None	331	(18.5)	655	(18.7)	986	(18.7)
Missing[c]	360	(20.1)	667	(19.1)	1,027	(19.4)

[a]Statistically significant at $p<0.01$

[b]Female respondents only

[c]"Missing" combines responses of "don't know," "refused," and "not applicable."

HIV = human immunodeficiency virus

N/A = not applicable

with someone they did not know ($p<0.01$), and sex while high, drunk, or on drugs ($p<0.01$) during the past year. In addition, males were more likely than females to report having sex with a person who was HIV-positive during the past year ($p<0.01$). However, the proportion of people reporting having sex with an HIV-positive partner did not differ when comparing females with males who reported having only female partners. Compared with males, females were more likely to have been diagnosed with at least one STD during the past year ($p<0.01$). Although a greater proportion of males than females reported believing they were at high risk for HIV infection ($p<0.01$), there were no differences by sex in the proportions of respondents who believed themselves to be at medium or low risk for infection.

Not including testing conducted on the day of the survey, 25% of respondents had been tested for HIV within six months prior to completing the survey, 18% had been tested six to 12 months prior, 11% had been tested one to two years prior, 5% had been tested more than two years prior, and 42% had never been tested for HIV. Among those who were in a sexual or romantic relationship, 28% of respondents reported that a partner had asked them to get tested for HIV, and 45% reported asking their last sexual partner if he or she had been tested for HIV before having sex.

Several sociodemographic characteristics were associated with increased likelihood of having been tested in the past (Table 3). The likelihood of having previously been tested for HIV increased as respondents' ages increased, and respondents who self-identified as bisexual were nearly twice as likely as heterosexuals to have been previously tested for HIV. Compared with

Table 3. Demographic and behavioral characteristics associated with having been tested for HIV in the past among people surveyed at seven historically black colleges and universities, January 2005–April 2007

	Previously tested		*Never tested*			
	Number	*(percent)*	*Number*	*(percent)*	*Odds ratio*	*(95% CI)*
Sex						
Male	994	(55.6)	794	(44.4)	0.9	(0.8, 1.0)
Female	2,058	(58.8)	1,441	(41.2)	1.0	Referent
Age (in years)						
14–18	427	(36.1)	757	(63.9)	0.4	(0.4, 0.5)
19–20	1,014	(57.3)	754	(42.7)	1.0	Referent
21–22	648	(64.7)	354	(35.3)	1.4	(1.2, 1.6)
23–24	324	(71.8)	127	(29.2)	1.9	(1.5, 2.4)
25–29	326	(79.1)	86	(20.9)	2.8	(2.2, 3.6)
30+	226	(65.5)	119	(35.5)	1.4	(1.1, 1.8)
Other	89	(69.0)	40	(31.0)	1.7	(1.1, 2.4)
Race/ethnicity						
Black/African American	2,926	(57.9)	2130	(42.1)	1.0	Referent
Other races	87	(51.7)	81	(48.3)	0.8	(0.6, 1.1)
Sexual orientation						
Heterosexual	2,663	(57.2)	1993	(42.8)		Referent
Bisexual	101	(70.6)	42	(29.4)	1.8	(1.3, 2.6)
Homosexual/gay/lesbian/other	86	(62.5)	51	(37.5)	1.2	(0.9, 1.8)
Academic year						
0–1 year	926	(47.4)	1053	(52.6)	1.0	Referent
2–3 years	1,042	(63.9)	591	(36.1)	2.0	(1.8, 2.3)
4–5 years	328	(68.8)	149	(31.2)	2.5	(2.3, 6.7)
6 or more years	62	(76.9)	18	(23.1)	3.9	(2.3, 6.0)
Unknown	16		7		2.6	(1.1, 6.3)
Residence						
On campus	1,538	(50.8)	1488	(49.2)	1.0	Referent
Off campus	1,442	(67.6)	692	(32.4)	2.0	(1.8, 2.3)
Project location[a]						
Arkansas	532	(52.4)	484	(47.6)	1.0	(0.8, 1.1)
Georgia	578	(56.3)	449	(43.7)	1.1	(1.0, 1.3)
Mississippi	887	(70.1)	379	(29.9)	2.0	(1.8, 2.4)
Washington, D.C.	1,057	(53.3)	925	(46.7)	1.0	Referent
Number of sex partners in the past 12 months						
No partners	116	(29.8)	273	(70.2)	1.0	Referent
1 partner	1,057	(57.3)	787	(42.7)	3.2	(2.5, 4.0)
2–5 partners	1,427	(61.9)	878	(38.1)	3.8	(3.0, 4.8)
6 or more partners	185	(71.0)	75	(29.0)	5.8	(4.1, 8.2)
Currently committed to one partner[b]	1,382	(59.6)	936	(40.4)	0.8	(0.7, 0.9)

continued on p. 122

Table 3 (continued). Demographic and behavioral characteristics associated with having been tested for HIV in the past among people surveyed at seven historically black colleges and universities, January 2005–April 2007

	Previously tested		*Never tested*			
	Number	*(percent)*	*Number*	*(percent)*	*Odds ratio*	*(95% CI)*
Perception of HIV risk						
High	132	(68.0)	62	(32.0)	2.0	(1.4, 2.7)
Medium	338	(67.2)	165	(32.8)	1.9	(1.5, 2.3)
Low	1,583	(61.4)	996	(38.6)	1.5	(1.3, 1.7)
None	515	(52.2)	472	(47.8)	1.0	Referent
Female sexual behavior (n=3,099)[b]						
Vaginal intercourse without a condom	371	(67.5)	179	(32.6)	1.6	(1.3, 1.9)
Sex with man who has sex with men	245	(67.3)	119	(32.7)	1.5	(1.2, 1.9)
Male-male sex[b]	164	(68.3)	76	(31.7)	1.9	(1.4, 2.5)
Sexual behavior in the past 12 months[b]						
Sex with a person of unknown HIV status	505	(56.3)	392	(43.8)	0.9	(0.8, 1.1)
Sex while high on drugs or drunk	391	(66.3)	198	(33.7)	1.5	(1.3, 1.8)
Any sexually transmitted disease	305	(75.1)	101	(24.9)	2.2	(1.7, 2.7)
Sex with unknown person	143	(64.6)	78	(35.5)	1.3	(1.0, 1.8)
Receptive unprotected anal intercourse	116	(64.1)	65	(35.9)	1.3	(1.0, 1.8)
Sex with person who is HIV-positive	20	(83.3)	4	(16.7)	3.7	(1.2, 10.7)
Used condom during last sexual intercourse	1,135	(60.9)	730	(39.1)	1.0	(0.9, 1.1)
Testing norms[b]						
Last partner ever requested that you be tested	1,074	(72.0)	418	(28.0)	2.1	(1.8, 2.4)
Asked last partner if they had been tested	1,645	(68.7)	750	(31.3)	1.8	(1.6, 2.1)
Previously been offered and refused HIV test	278	(62.3)	168	(37.7)	1.0	(0.8, 1.2)
Visit to a health-care provider in the past 12 months[b]						
Student health center	1,425	(60.2)	943	(39.8)	1.2	(1.1, 1.4)
Local hospital	708	(60.1)	471	(40.0)	1.2	(1.0, 1.3)
Private doctor	1,126	(59.5)	768	(40.6)	1.1	(1.0, 1.3)
Local health department	478	(71.5)	191	(28.6)	2.1	(1.7, 2.5)
Emergency department	522	(61.8)	323	(38.2)	1.2	(1.1, 1.5)
Faith-based organization	103	(49.3)	106	(50.7)	0.7	(0.5, 0.9)

[a]Surveys conducted in Arkansas were administered at the University of Arkansas in Pine Bluff, and Philander Smith College and Arkansas Baptist College, both in Little Rock; surveys conducted in Georgia were administered at Albany State University in Albany and Fort Valley State University in Fort Valley; surveys conducted in Mississippi were administered at Jackson State University in Jackson; and surveys conducted in Washington, D.C., were administered at Howard University.

[b]Referent groups for each row were those not reporting behavior.

HIV = human immunodeficiency virus

CI = confidence interval

respondents who had completed none to one year of college, there was an increasing likelihood of having previously been tested for HIV as the number of academic years respondents had completed increased. In addition, respondents who reported living off campus were twice as likely to have ever been tested for HIV as those living on campus. Respondents in Arkansas, Georgia, and Washington were less likely to have been tested for HIV in the past than respondents in Mississippi.

The likelihood of having been tested for HIV in the past was associated with several reported risk behaviors (Table 3). The likelihood of having ever been tested for HIV increased with the number of reported sex partners in the past 12 months. Compared with respondents who reported having no sex partners in the past 12 months, respondents who reported six or more sex partners in the past year were almost six times as likely to have been tested for HIV in the past. Respondents who reported having sex while drunk or under the influence of drugs, having been diagnosed with an STD, or having sex with a person who was HIV-positive during the past 12 months were one and a half, two, or almost four times as likely to have been tested for HIV in the past, respectively. Among female respondents, those who reported having either vaginal intercourse without a condom in the past year or sex with a man who has sex with men in the past year were more likely to have ever been tested for HIV. Compared with respondents who did not perceive themselves to be at risk for HIV infection, respondents who believed themselves to be at medium or high risk were twice as likely to have been tested for HIV in the past. The likelihood of having been tested for HIV in the past was approximately twofold greater for respondents who reported that their last partner asked him or her to be tested for HIV and for those who had asked their partners if they had been tested. Respondents who reported being committed to one sexual partner were less likely to have ever been tested for HIV.

Respondents who sought health care at a local health department, emergency department, or a student health center in the past year were more likely to have been previously tested for HIV compared with respondents who had not sought health care in these locations. However, respondents who visited a faith-based organization for health care in the past year were less likely to have been tested for HIV compared with those who had not.

DISCUSSION

Respondents in HBCU settings, including HBCU students and nonstudents from the community, who were at increased risk or perceived themselves to be at increased risk for HIV infection were more likely to have been previously tested for HIV. Almost 60% of people in our analysis reported that they had been previously tested for HIV. Our findings on risk behaviors and perception of risk for HIV infection were also consistent with previous research among black people or HBCU college students. For example, in a recent study on an HBCU campus, 48% of 161 students surveyed had been previously tested for HIV, and students who perceived themselves to be at high risk for acquiring HIV were more likely to consent to rapid HIV testing.[14]

Males in our survey reported more high-risk sexual behavior than females, but were less likely to have ever been tested for HIV than females. These findings are consistent with previous research among black college students that found males reported more high-risk sexual behaviors than females.[5] However, male respondents in our survey were also more likely to report believing they were at high risk for HIV infection compared with females, whereas Johnson and colleagues showed that males reported worrying less about acquiring HIV than females.[18] Male respondents who reported having sex with men and self-identified bisexual respondents were more likely to have ever been tested compared with males not reporting this behavior. Young black men who have sex with both men and women are an important group to consider in HIV transmission in the southern United States.[19] Therefore, it is encouraging that approximately 70% of respondents in this group had previously been tested for HIV.

In 2006, CDC recommended that all people aged 13 to 64 years be screened for HIV in all health-care settings after being notified that testing will be performed unless they decline.[20] In our survey, nearly half of the respondents had visited the student health clinic and approximately three-quarters had sought health care in the preceding year, yet only 43% had been tested for HIV in the past 12 months. The discrepancy between the proportion who sought health care at student health clinics, or health care anywhere, and the proportion who were tested for HIV in the past year highlights missed opportunities for HIV testing in HBCU settings. Although implementation of the CDC testing guidelines by student health centers at HBCUs would result in an increase in the number of people tested for HIV in HBCU settings, testing people who do not access health care regularly may require additional strategies. Increasing opportunities for HIV testing, expanding the venues in which testing is conducted, and making HIV testing an accepted and even expected service offered on HBCU campuses, as

demonstrated in this project, will likely increase the number of people tested at HBCUs.

Although more than 8,000 HIV tests were conducted at HBCUs during this project, only a small number of people were newly diagnosed with HIV infection. One possible reason for the paucity of new HIV diagnoses might be that people who perceived themselves to be at high risk for infection were less willing to be tested at HBCUs. Another possible reason for the small number of new HIV diagnoses may be that the prevalence of HIV infection in the HBCU communities included in this project was lower than the prevalence in the general population of black people aged 18 to 24 years in the U.S. In a 1990 study by Gayle and colleagues, 0.3% of black students at nine college campuses were HIV-positive. Although the HIV prevalence was higher among black students than among white students (0.2%) in that study, the HIV prevalence among black students was lower than among high-risk groups such as males reporting sex with males.[21]

Limitations

This study was subject to several limitations. All data about risk behaviors and testing history were self-reported. Although interviews with respondents were conducted to provide maximum privacy, some participants may have given inaccurate responses to questions about HIV risk behaviors and testing history for reasons of social desirability or because of recall bias. Because perceptions of risk affect interest in and willingness to be tested for HIV, people who did not perceive themselves to be at risk for HIV may have been less willing to participate in the project, leading to a selection bias that would result in an overestimation of risk behaviors and prior HIV testing. However, if people at high risk of HIV infection were less willing to be tested in HBCU settings, this would also lead to selection bias and result in an underestimation of risk behaviors and HIV testing in the past. Finally, because the respondents represented a convenience sample of people surveyed at seven HBCUs, these findings may not be generalizable to all members of these or other HBCU communities.

CONCLUSION

This study found that the respondents surveyed at HBCUs who reported more sexual behaviors that increase the risk for HIV infection and those who believed they were at increased risk for HIV infection were more likely to have been tested for HIV in the past. Understanding perceived and actual risk for HIV infection, patterns of health-care use, and knowledge of and attitudes toward HIV testing are important components of implementing effective HIV testing strategies.

The authors thank the following individuals and institutions for their help on the historically black colleges and universities Advancing HIV Prevention demonstration project: Elin Begley, Brian Boyett, Hollie Clark, Scott Kellerman, Jeff Schulden, Sharma Scott, and Vinit Shah of the Division of HIV/AIDS Prevention at the Centers for Disease Control and Prevention (CDC); Ada Babino, Shari Davis, Judith Jerry-Fluker, and Theresa Johnson of Howard University in Washington, D.C.; Melissa Benford, Modupe Daramola, Latonya Lott, and Leandro Mena of Jackson State University in Jackson, Mississippi; Julene Smith, Cartney Jones, Peggy Jones, Lakeisha West, Schvon May-Bussey, Gwendolyn Richardson, and Vickie Phillips of Albany State University in Albany, Georgia; Myldred P. Hill of Fort Valley State University in Fort Valley, Georgia; Arkansas Baptist College and Philander Smith College, both in Little Rock, Arkansas; the University of Arkansas at Pine Bluff; and Brent Moore, Benita Holmes, and Derwin Taylor of Jefferson Comprehensive Care Services Inc. in Pine Bluff, Arkansas.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the CDC.

REFERENCES

1. Racial/ethnic disparities in diagnoses of HIV/AIDS—33 states, 2001–2005. MMWR Morb Mortal Wkly Rep 2007;56(9):189-93.
2. HIV transmission among black college student and non-student men who have sex with men—North Carolina, 2003. MMWR Morb Mortal Wkly Rep 2004;53(32):731-4.
3. Hightow LB, MacDonald PD, Pilcher CD, Kaplan AH, Foust E, Nguyen TQ, et al. The unexpected movement of the HIV epidemic in the Southeastern United States: transmission among college students. J Acquir Immune Defic Syndr 2005;38:531-7.
4. Duncan C, Miller DM, Borskey EJ, Fomby B, Dawson P, Davis L. Barriers to safer sex practices among African American college students. J Natl Med Assoc 2002;94:944-51.
5. Taylor SE, Dilorio C, Stephens TT, Soet JE. A comparison of AIDS-related sexual risk behaviors among African-American college students. J Natl Med Assoc 1997;89:397-403.
6. Lewis JE, Malow RM, Ireland SJ. HIV/AIDS risk in heterosexual college students. A review of a decade of literature. J Am Coll Health 1997;45:147-58.
7. Johnson RL, Douglas W, Nelson A. Sexual behaviors of African-American male college students and the risk of HIV infection. J Natl Med Assoc 1992;84:864-8.
8. Johnson EH, Gilbert D, Lollis C. Characteristics of African-American college students with HIV/AIDS. J Natl Med Assoc 1994; 86:931-40.
9. Adoption of protective behaviors among persons with recent HIV infection and diagnosis—Alabama, New Jersey, and Tennessee, 1997–1998. MMWR Morb Mortal Wkly Rep 2000;49(23):512-5.
10. Wenger NS, Linn LS, Epstein M, Shapiro MF. Reduction of high-risk sexual behavior among heterosexuals undergoing HIV antibody testing: a randomized clinical trial. Am J Public Health 1991;81:1580-5.
11. Anderson JE, Chandra A, Mosher WD. HIV testing in the United States, 2002. Adv Data 2005;(363):1-32.
12. HIV testing among racial/ethnic minorities—United States, 1999. MMWR Morb Mortal Wkly Rep 2001;50(47):1054-8.
13. Brown EJ. Recruitment feasibility and HIV prevention intervention acceptability among rural north Florida blacks. J Community Health Nurs 2002;19:147-60.
14. Payne NS, Beckwith CG, Davis M, Flanigan T, Simmons EM, Crockett K, et al. Acceptance of HIV testing among African-American college students at a historically black university in the south. J Natl Med Assoc 2006;98:1912-6.

15. Advancing HIV prevention: new strategies for a changing epidemic—United States, 2003. MMWR Morb Mortal Wkly Rep 2003; 52(15):329-32.
16. Nova Research Co. QDS™ (Questionnaire Development System): Version 2.4. Bethesda (MD): Nova Research Co.; 2005.
17. SAS Institute Inc. SAS: Version 9.1. Cary (NC): SAS Institute Inc.; 2003.
18. Johnson EH, Gant L, Hinkle YA, Gilbert D, Willis C, Hoopwood T. Do African-American men and women differ in their knowledge about AIDS, attitudes about condoms, and sexual behaviors? J Natl Med Assoc 1992;84:49-64.
19. Hightow LB, Leone PA, Macdonald PD, McCoy SI, Sampson LA, Kaplan AH. Men who have sex with men and women: a unique risk group for HIV transmission on North Carolina college campuses. Sex Transm Dis 2006;33:585-93.
20. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep 2006;55(RR-14):1-17.
21. Gayle HD, Keeling RP, Garcia-Tunon M, Kilbourne BW, Narkunas JP, Ingram FR, et al. Prevalence of the human immunodeficiency virus among university students. N Engl J Med 1990;323:1538-41.