

The State of the Union: Sexual Health Disparities in a National Sample of US College Students

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Abstract. Objective: To examine sexual health disparities between blacks and whites in a national sample of US college students. **Participants and Method Summary:** Analyses utilized secondary data from 44,165 nonmarried undergraduates (aged 18–24; $M = 20.1$) responding to the Spring 2007 American College Health Association–National College Health Assessment; 64% were female and 94.7% were white. **Results:** Whites reported more experience in oral and anal sex, were less likely to use condoms for oral, anal, and vaginal sex, and less likely to have been tested for HIV (human immunodeficiency virus) compared with blacks. However, blacks reported more sex partners, lower use of hormonal contraceptives, and higher rates of adverse sexual health outcomes, such as sexually transmitted infections (STIs) and unintended pregnancy. Sexual behaviors and outcomes also varied across gender. **Conclusions:** This study highlights a need to increase access to hormonal contraceptives and early STI screening/treatment among blacks, improve HIV testing among whites, and increase condom use promotion for all students.

Keywords: college students, HIV, health status disparities, sexual behavior, sexually transmitted infections

One of the two overarching goals outlined in Healthy People 2010¹ and Healthy Campus 2010² is to eliminate health disparities among different segments of the US population. Sexual health disparities, in particular, remain a critical public health problem, as rates of HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome) are disproportionately higher among blacks compared to whites. For example, in 2007, blacks represented almost half (48%) of the estimated 551,932 persons living with HIV/AIDS,³ although this group represented only 13.5% of the US population that year.⁴ In terms of race/ethnicity and gender/sex, the highest rate of *new HIV in-*

fections in 2006 was among black males (115.7 per 100,000), with black females having the second highest rate (55.7 per 100,000).³

Blacks in the United States also tend to be disparately affected by other sexually transmitted infections (STIs). According to the most recent surveillance data, almost half of all new chlamydia cases in 2007 occurred among blacks; this group's chlamydia rate was approximately 8 times higher than the rate for whites.⁵ Whereas other racial groups in the United States witnessed lowered gonorrhea rates from 2006 to 2007, blacks witnessed a rate *increase*. Approximately 70% of all newly reported gonorrhea cases occurred among blacks, resulting in an overall rate that was 19 times higher than the rate for whites.⁵ Similarly, the syphilis rate for blacks in 2007 (14.0 per 100,000 population) was also markedly higher than the rate for whites (2.0 per 100,000 population).

In the general population, in addition to STIs, racial disparities also exist with regard to reproductive health. For instance, the unintended pregnancy rate among blacks in 2001 was more than one and a half times the rate for whites (98 per 1,000 women compared with 35 per 1,000 women, respectively).⁶ Such data equate to higher rates of unintended births and abortions for black women; blacks experienced unintended births at a rate of 35 per 1,000 women, whereas whites experienced rates roughly half that (17 per 1,000 women), and rate differences for abortion were even greater (49 abortions per 1,000 black women compared with 13 abortions per 1,000 white women).

Although national surveillance data are clear on disparities among adults in the general population, little is known about the sexual health differences among college students, specifically. Recent campus- and county-level studies, however, provide clues that HIV and other sexual health problems are pressing among young people and, particularly, among black college students. For instance, James et al⁷ revealed that among students attending 10 colleges in Alabama, Georgia, and Mississippi, the chlamydia prevalence for blacks was

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11% compared with 1% for whites. Furthermore, according to a review of men living in 69 North Carolina counties, Hightow and colleagues⁸ reported that 73 of the 84 college men (86.9%) who were newly diagnosed with HIV between 2000 and 2003 were black. Understanding such sexual health disparities is critical to the mission of college health professionals, as health is inexorably intertwined with academic achievement.⁹ For instance, a STI or unintended pregnancy can lead to emotional, social, or financial difficulties that may inhibit higher educational progress, which may, in turn, contribute to further racial disparities in morbidity and mortality.¹⁰

It is unknown how black college students' HIV/STI-related sexual behaviors differ from the behaviors of their white peers. Further, little is known regarding sexual risk behavior differences between black and white college students, by gender, on a national scale. Having this information is vital for shaping national program, policy, and funding priorities related to sexual health among college students (eg, promoting condom use or HIV/STI screening in certain priority populations of college students), especially with regards to the elimination of health disparities. For instance, legislators can utilize these data to direct policy solutions that can include the provision of priority funding and program resources to college communities with the highest reported incidence of HIV, STIs, and unintended pregnancy.^{11,12} Further, policies can be created to ease the cost of family planning and reproductive health services for students.

Using data from the American College Health Association–National College Health Assessment (ACHA-NCHA),¹³ our purpose was to examine the sexual health behaviors and outcomes—participation in oral, vaginal, and anal sex, associated condom use, number of sex partners, having a sexually transmitted infection within the last school year, HIV testing, and unintended pregnancy—among black and white college students, by gender, in an effort to identify disparities that may have important practical implications for college health policy and practice. Reflecting the disparities among adults in the general US population, we hypothesize that black students, compared with their white peers in this national sample, will exhibit more risky sexual health behaviors and more negative sexual health outcomes (STIs and unintended pregnancies).

METHODS

Procedure and Participants

The ACHA-NCHA is a survey that assesses a range of college students' perceptions and health issues, including alcohol, tobacco, and other drug use, sexual health, weight, nutrition, and exercise, mental health, personal safety, and violence. Conducted each fall and spring semester since 2000, through the spring 2007 survey period, 451,564 students have participated in the ACHA-NCHA at 389 different institutions self-selecting to administer the survey.¹⁴ Only colleges and universities that randomly select students, or survey students

in randomly selected classrooms, are included in the ACHA-NCHA databases.

Although the samples are not randomly drawn from the population of US college students, there is evidence to support the generalizability of the ACHA-NCHA findings. For instance, the generalizability of 3 ACHA-NCHA Pilots (Fall 1998, Spring 1999, and Fall 1999) and the Spring 2000 database was evaluated by comparing the results to other surveys of the same population that have been sampled to represent all US students, including the National College Health Risk Behavior Survey,¹⁵ Harvard School of Public Health College Alcohol Study,¹⁶ and National College Women Sexual Victimization Study.¹⁷ Findings from this analysis revealed estimates consistent with those from the national surveys, as well as sufficient evidence of validity (that is, results were similar to those from nationally representative surveys).¹⁸

For this study, institutional review board (IRB) approval to analyze ACHA-NCHA data was secured and the most recently available data set (from Spring 2007) was utilized.¹⁹ This data set contains information collected from 71,860 undergraduate and graduate students enrolled part- and full-time, at both 2- and 4-year institutions. However, for the purpose of generalizing to traditionally aged college students,²⁰ these analyses were limited to undergraduate students. Additionally, because the average student takes between 4 and 6 years from first enrollment to bachelor's degree completion,²¹ and because age-related developmental considerations can affect health promotion efforts, only students aged 18 to 24 years were included in these analyses. Married students do not represent typical college students; therefore, they were excluded from the analysis to avoid bias from potential differences in sexual behaviors. To illuminate sexual health disparities between black and white students, we included only students who were non-Hispanic black ($n = 2,325$, or 5.3%) or non-Hispanic white ($n = 41,840$, or 94.7%).

After applying these inclusion/exclusion criteria, the total resulting sample was comprised of 44,165 undergraduates attending 110 postsecondary institutions and representing each region of the United States. Most student respondents were enrolled in a 4-year college or university; only 5.9% were enrolled in 2-year institutions. Slightly less than two thirds of students (62.6%) were enrolled in public institutions, and one fifth (20.7%) attended religious-affiliated institutions. The average student was 20.1 years of age ($SD = 1.45$), female (64.3%), and enrolled full-time (98.0%); nearly half of all students lived in a campus residence hall (45.8%). Demographic and other characteristics of all students included in these analyses are presented in Table 1.

Measures

Demographics

Demographic items included age, gender, year in school, student status (ie, full- or part-time, international student), race, relationship status, living arrangement, and fraternity/sorority membership.

TABLE 1. Characteristics of American College Health Association–National College Health Assessment (ACHA-NCHA) Undergraduate Participants, White and Black Students Only, Spring 2007

Characteristic	Participants (<i>N</i> = 44,165)	
	Frequency (<i>n</i>)	% Valid
Age in years	Mean = 20.1, <i>SD</i> = 1.45, range = 18–24	
Gender (<i>N</i> = 43,612)		
Female	28,041	64.3%
Ethnicity		
White	41,840	94.7
Black	2,325	5.3
Year in school		
First year undergraduate	12,518	28.3
Second year undergraduate	11,056	25.0
Third year undergraduate	10,351	23.4
Fourth year undergraduate	8,267	18.7
Fifth year or more undergraduate	1,973	4.5
Current residence (<i>N</i> = 44,053)		
Campus residence hall	20,184	45.8
Off-campus housing	14,541	33.0
Parent/guardian's home	5,459	12.4
Other university/college housing	2,418	5.5
Fraternity or sorority house	721	1.6
Other	730	1.7
Member of social fraternity/sorority? (<i>N</i> = 43,866)		
Yes	3,832	8.7
International student? (<i>N</i> = 43,885)		
Yes	648	1.5
Full-time? (<i>N</i> = 43,882)		
Yes	43,014	98.0
Sexual orientation		
Heterosexual	41,342	94.3
Bisexual	1,084	2.5
Gay/lesbian	761	1.7
Transgendered	34	0.1
Attend 2- or 4-year college?		
2-year college	2,595	5.9
4-year college	41,570	94.1

Sexual Behavior

Sexual behavior was assessed on the ACHA-NCHA by asking: “Within the last 30 days, if you are sexually active, how many times did you have: Oral sex? Vaginal intercourse? Anal intercourse?” Respondents chose either a response option indicating that they had *not previously engaged* in the sexual behavior (“Never did this activity”), or chose an option indicating that they had previously engaged in the behavior (eg, [I did this] “1–2 times” [in the last 30 days]). For this study, we dichotomized each activity into 3 lifetime sexual behavior variables (ie, ever had oral sex = yes/no; ever had vaginal sex = yes/no; ever had anal sex = yes/no). Students

were next asked about condom use (“Did you use a condom the last time you had: Oral sex? Vaginal intercourse? Anal intercourse?”), and responses were again coded as a binary variable (eg, used a condom at last oral sex = yes/no). Also with regard to condom use, the ACHA-NCHA asked how often respondents used condoms in the last 30 days for each behavior—never, rarely, sometimes, mostly, and always. The number of sexual partners was measured by the question: “Within the last school year, with how many partners, if any, have you had sex (oral, vaginal, or anal)?” A binary variable was created to reflect students who reported having 4 or more partners for oral, vaginal and/or anal sex.^{22,23}

Sexual Health Outcomes

Regarding HIV, STIs, unintended pregnancy, and pregnancy prevention, the ACHA-NCHA asked a series of questions. Students were asked if they had ever been tested for HIV infection, as well as if they had any of the following (within the last school year): genital herpes, genital warts/human papillomavirus (HPV), hepatitis B or C, HIV, chlamydia, and gonorrhea. Unintended pregnancy was assessed by the question: “Within the last school year, have you unintentionally become pregnant or gotten someone else pregnant?” Students’ contraceptive use was measured by the item: “If you have had vaginal intercourse, what method did you or your partner use to prevent pregnancy the last time? (Select all that apply).” Response options included: Have not had vaginal intercourse, birth control pills, Depo-Provera (shots), Norplant (implant), condoms (male and female), diaphragm/cervical cap/sponge, spermicide (eg, foam), fertility awareness (calendar, mucous, basal body temperature), withdrawal, other, and nothing.

Analysis

Basic descriptive statistics were calculated using SPSS Statistics 17.0 for Windows (<http://www.spss.com/>). To understand the sexual health behavior and outcome disparities between black and white undergraduate students, 36 separate cross-tabulations were conducted with Phi (Pearson’s coefficient of mean-square contingency), a measure of association based on chi-square.²⁴ Phi eliminates the influence of sample size on results, and is commonly used in 2-by-2 tables formed by true dichotomies. Three independent samples *t* tests were also conducted to assess differences in the mean number of sex partners between black and white students, black and white men, and black and white women. Finally, 3 additional chi-square cross-tabulations were conducted to examine differences in last 30-day condom use frequency between black and white students. To control for multiple comparisons, a Bonferroni correction was applied (0.05/42), setting the statistical significance level at .001.²⁵ All percentages and comparisons are presented in the tables: black and white students (Table 2), black and white female students (Table 3), and black and white male students (Table 4).

TABLE 2. Sexual Health Differences Among Black (n = 2,325) and White (n = 41,840) Undergraduate Students (ACHA-NCHA, Spring 2007)

Sexual health behavior	Percent yes among black students	Percent yes among white students	Pearson χ^2	Phi	p value for χ^2
Ever had oral sex (N = 42,549)	61.9%	72.5%	110.09	-.051	<.001*
Ever had vaginal sex (N = 42,494)	68.0	66.9	1.20	.005	.273
Ever had anal sex (N = 42,369)	21.4	23.7	5.74	-.012	.017
Condom use at last oral sex (N = 30,812)	10.0	3.5	151.53	-.070	<.001*
Condom use at last vaginal sex (N = 28,712)	62.7	57.9	13.89	-.022	<.001*
Condom use at last anal sex (N = 7,484)	44.0	29.8	30.42	-.064	<.001*
Had 4 or more sex partners within last school year (N = 43,757)	11.8	8.3	34.09	.028	<.001*
Ever been tested for HIV (N = 41,613)	42.6	23.6	409.09	.099	<.001*
Used some form of hormonal contraception to prevent pregnancy at last vaginal sex (N = 28,437)	42.2	66.0	331.30	-.108	<.001*
Used no method to prevent pregnancy at last vaginal sex (N = 28,437)	5.9	2.5	58.25	.045	<.001*
Sexual health outcome					
Had an STI within last school year (N = 42,716)	7.8	3.8	87.58	.045	<.001*
Unintentionally pregnant or gotten someone pregnant within last school year (N = 29,170)	6.6	1.7	195.15	.082	<.001*

Note. To control for multiple comparisons, a Bonferroni correction was applied (0.05/42), setting the significance level at .001, and statistically significant differences are denoted with an asterisk (*).

TABLE 3. Sexual Health Differences Among Black (n = 1,584) and White Undergraduate Women (n = 26,457), ACHA-NCHA, Spring 2007

Sexual health behavior	Percent yes among black women	Percent yes among white women	Pearson χ^2	Phi	p value for χ^2
Ever had oral sex (N = 27,030)	58.1%	71.7%	119.58	-.067	<.001*
Ever had vaginal sex (N = 26,996)	66.6	66.9	.06	-.002	.804
Ever had anal sex (N = 26,956)	17.4	21.1	11.01	-.020	.001*
Condom use at last oral sex (N = 19,237)	8.1	3.5	50.65	-.051	<.001*
Condom use at last vaginal sex (N = 18,305)	59.5	54.7	9.33	-.023	.002
Condom use at last anal sex (N = 4,309)	37.4	24.3	15.99	-.061	<.001*
Had 4 or more sex partners within last school year (N = 27,820)	8.5	6.7	6.73	.016	.009
Ever been tested for HIV (N = 26,370)	44.9	25.9	262.34	.100	<.001*
Used some form of hormonal contraception to prevent pregnancy at last vaginal sex (N = 18,067)	42.4	68.2	263.61	-.121	<.001*
Used no method to prevent pregnancy at last vaginal sex (N = 18,067)	5.7	2.4	37.97	.046	<.001*
Sexual health outcome					
Had an STI within last school year (N = 27,274)	8.8	4.9	44.88	.041	<.001*
Unintentionally pregnant within last school year (N = 18,671)	6.5	1.6	128.01	.083	<.001*

Note. To control for multiple comparisons, a Bonferroni correction was applied (0.05/42), setting the significance level at .001, and statistically significant differences are denoted with an asterisk (*).

TABLE 4. Sexual Health Differences Among Black ($n = 695$) and White Undergraduate Men ($n = 14,876$), ACHA-NCHA, Spring 2007

Sexual health behavior	Percent yes among black men	Percent yes among white men	Pearson χ^2	Phi	p value for χ^2
Ever had oral sex ($N = 15,021$)	70.5%	73.9%	3.64	-.016	.056
Ever had vaginal sex ($N = 15,000$)	70.5	66.7	4.07	.016	.044
Ever had anal sex ($N = 14,921$)	30.2	28.3	1.17	.009	.280
Condom use at last oral sex ($N = 11,180$)	13.6	3.6	114.80	-.101	<.001*
Condom use at last vaginal sex ($N = 10,030$)	69.8	63.8	7.01	-.026	.008
Condom use at last anal sex ($N = 3,070$)	52.8	37.7	13.13	-.065	<.001*
Had 4 or more sex partners within last school year ($N = 15,399$)	19.0	11.0	41.04	.052	<.001*
Ever been tested for HIV ($N = 14,724$)	37.2	19.4	124.17	.092	<.001*
Used some form of hormonal contraception to prevent pregnancy at last vaginal sex ($N = 10,023$)	40.9	62.1	80.56	-.090	<.001*
Used no method to prevent pregnancy at last vaginal sex ($N = 10,023$)	6.3	2.6	21.38	.046	<.001*
Sexual health outcome					
Had an STI within last school year ($N = 14,937$)	4.8	1.8	31.90	.046	<.001*
Unintentionally gotten someone pregnant within last school year ($N = 10,117$)	6.7	1.7	59.33	.077	<.001*

Note. To control for multiple comparisons, a Bonferroni correction was applied (0.05/42), setting the significance level at .001, and statistically significant differences are denoted with an asterisk (*).

FINDINGS

Sexual Behavior

Among both races, of the 42,529 students who responded, 75.1% reported ever having had oral, vaginal, or anal sex (eg, *any sexual experience*). Among both races, the most commonly reported sexual behavior by undergraduate students was oral sex; of the 42,549 who responded, greater than two thirds of students (72.0%) reported *ever having had oral sex*. A smaller percentage of black students (61.9%) reported ever engaging in this behavior, compared with white students (72.5%) (Table 2), and a smaller percentage of black women (58.1%), compared with white women (71.7%), reported ever having oral sex (Table 3). Reporting of vaginal sex was also quite common among students; of the 42,494 who responded, about two thirds (66.9%) reported *ever having had vaginal sex*. However, unlike with oral sex, no statistically significant black/white differences emerged regarding ever engaging in this behavior. In total, 23.6% of the 42,369 students responding reported *ever having had anal sex*. A statistically significantly greater percentage of white women (21.1%) reported ever engaging in anal sex compared with black women (17.4%). No differences in anal sex experience were observed between black men and white men (Table 4).

Condom Use

Across the 3 sexual behaviors assessed, students' condom use varied. Of all students who reported engaging in oral and anal sex in the last 30 days, only 4.3% and 31.4%, respectively, reported using a condom at last such sex act. Of all

students who reported *ever engaging in vaginal sex*, condom use was more common; 58% of students reported using a condom at last vaginal sex. Compared with white students, a greater percentage of black students reported condom use for all 3 sexual behaviors (Table 2). Black men and black women, compared with white men and white women, respectively, were more likely to report condom use at last oral, last vaginal, and last anal sex (Tables 3 and 4). Further, compared to their white counterparts, black students reported more frequent condom use for oral, vaginal, and anal sex acts during the last 30 days (Table 5).

Number of Sexual Partners

The students who reported having *any sexual experience* had a mean (M) of 1.41 oral, vaginal, and/or anal sex partners within the last school year ($SD = 2.44$). As previously noted, 3 independent samples t tests were conducted to examine differences in the number of sex partners among black versus white students overall, and black versus white women and black versus white men, specifically. Levene's test for equity of variances was computed, and differences were found for black versus white students ($F = 68.58, p < .001$), black versus white women ($F = 12.18, p < .001$), and black versus white men ($F = 64.42, p < .001$). With equal variances not assumed, the t test revealed that black students had a greater number of sex partners than white students, $M_{\text{black}} = 1.72$ ($SD = 3.49$), $M_{\text{white}} = 1.40$ ($SD = 2.36$); $t(2400.84) = -4.36, p < .001$. Black men also reported a greater number of sex partners than white men, $M_{\text{black men}} = 2.43$ ($SD = 5.21$), $M_{\text{white men}} = 1.61$ ($SD = 2.90$); $t(698.54) = -4.11, p < .001$.

TABLE 5. Last 30-Day Condom Use Frequency for Oral, Vaginal, and Anal Sex (Black Versus White Undergraduate Students), ACHA-NCHA, Spring 2007

Within the last 30 days, how often did you or your partner(s) use a condom during:	Percentages					Pearson χ^2	df	p value
	Never (0)	Rarely (1)	Sometimes (2)	Mostly (3)	Always (4)			
<i>Oral sex?</i>								
Black students (n = 805)	80.9%	7.3%	2.5%	2.0%	7.3%	156.65	4	<.001*
White students (n = 19,546)	92.4	3.3	1.4	0.8	2.1			
<i>Vaginal sex?</i>								
Black students (n = 992)	19.9	9.9	9.4	19.1	41.8	22.19	4	<.001*
White students (n = 19,381)	26.6	8.8	8.8	17.0	38.9			
<i>Anal intercourse?</i>								
Black students (n = 168)	44.6	5.4	6.0	8.9	35.1	16.96	4	<.002
White students (n = 3,676)	59.0	6.2	5.1	6.3	23.4			

Note. To control for multiple comparisons, a Bonferroni correction was applied (0.05/42), setting the significance level at .001, and statistically significant differences are denoted with an asterisk (*).

No statistically significant differences were found between black and white women, $M_{\text{black women}} = 1.37$ ($SD = 1.91$), $M_{\text{white women}} = 1.27$ ($SD = 1.92$); $t(1754.80) = -1.87$, $p = .062$.

Almost 9% of all students with any sexual experience reported having 4 or more sex partners within the last school year. Compared with white students (8.3%), a greater percentage of black students (11.8%) reported this sexual risk behavior (Table 2). Proportionately, almost twice as many black men reported having 4 or more sex partners than did white men (19% compared with 11%, respectively; Table 4). Using the Bonferroni corrected significance level of .001, there were no statistical differences between black and white women (Table 3).

HIV Testing and STIs

Overall, nearly one quarter of all students (23.2%) reported that they had ever been tested for HIV infection. Proportionately, almost twice as many black students (42.6%) reported HIV testing, compared with white students (23.6%) (Table 2). A greater percentage of black women and black men, compared with their white counterparts, reported HIV testing (Tables 3 and 4). Differences were also statistically significant for having an STI in the last school year. Although very few students in the sample reported this outcome (n = 2,145, 3.9%), a greater percentage of black students in all 3 groups (total sample, men only, and women only) reported having an STI in the last school year. In all, the most frequently reported STIs were genital warts (2.4%), chlamydia (0.8%), and genital herpes (0.7%).

Contraceptive Use and Unintended Pregnancy

Only 2.7% of all students with vaginal sex experience reported using no contraceptive method at last vaginal sex. Proportionately, more than twice as many black students (5.9%) as white students (2.5%) reported this behavior. Black women

and black men, compared with white women and white men, were more likely to report using no method (Tables 3 and 4). The most frequently reported contraceptive method was birth control pills, used by 63.1% of students with vaginal sex experience, followed by condoms (59.8%), withdrawal (23.6%), spermicide (3.7%), fertility awareness (3.3%), and Depo-Provera (1.9%). Almost two thirds of students with vaginal sex experience (64.9%) reported using some form of hormonal contraceptive—birth control pills, Depo-Provera, or Norplant. Greater than two thirds of students with vaginal sex experience (68.9%) reported using both a condom and another method at last vaginal sex. Statistically significantly greater percentages of vaginal sex-experienced white students, white women, and white men reported using some form of hormonal contraceptive, compared with their black peers (Tables 2, 3, and 4). Of the 29,170 students responding, few (1.9%) reported having an unintended pregnancy or getting someone else pregnant within the last school year. However, almost 4 times as many black students (6.6%) reported an unintended pregnancy in the last school year compared with white students (1.7%). Racial differences within each gender were also statistically significant (Tables 3 and 4).

COMMENT

This study examined sexual health disparities between black and white college students in the United States and demonstrates that sexual health disparities in US college students generally mirror those among high school students and among US adults. Our findings related to anal and vaginal sex experience, as well as reported condom use during such behaviors, varied across groups. Although white women were more likely to report anal sex experience compared with black women, they were less likely than black women to report using a condom at last anal sex. Although we uncovered no disparities regarding vaginal sex experience, our analyses

did reveal differences in students' reported condom use at last vaginal sex. For instance, white students were less likely than their black counterparts to report *using a condom* at last sex. These findings are somewhat consistent with findings from the Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Surveillance System, in which black high school students (67%) were more likely than white students (60%) to report condom use during last sex.²⁶ Although it is encouraging that roughly 60% of students used condoms at last sex, less than half of students reported *consistent* condom use for vaginal sex, and even fewer students reported consistent condom use for anal sex. Thus, it appears that condom use promotion efforts may need to focus specifically on *consistent* use of condoms, as well as the importance of using condoms for anal sex.

Consistent with findings of a previous national study of youth aged 15 to 21 years, white students in our study reported lifetime oral sex experience at greater rates than black students.²⁷ This finding, coupled with the fact that black students were more likely than white students to report using a condom at last oral sex (albeit at very low rates), has important STI implications. In addition to chlamydia and gonorrhea, one major STI-related concern is that of oral HPV, which can enter the mouth during oral sex; several recent research studies have implicated HPV in a number of oropharyngeal cancers.^{28,29} Because white students may be at greater risk for oropharyngeal cancers than black students, given their sexual behavior, white students may be a priority population for educational campaigns and behavioral interventions regarding oral sex and HPV/cervical cancer risk reduction. Additional research is sorely needed to examine students' attitudes, perceived susceptibility, and perceived threat associated with oral HPV, in addition to the development and testing of health promotion messages regarding oral sex and condom use, especially for white students.

Based on students' self-reported oral and anal sex behaviors and related condom use, these data suggest differences in black and white students' *behavioral* risk for STIs and HIV. White students were more likely to engage in oral sex and less likely to use condoms at last intercourse, and black students—specifically, black men—were more likely to have ≥ 4 sex partners during the last school year. However, black students appear to be experiencing worse sexual health *outcomes*. For example, black students (overall, and among black women and black men specifically) were much more likely than their white peer groups to report a past year STI. It may be that black students are at greater risk because they have more sexual partners, and thus a greater exposure to STIs. Or it may be that black students are at greater risk because of their sexual networks. Research has suggested that STIs may continue to disproportionately affect African Americans, because blacks tend to choose other blacks as sexual partners, thus keeping STIs within the black community.^{30–32} Alternatively, the higher STI prevalence reported among black students may be due to greater rates of screening among blacks.³³ The rate of HIV testing, specifically, is one illustration; proportionately, compared with white stu-

dents, almost twice as many black students in this sample reported ever being tested for HIV. This is consistent with higher rates of HIV testing among black US high school students,²⁶ and may be an artifact of intensive recent HIV testing initiatives targeting black students.³⁴ For instance, in a study of 5,291 people in 7 historically black college and university settings, researchers found that 58% of respondents reported ever being tested for HIV.³⁵ This percentage far outweighs the percentage of white students in the current sample who reported past testing for HIV infection.

We also noted disparities in unintentional pregnancy rates. Higher unintentional pregnancy rates reported by blacks in this sample may be due to substantial racial differences in students' usage of hormonal contraceptive methods. Two thirds of white students, compared with less than 42% of black students, reported using a hormonal contraceptive method to prevent pregnancy at last vaginal sex. Further, black students were more than twice as likely as white students to report using *no method* to prevent pregnancy. Other studies have demonstrated lower rates of contraceptive use among black high school students,³⁶ black women aged 15 to 19 years,³⁷ black women aged 13 to 35 years,³⁸ and black women aged 15 to 44 years.³⁷ It has been posited that such differences may be due to conspiracy beliefs about birth control—that “birth control is a form of black genocide” (page 477), and that the government does not assure the safety of birth control methods.³⁹ Yet only partial support has been found for this assertion.⁴⁰ Other research suggests that, for blacks especially, the inconvenience of obtaining a prescription for the Pill impedes hormonal contraception use.⁴⁰ Further research is warranted to understand such racial differences in the use of hormonal contraceptives, particularly among college students who may have more consistent access to low-cost reproductive health care than women in the general population.

These analyses are not without limitations. Although the Spring 2007 ACHA-NCHA was administered on more than 100 college campuses, reflecting responses from 44,165 participants, our findings may not be fully generalizable to all undergraduate students in the United States. For instance, black undergraduate students are *underrepresented* in these data. Although blacks comprise 13% of the total US undergraduate student population,⁴¹ they represent only 5.3% of respondents in this sample. Further, students attending 2-year colleges are also underrepresented in this sample. Additionally, the ACHA-NCHA does not collect data on socioeconomic status or income; therefore, we were unable to examine the relationship between these factors and sexual health disparities. Because these analyses were conducted with students' survey data, self-report bias also remains a concern. However, previous formative research indicates that the ACHA-NCHA is somewhat comparable to other large national health risk behavior surveys.¹⁸ Lastly, the ACHA-NCHA was not designed as a comprehensive sexual health assessment, and therefore some relevant information was unavailable. For example, no information was asked about students' sex partners and, although students were asked about HIV testing, students were not asked whether or not they had

been tested for other STIs, which limits interpretation of the disparate rates of STI diagnoses.

Despite these limitations, this study has several notable strengths, which allow it to fill a critical gap in the literature related to sexual health disparities between black and white college students. As noted above, one strength of this research is that the data set contains a large, national—although not nationally representative—sample of undergraduate students enrolled in more than 100 2- and 4-year colleges, in every region of the United States. To date, we have identified no other recent large studies of sexual health disparities in college students. Also, this sample allows for analyses of a range of sexual behaviors—including oral, anal, and vaginal sex, condom use for each sexual activity, and contraceptive use behaviors—and outcomes—including HIV testing, STI history, and unintended pregnancy—unparalleled by other college student surveys.

Given the findings from this study, important areas for sexual health disparities research remain. For one, as noted above, further research is warranted to understand the racial differences in the use of hormonal contraceptives, particularly among college students. Another area involves the potential bridging population of college men who have sex with men and women (MSMW). While not reported in this summary, in preliminary analyses we found that MSMW were twice as likely to be black than be white. Coupled with the results regarding STI history, presented above, these findings reflect recent research^{42–45} and provide a clue that black MSMW may represent a critical transmission bridge for HIV and other STIs between male/male and male/female sexual partnerships. Another area in need of research includes an assessment of how the patterns, observed in the study, and population may have changed following a provision in the Deficit Reduction Act of 2005 that went into effect on January 1, 2007.⁴⁶ As a result of this provision, the cost of brand-name hormonal contraception increased dramatically on many college and university campuses nationwide. Finally, because black Americans are overrepresented among new HIV cases, we chose to examine the behavioral contributors of such sexual health outcomes among black undergraduates, compared with their white counterparts. However, future research efforts should assess sexual health disparities between other racial and ethnic groups, including Hispanic/Latino college students.

Our findings related to college students' sexual behaviors and outcomes have important implications for college health professionals. There is a clear need for theory-driven and targeted campus sexual health promotion interventions. In almost all areas of sexual health, risk reduction efforts are needed for both white and black students, regardless of gender. However, tailoring such interventions to meet the specific sexual health needs of each risk group is warranted. Among white students, for instance, such interventions should focus on increasing condom use, especially for oral and anal sex, and promoting STI and HIV testing (particularly among white college men, as this group represents the smallest percentage of respondents reporting past HIV test-

ing). For black students, interventions that focus on reducing the number of sex partners and promoting the use of hormonal contraceptives—in addition to the use of condoms—may be especially impactful. College health professionals who wish to develop culturally sensitive interventions may wish to include minority students on health center advisory committees. Representation from minority groups in the student body may allow for the inclusion of diverse ideas and assurance that the needs of underrepresented populations are addressed in both health care and prevention efforts. Forming partnerships with student groups, campus programs, and community organizations may also help to achieve this goal.

In sum, we have not yet met the overarching Healthy Campus 2010 goal of eliminating health disparities. We have also not met many *responsible sexual behavior*-related objectives, such as increased condom use and decreased unintentional pregnancies.² Since 2000, whereas white students' use of contraceptive methods has improved, black students' use has remained virtually unchanged.⁴⁷ With this finding in mind—and the fact that we found significant and important sexual health disparities between black and white college students—many critical questions remain. For instance, why are black college students reporting higher rates of HIV/STIs when they are more likely than white students to report condom use at last sex? Is it because of increased testing rates among black students or is it because blacks are choosing other blacks as sexual partners, thus maintaining higher rates of STIs within the black community? How can we explain the high proportion of both black and white students not reporting condom use for anal sex, and what explains students' inconsistent condom use for oral, anal, and vaginal sex? Is it students' use of hormonal contraceptives, the lack of condom availability, assumptions of partner monogamy, a desire for pleasure or intimacy, feelings of invulnerability, perceptions of social norms, or a multifaceted combination of these factors? Lastly, as college health professionals, how can we effectively promote more consistent condom use in this priority population? The State of the Union, in terms of eliminating sexual health disparities, depends on answers to these critical questions.

NOTE

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REFERENCES

1. US Department of Health and Human Services. Healthy People 2010: What Are Its Goals? Available at: <http://www.healthypeople.gov/About/goals.htm>. Accessed February 10, 2009.
2. American College Health Association Task Force on National Health Objectives for 2010. *Healthy Campus 2010: Making it Happen*. Baltimore, MD: American College Health Association; 2004.

3. CDC. HIV/AIDS Surveillance Report, 2007. Available at: <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/>. Accessed February 23, 2009.
4. US Census Bureau. Black (African-American) History Month: February 2009. Available at: http://www.census.gov/Press-Release/www/releases/archives/facts_for_features_special_editions/013007.html. Accessed February 23, 2009.
5. CDC. *Sexually Transmitted Disease Surveillance, 2007*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2008.
6. Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect Sex Reprod Health*. 2006;38:90–96.
7. James AB, Simpson TY, Chamberlain WA. Chlamydia prevalence among college students: reproductive and public health implications. *Sex Transm Dis*. 2008;35:529–532.
8. Hightow LB, MacDonald PDM, Pilcher CD, et al. The unexpected movement of the HIV epidemic in the southeastern United States: transmission among college students. *J Acquir Immune Defic Syndr*. 2005;38:531–537.
9. Marx E, Wooley SF, eds. *Health is Academic: A Guide to Coordinated School Health Programs*. New York: Teachers College Press; 1998.
10. Lleras-Muney A. The relationship between education and adult mortality in the United States. *Rev Econ Stud*. 2005;72:89–221.
11. Council of State Governments. Addressing Adolescent Health Disparities Through Schools. Available at: <http://www.healthystates.csg.org/>. Accessed August 17, 2009.
12. Council of State Governments. State Policy Guide: Using Research in Public Health Policymaking. Available at: <http://www.healthystates.csg.org/>. Accessed August 17, 2009.
13. American College Health Association. American College Health Association–National College Health Assessment, Spring 2007 [computer file]. Baltimore, MD: American College Health Association [producer and distributor].
14. American College Health Association. About ACHA-NCHA: Participation History. Available at: http://www.achanCHA.org/partic_history.html. Accessed February 10, 2009.
15. CDC. Youth Risk Behavior Surveillance: National College Health Risk Behavior Survey—United States, 1995. *MMWR Morb Mort Wkly Rep*. 1997;46(SS-6):1–54.
16. Wechsler H, Lee JE, Kuo M, Lee H. College binge drinking in the 1990s: a continuing problem: results of the Harvard School of Public Health 1999 College Alcohol Study. *J Am Coll Health*. 2000;48:199–210.
17. Fisher BS, Cullen FT, Turner MG. *The Sexual Victimization of College Women*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice; 2000. NCJ 182369.
18. American College Health Association. *National College Health Assessment: Reliability and Validity Analyses, 2000*. Baltimore, MD: American College Health Association; 2004.
19. American College Health Association. American College Health Association–National College Health Assessment Spring 2007 Reference Group Data Report (abridged). *J Am Coll Health*. 2008;56:469–479.
20. US Department of Education National Center for Education Statistics. *The Condition of Education 2005*. Washington, DC: US Government Printing Office; 2005. NCES 2005-094.
21. US Department of Education National Center for Education Statistics. *The Condition of Education 2003*. Washington, DC: U.S. Government Printing Office; 2003. NCES 2003-067.
22. Salazar LF, Crosby RA, DiClemente RJ, et al. African-American female adolescents who engage in oral, vaginal and anal sex: “Doing it all” as a significant marker for risk of sexually transmitted infection. *AIDS Behav*. 2009;13:85–93.
23. Sifakis F, Hylton JB, Flynn C, et al. Racial disparities in HIV incidence among young men who have sex with men: The Baltimore Young Men’s Survey. *J Acquir Immune Defic Syndr*. 2007;46:343–348.
24. Agresti A. *An Introduction to Categorical Data Analysis*. 2nd ed. New York: John Wiley & Sons; 2007.
25. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. 5th ed. Boston: Pearson; 2007.
26. CDC. Youth Risk Behavior Surveillance—United States, 2007. *MMWR Morb Mort Wkly Rep*. 2008;57:1–136.
27. Brewster KL, Tillman KH. Who’s doing it? Patterns and predictors of youths’ oral sexual experiences. *J Adolesc Health*. 2008;42:73–80.
28. D’Souza G, Kreimer AR, Viscidi R, et al. Case-control study of human papillomavirus and oropharyngeal cancer. *N Engl J Med*. 2007;356:1944–1956.
29. Worden FP, Kumar B, Lee JS, et al. Chemoselection as a strategy for organ preservation in advanced oropharynx cancer: response and survival positively associated with HPV16 copy number. *J Clin Oncol*. 2008;26:3138–3146.
30. Adimora AA, Schoenbach VJ, Doherty IA. HIV and African Americans in the southern United States: sexual networks and social context. *Sex Transm Dis*. 2006;33:S39–S45.
31. Gorbach PM, Stoner BP, Aral SO, et al. “It takes a village”: understanding concurrent sexual partnerships in Seattle, Washington. *Sex Transm Dis*. 2002;29:453–462.
32. Laumann EO, Youm Y. Racial/ethnic group differences in the prevalence of sexually transmitted diseases in the United States: a network explanation. *Sex Transm Dis*. 1999;26:250–261.
33. Tao G, Tian LH, Peterman TA. Estimating chlamydia screening rates by using reported sexually transmitted disease tests for sexually active women aged 16 to 25 years in the United States. *Sex Transm Dis*. 2007;34:180–182.
34. Healthy Black Communities Inc. National Black HIV/AIDS Awareness Day. Available at: <http://blackaidsday.org/>. Accessed February 11, 2009.
35. Thomas PE, Voetsch AC, Song B, et al. HIV risk behaviors and testing history in historically black college and university settings. *Public Health Rep*. 2008;123(Suppl 3):115–125.
36. Santelli JS, Morrow B, Anderson JE, et al. Contraceptive use and pregnancy risk among U.S. high school students, 1991–2003. *Perspect Sex Reprod Health*. 2006;38:106–111.
37. Santelli JS, Lindberg LD, Finer LB, et al. Explaining recent declines in adolescent pregnancy in the United States: the contribution of abstinence and improved contraceptive use. *Am J Public Health*. 2007;97:150–156.
38. Krings KM, Matteson KA, Allsworth JE, et al. Contraceptive choice: how do oral contraceptive users differ from condom users and women who use no contraception? *Am J Obstet Gynecol*. 2008;198:e46–e47.
39. Thorburn S, Bogart LM. Conspiracy beliefs about birth control: barriers to pregnancy prevention among African Americans of reproductive age. *Health Educ Behav*. 2005;32:474–487.
40. Landau SC, Tapias MP, McGhee BT. Birth control within reach: a national survey on women’s attitudes toward and interest in pharmacy access to hormonal contraception. *Contraception*. 2006;74:463–470.
41. The Nation: A Statistical Overview. *The Chronicle of Higher Education, 2008–09 Almanac*. 2008;55:1.
42. Dodge B, Jeffries WL, Sandfort TG. Beyond the down low: sexual risk, protection, and disclosure among at-risk black men who have sex with both men and women (MSMW). *Arch Sex Behav*. 2008;37:683–696.
43. Hightow LB, Leone PA, Pia DM, et al. Men who have sex with men and women: A unique risk group for HIV transmission on North Carolina college campuses. *Sex Transm Dis*. 2006;33:585–593.

44. Lauby JL, Millett GA, LaPollo AB, Bond L, Murrill CS, Marks G. Sexual risk behaviors of HIV-positive, HIV-negative, and serostatus-unknown black men who have sex with men and women. *Arch Sex Behav*. 2008;37:708–719.

45. Millett G, Malebranche D, Mason B, Spikes P. Focusing “down low”: bisexual black men, HIV risk and heterosexual transmission. *J Natl Med Assoc*. 2005;97:52S–59S.

46. American College Health Association. Contraceptive Drug Nominal Price Exemption White Paper. Available at: http://www.acha.org/ACHA_Nominal_Price_for_Contraceptives_White_Paper%202...pdf. Accessed March 12, 2009.

47. Burwell C, Dewald L, Grizzell J. Healthy Campus 2010 Midcourse Review: Health Disparities. Available at: <http://www.healthedpartners.org/hc2010/hc2010midcourseeachapresentation.pdf> (Page 82). Accessed August 22, 2009.