Racial Disparities in Contraceptive Use Between Student and Nonstudent Populations

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Abstract

Background: In order to explore opportunities for eliminating the persistent racial disparities in contraceptive use between Caucasian and African American young adults, we examined whether student populations display a reduced racial disparity in overall contraceptive use and use of highly effective contraceptives.

Methods: Using data collected from the Behavioral Risk Factor Surveillance System (BRFSS) over 3 years, we conducted multivariate analysis to compare racial disparities in contraceptive use in the nonstudent, young adult (18–24 years) population with those in the student population. Analyses are controlled for age, income, education, and insurance status.

Results: Both African American students and nonstudents demonstrate a trend of being more likely than their Caucasian counterparts to forego use of contraception, but the findings are statistically significant only for the impact of race on nonstudents (OR = 1.45, 95% CI 1.15–1.84). However, African American students show a greater disparity in using effective contraceptive methods compared with Caucasian peers (OR = 0.459, 95% CI 0.316–0.668) than in the nonstudent population (OR = 0.591, 95% CI 0.488–0.715).

Conclusions: Although race is not significant for predicting overall use of contraceptives among students, racial disparities are magnified among student populations with regard to use of highly effective contraceptives. Contraceptive counseling for African American young adults should focus on method effectiveness and consider additional issues, such as insurance coverage for contraceptives. For students, targeted counseling or interventions may be required.

Introduction

THE HIGH RATE OF UNINTENDED PREGNANCY in the United States, despite the availability of effective contraception, has been a long-standing concern among family planning clinicians, researchers, and policymakers who seek to understand this apparent paradox. Almost one half of the pregnancies in the United States are unintended,¹ but this proportion varies by region, state, age, marital status, and race/ethnicity. Among young women aged 20–24, 45% of pregnancies are unintended, and over 1/2 (54.7%) of African American pregnancies are unintended for this age group.² Racial disparities in unintended pregnancy rates persist, even when controlling for socioeconomic variables, such as income and education.^{1,3–5}

A major research question is if racial disparities in unintended pregnancy result from different patterns of contraceptive use. Previous work to examine racial disparities in adult contraceptive use was conducted primarily with low-

income women or in the heterogeneous population of all sexually active women.^{5–7} In these populations of sexually active women not planning on becoming pregnant, researchers have found that African American women are far less likely than Caucasian women to be using effective contraception. Mosher et al.⁶ found that in the general population, African American women were slightly less likely (97.3%) to have ever used contraception than Caucasian (98.8%) women (not statistically significant), but were significantly less likely to currently use contraception (57.6% vs. 64.6%). Civic et al.⁷ found that minorities were more likely to report incorrect condom use. An important missing piece of information is whether there is a contraceptive use disparity between African Americans and Caucasians in the presumably low-risk population of future-oriented students enrolled in institutions of higher education. There are multiple reasons to believe that the higher education setting would result in reduced racial disparities in contraceptive use. The literature indicates that being actively engaged (participating in

educational or afterschool activities) is an antidote for teen pregnancy⁸⁻¹⁰; we expect college/university attendance would have similar effects. The environment of a college/university campus also offers theoretically equal access to educational and clinical family planning services for all students, as well as increased accessibility to these services. Finally, most universities provide access to insurance coverage in some form for enrolled students. If, in fact, college/university settings offer reduced racial disparities in contraceptive use, this may offer one starting point for addressing chronic issues of unintended pregnancy and related negative birth outcomes in African American and minority populations.

Based on these assumptions, we hypothesized that racial disparities in contraceptive use should be less among students than in the nonstudent population of young adults. In order to examine this hypothesis, we conducted multivariate analyses of the 1998, 2002, and 2004 Behavioral Risk Factor Surveillance System (BRFSS) datasets to analyze differences in contraceptive use between African Americans and Caucasians in the nonstudent and student populations. We also examined the role of insurance as a key covariate in determining contraceptive use. If, as we expect, racial disparities in contraceptive use are diminished among college students, further research into the underlying reasons for reduced disparities would be warranted. Results from this study may be able to inform clinical counseling protocols for African American young adults.

Materials and Methods

Data sources

The BRFSS,¹¹ a CDC-sponsored, state-based survey of health risk factors, is a standardized telephone survey carried out by health agencies in all states and the District of Columbia. The primary purpose of the BRFSS is to provide state-specific estimates of the prevalence of behaviors associated with leading causes of death in the United States. Each participating state independently selects for interview a probability sample from adult residents, aged ≥ 18 years, in households with telephones. All states in a given year use an identical core questionnaire covering various health behavior topics. States may also choose to administer optional modules on other topics at their discretion.

The present study used the 1998, 2002, and 2004 BRFSS data from all states to assess patterns of birth control use and effectiveness of method used by race and health insurance status in the 18–24-year-old adult population. Data from 1998, 2002, and 2004 were selected because family planning questionnaire items were included in the fixed core modules of the BRFSS survey instrument during those years and, therefore, were used by all states. These questions were not included in the fixed core module in other years.

Respondents reporting occupations other than student, retiree, and permanent disability within the pertinent age group comprised the general, nonstudent population for purposes of the present analyses. Given our interest in comparing students with the nonstudent population, we compared this nonstudent group with individuals who self-reported student status in response to the employment status questionnaire item in the BRFSS. Males and females were included, except for data from 1998, in which only women were surveyed.

Analyses were restricted to African American and Caucasian respondents and excluded subjects who reported being pregnant, positive intention to conceive, and lack of sexual activity as reasons for not using contraception, resulting in a sample size of 16,191 in the nonstudent population and 4,441 in the student population.

Contraception use was determined by responses to the family planning questionnaire item inquiring whether the female or male partner is currently using contraception to prevent pregnancy. The exact wording of the question changed between 2002 and 2004 from “What kinds of birth control are you or your partner using now?” to “What are your or your partner doing now to keep from getting pregnant?” Among respondents reporting use of contraception, further assessment of the effectiveness of method used was carried out by classifying reported methods into highly effective methods vs. other methods, in accordance with existing literature.¹² Highly effective contraceptive methods included male/female sterilization, oral contraceptive pills and patch, intrauterine devices, Norplant (Wyeth-Ayerst, Philadelphia, PA), and injections (Depo-Provera, Upjohn, Kalamazoo, MI; Lunelle, Pfizer, Inc., NY, NY). All other methods of contraception, including emergency contraception, were grouped into a moderate/low effectiveness category and compared with the high effectiveness methods. Health insurance status was determined from the BRFSS core questionnaire item: “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” Education level, student status, household income, race, and gender were determined from responses to the demographics fixed core questionnaire items.

Data analysis

In order to explore contraceptive use in the young adult population, we began by constructing a full multivariate logistic model for the entire young adult population (18–24 years of age) of students and nonstudents alike. Covariates and potential confounders were selected *a priori* from existing literature on contraceptive use and family planning. Multivariate models were constructed to examine the association between two outcome variables: (1) any contraceptive use and (2) effectiveness of birth control used, controlling for race, student status, health insurance status, age, education, gender, marital status, household income, and year of query. We also included interaction terms for the student, race, and insurance variables.

Although the results for the race/student interactions were not significant (data not shown), we decided to conduct further analyses by subsetting the population into student and nonstudent samples. Analyses of the student and nonstudent populations were also subsetted by gender to allow examination of differences in influences of contraceptive use for men and women separately.

We constructed multivariate logistic models for sexually active respondents in the nonstudent population and the student population, aged 18–24 years, to examine overall contraceptive use and selection of highly effective contraceptive methods in each population. Education level was included in models examining contraceptive use patterns by race and health insurance status in the nonstudent population only. Adjusted odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were obtained to assess adjusted

independent effects of race and health insurance status on contraceptive use and method effectiveness. All analyses were restricted to respondents reporting sexual activity, no current pregnancy or nursing, and no intention of becoming pregnant. Responses coded as don't know, refused, or missing were excluded. Of an initial sampling frame of 701,128 subjects, 34,791 were between the ages of 18 and 24, and 27,021 respondents reported an employment status other than student, retiree, or disabled; these respondents comprised the 18–24-year-old general, nonstudent sample population. Applying the aforementioned exclusion criteria resulted in final samples for analyses of 16,191 for 18–24-year-old general, nonstudent population and 4,441 for the 18–24-year-old student population. Analyses were weighted to national proportions to be nationally representative. All statistical analyses were performed using SAS version 9 (SAS Institute, Cary, NC) and SUDAAN for statistical weighting (RTI International, Research Triangle Park, NC).

Results

Demographics and contraceptive use by method

Table 1 provides a demographic profile of the sample population; the study population is majority Caucasian (approximately 15% African American), single, female, and insured. As shown in Table 2, students and Caucasians generally show a higher use of highly effective contraceptive methods, with the exception of hormonal shots (Depo-Provera and Lunelle) which are more widely used by African Americans and nonstudents. Use of less effective contraceptives seems to be driven by condom use. Additional analyses (data not shown) indicate that condom use is driven by male reports of contraceptives, particularly among African Americans.

Contraceptive use and use of effective contraception in full model

Table 3 details the full model analysis of contraceptive use and effectiveness prior to segmenting the population into

students and nonstudents. As shown in Table 3, race and insurance status are both significant predictors of overall contraceptive use and use of effective methods of contraception; however, student status is only marginally significant (at the 0.10 level), and interactions between race and student status were not statistically significant and were removed from the analysis. When we graph the marginal effects of the race/student status interactions (data not shown), however, we see that although the overall interaction is not statistically significant, the effect is significant for many members of the population. Given the limitations in determining marginal effects for interaction terms, these graphic findings suggest that further examination of this interaction may be warranted.

Contraceptive use in nonstudent, young adult population

Table 4 details patterns of contraceptive use for the nonstudent and student populations. Among nonstudents, African Americans were significantly more likely than their Caucasian counterparts to not use contraception. Logistic model analysis reveals that being African American increases the likelihood of not using birth control by 45% (OR = 1.45, 95% CI 1.15–1.84). Having health insurance decreases the likelihood of not using birth control by 35.8% (OR = 0.642, 95% CI 0.529–0.780), and education and female gender also demonstrate a protective effect (OR = 0.682, 95% CI 0.561–0.828, and OR = 0.785, 95% CI 0.654–0.942, respectively). Income and age were not significant for the nonstudent population. Further details of the analysis by gender are shown in Table 4.

Contraceptive use in student population

Similar to the finding for nonstudents, in multivariate analysis among students, being African American increases the likelihood of not using birth control among uninsured students, but the finding is only significant for women (OR = 2.24, 95% CI 1.21–4.16). As one would expect, the impact of insurance is decreased in the student population, but continues to show an inverse relationship with lack of contraceptive use (OR = 0.678, 95% CI 0.432–1.07), moderately significant at the 10% level. Lower income is marginally associated with a higher risk of noncontraception use among females (OR = 1.75, 95% CI 0.961–3.17). Age and marital status increase the likelihood of not using contraception, but act differently for men and women.

Contraceptive effectiveness in nonstudent population

African American, nonstudent young adults are significantly less likely to use effective contraceptives than Caucasian nonstudent young adults (Table 5). Within the nonstudent population of users of contraception, regression models show that race and health insurance each have strong effects on the likelihood of using highly effective birth control methods. Female gender is also associated with a greater than 2-fold increase in the likelihood of using highly effective contraceptives (OR = 2.08, 95% CI 1.81–2.40). African American race is negatively associated with use of highly effective contraceptives (OR = 0.591, 95% CI 0.488–0.715). Being insured is positively associated with use of highly effective contraceptives

TABLE 1. SAMPLE DEMOGRAPHICS ($n = 36,414$)

Demographic	Student		Nonstudent	
	%	SE	%	SE
<i>Race</i>				
Caucasian	86.32	0.34	85.43	0.35
African American	13.68	0.34	14.57	0.35
<i>Education</i>				
High school graduate or less	–	–	53.47	0.50
Beyond high school	–	–	46.53	0.50
<i>Income</i>				
<\$10,000	19.27	0.39	7.47	0.26
>\$10,000	80.73	0.39	92.53	0.26
<i>Gender</i>				
Female	58.88	0.49	55.22	0.50
Male	41.12	0.49	44.78	0.50
<i>Insurance status</i>				
Insured	81.70	0.39	70.71	0.46
Uninsured	18.30	0.39	29.29	0.46
<i>Marital status</i>				
Married	8.66	0.28	26.30	0.44
Single	91.34	0.28	73.70	0.44

TABLE 2. CONTRACEPTIVE USE BY STUDENT STATUS AND RACE

Contraceptive method	Student n = 4441		Nonstudent n = 16,191	
	Caucasian n (%)	African American n (%)	Caucasian n (%)	African American n (%)
<i>Highly effective</i>	2324 (61.01)	268 (42.41)	8294 (60.06)	1024 (43.01)
Tubes tied/vasectomy	43 (1.13)	7 (1.10)	582 (4.21)	104 (4.37)
Hysterectomy	1 (0.03)	0 (0)	14 (0.10)	0 (0)
Pill	2017 (52.95)	184 (29.11)	6242 (45.20)	561 (23.56)
Shots	180 (4.73)	56 (8.86)	972 (7.04)	289 (12.14)
Implant	12 (0.32)	3 (0.47)	67 (0.49)	12 (0.50)
IUD	30 (0.79)	3 (0.47)	207 (1.49)	19 (0.80)
Patch	41 (1.08)	15 (2.37)	210 (1.59)	39 (1.64)
<i>Less effective</i>	1168 (30.66)	291 (46.04)	3807 (27.57)	960 (40.32)
Condom	953 (25.10)	267 (42.25)	3139 (22.73)	836 (35.11)
Diaphragm, cervical ring or cap	20 (0.53)	1 (0.16)	68 (0.49)	9 (0.38)
Rhythm method	91 (2.39)	7 (1.11)	275 (2.09)	47 (1.97)
Withdrawal	14 (0.37)	4 (0.63)	73 (0.53)	10 (0.42)
EC	0 (0)	0 (0)	1 (0.01)	0 (0)
Other (foam, jelly)	90 (2.36)	12 (1.90)	251 (1.82)	58 (2.44)
No contraceptive	317 (8.32)	73 (11.55)	1709 (12.38)	397 (16.67)
Total	3809 (100)	632 (100)	13810 (100)	2381 (100)

(OR = 1.44, 95% CI 1.22-1.69), but only significant for females when gender subsets are examined. Age and marriage also have a protective effect on the likelihood of using effective birth control methods (OR = 1.04, 95% CI 1.00-1.08 for age, and OR = 1.80, 95% CI 1.51-2.15 for marriage). Household income has no effect on the likelihood of using effective birth control methods. Table 5 further details contraceptive method choice by effectiveness for the nonstudent and student populations.

Contraceptive effectiveness in student population

Similar to nonstudents, uninsured African American students were significantly less likely than Caucasian students to

use effective contraceptives. Logistic models reveal the effect of race to be strong among the student population for method choice, decreasing the likelihood of using highly effective contraceptive methods significantly (OR = 0.459, 95% CI 0.316-0.668). Insured students, particularly females, were somewhat more likely to use effective contraceptives (OR = 1.38, 95% CI 0.946-2.01). In contrast to the findings on overall contraceptive use, this finding shows that racial disparity among students regarding contraceptive effectiveness is actually greater than in the nonstudent population. Female gender and age remain highly protective of using highly effective contraceptives (OR = 3.01, 95% CI 2.33, 3.90, and OR = 1.15, 95% CI 1.06-1.23, respectively).

TABLE 3. FULL MODEL REGRESSION EXAMINING IMPACT OF STUDENT AND RACE ON CONTRACEPTIVE USE AND CHOICE OF EFFECTIVE CONTRACEPTIVES

	Odds ratio (95% confidence interval)	
	No contraceptive use n = 18,037	Use of highly effective contraceptives n = 15,593
Student	0.824 (0.647-1.05)	0.880* (0.752-1.03)
African American	1.44** (1.16-1.78)	0.565** (0.476-0.670)
Insured	0.658** (0.549-0.788)	1.41** (1.21-1.64)
Female	0.765** (0.646-0.906)	2.25** (1.98-2.55)
Married	1.38** (1.14-1.66)	1.82** (1.54-2.15)
>High school education	0.644** (0.536-0.773)	1.13* (0.980-1.31)
>\$10,000	1.24 (0.878-1.74)	0.950 (0.718-1.26)
Age	1.02 (0.972-1.07)	1.06** (1.02-1.10)
Year 1998 vs. 2004	1.18 (0.788-1.76)	0.989 (0.748-1.31)
Year 2002 vs. 2004	0.767** (0.650-0.906)	1.18** (1.04-1.35)

*Indicates significance at the 10% level; **indicates significance at the 5% level.

Discussion

Contrary to our hypothesis, racial disparities in contraceptive use in the student population appear to be magnified rather than diminished, at least with regard to use of effective contraceptives. These findings suggest that increased attention should be focused on education for African American students as a means of reducing racial disparities in effective contraceptive use. In fact, whether for reasons of education, cultural preference, partner preference, access, or other issues, African American students are putting themselves at consistently higher risk for unintended pregnancy through use of less effective contraceptive methods.

Condoms, which are included in our categorization of less effective contraceptives, appear to drive the differential in contraceptive effectiveness use between African American and Caucasian students who use contraceptives. Although condoms may offer protection from sexually transmitted infections, they offer inferior protection from unintended pregnancy when used as the sole method of protection. The interesting finding is that African American students seem more likely to rely exclusively on condoms for protection from all sex-related risks. This raises questions about the reasons for heavier reliance on condoms among African American students. These findings also have important

TABLE 4. ADJUSTED ODDS OF NO CONTRACEPTIVE USE BY GENDER AND STUDENT STATUS

	Odds ratio (95% confidence interval)					
	Students			Nonstudents		
	Total n = 3649	Female n = 2390	Male n = 1259	Total n = 14,388	Female n = 8676	Male n = 5712
Female	0.662* (0.430-1.02)	—	—	0.785** (0.654-0.942)	—	—
African American	1.39 (0.853-2.28)	2.24** (1.21-4.16)	0.773 (0.374-1.60)	1.45** (1.15-1.84)	1.65** (1.22-2.22)	1.28 (0.871-1.88)
Insured	0.678* (0.432-1.07)	0.580* (0.315-1.07)	0.745 (0.399-1.39)	0.642** (0.529-0.780)	0.704** (0.551-0.900)	0.585** (0.440-0.778)
Married	1.80** (1.01-3.20)	1.76 (0.853-3.65)	2.29** (1.08-4.87)	1.35** (1.10-1.64)	1.29** (1.01-1.66)	1.44** (1.06-1.94)
>High school education	—	—	—	0.682** (0.561-0.828)	0.522** (0.413-0.660)	0.867 (0.652-1.15)
>\$10,000	1.48 (0.790-2.78)	1.75* (0.961-3.17)	1.37 (0.440-4.25)	1.17 (0.780-1.74)	0.994 (0.593-1.67)	1.50 (0.817-2.75)
Age ^a	0.861** (0.765-0.968)	0.824** (0.698-0.972)	0.876 (0.744-1.03)	1.04 (0.985-1.10)	0.998 (0.934-1.07)	1.07 (0.982-1.15)
Year 1998 vs. 2004	2.23 (0.719-6.89)	2.46 (0.757-7.96)	—	1.02 (0.692-1.50)	1.12 (0.753-1.68)	—
Year 2002 vs. 2004	0.853 (0.554-1.31)	0.989 (0.534-1.83)	0.762 (0.420-1.38)	0.754** (0.631-0.900)	0.916 (0.722-1.16)	0.648** (0.501-0.837)

*Indicates significance at the 10% level; **indicates significance at the 5% level.

^aAge is modeled as a continuous variable.

TABLE 5. ADJUSTED ODDS OF USING HIGHLY EFFECTIVE CONTRACEPTION BY GENDER AND STUDENT STATUS

	Odds ratio (95% confidence interval)					
	Students			Nonstudents		
	Total n = 3282	Female n = 2184	Male n = 1098	Total n = 12,311	Female n = 7573	Male n = 4738
Female	3.01** (2.33-3.90)	—	—	2.08** (1.81-2.40)	—	—
African American	0.459** (0.316-0.668)	0.478** (0.307-0.743)	0.419** (0.228-0.770)	0.591** (0.488-0.715)	0.536** (0.431-0.666)	0.606** (0.445-0.825)
Insured	1.38* (0.946-2.01)	1.49** (1.01-2.21)	1.28 (0.678-2.43)	1.44** (1.22-1.69)	1.82** (1.47-2.26)	1.14 (0.910-1.44)
Married	2.17** (1.38-3.43)	1.50* (0.937-2.41)	6.81** (2.68-17.3)	1.80** (1.51-2.15)	1.26** (1.02-1.56)	2.84** (2.15-3.75)
>High school Education	—	—	—	1.10 (0.939-1.28)	0.901 (0.744-1.09)	1.32** (1.04-1.67)
>\$10,000	0.969 (0.690-1.36)	1.04 (0.717-1.50)	0.960 (0.551-1.67)	0.958 (0.653-1.41)	0.972 (0.617-1.53)	0.977 (0.530-1.80)
Age ^a	1.15** (1.06-1.23)	1.09* (0.988-1.20)	1.22** (1.10-1.36)	1.04* (1.00-1.08)	1.05* (0.994-1.11)	1.02 (0.961-1.08)
Year 1998 vs. 2004	1.20 (0.646-2.22)	1.08 (0.578-2.02)	—	0.943 (0.693-1.28)	0.982 (0.722-1.34)	—
Year 2002 vs. 2004	1.26 (0.958-1.64)	1.03 (0.748-1.43)	1.58** (1.08-2.32)	1.17** (1.01-1.35)	1.28** (1.06-1.54)	1.07 (0.876-1.31)

*Indicates significance at the 10% level; **indicates significance at the 5% level.

^aAge is modeled as a continuous variable.

counseling implications; providers should be cognizant of the fact that certain populations, including African Americans, young adults on the whole, and students particularly, are more likely to use less effective contraceptive methods. Accordingly, providers should counsel women and couples who do not wish to conceive to consider the use of highly effective contraceptive methods, including hormonal methods; long-acting, user-independent methods, such as intrauterine devices or implants;¹³ or two highly or moderately effective user-dependent contraceptives, such as the Double-Dutch method of combining hormonal contraceptives with condoms taught throughout the Netherlands.¹⁴ Similarly, they should be counseled prospectively about emergency contraception; this counseling should be offered to all women, but an increased awareness for African American patients may be beneficial.

Also worth noting is the ongoing discourse about pregnancy intention and the difficulty in defining whether a pregnancy is or is not intended.^{15–17} As many young adults, students and nonstudents alike, may face ambivalence about pregnancy, resulting contraceptive behaviors may evolve (intentionally or not) to focus on less effective contraceptive methods^{18,19} for a proportion of the population. Considering this reality may improve contraceptive counseling as well.

BRFSS has been widely used by researchers to examine various aspects of reproductive health, ranging from healthy behavior during pregnancy²⁰ to the impact of obesity on contraceptive effectiveness,²¹ and is widely accepted as a strong data source for reproductive health data. However, these data are not without limitations. The Centers for Disease Control and Prevention (CDC) has noted that contraceptive use rates may vary greatly across states and regions.²² Other researchers have compared issues of pregnancy intention²³ and contraceptive use estimates²⁴ between BRFSS and other datasets, such as the National Survey of Family Growth (NSFG), and found that although estimates were similar, the populations differed in certain key demographics. The BRFSS respondents tended to be more educated, with higher incomes and more likely to be married.²⁴ Therefore, this study may not capture the lowest income respondents.

Data from BRFSS also do not provide insight into reasons behind the observed racial differences in contraceptive use. Without further in-depth research, we can only hypothesize about the underlying reasons behind these findings. This study is limited to 3 years, 1998, 2002, and 2004, because these are the only years for which the BRFSS included the family planning questionnaire as a core module, used by all states. By pooling data from 3 nonconsecutive years, we may face bias from policy interventions occurring over the 6-year period from which the study data are collected. It is also notable that the year 2002 is significantly and positively correlated with increased contraceptive use overall and use of highly effective contraceptives for nonstudent and student males (highly effective contraceptives only). This may be because of a sampling change in BRFSS or an external factor not controlled for in the analysis. We recognize that further research into this finding is warranted, but is beyond the scope of this article.

BRFSS is a survey of people living in private residences and systematically excludes students who live in dormitories, fraternities, and sororities. Although we recognize this as a limitation, approximately 50% of undergraduate students in the United States attend community (nonresidential) colleges,

and many residential students live in private, off-campus housing. Therefore, a substantial portion of students may be captured by this dataset. In addition, BRFSS excludes households that have only cell phones, an increasing trend in recent years (less so in the late 1990s and early 2000s) and for students. BRFSS, therefore, may provide a somewhat biased sample of participants aged 18–24. Additionally, in the year 1998, data were collected only from female respondents. Finally, BRFSS does not include data on potential confounders that would be ideal for an analysis such as this; ideally, we would have captured measures of frequency of sex and motivation to use contraception or prevent pregnancy.

Future research should consider if African American and Caucasian students equally weigh their risks for HIV and sexually transmitted infections. Do they equally weight their risks for unintended pregnancy? Or are there relatively different risk weights placed on each of these outcomes of unprotected intercourse in different racial/ethnic groups? Further, if there are different risk weights, what are the reasons for the differences? Are African American students more cautious about HIV and sexually transmitted infections and, therefore, more reliant on condoms? Is there a difference in the level of monogamous relationships or perceived monogamy between African American and Caucasian students, such that monogamous partners are less likely to rely on condoms? Are there cultural biases against other forms of contraception or multiple forms of contraception? For example, there exists a history of forced and coerced sterilizations and contraception among African Americans.^{25,26} Many advocates believe that this eugenics is continued today by such organizations as Project Prevention,²⁷ which provides financial incentives to primarily minority, substance-abusing women who agree to undergo sterilization or long-term contraceptive interventions, such as use of IUDs and injections. Use of the very effective contraceptives, injections and IUDs, may be negatively associated with this history and, therefore, less acceptable to African American women. All of these issues of relationship status, culture, and history warrant further research.

Two things are clear: (1) there is a racial differential in certain aspects of contraceptive use among students, and (2) racial differences in use of effective contraceptives are magnified in comparison to the nonstudent population. In a population of young African Americans that has shown persistent disparities for unintended pregnancy and poor pregnancy outcomes, these findings offer a potential guidepost for next steps. Some characteristics of college and university campuses, beyond income and education, which have been previously controlled for, may be protective against lack of contraception use and using less effective contraceptive methods, yet African American students do not seem to receive these benefits on a population level. Further examination of issues of how and why African Americans use contraception may offer insight into ways to reduce racial disparities for the African American young adult population.

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References

1. Henshaw SK. Unintended pregnancy in the United States. *Fam Plann Perspect* 1998;30:24–29, 46.
2. Chandra A, Martinez GM, Mosher WD, Abma JC, Jones J. Fertility, Family Planning and Reproductive Health of U.S. Women: Data from the 2002 National Survey of Family Growth. National Center for Health Statistics. *Vital Health Stat* 2005;23.
3. Brown S, Eisenberg L, editors. The best intentions: Unintended pregnancy and the well-being of children and families. Institute of Medicine. National Academy Press. Washington, D.C. 1995.
4. Cubbin C, Braveman PA, Marchi KS, et al. Socioeconomic and racial/ethnic disparities in unintended pregnancy among postpartum women in California. *Matern Child Health J* 2002;6:237–246.
5. Foster DG, Bley J, Mikanda J, et al. Contraceptive use and risk of unintended pregnancy in California. *Contraception* 2004;70:31–39.
6. Mosher W, Martinez G, Chandra A, Abma J, Wilson S. Use of contraception and use of family planning services in the United States: 1982–2002. Advance data from Vital and Health Statistics. CDC 2004;350–000.
7. Civic D, Scholes D, Ichikawa L, et al. Ineffective use of condoms among young women in managed care. *AIDS Care* 2002;14:779–788.
8. Kriby D, Lepore G, Ryan J. Sexual risk and protective factors: Factors affecting teen sexual behavior, pregnancy, childbearing and sexually transmitted diseases: Which are important? Which can you change. Washington, DC: The National Campaign to Prevent Teen Pregnancy, 2005.
9. Philliber S, Kaye JW, Herrling S, et al. Preventing pregnancy and improving health care access among teenagers: An evaluation of the Children's Aid Society-Carrera program. *Perspect Sex Reprod Health* 2002;34:244–251.
10. Kirby D. Emerging answers: Research findings on programs to reduce teen pregnancy. Washington, DC: The National Campaign to Prevent Teen Pregnancy, 2001.
11. Behavioral Risk Factor Surveillance System. Atlanta, GA: Centers for Disease Control, 1998–2004.
12. Trussel J. Contraceptive failure in the United States. *Contraception* 2004;70:89–96.
13. Hatcher R, Trussel J, Nelson A, Cates W, Stewart F, Kowal D. Contraceptive technology, 19th ed. New York: Ardent Media, 2007.
14. Rademakers D. Lessons from the Dutch abortion experience. *Stud Fam Plann* 1996;27:341–343.
15. Klerman L. The intendedness of pregnancy: A concept in transition. *Matern Child Health J* 2000;4:155–162.
16. Liffalander A, Gaydos L, Hogue C. Circumstances of pregnancy: Low income women in Georgia describe the difference between planned and unplanned pregnancies. *Matern Child Health J* 2007;11:81–89.
17. Sable M, Libbus M. Pregnancy intention and pregnancy happiness: Are they different? *Matern Child Health J* 2000;4:191–196.
18. Bruckner H, Martin A, Bearman P. Ambivalence and pregnancy: Adolescents' attitudes, contraceptive use and pregnancy. *Perspect Sex Reprod Health* 2004;36:248–257.
19. Crosby R, Diclemente RJ, Wingood GM, et al. Adolescents' ambivalence about becoming pregnant predicts infrequent contraceptive use: A prospective analysis of nonpregnant African American females. *Gen Obstet Gynecol* 2002;186:251–252.
20. Xaverius P, Tenkku LE, Salas J, et al. Exploring health by reproductive status: An epidemiological analysis of pre-conception health. *J Womens Health* 2009;18:49–56.
21. Huber L, Hogue CJ, Stein AD, et al. Body mass index and risk for oral contraceptive failure: A case-cohort study in South Carolina. *Ann Epidemiol* 2006;16:637–643.
22. CDC. Contraceptive use—United States and territories. Behavioral Risk Factor Surveillance System, 2002. *Surveill Sum*, November 18, 2005. 2002.
23. Ahluwalia I, Whitehead N, Bensyl D. Pregnancy intention and contraceptive use among adult women. *Matern Child Health J* 2007;11:347–351.
24. Santelli J, Lindberg LD, Finer LB, et al. Comparability of contraceptive prevalence estimates for women from the 2002 Behavioral Risk Factor Surveillance System. *Public Health Rep* 2008;123:147–154.
25. Kimelman D. Poverty and Norplant: Can contraception reduce the underclass? *Philadelphia Inquirer* 1990:A18.
26. Roberts D. Killing the black body: Race reproduction and the meaning of liberty. New York: Random House, 1997.
27. Project Prevention: Objectives. Available at www.projectprevention.org. Accessed December 29, 2009.

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