
Factors Influencing First Intercourse for Teenage Men

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Synopsis

Analyses of a nationally representative survey of 1,880 15- to 19-year-old men were conducted to examine factors associated with (a) the age when

first sexual intercourse occurred and (b) whether a condom or other contraceptive method was used at first intercourse. Discrete time-event history models assessed factors influencing their age until first intercourse. Black males began sexual activity significantly earlier than white or Hispanic males. Males who had been held back in school also began sexual activity earlier. If a respondent's mother had been a teenager when she first gave birth, or if his mother was employed during his childhood, he was more likely to initiate intercourse early.

A variety of combinations of AIDS and sex education topics were examined for their association with one's age at the time of first intercourse: two topics were associated with earlier intercourse, and one was associated with delays in first intercourse. Logistic regression models examined correlates of using a condom or any effective male or female method of contraception at first intercourse: having received education about birth control was marginally associated with increased probability of using a condom or any effective male or female contraceptive method at first intercourse. These findings indicate the relevance of integrated approaches to school-based sex and AIDS education in delaying intercourse and promoting use of contraceptive methods.

BECAUSE OF CONCERNS about human immunodeficiency virus (HIV) and sexually transmitted disease (STD) transmission, as well as adolescent pregnancy, national health objectives for the year 2000 include reducing the levels of early intercourse among teenagers, increasing the use of condoms and contraceptives, and increasing youths' exposure to information about sex from parents, schools, and other sources (1).

Recent analyses have indicated that the receipt of HIV and sex education is associated with *increases* in condom use and *decreases* in the number of partners and frequency of intercourse in the last year among teenage men (2). The twin changes in condom use and sexual activity are important; a common fear about HIV and sex education is that they might lead to increased or earlier sexual activity among adolescents.

This paper extends the prior analyses of these issues by analyzing the relationship between receipt of HIV and sex education with when young men first have intercourse and whether they or their partners used condoms or other contraceptives at first intercourse. In addition, it examines other sociodemographic characteristics that may affect the onset of sexual activity by young males.

The initiation of sexual activity is an important milestone in young men's lives. It is one sign of entering into adult life. It also marks the beginning of the period of risks associated with pregnancy and paternity, as well as HIV and STD transmission. The early onset of sexual activity has been associated with other adolescent risk behaviors, such as substance use or criminal behavior (3,4). A variety of personal, family, social, and policy variables may affect the initiation of intercourse

and contraceptive behavior (5). However, research about adolescent sexual behavior has generally focused on females; the literature about males is scarce. Nonetheless, males usually begin intercourse earlier than females and are more sexually active than females (6).

This study examines personal, family, and socio-demographic factors which influence (a) the age at the time of first intercourse and (b) condom and contraceptive use at first intercourse, based on the 1988 National Survey of Adolescent Males (NSAM), a nationally representative survey of never-married American males who were 15 to 19 years old. We examined the relationship of numerous personal, family, and social factors, including race and ethnicity, family fertility background, family environment, socioeconomic background, educational achievement, religious experience, birth cohort, and receipt of formal sex education or education about acquired immunodeficiency syndrome (AIDS) before first intercourse.

In previous analyses, we investigated factors affecting young men's recent behaviors, including condom use and sexual activity (7-10). An important distinction of this paper is that we are examining developmental phases which occurred earlier in the young men's lives, sometimes many years before the survey interview. A side effect is that we have a more limited set of variables to explore as possible factors preceding the transition from virginity. Although there are a variety of biological, attitudinal, or community traits that might affect whether a young man initiates intercourse, we restrict the analyses to variables about the respondent or his family at or before first intercourse. For example, Udry and Billy observed hormonal influences on initiation of intercourse (11), but NSAM was unable to include such information.

Methods

Source of data. The data are from the 1988 National Survey of Adolescent Males, a nationally representative sample of 1,880 never married, non-institutionalized males 15 to 19 years old. The survey oversampled black and Hispanic males; sample weights are used in presenting descriptive data, but the multivariate analyses were conducted unweighted. The overall response rate was 73.9 percent. The interviews lasted about 1 hour and were conducted in the respondents' home or another confidential location. Other information about the survey has been published elsewhere (6,10).

Variables. In longitudinal analyses, an important question is whether variables change over time. Certain traits, such as race and ethnicity, being born in the United States, first language spoken, maternal education, and whether the mother was a teenager at her first birth are basically constant. Others, such as number of siblings and birth order, are relatively consistent across the ages of interest in this study (10 to 19 years old) and are treated as being essentially constant.

NSAM asked about the composition of the respondent's family, strictness of family rules, and frequency of attendance at religious services at the age of 14. We grouped family composition at age 14 into (a) living with two parents (including biological or adoptive parents and step-parents), (b) mother alone (living with only his mother and no other adults), (c) mother and others (living with his mother and other adults, including boyfriend, other relatives, or unrelated adults) and (d) other type (other configurations, including living only with father, foster parents, grandparents, or living alone).

Strictness of family rules was determined by the answer to the question, "When you were 14 years old, how would you describe the rules at home about things like staying out late, dating, alcohol, and so on?" Answers were coded as very strict, somewhat strict, not strict at all, or no rule. Maternal employment was based on "During most of the time that you were growing up, that is, when you were between the ages of 5 and 15, did your mother or the woman who raised you usually work full-time or part-time, or did she not work at all?"

Two variables were asked for the period covered by the interview: religious denomination and whether the respondent was ever retained a grade. Religious denominations probably do not change greatly over time. While NSAM did not determine when grade retentions occurred, repeating a grade predominantly occurs at very young ages, for example, first or second grade (Richard Whelan, National Center for Educational Statistics, personal communication, January 1991).

As will be described in the section, Methods of Analysis, the models examining the age at first intercourse were based on duration analyses. In these models, there were five time-varying covariates. The first time-varying covariate was based on the age when the person had first attended church school. The other four were based on the age at which the respondent first received formal instruction in four categories of sex or AIDS education. (NSAM did not ask the age at which

'This paper . . . analyzes the relationship between receipt of HIV and sex education with when young men first have intercourse and whether they or their partners used condoms or other contraceptives at first intercourse.'

instruction first occurred, but the *grade* at which it occurred. We converted grade to age, using the formula that age usually equals grade plus 5. This is based on the modal age of students in each grade in the Current Population Survey. When a student reported that he had been retained in grade, we added 1 to this converted age.)

In 42 cases, the reported age at first intercourse was under 10. We were concerned whether these data were accurate or reflected voluntary sexual activity. To mitigate the effects of these observations of the very young, the age at first intercourse was truncated to age 10 in all the analyses that follow.

NSAM asked respondents about their receipt of instruction in 10 subject areas concerning sex and AIDS; the areas were then grouped into four clusters:

1. biological topics, including "how pregnancy occurs," "female monthly periods, that is, the menstrual cycle," and "venereal diseases or VD;"
2. birth control, including "methods of birth control" and "where to obtain contraceptives;"
3. resistance skills, "how to say no to sex;" and
4. AIDS, including "AIDS" and "how to prevent AIDS using safe sex methods."

These four clusters were selected based on preliminary factor analyses in which these four groupings accounted for 77 percent of the variance in the 10 topics. In the duration models, the time-varying covariates are coded as 1 if the person had instruction in any topic in the cluster in that person-year or a prior year and 0 if the person had no prior instruction.

All categorical variables were coded so that increases meant either that the trait was present (for dichotomous variables, 1 = yes, 0 = no) or increased in intensity (for example, family rules became more strict). In multivariate analyses, one group was omitted as the reference category; these reference categories are denoted in the tables.

We also examine, among the sample of youth who have had intercourse, whether they used a condom or any effective male or female contraceptive method at first intercourse, based on logit models. Effective contraceptive methods include use of one or more of the following methods by the respondent or his partner: condom, oral contraceptives, diaphragm, IUD, contraceptive foam, jelly or cream, and Today sponge. The five time-varying covariates were converted to simple binary variables, depending on the person's condition at the age of first intercourse.

For these analyses, variables about the first sexual partner also included her age, whether she was believed to be virgin, and relationship type at first intercourse. Relationship types were "just met," "engaged," or "other;" the "other" category included "going with her or going steady," "going out with her once in a while," and "just friends." Preliminary analyses indicated that there was no significant distinction between the categories "going with her or going steady," "going out once in a while" and "just friends," so we grouped them together. The inability to distinguish them may be due to the judgmental nature of classifying relationships.

Methods of analyzing age until first intercourse.

The main method of analyzing the determinants of age until first intercourse was discrete-time event history models with time-varying covariates (12). The years between age 10 and the respondent's age at interview were converted to person-years of experience, and the years following the year of first intercourse were deleted from the sample. The dependent variable, first intercourse, was coded as 0 in the person-years prior to first intercourse, 1 in the year of first intercourse, and unobserved after the year of first intercourse. A person with no intercourse would be counted with 0s in all years. The covariates have values appropriate for each of the appropriate person years. Logistic regression is used to estimate the model:

$$\ln(P_{it} / (1 - P_{it})) = \beta_0 + \beta X_i + \beta_t X_{it},$$

where P_{it} is the probability of having first intercourse in a person-year (therefore it is a rate); β_0 is the constant; X_i and X_{it} are vectors of time-constant and time-varying variables in person-years; and the β s are the estimated coefficients. We can interpret the discrete-time coefficients by noting that e^β is the odds ratio which expresses the ratio of the odds of transition from virginity to nonvirginity in

Table 1. Weighted frequencies of selected characteristics related to first intercourse in males 15–19 years, National Survey of Adolescent Males, 1988

| <i>Whole sample</i> | | <i>Those with sexual intercourse</i> | |
|--|----------------|--|----------------|
| <i>Trait</i> | <i>Percent</i> | <i>Trait</i> | <i>Percent</i> |
| Race, ethnicity: | | Race, ethnicity: | |
| White, non-Hispanic | 72.9 | White, non-Hispanic | 68.6 |
| Black, non-Hispanic | 14.6 | Black, non-Hispanic | 19.5 |
| Hispanic | 9.4 | Hispanic | 9.2 |
| Other race | 3.1 | Other race | 2.7 |
| Maternal age at first birth: | | Contraceptive use at first intercourse: | |
| Mother 20 or older | 66.2 | Used condom | 54.5 |
| Mother under 20 years | 30.8 | Used condom or effective female contraceptive | 61.6 |
| Maternal age missing | 3.0 | | |
| Family structure at age 14: | | First partner's prior experience: | |
| Two parents | 79.7 | She was a virgin | 45.1 |
| Mother only | 14.3 | She was experienced | 39.6 |
| Mother and other adult | 1.5 | Don't know her experience | 15.3 |
| Other structure | 4.5 | | |
| Maternal employment: | | Relationship with first partner: | |
| Did not work outside home | 25.7 | Engaged | 1.2 |
| Part-time work | 28.1 | Going steady, going out once in a while, just friends | 91.4 |
| Full-time work | 46.2 | Just met | 7.4 |
| Family strictness at age 14: | | Discussed contraception at first intercourse | |
| No rules | 1.3 | | 40.5 |
| Not strict at all | 34.2 | | |
| Somewhat strict | 52.5 | Had sex or AIDS education before first intercourse: | |
| Very strict | 11.9 | Biological topics | 57.8 |
| Ever retained in grade | | AIDS | 17.8 |
| | 30.1 | Resistance skills | 20.3 |
| Went to church school¹ | | Birth control | 40.1 |
| | 16.4 | | |
| Ever had sex or AIDS education: | | | |
| Biological topics ¹ | 91.9 | | |
| AIDS ¹ | 72.8 | | |
| Resistance skills ¹ | 58.0 | | |
| Birth control ¹ | 78.7 | | |

¹ Time-varying covariate in duration analyses.

person-years for a one-unit change in the covariate, controlling for all other factors.

Discrete-time models require assumptions about (a) the functional form of the hazard rate and (b) the independence of person-years of observation. Preliminary analyses indicated that, for the age span we were investigating, we should include time (that is, year of age being evaluated minus 10) as a linear term (that is, indicating an exponential hazard) and add an interaction term between time and being black.

The age at first intercourse used in the study was a computed age based on the separate reports of month and year of first intercourse, as opposed to the respondent's report of age in years. There were trivial discrepancies between the two, and some rounding was required in figuring person-years. We used a rounding rule so that a person with no intercourse who was half or more through that year of age was counted as a person-

year with no intercourse and a person less than half a year through was counted as a year with intercourse.

We compared these specifications with Cox's proportional hazards models with time-varying covariates (13), a nonparametric continuous-time method of duration analysis, and obtained almost exactly the same coefficients. The discrete-time models were far less intensive computationally, so we used them for the balance of the analyses. Since proportional hazards models make no prior assumptions about the functional form for the hazard, the consistency of results indicates that the functional form used in our discrete-time models are reasonable and that findings are relatively robust.

Methods of analyzing condom and contraceptive use. We analyzed condom and contraceptive use at first intercourse through logit models. These

Table 2. Factors affecting age until first intercourse of the whole sample of adolescent males, discrete-time event history model

| Variables | Estimated coefficient | Odds ratio | P value |
|---|-----------------------|------------|---------|
| Race, ethnicity:¹ | | | |
| Black | 1.472 | 4.357 | <0.001 |
| Hispanic | 0.240 | 1.271 | <0.1 |
| Other | -0.138 | 0.871 | ... |
| Immigrant | -0.193 | 0.824 | ... |
| First language spoken:² | | | |
| Spanish | -0.408 | 0.665 | <0.05 |
| Other non-English | -0.359 | 0.698 | ... |
| Mother's education:³ | | | |
| Less than high school .. | 0.092 | 1.096 | ... |
| High school graduate ... | 0.225 | 1.252 | <0.05 |
| Some college | 0.037 | 1.037 | ... |
| Education missing | -0.069 | 0.933 | ... |
| Number of siblings | 0.037 | 1.038 | <0.1 |
| Birth order:⁴ | | | |
| Only child | 0.087 | 1.090 | ... |
| Middle child | 0.152 | 1.165 | <0.1 |
| Youngest | 0.068 | 1.070 | ... |
| Mother's age at first child:⁵ | | | |
| Teenage mother | 0.373 | 1.452 | <0.001 |
| Age missing | -0.018 | 0.982 | ... |
| Family structure at age 14:⁶ | | | |
| Mother only | 0.110 | 1.116 | ... |
| Mother and other adults | 0.188 | 1.207 | ... |
| Other structures | 0.402 | 1.494 | <0.01 |
| Maternal employment:⁷ | | | |
| Part-time work | 0.229 | 1.258 | <0.05 |
| Full-time work | 0.374 | 1.454 | <0.001 |
| Retained in grade | 0.230 | 1.258 | <0.01 |
| Religiosity at age 14 | -0.074 | 0.928 | <0.05 |
| Religious denomination:⁸ | | | |
| Fundamentalist | -0.146 | 0.865 | <0.1 |
| Catholic | 0.086 | 1.090 | ... |
| Non-Christian | 0.182 | 1.199 | ... |
| No religion | -0.062 | 0.940 | ... |
| Strictness of family rules .. | -0.129 | 0.879 | <0.01 |
| Age at interview | -0.186 | 0.830 | <0.001 |
| Year of age | 0.623 | 1.865 | <0.001 |
| Year of age (black) | -0.140 | 0.869 | <0.001 |
| Time-varying covariates: | | | |
| Church school | -0.141 | 0.868 | ... |
| Biological topics | 0.275 | 1.316 | <0.01 |
| AIDS education | -0.306 | 0.736 | <0.01 |
| Resistance skills | -0.347 | 0.707 | <0.01 |
| Birth control | 0.261 | 1.299 | <0.05 |

Omitted variables used as reference categories are ¹ white, non-Hispanic, ² English, ³ college graduate or more, ⁴ oldest child, ⁵ mother 20 or older at first birth, ⁶ 2 parents, ⁷ no maternal work outside home, and ⁸ other Christian.

NOTES: The number of observations was 10,566 person-years and the mode chi-square was 1399.7.

analyses were restricted to those who had intercourse. We modeled these separately from the age at first intercourse equations. Although Guilkey and coworkers observed that there is joint decision between age of first intercourse and method of contraceptive use for adolescent females, they also found that modelling the decisions separately made almost no difference in the results ("Estimating the Determinants of Age and Contraception Use at First Intercourse from Censored Data," by D. Guilkey, R. Rindfuss, and J. Kahn, University of North Carolina Population Center, unpublished manuscript).

Results

Descriptive data. The cumulative pattern of first intercourse for black, Hispanic, and white adolescent males in the United States between ages 10 and 19 is illustrated in the figure; it is based on life table computations of the weighted data, which means that analyses exclude those whose current age is less than or equal to the designated age. For example, the estimates of those who had first intercourse before age 17 exclude 15- and 16-year-olds, who have not yet attained their 17th birthday. The 50 percent line represents the median age of first intercourse (including censored observations of those without intercourse).

About 50 percent of black youth report first intercourse by age 15, while the equivalent 50th percentile for white and Hispanic youth is between 16 and 17 years old. As expected, there are relatively few transitions to intercourse in the early teens, and the rate of initiating intercourse increases in the mid-teens. Black males consistently engage in earlier intercourse than white and Hispanic males. Although there are some differences between white and Hispanic males, they are relatively small and may be attributable to sampling error. For example, the small reduction in the proportion of Hispanic males with intercourse at age 18 is an anomaly probably due to random sampling error.

Table 1 presents weighted frequency distributions on selected variables for the whole sample and for those who have had intercourse. In the left hand column for the whole sample, almost all respondents (92 percent) report having formal instruction in biological aspects of sex, about three-quarters had instruction about AIDS (73 percent) or birth control (79 percent), and more than half learned about resistance skills (58 percent). These findings appear to indicate increases in the receipt of sex

education compared with 1984 surveys, although the questions were worded differently. In an earlier survey, about 40 to 50 percent of young men and 40 to 60 percent of women reported some form of sex education (14). The increasing availability of sex and AIDS education is consistent with reports from the nation's schools (15,16).

We note that the NSAM findings do *not* indicate that the respondents attended a special sex or AIDS education program or class taught by a trained instructor; instruction could include applicable topics along with other curriculums. Virtually all (95 to 96 percent) of the instruction was provided in schools, as opposed to community centers, family planning clinics, churches, and other sites; so consequently these findings essentially apply to school-based sex and AIDS education.

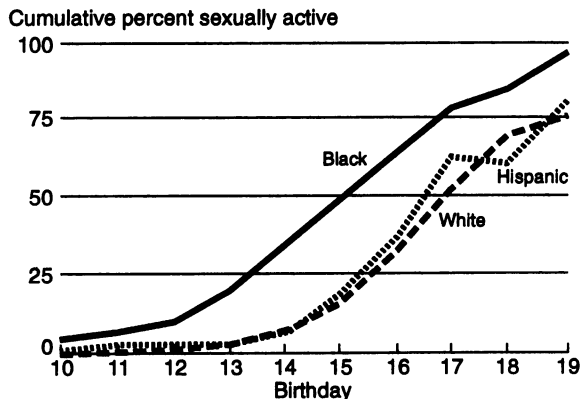
As seen in the right half of table 1, the proportions of sexually experienced youth who received sex or AIDS education before first intercourse was much smaller than the proportion who ever received it. Only a fifth of the sexually active were taught about AIDS (18 percent) or resistance skills (20 percent) prior to first intercourse, two-fifths had instruction on birth control, and just over half learned about biological aspects of sex. This indicates that sex and AIDS education is often provided late relative to the initiation of sexual activity.

It can also be seen in the right-hand column that 55 percent, a majority of sexually active youth, used a condom or an effective male or female contraceptive method (62 percent) at first intercourse. Some couples used both a condom and an effective female method; hence the difference between the two numbers is not equal to estimates of female contraceptive use. In general, we expect that a male's recall of female methods of contraception will be poorer and less reliable than his recall of his own method. For these analyses, we recoded "don't knows" about female methods to "none."

Determinants of Age at First Intercourse

The analysis was conducted in three phases. First, duration models were developed for the overall sample and are presented in table 2. Second, given the large differences in black and nonblack youth seen in the figure, separate models were developed for blacks and nonblacks. These are shown in table 3. Finally, findings about sex and AIDS education and about maternal employment and education were further explored in table 4. We base our initial conclusions on the overall model presented in table 2, and then discuss

Cumulative proportion of never married U.S. males 15-19 years who reported that they had sexual intercourse by their Nth birthday, 1988 National Survey of Adolescent Males



important variations from these findings shown in tables 3 and 4.

Table 2 presents the results of a discrete-time event history model analyzing age prior to first intercourse in the whole sample. A coefficient greater than 0 or an odds ratio greater than 1 means that the risk of early intercourse is elevated for this trait. A coefficient less than 0 or an odds ratio under 1 means that the risk of early intercourse is reduced when this trait is present. The number of observations for discrete-time models is inflated since each person may have up to 10 person years.

Racial and ethnic characteristics. Being black was consistently associated with a much higher relative risk of early intercourse, as seen in table 2. Being Hispanic was associated with a small, but nonsignificant increase in risk of intercourse, although speaking Spanish as one's first language significantly delays first intercourse in the overall sample population.

The interaction of time (year of age) and being black was significant and negative. Although blacks begin with a much higher odds ratio than nonblack youth, this gap diminishes over time. Based on the coefficients in table 2, we estimate that the odds ratio for first intercourse for black versus nonblack is 4.4 at age 10, but only 1.2 at age 19.

Family fertility background. Being the child of a woman who first gave birth as a teenager consistently increased the risk of early intercourse; the odds ratios were increased by 37-45 percent. This is compatible with the literature on adolescent sexual activity for males and females (5,17).

Table 3. Factors affecting age until first intercourse among adolescent males, black and nonblack, discrete-time event history model

| Variables | Nonblack | | | Black (non-Hispanic) | | |
|-------------------------------------|-----------------------|------------|---------|-----------------------|------------|---------|
| | Estimated coefficient | Odds ratio | P value | Estimated coefficient | Odds ratio | P value |
| Race, ethnicity: | | | | | | |
| Hispanic..... | 0.248 | 1.282 | <0.1 | ... | ... | ... |
| Other..... | -0.076 | 0.927 | ... | ... | ... | ... |
| Immigrant..... | -0.369 | 0.692 | <0.5 | 0.480 | 1.616 | ... |
| First language spoken: | | | | | | |
| Spanish..... | -0.251 | 0.778 | ... | ... | ... | ... |
| Other non-English..... | -0.177 | 0.838 | ... | ... | ... | ... |
| Mother's education: | | | | | | |
| Less than high school..... | -0.013 | 0.987 | ... | 0.265 | 1.303 | ... |
| High school graduate..... | 0.259 | 1.296 | <0.1 | 0.266 | 1.305 | ... |
| Some college..... | -0.071 | 0.932 | ... | 0.138 | 1.148 | ... |
| Education missing..... | -0.269 | 0.765 | ... | 0.266 | 1.304 | ... |
| Number of siblings..... | -0.006 | 0.994 | ... | 0.085 | 1.089 | <0.01 |
| Birth order: | | | | | | |
| Only child..... | 0.101 | 1.106 | ... | 0.167 | 1.181 | ... |
| Middle child..... | 0.293 | 1.341 | <0.05 | 0.041 | 1.042 | ... |
| Youngest child..... | 0.090 | 1.095 | ... | 0.050 | 1.051 | ... |
| Mother's age at first child: | | | | | | |
| Teenage mother..... | 0.375 | 1.455 | <0.001 | 0.357 | 1.429 | <0.01 |
| Age missing..... | 0.233 | 1.262 | ... | -0.266 | 0.766 | ... |
| Family structure at age 14: | | | | | | |
| Mother only..... | 0.168 | 1.182 | ... | 0.089 | 1.093 | ... |
| Mother and other adults..... | 0.194 | 1.214 | ... | 0.256 | 1.292 | ... |
| Other structures..... | 0.601 | 1.823 | <0.01 | 0.310 | 1.364 | ... |
| Maternal employment: | | | | | | |
| Part-time work..... | 0.141 | 1.151 | ... | 0.443 | 1.558 | <0.05 |
| Full-time work..... | 0.227 | 1.255 | <0.05 | 0.635 | 1.887 | <0.001 |
| Retained in grade..... | 0.274 | 1.315 | <0.01 | 0.206 | 1.229 | <0.1 |
| Religiosity at age 14..... | -0.107 | 0.899 | <0.05 | 0.000 | 1.000 | ... |
| Religious denomination: | | | | | | |
| Fundamentalist..... | -0.220 | 0.803 | ... | -0.118 | 0.888 | ... |
| Catholic..... | 0.014 | 1.014 | ... | 0.473 | 1.605 | <0.1 |
| No religion..... | 0.094 | 1.098 | ... | -0.339 | 0.713 | <0.1 |
| Non-Christian..... | 0.080 | 1.083 | ... | ... | ... | ... |
| Strictness of family rules..... | -0.140 | 0.870 | <0.05 | -0.120 | 0.887 | ... |
| Age at interview..... | -0.198 | 0.820 | <0.001 | -0.169 | 0.845 | <0.001 |
| Year of age..... | 0.654 | 1.922 | <0.001 | 0.462 | 1.587 | <0.001 |
| Time-varying covariates: | | | | | | |
| Church school..... | -0.124 | 0.883 | ... | -0.138 | 0.871 | ... |
| Biological topics..... | 0.211 | 1.235 | <0.1 | 0.375 | 1.454 | <0.05 |
| AIDS education..... | -0.224 | 0.800 | ... | -0.499 | 0.607 | <0.05 |
| Resistance skills..... | -0.481 | 0.618 | <0.001 | -0.085 | 0.918 | ... |
| Birth control..... | 0.221 | 1.247 | <0.1 | 0.350 | 1.419 | <0.1 |

NOTES: For nonblack males these were 7,247 person-years and the model chi-square was 925.5. For black males there were 3,269 person-years and the

model chi-square was 406.2. See Table 2 for omitted reference categories.

Family environment. We examined the relative effects of four family structures at age 14: two parents (parent or stepparent); mother only; mother and other adult (for example, boyfriend or other friend of relative); and other family structure (for example, father only, grandparents, foster care). For the full sample, being in other family

structures—the only group with no mother present—was associated with significantly earlier intercourse compared with those with two parents. Although the risks for those living with single mothers or with mothers and other adults were somewhat elevated, they were not significant at a .05 level.

Table 4. Selected coefficients and odds ratios for combinations of maternal education and employment and sex and AIDS education before intercourse, whole sample discrete-time analyses

| Variables | Estimated coefficient | Odds ratio | P value | Unweighted percent of person-years |
|---|-----------------------|------------|---------|------------------------------------|
| <i>Combinations of maternal work and education</i> | | | | |
| No maternal work and: | | | | |
| College graduate or more ¹ | 0.000 | 1.000 | ... | 12.86 |
| Some college | -0.321 | 0.726 | ... | 2.71 |
| High school graduate | 0.401 | 1.493 | <0.05 | 8.29 |
| Less than high school | 0.015 | 1.015 | ... | 7.33 |
| Part-time maternal work and: | | | | |
| College graduate or more | -0.211 | 0.810 | ... | 4.21 |
| Some college | 0.632 | 1.882 | <0.01 | 3.04 |
| High school graduate | 0.462 | 1.587 | <0.01 | 10.03 |
| Less than high school | 0.393 | 1.481 | <0.05 | 4.95 |
| Full-time maternal work and: | | | | |
| College graduate or more | 0.588 | 1.800 | <0.001 | 8.85 |
| Some college | 0.331 | 1.393 | <0.05 | 6.45 |
| High school graduate | 0.502 | 1.652 | <0.001 | 21.09 |
| Less than high school | 0.384 | 1.468 | <0.01 | 10.19 |
| <i>Combinations of sex and AIDS education</i> | | | | |
| No topics ¹ | 0.000 | 1.000 | ... | 70.79 |
| One topic only: | | | | |
| Biological topics | 0.339 | 1.403 | <0.01 | 9.42 |
| Birth control | 1.663 | 5.277 | <0.1 | 0.44 |
| AIDS | 0.453 | 1.573 | ... | 0.26 |
| Resistance skills | 0.195 | 1.215 | ... | 0.31 |
| Two topics: | | | | |
| Biology and birth control | 0.550 | 1.733 | <0.001 | 4.85 |
| Biology and AIDS | 0.397 | 1.487 | ... | 0.76 |
| Biology and resistance skills | 0.099 | 1.104 | ... | 1.28 |
| Birth control and AIDS | 1.663 | 5.277 | <0.1 | 0.05 |
| Birth control and resistance skills | -0.197 | 0.821 | ... | 0.07 |
| AIDS and resistance skills | -0.304 | 0.738 | ... | 0.14 |
| Three topics: | | | | |
| Biology, birth control and AIDS | 0.157 | 1.170 | ... | 2.09 |
| Biology, birth control, and resistance skills | 0.267 | 1.306 | <0.1 | 3.68 |
| Biology, AIDS, and resistance skills | -1.140 | 0.320 | <0.05 | 0.50 |
| Birth control, AIDS, and resistance skills | -0.380 | 0.684 | ... | 0.04 |
| All four topics | -0.083 | 0.921 | ... | 5.32 |

¹ Omitted reference group.

NOTE: The discrete-time model also controlled for all other covariates shown in

table 2. N = 10,606. Model chi-square = 6120.5.

Stricter family rules were related to delays in first intercourse. However, it is possible that this variable is somewhat more subject to recall bias, so that a virgin may recollect stricter family rules than a nonvirgin from the same family might recall.

Educational achievement. Educational achievement was based on ever having been retained in grade. Being held back in school was related to earlier intercourse. As noted previously, the great majority of grade retention occurs very early (for example, first and second grades), so that the problems with educational attainment precede sexual activity.

Religious experience. For the full sample, males who went to church more often at age 14 were less

likely to have early intercourse. However, a respondent's actual religious denomination did not appear to influence his sexual activity. The time-varying covariate, prior church school, also did not influence first intercourse.

Age at interview. The duration models include a term for time: the *year of age* at which the hazard is being evaluated. The *age at the interview* is a separate independent variable. The most straightforward interpretation is that age at interview indicates a birth cohort effect. The negative coefficient of age at interview means that older youth, who were born earlier, reported having first intercourse later. Interpreted this way, each year born earlier reduces risk by 15-18 percent. Comparisons

Table 5. Determinants of condom and effective male or female contraceptive use at first intercourse among sexually experienced adolescent males, logistic regression

| Variable | Used a condom | | | Used male or female contraceptive method | | |
|-------------------------------------|-----------------------|------------|---------|--|------------|---------|
| | Estimated coefficient | Odds ratio | P value | Estimated Coefficient | Odds ratio | P value |
| Race, ethnicity: | | | | | | |
| Black | -0.436 | 0.646 | <0.01 | -0.402 | 0.669 | <0.05 |
| Hispanic | -0.214 | 0.807 | ... | -0.329 | 0.720 | ... |
| Other | -0.073 | 0.930 | ... | -0.407 | 0.666 | ... |
| Immigrant | 0.039 | 1.039 | ... | 0.004 | 1.004 | ... |
| First language spoken: | | | | | | |
| Spanish | -0.200 | 0.819 | ... | -0.137 | 0.872 | ... |
| Other non-English | 0.053 | 1.054 | ... | -0.230 | 0.794 | ... |
| Maternal education: | | | | | | |
| Years of school | 0.037 | 1.037 | ... | 0.047 | 1.048 | ... |
| Education missing | 0.511 | 1.667 | ... | 0.615 | 1.851 | ... |
| Number of siblings | -0.026 | 0.974 | ... | -0.032 | 0.968 | ... |
| Birth order: | | | | | | |
| Only | -0.274 | 0.760 | ... | -0.087 | 0.916 | ... |
| Youngest | -0.152 | 0.859 | ... | -0.098 | 0.907 | ... |
| Middle | -0.265 | 0.767 | ... | -0.308 | 0.735 | <0.1 |
| Mother's age at first child: | | | | | | |
| Teenage mother | -0.107 | 0.898 | ... | -0.102 | 0.903 | ... |
| Age missing | 0.039 | 1.039 | ... | 0.208 | 1.231 | ... |
| Family structure at age 14: | | | | | | |
| Mother only | 0.046 | 1.047 | ... | 0.030 | 1.031 | ... |
| Mother and other adults | 0.160 | 1.173 | ... | 0.205 | 1.227 | ... |
| Other structures | 0.332 | 1.393 | ... | 0.405 | 1.499 | ... |
| Maternal employment: | | | | | | |
| Full-time work | -0.135 | 0.874 | ... | -0.098 | 0.907 | ... |
| Part-time work | 0.127 | 1.136 | ... | 0.166 | 1.180 | ... |
| Retained in grade | -0.080 | 0.923 | ... | -0.218 | 0.804 | ... |
| Religiosity at 14 | 0.090 | 1.094 | ... | 0.114 | 1.121 | <0.1 |
| Religious denomination: | | | | | | |
| Fundamentalist | -0.143 | 0.867 | ... | -0.194 | 0.824 | ... |
| Catholic | -0.093 | 0.911 | ... | -0.085 | 0.919 | ... |
| Other non-Christian | -0.051 | 0.950 | ... | -0.020 | 0.981 | ... |
| No religion | -0.234 | 0.792 | ... | -0.266 | 0.766 | ... |
| Church school | -0.326 | 0.722 | ... | -0.321 | 0.725 | ... |
| Strictness of family rules | 0.059 | 1.060 | ... | 0.004 | 1.004 | ... |
| Age at first intercourse | 0.207 | 1.229 | <0.001 | 0.266 | 1.305 | <0.001 |
| Age at interview | -0.201 | 0.818 | <0.001 | -0.175 | 0.840 | <0.01 |
| Biological topics | 0.005 | 1.005 | ... | -0.175 | 0.840 | ... |
| AIDS | -0.140 | 0.869 | ... | -0.166 | 0.847 | ... |
| Resistance skills | -0.013 | 0.987 | ... | 0.164 | 1.178 | ... |
| Birth control | 0.271 | 1.311 | ... | 0.309 | 1.362 | ... |
| Partner's age | 0.081 | 1.084 | <0.05 | 0.093 | 1.097 | <0.05 |
| Partner's prior experience: | | | | | | |
| Not a virgin | -0.468 | 0.626 | <0.01 | -0.284 | 0.753 | <0.1 |
| Don't know | -0.183 | 0.833 | ... | -0.117 | 0.889 | ... |
| Relationship with partner: | | | | | | |
| Engaged | -1.045 | 0.352 | ... | 0.156 | 1.169 | ... |
| Just met | -0.576 | 0.562 | <0.05 | -0.595 | 0.551 | <0.05 |

NOTES: For both models, the sample size was 1,192 males. For condom use, the model chi-square was 1,519.6 and for contraceptive use it was 1,473.9. See

Table 2 for omitted reference categories.

of sexual activity data for 1979 and 1988 reveal that a higher proportion of 17- to 19-year-olds had intercourse in 1988, although fewer nonblack males had sex before their 15th birthday (8).

There are two possible technical problems with the birth cohort interpretation. First, analyses of right-censored data (that is, cases in which first intercourse has not occurred) assume that there is no bias in the pattern of censoring. Since older youth are more likely to have had first intercourse than younger youth, older youth have fewer censored observations. The effects of age at interview might also be detecting biases due to uneven patterns of censored data. We could have truncated the sample by excluding all observations past the age of 15, but decided that this would sacrifice too much information. Second, age at interview may be associated with biases in erroneously reported ages at first intercourse. Some researchers (18) have suggested that young men may be overinclined to report having had intercourse. This tendency may introduce age-related errors into estimates: a 15-year-old virgin may be more inclined to report falsely having prior intercourse and must therefore claim a relatively low age of first intercourse (15 or younger).

Socioeconomic background. Examining the effect of maternal education in table 2, a significant increase in risk was found for those whose mothers completed high school (or a GED), but attended no college. There was no significant difference for those whose mothers had not completed high school.

Maternal work during the respondents' formative years had a relatively potent and consistent effect in increasing the risk of early intercourse. Further, the effect was greater for mothers working full-time than for mothers working part-time. Part-time work was associated with a 26 percent increase in the odds ratio of early intercourse (compared with mothers who did not work) and full-time work was associated with a 45 percent increase compared with mothers who did not work. While Haurin and Mott's (17) analysis of males did not detect significant effects of maternal work at age 14, the trends indicated that maternal work was associated with earlier intercourse.

Sex and AIDS education. As explained in the Methods section, we divided 10 specific sex and AIDS education topics into four groups of topics: biological aspects of sexuality, AIDS, resistance skills, and birth control. The duration analyses of

these time-varying covariates examined whether prior formal instruction in each of these areas affected first intercourse. For example, a person with first intercourse at age 15 would be counted as having prior instruction on biological aspects of sex if he first encountered this topic at age 14, but not if he first had it at age 15. Similar types of analyses of the effects of sex education on the age at first intercourse among young women have been performed by Dawson (19) and Marsiglio and Mott (14), although their analyses did not divide sex education by topic, and AIDS education was not a topic in their data sets.

The findings are complex. In analyses of the full sample (table 2), prior AIDS education and resistance skills are each associated with significant decreases in the risk of first intercourse (AIDS education: 26 percent reduction; resistance skills: 29 percent reduction). Significant increases in the odds ratios were detected for prior instruction in birth control (30 percent increase) or in the biological aspects of sex (32 percent increase).

Black Versus Nonblack Comparison

Table 3 presents separate analyses for black (non-Hispanic) and nonblack subsamples. Certain variables were deleted from inclusion in the black sample since they were inappropriate (that is, Hispanic or other race) or too rare (that is, first language other than English and non-Christian religion). Many of the variables for these two groups produce similar results. For both black and nonblack samples, having a mother who had her first child while a teenager, having a mother who worked full-time, and being born in a more recent year were significantly associated with increased risk.

Even though the findings for black and nonblack males are fairly similar, statistical significance is often reduced among black youth due to the reduction in sample size. This apparent discrepancy due to the smaller sample size is seen when examining the effects of sex and AIDS education. Since sample size was reduced, the subgroup analyses sometimes failed to meet a 0.05 significance criterion, but generally met a 0.10 significance criterion, except for one case. The one exception is that "resistance skills" had almost no impact on age of first intercourse for black males, whereas the effect was quite strong for nonblacks.

The comparisons in table 3 indicate that there are also some other discrepancies between the two groups. For example, nonblack immigrants delay

intercourse more than nonimmigrants, but there is no such effect among black immigrants as seen in table 3. Also, subgroup analysis suggests that the tendency of those who at age 14 go to church more often being less likely to have early intercourse only occurs among nonblack males.

Family background (from both a fertility and socioeconomic standpoint) is another area that affects nonblacks and blacks to different degrees. For instance, a greater number of siblings is associated with an increase in the risk of early intercourse for black youth, but not for nonblack males. Also, being a middle child was not associated with earlier intercourse for young blacks, but was significantly associated with earlier intercourse among nonblack youth. Additionally, maternal employment had a much greater effect for blacks than for nonblacks. In fact, both part-time and full-time maternal work significantly increased the risk of early intercourse for black youths' age at first intercourse; part-time employment did not significantly affect nonblacks.

Combining maternal employment and maternal education. The strong effects associated with maternal employment were surprising and led us to wonder whether the effects may be masking other socioeconomic variables. Some women are employed because they are single mothers who would otherwise have no income, while others are members of two-income families.

We examined combinations of maternal employment with household structure (including additional covariates of being divorced or widowed) and failed to find significant interactions. However, there were significant interactions between maternal employment and education which can serve as a social class indicator. The results are shown in the top part of table 4. The model was not run with traditional interaction terms as the products of the main effects terms. All possible combinations were enumerated and run as separate variables; those with no maternal employment and whose mothers were college graduates were the omitted reference category. The results demonstrate that any level of maternal employment (aside from college graduates working part-time) is associated with increased earlier intercourse. Among nonemployed women, only the sons of high school graduates with no college had an increased risk.

Combining sex education and AIDS education. Prior research (20,21) has indicated that sex education and AIDS education are often sequenced

in schools, with topics relating to the biology of sexuality being taught first. Bearing this in mind, an alternative approach to examining the effects of sex and AIDS education is to decompose these into combinations of topics taught (for example, youth instructed in one topic, two topics, and so forth). This decomposition is shown in the lower part of table 4. As with maternal employment and education, this was done by enumerating all possible combinations; those with no education in any topic were the omitted reference category.

Only three combinations were significant: two increased the risk of early intercourse (biology of sex only and biology plus birth control) and one delayed intercourse significantly (biology, AIDS, and resistance skills), compared with the periods of no instruction at all. In general, the increased risks seemed to be associated with those persons who received some, but not much, instruction, and the risks were reduced among those who received multiple forms of instruction. Thus, it is possible that a little sex education increases risks, but a lot decreases risks. However, we failed to detect a significant effect for those youth who had all four topics, although the direction of the effect was toward reduced risk.

Condom and Contraceptive Use

The last phase examined whether condoms or contraceptives were used at first intercourse. Since condoms prevent HIV and STD infection, while both male and female methods are effective in preventing pregnancy, we present two alternative forms of the dependent variable: (a) condom use at first intercourse and (b) effective male or female contraceptive use at first intercourse, which includes any use of condom, oral contraceptive, diaphragm, IUD, contraceptive foam or jelly, or Today sponge, alone or in combination. Condom use is relevant as the method which the male himself controls and which is effective in preventing HIV or STD infection. Effective male or female contraceptive use shows any method which would deter pregnancy, including methods used by the female partner. The difference between the two variables is the marginal share of men who did not use a condom, but whose partners used an effective female method at first intercourse. Results were very similar for either variable and both are displayed, since the two variables have different relevance (disease prophylaxis and pregnancy prevention). These logistic regression analyses are confined to those who had intercourse.

As seen in table 5, the most important factors affecting condom use at first intercourse were age at first intercourse and age at interview. With each year that first intercourse was delayed, the odds of condom use increases by 23 percent and the odds of effective male or female contraceptive use increases by 31 percent. The negative effect of the age at interview can be interpreted as a birth cohort effect: for every year that a male was born earlier, use of condoms or contraceptive methods decreases. This is probably due to the impact of AIDS awareness on condom use. Earlier analyses showed substantial increases in condom use between 1979 and 1988 (7).

The only significant sociodemographic trait was being black, which was associated with reduced condom and contraceptive use at first intercourse. Other traits had marginally significant effects. Increased religious attendance was associated with somewhat higher condom and contraceptive use, but attendance in church school was associated with somewhat lower condom and contraceptive use. Contraceptive use increased marginally with increasing maternal education. (Years of maternal education was expressed as an interval variable, unlike the categorical version in the duration analyses, since the effect seemed relatively linear.) Being a middle child was marginally associated with decreased condom and contraceptive use. Living without mother at age 14 was also marginally associated with increased condom and contraceptive use.

Prior sex or AIDS education did not have effects significant at the 0.05 level. However, instruction about birth control which occurred before first intercourse was marginally associated ($P = 0.15$ and 0.11) with higher condom and contraceptive use. Instruction in birth control increased the odds of condom use by 31 percent and the odds of effective male or female contraceptive use by 36 percent, controlling for the age of first intercourse and all other factors. We note also that, since age at first intercourse is a strong predictor of condom and contraceptive use, there is an indirect role of learning about AIDS or resistance skills in increasing condom and contraceptive use by delaying first intercourse.

Partner characteristics had relatively strong effects on condom and contraceptive use at first intercourse. Use of condoms or effective male or female contraception increased as the partner's age increased. The odds of condom and contraceptive use declined if the partner was not a virgin; that is, a couple was more likely to use a condom or other

... 'increased risks seemed to be associated with those persons who received some, but not much, instruction, and the risks were reduced among those who received multiple forms of instruction. Thus it is possible that a little sex education increases risks, but a lot decreases risks.'

contraceptive when the female was a virgin. When the relationship with the first partner was "just met," the odds of condom and contraceptive use declined by 44 to 45 percent.

The positive effect of partner's age was somewhat stronger for effective male or female contraceptive use than for condom use, while the negative effect of the partner's sexual experience was stronger for condom use. The difference in patterns suggests a partial compensatory role of the female's contraceptive actions—that is, that older and more experienced partners are more likely to use effective female contraceptive methods.

Discussion

This study found that a number of personal, family, educational, and partner characteristics help shape the first sexual experience of American teenage men, specifically the age of first intercourse and the use of a condom or any effective male or female contraceptive method at first intercourse. It is important to recall that these findings are drawn from a retrospective, cross-sectional survey, not a prospective intervention. Results from this study are useful in answering the question "Who is most at risk of early intercourse or who fails to use contraception at first intercourse?" These observations can be used in formulating policies on how to target intervention programs. The results regarding the relationship of sex and AIDS education with one's age at the time of first intercourse and condom or other contraceptive use should not be considered as rigorous as findings drawn from prospective experiments.

Race is a powerful influence on first intercourse. Black youth generally have intercourse at a younger age and are less likely to use effective male or female contraceptive methods at first intercourse than white youth. However, the racial pattern of contraceptive use changes with time. In other

analyses, we have found that black youth were more likely to be using condoms with recent partners (9). Hispanic males have a marginally greater chance of early intercourse than white non-Hispanic youth. It is possible that race and ethnicity are mediating some other unmeasured socioeconomic characteristic such as income, which could not be measured in the right time frame for this study. However, in other analyses (2) we were able to control for income and other traits and continued to find that black males reported higher levels of recent sexual activity.

Earlier analyses found that recent sexual behavior correlates with other risk behaviors, such as substance use and reduced condom use (10). Consistent with the problem behavior framework, we demonstrate here that early sexual activity is correlated with poor educational attainment, based on grade retention. Since most grade retentions occur in early grades, educational problems appear to precede early sexual activity. Using a British longitudinal sample, Dearden found that academic problems as early as the age of 7 years predicted subsequent teenage fatherhood (22).

Earlier intercourse was detected among those who grew up in households with employed mothers or who grew up in households with no mother. Does this indicate some broader effect of maternal presence or are these unrelated findings? On one hand, we might believe that, in general, greater maternal presence (that is, a mother at home more often) may lead to more conservative behavior because of increased parental control and less unsupervised time on the part of the child or because of a developmental and moral influence from young men's mothers. On the other hand, the finding regarding family structure may indicate an effect of very nonstandard family types (including living with father only, with grandparents or other relatives, but not with a mother) which may signal some other underlying family problem. In that event, the findings about maternal employment and family structure may be two unrelated findings.

Children of employed mothers are at greater risk of early first intercourse. Although we do not know why this occurs, it suggests that young adolescent children of employed mothers might be an appropriate target population for prevention programs, possibly coupled with after-school educational or recreational programs. Haurin and Mott found a similar, but nonsignificant, trend regarding the association of maternal employment and higher risk. The effect of maternal employment may not affect female adolescents (17). Other

research has suggested that sons may be somewhat more vulnerable to the effects of maternal employment than daughters (23,24).

Consistent with prior research about precursors of females' sexual initiation, we found that respondents whose mothers were teenagers at first birth were likely to have earlier intercourse. This observation may represent the effect of family norms regarding sexual activity. Haurin and Mott found that older siblings' behaviors affected when adolescents first had sex (17).

Some, but not all, of the variables relating to family values affect the initiation of sexual activity. Stricter family rules and increased attendance at religious services were associated with delays in first intercourse, although the association of religious attendance did not pertain to black youth. Although personal and social traits influenced the age at first intercourse, they had much less of an association with condom and other contraceptive use at first intercourse. It is interesting to note that attendance at religious services at age 14 had a marginally positive role in increasing use of contraceptives, but church school attendance had a marginally negative effect.

Young men born more recently are more likely to be sexually experienced and to use a condom at first intercourse. This parallels earlier results showing similar trends between 1979 and 1988 (15). The Public Health Service's national health objectives for the year 2000 include reducing the levels of early intercourse among adolescents, increasing adolescents' exposure to information about sex from parents, schools, or other sources, and increasing condom use among adolescents. The data from these analyses indicate that historical trends point toward increased exposure to sex and AIDS education and to greater condom use. While we cannot be assured that these trends will last into the future, they indicate progress in the right direction. On the other hand, historical trends for males and females have generally pointed in the opposite direction toward greater sexual activity among teenagers (6). Thus, this objective may be more difficult to attain.

Partner characteristics affected condom and contraceptive use at first intercourse. Youth were less likely to use a condom or any contraceptive when their first partners were not reported to be virgins. Since HIV and other STDs are communicable, use of condoms is relatively more important with experienced partners. However, condom and contraceptive use was markedly lower if they "just met" their first partner. Previous research (5)

indicated that first intercourse was often unplanned. While NSAM did not have a comparable question, the effect of "just met" suggests that spontaneity decreases condom and contraceptive use at first intercourse.

Perhaps the most important findings from this study concern AIDS and sex education for school children. Instruction about AIDS and resistance skills was associated with delays in first intercourse, although instruction about resistance skills was not significant for black males. Instruction about biological aspects of sexuality and birth control was associated with earlier first intercourse, although these effects were mitigated by the addition of the other two topics. In more detailed analyses we examined exposure to 16 different combinations of the four topics and found that two (being instructed only about biological topics and being instructed about biological topics and about birth control) were significantly associated with earlier first intercourse and one (being instructed about biological topics, AIDS, and resistance skills) was associated with significant delays in first intercourse. Since AIDS education includes being taught about "how to prevent AIDS using safe sex practices," these analyses *cannot* be interpreted as saying that any instruction about contraceptive methods leads to earlier first intercourse.

One plausible interpretation of the findings here is that the apparent negative effects of being instructed about biological topics or about birth control were associated with these being the only subjects taught. Increasing the breadth of topics taught was associated with reduced risk of early intercourse. This finding suggests the relevance of more integrated or comprehensive curriculums that teach about abstinence, contraception, and AIDS.

This analysis also examined the association of sex and AIDS education with the use of a condom or any effective male or female contraceptive at first intercourse. Instruction about birth control was marginally associated with increased condom and contraceptive use at first intercourse, on a direct basis. Since being older at first intercourse was strongly associated with increased condom and other contraceptive use, education about AIDS and resistance skills may delay first intercourse and indirectly increase use of condoms or contraceptive methods via an age effect.

In earlier surveys of adolescent it was found that sex education is associated with some increases in early intercourse, but it also increased contraceptive use (14,17). By disassociating sex and AIDS education into four topics, we found that some compo-

nents are associated with delayed intercourse, while others are related to earlier intercourse.

Other analyses of NSAM investigated the association of sex and AIDS education with young men's recent sexual behavior and condom use: the number of partners in the past year, the number of acts of intercourse in the past year, and the percent condom use in the last year (2). In general, we found that receipt of sex and AIDS education was associated with reductions in the number of partners and acts of intercourse and increases in condom use. None of the topics of education was associated with adverse behaviors in the previous year. The recent behaviors are more clinically and epidemiologically relevant to concerns about risk of HIV or STD transmission or pregnancy than are behaviors at first intercourse. However, first intercourse is an important marker of developmental progress.

The findings regarding the effect of resistance skills are somewhat surprising, since traditionally "saying no" has been the prescribed role of virtuous female adolescents. This finding may, in part, reflect changes in sex education which have occurred during the AIDS era, in which abstinence became more salient to males. As noted previously, being taught about resistance skills was not significantly related to delays in intercourse for black males. There may be a need to develop better educational programs regarding delaying sexual initiation for black males, who are at higher risk of early intercourse.

These findings have implications about quality and comprehensiveness of sex and AIDS education. While NSAM did not have direct measures of quality of education, increased coverage of topics implies a more comprehensive approach to instruction. We believe the results presented in this paper, as well as those presented earlier (2), support the importance of integrated and comprehensive approaches to education about AIDS, abstinence, and contraception.

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