

# STD and HIV Testing Behaviors Among Black And Puerto Rican Young Adults

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**CONTEXT:** Given the high rates of infection among urban young adults, STD and HIV testing promotion is a public health priority. To inform future testing efforts, lifetime and recent testing behaviors of this population within casual and serious relationships should be better understood.

**METHODS:** Data from a 2007–2008 study conducted in select neighborhoods in Hartford and Philadelphia were used to examine self-reported STD and HIV testing behaviors and attitudes among 483 sexually active black and Puerto Rican young adults aged 18–25. Multivariate ordered logit regression analyses were conducted to assess characteristics associated with lifetime number of STD tests.

**RESULTS:** More than eight in 10 participants reported having been tested for STDs, and a similar proportion for HIV, most of them multiple times. Nineteen percent had ever had an STD diagnosis. A majority—86%—perceived their risk of STD infection in the next year as “not at all likely.” Sixty-one percent of those in serious relationships reported that both partners had been tested, compared with 25% of those in casual relationships. Characteristics associated with higher lifetime number of STD tests were being female (odds ratio, 2.2), being from Philadelphia (2.5), being black (1.5), having lived with two or more serious partners (1.7) and having ever received an STD diagnosis (2.3).

**DISCUSSION:** Despite their risks, participants did not perceive themselves to be at risk of STDs. However, they did report testing repeatedly. Testing was highly acceptable, particularly within serious relationships. Questions about the timing of testing initiation and repeat testing merit attention for the benefits of widespread testing to be fully realized.

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The burden of STDs among adolescents and young adults in the United States is well known. In 2009, women aged 15–19 had the highest rate of chlamydia of any group categorized by age and sex (3,330 cases per 100,000 population); they were followed closely by women aged 20–24 (3,274 cases per 100,000). Among men, those aged 20–24 had the highest rate of chlamydia (1,121 per 100,000). A similar pattern for both sexes was seen for gonorrhea.<sup>1</sup> Black youth face particularly high rates of infection for nearly all STDs, including HIV.<sup>2–4</sup>

While typically lower than those for blacks, STD infection rates for Hispanics are often many times those for whites. For example, in 2009, the rate of HIV diagnosis among 20–24-year-olds was 144.7 per 100,000 for blacks, 38.3 per 100,000 for Hispanics and 11.2 per 100,000 for whites.<sup>5</sup> These racial and ethnic disparities have been a steady cause for concern within the STD and HIV fields, and are thought to be related to a combination of factors, including socioeconomic, social network and other epidemiologic characteristics.<sup>6,7</sup>

Given the relatively high prevalence and the asymptomatic nature of many STDs, testing is a key public health recommendation. The Centers for Disease Control and Prevention (CDC) recommends annual chlamydia screening for all sexually active women aged 25 or younger, and

annual gonorrhea screening for women in this age-group at increased risk (e.g., because of a history of STDs or multiple sex partners); testing for reinfection is recommended three months after a positive result.<sup>8</sup> The CDC also recommends that clinicians in all health care settings screen all adults and adolescents for HIV, and that people likely to be at high risk for HIV (e.g., injection-drug users and partners of HIV-infected persons) get tested annually.<sup>9</sup> Evidence to support recommendations for testing initiation and repeat testing is growing.<sup>10,11</sup>

The prevalence of STD and HIV testing among adolescents and young adults is one of the nation's indicators for sexual health.<sup>12</sup> Prevalence estimates vary widely, depending on the data source, the measures and the population studied. National health claims data from Medicaid showed that in 2009, 57% of sexually active females aged 16–25 had been screened for chlamydia in the preceding year—a significant increase from 51% in 2005 and 40% in 2001.<sup>13</sup> STD testing prevalence has been consistently high in studies with self-reported data and from samples at relatively high risk for infection; for example, 70% of a sample of homeless youth reported testing over a 24-month period,<sup>14</sup> and 70% of urban young women sampled in high-prevalence communities reported testing in the last 12 months.<sup>15</sup>

Studies about HIV testing show similar variation. Among men and women aged 18–22 who participated in the 2002 National Survey of Family Growth, 27% of students and 43% of nonstudents reported having been tested for HIV for reasons other than blood donation.<sup>16</sup> In a national sample of college students, 43% of blacks and 24% of whites had ever been tested.<sup>17</sup> Among a large sample of sexually active black adolescents from four cities, 34% of females and 23% of males reported ever having been tested; of these, 41% reported that their most recent test had been in the preceding three months.<sup>18</sup>

Several characteristics associated with STD infection<sup>2,3</sup> are also associated with testing: Women, blacks and individuals with multiple sexual partners are more likely than others to report STD or HIV testing<sup>14,15,18–20</sup> (although in two studies, number of sexual partners was not associated with testing in multivariate analyses<sup>14,18</sup>). Other correlates positively associated with STD or HIV testing have included having public health insurance,<sup>21,22</sup> perceiving STD-related stigma as low,<sup>15</sup> having had a physical exam in the preceding year<sup>20</sup> and having a history of pregnancy involvement.<sup>14,18</sup> Access to services, discomfort with testing procedures and concerns about confidentiality also emerged as barriers to STD testing in qualitative studies.<sup>23–26</sup>

Despite the importance of the timing of testing initiation and repeat testing to effective screening and treatment, not many studies have assessed these aspects of testing. Tu and colleagues found that among adolescents who had ever been tested, the median age at first STD test was 15 years, approximately one year after the median age at first intercourse.<sup>10</sup> However, younger ages at first sex did not translate into younger ages at first test; rather, the younger the age at first sex, the longer the lag time before first test. Using commercial health plan claims data, Heijne and colleagues found that among women aged 15–24 who had been insured for five years, fewer than 1% were tested annually, and 74% were never tested.<sup>27</sup> The prevalence of repeat testing may be greater among higher risk populations, but it still lags behind public health recommendations.<sup>28,29</sup> Hall and colleagues found that among young adults aged 20–24 who had received an HIV diagnosis, two-thirds indicated that they had been tested for HIV at least one time prior to receiving their diagnosis.

Qualitative studies in the United States and Europe have illustrated some reasons that individuals seek STD testing, beside experiencing physical symptoms of an STD. For some people, these reasons reflect the relevance of relationship-level events—unprotected sex with a new partner, a life or relationship transition (e.g., from a “wild” period in one’s life to a less “wild” period, or from a casual to a serious relationship), or concerns about a partner’s trustworthiness or fidelity.<sup>23–25,30,31</sup> For others, STD testing could be described as routine, as it apparently was for the 59% of females and 42% of males in Cunningham and colleagues’ survey of Baltimore youth who reported that

their most recent test occurred as part of a routine medical checkup.<sup>15</sup>

In the study described here, we examined the testing behaviors of black and Puerto Rican young adults aged 18–25, using data from street-intercept surveys conducted in Philadelphia and Hartford in 2007–2008. We explored testing behaviors for both HIV and other STDs across these young adults’ lifetimes and within their recent sexual relationships. The aim was to provide a more comprehensive picture of testing behaviors for this at-risk population and assess the degree to which testing is normalized in their lives and relationships.

## METHODS

### Data

We analyzed data from the Philadelphia and Hartford Research and Education on Sexual Health and Communication (PHRESH) project, which was funded by the CDC and carried out in 2004–2008 by the University of Connecticut and the Family Planning Council in Philadelphia. The study was approved by the institutional review boards of the CDC and partner institutions.

The project was conducted in select neighborhoods with relatively high STD and teen pregnancy rates and high proportions of black or Puerto Rican populations. For this study, we relied on the quantitative survey carried out in 2007–2008 among 483 black and Puerto Rican participants, who were recruited by study teams using a time-place sampling methodology.<sup>32,33</sup> The teams mapped neighborhood sites in the two cities where members of the study demographic gathered on a regular basis, such as Laundromats, bus stops, corner stores and parks. They used that information to create sampling frames from which they randomly selected recruitment sites to fill their fieldwork calendars. Most venues were eligible for selection for all sampling periods, most of which were during the day and included weekdays and weekends. During sampling periods, research staff approached individuals who appeared to be from the target population, attempting interviews with as many eligible individuals as possible. Most people who were eligible and agreed to participate completed the survey in a private area at or adjacent to the recruitment venue.

In Hartford, the sampling frame comprised 41 venues distributed across nine neighborhoods. Some 478 people were screened; 108 were deemed ineligible, 76 eligible people declined to participate and 53 did not show up for interview appointments (which had to be scheduled because of inclement weather conditions on the day of recruitment). In total, 241 individuals (50% of all screened) completed interviews in Hartford. The Philadelphia study team created three sampling frames, two for blacks and one for Puerto Ricans, crossing seven zip codes, with a total of 207 venues. The interview teams screened 325 people. Of those, 74 were ineligible, and nine eligible people declined to participate; 242 individuals (75% of all screened) completed interviews in Philadelphia.

To be eligible, participants had to identify themselves as Puerto Rican, African American or black; be aged 18–25; have been born on the U.S. mainland or in Puerto Rico; speak English fluently; and have had sex with a heterosexual partner in the preceding six months. Females could not be pregnant at the time of the survey. The study teams recruited roughly equal numbers of males and females, and of Puerto Rican and black participants, to facilitate comparative analysis by these characteristics and for consistency with the qualitative data components of PHRESH. Survey interviews lasted 20–30 minutes each, and participants were compensated \$35.

The survey content was informed by previous literature, as well as qualitative data collected as part of the larger research project. Participants were asked separately about HIV testing and other STD testing;\* questions covered their age at first test, age at most recent test, reasons for last test and lifetime number of tests, as well as whether they shared the results of the most recent test with a partner. In addition, participants were asked for their perceptions of their risk of STD infection in the next year, and for their beliefs about how often people their age and in their neighborhoods got tested for STDs, worried about getting an STD and worried about getting HIV.

Participants also were asked about all partners from the last six months, and answered in-depth questions about their most recent serious and casual sexual partners (defined by them, but explicitly excluding one-night stands). For these two kinds of partners, interviewers asked whether the participant had talked with the partner about going for STD and HIV testing, and if either or both had gotten tested, since beginning the relationship. In addition, participants were asked whether they had talked with their partner, both before and after first having sex within the relationship, about past STD or HIV diagnoses and testing. The questionnaire also included other demographic, relationship and sexual behavior measures; it did not include questions about current STD or HIV infection, and the study did not conduct testing.

**Analysis**

We present descriptive statistics of reported testing behaviors, highlighting comparisons by sex, ethnicity and city. For all statistical tests shown, we adjusted for clustering by participants' zip code of residence. To facilitate interpretation, for many attitudinal variables, scaled response categories were collapsed, depending on the distribution. We used adjusted Wald tests to compare means and corrected Pearson tests that were converted to F statistics to compare categorical variables. Because a number of par-

\*Prior to the main section on STDs, the questionnaire read, "The questions in this section focus on STDs, or sexually transmitted diseases. STDs include things like chlamydia, gonorrhea, trich (trichomonas), genital herpes, hepatitis B, HPV (human papillomavirus) and syphilis. We will wait until the next section of the survey to talk about HIV, or the virus that causes AIDS."

**TABLE 1. Selected characteristics of a community-based sample of Puerto Rican and black young adults in Philadelphia and Hartford, 2007–2008**

Characteristic	% or median (N=483)
Female	50
Puerto Rican	50
From Philadelphia	50
Median age (range, 18–25)	21
In school	32
Educational attainment	
<high school	38
High school	49
>high school	13
Employed	46
Ever been in jail/prison	35
Living with partner	25
Living with parent	30
Ever lived with a serious partner	79
Had biological children	51
Had >1 partner in the last six mos.	33
Median lifetime no. of partners (range, 1–400)	7
Median age at first vaginal sex (range, 9–23)	14

Notes: Unless otherwise noted, data are percentages. Data on partners refer to heterosexual partners. N=481 for educational attainment and 482 for ever having lived with a partner.

ticipants reported on both casual and serious partners, we did not run statistical tests to compare characteristics of those relationship types; instead, we present only 95% confidence intervals.

We also carried out multivariate ordered logit regression to identify predictors of participants' reported lifetime number of STD tests. Potential correlates were selected on the basis of past literature and data availability: sex; ethnicity; city; age (measured as a continuous variable); educational attainment (less than high school, high school, more than high school); history of cohabitation within a serious, committed relationship (0–1 time, 2 or more times); history of STD diagnosis (ever, never); age at first vaginal sex (younger than 14, 14 or older), number of biological children (0–1, 2 or more); and lifetime number of heterosexual partners (1–3, 4–6, 7–10, 11 or more). We assessed a variety of categorical cutpoints for age at first vaginal sex, number of children, times cohabited and lifetime number of partners. Final categories were selected on the basis of observed differences or, if results were similar regardless of categorical scheme, for parsimony. The final model includes variables that were significant at the .10 level in bivariate analysis or that became significant at the .05 level in a multivariate model. The test for the assumption of proportional odds for the ordered logit model had a p value of .054, indicating that the assumption was nearly violated at the .05 level. However, none of the same tests of individual variables was significant. We also applied a continuation ratio model and a stereotype logistic regression model to these data; both of these relax the assumptions of proportional odds and achieved similar results. We show the ordered logit results for ease of interpretation. Finally, we assessed reported lifetime number of HIV tests in a similar way for comparison.

## RESULTS

These young adults varied in their socioeconomic characteristics and their reproductive and sexual behavior histories (Table 1). For example, 38% had attained less than a high school education, and 46% were employed. Most participants had ever lived with a serious sexual partner, and half had at least one child. One-third of participants reported more than one heterosexual sexual partner in the previous six months, and the median lifetime number of sexual partners was seven. Most participants (71%) had had only a serious partner in the prior six months, and 13% reported on both a serious and a casual partner; on average, serious relationships had lasted about two years, while casual relationships had lasted four months (not shown).

### Lifetime and Recent Testing Behaviors

Eighty-nine percent of participants reported having been tested for STDs, and 84% for HIV (Table 2). Across all subgroups, about one-third of participants (27–40%) reported having been tested 2–3 times, for both outcomes, but substantial proportions reported having been tested eight or more times (5–26%). Women and participants from Philadelphia tended to report more lifetime testing of both STDs and HIV than their respective counterparts. While women initiated sex at a later age than men (mean, 14.9 vs. 13.8), women and men had their first STD test around the same age (16.4 vs. 16.7), indicating that men delayed their first test for longer than women did. Women also reported older age at most recent STD test, resulting in an average of 4.3 years between first and last test, com-

pared with 3.3 years for men. Although the specific rate or pace of testing could not be calculated from these data, the figures suggest that participants had had about one test per year since initiating testing. In general, the earlier the age at first test, the higher the lifetime number of tests reported (not shown). Half of participants (51%) who had ever been tested for STDs were the same age at their most recent test as they were at the interview, indicating recent testing or certainly testing within the previous year. The finding was similar for HIV testing (45%—not shown).

Participants were asked to indicate a single, main reason for their most recent STD and HIV tests. The response distributions (not shown) were similar for both outcomes. Forty-one percent and 47%, respectively, cited peace of mind; 18% and 15% reported that testing was part of a physical exam. Other reasons were that participants got tested on a regular basis (12% and 11%), worried they had acquired an STD or HIV (10% and 7%) and had a new sexual partner (3% and 2%). Pregnancy (or partner's pregnancy) was the main reason for 10% of most recent HIV tests, and recommendations from a sexual partner, health department representative or health care provider were the motivation for a combined 10% of most recent STD tests.

Majorities of all subgroups reported sharing their most recent STD and HIV test results with a partner (76–89%—Table 3, page 242). Nineteen percent overall reported ever having received an STD diagnosis. (The questionnaire did not ask about HIV infection.) A larger proportion of women than of men reported having received an STD diagnosis (28% vs. 9%). However,

**TABLE 2. Selected measures of lifetime STD and HIV testing history among Puerto Rican and black young adults in Philadelphia and Hartford**

Measure	All	Gender		Race/ethnicity		City	
		Male	Female	Puerto Rican	Black	Philadelphia	Hartford
<b>PERCENTAGE DISTRIBUTIONS</b>							
<b>Lifetime no. of STD tests</b>							
0	11	17	6**	15	7	9	13**
1	12	14	9	13	11	9	14
2–3	32	37	27	29	35	29	35
4–5	17	14	19	16	17	15	18
6–7	10	8	13	10	11	12	9
≥8	18	10	26	17	19	26	10
<b>Lifetime no. of HIV tests</b>							
0	16	24	9**	20	13	15	18**
1	18	20	16	17	19	15	22
2–3	33	32	35	27	40	30	36
4–5	13	11	15	14	11	12	13
6–7	7	5	8	6	8	8	5
≥8	13	8	17	16	9	20	5
Total	100	100	100	100	100	100	100
<b>MEANS</b>							
<b>Age at first sex</b>	14.4	13.8	14.9**	14.3	14.5	14.5	14.3
<b>Age at first STD test†</b>	16.5	16.7	16.4	16.5	16.6	16.4	16.7
<b>Age at most recent STD test†</b>	20.4	20.0	20.7**	20.4	20.4	20.5	20.4
<b>Age at first HIV test‡</b>	17.1	17.5	16.8*	16.8	17.3	16.8	17.3
<b>Age at most recent HIV test‡</b>	20.4	20.2	20.6	20.5	20.3	20.5	20.3

\*p<.05. \*\*p<.01. †Among those who ever tested for STDs. ‡Among those who ever tested for HIV. Notes: Ns vary from 427 to 481. Percentages may not add to 100 because of rounding.

**TABLE 3. Percentage distribution of Puerto Rican and black young adults in Philadelphia and Hartford, by STD and HIV testing behaviors and attitudes, according to gender, race or ethnicity, and city**

Measure	All	Gender		Race/ethnicity		City	
		Male	Female	Puerto Rican	Black	Philadelphia	Hartford
<b>Shared most recent STD test result with partner</b>							
Yes	81	76	86	78	85	80	83
No	19	24	14	22	15	20	17
<b>Shared most recent HIV test result with partner</b>							
Yes	86	82	89	86	86	86	86
No	14	18	11	14	14	14	14
<b>Ever had an STD</b>							
Yes	19	9	28**	16	22	18	20
No	81	91	72	84	78	82	80
<b>Self-perceived risk of getting an STD in next year</b>							
Not at all likely	86	86	86	85	86	83	89**
Other response†	14	14	14	15	14	17	11
<b>Perceived % of neighborhood peers who have had ≥1 STD test</b>							
Very few	29	37	22**	31	27	31	28
<half	17	23	11	18	16	17	17
About half	23	18	28	23	23	21	25
>half	14	10	18	14	15	14	14
Almost all	10	5	15	7	13	12	7
Don't know	7	7	6	7	6	5	9
<b>Perceived neighborhood peers' worry about getting an STD</b>							
Never/a little	44	42	46	47	42	51	37*
Some/a lot	54	56	52	51	57	47	61
Don't know	2	2	2	2	2	2	2
<b>Perceived neighborhood peers' worry about getting HIV</b>							
Never/a little	39	37	41	39	39	47	31*
Some/a lot	60	63	57	60	60	51	68
Don't know	1	<1	2	1	1	1	1
Total	100	100	100	100	100	100	100

\*p<.05. \*\*p<.01. †A little, somewhat, very or extremely likely, or don't know. Notes: Ns vary from 393 to 483. Percentages may not add to 100 because of rounding.

the majority of participants believed that they were not at all likely to get an STD in the next year (86%). Perceptions were similar across subgroups except that the proportion considering themselves risk-free was lower in Philadelphia than in Hartford (83% vs. 89%). Self-perceived risk of STD in the next year was not associated with history of lifetime testing (not shown).

Though nearly all survey participants had had an STD test, 29% believed that very few people their age in their neighborhoods had ever been tested, and only 10% thought that almost all had. Men were slightly more pessimistic than women about their peers' testing behavior: Thirty-seven percent and 22%, respectively, believed very few of their peers had been tested. Forty-four percent of participants believed their peers never worried or worried a little about getting an STD, while 39% gave these responses with regard to getting HIV. For both issues, significantly larger proportions of participants from Philadelphia than from Hartford gave these answers.

**Testing and Communication About Testing**

•**Within recent relationships.** Both discussion about testing and testing were common within participants' most recent sexual relationships, particularly serious ones (Table 4). Seventy-seven percent of participants reporting serious relationships said that they had ever talked with their partner about "getting tested for STDs or HIV, so they wouldn't have to worry about STD or HIV," compared with 39% of those reporting casual relationships. The majority of people in serious relationships also had asked their partner about his or her testing history: 40% both before and after the couple first had sex, and 25% either before or after. Although discussion of testing-related issues was less common within casual relationships, 30% of participants in such relationships reported talking with their partner about past testing both before and after first sex. Similar patterns were evident for communication measures related to past STD and HIV diagnoses and testing (not shown). The difference by

**TABLE 4. Percentage distribution of Puerto Rican and black young adults in Philadelphia and Hartford, by STD and HIV testing and communication in the preceding six months, by partner type**

Measure	Serious partner (N=403)	Casual partner (N=131)
<b>Ever talk about getting tested</b>		
Yes	77 (72–82)	39 (28–51)
No	23 (18–28)	61 (49–72)
<b>Ever asked about partner's testing history</b>		
Never	35 (27–44)	57 (47–67)
Before first sex	15 (11–22)	8 (4–14)
After first sex	10 (5–16)	5 (2–11)
Before and after first sex	40 (33–48)	30 (21–42)
<b>Tested within relationship</b>		
Neither	17 (13–22)	45 (34–56)
Participant only	18 (15–22)	29 (22–37)
Partner only	4 (2–6)	2 (0–6)
Both	61 (55–67)	25 (18–34)
Total	100	100

Notes: Figures in parentheses are 95% confidence intervals. Percentages may not add to 100 because of rounding.

relationship context was emphasized by the 61 participants who reported both relationship types. Most of those reported different communication patterns for their two relationships (not shown). Testing within serious and casual relationships was also fairly common; the proportions of participants reporting that they, their partner or both had been tested were above 50% for both relationship types. However, testing by both partners was more common within serious relationships than within casual ones (61% vs. 25%).

### Characteristics Associated with Testing

Results of the multivariate ordered logit regression assess associations between select participant characteristics and the odds of moving from any one category of number of lifetime tests to the next higher one (e.g., from 2–3 to 4–5 lifetime tests). In other words, they reflect associations between participants' characteristics and a latent tendency toward more testing. They are similar to the results of logistic regression, yet the model utilizes the full range of responses in an ordered, categorical outcome (i.e., the increasing numbers of tests) to estimate the odds ratios.

Females and participants from Philadelphia were likely to report a higher lifetime number of tests than males and those from Hartford, after adjustment for other characteristics (odds ratios, 2.2 and 2.5, respectively—Table 5). Blacks were likely to report more STD testing than Puerto Ricans, though the magnitude of that difference was less than that for sex and city (1.5). A history of cohabiting at least twice with a serious partner also was positively associated with lifetime number of STD tests (1.7). Lifetime number of tests was also positively associated with having had an STD diagnosis (2.3). Age and having two or more biological children both became nonsignificant in the multivariate model. Educational attainment, age at first

**TABLE 5. Odds ratios (and 95% confidence intervals) from bivariate and multivariate ordered logit analyses assessing associations between selected characteristics of Puerto Rican and black young adults and their lifetime number of STD tests**

Characteristic	Bivariate	Multivariate
<b>Gender</b>		
Male (ref)	1.00	1.00
Female	2.86**	2.22 (1.77–2.77)**
<b>City</b>		
Hartford (ref)	1.00	1.00
Philadelphia	2.04**	2.52 (2.00–3.16)**
<b>Race/ethnicity</b>		
Puerto Rican (ref)	1.00	1.00
Black	1.32	1.46 (1.04–2.05)*
<b>Age</b>		
	1.17**	1.08 (1.00–1.18)
<b>Educational attainment</b>		
<high school (ref)	1.00	na
High school	1.02	na
>high school	1.75	na
<b>Ever lived with a serious partner</b>		
<2 times (ref)	1.00	1.00
≥2 times	1.69**	1.66 (1.24–2.22)**
<b>STD diagnosis</b>		
Never (ref)	1.00	1.00
Ever	3.20**	2.31 (1.36–3.94)**
<b>Had biological children</b>		
<2 (ref)	1.00	1.00
≥2	2.32**	1.56 (0.94–2.58)
<b>Age at first vaginal sex</b>		
≥14 (ref)	1.00	na
<14	1.18	na
<b>Lifetime no. of sexual partners</b>		
1–3 (ref)	1.00	na
4–6	1.10	na
7–10	1.06	na
>10	0.82	na

\*p<.05. \*\*p<.01. Notes: N=472 for the multivariate model. ref=reference group. na=not applicable.

sex and lifetime number of partners were not associated with STD testing.

In the analogous analysis of lifetime HIV tests, the results were similar (not shown). The two exceptions were that ethnicity was not significant, and having some college education was positively associated with testing (odds ratio, 1.8, p<.05).

### DISCUSSION

The young adults in this study represent a priority population for testing efforts—ethnic minorities living in urban areas with relatively high rates of STD and HIV. These young adults reported high prevalence of testing, and repeat testing, for STDs—even higher than levels reported in other studies about youth.<sup>15,17,22</sup> Our exclusion of adolescents younger than 18 may partially account for these differences, but the high prevalence of testing could also reflect increased acceptability of testing in this study's population, time period and locations.

Differences in testing behaviors and attitudes between men and women were evident, but these differences were not as large as those seen in some other studies.<sup>15,19</sup> For various reasons, women tend to access health care more often and regularly than men.<sup>34</sup> Nevertheless, a large proportion of young men in this study reported having been tested numerous times, indicating good access to and use of those services. Differences by ethnicity were few and relatively small, while differences by city were notable. The two cities are distinct in size, composition, wealth and health service infrastructure—Philadelphia outweighs Hartford on all counts—so some differences are perhaps unsurprising. Also, Philadelphia implemented an STD testing campaign across its high schools in the middle of the last decade and a rapid HIV testing program in public health clinics in 2007, which may help account for the differences in testing.<sup>35–37</sup>

Two findings highlight the relevance of relationship context to some testing behaviors—the greater level of testing and communication about testing in serious relationships than in casual relationships, and the positive independent association between lifetime number of STD tests and a history of cohabitation (as a potential marker for having had at least two fairly serious relationships). The reported communication differences may simply reflect more opportunity to talk about testing and to get tested, given differences in how long serious and casual relationships lasted. However, the differences in communication might also reflect a particular role for testing, as a means of handling suspicion or acts of infidelity, or a transition away from condom use. Other research has begun to document the latter scenario,<sup>31,38</sup> but the timing and meaning of testing within relationships need to be further explored, particularly with longitudinal data.

The fact that most of these young adults reported having been tested multiple times for STDs and HIV is significant. First, it indicates that large proportions of them were regularly accessing sexual health care services. The relatively frequent testing, mixed with a low sense of risk of future STD infection, is consistent with the notion that these young adults may have viewed testing as preventive or part of a sexual health checkup. The many participants who said that they get tested on a regular basis or for peace of mind further support this idea.

The results most clearly indicate that these young adults viewed repeat testing as acceptable. The relatively high amount of discussion about testing within sexual relationships, particularly serious ones, as well as the high proportions of participants reporting that they shared their last test results with a sexual partner, further indicates that testing is far from taboo and perhaps is expected among these sexually active young adults. However, there are still important areas for improvement in this population's openness about STD risk and testing. Participants guessed that relatively few of their peers have tested for STDs (contrary to their

own behavior), perhaps suggesting that many kept their testing behaviors fairly private. Also, there were large gaps in communication about STD and HIV testing in casual relationships.

### Limitations

Self-reported data on STD and HIV testing are fairly reliable, but have shortcomings.<sup>39</sup> They suffer from the typical recall problems that many measures of sexual risk behaviors do.<sup>40</sup> Moreover, some people may have mistakenly believed they were tested for STDs and HIV because of misunderstanding about what specific tests were done during a clinical encounter. For example, confusion of the Pap smear with STD testing and related misperceptions could lead to significant overreporting of testing among women.<sup>41–43</sup> The stark similarity in reported testing patterns for STDs and HIV, identified also in other research,<sup>18,19</sup> may in part reflect integration of testing services, but also raises serious concern about misunderstandings about what specific tests include.

The degree to which respondents may have misestimated their lifetime testing or related attitudes is unknown. Given the relatively frequent testing reported, however, it seems unlikely that as a whole, participants underestimated their lifetime testing. A bias in favor of reporting on testing could actually indicate good news, suggesting that testing is not as stigmatized as it once was or is in some populations.<sup>44</sup>

Additional limitations of this study include the venue-based community sample, which represents the Puerto Rican and black young adults who visited the sampling sites. Generalization of the results to other ethnic groups in Hartford and Philadelphia, or to young adults more broadly, is unwarranted, but it is unlikely that this survey's participants were very distinct from their peers in similar urban settings in the region. Also, the limited set of measures we had to evaluate correlates of lifetime testing behaviors resulted in an exploratory analysis that sheds no light on causality. Finally, though we had some unique measures of testing and testing attitudes, there were notable gaps—for example, in where and when respondents got tested and whether they tested with their partners or friends.

### Conclusions

Our findings highlight potential areas for future work on testing behaviors and practices. Despite its weaknesses, this study demonstrates the value of moving beyond assessments of whether individuals have ever been tested, and looking at testing behaviors in more detail and at STD and HIV testing issues jointly. This makes sense, given that testing uptake is higher than in the early 2000s and testing services are more integrated and widespread today.<sup>9,13</sup> Additional research may focus on a number of key questions: What makes someone a routine tester? How do individuals' STD and HIV testing patterns change in relation to their relationship histories? What

is the role of testing within the transition from casual to serious relationships? Also, to better understand and overcome the limitations of self-reported data, research should continue to seek medical record or claims data to develop objective prevalence estimates of joint STD and HIV testing, as well as to assess individual testing patterns over time. However, claims data clearly do not help address these questions for people without consistent insurance coverage.

This research also raises questions about what happens in the clinical or testing setting. If clients view and use testing as a prevention strategy—when, in fact, it is a tool for diagnosis and an opportunity for providers to promote primary prevention of STDs—then a disconnect may exist between providers and clients that is important to overcome. Our findings support efforts to take fuller advantage of any visit for STD or HIV testing to discuss STD risk and risk perceptions, relationship transitions and related issues. Finally, if individuals are not actually receiving the tests they believe they are getting, then they may unknowingly be infected and remain at high risk of transmission. More clarity on the part of both clinicians and clients about which tests are sought and provided would help alleviate this concern. The willingness to undergo testing for STDs and HIV that is represented in these data is encouraging, but more research and active promotion at the community and clinic levels are needed to help channel that willingness into testing behavior that will lead to reduced transmission.

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