

# Racial and Ethnic Disparities in Sexual Risk Behaviors And STDs During Young Men's Transition to Adulthood

**CONTEXT:** Racial and ethnic health disparities are an important issue in the United States. The extent to which racial and ethnic differences in STDs among youth are related to differences in socioeconomic characteristics and risky sexual behaviors requires investigation.

**METHODS:** Data from three waves of the National Survey of Adolescent Males (1988, 1990–1991 and 1995) were used to examine 1,880 young men's history of STDs and their patterns and trajectories of sexual risk behavior during adolescence and early adulthood. Multinomial and logistic regression analyses were conducted to test whether racial and ethnic differences in STDs are due to the lower socioeconomic status and higher levels of risky sexual behavior among minority groups.

**RESULTS:** Young black men reported the highest rates of sexual risk and STDs at each wave and across waves. Compared with white men, black and Latino men had higher odds of maintaining high sexual risk and increasing sexual risk over time (odds ratios, 1.7–1.9). In multivariate analyses controlling for socioeconomic characteristics, black men were more likely than white men to have a history of STDs (3.2–5.0); disparities persisted in analyses controlling for level of risky sexual behavior.

**CONCLUSIONS:** Race and ethnicity continue to differentiate young black and Latino men from their white peers in terms of STDs. Prevention programs that target different racial and ethnic subgroups of adolescent men and address both individual- and contextual-level factors are needed to curb STD incidence.

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The elimination of racial and ethnic health disparities is a major U.S. public health goal.<sup>1</sup> To accomplish this goal, it is essential to establish the underlying reasons for such disparities, so that policies and interventions can be developed accordingly. Disparities by race or ethnicity may be spurious, due in part or wholly to the strong association between minority group membership and low socioeconomic status. Alternatively, they may emerge because members of different racial and ethnic groups engage in risky health behaviors at different rates. In the United States, social and demographic characteristics (e.g., family structure at age 14) and sexual behavioral variables (e.g., age at first sex) are associated with sexual risk-taking.<sup>2–4</sup>

Our focus in this article is racial and ethnic disparities in STDs among U.S. adolescents and young adults, which are substantial. Each year, STDs (including HIV) among young men and women result in significant public health and social costs. Chlamydia and gonorrhea are the most prevalent STDs among U.S. 15–24-year-olds.<sup>5,6</sup> STDs occur disproportionately among young people: Half of the approximately 18.9 million new STD cases each year are among sexually active 15–24-year-olds, although that population constitutes only one-fourth of the sexually active population overall.<sup>7</sup>

Notable racial and ethnic disparities are apparent in STD prevalence. According to the Centers for Disease Control

and Prevention (CDC), in 2007, the chlamydia rate of black males aged 20–24 was four times that of Latino males and eight times that of white males;<sup>8</sup> half of all chlamydia and syphilis cases, and 70% of gonorrhea cases, occurred among black men and women. Paradoxically, black youth are more likely than Latino and white youth to use condoms.<sup>9–14</sup> Between 1995 and 2002, the proportion of 15–19-year-old black men who used a condom at first sex increased from 61% to 85%; the proportion of Latino men increased less during the period (from 55% to 67%), whereas the proportion among white men decreased (from 76% to 68%). In 2007, condom use at last sex was greater among black male high school students than among their white peers (74% vs. 66%).<sup>15</sup> Yet, black adolescents experience disproportionately higher STD rates than Latino and white youth.<sup>16</sup> According to findings from a nationally representative survey, however, racial and ethnic differences in disease reporting or in access to care and treatment do not account for these disparities.<sup>17</sup> The fact remains that STDs are preventable, if we can understand factors contributing to their spread.

Numerous studies have explored how individual characteristics and behaviors contribute to increased STD risk, including age at first sex,<sup>18</sup> having same-sex partners (i.e., men who have sex with men),<sup>19</sup> use of alcohol or drugs,<sup>20</sup> having multiple sexual partners,<sup>21,22</sup> having risky sexual

partners<sup>23</sup> and inconsistent use of condoms.<sup>24</sup> These variables differ by racial and ethnic group. For example, the 2007 national Youth Risk Behavior Surveillance System found that in grades 9–12, 73% of black males and 58% of Latino males had ever had sexual intercourse, compared with 44% of their white peers;<sup>15</sup> a larger proportion of black than of Latino or white males had had more than four sexual partners (38% vs. 23% and 12%, respectively). These differences may result from differences in age at sexual debut. According to the CDC, 26% of black males had sex before age 13, compared with 12% of Latinos and 6% of whites males.<sup>25</sup> Thus, the window of risk exposure is greater for black adolescents than for Latino and white youth. Although black males report more sexual partners after age and basic demographic characteristics are controlled for, this difference is largely explained by years since sexual debut, which at any given age is higher for black males because of earlier age at first sex.<sup>26</sup>

Racial and ethnic differences in patterns and trajectories of sexual risk behaviors may also contribute to the observed disparities in STD risk.\* In terms of patterns, according to the 2002 National Survey of Family Growth (NSFG), the proportion of black men who have had at least one concurrent partnership within the previous year is three times that of white men.<sup>27</sup> Concurrency, in turn, has been associated with STD risk<sup>28</sup> and the rapid transmission of STDs within sexual networks.<sup>29</sup> In terms of trajectories, cumulative risky sexual behavior increases a person's exposure to and likelihood of acquiring STDs;<sup>30</sup> even if the risk associated with each act is small, repeatedly engaging in those acts over time substantially increases risk.

Our goal is to investigate the reasons for racial and ethnic health disparities by examining detailed data on sexual behavior and STDs collected from a nationally representative, longitudinal sample of American men as they matured from late adolescence to their early to mid-20s. We tested two hypotheses: that racial and ethnic disparities in STDs are due to the association of ethnic minority status with relatively low socioeconomic status, and thus reflect socioeconomic health disparities; and that any disparities in STDs left unaccounted for by socioeconomic factors can be partially or fully explained by racial and ethnic differences in risky sexual behavior.

**METHODS**

**Data**

We used data from the National Survey of Adolescent Males (NSAM), which has been described in detail elsewhere.<sup>31,32</sup> Briefly, NSAM is a longitudinal survey exploring the sexual relationships, contraceptive practices, and STD knowledge and attitudes of males from adolescence into young adulthood. Nonsensitive data were elicited during face-to-face in-home interviews, whereas the most sensitive data (e.g., same-sex experiences, illicit drug use) were

\*We use the term "pattern" when referring to cross-sectional findings and "trajectories" when referring to longitudinal findings.

**TABLE 1. Selected characteristics of young men, by survey wave, National Survey of Adolescent Males, 1988–1995**

| Characteristic                            | Wave 1<br>(N=1,880) | Wave 2<br>(N=1,676) | Wave 3<br>(N=1,377) |
|-------------------------------------------|---------------------|---------------------|---------------------|
| <b>PERCENTAGE DISTRIBUTIONS</b>           |                     |                     |                     |
| <b>Race/ethnicity</b>                     |                     |                     |                     |
| Black                                     | 15.0                | 15.0                | 15.1                |
| White                                     | 74.6                | 74.7                | 74.4                |
| Latino                                    | 10.4                | 10.3                | 10.5                |
| <b>Age at Wave 1</b>                      |                     |                     |                     |
| 15                                        | 20.1                | 20.1                | 20.1                |
| 16                                        | 19.0                | 19.6                | 19.6                |
| 17                                        | 22.5                | 21.8                | 21.8                |
| 18                                        | 22.9                | 23.4                | 23.4                |
| 19                                        | 15.5                | 15.1                | 15.1                |
| <b>Mother was a teenage parent</b>        |                     |                     |                     |
| Yes                                       | 46.4                | 46.0                | 44.3                |
| No                                        | 53.6                | 54.0                | 55.7                |
| <b>Living arrangement at age 14</b>       |                     |                     |                     |
| Two biological parents                    | 70.5                | 70.0                | 71.0                |
| One biological parent                     | 17.4                | 17.7                | 18.2                |
| Biological parent and stepparent          | 9.7                 | 9.8                 | 9.3                 |
| Neither biological parent                 | 2.4                 | 2.5                 | 1.5                 |
| <b>Repeated a grade by Wave 1</b>         |                     |                     |                     |
| Yes                                       | 30.1                | 30.7                | 28.5                |
| No                                        | 69.9                | 69.3                | 71.5                |
| <b>Held behind in school by Wave 2</b>    |                     |                     |                     |
| Yes                                       | na                  | 12.1                | 10.5                |
| No                                        | na                  | 87.9                | 89.5                |
| <b>Region of residence at Wave 1</b>      |                     |                     |                     |
| Northeast                                 | 19.0                | 19.0                | 18.7                |
| South                                     | 37.2                | 37.4                | 37.6                |
| Midwest                                   | 23.7                | 23.7                | 24.2                |
| West                                      | 20.1                | 19.9                | 19.6                |
| <b>Ever had STD diagnosis</b>             |                     |                     |                     |
| Yes                                       | 1.7                 | 6.6                 | 11.5                |
| No                                        | 98.3                | 93.4                | 88.5                |
| <b>Had STD diagnosis in past year</b>     |                     |                     |                     |
| Yes                                       | na                  | na                  | 1.3                 |
| No                                        | na                  | na                  | 98.7                |
| <b>Positive chlamydia test</b>            |                     |                     |                     |
| Yes                                       | na                  | na                  | 3.6                 |
| No                                        | na                  | na                  | 96.4                |
| Total                                     | 100.0               | 100.0               | 100.0               |
| <b>MEANS</b>                              |                     |                     |                     |
| <b>Age at first sex</b>                   | 15.8                | 15.9                | 16.0                |
| <b>Mother's no. of years of education</b> | 12.9                | 13.1                | 12.9                |

Notes: Wave 1 occurred in 1988, Wave 2 in 1990–1991 and Wave 3 in 1995. All Ns are weighted. na=not applicable.

collected via self-administered questionnaires. The study's first wave occurred in 1988 and included a nationally representative sample of 1,880 noninstitutionalized unmarried males aged 15–19 living in the coterminous United States; black and Latino males were oversampled. Some 1,676 participants were reinterviewed in 1990–1991, at ages 17–22, and 1,377 were surveyed again in 1995, at ages 21–26, when they also provided urine samples for chlamydia testing.<sup>33</sup> The study had a 75% response rate across the three waves, and longitudinal weights were

used to adjust for nonresponse. We used all available data from any of the three waves in our cluster analysis, instead of relying only on data from men who completed all three waves.<sup>30</sup> In the first wave, an unweighted 36% of men in our sample were black, 40% were white, 21% were Latino, and 3% were members of other racial or ethnic groups; on average, men were 17 years old.

We used the NSAM for several reasons. First, it includes extensive individual-level data, which have previously enabled us to identify distinct patterns in men's sexual behavior as they mature from adolescents to adults, as well as high-risk patterns and trajectories of behavior that are associated with STDs.<sup>30</sup> The longitudinal nature of these data enables us to examine the degree to which the high rates of STDs among black and Latino men are because of differences in and trajectories of behaviors. Second, the data are nationally representative and allow us to assess racial and ethnic differences net of a broad array of socio-economic controls. Thus, we can be reasonably confident that any racial or ethnic differences found are not because black and Latino men in the United States are more likely than white men to come from disadvantaged backgrounds. Third, although most of the data are self-reported, the Wave 3 urine test provides a clinical indicator of chlamydia infection. Finally, men's risky sexual behaviors start in adolescence, peak in late adolescence and decline in early adulthood, when their professional and personal lives stabilize.<sup>34,35</sup> Therefore, the developmental period covered by these data—the transition to adulthood—is particularly salient for the examination of STD risk.

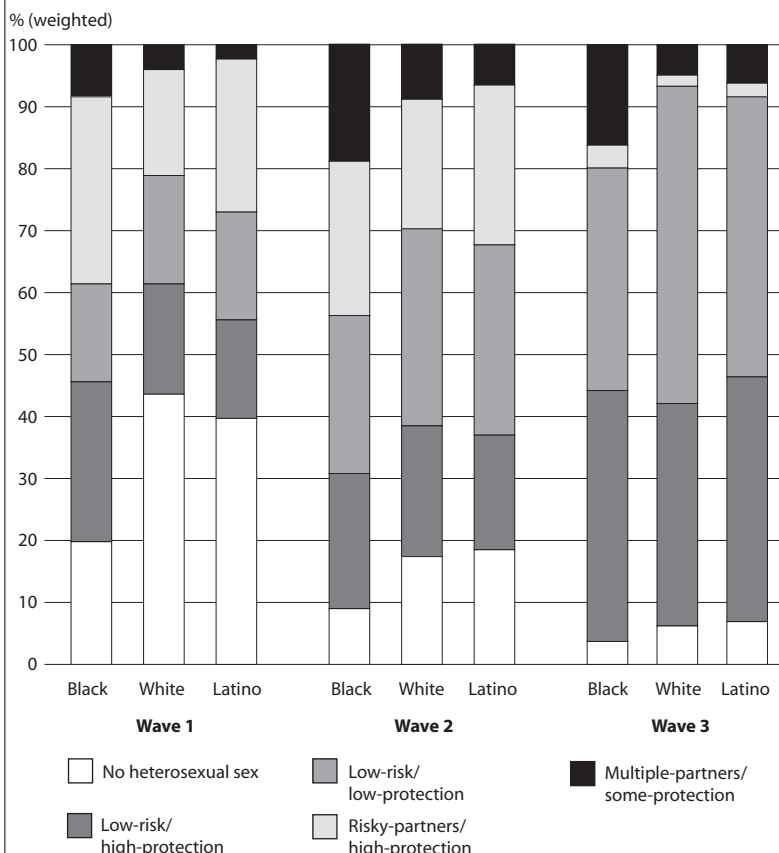
## Measures

•**STD history.** At each wave, young men reported whether they had ever received an STD diagnosis. For multivariate analyses, we combined the individual wave measures into a single indicator of whether males ever reported having had an STD. In addition, we included a measure of recent STD history based on a Wave 3 item asking whether young men had received an STD diagnosis in the prior year, and a measure of chlamydia at Wave 3 based on results from clinical testing of urine samples.

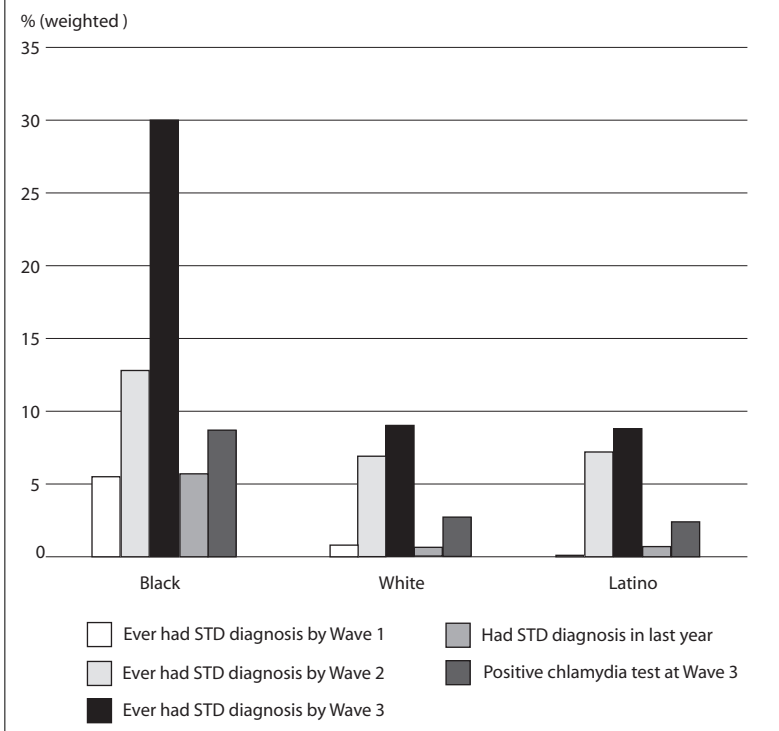
•**Race and ethnicity.** Young men reported whether they considered themselves Latino or of Spanish origin or descent. They were then asked which race they considered themselves; response options were black, white, American Indian/Alaska Native and Asian/Pacific Islander, as well as "other," an open-ended option. Men who identified as Asian did not differ from white men on other social and demographic variables of interest and were added to the white racial group; men who identified as American Indian/Alaskan Native did not differ from black men and were added to the black racial group.

•**Social and demographic measures.** We included measures for respondent's age at Wave 1, region of residence at Wave 1, living arrangement at age 14 (living with both biological parents, one biological parent, one biological and one stepparent, or neither biological parent), and

**FIGURE 1. Percentage distribution of young men, by sexual risk-taking cluster, according to race or ethnicity and survey wave**



**FIGURE 2. Percentage of young men experiencing selected STD outcomes, by race or ethnicity**



**TABLE 2. Percentage distribution of young men, by sexual risk trajectory, according to race or ethnicity**

| Risk trajectory | Black (N=460) | White (N=556) | Latino (N=274) |
|-----------------|---------------|---------------|----------------|
| Steady low      | 32.5*         | 53.8          | 49.3†          |
| Peak high       | 17.8          | 18.5          | 15.3           |
| Downward        | 29.8*         | 21.0          | 23.0*,†        |
| Upward          | 10.7*         | 4.3           | 8.4*,†         |
| Steady high     | 9.2*          | 2.3           | 4.0†           |
| Total           | 100.0         | 100.0         | 100.0          |

\*Differs from percentage for whites at  $p < .05$ . †Differs from percentage for blacks at  $p < .05$ . Note: All percentages are weighted.

**TABLE 3. Odds ratios (and 95% confidence intervals) from multinomial logistic regression analyses assessing the likelihood of being in a sexual risk trajectory, compared with white youths', by race or ethnicity**

| Risk trajectory  | Odds ratio       |
|------------------|------------------|
| <b>Black</b>     |                  |
| Steady low (ref) | 1.0              |
| Peak high        | 1.2 (1.0–1.5)†   |
| Downward         | 1.2 (1.0–1.5)†   |
| Upward           | 1.8 (1.4–2.5)*** |
| Steady high      | 1.9 (1.3–2.8)*** |
| <b>Latino</b>    |                  |
| Steady low (ref) | 1.0              |
| Peak high        | 1.1 (0.9–1.4)    |
| Downward         | 1.3 (1.0–1.7)*   |
| Upward           | 1.7 (1.2–2.4)**  |
| Steady high      | 1.7 (1.1–2.7)*   |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . † $p < 0.1$ . Notes: Analyses controlled for age, living arrangement at age 14, having repeated a grade by Wave 1, having been held behind in school, region of residence, mother's having been a teenage parent and mother's educational level. ref=reference group.

whether young men had repeated an academic grade by Wave 1 or had been held behind a year in school by Wave 2. In addition, we included two measures for the respondent's mother: her highest level of education and whether she had had her first birth as a teenager.

•**Sexual risk behavior.** Young men who reported that they had ever had sexual intercourse with a female were asked how old they had been at first sex. Additionally, we used cluster analysis from previous research,<sup>30</sup> which categorized young men at each wave into five distinct clusters—three low-risk and two high-risk. One low-risk cluster included young men who had never had sex with a female partner and had not used condoms (“no heterosexual sex”); one comprised those who had had few sex-

\*The low-risk/high-protection cluster consisted of men who had had an average of 1.4 female sexual partners in the past year and had used condoms 85% of the time. The low-risk/low-protection cluster comprised men who had had an average of 1.7 female sexual partners in the past year and had used condoms 7% of the time. The risky-partners/high-protection cluster consisted of men who had had an average of 1.1 risky partners and 1.9 total female sexual partners in the past year, and had used condoms 83% of the time. The many-partners/some-protection cluster included men who had had an average of 7.4 female sexual partners in the past year, had 7.5 months in the past year with two or more female sexual partners and had used condoms 39% of the time.

ual partners in the past year and used condoms fairly consistently (“low-risk/high-protection”); and one was made up of those who had had few sexual partners in the past year and used condoms rarely (“low-risk/low-protection”). One high-risk cluster included men who had had some risky sexual partners (i.e., one time partners, male partners, sex workers and injection-drug users) in the past year and used condoms fairly consistently (“risky-partners/high-protection”); the other, those who had had many and multiple female sexual partners in the past year and used condoms inconsistently (“many-partners/some-protection”).\*

We then categorized men by their sexual risk trajectories through late adolescence and early adulthood. Those in a low-risk cluster across all three waves and those in a high-risk cluster across all three waves were classified as “steady low risk” and “steady high risk,” respectively. Young men in a low-risk cluster at Wave 1 but a high-risk cluster at Wave 3 were classified as “upward risk”; those with the opposite trajectory were classified as “downward risk.” Finally, young men who were low-risk at Waves 1 and 3, but high-risk at Wave 2 were classified as “peak high risk.”

**Analyses**

We began by examining racial and ethnic disparities in STDs during adolescence and early adulthood. We performed descriptive analyses to investigate whether these disparities can be partly or fully attributed to differences in individual behavior. To this end, we examined racial and ethnic variation in high-risk sexual behavior and high-risk trajectories of sexual behavior by conducting univariate parametric statistical tests (analysis of variance) with follow-up Tukey-adjusted pairwise comparisons.

Next, we performed multivariate analyses that controlled for individual and family background characteristics. This step was crucial to determine whether racial and ethnic health disparities actually reflected socioeconomic health disparities. Finally, we used multinomial logistic regression analyses to examine whether STD disparities by race and ethnicity were associated with racial and ethnic differences in levels of risky sexual behavior. All analyses were conducted using SAS 9.1.

**RESULTS**

**Descriptive Findings**

In the weighted sample, 15% of young men at each wave were black, 74–75% white and 10–11% Latino (Table 1, page 52). The sample was about equally distributed by year of age, except for a slightly smaller proportion of 19-year-olds; at Wave 1, the average age was 16.9 years (not shown). At each wave, the average age at first sex was 16. Between 44% and 46% of youth reported that their mother had had her first birth as a teenager; on average, respondents' mothers had had 13 years of education. Some 70–71% of young men at each wave reported having lived with both biological parents at age 14, and 2–3% had lived

**TABLE 4. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing young men's risk of experiencing selected STD outcomes**

| Variables                           | STD diagnosis ever (N=1,096) |                     | STD diagnosis in last year† (N=1,010) |                    | Positive chlamydia test‡ (N=1,093) |                     |
|-------------------------------------|------------------------------|---------------------|---------------------------------------|--------------------|------------------------------------|---------------------|
|                                     | Model 1                      | Model 2             | Model 1                               | Model 2            | Model 1                            | Model 2             |
| <b>Race/ethnicity</b>               |                              |                     |                                       |                    |                                    |                     |
| Black                               | 3.2***<br>(2.2–4.9)          | 2.9***<br>(1.9–4.3) | 5.0**<br>(1.7–14.3)                   | 4.0*<br>(1.3–12.0) | 4.1***<br>(1.9–9.0)                | 4.1***<br>(1.8–9.0) |
| Latino                              | 1.4<br>(0.8–2.4)             | 1.2<br>(0.7–2.2)    | 2.2<br>(0.5–8.7)                      | 1.8<br>(0.4–7.4)   | 2.2<br>(0.9–5.7)                   | 2.2<br>(0.9–5.7)    |
| White (ref)                         | 1.0                          | 1.0                 | 1.0                                   | 1.0                | 1.0                                | 1.0                 |
| <b>Age</b>                          |                              |                     |                                       |                    |                                    |                     |
|                                     | 1.0<br>(0.9–1.1)             | 1.0<br>(0.9–1.1)    | 1.5**<br>(1.1–2.0)                    | 1.5**<br>(1.1–2.1) | 1.2<br>(1.0–1.5)                   | 1.2<br>(1.0–1.5)    |
| <b>Age at first sex</b>             |                              |                     |                                       |                    |                                    |                     |
|                                     | 1.2***<br>(1.1–1.2)          | 1.1***<br>(1.1–1.2) | 1.0<br>(0.8–1.1)                      | 0.9<br>(0.7–1.1)   | 1.0<br>(0.9–1.1)                   | 1.0<br>(0.9–1.1)    |
| <b>Mother was a teenage parent</b>  |                              |                     |                                       |                    |                                    |                     |
|                                     | 1.2<br>(0.8–1.7)             | 1.1<br>(0.8–1.6)    | 0.4<br>(0.2–1.0)                      | 0.4*<br>(0.1–0.9)  | 0.8<br>(0.4–1.4)                   | 0.8<br>(0.4–1.5)    |
| <b>Living arrangement at age 14</b> |                              |                     |                                       |                    |                                    |                     |
| One biological parent               | 1.2<br>(0.8–1.8)             | 1.3<br>(0.9–1.9)    | 1.2<br>(0.5–2.9)                      | 1.2<br>(0.5–3.2)   | 0.7<br>(0.4–1.3)                   | 0.8<br>(0.4–1.4)    |
| Biological parent and stepparent    | 0.8<br>(0.5–1.4)             | 0.9<br>(0.5–1.6)    | 1.0<br>(0.3–3.6)                      | 0.9<br>(0.2–3.2)   | 1.6<br>(0.5–5.5)                   | 1.6<br>(0.5–5.5)    |
| Neither biological parent           | 1.4<br>(0.5–4.0)             | 1.4<br>(0.5–4.0)    | 0.2<br>(0.1–0.8)                      | 0.2*<br>(0.0–0.7)  | 0.9<br>(0.2–4.1)                   | 0.9<br>(0.2–4.2)    |
| Two biological parents (ref)        | 1.0                          | 1.0                 | 1.0                                   | 1.0                | 1.0                                | 1.0                 |
| <b>Repeated a grade</b>             |                              |                     |                                       |                    |                                    |                     |
|                                     | 1.0<br>(0.7–1.4)             | 1.0<br>(0.7–1.5)    | 0.7<br>(0.3–1.7)                      | 0.5<br>(0.2–1.4)   | 1.2<br>(0.7–2.3)                   | 1.3<br>(0.7–2.3)    |
| <b>Held behind in school</b>        |                              |                     |                                       |                    |                                    |                     |
|                                     | 0.7<br>(0.4–1.1)             | 0.7<br>(0.4–1.1)    | 0.4<br>(0.1–1.1)                      | 0.3<br>(0.1–1.0)   | 0.9<br>(0.4–2.0)                   | 0.9<br>(0.4–2.0)    |
| <b>Mother's education</b>           |                              |                     |                                       |                    |                                    |                     |
|                                     | 1.0<br>(0.9–1.1)             | 1.0<br>(1.0–1.1)    | 0.9<br>(0.8–1.1)                      | 1.0<br>(0.8–1.1)   | 1.0<br>(0.9–1.1)                   | 1.0<br>(0.9–1.1)    |
| <b>Region</b>                       |                              |                     |                                       |                    |                                    |                     |
| Northeast                           | 1.5<br>(0.9–2.4)             | 1.5<br>(0.9–2.5)    | 1.8<br>(0.6–5.4)                      | 2.1<br>(0.7–6.9)   | 1.9<br>(0.8–4.6)                   | 1.9<br>(0.8–4.6)    |
| Midwest                             | 0.8<br>(0.6–1.3)             | 0.8<br>(0.5–1.2)    | 2.4<br>(0.8–7.3)                      | 2.1<br>(0.7–6.6)   | 1.3<br>(0.6–2.9)                   | 1.3<br>(0.6–2.9)    |
| West                                | 1.4<br>(0.8–2.4)             | 1.3<br>(0.7–2.3)    | 6.8<br>(0.8–54.4)                     | 8.5<br>(1.0–74.2)  | 1.0<br>(0.4–2.3)                   | 1.0<br>(0.4–2.4)    |
| South (ref)                         | 1.0                          | 1.0                 | 1.0                                   | 1.0                | 1.0                                | 1.0                 |
| <b>Risk trajectory</b>              |                              |                     |                                       |                    |                                    |                     |
| Steady high                         | na                           | 2.9***<br>(1.5–5.5) | na                                    | 4.1<br>(0.9–18.3)  | na                                 | 1.2<br>(0.4–3.2)    |
| Peak high                           | na                           | 1.4<br>(0.7–2.6)    | na                                    | 3.1<br>(0.6–15.5)  | na                                 | 1.4<br>(0.5–3.9)    |
| Downward                            | na                           | 2.0*<br>(1.1–3.7)   | na                                    | 1.5<br>(0.4–5.4)   | na                                 | 1.6<br>(0.6–4.4)    |
| Upward                              | na                           | 0.9<br>(0.4–1.8)    | na                                    | 0.2*<br>(0.1–0.9)  | na                                 | 1.3<br>(0.4–4.3)    |
| Steady low (ref)                    | na                           | 1.0                 | na                                    | 1.0                | na                                 | 1.0                 |

\*p<.05. \*\*p<.01. \*\*\*p<.001. †Assessed at Wave 3. Notes: ref=reference group. na=not applicable. Ns differ because only sexually experienced respondents with completed STD data were included. Measures for which no reference category are shown were dichotomous (mother was a teenage parent, repeated a grade and held behind in school) or continuous (age, age at first sex and mother's education).

with neither biological parent. Between 29% and 31% reported having repeated a grade by Wave 1, and 11–12% reported that they had been held behind a year in school by Wave 2. The greatest proportions reported having lived in the South at Wave 1 (37–38%). The proportion of youth who reported having ever received an STD diagnosis increased between Waves 1 and 3, from 2% to 12%; at Wave 3, 1% reported having received an STD diagnosis in the past year, and 4% tested positive for chlamydia.

### Racial-Ethnic Risk Patterns

At each wave, a smaller proportion of black youth than of Latino or white youth were in the cluster representing no heterosexual sex (Figure 1, page 53). Furthermore, a greater proportion of young black men than of others were in the cluster with the highest risk,<sup>30</sup> multiple-partners/some-protection: Nineteen percent of black youth belonged to this cluster at Wave 2, compared with 9% of white and 7% of Latino youth. Although membership in

this high-risk cluster increased for all three racial and ethnic groups from Wave 1 to Wave 2, black and Latino men maintained the highest proportions at Wave 3 (16% and 6%, respectively). At each wave, a greater proportion of young black men than of their white or Latino peers were in the low-risk/high-protection group, whereas a greater proportion of white or Latino youth than of black youth were in the low-risk/low-protection group. Condom use decreases as relationship duration and age increase.<sup>36</sup> The pronounced larger membership in the low-risk/high-protection cluster among black adolescents may reflect either that they take longer than their white and Latino peers to establish long-term monogamous sexual relationships or that they lack trust in their sexual partners' fidelity or STD status, or vice versa.

According to all five STD measures, young black men exhibited higher levels of STD than did their white or Latino peers (Figure 2, page 53); the STD levels for white and Latino youth did not differ. At Wave 3, 30% of young black men had ever received an STD diagnosis, 6% reported that they had received an STD diagnosis in the past year and 9% tested positive for chlamydia. In comparison, 9% of white and Latino youth had ever received an STD diagnosis, fewer than 1% had received a recent STD diagnosis and 3% had a positive chlamydia test.

**Racial-Ethnic Risk Trajectories**

Sexual behavior trajectory distributions by race and ethnicity provide a context for the STD outcomes shown in Figure 2. Among the 1,290 men for whom we had data from all three waves, the largest proportion of each racial and ethnic group followed a trajectory of steady low risk (Table 2, page 54); how normative this trajectory was, however, differed by race and ethnicity. Greater proportions of white and Latino youth than of black youth were in low-risk clusters across all three waves (54% and 49% vs. 33%). Nearly as large a proportion of black males followed a trajectory of downward risk (30%) as did one of steady low risk. In addition, one-third had been in a high-risk group for at least two waves (not shown); by comparison, 15% of young white and Latino men reported high sexual risk for at least two waves. A greater proportion of black men than of their white or Latino peers followed the

steady high-risk category (9% vs. 2% and 4%). A smaller proportion of white youth than of Latino or black youth increased from low risk at Wave 1 to high risk at Wave 3 (4% vs. 8% and 11%, respectively).

After we controlled for socioeconomic characteristics in multinomial logistic regression analyses, both black and Latino men were more likely than their white peers to be in steady high-risk and upward trajectory groups rather than in the steady low-risk group (odds ratios, 1.7–1.9; Table 3, page 54). Latino men had greater odds than white men of following the downward risk trajectory rather than the steady low (1.3); black males appeared to leave greater odds than white males of following the peak high and downward trajectories, but the findings were only marginally significant (1.2 each). Hence, higher sexual risk behavior may account, at least in part, for higher STD reports among black men.

**STD Outcomes by Race-Ethnicity**

In logistic regression analyses controlling for a fairly extensive set of socioeconomic factors, black males—but not Latino males—were more likely than white males to have an STD history (Table 4, page 55). Depending on the outcome, black youth had 3–5 times the odds of white youth of having had an STD (odds ratios, 3.2–5.0). When we added sexual risk trajectories to the models, the odds ratios for black men did not diminish substantially and remained significant (2.9–4.1), suggesting that racial disparities in STDs are not completely explained by racial differences in risky sexual behavior. We found some significant relationships between risk trajectory and STD outcome: Men with steady high risk and men with downward risk were more likely than those with steady low risk to have ever received an STD diagnosis (2.9 and 2.0, respectively), whereas men with upward risk were less likely than those with steady low risk to have received an STD diagnosis in the past year (0.2). Thus, the similarities in findings of these two models are not due to a lack of significant relationships between risk trajectory and STD outcome. These findings support the conclusion that race and ethnicity and sexual risk behaviors both predict ever having an STD into early adulthood.

We further explored the finding that sexual behaviors do not fully mediate the relationship between race and ethnicity and STD outcomes, and found that within each risk trajectory, a greater proportion of black youth than of white youth had an STD history (Table 5). Of particular note, even among those who had a steady low risk, a greater proportion of black men than of white or Latino men had ever received an STD diagnosis (19% vs. 5% each).

**DISCUSSION**

Even after sexual risk trajectories and a range of social and economic variables were controlled, black men were more likely than their white peers to have an STD history. Moreover, although young black and Latino men

**TABLE 5. Percentage of young men experiencing selected STD outcomes, by risk trajectory, according to race or ethnicity**

| Risk trajectory | Black        |               |                    | White      |               |                    | Latino      |               |                    |
|-----------------|--------------|---------------|--------------------|------------|---------------|--------------------|-------------|---------------|--------------------|
|                 | STD ever     | STD last year | Positive chlamydia | STD ever   | STD last year | Positive chlamydia | STD ever    | STD last year | Positive chlamydia |
| <b>All</b>      | <b>28.9*</b> | <b>5.5*</b>   | <b>8.7*</b>        | <b>8.4</b> | <b>0.6</b>    | <b>2.7</b>         | <b>8.0†</b> | <b>0.7†</b>   | <b>2.4†</b>        |
| Steady low      | 18.8*        | 1.4           | 9.6*               | 5.1        | 0.8           | 4.2                | 4.6*,†      | 0.4           | 2.2*,†             |
| Peak high       | 27.7         | 3.4           | 7.4*               | 17.1       | 0.2           | 0.2                | 19.0        | 0.9           | 1.0*,†             |
| Downward        | 29.6*        | 6.7*          | 6.1*               | 6.8        | 0.0           | 0.7                | 6.1†        | 0.0†          | 2.4*,†             |
| Upward          | 43.8*        | 19.0*         | 9.7                | 18.8       | 1.9           | 5.9                | 16.8*,†     | 2.7*,†        | 8.6                |
| Steady high     | 47.7*        | 5.9           | 15.5               | 16.2       | 0.0           | 0.0                | 13.5†       | 9.6           | 0.0                |

\*Differs from percentage for whites at p<.05. †Differs from percentage for blacks at p<.05. Note: All percentages are weighted.

exhibited higher levels of risky sexual behavior than white youth—which is consistent with previous findings<sup>25,27,28</sup>—our controlling for these behaviors did not substantially change the association. In fact, we observed large disparities between black and white youth even within groups that had very low levels of risky behavior.

What is causing these disparities? Social context might be one avenue for further research to explore. In particular, the relatively high STD levels documented here might themselves be responsible, given that women and men tend to have sex with people who share their social and demographic characteristics.<sup>37</sup> If people select their partners from within their own racial and ethnic groups, and one group has a higher level of STDs than others, then regardless of behavior, members of this group will be at higher risk. This may explain our finding that 19% of black men with a steady low risk had an STD history—a proportion higher than those among white and Latino men with a steady high risk. Policies and interventions to combat disparities that respond to environmental or network differences would be quite different from those that aim to change behaviors. Future research would benefit from examining the romantic and sexual networks of young men, to assess the degree to which these networks predict STD outcomes independently of sexual behavior, sexual debut, race and ethnicity. Knowing the STD prevalence rates of census tracts and the male-to-female ratio within these tracts may help disentangle the unmeasured variance being assumed by race and ethnicity.

Furthermore, mapping the density and availability of sexual and reproductive health services, as well as pharmacies and drugstores that carry condoms, may provide insight into whether racial and ethnic disparities exist for STD prevention and treatment. A finding of disparities in access to condoms may explain why sexual risk-taking and STD outcomes were more prevalent among black men than white men, and would provide insight into different and potentially more effective preventive strategies.

Measurement error is also an issue. Youth may report condom use, but may not use condoms properly during all forms of sexual activity (including oral sex). Intervention and prevention strategies need to cover how to use condoms effectively and consistently when engaging in any type of sex. Likewise, survey items that assess only whether a condom was ever used, used at last intercourse or used at first intercourse are not sufficient to describe true STD risk and exposure.

### **Strengths and Limitations**

One of the most obvious limitations of this study is that the findings cannot be generalized to young women. Much past research has been conducted on women. One way to include women in a study of sexual risk behaviors and STD outcomes is to examine sexual networks of men. In addition, although we used all possible measures contained in NSAM to capture socioeconomic status in youth, our measures of current socioeconomic status were

limited. Our race and ethnicity variable may account for variance typically explained by unavailable measures of socioeconomic status.

Longitudinal data, such as the NSAM data we used, are both an asset and a challenge. They provide the opportunity to examine change and stability over developmental stages, and the approach we used went beyond the individual to examine clusters and cluster trajectories. Attrition, however, poses serious selection concerns and power issues for which sampling, design and attrition weights can only partially adjust. Stratification by race and ethnicity further reduces cell sizes. One benefit of NSAM, however, is that it oversampled minority men; we therefore were able to examine differential trends in sexual risk by race and ethnicity for each wave and across waves, and to link these trends to STD outcomes for all three racial and ethnic groups. We are confident that our findings will spark future research into the mechanisms by which race and ethnicity predict differences independently of demographic characteristics. Modeling mechanisms will move the field forward in terms of STD prevention and intervention efforts.

Even though the most recent NSAM data were collected in 1995, the 21–26-year-old men resemble same-aged male respondents from the 2002 NSFG in terms of sexual risk-taking variables we used to create our clusters.<sup>30</sup> Furthermore, as NSAM Wave 4 data are expected to be available for analysis in early 2012, the exploration of sexual risk-taking trajectories by race and ethnicity can be extended to middle adulthood and to other outcomes later in life. NSAM remains the only longitudinal data set with information on men's sexual and reproductive behaviors and HIV risk factors in this degree of depth. The measures collected, including urine samples for clinical STD testing, remain unparalleled by other data and continue to allow for innovative models of men's behaviors and outcomes.

### **Conclusions**

Our results corroborate a growing body of literature that posits that individual-level risk behaviors alone do not account for racial and ethnic disparities in STD prevalence and incidence. In fact, network-level factors, such as concurrent sexual partnerships and sexual mixing patterns, may account for observed disparities.<sup>38–41</sup> The implications are important, given that the past and current national strategy for achieving positive sexual and reproductive health is to promote minimal exposure to and engagement in sexual risk behaviors. Steady low sexual risk for black men, compared with steady low sexual risk for white and Latino men, is not as effective in preventing STD outcomes, even if black men's levels of such outcomes are lower than those of their black peers who engage in riskier behaviors.

Minimizing sexual risk behaviors, however, does matter. Since 1988, the use of condoms—primarily as a single method of protection—has increased remarkably among teenagers in the United States.<sup>9,10,12–14</sup> Yet, STD incidence

among youth is increasing at a faster pace.<sup>7</sup> But interventions focusing only on individual-level factors have had limited success in curbing STD disparities.<sup>42,43</sup> Developers of STD prevention programs need to recognize that STD transmission is influenced not simply by one's own risk behaviors, but also by the risk of one's sexual partners.<sup>37</sup>

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