



Published in final edited form as:

Vulnerable Child Youth Stud. 2017 ; 12(4): 277–291. doi:10.1080/17450128.2016.1268741.

Risk factors for self-report of not receiving an HIV test among adolescents in NYC with a history of sexual intercourse, 2013 YRBS

Tina Y. Gao, MPH¹, Chanelle J. Howe, PhD MHS MPH¹, Andrew R. Zullo, PharmD, ScM², and Brandon D.L. Marshall, PhD¹

¹Centers for Epidemiology and Environmental Health, Department of Epidemiology, Brown University School of Public Health, 121 South Main Street, Providence, Rhode Island, USA

²Department of Health Services, Policy and Practice, Brown University School of Public Health, 121 South Main Street, Providence, Rhode Island, USA

Abstract

The Centers for Disease Control and Prevention (CDC) has previously recommended that all adolescents undergo HIV testing in the United States (US). Despite these recommendations, national HIV testing among US adolescents has remained low. This study estimated the prevalence of and identified risk factors for not receiving an HIV test among adolescents with a history of sexual intercourse in New York City (NYC), an urban area that has been greatly impacted by the HIV epidemic. Cross-sectional data on 1,199 NYC high school students who completed the 2013 NYC Youth Risk Behavior Survey were used. Modified Poisson regression models were used to assess whether demographic factors, alcohol/drug use, and sexual behaviors were associated with self-report of lack of HIV testing. In the weighted study population, about 72% were 16 years old, approximately 35% were African American, and nearly half were male. Sixty percent reported no history of HIV testing. In adjusted analyses, younger age, male gender, White race/ethnicity, heroin use, as well as reporting one prior sexual partner were significantly and positively associated with no prior history of HIV testing. Our findings suggest that among NYC adolescents with a history of sexual intercourse, the prevalence of HIV testing is low. HIV testing may have been low in part because of limited experience with current screening guidelines among clinicians. Furthermore, many of the adolescents identified as being more likely to not be tested, may have not been screened because of inadequate knowledge about HIV, a low perceived HIV risk, or an unstable lifestyle. Therefore, to increase HIV testing among NYC adolescents, interventions that enhance HIV knowledge among adolescents as well as interventions that promote review and application of current screening guidelines among clinicians should be implemented in NYC. Educational interventions should especially be targeted at the adolescents identified in this study.

Corresponding Author: Chanelle J. Howe, PhD MHS MPH, Tel: (401) 863-7406, Fax: (401) 863-3713, Assistant Professor of Epidemiology, Centers for Epidemiology and Environmental Health, Department of Epidemiology, Brown University School of Public Health, 121 South Main Street, Providence, Rhode Island, USA.

Conflicts of Interest: The authors declare that they have no conflict of interest.

Keywords

Adolescent HIV testing; Youth risk behavior; Sexual intercourse; Risk-taking; New York City Youth Risk Behavior Survey

Introduction

New York City (NYC) remains greatly impacted by the HIV epidemic (Kessler et al., 2013; Laraque, Mavronicolas, Robertson, Gortakowski, & Terzian, 2013). In 2013, 4% of new HIV diagnoses in NYC occurred among teenagers aged 13-19 ("HIV Surveillance Annual Report, 2013," 2014). However, almost 70% of NYC high school students had never been tested for HIV in 2011 ("2011 Youth Risk Behavior Survey Results," 2011), despite the fact that a considerable proportion of teenagers in the United States (US) have reported not using protection the last time that they had sex ("HIV Testing Among Adolescents: What Schools and Education Agencies Can Do," 2012) and the Centers for Disease Control and Prevention (CDC) has previously recommended that all US adolescents undergo HIV testing (Branson et al., 2006). Thus, improved HIV screening, particularly among at-risk adolescents in NYC, is imperative.

Relevant prior work indicates that environmental (e.g., testing hours) (Akhter, Gorelick, & Beckmann, 2012; "Frequently Asked Questions regarding the HIV Testing Law," 2015; Hyden, Allegrante, & Cohall, 2014; Mehta, Goyal, Dowshen, & Mistry, 2015; Minniear et al., 2009) as well as individual-level factors (e.g., race/ethnicity, risky sexual activity, at-risk alcohol use, drug use, mental illness, intimate partner violence, and obesity) (Brown et al., 2006; Campbell, Lucea, Stockman, & Draughon, 2013; Coeytaux, Kramer, & Sullivan, 2014; DiClemente et al., 2001; Klevens, Jones, Ward, Holtzman, & Kann, 2015; Lee & Rotheram-Borus, 2009; Lowry, Robin, Kann, & Galuska, 2014; Main, Iverson, & McGloin, 1994; Murphy, Mitchell, Vermund, & Futterman, 2002; Remafedi, 1988; Tillerson, 2008; Tolou-Shams, Ewing, Tarantino, & Brown, 2010; Van Handel, Kann, Olsen, & Dietz, 2016; Wingood, DiClemente, Harrington, & Davies, 2002) may influence whether a NYC adolescent is tested for HIV. However, none of the aforementioned relevant prior work has quantified the prevalence of HIV testing as well as the relationship between environmental and individual-level factors and HIV testing among at-risk adolescents (such as those with a history of sexual intercourse) living in NYC. Therefore, the purpose of this study was to be among the first to estimate the prevalence of and identify risk factors for not receiving an HIV test among NYC adolescents with a history of sexual intercourse using the 2013 NYC Youth Risk Behavior Survey (YRBS).

Methods

Study Design

Data from the 2013 NYC YRBS were analyzed in this study. The NYC YRBS is a cross-sectional questionnaire that is conducted bi-annually (odd-numbered years) in NYC public high schools by the NYC Department of Health and Mental Hygiene. The 2013 YRBS used a two-stage cluster sampling design. In stage one, there were 81 public high schools

randomly selected across the city to participate in the study. In stage two, classes (9th - 12th grade) were again randomly chosen from these schools. Survey weights were used to correct estimates for non-response and unequal probability of inclusion in the survey sample and in turn provide a better representation of the general high school population in NYC during analyses. Additional details regarding the design and methodology of the 2013 NYC YRBS are available elsewhere (“Comprehensive YRBS Methods Report,” 2014). This secondary data analysis used publicly available de-identified data and did not require approval by an Institutional Review Board.

Subpopulation of interest

There were 9,439 respondents to the 2013 NYC YRBS survey. As shown in Figure 1, the subpopulation of interest for our analysis was respondents who had data available on all relevant characteristics and potential risk factors, provided a “yes” or “no” answer to the HIV testing question, and who reported ever engaging in sexual intercourse during their life. The sample size for the subpopulation of interest was 1,199.

Dependent and Independent Variable(s)

The question, “have you ever been tested for HIV, the virus that causes AIDS (do not count tests done if you donated blood)” was asked and used to create the dependent variable, a self-reported binary indicator of not receiving an HIV test. There were 13 non-demographic independent variables of interest which included: lack of condom use during the last sexual intercourse; intimate partner violence and sexual abuse while dating or going out during the past 12 months; as well as alcohol or drug use before last intercourse.

The remaining non-demographic variables were ever used cocaine, heroin, methamphetamines, or ecstasy during life; ever injected illicit drugs during life; experienced serious suicidal thoughts during the past 12 months; binge drinking during the past 30 days, lifetime number of sexual partners, and body mass index. The demographic independent variables included age, gender, grade, race/ethnicity, borough of residence, and sexual orientation.

Statistical Analyses

Unweighted counts and weighted percentages were used for descriptive statistics. Modified Poisson regression with weighted data was used to estimate prevalence ratios (PRs). Unadjusted models were first used to evaluate the relationship between the lack of HIV testing and each independent variable of interest. A single adjusted model was subsequently fit that included all of the aforementioned independent variables that were statistically significant (p -value < 0.05) in the unadjusted models plus demographic variables (excluding school grade to avoid potential collinearity with age). Although all demographic variables (excluding school grade) were kept in the adjusted model to control for potential sources of selection bias related to restrictions, all demographic variables included in the adjusted model were of interest in terms of identifying risk factors for not receiving an HIV test regardless of their significance level in unadjusted models.

PRs and 95% confidence limits were reported for unadjusted and adjusted models. Survey procedures were used to account for weighting and the complex survey design. Subpopulation estimation procedures were used to analyze the subpopulation of interest. Stata version 13 (College Station, TX: StataCorp. LP) was used for all analyses.

Results

The 1,199 respondents in the subpopulation of interest differed from the 4,234 respondents who were excluded for reasons specified in Table 1 by demographic and non-demographic factors. Among the 1,199 respondents, about 60% had never been tested for HIV. Among the respondents of interest who had never been tested for HIV, about 26% had four or more sexual partners, 42% were female, 36% were in the 12th grade, 32% were African American, and 86% were heterosexual (Table 2).

Heroin use and the lifetime number of sexual partners were the only non-demographic factors that were significantly associated with not being tested for HIV after adjusting for age, gender, race/ethnicity, borough of residence, and sexual orientation. Specifically, adolescents with one past sexual partner or who used heroin were more likely to not be tested for HIV. The following demographic groups were statistically more likely to not receive an HIV test in the final adjusted model: adolescents 17 years old, males, and Whites compared to African Americans (Table 3).

Discussion

Among NYC high school students reporting a history of sexual intercourse, self-report of lifetime receipt of an HIV test was low despite prior CDC recommendations for universal HIV testing among adolescents (Branson et al., 2006). Adolescents who were younger, White, male, ever engaged in heroin use, and had one prior sexual partner were independently more likely to not be tested for HIV. Because the 2013 NYC YRBS did not ask about the reasons for not being tested for HIV, we were not able to identify specific reasons for lack of HIV testing among respondents. However, based on prior work, self-report of lifetime receipt of an HIV test may have been low in our study because of limited experience with current screening guidelines, discomfort with discussing HIV test results with patients, and the perception of pretest/posttest counseling being time-consuming among providers (Akhter et al., 2012; Mehta et al., 2015; Minnietar et al., 2009). Conflicts between HIV testing times and school hours may have also served as a barrier to screening. Hyden et al. (Hyden et al., 2014) found that, of the NYC HIV counseling and testing sites that they were able to successfully contact in 2010, almost a quarter only provided screenings on weekdays during times that conflicted with regular school hours.

HIV testing may have been lower among adolescents who were younger, White, male, ever engaged in heroin use, and had one prior sexual partner due to inadequate HIV knowledge, a perceived low HIV risk, or an unstable lifestyle. For example, African Americans continue to be the racial/ethnic group at greatest risk for HIV infection. Therefore, White adolescents in our study may not have considered themselves to be at risk for HIV infection and in turn

not have been tested (Castel, Magnus, & Greenberg, 2015; Centers for Disease Control and Prevention, 2012; Prejean et al., 2011).

Our results are consistent with previously observed HIV testing rates (“2011 Youth Risk Behavior Survey Results,” 2011; Van Handel et al., 2016) as well as national data showing that among high school students with a history of sexual intercourse, students in a higher grade were more likely to be tested for HIV (Coeytaux et al., 2014) and White males were the least likely group defined by race/ethnicity and gender to be tested for HIV (Van Handel et al., 2016). Our findings also add to prior studies that have shown injection drug use, sexual intercourse, early sexual debut, having multiple lifetime partners, and reporting being forced to have sexual intercourse to be positively associated with HIV testing among high school students (Coeytaux et al., 2014; Main et al., 1994).

Prior work (Minniear et al., 2009; Van Handel et al., 2016) suggests that to increase HIV testing among NYC adolescents, all NYC health care providers should review current screening guidelines. Implementing educational interventions (e.g., continuing medical education programs) may facilitate this process (Arrington-Sanders & Ellen, 2011; Grimes, Courtney, & Vindekilde, 2001). Consistent with current CDC screening guidelines, NYC health care providers should plan to screen all adolescent patients for HIV unless they opt-out of testing (Branson et al., 2006). To decrease the likelihood that their adolescent patient opts-out, especially those who perceive their risk to be low, providers should explain the benefits of HIV testing to their adolescent patients while providing a supportive environment and encouraging discussion of sensitive topics such as sexual orientation (Flynn et al., 2011). HIV testing among NYC adolescents may also be increased by changing the hours of NYC HIV counseling and testing sites to minimize conflicts with regular school hours (Hyden et al., 2014). Introducing innovative social media campaigns in NYC may further yield increases in adolescent HIV testing as seen in Philadelphia after the implementation of the IknowUshould2 campaign that used media such as Facebook and YouTube to promote knowledge about HIV and sexually transmitted infections among teenagers (Dowshen, Lee, Matty Lehman, Castillo, & Mollen, 2015).

There were several limitations in this study. A large number of respondents were excluded. Excluded and included respondents were shown to differ on measured factors. Although we controlled for demographics in the adjusted regression model to help minimize the potential for selection bias due to exclusions, sources of selection bias that were uncontrolled for during analyses may remain and in turn selection bias may still be considerable. The aforementioned exclusions may also limit the ability to generalize our findings to relevant adolescents who are similar to excluded respondents. Our results may also not generalize to adolescents in NYC who are not attending public school or nationwide.

The sample size of the subpopulation of interest was small which may have contributed to random error. The study had a cross-sectional design. Self-reported data were not validated and may be a source of social desirability bias (Kelly, Soler-Hampejsek, Mensch, & Hewett, 2013). Respondents may also not have understood the HIV testing question.

Despite these limitations, this study is among the first to provide a population estimate of the prevalence of as well as identify risk factors for not being tested for HIV among NYC adolescents with a history of sexual intercourse. So that HIV testing trends can continue to be monitored, the current HIV testing question should continue to be included in the NYC YRBS. The survey should also include questions that ask about the reasons for not being tested for HIV to aid with future efforts to improve HIV screening.

Acknowledgments

The authors thank Dr. Annie Gjelsvik for providing expert advice. Dr. Andrew Zullo was supported by the Agency for Healthcare Research and Quality (5K12HS022998-02). Dr. Brandon Marshall was supported by the Henry Merritt Wriston Fellowship from Brown University.

References

- New York City Department of Health and Mental Hygiene. 2011 Youth Risk Behavior Survey Results. 2011. Retrieved from <http://www.nyc.gov/html/doh/downloads/pdf/episrv/codebook-citywide-yrbs-2011-revised.pdf>
- Akhter S, Gorelick M, Beckmann K. Rapid human immunodeficiency virus testing in the pediatric emergency department: a national survey of attitudes among pediatric emergency practitioners. *Pediatr Emerg Care*. 2012; 28(12):1257–1262. DOI: 10.1097/PEC.0b013e3182767add [PubMed: 23187980]
- Arrington-Sanders R, Ellen J. A Systems Approach to Improve Human Immunodeficiency Virus Screening in Sexually Active Youth in Urban Academic Ambulatory Settings. *Sex Transm Dis*. 2011; 38(8):777–779. DOI: 10.1097/OLQ.0b013e318214bd48 [PubMed: 21750478]
- Branson, BM., Handsfield, HH., Lampe, MA., Janssen, RS., Taylor, AW., Lyss, SB., Clark, JE. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. 2006. p. 1545–8601.(Electronic) Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16988643>
- Brown A, Yung A, Cosgrave E, Killackey E, Buckby J, Stanford C, McGorry P. Depressed mood as a risk factor for unprotected sex in young people. *Australas Psychiatry*. 2006; 14(3):310–312. DOI: 10.1111/j.1440-1665.2006.02291.x [PubMed: 16923045]
- Campbell JC, Lucea MB, Stockman JK, Draughon JE. Forced sex and HIV risk in violent relationships. *Am J Reprod Immunol*. 2013; 69(Suppl 1):41–44. DOI: 10.1111/aji.12026
- Castel AD, Magnus M, Greenberg AE. Update on the Epidemiology and Prevention of HIV/AIDS in the United States. *Curr Epidemiol Rep*. 2015; 2(2):110–119. DOI: 10.1007/s40471-015-0042-8 [PubMed: 25960941]
- Coeytaux K, Kramer MR, Sullivan PS. HIV testing among United States high school students at the state and national level, Youth Risk Behavior Survey 2005–2011. *Springerplus*. 2014; 3:202.doi: 10.1186/2193-1801-3-202 [PubMed: 24855587]
- New York City Department of Health and Mental Hygiene. Comprehensive YRBS Methods Report. 2014. Retrieved from <http://www.nyc.gov/html/doh/downloads/pdf/survey/yrbs-methods-report.pdf>
- DiClemente RJ, Wingood GM, Crosby RA, Sionean C, Brown LK, Rothbaum B, Davies S. A prospective study of psychological distress and sexual risk behavior among black adolescent females. *Pediatrics*. 2001; 108(5):E85.doi: 10.1542/peds.108.5.e85 [PubMed: 11694669]
- Dowshen N, Lee S, Matty Lehman B, Castillo M, Mollen C. IknowUshould2: Feasibility of a Youth-Driven Social Media Campaign to Promote STI and HIV Testing Among Adolescents in Philadelphia. *AIDS Behav*. 2015; doi: 10.1007/s10461-014-0991-9
- Flynn PM, Aldrovandi GM, Chadwick EG, Chakraborty R, Cooper ER, Emmanuel PJ, AIDS CP. Adolescents and HIV Infection: The Pediatrician's Role in Promoting Routine Testing. *Pediatrics*. 2011; 128(5):1023–1029. DOI: 10.1542/peds.2011-1761 [PubMed: 22042816]

- New York State Department of Health. Frequently Asked Questions regarding the HIV Testing Law. 2015. Retrieved from https://www.health.ny.gov/diseases/aids/providers/testing/law/faqs.htm-question_5
- Grimes RM, Courtney CC, Vindekilde J. A collaborative program between a school of public health and a local health department to increase HIV testing of pregnant women. *Public Health Rep.* 2001; 116(6):585–589. DOI: 10.1093/phr/116.6.585 [PubMed: 12196618]
- New York City Department of Health and Mental Hygiene. HIV Surveillance Annual Report, 2013. 2014. Retrieved from <http://www.nyc.gov/html/doh/downloads/pdf/dires/2013-hiv-surveillance-annual-report.pdf>
- Centers for Disease Control and Prevention. HIV Testing Among Adolescents: What Schools and Education Agencies Can Do. 2012. Retrieved from http://ftp.cdc.gov/pub/Data/YRBS/2013/tobaccofactsheets/hivtesting_adolescents.pdf
- Centers for Disease Control and Prevention. Estimated HIV incidence in the United States, 2007–2010. *HIV Surveill Suppl Rep.* 2012; 17(4)
- Hyden C, Allegrante JP, Cohall AT. HIV testing sites' communication about adolescent confidentiality: potential barriers and facilitators to testing. *Health Promot Pract.* 2014; 15(2):173–180. DOI: 10.1177/1524839913499347 [PubMed: 23966274]
- Kelly CA, Soler-Hampejsek E, Mensch BS, Hewett PC. Social desirability bias in sexual behavior reporting: evidence from an interview mode experiment in rural Malawi. *Int Perspect Sex Reprod Health.* 2013; 39(1):14–21. DOI: 10.1363/3901413 [PubMed: 23584464]
- Kessler J, Myers JE, Nucifora KA, Mensah N, Kowalski A, Sweeney M, Braithwaite RS. Averting HIV infections in New York City: a modeling approach estimating the future impact of additional behavioral and biomedical HIV prevention strategies. *PLoS One.* 2013; 8(9):e73269.doi: 10.1371/journal.pone.0073269 [PubMed: 24058465]
- Klevens RM, Jones SE, Ward JW, Holtzman D, Kann L. Trends in Injection Drug Use Among High School Students, U.S., 1995–2013. *Am J Prev Med.* 2015; doi: 10.1016/j.amepre.2015.05.026
- Laraque F, Mavronicolas HA, Robertson MM, Gortakowski HW, Terzian AS. Disparities in community viral load among HIV-infected persons in New York City. *AIDS.* 2013; 27(13):2129–2139. DOI: 10.1097/QAD.0b013e328360f619 [PubMed: 24384591]
- Lee SJ, Rotheram-Borus MJ. Beyond the “model minority” stereotype: trends in health risk behaviors among Asian/Pacific Islander high school students. *J Sch Health.* 2009; 79(8):347–354. DOI: 10.1111/j.1746-1561.2009.00420.x [PubMed: 19630868]
- Lowry R, Robin L, Kann L, Galuska DA. Associations of body mass index with sexual risk-taking and injection drug use among US high school students. *J Obes.* 2014; 2014:816071.doi: 10.1155/2014/816071 [PubMed: 25105024]
- Main DS, Iverson DC, McGloin J. Comparison of HIV-risk behaviors and demographics of adolescents tested or not tested for HIV infection. *Public Health Rep.* 1994; 109(5):699–702. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/7938393>. [PubMed: 7938393]
- Mehta AS, Goyal MK, Dowshen N, Mistry RD. Practices, Beliefs, and Perceived Barriers to Adolescent Human Immunodeficiency Virus Screening in the Emergency Department. *Pediatr Emerg Care.* 2015; doi: 10.1097/PEC.0000000000000370
- Minnear TD, Gilmore B, Arnold SR, Flynn PM, Knapp KM, Gaur AH. Implementation of and barriers to routine HIV screening for adolescents. *Pediatrics.* 2009; 124(4):1076–1084. DOI: 10.1542/peds.2009-0237 [PubMed: 19752084]
- Murphy DA, Mitchell R, Vermund SH, Futterman D. Factors associated with HIV testing among HIV-positive and HIV-negative high-risk adolescents: The REACH study. *Pediatrics.* 2002; 110(3)doi: 10.1542/peds.110.3.e36
- Prejean J, Song R, Hernandez A, et al. Estimated HIV incidence in the United States, 2006–2009. *PLoS One.* 2011; 6(8):e17502. [PubMed: 21826193]
- Remafedi GJ. Preventing the sexual transmission of AIDS during adolescence. *J Adolesc Health Care.* 1988; 9(2):139–143. DOI: 10.1016/0197-0070(88)90060-5 [PubMed: 3283090]
- Tillerson K. Explaining racial disparities in HIV/AIDS incidence among women in the U.S.: a systematic review. *Stat Med.* 2008; 27(20):4132–4143. DOI: 10.1002/sim.3224 [PubMed: 18551508]

- Tolou-Shams M, Ewing SW, Tarantino N, Brown LK. Crack and Cocaine Use among Adolescents in Psychiatric Treatment: Associations with HIV Risk. *J Child Adolesc Subst Abuse*. 2010; 19(2): 122–134. DOI: 10.1080/10678281003634926 [PubMed: 22224066]
- Van Handel M, Kann L, Olsen EO, Dietz P. HIV Testing Among US High School Students and Young Adults. *Pediatrics*. 2016; 137(2):1–9. DOI: 10.1542/peds.2015-2700
- Wingood GM, DiClemente RJ, Harrington K, Davies SL. Body image and African American females' sexual health. *J Womens Health Gend Based Med*. 2002; 11(5):433–439. DOI: 10.1089/15246090260137608 [PubMed: 12165160]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

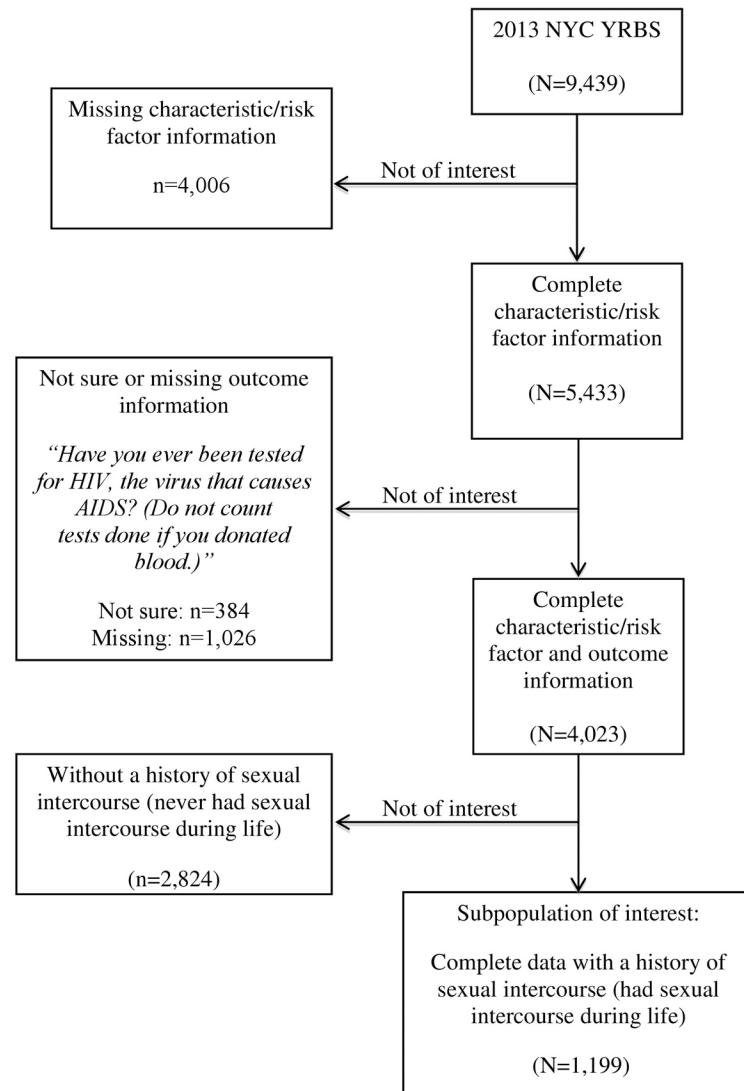


Figure 1.
Steps applied to obtain subpopulation of interest using data from the 2013 New York City Youth Behavior Survey.

Table 1

Characteristics of the respondents to the 2013 NYC YRBS.

Characteristics ^a	Respondents with complete characteristic/risk factor and outcome information (with a history of sexual intercourse)	Respondents with complete characteristic/risk factor and outcome information (without a history of sexual intercourse)	Respondents excluded from subpopulation of interest due to answering “not sure” to HIV testing question	Respondents excluded from subpopulation of interest due to missing HIV testing information
Total	1,199 (21.1%)	2,824 (52.6%)	598 (11.8%)	812 (14.5%)
Age (years) ^{b,c,d}				
14 or younger	114 (10.5%)	755 (26.0%)	205 (34.9%)	256 (37.6%)
15	205 (18.0%)	783 (29.4%)	163 (27.0%)	207 (27.0%)
16	353 (26.5%)	751 (26.2%)	132 (21.0%)	145 (15.3%)
17	424 (35.9%)	451 (26.2%)	87 (14.5%)	153 (15.5%)
18 or older	103 (9.1%)	84 (3.2%)	11 (2.6%)	51 (4.6%)
Gender ^b				
Male	585 (53.5%)	1,119 (43.6%)	290 (49.4%)	396 (50.1%)
Female	614 (46.5%)	1,705 (56.4%)	308 (50.6%)	416 (49.9%)
Grade ^{b,c,d}				
9 th	141 (14.4%)	742 (26.0%)	208 (35.4%)	288 (41.8%)
10 th	241 (19.5%)	850 (32.0%)	174 (28.9%)	208 (26.2%)
11 th	334 (25.0%)	716 (25.2%)	123 (19.5%)	131 (12.0%)
12 th	483 (41.1%)	516 (16.8%)	93 (16.2%)	185 (20.0%)
Race/ethnicity ^{b,c}				
White	162 (12.1%)	542 (18.0%)	138 (21.9%)	93 (12.3%)
African American	335 (35.3%)	611 (26.3%)	113 (20.3%)	240 (32.2%)
Hispanic/Latino	267 (20.1%)	527 (15.9%)	101 (16.2%)	209 (24.3%)
Asian	50 (5.2%)	482 (24.0%)	115 (27.0%)	50 (9.2%)
Multiracial	361 (26.8%)	594 (15.2%)	121 (14.2%)	193 (21.1%)
Native American/Pacific Islander	24 (0.5%)	68 (0.6%)	10 (0.4%)	27 (0.9%)
Borough of Residence ^{b,c}				
Manhattan	132 (8.9%)	226 (8.1%)	59 (9.8%)	109 (11.4%)
Brooklyn	246 (32.2%)	577 (35.5%)	105 (30.1%)	205 (35.6%)
Bronx	321 (24.4%)	593 (17.1%)	101 (13.9%)	212 (24.4%)
Queens	269 (29.0%)	698 (31.2%)	169 (38.3%)	143 (23.3%)
Staten Island	231 (5.5%)	730 (8.1%)	164 (7.9%)	143 (5.3%)
BMI ^{b,c}				
Underweight	89 (8.5%)	418 (16.1%)	89 (17.7%)	88 (12.8%)
Normal	785 (64.8%)	1,752 (61.0%)	369 (60.5%)	502 (59.5%)
Overweight	219 (18.2%)	456 (16.1%)	102 (16.9%)	147 (17.4%)
Obese	106 (8.5%)	198 (6.8%)	38 (4.9%)	75 (10.3%)
Ever tested for HIV ^b				

Characteristics ^a	Respondents with complete characteristic/risk factor and outcome information (with a history of sexual intercourse)	Respondents with complete characteristic/risk factor and outcome information (without a history of sexual intercourse)	Respondents excluded from subpopulation of interest due to answering “not sure” to HIV testing question	Respondents excluded from subpopulation of interest due to missing HIV testing information
Yes	458 (39.6%)	347 (11.6%)	--	--
No	741 (60.4%)	2,477 (88.4%)	--	--
Ever Had Sexual Intercourse ^{b,c,d}				
Yes	1,199 (100%)	0 (0%)	109 (19.7%)	267 (29.0%)
No	0 (0%)	2,824 (100%)	489 (80.3%)	545 (71.0%)
Condom Use ^{b,c,d}				
Yes	828 (68.8%)	0 (0%)	85 (16.1%)	185 (20.7%)
No	371 (31.2%)	0 (0%)	24 (3.6%)	82 (8.3%)
Never Had Sexual Intercourse	0 (0%)	2,824 (100%)	489 (80.3%)	545 (71.0%)
Number of Sexual Partners ^{b,c,d}				
0	0 (0%)	2,824 (100%)	489 (80.3%)	545 (71.0%)
1	507 (40.4%)	0 (0%)	56 (9.0%)	97 (9.8%)
2-3	358 (28.8%)	0 (0%)	29 (5.6%)	81 (8.9%)
4 or more	334 (30.8%)	0 (0%)	24 (5.1%)	89 (10.3%)
Used Alcohol/Drugs Before Sexual Intercourse ^{b,c,d}				
Yes	183 (15.1%)	0 (0%)	13 (2.1%)	43 (5.1%)
No	1,016 (84.9%)	0 (0%)	96 (17.6%)	224 (23.9%)
Never Had Sexual Intercourse	0 (0%)	2,824 (100%)	489 (80.3%)	545 (71.0%)
Ever Used Cocaine ^{b,c,d}				
Yes	57 (5.3%)	10 (0.3%)	19 (1.1%)	16 (2.3%)
No	1,142 (94.7%)	2,814 (99.7%)	588 (98.9%)	796 (97.7%)
Ever Used Heroin ^b				
Yes	16 (1.2%)	5 (0.1%)	5 (0.7%)	6 (0.8%)
No	1,183 (98.8%)	2,819 (99.9%)	593 (99.3%)	806 (99.2%)
Ever Used Methamphetamines ^b				
Yes	20 (1.3%)	8 (0.2%)	7 (0.6%)	7 (1.0%)
No	1,179 (98.7%)	2,816 (99.8%)	591 (99.4%)	805 (99.0%)
Ever Used Ecstasy ^{b,d}				
Yes	80 (6.8%)	18 (0.6%)	10 (2.5%)	25 (3.1%)
No	1,119 (93.2%)	2,806 (99.4%)	588 (97.5%)	787 (96.9%)
Ever Injected Illicit Drugs ^b				
Yes	22 (1.7%)	7 (0.3%)	5 (1.0%)	9 (0.8%)
No	1,177 (98.3%)	2,817 (99.7%)	593 (99.0%)	803 (99.2%)
Intimate Partner Violence ^{b,c,d}				
Yes	139 (10.1%)	56 (1.8%)	19 (2.8%)	58 (6.2%)
No	882 (74.9%)	1,149 (39.5%)	261 (44.4%)	454 (56.7%)

Characteristics ^a	Respondents with complete characteristic/risk factor and outcome information (with a history of sexual intercourse)	Respondents with complete characteristic/risk factor and outcome information (without a history of sexual intercourse)	Respondents excluded from subpopulation of interest due to answering “not sure” to HIV testing question	Respondents excluded from subpopulation of interest due to missing HIV testing information
Did Not Date	178 (15.0%)	1,619 (58.7%)	318 (52.8%)	300 (37.1%)
Sexual Abuse ^{b,c,d}				
Yes	122 (9.1%)	66 (2.2%)	24 (3.9%)	61 (5.3%)
No	899 (75.9%)	1,139 (39.1%)	256 (43.3%)	451 (57.6%)
Did Not Date	178 (15.0%)	1,619 (58.7%)	318 (52.8%)	300 (37.1%)
Suicidal Thoughts ^b				
Yes	197 (14.6%)	298 (10.0%)	77 (14.2%)	105 (12.4%)
No	1,002 (85.4%)	2,526 (90.0%)	521 (85.8%)	707 (87.6%)
Binge Drinking ^{b,c,d}				
Yes	260 (20.2%)	151 (4.3%)	43 (6.2%)	102 (10.6%)
No	939 (79.8%)	2,673 (95.7%)	555 (93.8%)	710 (89.4%)
Sexual Orientation ^b				
Heterosexual (Straight)	996 (85.5%)	2,570 (91.7%)	526 (85.7%)	695 (82.2%)
Gay/Lesbian	37 (2.3%)	22 (1.0%)	12 (2.3%)	15 (3.4%)
Bisexual	142 (9.0%)	131 (4.0%)	38 (6.5%)	69 (8.9%)
Not Sure	24 (3.2%)	101 (3.3%)	22 (5.5%)	33 (5.5%)

^aThe counts are unweighted but the percentages are weighted where the weighted %'s add to 100% across the column for the first row and down the column for the remaining rows.

^bP-values obtained from Pearson's chi-squared tests that are below 0.05 (column 2 compared to column 3). Chi-squared tests are based on the weighted data.

^cP-values obtained from Pearson's chi-squared tests that are below 0.05 (column 2 compared to column 4). Chi-squared tests are based on the weighted data.

^dP-values obtained from Pearson's chi-squared tests that are below 0.05 (column 2 compared to column 5). Chi-squared tests are based on the weighted data.

Table 2

Characteristics of NYC high school student participants who reported a history of sexual intercourse on the 2013 NYC YRBS.

Characteristics ^a	Total N=1,119 (100%) ^a	Ever been tested for HIV N=458 (39.6%) ^a	Never been tested for HIV N=741 (60.4%) ^a
Age (years)			
14 or younger	114 (10.5%)	33 (7.7%)	81 (12.5%)
15	205 (18.0%)	56 (12.8%)	149 (21.4%)
16	353 (26.5%)	120 (22.7%)	233 (28.9%)
17	424 (35.9%)	189 (41.3%)	235 (32.3%)
18 or older	103 (9.1%)	60 (15.5%)	43 (4.9%)
Gender			
Male	585 (53.5%)	203 (47.4%)	382 (57.6%)
Female	614 (46.5%)	255 (52.6%)	359 (42.4%)
Grade			
9 th	141 (14.4%)	47 (13.0%)	94 (15.3%)
10 th	241 (19.5%)	73 (14.7%)	168 (22.5%)
11 th	334 (25.0%)	115 (23.0%)	219 (26.4%)
12 th	483 (41.1%)	223 (49.3%)	260 (35.8%)
Race/ethnicity			
White	162 (12.1%)	30 (5.8%)	132 (16.2%)
African American	335 (35.3%)	149 (40.6%)	186 (31.8%)
Hispanic/Latino	267 (20.1%)	107 (20.2%)	160 (20.1%)
Asian	50 (5.2%)	16 (4.0%)	34 (6.0%)
Multiracial	361 (26.8%)	144 (28.9%)	217 (25.5%)
Native American/Pacific Islander	24 (0.05%)	12 (0.5%)	12 (0.4%)
Borough of Residence			
Manhattan	132 (8.9%)	57 (10.6%)	75 (7.7%)
Brooklyn	246 (32.2%)	86 (27.3%)	160 (35.4%)
Bronx	321 (24.4%)	169 (34.7%)	152 (17.6%)
Queens	269 (29.0%)	84 (23.8%)	185 (32.5%)
Staten Island	231 (5.5%)	62 (3.6%)	169 (6.8%)
BMI			
Underweight	89 (8.5%)	31 (6.1%)	58 (10.0%)
Normal	785 (64.8%)	284 (64.9%)	501 (64.8%)
Overweight	219 (18.2%)	90 (18.0%)	129 (18.3%)
Obese	106 (8.5%)	53 (11.0%)	53 (6.9%)
Condom Use			
Yes	828 (68.8%)	295 (65.3%)	533 (71.1%)
No	371 (31.2%)	163 (34.7%)	208 (28.9%)
Number of Sexual Partners			
1	507 (40.4%)	151 (31.6%)	356 (46.1%)

Characteristics ^a	Total N=1,119 (100%) ^a	Ever been tested for HIV N=458 (39.6%) ^a	Never been tested for HIV N=741 (60.4%) ^a
2-3	358 (28.8%)	147 (30.4%)	211 (27.7%)
4 or more	334 (30.8%)	160 (38.0%)	174 (26.2%)
Alcohol/Drug Use Before Intercourse			
Yes	183 (15.1%)	75 (17.8%)	108 (13.3%)
No	1,016 (84.9%)	383 (82.2%)	633 (86.7%)
Ever Used Cocaine			
Yes	57 (5.3%)	19 (4.5%)	38 (5.8%)
No	1,142 (94.7%)	439 (95.5%)	703 (94.2%)
Ever Used Heroin			
Yes	16 (1.2%)	4 (0.2%)	12 (1.8%)
No	1,183 (98.8%)	454 (99.8%)	729 (98.2%)
Ever Used Methamphetamines			
Yes	20 (1.3%)	6 (0.7%)	14 (1.6%)
No	1,179 (98.7%)	452 (99.3%)	727 (98.4%)
Ever Used Ecstasy			
Yes	80 (6.8%)	28 (5.9%)	52 (7.3%)
No	1,119 (93.2%)	430 (94.1%)	689 (92.7%)
Ever Injected Illicit Drugs			
Yes	22 (1.7%)	7 (0.6%)	15 (2.4%)
No	1,177 (98.3%)	451 (99.4%)	726 (97.6%)
Intimate Partner Violence			
Yes	139 (10.1%)	60 (11.6%)	79 (9.2%)
No	882 (74.9%)	329 (73.6%)	553 (75.7%)
Did Not Date	178 (15.0%)	69 (14.8%)	109 (15.1%)
Sexual Abuse			
Yes	122 (9.1%)	41 (7.8%)	81 (10.0%)
No	899 (75.9%)	348 (77.4%)	551 (74.9%)
Did Not Date	178 (15.0%)	69 (14.8%)	109 (15.1%)
Suicidal Thoughts			
Yes	197 (14.6%)	76 (16.9%)	121 (13.1%)
No	1,002 (85.4%)	382 (83.1%)	620 (86.9%)
Binge Drinking			
Yes	260 (20.2%)	107 (19.5%)	153 (20.6%)
No	939 (79.8%)	351 (80.5%)	588 (79.4%)
Sexual Orientation			
Heterosexual (Straight)	996 (85.5%)	379 (85.3%)	617 (85.6%)
Gay/Lesbian	37 (2.3%)	16 (2.9%)	21 (1.8%)
Bisexual	142 (9.0%)	55 (10.0%)	87 (8.4%)
Not Sure	24 (3.2%)	8 (1.8%)	16 (4.2%)

^aThe counts are unweighted but the percentages are weighted.

Table 3

Weighted unadjusted and adjusted modified Poisson regression models examining association between potential risk factors and not being tested for HIV among 2013 NYC YRBS participants with a history of sexual intercourse.

	Unadjusted Prevalence Ratio (95% CL) ^a	Adjusted Prevalence Ratio (95% CL) ^{a,b}
Age (years)		
14 or younger	2.21 (1.53, 3.21) ^c	2.02 (1.38, 2.95) ^c
15	2.23 (1.45, 3.42) ^c	2.05 (1.32, 3.18) ^c
16	2.04 (1.37, 3.04) ^c	1.86 (1.22, 2.82) ^c
17	1.68 (1.08, 2.62) ^c	1.62 (1.03, 2.55) ^c
18 or older	1.00 (Ref)	1.00 (Ref)
Gender		
Male	1.00 (Ref)	1.00 (Ref)
Female	0.85 (0.71, 1.01)	0.86 (0.75, 0.98) ^c
Grade ^d		
9 th	1.22 (1.01, 1.48) ^c	--
10 th	1.33 (1.17, 1.51) ^c	--
11 th	1.21 (0.97, 1.51)	--
12 th	1.00 (Ref)	--
Race/ethnicity		
White	1.49 (1.25, 1.77) ^c	1.29 (1.10, 1.51) ^c
African American	1.00 (Ref)	1.00 (Ref)
Hispanic/Latino	1.11 (0.88, 1.38)	1.18 (0.97, 1.45)
Asian	1.28 (1.02, 1.60) ^c	1.17 (0.96, 1.42)
Multiracial	1.05 (0.86, 1.29)	1.10 (0.92, 1.31)
Native American/Pacific Islander	1.04 (0.68, 1.57)	1.06 (0.66, 1.73)
Borough of Residence		
Manhattan	1.00 (Ref)	1.00 (Ref)
Brooklyn	1.26 (1.02, 1.57) ^c	1.26 (0.98, 1.62)
Bronx	0.83 (0.64, 1.07)	0.85 (0.65, 1.10)
Queens	1.29 (1.05, 1.57) ^c	1.21 (0.95, 1.53)
Staten Island	1.42 (1.13, 1.78) ^c	1.24 (0.93, 1.65)
BMI		
Underweight	1.18 (0.99, 1.41)	--
Normal	1.00 (Ref)	--
Overweight	1.01 (0.85, 1.19)	--
Obese	0.81 (0.61, 1.08)	--
Condom Use		
Yes	1.00 (Ref)	--
No	0.90 (0.76, 1.05)	--

	Unadjusted Prevalence Ratio (95% CL) ^a	Adjusted Prevalence Ratio (95% CL) ^{a,b}
Number of Sexual Partners		
1	1.35 (1.14, 1.59) ^c	1.28 (1.10, 1.49) ^c
2-3	1.13 (0.97, 1.33)	1.14 (0.98, 1.32)
4 or more	1.00 (Ref)	1.00 (Ref)
Alcohol/Drug Use Before Intercourse		
Yes	0.86 (0.73, 1.02)	--
No	1.00 (Ref)	--
Ever Used Cocaine		
Yes	1.10 (0.74, 1.65)	--
No	1.00 (Ref)	--
Ever Used Heroin		
Yes	1.53 (1.34, 1.75) ^c	1.31 (1.08, 1.57) ^c
No	1.00 (Ref)	1.00 (Ref)
Ever Used Methamphetamines		
Yes	1.31 (0.94, 1.81)	--
No	1.00 (Ref)	--
Ever Used Ecstasy		
Yes	1.09 (0.84, 1.40)	--
No	1.00 (Ref)	--
Ever Injected Illicit Drugs		
Yes	1.44 (1.20, 1.73) ^c	1.07 (0.84, 1.35)
No	1.00 (Ref)	1.00 (Ref)
Intimate Partner Violence		
Yes	0.90 (0.72, 1.11)	--
No	1.00 (Ref)	--
Did Not Date	1.00 (0.81, 1.22)	--
Sexual Abuse		
Yes	1.11 (0.92, 1.34)	--
No	1.00 (Ref)	--
Did Not Date	1.02 (0.82, 1.27)	--
Suicidal Thoughts		
Yes	0.88 (0.73, 1.08)	--
No	1.00 (Ref)	--
Binge Drinking		
Yes	1.03 (0.90, 1.18)	--
No	1.00 (Ref)	--
Sexual Orientation		
Heterosexual (Straight)	1.00 (Ref)	1.00 (Ref)
Gay/Lesbian	0.81 (0.53, 1.23)	0.79 (0.50, 1.23)
Bisexual	0.93 (0.75, 1.14)	0.93 (0.77, 1.13)
Not Sure	1.29 (0.98, 1.71)	1.13 (0.89, 1.42)

^a95% CL = 95% confidence limit.

^bPrevalence ratios and 95% confidence limits reported after adjusting for all factors included in the table with a value.

^cPrevalence ratios statistically significant at the 0.05 level.

^dGrade was excluded from the adjusted model to avoid collinearity with age.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript