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## **HIV and STI Risk for Young Blacks in High Prevalence Areas: Implications for Health Equity in Communities Hosting Historically Black Colleges and Universities (HBCUs)**

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### **ABSTRACT**

#### **Background**

Every year, thousands of young black, high school graduates who are seeking higher education, attend one of the 105 historically black colleges and universities (HBCUs) located primarily in the south and east. The objective of the research was to examine the geographic proximity of HBCUs to areas of high HIV and STI disease burden among college age people to assess infectivity of potential sex partners in the areas surrounding HBCUs.

#### **Methods**

We examined the 14 states reporting the greatest HIV diagnoses burden among persons age 20-24 years old and STI burden among persons age 15 to 24 years old available for 2010. The Geographic Information System was used to create a spatially referenced data base of state level HIV and STI disease rates and HBCU zip codes to answer the question "How many HBCUs are in this location?" Maps were created to show HBCU locations in states along with the associated HIV and STI disease burden.

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**Findings**

Results suggest high HIV and STI disease burden in the general population of persons ages 15-24 in 10 states with 4 or more Historically Black Colleges and Universities (HBCU) and an overall high rate of HIV and STI exposure in the pool of potential sex partners. Less risky behavior by minority young adults attending HBCUs could potentially translate to high risk for contracting the diseases because of high prevalence in surrounding communities.

**Public Health Message**

Public health agencies may want to consider prioritizing HBCUs for enhanced HIV and STI prevention collaborative efforts in those areas with a high burden of HIV and other STIs.

**Keywords:** HIV, STIs, young adults, disparities, prevention, HBCUs

## INTRODUCTION

In the past 20 years, sexual risk behaviors among youth in the United States (U.S.) have declined, particularly among blacks (Centers for Disease Control and Prevention, 2012). Paradoxically, based on 2010 Census data (Centers for Disease Control and Prevention, 2012), though youth ages 15 to 29 represent 21% of the total American population, in 2009, youth (ages 13-29) accounted for 39% of new HIV diagnoses (Centers for Disease Control and Prevention, 2012). An estimated 8,294 young persons were diagnosed with HIV infection in 2009 in the 40 states with long-term HIV reporting, representing about 20% of the persons diagnosed during that year. Seventy-five percent (6,237) of these diagnoses occurred in young people aged 20–24 years (Centers for Disease Control and Prevention, 2009). Persons aged 20–24 years had the highest number and rate of HIV diagnoses of any age group with 36.9 new HIV diagnoses/100,000 population (Centers for Disease Control and Prevention, 2009). Young blacks and particularly young black men who have sex with men (MSM) are disproportionately affected. In 2009, young MSM accounted for 27% of new HIV infections in the US and 69% of new HIV infections among persons aged 13–29 years. Among young black MSM, new HIV infections increased 48% from 2006 through 2009 (Centers for Disease Control and Prevention, 2009).

Likewise, young people are disproportionately affected by other sexually transmitted infections (STIs), notably chlamydia and gonorrhea. Nearly half the newly acquired STIs are among persons ages 15-24 years (Centers for Disease Control and Prevention, 2010a). During the period, 2009-2010 rates of chlamydia increased 6.9% among female and 8.8% among males -ages 20-24 to 3,407.9 cases per 100,000 for females and 1,187.0 cases per 100,000 for males (Centers for Disease Control and Prevention, 2010a). Gonorrhea rates increased 4.9% among similar aged males and females during the same period (Centers for Disease Control and Prevention, 2010a). Young black females in two age categories (15 -19 years and 20 -24 years) are disproportionately affected by chlamydia, 6.6 and over 5 times the rate for white females in the same age groups, respectively (Centers for Disease Control and Prevention, 2010a). Gonorrhea rates for young black females ages 15 - 19 years and 20- 24 years were also significantly greater compared with young white females of similar age ranges (Centers for Disease Control and Prevention, 2010a).

A recent national study of 9<sup>th</sup>-12<sup>th</sup> grade high school students showed that sexual risk behaviors that contribute to contracting HIV and STI varied with academic achievement (Centers for Disease Control and Prevention, 2010b). Youth with low academic achievement (earning Ds and Fs on school work) are more likely to report engaging in risk behaviors, including: having more than four lifetime sex partners (31%), having sex in the last 3 months (54%), and using alcohol or drugs before last sexual intercourse (40%) (Centers for Disease Control

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and Prevention, 2010b). However, the same study showed that 38% of sexually active students with high academic achievement (earning As on school work) did not use a condom during last sexual intercourse (Centers for Disease Control and Prevention, 2010b). Given these data, sexually active students, including those with higher academic achievement who are potentially college bound, should also receive critical information regarding how to protect themselves from HIV and other STIs. One overlooked concern for high-achieving students is the context of risks, which includes the high burden of STIs among the pool of potential sex partners for young adults.

Every year, thousands of black high school graduates seek higher education and attend one of the 105 historically black colleges and universities (HBCUs) located primarily in the south and east (Wilson, 2007). HBCUs represent just 3.3 percent of all American colleges and universities, however they graduate about a third of all black graduates, including 50 percent of black teachers, 22 percent of black students with a bachelor's degree in science and engineering, 28 percent of all blacks who go on to receive a PhD in engineering, 70 percent of black dentists, 85 percent black doctors and 20 of the top 50 U.S. institutions producing black science/engineering doctorate recipients were HBCUs (Wilson, 2007; United Negro College Fund, 2011).

High rates of STIs, including HIV infection among young persons, are observed in the south and east (Centers for Disease Control and Prevention, 2009; Centers for Disease Control and Prevention, 2010a). Approximately 65% of HBCUs are also located in the south and east (Provasnik et al., 2004). The southern states are also disproportionately affected (compared with other regions in the United States) by other social determinants of health, including a historic distrust of the health service system, racial discrimination, lack of infrastructure in some areas, high HIV stigma, distance to care services, poverty, unemployment, and lack of affordable housing (Prejean et al., 2013; Sutton et al., 2010); these all contribute to poorer health outcomes in the south. However, not much information is available regarding HIV and STI individual- and social-level risks and interventions for students attending HBCUs.

For this study, we investigated the HIV and STI disease burden among young people in the general populations of states in which HBCUs are located to assess the HIV/STI infectivity of the potential sex partners in the communities surrounding some HBCUs. The objective of the research was to examine the geographic proximity of HBCUs to areas of high HIV and STI disease burden among college age people in order to inform current and future public health interventions.

## **METHODS**

We used 2010 HIV and STI surveillance data and slide set maps (2, 3, 14, 16) of young adults age 20-24 years old and 15-24 years old, respectively showing rates of disease diagnoses for that year by state. Estimated numbers and rates of diagnoses of HIV infection are based on data from 46 states and 5 U.S. dependent areas that have had confidential name-based HIV infection reporting for a sufficient length of time (i.e., implemented in area since at least January 2007 and reported to CDC since at least June 2007). Estimated numbers resulted from statistical adjustment that accounted for reporting delays, but not for incomplete reporting. The STI surveillance systems are operated by state and local STI control programs, which provide the case report data for chlamydia and gonorrhea.

We examined the 14 states (data not shown) reporting the greatest HIV diagnoses burden among persons age 20-24 years old and STI burden among persons age 15 to 24 years old available for 2010. We compared national rates for HIV, chlamydia and gonorrhea diagnoses per 100,000 population with similar disease rates for youth in 10 of these states with four or more HBCUs (North Carolina, Alabama, Georgia, South Carolina, Mississippi, Texas, Tennessee, Virginia, Florida and Louisiana). The Geographic Information System (GIS) was used to create a spatially referenced data base of state level HIV and STI disease rates and HBCU zip codes to answer the question "How many HBCUs are in this location?" Maps were created to show HBCU locations in states along with the associated HIV and STI disease burden.

## **RESULTS**

Fourteen states reported HIV diagnosis rates greater than 40 per 100,000 population (national average 36.9) among persons 20-24 years old. Seventy-one percent or 10 of these states have four or more HBCUs (range 4 to 11) and are located in the south or east. For example, North Carolina, with 11 HBCUs (Figure 1) and Georgia with 8 HBCUs had HIV rates of 44 per 100,000 population and 67.7 per 100,000 (Figure 1) respectively. Chlamydia and gonorrhea rates per 100,000 population in 2010 among persons ages 15-24 years old in the 10 selected HBCU states also exceeded national estimates for these diseases (Table 1). Chlamydia and gonorrhea rates for all age groups exceeded national estimates in states with HBCUs (Figures 3 and 4).

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**Table 1: HIV and STI Diagnosis Rates in 2010 by Selected Southern States and Number of Colleges and Universities, including HBCUs\***

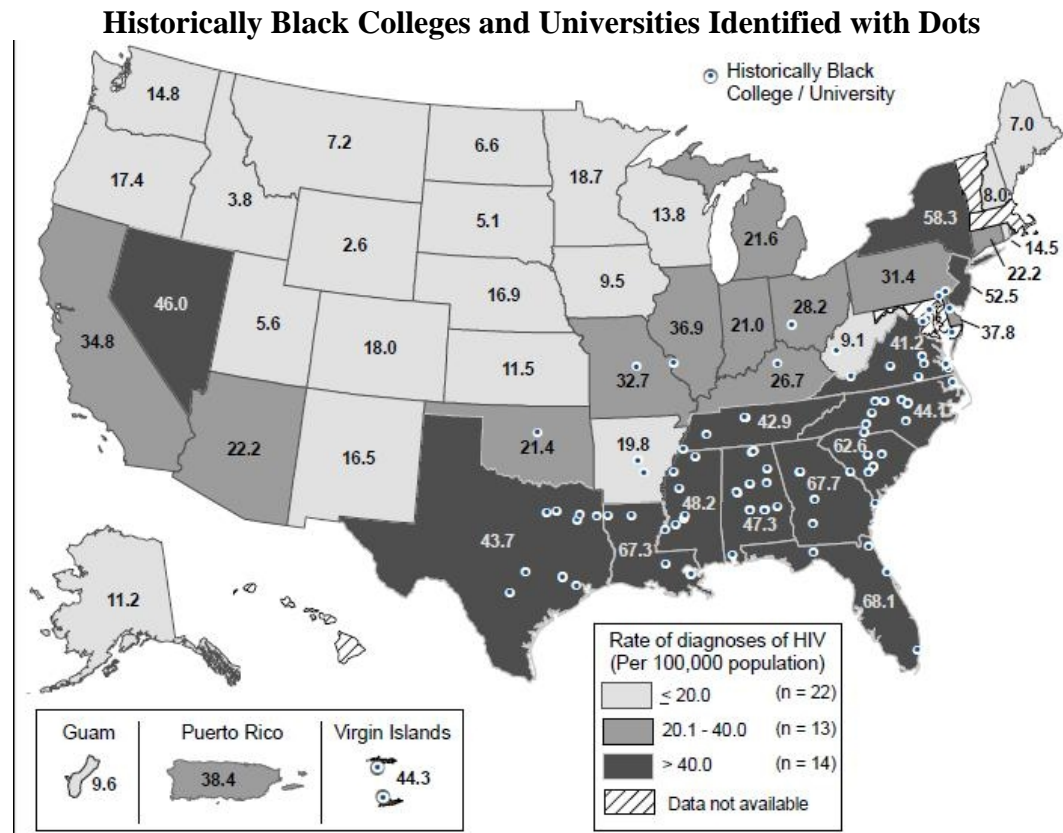
<b>State</b>	<b>HIV Rate Per 100,000 population [ages 20-24]</b>	<b>Chlamydia Rate Per 100,000 population</b>	<b>Chlamydia Rate Per 100,000 population</b>	<b>Gonorrhea Rate Per 100,000 population</b>	<b>Gonorrhea Rate Per 100,000 population</b>	<b>Total Number of HBCUs Nationally</b>	<b>Number of All Colleges Located in the Southern U.S.</b>
	<b>Total National Rate = 36.9</b>	<b>Total National Rate = 422.6</b>	<b>Total National Rates</b> <b>Ages 15-19</b> <b>2049.1</b> <b>Ages 20-24</b> <b>2270.2</b>	<b>Total National Rate = 99.6</b>	<b>Total National Rates</b> <b>Ages 15-19</b> <b>409.7</b> <b>Ages 20-24</b> <b>490.3</b>	<b>N=105</b>	<b>N=2755</b>
<b>Rates for ages 15-24 years</b>				<b>Rates for ages 15-24 years</b>			
<b>North Carolina</b>	44.0	448	2377.7	150.4	700.9	11	124
<b>Alabama</b>	47.3	574	3080.6	168.5	828.6	9	77
<b>Georgia</b>	67.7	459	2364.4	161.3	753.6	8	132
<b>South Carolina</b>	62.6	582	3097.2	174.7	864.4	8	64
<b>Mississippi</b>	48.2	726	3684.5	168.5	971.0	7	38
<b>Texas</b>	43.7	484	2364.9	128.3	575.9	7	213
<b>Tennessee</b>	42.9	450	2521.0	113.1	557.3	6	84
<b>Virginia</b>	41.2	391	1988.4	93.9	423.0	5	101
<b>Florida</b>	68.1	403	2248.3	108.8	540.0	4	181
<b>Louisiana</b>	67.3	649	3210.1	209.9	884.7	4	81
					<b>69/105 HBCUs (66%)</b>	<b>1095/2775 (40%)</b>	

\* Data obtained from: CDC. HIV Surveillance in Adolescents and Young Adults. Slide Set. 2010; CDC. Sexually Transmitted Disease Surveillance 2010, and CDC. 2011. Reportable STDs in Young People 15-24 Years of Age, by State.

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**Figure 1: Rates of HIV Diagnoses among Young Adults-Aged 20-24, 2010- 46 States and 5 U. S. Dependent Areas**  
N= 7675

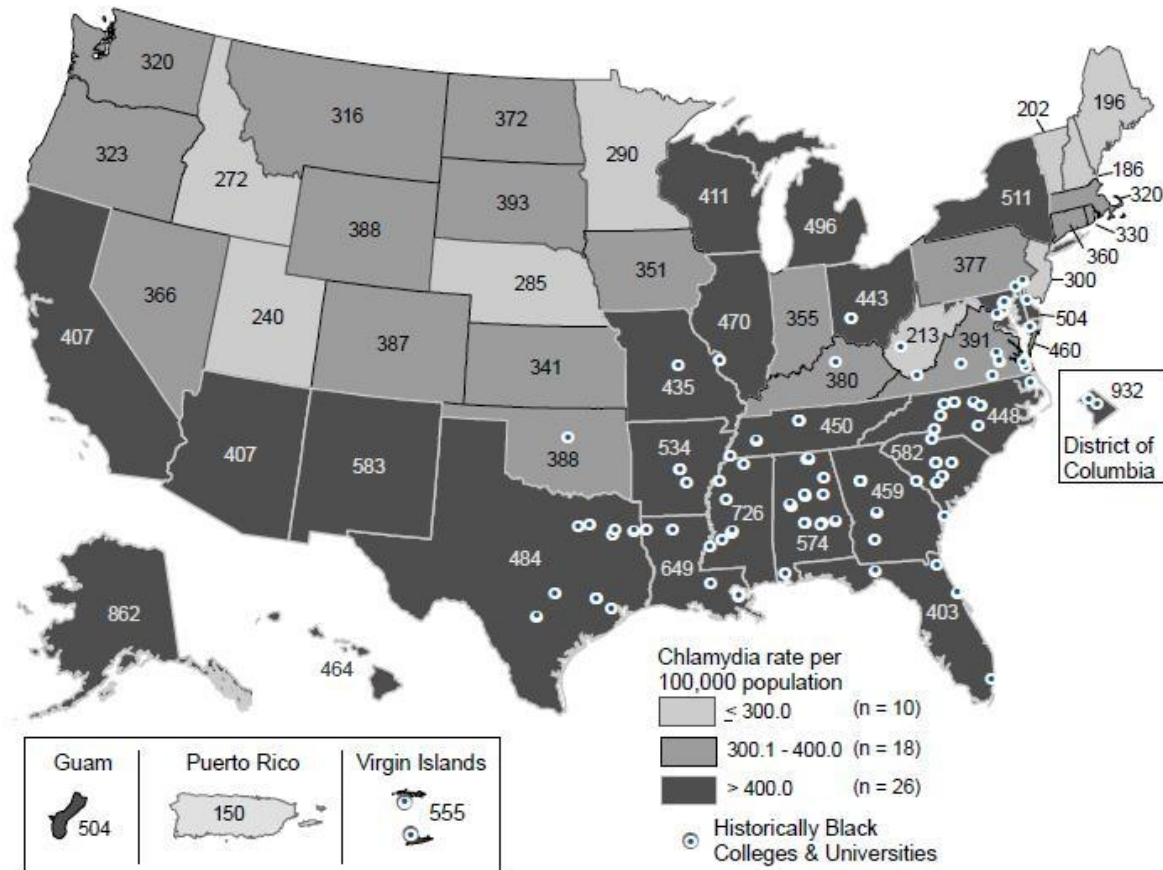


Centers for Disease Control and Prevention. HIV/AIDS Slide Set- HIV Surveillance in Adolescents and Young Adults.  
<http://www.cdc.gov/hiv/topics/surveillance/resources/slides/index.htm>

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**Figure 2: Chlamydia Rates by States, United States and Outlying Areas, 2010  
Historically Black Colleges and Universities Identified with Dots**

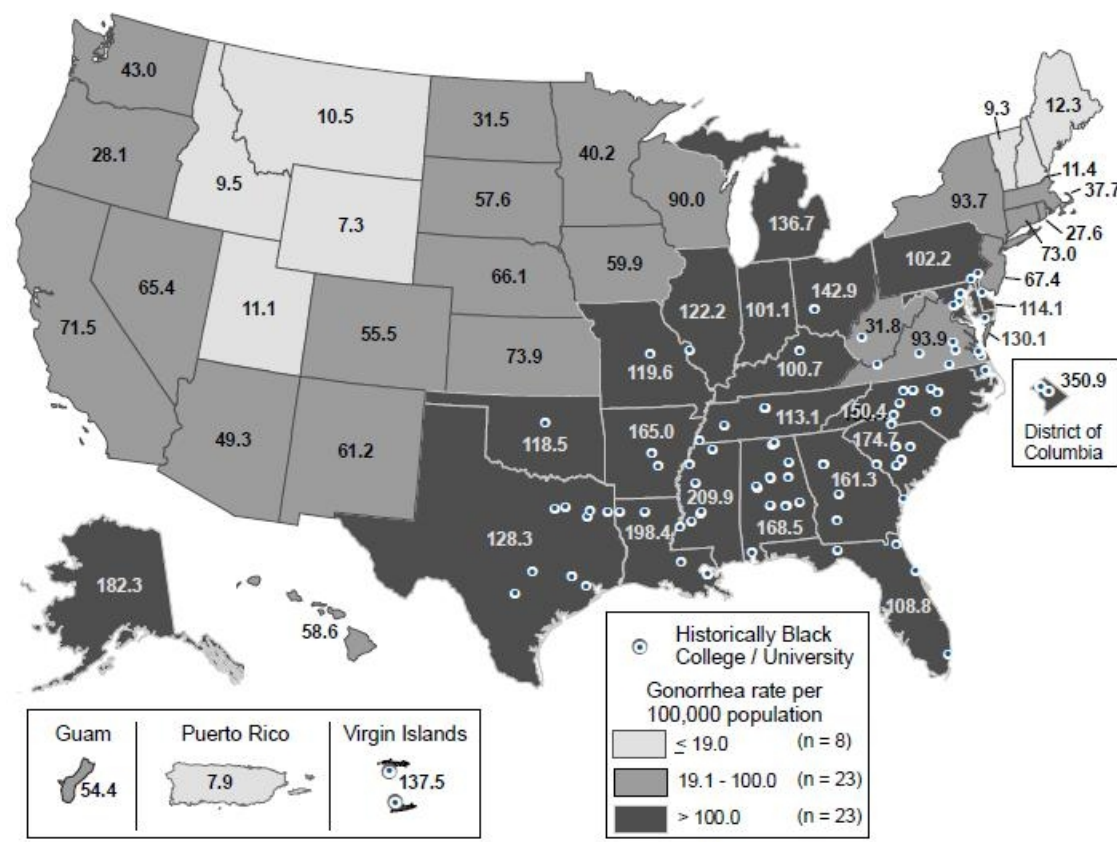


Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2010*. Atlanta: U.S. Department of Health and Human Services; 2011. Slide set- Adolescents and Young Adults.

<http://www.cdc.gov/std/stats10/slides.htm>



**Figure 3: Gonorrhea—Rates by State, United States and Outlying Areas, 2010**  
**Historically Black Colleges and Universities Identified with Dots**



Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2010*. Atlanta: U.S. Department of Health and Human Services; 2011. Slide set- Adolescents and Young Adults.

<http://www.cdc.gov/std/stats10/slides.htm>

## DISCUSSION

Our findings suggest high HIV and STI disease burden in the general population of persons ages 15-24 years in 10 states with 4 or more HBCUs and an overall high rate of infectivity in the potential sex partners in communities surrounding HBCUs. However, recent research discussed below suggests that students attending HBCUs may not be aware of the potential risk of contracting HIV and STI.

The Buhi, et. al. 2010 survey of 44,165 college students reported that although black and white college students sexual risk behaviors were somewhat similar (used condom last vaginal sex, 62.7% black and 57.9% white), the adverse outcomes for blacks were notably worse. For example, 7.8% of blacks versus 3.8% whites ( $p < .001$ ) reported acquiring an STI in the last school year before participating in the survey (Buhi et al., 2010). Sutton et al.'s 2011 survey of 1,051 students at 24 HBCUs reported that a majority of participants considered themselves both knowledgeable regarding HIV risk (82%) and at low risk for the disease (79%). At the same time, 64% of students surveyed reported 2 or more sex partners in the previous 12 months and among this group, 64% did not use a condom at last sexual encounter (Sutton et al., 2011). Similarly, Thomas et al.'s 2008 study of 5,287 students and non-students at 7 HBCUs found that 48.8% of participants perceived themselves at low risk, but 48.8% reported 2 or more sex partners in the previous 12 months (range 2-11+) and 35% did not use a condom at last sexual encounter (Thomas et al., 2008). Our findings suggest that under circumstances of high STI and HIV disease burden in states where HBCUs are located, student perceptions of low risk may potentially lead to false assurance, because the number of infected potential partners within the local community sexual networks may be greater than students are aware.

For additional HIV/STI prevention and services context, we considered the availability of health services at HBCUs and American colleges and universities more broadly. Of note, 34% of all American colleges and universities (N= 2755) are located in the south (Koumans et al., 2005) and of these, 40% (N = 1095) are located in the southern states included in this analysis. In Koumans, et. al.'s study of 736 US colleges with an enrollment of 500 or more, 60% of schools had health centers available to students. Only 54% of southern schools (N=252) surveyed had health care centers available (Koumans et al., 2005). Of schools with health centers, 331 (66%) offered STD services (Koumans et al., 2005); and 44% of southern schools provided condoms on campus, lower than the proportion of all schools (52%) (Koumans et al., 2005). These results may suggest

gaps in HIV/STI prevention services available to young people seeking higher education in southern states.

HIV and other sexually transmitted infections continue to be a public health concern for young black persons. At year- end 2009, an estimated 26,329 young person's age 20 to 24 years were living with a diagnosis of HIV infection in the 46 states and 5 U.S. dependent areas with confidential name-based HIV infection reporting since January 2007. The estimated rate of young persons living with a diagnosis of HIV infection was 126.5 per 100,000 population; a disproportionate number of young persons affected by HIV are black. Of the 16 states with rates of young persons living with a diagnosis of HIV infection over 100.0 per 100,000 population, 10 (62%) were located in the South, including Florida, Louisiana, Georgia, Mississippi, South Carolina, and North Carolina (Centers for Disease Control and Prevention, 2010c ; these states have over half of the nation's HBCUs (Provasnik et al., 2004; Colleges by State, 2012). These southern states are also disproportionately affected by social determinants which may create barriers to services for timely diagnosis and treatment for HIV and other STIs (Prejean et al., 2013; Sutton et al., 2010). In addition, in 2009, blacks had 8.7 times the reported chlamydia and 20 times the reported gonorrhea rates of whites (Centers for Disease Control and Prevention, 2011b). The greater disease burden of chlamydia and gonorrhea among young persons contributes to life-altering consequences, including an increased likelihood of contracting HIV infection by as much as 2-to-5 fold, infertility among women and chronic pelvic pain (Centers for Disease Control and Prevention, 2011a; Centers for Disease Control and Prevention, 2011b; Fleming & Wasserheit, 1999).

These data underscore the importance of increased strategies to engage affected communities in HIV/STI prevention efforts. Recent efforts by public health partners, including the Black AIDS Institute (Black AIDS Institute, 2010), Morehouse School of Medicine (2013), and the National Council of Negro Women (Royal, 2012), include working with students at HBCUs and surrounding communities in an effort to increase awareness about the broader HIV/STI epidemics that are disproportionately affect black youth. Directly engaging our youth can help ensure more tailored and culturally relevant prevention solutions and help decrease racial/ethnic HIV/STI disparities, consistent with US National HIV/AIDS Strategy goals (Office of AIDS Policy, 2010).

Although CDC has a long history of partnering with HBCUs and majority colleges and universities serving minorities to organize health fairs and HIV testing events, more may be needed to address the heightened HIV/STI burden in communities surrounding some HBCUs. Based on the data presented in this paper, institutions of higher learning, especially those in the south, should be considered for strengthened partnerships and collaborations to develop more effective HIV and STI prevention interventions for students. For example, some

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of the STI/HIV prevention interventions used with individuals or youth groups are skills-building programs to encourage safer sexual behaviors, reduce substance use, address improvement in social and communications skills, and provide practice in assertiveness and coping skills. Some effective programs have also engaged student peers to convey messages with appropriate content and tone. Interventions such as these could be extended to include data on area based disease rates and assessments of local infectivity.

In addition, vital information regarding the social determinants of HIV and STI, including poverty status, educational and employment attainment, substance use and access to care should be further examined in each local jurisdiction and shared with local public health practitioners, HBCU administrators and policy leaders, to determine broader social and structural-level interventions which may be warranted to more effectively address HIV/STI risk that is broader than individual-level factors. The burden for young adults in the south inside and outside of HBCUs warrants a comprehensive, holistic approach that considers networks of joblessness, drug use, educational opportunities, and the legacies of historical mistrust that remain in the southern United States to more effectively address risk-reduction efforts (Reif et al., 2011).

It is also important for HBCU students and faculty to be aware of the high disease burden in the surrounding communities. This is needed because of assortative mixing and the high HIV/STI prevalence in host communities despite less risky behavior by minority young adults. As studies have shown that blacks generally have sex with other blacks (Adimora & Schoenbach, 2005), assortative mixing in this context refers to racially segregated networks of potential partners in which low-risk communities overlap with high-risk communities (Adimora & Schoenbach, 2005; Sharpe et al., 2012). Given the trend toward assortative mixing, and STI and HIV disease burden higher than national averages in states with 4 or more HBCUs, stronger public health messages targeting young black college age people should fill gaps in knowledge regarding contexts of risk.

Our study is limited by the need for a detailed analysis of the social determinants of health in the areas noted in this report to have the highest burden of HIV/STI disease. Future studies should consider these social and structural determinants as part of the HIV/STI risk dialogue for students at HBCUs and the surrounding communities. A public health approach that considers all factors and engages multiple groups in affected communities will increase our ability to meet our HIV and STI prevention goals and improve health equity.

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