

Using Information on the Prevalence of Sexually Transmitted Infections and Bacterial Vaginosis among Female Adolescents to Evaluate the Reliability of Self-Reported Incidence of Sexual Activity

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Abstract

Using findings presented by Forhan, Gottlieb, Sternberg, Xu, Datta, Berman and Markowitz (2008), this study concludes that NHANES 2003–2004 participants likely underreport their sexual activity. The incidence of STIs and BV among survey participants who did not report having had sex indicate that almost two-thirds of survey participants have had sex. Approximately 25 percent of survey participants who have had sex did not report having had sex.

Background

Forhan et al. (2008) present data from the National Health and Nutrition Examination Survey (NHANES) (2003–2004) on the prevalence of sexually transmitted infections (STIs) and bacterial vaginosis (BV) among female adolescents. More than half of the survey participants did not report ever having had sex (Table 1). In contrast, Mosher, Chandra and Jones (2005) find that only 35.5 percent of females aged 15–19 had some no sexual contact with another person.

Female participants aged 14–19 years in NHANES 2003–2004 underwent testing for *Chlamydia trachomatis* (CT), herpes simplex virus type 2 (HSV-2), *Trichomonas vaginalis* (TV), BV, and human papillomavirus (HPV). Among survey participants who did not report ever having had sex, 12.7 percent tested positive for one or more STIs or BV. The relatively high prevalence of STIs and BV among the survey participants who did not report ever having had sex suggests potential underreporting of sexual activity by the survey participants (Datta, Sternberg, Johnson, Berman, Papp, McQuillan and Weinstock 2007).

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Table 1: Prevalence of STIs and BV among Female Adolescents and Self-Reported Incidence of Sexual Activity

Description	Total	Reported Having Sex	Not Reported Having Sex
Number of survey participants	838	404	434
Percent of total	100.0%	48.2%	51.8%
Number with any sexually transmitted infection (STI)	215	160	55
Percent	25.7%	39.5%	12.7%
Number with human papillomavirus (HPV)	153	119	34
Percent	18.3%	29.5%	7.8%
Number with Chlamydia trachomatis (CT)	33	29	4
Percent	3.9%	7.1%	0.9%
Number with Trichomonas vaginalis (TV)	21	15	6
Percent	2.5%	3.6%	1.4%
Number with herpes simplex virus type 2 (HSV-2)	16	14	2
Percent	1.9%	3.4%	0.5%

Source: Forhan, et al. (2008)

This study applies Bayes' Theorem to Forhan et al.'s (2008) findings to reconcile the prevalence of STIs and BV with the proportion of survey participants who did not report ever having had sex. Bayes Theorem is given by the following equation:

$$\Pr(A|B) = \frac{\Pr(B|A) \cdot \Pr(A)}{\Pr(B)}. \quad (1)$$

Prevalence of Sexual Activity

Let $\Pr(A)$ be the prevalence of sexual activity, measured as the probability that a survey participant has had sex. Let $\Pr(B) = 0.257$ be the prevalence of STIs or BV, measured as the probability that a survey respondent has one or more STIs or BV. Let $\Pr(C) = 0.482$ be the proportion of survey respondents who reported having had sex. Let $\Pr(B|A)$ be the prevalence of STIs or BV among respondents who have had sex, measured as the probability that a survey respondent has one or more STIs or BV. Assume the the prevalence of STIs or BV among respondents who have had sex is identical to the the prevalence of STIs or BV among respondents who have reported having had sex: $\Pr(B|A) = \Pr(B|C) = 0.395$ Assume that the probability of having had sex given that a participant has an STI or BV is equal to one: $\Pr(A|B) = 1$. Bayes' Theorem indicates that $\Pr(A) = 0.651$ That is, 65.1 percent of NHANES 2003–2004 participants has had sex. This result is consistent with Mosher et al.'s (2005) findings that 64.5 percent of females aged 15–19 had had some type of sexual contact.

Reliability of Self-Reported Incidence of Sexual Activity

Let $\Pr(C|A)$ be the probability that a survey participant who has had sex reports having had sex. Assume that the probability of having had sex given that a participant reports having had sex is equal to one: $\Pr(A|C) = 1$. As above, let $\Pr(C) = 0.482$ be the proportion of survey respondents who reported having had sex. The result given above estimates the probability that a survey participant has had sex: $\Pr(A) = 0.651$. Bayes' Theorem indicates that $\Pr(C|A) = 0.740$. Conversely 25.9 percent of NHANES 2003–2004 participants who have had sex did not report having had sex.

Conclusions

NHANES 2003–2004 participants likely underreport their sexual activity. Self-reported incidence of sexual activity indicate that less than half of survey participants have had sex. In contrast, this study finds that the incidence of STIs and BV among those who did not report having had sex indicate that almost two-thirds of survey participants have had sex. This study's results are consistent with the findings of Mosher et al. (2005).

Approximately 25 percent of survey participants who have had sex did not report having had sex. Research and policies relying on NHANES 2003–2004 should account for potential sample selection issues that could produce biased statistical results.

References

- Datta, S. Deblina, Maya Sternberg, Robert E. Johnson, Stuart Berman, John R. Papp, Geraldine McQuillan, and Hillard Weinstock**, "Gonorrhea and Chlamydia in the United States among Persons 14 to 39 Years of Age, 1999 to 2002," *Annals of Internal Medicine*, 2007, 147, 89–96.
- Forhan, Sara E., Sami L. Gottlieb, Maya R. Sternberg, Fujie Xu, S. Deblina Datta, Stuart Berman, and Lauri E. Markowitz**, "Prevalence of Sexually Transmitted Infections and Bacterial Vaginosis among Female Adolescents in the United States: Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004," March 2008.
- Mosher, William D., Anjani Chandra, and Jo Jones**, "Sexual Behavior and Selected Health Measures: Men and Women 14–44 Years of Age, United States, 2002," *Advance Data from Vital Health Statistics*, September 2005, 362.