

EXHIBIT NO. 6DATE: 3.6.13BILL NO. HB 239

March 6, 2013

Dear Committee Members:

Hello, my name is Madison Ekey. For the past two years I have had the privilege and opportunity to be a peer educator Through Bridgercare. I have taught many middle and high school classes about healthy relationships and sexual health. As both a student recipient and a teacher of sexual education I most vividly remember the days that the peer educators came into the classroom and taught sexual education, unembarrassed and knowledgeable. The knowledge that we provide as peer educators combined with the sexual education that students receive in health enhancement classes provide them with the ammunition that they need to make informed decisions regarding the decision to have sex.

The embarrassment that often surrounds the subject of sex and sex education is currently shared by all students, if sex- education were made opt-in a certain stigmatism might surround those students who are opted in. Further the students who need the information provided most by sexual education may be the ones who do not have the opportunity to receive it.

After watching the testimonial in House Education Committee hearing of HB239 I was frustrated that many of the individuals testifying brought the bill back to a debate on abortion. The purpose and necessity of sexual education is not to encourage abortion as a contraceptive method but instead to reinforce healthy behavior like abstinence or protection that would prevent students from being in a situation where they would have to think about the possibility of abortion.

Removing sexual education could lead to an increase of STI's or pregnancy. Studies have shown that students who have comprehensive sex-ed will postpone having sexual intercourse more so than those who have not. Isn't that what all of us want?



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## The Association Between Sex Education and Youth's Engagement in Sexual Intercourse, Age at First Intercourse, and Birth Control Use at First Sex

Trisha E. Mueller, M.P.H.\*, Lorrie E. Gavin, Ph.D., and Aniket Kulkarni, M.B.B.S., M.P.H.

*Centers for Disease Control and Prevention, Division of Reproductive Health, Atlanta, Georgia*

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### Abstract

**Purpose:** Sex education is intended to provide youth with the information and skills needed to make healthy and informed decisions about sex. This study examined whether exposure to formal sex education is associated with three sexual behaviors: ever had sexual intercourse, age at first episode of sexual intercourse, and use of birth control at first intercourse.

**Methods:** Data used were from the 2002 National Survey of Family Growth, a nationally representative survey. The sample included 2019 never-married males and females aged 15–19 years. Bivariate and multivariate analyses were conducted using SUDAAN. Interactions among subgroups were also explored.

**Results:** Receiving sex education was associated with not having had sexual intercourse among males (OR = .42, 95% CI = .25–.69) and postponing sexual intercourse until age 15 among both females (OR = .41, 95% CI = .21–.77) and males (OR = .29, 95% CI = .17–.48). Males attending school who had received sex education were also more likely to use birth control the first time they had sexual intercourse (OR = 2.77, 95% CI = 1.13–6.81); however, no associations were found among females between receipt of sex education and birth control use. These patterns varied among sociodemographic subgroups.

**Conclusions:** Formal sex education may effectively reduce adolescent sexual risk behaviors when provided before sexual initiation. Sex education was found to be particularly important for subgroups that are traditionally at high risk for early initiation of sex and for contracting sexually transmitted diseases. © 2008 Society for Adolescent Medicine. All rights reserved.

### Keywords:

Adolescents; Sex education; Sexual behavior; Contraception; Age at sexual initiation

Although the appropriate content is debated, 93% of Americans support some form of sex education being taught in schools [1]. Similarly, a number of professional organizations have recommended that adolescents be counseled about sex to provide them with the information and skills needed to make healthy and informed decisions about sexual behavior [2–5]. Equipping youth with the necessary skills and knowledge to make responsible decisions about sex may help to reduce the more than 750,000 pregnancies among teens [6,7] and the approximately 9 million cases of sexually trans-

mitted disease (STD) infections among youth aged 15–24 years old [8,9] that occur in the United States each year.

However, existing population-level research on the impact of sex education on reducing adolescent sexual risk behavior has suggested that the effect is, in fact, weak. Several population-based studies conducted during the 1970s through the early 1990s demonstrated that sex education had little or no effect on the likelihood of youth engaging in sexual intercourse [10–14]. Sex education appeared to be somewhat more influential in the contraceptive decisions of youth, with some studies showing that sex education had a positive effect on greater contraceptive use at first episode of sexual intercourse (referred to in this study as “first sex”) [10,11,13,15–17].

\*Address reprint requests to: Trisha Mueller, M.P.H., 4770 Buford Highway, MS K22, Atlanta, GA 30341.

E-mail address: [tmueller@cdc.gov](mailto:tmueller@cdc.gov)

During the past two decades, however, a number of changes have occurred in how sex education is provided to adolescents [18]. First, sex education has become more widespread [6,19]. In 2002, more than 80% of 15–19-year-old youth reported being taught “how to say no” to sex, and more than 65% reported receiving education on birth control methods [6]. In contrast, only 60% of females and 52% of males reported receiving any sex education by the age of 19 years in 1984 [11]. Second, youth are receiving sex education at earlier ages than in the past. Studies show that during the 1980s, 21%–47% of youth received a sex education course by the time they reached their 15th birthday [10,11]. In a recent national study of middle school teachers, 72% of fifth- and sixth-grade teachers reported that sex education was taught in their schools at one or both grade levels [15]. According to 2002 data, two thirds of teens reported being taught about “how to say no” before they entered high school, whereas education on birth control methods occurred later [6]. In addition, researchers have also demonstrated that abstinence-only education has increased in recent years, and education on birth control methods has decreased since 1995 [18].

Evidence from intervention efficacy research accumulated during the past 20 years shows that some, but not all, sex education curricula can effectively reduce adolescent sexual risk behavior [20,21]. However, the extent to which these effective sex education programs have been implemented is not well understood. A recent study of school-based substance-use prevention programs suggests poor uptake of evidence-based programs by providers; only 14% of substance-abuse prevention providers used evidence-based content and delivery methods [22].

No recent national studies have been conducted to assess the effect of sex education on the sexual behaviors of youth. It is possible that the changes in how and when sex education is provided (i.e., increased coverage of sex education, providing sex education at earlier ages, and availability of evidence-based curricula) will have translated into a greater impact at the population level. This study was developed by using a recent, nationally representative survey to explore the association between adolescents’ receipt of sex education with sexual risk behaviors, including initiation of sexual intercourse, age at first sex, and birth control use at first sex. Previous studies have not included an extensive analysis of the impact of sex education on subgroups of youth; therefore, this study also explored how those associations vary among different sociodemographic subgroups of adolescents.

## Methods

### Sample

The data analyzed were from the 2002 National Survey of Family Growth (NSFG), a nationally representative sur-

vey of male and female individuals 15–44 years of age that was designed to provide estimates of sexual activity, use of contraception, and births. The survey methodology has been described previously [23]. The overall response rate among 15–19-year-olds in the 2002 NSFG was 81%. Our sample was limited to males and females aged 15–19 years who had never been married; among respondents who reported a history of sexual activity, we excluded those who had their first sexual intercourse at or before age 10 ( $n = 10$ ). Youth who reported their race as other than white, Hispanic, or African American were excluded from the analysis because of the small sample size ( $n = 117$ ). When exclusion criteria were applied, the total sample comprised 2019 adolescents ( $n = 1026$  males and 993 females).

### Measures

Adolescents were asked whether they had ever received any formal instruction on “how to say no” to sex and any formal education on methods of birth control. These items were asked as separate questions. If respondents answered yes to either question, they were then asked at what grade level they had received the education. “Formal” sex education included any sex education that was provided in schools, in churches, or by community organizations. Exposure to sex education was coded as “ever” received sex education on either “how to say no” to sex or methods of birth control versus “never” received any education on these two topics. Variables indicating the timing of sex education (i.e., before or after a respondent’s first sexual intercourse) were also created. The age at which females and males received formal sex education was determined by adding 5 to the grade level that they reported as having received sex education, a method consistent with previous research [19]. By comparing the age at which the respondents received formal sex education with the age at first sexual intercourse, we were able to determine whether the education occurred before or after the respondents had sexual intercourse for the first time. If the age at first sex and age at sex education were the same, sex education was determined to have occurred after first sex. For respondents who reported not having had sexual intercourse but having received formal sex education, the education was coded as having occurred before first sex.

Three behavioral outcomes were included in this analysis. Sexual intercourse was classified as “ever” versus “never” having had sexual intercourse. Age at first sex was dichotomized into “under 15 at first sex” and “equal to or greater than 15 at first sex.” We chose 15 years to be consistent with the Healthy People 2010 goal of increasing the proportion of adolescents who abstain from sex until at least age 15 years [24]. Youth who reported they had not had sexual intercourse were classified as having sex at age 15 or older. Birth control use at first sex was assessed only among sexually experienced adolescents. Youth who indicated

that they did not use effective or modern methods of birth control the first time that they had sexual intercourse or who had used withdrawal, natural family planning, or rhythm method were classified as not using a method of birth control at first sex.

Six sociodemographic covariates were used in the analysis. Age at interview and age at first sex were coded as continuous variables. Family income, race/ethnicity, family situation at age 14 years (living with one parent/other or living with two parents), school status (in-school/graduated from school or dropout), and residence status were treated as categorical variables (Table 1).

### Data analysis

Data were weighted to adjust for varying probabilities of selection and nonresponse. All analyses were conducted using the statistical software package SUDAAN (version 8), which accounts for the complex sampling design used in this survey and provides appropriate standard errors [25].

Bivariate analyses examined associations between (1) the exposure variable (receipt of sex education) and the demographic covariates and (2) the exposure variable and

the three behavioral outcomes. Bivariate relationships were examined using the  $\chi^2$  test.

Two multivariable analyses were performed for each of the three outcomes. In the first analysis, multivariable logistic regression was used to determine whether the association between the exposure and outcome variables remained after adjusting for all sociodemographic covariates. The covariates were included in the model irrespective of their significance level.

In the second multivariable analysis, to determine whether the effect of sex education differed among subgroups, we examined for interaction terms between the exposure and the following four sociodemographic variables: race/ethnicity, family situation at age 14, school status, and residence. Age at interview (only for the association between receipt of sex education and ever having had sexual intercourse), age at first sex (only for the association between receipt of sex education and use of birth control at first sex), and family income were treated as confounders and were adjusted for regardless of their significance level in the interaction model. The interaction model included all main effects variables (exposure and confounders), and all possible two-way interaction variables. Direct backward elimination technique was used to remove the two-way interaction variables one at a time until the model included all possible two-way interactions at the .05 significance level (Wald *F* test,  $p < .05$ ). If any of the four covariates (race/ethnicity, family situation at age 14 years, school status, or residence) did not interact with the exposure, it was treated as a confounder. Three-way interactions were examined if the model had more than two two-way interactions, but none were significant at a level of  $p < .05$ . Odds ratios (OR) were calculated manually using the final model, which included all the main effects variables, and significant two-way interactions.

Table 1 presents the sociodemographic characteristics of the study sample. Substantial variation existed in family incomes, with 19%–24% below the federal poverty level, 40%–45% between 100% and 300% of or above the federal poverty level, and 32%–41% more than 300% above the federal poverty level. The sample was predominantly white (68% of females and 68% of males), with smaller percentages of African Americans (17% of females and 15% of males) and Hispanics (15% of females and 17% of males). Most youth lived in a home with two parents/guardians (78% of females and 82% of males), and the vast majority either attended or had graduated from high school (92% of females and 91% of males). Approximately three fourths of the sample lived in a MSA-central city/MSA-other (78% of females and 81% of males), with the remainder living outside of an MSA. Less than half of the adolescents were sexually experienced (42% of females and 44% of males; data not shown), and a relatively small percentage reported having sexual intercourse before age 15 years (12% of females and 14% of males; data not shown). Among sexu-

Table 1  
Sociodemographic characteristics of study sample\*

Characteristic	Total	
	Females <i>n</i> (%)	Males <i>n</i> (%)
Youth age (years)		
15	207 (20)	190 (19)
16	207 (21)	218 (20)
17	208 (21)	185 (18)
18	191 (19)	244 (23)
19	180 (18)	189 (19)
Family income†		
<100%	251 (24)	206 (19)
100%–199%	241 (24)	205 (22)
200%–299%	187 (21)	202 (19)
300%–399%	138 (15)	177 (19)
400%–499%	105 (11)	144 (13)
>500%	71 (6)	92 (9)
Race/ethnicity		
White	562 (68)	606 (68)
African American	232 (17)	197 (15)
Hispanic	199 (15)	223 (17)
Family situation at age 14 years		
Lived with two parents	726 (78)	800 (82)
Lived with one parent/other	267 (22)	226 (18)
School status		
In school	921 (92)	926 (91)
Dropout	72 (8)	100 (9)
Residence		
MSA, central city or MSA, other	805 (78)	855 (81)
Non-MSA	188 (22)	171 (19)

MSA = Metropolitan Statistical Area.

\* All *n* values are presented as unweighted frequencies; percentages are given as weighted percentages.

† Family income in relation to federal poverty level.

Table 2  
Bivariate associations between exposure to formal sex education and youth's sexual risk behaviors, 2002

	Received sex education before first sex <sup>†</sup>			
	Females <i>n</i> (%)		Males <i>n</i> (%)	
	Yes	No	Yes	No
Ever had sexual intercourse	357 (41)	75 (54)*	397 (42)	98 (64)***
Age at first sex at age <15 years <sup>‡</sup>	79 (9)	40 (22)**	93 (10)	62 (32)***
Used birth control at first sex	269 (76)	45 (59)*	331 (83)	75 (72)

<sup>†</sup> Youth were considered to have received sex education prior to first sexual intercourse if they met one of two conditions: (1) they reported receiving sex education prior to the year of first sexual intercourse; or (2) they reported receiving sex education but not having had sexual intercourse.

<sup>‡</sup> Exposure to formal sex education is defined as exposure to any formal sex education before first sexual intercourse AND before the age of 15 for this sexual risk behavior.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

ally experienced youth, the majority reported using an effective or modern method of birth control at first sex (73% of females and 80% of males; data not shown).

Table 2 shows the results of bivariate analyses examining the association between exposure to sex education before first sex and three sexual risk behaviors. Adolescent females who had received sex education before first sex were less likely to have had sexual intercourse than females who had not had sex education before first sex (41% vs. 54%,  $p < .05$ ). Adolescent females who had received sex education before first sex were also less likely to have had sexual intercourse before age 15 years than females who had not had sex education before first sex (9% vs. 22%,  $p < .01$ ). Sexually experienced females who had had sex education before first sex were more likely to have reported using some form of birth control at first sex than those who had not had sex education before first sex (76% vs. 59%,  $p < .05$ ). Males who had received sex education before first sex were less likely than those who had not received sex education to have had sexual intercourse before first sex (42% vs. 64%,  $p < .001$ ). Males who had received sex education before first sex were also less likely than those who had not had sex education before first sex to have had sexual intercourse before age 15 (10% vs. 32%,  $p < .001$ ). Among sexually experienced males, no significant difference was found between used and did not use birth control at first sex based on history of sex education (83% vs. 72%,  $p = .147$ ).

Among females, no association was found between exposure to sex education before first sex and having had sex after adjusting for all sociodemographic characteristics (Table 3). However, the following significant interactions were found: urban African American females were less likely to have had sexual intercourse if they had received sex education before first sex (OR = 0.12, 95% confidence interval [CI] = .04–.36) and non-MSA white females were more likely to have had sexual intercourse if they had received sex education before first sex (OR = 3.16, 95% CI =

1.01–9.87). Among males, those who received sex education before first sex were less likely to have had sexual intercourse after adjusting for all sociodemographic characteristics (OR = .42, 95% CI = .25–.69), and no significant interactions were found between exposure to sex education before first sex and sociodemographic characteristics.

Among females, a statistically significant association was found between receipt of sex education before first sex and age at sexual initiation after adjusting for all sociodemographic characteristics (OR = .41, 95% CI = .21–.77) (Table 4). Significant interactions were also found between receiving sex education before first sex and several sociodemographic characteristics. Among African American females who either were attending or had graduated from high school, those who had received sex education before first sex were less likely to have had sexual intercourse before age 15 years than those who had not received sex education before first sex (OR = .09, 95% CI = .04–.22). Among both white and Hispanic females who were not enrolled in high school or had dropped out, those who had received sex education before first sex were more likely to have reported having had sexual intercourse before age 15 than those who had not had sex education before first sex (for whites, OR = 10.18, 95% CI = 1.25–82.86; for Hispanics, OR = 14.44, 95% CI = 1.68–123.97).

Among males, those who had received sex education before first sex were more likely to have abstained from sex until at least age 15 years, even after controlling for sociodemographic characteristics (OR = .29, 95% CI = .17–.48). Two significant interactions were noted: (1) among males who lived in a two-parent home, those who had received sex education before first sex were less likely than those who had not received sex education before first sex to have had sexual intercourse before age 15 (OR = .38, 95% CI = .21–.68); and (2) among males who lived in a one-parent/other home, those who received sex education before first sex were less likely than those who had not received sex

Table 3  
Results of multivariate regression analysis using “ever had sexual intercourse” as dependent variable, separately for females and males 15–19 years of age, 2002

	Females		Males	
	OR	95% CI	OR	95% CI
Exposure				
Received sex education	.64	(.37–1.11) <sup>a</sup>	.42*	(.25–.69) <sup>a</sup>
Did not receive sex education	1.0		1.0	
Significant interactions				
SexEd*Residence*Race				
MSA + white				
Received sex education	.59	(.29–1.23) <sup>b</sup>	—	—
Did not receive sex education	1.0			
MSA + African American				
Received sex education	.12*	(.04–.36) <sup>b</sup>	—	—
Did not receive sex education	1.0			
MSA + Hispanic				
Received sex education	.66	(.19–2.27) <sup>b</sup>	—	—
Did not receive sex education	1.0			
Non-MSA + white				
Received sex education	3.16*	(1.01–9.87) <sup>b</sup>	—	—
Did not receive sex education	1.0			
Non-MSA + African American				
Received sex education	.63	(.13–2.97) <sup>b</sup>	—	—
Did not receive sex education	1.0			
Non-MSA + Hispanic				
Received sex education	3.49	(.71–17.12) <sup>b</sup>	—	—
Did not receive sex education	1.0			

CI = confidence interval; OR = odds ratio; MSA = metropolitan statistical area.

<sup>a</sup> Adjusted for youth's age at interview, family income, race, family structure, school status, and residence.

<sup>b</sup> Adjusted for youth's age at interview, family income, family structure, and school status.

\* Denotes significant odds ratio.

education before first sex to have had sexual intercourse before age 15 (OR = .13, 95% CI = .06–.30).

Among females, the association between sex education before first sex and use of effective or modern methods of birth control at first sex was not significant after adjusting for sociodemographic characteristics (Table 5); similarly, no significant interactions were found. Among males, no significant association was found after adjusting for all covariates; however, some significant interactions were noted. Among males who either were attending or had graduated from high school, those who had received sex education before first sex were more likely to have used an effective or modern method of birth control at first sex than males attending high school or that had graduated from high school who had not received sex education before first sex (OR = 2.77, 95% CI = 1.13–6.81).

## Discussion

Overall, results suggest that receiving formal sex education before first sex was associated with abstaining from sexual intercourse, delaying initiation of sexual intercourse, and greater use of contraception at first sex. Receiving sex education before first sexual intercourse may help contribute to reaching the Healthy People 2010 goals of reducing

the number of adolescents who have sexual intercourse, reducing the number of adolescents younger than age 15 years who have sexual intercourse, and increasing the number of adolescents who use contraceptive methods. This analysis provides results from recent data using a nationally representative sample of youth to demonstrate these findings. Unlike many previous studies, our results suggest that sex education before first sex protects youth from engaging in sexual intercourse at an early age [10,11,13,16]. Among all females, those who received sex education before first sex were more likely to postpone having sexual intercourse until at least age 15. In addition, results suggest that sex education may be particularly beneficial for certain subgroups of youth, many of which are traditionally considered to be at high risk for adverse sexual health outcomes. Specifically, urban African American females were more likely to have not had sex and African American females attending school were more likely to have postponed sexual initiation until at least age 15 if they had received sex education before first sex.

Similar positive findings were demonstrated among males. Those who had received sex education before first sex were more likely than those who had not received sex education before first sex to have not had sexual intercourse and to have postponed sexual intercourse until at least age

Table 4  
Results of multivariate regression analysis using “had sexual intercourse before age 15 years” as dependent variable, separately for females and males 15–19 years of age, 2002

	Females		Males	
	OR	95% CI	OR	95% CI
<b>Exposure</b>				
Received sex education	.41*	(.21–.77) <sup>a</sup>	.29*	(.17–.48) <sup>a</sup>
Did not receive sex education	1.0		1.0	
<b>Significant interactions</b>				
<b>SexEd*Race*School Status</b>				
White + in school				
Received sex education	.47	(.16–1.36) <sup>b</sup>	—	—
Did not receive sex education	1.0			
White + dropout				
Received sex education	10.18*	(1.25–82.86) <sup>b</sup>	—	—
Did not receive sex education	1.0			
African American + in school				
Received sex education	.09*	(.04–.22) <sup>b</sup>	—	—
Did not receive sex education	1.0			
African American + dropout				
Received sex education	2.01	(.30–13.74) <sup>b</sup>	—	—
Did not receive sex education	1.0			
Hispanic + in school				
Received sex education	.67	(.19–2.35) <sup>b</sup>	—	—
Did not receive sex education	1.0			
Hispanic + dropout				
Received sex education	14.44*	(1.68–123.97) <sup>b</sup>	—	—
Did not receive sex education	1.0			
<b>SexEd*Family situation</b>				
Living with 2 parents				
Received sex education	—	—	.38*	(.21–.68) <sup>c</sup>
Did not receive sex education			1.0	
Living with 1 parent				
Received sex education	—	—	.13*	(.06–.30) <sup>c</sup>
Did not receive sex education			1.0	

CI = confidence interval; OR = odds ratio.

<sup>a</sup> Adjusted for family income, race/ethnicity, family situation, school status, and residence.

<sup>b</sup> Adjusted for family income, family situation, and residence.

<sup>c</sup> Adjusted for family income, race/ethnicity, school status, and residence.

\* Denotes significant odds ratio.

15 years. Sex education seems to be more beneficial in postponing sexual intercourse until age 15 in single parent homes. Previous research shows that youth from one-parent households are more likely to report sexual experience and earlier initiation of sex [26–28]. With the growing population of youth in single-parent households [29], this research highlights the potential benefit of sex education before first sex among these youth in postponing sexual intercourse.

Our study demonstrates positive associations between receiving sex education before first sex with several sexual risk behaviors, whereas many previous studies did not find associations with postponing sexual intercourse [11–13]. Reasons for our positive findings may be related to the fact that we were able to control for the sequence of events (i.e., whether sex education was provided before or after sexual intercourse), whereas earlier studies were not able to do this [13,14]. In addition, greater proportions of youth are now receiving sex education as well as receiving it at younger

ages than in the past. These changes in how and when sex education is provided may account for youth attaining the skills and knowledge needed to influence their decision making about responsible sexual behavior. Another possible explanation is that schools, community centers, and faith-based institutions are using more effective curricula. During the past two decades, a substantial number of effective sex education programs have been developed [30]. Although the extent to which schools and community organizations are using these programs and maintaining fidelity to the curricula are not known, the use of these programs may be a contributing factor to the positive effects of sex education found in our study. Future research should investigate the prevalence of evidence-based programs used in formal settings as well as determine their effectiveness when implemented on a large scale. There is also a need to better understand the process of scaling up the implementation of evidence-based programs.

Table 5  
Results of multivariate regression analysis using “used birth control\* at first sexual intercourse” as dependent variable, separately for females and males 15–19 years of age, 2002

	Females		Males	
	OR	95% CI	OR	95% CI
Exposure				
Received sex education	1.80	(.98–.29) <sup>a</sup>	1.84	(.76–4.47) <sup>a</sup>
Did not receive sex education	1.0			
Significant interactions				
SexEd*School status				
In school				
Received sex education	—	—	2.77 <sup>†</sup>	(1.13–6.81) <sup>b</sup>
Did not receive sex education			1.0	
Dropout				
Received sex education	—	—	.28	(.07–1.06) <sup>b</sup>
Did not receive sex education			1.0	

CI = confidence interval; OR = odds ratio.

\* Excludes withdrawal, rhythm method, and natural family planning.

<sup>†</sup> Denotes significant odds ratio.

<sup>a</sup> Adjusted for age at first sexual intercourse, family income, school status, race/ethnicity, family situation, and residence.

<sup>b</sup> Adjusted for age at first sexual intercourse, family income, race/ethnicity, family situation, and residence.

In addition to this study’s positive findings, some unexpected results were noted, suggesting that sex education may not be protective for some subgroups. Exposure to sex education was significantly associated with ever having had sexual intercourse for non-MSA (i.e., rural) females and was significantly associated with early initiation of sexual intercourse for white and Hispanic females who dropped out of school. These findings may have several possible explanations. First, these results may be due to the small numbers of youth in these subcategories, which resulted in unstable estimates as evidenced by the wide confidence intervals surrounding each point estimate. In addition, because of the numerous tests of significance completed for this analysis ( $n = 28$ ), we could expect to find one to two statistical tests to be significant by chance. Thus, these unexpected findings may have been found by chance. Alternatively, the effect may be real, and certain subgroups may not benefit from sex education in the same way as the larger population of youth. The content of education and fidelity to programs may also be a problem among these populations, although we are not able to address this issue with this data. Future research on youth dropouts and rural youth may be justified to determine whether this study’s findings can be validated and, if so, the reasons for them.

The findings of this study must be considered in light of the study’s strengths and limitations. The study included a nationally representative sample of adolescents and considered the timing of sex education in relation to the initiation of sexual intercourse. However, the study was limited by the fact that it relied on self-reported measures; respondents may have given socially acceptable answers, and recall bias should be considered. Also, sex education is not the only factor that influences the sexual behaviors of youth; parents,

peers, media, and other outside influences are among many influences that may also need to be considered. No conclusions about type of sex education (i.e., comprehensive sex education vs. focus on abstinence-only) can be drawn from this analysis. Because the content, as well as the quantity and quality of sex education can vary between locations, further research must be conducted to examine sex education content and also whether differences in sexual behaviors of youth occur based on type of sex education received.

Our analyses suggest that sex education before first sex helps protect youth from risky sexual behaviors. For population groups that are often considered the most disadvantaged (i.e., urban, African American females), sex education seems to be the most beneficial. Researchers have recently documented the contribution of delayed sexual initiation and improved contraceptive use to the decreased teen pregnancy rate [31]; findings from our analysis suggest that sex education received before first sex by youth in formal settings may contribute to this positive outcome. Sex education should continue to be implemented in schools, community centers, and churches and, to be most effective, should occur before youth engage in sexual intercourse for the first time. Sex education provides youth with the knowledge and skills to make healthy and informed decisions about sex, and this study indicates that sex education is making a difference in the sexual behaviors of American youth.

#### Acknowledgment

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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