

# Premarital Sex, Schoolgirl Pregnancy, and School Quality in Rural Kenya

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*Using data from nearly 600 adolescents aged 12–19 in combination with data collected from 33 primary schools that the adolescents attended, this report explores whether certain aspects of the school environment affect the initiation of premarital sex among girls and boys in three districts of Kenya. The results suggest that, although neither the school nor the home appears to influence whether boys engage in sex prior to marriage, for girls, a school characterized by a gender-neutral atmosphere appears to reduce the risk of their engaging in premarital sex. Furthermore, although policymakers in Kenya are clearly concerned with the problem of “schoolgirl pregnancy,” the data indicate that in this sample, pregnancy is not the primary reason that girls leave school. (STUDIES IN FAMILY PLANNING 2001; 32[4]: 285–301)*

Given the fluidity of the traditional African marriage process, the onset of sexual relations and childbearing prior to the initiation of a formal union was not uncommon in Kenya in the past (Meekers 1992). Adolescent sexual and reproductive behavior is changing, however, in ways that potentially undermine the physical health and social and economic well-being of young people. Because the environment in which adolescents are currently growing up places a greater premium on the acquisition of skills, the consequences of early sex and pregnancy may be more severe than they were in the past. These consequences are potentially more problematic for girls, who are especially vulnerable to sexually transmitted diseases (STDs) and HIV/AIDS as teenagers,<sup>1</sup> who shoulder all of the burden of premarital childbearing, and, according to Bledsoe and Cohen (1993), most of the cost

and burden of childrearing. Until recently, marriage and childbearing during the adolescent years were not only regarded as normative for girls in sub-Saharan Africa but also were considered desirable (Bledsoe and Cohen 1993). As education has become more widespread, marriage and, especially, childbearing among teenagers are increasingly mentioned as limiting formal schooling and reducing early training and work opportunities (Caldwell et al. 1992).

Although the rising age of marriage has led to an overall decline in adolescent fertility in Kenya, the proportion of births among teenagers that occur before marriage is increasing. Demographic and Health Survey (DHS) data indicate that the fraction of women who have had a premarital birth before age 20 has risen from about 20 percent for older cohorts of women to approximately 30 percent for those aged 20–24 in 1998. Indeed, the data indicate that age at marriage is rising more rapidly than adolescent childbearing is declining. Although about 25 percent of women aged 20–24 in 1998 were married by age 18, compared with 42 percent of those aged 35–39, 46 percent of women aged 20–24 gave birth by age 20, compared with 58 percent of 35–39-year-olds. More than half of teenage childbearing in Kenya now results from a premarital conception (Singh 1998).

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Reliable data on trends in sexual activity before marriage are not available. A comparison of age at first sexual intercourse with age at first marriage across age cohorts of women, however, reveals an increase in the gap between sexual initiation and marriage in Kenya that is consistent with a rise in premarital sexual activity (Blanc and Way 1998). Although sexual activity before marriage apparently is increasing among women, contraceptive use remains sporadic among never-married girls who are sexually active. For example, analysis of the 1998 Kenya DHS indicates that less than 20 percent of single women aged 15–19 who said they were sexually active reported current use of a modern method of contraception. As for men, despite the absence of time-series data on age at first intercourse, the perception exists that, throughout sub-Saharan Africa, a young man “in the past [in contrast to the present] . . . might have had little opportunity for full sexual expression until his late twenties” (Bledsoe and Cohen 1993: 85).

At the same time that premarital sex and childbearing have increased in Kenya, educational participation has expanded considerably, especially for girls. More than 95 percent of males and females aged 15–19 had ever attended school, compared with about 85 percent of males and 60 percent of females aged 40–44 (NCPD et al. 1994). The high childhood-enrollment rates that now exist in Kenya fall off steadily during the teenage years, reaching 57 percent by age 18 (Montgomery and Lloyd 1999). Moreover, although gender equity in school participation is found among 12–13-year-olds, a gap in attendance between boys and girls emerges and expands during adolescence such that 5 percent more boys than girls go to school at ages 14–15, 9 percent more at ages 16–17, and 23 percent more at ages 18–19 (Mensch et al. 1998).

In light of the nearly universal participation of adolescents in primary school and the evidence for rising rates of sexual activity prior to marriage, this study explores the question of what role primary school might play in affecting the initiation of premarital sex. Although no data are available with which to address the issue of whether the increase in school participation in Kenya has led to a rise in premarital sexual activity, the extent to which some schools, because of their particular characteristics, put girls, and possibly even boys, at greater risk of early and unprotected sex is examined here using recently collected data from rural areas of three districts of Kenya—Kilifi, Nakuru, and Nyeri. These districts were selected because they represent the range of adolescent schooling experience in the country. In addition to the conventional family and household factors associated with premarital sex, the effect of variables that measure school quality is investigated. In

particular, those aspects of the school environment are considered that might affect the likelihood of early and unprotected sex, such as perceptions of how boys and girls are treated in school, the level of harassment, and the extent to which the school provides information on family-life education. The temporal relationship between sexual behavior and staying in school is also investigated in order to determine whether premarital sexual activity and pregnancy generally take place prior or subsequent to leaving school.

## Premarital Sex in Sub-Saharan Africa

A considerable body of research exists concerning adolescent sexual behavior in sub-Saharan Africa, but few studies have attempted to explain that behavior in a systematic fashion. For the most part, investigations of adolescent sexual and contraceptive behavior document levels of sexual activity, number and age of sexual partners, and knowledge and use of contraceptive methods (see Ajayi et al. 1991 for Kenya; Boohene et al. 1991 for urban Zimbabwe; Gage-Brandon and Meekers 1993 for six Demographic and Health Survey countries; Kane et al. 1993 for urban Gambia; Kiragu and Zabin 1993 and 1995 for Kenyan school students; Meekers 1994 for seven DHS countries; Gørgen et al. 1998 for urban Guinea; and Matasha et al. 1998 for school students in Mwanza Region, Tanzania).

One of the few studies that investigates the determinants of sexual behavior in sub-Saharan Africa is Kiragu and Zabin’s 1993 analysis of approximately 3,000 adolescents attending primary, secondary, and vocational schools in Kenya. Although the study is noteworthy in going beyond purely descriptive tabulations and in focusing on primary as well as secondary school, it has several limitations. First, the analysis is restricted to adolescents currently attending school, ignoring the possibility that those who have dropped out of school may behave differently from those who are still enrolled. Second, many of the explanatory variables included in the model, for example, substance use, attitudes toward premarital sex, and disco attendance, are endogenous, that is, the same factors that explain variability in levels of premarital sex would likely explain differences in these other variables. As a result, the coefficients and standard errors for these variables as well as for the exogenous variables may be biased. Third, the analysis does not consider that many of the young people who lack sexual experience ultimately will engage in premarital sex during adolescence. Ignoring censored observations (that is, the young adolescents who delay sex) can result in biased parameter estimates if the determinants of engaging in sex early differ from those of engaging in sex later.

Although analyses of sexual activity are to some degree flawed statistically, and reporting of sexual activity problematic, inferences from these earlier studies seem plausible. Indeed, despite varying levels of sexual activity and contraceptive use reported in these studies, the conclusions are similar: Substantial numbers of adolescents in sub-Saharan Africa are engaging in premarital sex with insufficient knowledge of reproduction and alarmingly low use of family planning methods, especially condoms.

This research from Kenya and elsewhere in sub-Saharan Africa has contributed to our understanding of the risks and dangers that adolescents face. It has paid little attention, however, to the context of adolescent sexual activity. What social factors lead adolescent girls and boys to have sex? As Bledsoe and Cohen (1993) theorize, are there evolving sexual expectations and liberties for boys and increasing pressures and hazards for girls? In addition to household factors, what characteristics of schools, in which increasing numbers of adolescents in sub-Saharan Africa are enrolled, promote sexual activity and what characteristics of schools discourage it?

### *Premarital Sex and Schooling in Kenya*

The rapid expansion of education in Kenya has led to an increasing association in the public mind between premarital sexual activity, childbearing, and schoolgirl dropouts. For example, a recent conference of government ministers from the region devoted to this subject was entitled "Counting the Cost: School Dropout and Adolescent Pregnancy." Indeed, in drawing attention to the rise in premarital fertility, policymakers and researchers describe the situation in terms of increasing levels of "schoolgirl pregnancy"<sup>2</sup> (Ferguson 1988; Meekers 1994; Njau and Wamahiu 1994; Meekers et al. 1995; Meekers and Ahmed 1999).

Because of the large number of school dropouts of all ages in Kenya and because reported dropouts due to pregnancy appear to represent only about one percent of girls currently enrolled in school each year,<sup>3</sup> pregnancy is unlikely to be the leading proximate cause of girls' leaving school early. Although the assumption is often made that girls who are forced to withdraw because of pregnancy would have continued in school had they not become pregnant (see, for example, Meekers and Ahmed 1999), many other reasons may cause a girl to withdraw from school during her adolescence. The absence of social and economic opportunities for girls and women and the demands placed on them, coupled with the gender inequities known to exist within the educational system (Mensch and Lloyd 1998) may result in unsatis-

factory school experiences, poor academic performance, and resignation to or preference for early motherhood. Therefore, although pregnancy is often thought to disrupt the education of adolescent girls, teenage reproductive behavior may be endogenous to school completion in that many of the same factors lead to dropout and early childbearing (Lloyd and Mensch 1999).

The question remains whether the increase in school enrollment—which has undoubtedly contributed to the rise in age at marriage and thus lengthened the period of exposure to the risk of experiencing premarital sex—has intensified the contact between adolescent girls and boys, undermined the authority of parents, and increased the likelihood that an adolescent girl will have premarital sex. Zabin and Kiragu (1998: 215) speculate that in sub-Saharan Africa, "schooling may actually encourage sexual onset, especially as it tends to remove young people from the supervision of traditional caretakers." Indeed, Bledsoe and Cohen (1993) attribute the increase in premarital sexual activity to schooling and employment opportunities available to young men, which give them greater independence from their families and sexual access to young women. In the past, sexual activity was regulated by the community. For example, among the Kikuyu in Kenya, newly circumcised young men and women were taught how to practice *ngwiko*, non-penetrative stimulation of the sexual organs before marriage (Kenyatta 1971), which permitted sexual release but reduced the risk of pregnancy. Now, according to Bledsoe and Cohen (1993), boys have heightened expectations and make sexual demands on girls away from the watchful eyes of their elders.

Although schooling undoubtedly increases the level of unsupervised interaction of an innocuous or consensual sort, abundant evidence reveals that the type of attention girls receive from boys is often offensive and unwanted. Qualitative and quantitative data collected by the authors and their colleagues indicate that considerable harassment of girls of both a sexual and nonsexual nature takes place in Kenyan schools (Mensch and Lloyd 1998). Periodic reports of mass rapes of schoolgirls (see, for example, Muniyiri and Mwati 1996), are further evidence of the existence of nonconsensual sexual activity within schools. A national survey of nearly 10,000 secondary schoolgirls indicated that, of the one-third reporting sexual activity, approximately 40 percent said that their first encounter was forced or that they were "cheated into having sex" (Youri 1994; Mensch et al. 1998). Although the extent to which such encounters have occurred in transit to or from school is unknown, of the approximately 1,350 girls who said they were forced or cheated into having sex, about 70 percent said

their first partner was a male student “about my age” or “older than myself.” Only 5 percent said the first sexual partner was an adult male or older male relative.<sup>4</sup>

The expansion in schooling may have led to increased rates of sexual activity among girls in sub-Saharan Africa for yet another reason. The imposition of school fees, which includes not only tuition but also uniform and textbook charges, may force girls whose parents cannot afford to educate all their offspring or who are expected to be financially independent by virtue of their student status to acquire older sexual partners. Such “sugar daddies” or “sponsors” give girls money for school expenses and other needs in exchange for sexual favors (Bledsoe 1990; Odaga and Heneveld 1995; Meekers and Calvès 1997).

## The Conceptual Model

This study explores the relationship between school quality and initiation of premarital sex. To the extent that researchers have paid attention to the potential link between schooling and sexual behavior of adolescents, the analyses simply distinguish between young people in and out of school. To the authors’ knowledge, no study has investigated the impact of school quality on the timing of first sexual encounter. Indeed, few studies have investigated the effect of school quality on educational attainment. Moreover, to the extent that researchers have examined the link between school quality and academic achievement, the factors included in models are typically limited to a standard list of material inputs such as the state of facilities, instructional materials, and the number and training of teaching staff (see, for example, Glewe et al. 1995).

To broaden this narrow conception of school quality, and to explore the relationship between school quality and differential outcomes for boys and girls, a small-scale field study in rural areas of three districts in Kenya was conducted. A key feature of the study design was the linkage of school-based data with a population-based sample of both in-school and out-of-school adolescents so that the implications of school quality for a broad range of educational and reproductive outcomes could be assessed.

In analyzing the effect of school quality on school dropout, the authors developed a conceptual model of the educational process that includes traditional elements such as “material inputs” and “time to learn,” as well as “school and classroom dynamics,” which encompasses school policies, how students are treated, and underlying attitudes of teachers (Mensch and Lloyd 1998; Lloyd and Mensch 1999; Lloyd et al. 2000). This last dimension, which is missing from the literature on

the effectiveness of schooling in producing cognitive competencies, is most relevant here.

Elements of school and classroom dynamics reflect gender systems operating at the school level. Those elements that are either different for girls and boys or those that have a potentially different effect for girls and boys are identified here. The argument is made that “a successful transition to adulthood is one in which a young person is allowed to grow to develop her or his full potential physically, intellectually, and emotionally before taking on adult roles” (Lloyd et al. 2000: 118). School, because it is the most important socializing institution outside the family, may play a significant role in certain aspects of this transition to adulthood, including the decision to engage in premarital sex (Mensch and Lloyd 1998; Lloyd and Mensch 1999). The nature of the school a girl or boy attends is presumed to be important because of the negotiation process around sex. According to descriptions of this process in Kenya, girls “give in” to boys in exchange for gifts, money, or safe transit (Erulkar and Mensch 1997). Thus the authors speculate that those schools that are more supportive of girls, both because there is less sexual harassment and greater encouragement of academic achievement, equip them with the facility to ward off unwanted attention from boys, or, for those that are curious, to delay sex until their education is completed.

A fourth dimension of school quality—availability of and attitudes toward family-life education—was also included in the model because of its potential relevance to adolescent behavior. The provision of reproductive health information in schools may affect sexual behavior. For the analysis here, school-quality variables are limited to those measuring this fourth dimension and the third dimension, school and classroom dynamics.

This study considers the effect of primary-school quality as it was measured at the time of the survey on premarital sex that had occurred at various times in the recent past. Because of late entry, grade repetition, and the limited number of places in secondary school, the vast majority of adolescents in Kenya who are enrolled in school are attending primary school. Thus, the analysis here is restricted to the data from primary schools.

## Data

### *Linked Adolescent and School Survey*

As indicated above, the data for this study are drawn from a two-part, linked, community and school survey conducted in three rural districts of Kenya in mid-1996.

Although the districts were not selected randomly, they were purposively chosen to maximize the range of school quality observed in Kenya, with Kilifi being at the low end of the spectrum, Nakuru the middle, and Nyeri the high. The selection was based on 1993 rankings of the Kenya Certificate of Primary Education, the primary-school-leaving exam, and primary- and secondary-school enrollment data.

Clearly, these rankings reflect historical differences between the districts. Nyeri belongs to the region of Kenya previously known as the "White Highlands" because it was the home of European colonial settlers, many of whom were involved in coffee production. Tea, another source of foreign exchange, is also grown in this area, which is considered to have the richest agricultural land in the country. Although Africans were not involved in coffee and tea cultivation during the colonial period, after independence, when settlement schemes provided access to these areas, a "privileged" group began to cultivate high-value export crops (Kitching 1980).

Because of the European presence, the African population in the White Highlands had much greater access to Western education provided by Christian missionaries than did their counterparts in other parts of Kenya. Moreover, the Bantu-speaking Kikuyu, who dominate the area numerically (they are 98 percent of the Nyeri sample), were politically the most powerful ethnic group at independence. Although Jomo Kenyatta, who led the struggle for liberation from Britain and was Kenya's first president, "insisted on . . . national representation at the ministerial level of government," he "put his trust in the Kikuyu 'old guard'" (Rinehart 1984: 55).<sup>5</sup> In short, Nyeri District is historically one of the wealthiest and certainly one of the better-developed areas in Kenya.

Nakuru and Kilifi do not feature in accounts of the economy and political environment of colonial and post-independence Kenya. We are limited, therefore, to survey and census data in describing these two provinces. Kilifi, in Coast Province, is populated primarily by Swahili- (from the Arabic word for coastal) speaking people whose ancestors consist of indigenous Bantu-speaking Africans who intermarried with migrating Arab merchants (Rinehart 1984). Like Nyeri, Kilifi is ethnically homogeneous with 98 percent of the sample population reporting that they are members of the Mijikenda ethnic group. Kilifi is one of the poorest districts in Kenya in terms of conventional socioeconomic indicators. Educational attainment has always been lower than that of other areas of Kenya, in part because the predominantly Muslim population has been "reluctant to send their children to secular schools" associated with Christian missionary activity (Kaplan 1984: 122).

The situation of Nakuru, our "middle" district, has changed over the last couple of decades, largely because it is the home of the current president of Kenya, Daniel arap Moi. Moi is a member of the Kalenjin, a Nilotic group believed to have migrated from Ethiopia. In the sample, the Kalenjin constitute 35 percent of the Nakuru population. (The Kikuyu make up 56 percent of the Nakuru sample.) Moi, who was the vice president under Kenyatta and was selected for office in order to bring ethnic diversity to Kenyatta's cabinet, is now thought to favor his own group at the expense of the numerically dominant and economically more powerful Kikuyu; Nakuru has undoubtedly benefitted from this turn of events.

Once Nyeri, Kilifi, and Nakuru were chosen for the study, clusters within these districts were selected from the national sampling frame to reflect the high, middle, and low end of the educational range as well as to maximize the overlap of adolescents from the community-based sample with the schools they attend.<sup>6</sup>

The first part of the survey involved household interviews with 774 adolescents aged 12–19. In each of the 19 clusters selected, all households with a resident adolescent were designated for an interview. In households with more than one adolescent, one was randomly selected for the interview from previously collected household lists using a Kish grid. This strategy was followed to minimize the possibility that other young people in the household would be familiar with the questions asked. Inclusion of multiple respondents in the household might have discouraged an adolescent girl from reporting that she was sexually active for fear that she would be asked later by a sibling or relative how she had answered the question (Mensch et al. 1998). In order to ensure as complete a listing of adolescents as possible, the household listing form asked for the names of all residents in the household, not just for those aged 12–19, and also asked that children who were away at school be included. The adolescent to be interviewed was identified prior to the interviewer's visit to the household in order to make sure that the visits would not produce a convenience sample of "at home" adolescents. If the selected adolescent was not home at the time the interviewer visited, an appointment was made for a time when the adolescent would be available. If necessary, interviewers revisited a household at least three times. Adolescents who were away at boarding school were interviewed at the completion of the school term. Survey completion rates ranged from 76 to 78 percent for the three districts. (See the appendix for further discussion of the fieldwork and the sample-completion rate.)

Information was collected on family background, educational history, time use, puberty, sexual experience,

reproductive knowledge and behavior, drug use, delinquency, gender-role attitudes, self-esteem, and aspirations. For each preselected adolescent, a parent or responsible adult was also interviewed. All interviews were conducted in as private an environment as possible. Because the study area was rural, finding a private place to administer the questionnaire was usually not difficult. Most interviews took place at farms or in fields. Of the 774 adolescents surveyed, only 24, eight girls and 16 boys, were interviewed in the presence of others, and 17 of these 24 bystanders were children under the age of 12.<sup>7</sup>

Although a fairly even distribution of boys and girls was obtained for the adolescent sample—381, or 49 percent, were girls and 393, or 51 percent, were boys—too few 19-year-olds were obtained for the interview. Because of the positive rate of growth of the population—Kenya is growing by about 2 percent per year—the authors expected a greater fraction of younger adolescents. The difference in the number of 19-year-olds in the sample, compared with that of 17- and 18-year-olds, is too large to be explained by smaller cohorts at older ages, however. Whereas 12 percent of the boys in the sample are 17 and 12 percent are 18, only 7 percent are 19. Similarly, 11 percent of girls in the sample are 17, 12 percent are 18, and 8 percent are 19. One explanation for the small number of 19-year-olds is a misreporting of respondents' ages. Typically, in surveys for which the upper age of the target sample ends in 9, the number of respondents at the boundary is artificially small because respondents who don't know their ages round to the nearest 10.<sup>8</sup> Another explanation is that 19-year-olds are highly mobile and may have migrated between the time of the listing and the time of the interview. Thus, the 19-year-olds who were captured may be selective to some degree, a situation that may bear on their reports of sexual activity, as discussed below.

The second part of the survey involved visits to 36 primary schools attended by adolescents in the sample. Overall, 76 percent of the adolescents in the household survey had attended or were currently attending one of the 36 primary schools in the sample. The names of the schools that were visited were identified by adolescents in the household survey. Each school was visited by a three-person team for two to three days. The school was contacted in advance and the head of school informed that a visit would take place but, in order to ensure that the situation was as normal as possible, he or she was not told the date of the prospective visit. Each school visit consisted of an interview with the head of school, the observation of school facilities and activities in the school yard, the observation of four English and four math classes (two per teacher) for standards 7 and 8 (the last

two years of the eight-year primary cycle), interviews with the two English and two math teachers who were observed, and a self-administered questionnaire given to a random sample of 30 boys and 30 girls enrolled in standards 7 and 8. For further details of the sampling design and the survey, see Ajayi et al. (1997) and Mensch and Lloyd (1998).

The observation data were expected to be particularly revealing of school and classroom dynamics. Indeed, many examples of inadequate school quality were detected. Many teachers were uneasy about being observed, however, and were convinced, despite the best efforts of the field teams, that they were being inspected. As became clear from comments teachers made in class about student punishment and from the difference between students' reports of punishment and punishment that was observed, what the field-workers saw was atypical. Moreover, although the field teams intended to visit regularly scheduled classes, in a few cases, classes were specially organized for them.<sup>9</sup> In light of these courtesy biases, the many instances of poor school quality that were observed were likely reflective of the actual school environment.

### *The Matched Sample*

The premarital sex models that include school variables are based on the sample of adolescents who attended one of the 33 mixed-sex primary schools.<sup>10</sup> Because this model is restricted to adolescents who attended a primary school that was visited, a potential problem with selectivity exists.

For our earlier study of the effects of primary-school quality on school dropout, we compared the characteristics of adolescents whose schools were visited with the characteristics of adolescents whose schools were not visited. Two significant differences were observed: Adolescents whose schools were not visited are approximately one year older and have a slightly higher standard of living as measured by a household-possessions index. In all probability, the older the adolescent and the higher the standard of living of his or her household, the more likely was the student's family to have moved away from the area in which the primary school was situated or, alternatively, the more likely was the adolescent to be sent away to school (see Lloyd et al. 2000).

### *Means and Standard Deviations of Household and School Variables*

The independent variables can be separated conceptually into two groups: those that are individual and family characteristics, which are included as controls, and

those that are school characteristics. The means and standard deviations of all variables from the matched sample that are included in the analysis of the risk of engaging in premarital sex are shown in Table 1.

Selection of individual and family variables was based on a desire to control for confounding cultural, demographic, and socioeconomic factors that might af-

fect an adolescent's risk of having premarital sex, for example, ethnicity and religion; age, both chronological and physiological; socioeconomic status (including maternal education and household wealth); and household structure, namely, whether the household was headed by a woman and whether both parents were resident. Four of these variables warrant further explanation. Pu-

**Table 1** Means and standard deviations of household and school variables, Kenya, 1996

Variable	Girls (N = 281)		Boys (N = 308)	
	Mean	Standard deviation	Mean	Standard deviation
<b>Individual and family characteristics</b>				
Have reached puberty (omitted category: no)				
Yes	0.48	0.50	0.54	0.50
Age (omitted: <14 years)				
14–16	0.34	0.25	0.39	0.49
17–19	0.25	0.44	0.28	0.45
Ethnicity (omitted: Kikuyu)				
Kalenjin	0.14	0.34	0.13	0.33
Mijikenda	0.31	0.46	0.33	0.47
Other	0.04	0.19	0.02	0.15
Female-headed household (omitted: no)				
Yes	0.33	0.47	0.40	0.49
Living with both parents (omitted: no)				
Yes	0.50	0.50	0.54	0.50
Total number of same-sex adolescents resident in household	1.68	0.81	1.73	0.88
Household-possessions index (0–10)	3.90	1.88	3.84	1.88
Mother's education (omitted: <primary)				
Completed primary	0.40	0.49	0.38	0.49
Completed secondary	0.20	0.40	0.16	0.37
Missing	0.18	0.39	0.22	0.42
Religion (omitted: Muslim; other)				
Christian	0.91	0.29	0.81	0.39
<b>School characteristics</b>				
Head of school				
Favors severe response to teacher–student sex (omitted: no)				
Yes	0.81	0.39	0.81	0.40
Approves of family planning/sexuality education in primary school (0–2) (omitted: no)				
Yes	1.19	0.83	1.28	0.80
Believes pregnant girl should be allowed to stay in school (omitted: no)				
Yes	0.42	0.49	0.39	0.49
Favors serious response to male student's impregnating female student (omitted: no)				
Yes	0.47	0.50	0.56	0.50
Percent of teachers who feel that math is an important subject for girls	66.0	22.7	68.8	23.3
Percent of teachers who do not express a preference for teaching boys	80.1	21.5	81.7	21.8
Classroom observation				
Average number of positive teacher–student interactions observed	29.62	13.60	27.73	14.13
School inventory				
Scale (0–3) of family-life education subjects taught	1.24	0.73	1.22	0.70
Percent of students of either sex who report that an adult at school talks with students about their problems	81.1	12.8	85.1	15.7
Percent of students of either sex who report that the sexes are treated equally at school	86.4	12.2	86.2	10.9
Percent of girls checked for pregnancy after last Easter break	2.4	3.5	22.2	35.7
Average percent of correct answers given by students of either sex to series of questions concerning reproductive health knowledge	51.5	6.2	57.5	75.3
Percent of students of either sex who participate in school clubs	29.4	20.1	30.8	21.8
Percent of students of either sex who participate in school sports	50.9	18.2	50.0	20.2

**Note:** Missing-value dummy variables were included in order to minimize loss of cases due to missing data.

berty is defined as the onset of menarche for girls and the first experience of nocturnal emissions for boys.<sup>11</sup> The household-possession index, which is a proxy for permanent income, is an additive index based on possession of ten items.<sup>12</sup> A variable is included measuring residence with both parents as well as one measuring residence in a female-headed household. The correlation between the two variables is surprisingly low:  $-0.48$ , indicating that they are measuring different familial conditions. A father's not being present does not preclude the household's being headed by a male. Moreover, living in a household headed by a woman does not preclude having a father present; 13 percent of households with both parents present are headed by a woman.

Numerous variables were produced from the school survey that tapped aspects of school quality. Each adolescent attending a particular school was assigned the same value for each school-level variable or, for some variables, all girls were assigned the same value and all boys were assigned the same value. In many cases, this assignment was straightforward in that the variable measured the response of the head of school to a particular question or was drawn from the school inventory. Some variables, however, required that data be aggregated, for example, variables that were based on student interviews resulted in the computation of a mean value across all the students interviewed at that school. Those school variables that the authors judged to be poorly measured or that were not reliably reported were discarded; those that might plausibly be associated with engaging in premarital sex and with contraceptive use were selected. As indicated above, all of the variables selected here are drawn from two of the four dimensions of school quality that were included in the conceptual model: school and classroom dynamics and family-life education (Mensch and Lloyd 1998).

Some of the school variables—teachers' attitudes toward the importance of math for girls, the absence of a preference for teaching boys, girls' and boys' attitudes about equal treatment of the sexes in school, severe response to teacher–student sex, serious response to male students' making female students pregnant—reflect directly the degree to which the school environment is gender-sensitive. Other variables—average number of positive teacher–student interactions and presence of an advisor—reflect the degree to which the school is a congenial or supportive place in which to learn. Yet another set of variables—approval of sex and family planning education, approval of allowing pregnant girls to remain in school, number of family-life education subjects taught, pregnancy checks for girls, and students' reproductive knowledge—reflect administrators' views toward ado-

lescent sexual and family planning behavior and the teaching of family-life education at school. A final pair of variables—club and sports participation—reflects the degree to which activities exist that occupy adolescents' time and that may bring boys and girls into contact.<sup>13</sup>

The description of some school variables includes the phrase "student of either sex," indicating that the variable in question is divided into two, one recording male students' responses and the other recording female students' responses; this description is used if the correlation between the boys' and girls' variables was lower than 0.7. In all such cases, the boys' variable has been included in the boys' model and the girls' variable in the girls' model.

## Methodological Issues

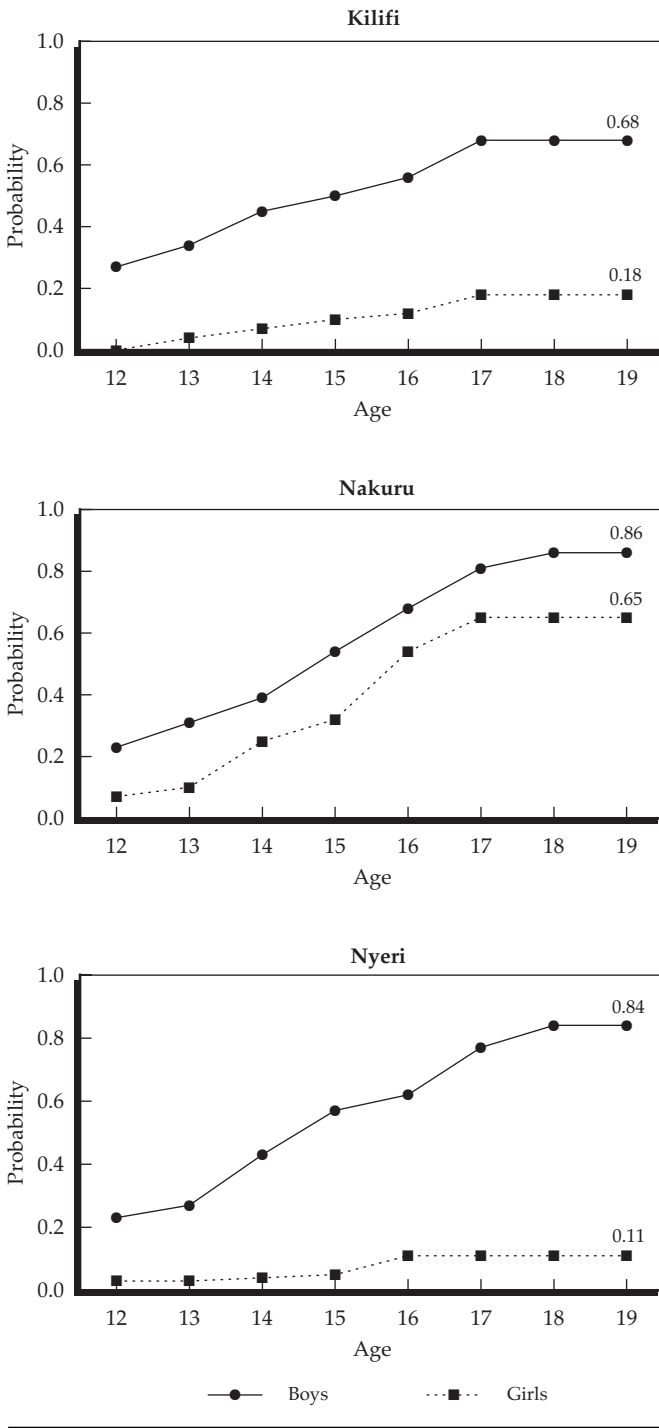
Because the topics to be explored were particularly sensitive, a small-scale qualitative study was undertaken among young people in the study communities before the survey questionnaire was developed. Fourteen focus-group discussions, segregated by age and sex, were conducted with 139 adolescents. The objectives were: (1) to understand how best to ask sensitive questions of young people in order to elicit the most accurate responses; (2) to identify possible markers and proxies for those behaviors; and (3) to understand what sort of interviewer would be most effective in putting the adolescent respondents at ease.

Young people everywhere have an extensive slang vocabulary for concepts and behaviors related to sex. This language is often used in the context of jokes and is considered appropriate to use among peers only and is not used with outsiders, including survey interviewers. The phrase "playing sex" (*kufanya mapenzi*) is the most commonly accepted expression for sex among Kenyan adolescents. In order to encourage reporting, the series of questions on sexual activity was introduced with an acknowledgment of the different circumstances in which sex takes place: "Sometimes young people play sex. They play sex for different reasons—for love, or because they are convinced, forced, or tricked."

Before analyses of the determinants of sexual initiation are presented, descriptive data on premarital sex for both girls and boys are shown. Figure 1 compares the probability of adolescents' engaging in premarital sex, by district and sex, for the entire sample. Because the experience of many of the adolescents in the survey is censored, this graph is based on a life-table analysis. Note that the life tables and all subsequent descriptive analyses are weighted to account for the over-represen-



**Figure 1** Probability of adolescents' engaging in premarital sex, by district, Kenya 1996 (weighted)



tation of smaller families in the sample that results from inclusion of only one adolescent per household. The weight adjusts for the differential sampling rate.

As suggested above, premarital sexual activity for girls, even though common, is not socially sanctioned in much of sub-Saharan Africa. Therefore, the reliability of

data presented here is uncertain. In both Kilifi and Nyeri districts, girls report significantly lower levels of premarital sexual activity than do boys, whereas in Nakuru, the difference by sex is much smaller. The authors surmise that girls in Kilifi are, in fact, less likely than boys to have premarital sex. Kilifi is located in Coast Province, arguably the poorest and most conservative province in the country, with the lowest level of female education and employment, and the lowest level of male approval of family planning (NCPD et al. 1999). Moreover, Kilifi has a substantial Islamic minority (about 20 percent of adolescents in the study sample). It is an area where girls still marry early, are less likely to attend school, and are monitored more closely than are girls in other areas of Kenya. On the other hand, girls in Nyeri are likely to have higher levels of premarital sex than they report, levels comparable to those of Nakuru.

One explanation for the difference in the accuracy of reporting between the two districts may be that Nyeri is much more homogeneous than is Nakuru. Nakuru is not dominated by one ethnic group. Nyeri, as we noted earlier, is composed almost entirely of Kikuyus and is the center of the opposition that, because divergent views are not well tolerated in Kenya, has caused residents to be suspicious of outsiders. Whereas Nakuru's ethnic diversity might allow girls more freedom to admit to being sexually experienced, Nyeri's close-knit, comparatively closed community with strong cultural taboos against open discussion of sexual behavior might discourage frank reporting. Alternatively, the differences between Nakuru and Nyeri may be real. Nakuru experienced considerable ethnic unrest before and during the time of the survey. These disputes, between the Kalenjin and the Kikuyu, may have resulted in social disruption sufficient to increase sexual activity among girls.

In addition to investigating the internal consistency of the data on sexual initiation, the reporting in the survey was compared with that in the 1998 DHS. The DHS data are designed to be representative at the provincial but not at the district level. Nevertheless, a comparison of the reports of sexual activity and marriage with those of the 1998 Kenya DHS in rural areas of Kilifi, Nakuru, and Nyeri is illuminating. Because the DHS does not include girls younger than 15, the analysis is limited to those aged 15–19.

The first row of Table 2 suggests that the reporting of sexual activity among the unmarried is considerably lower in the three districts in the adolescent survey compared with the DHS data, 18 percent versus 27 percent. Some of this difference may simply be due to statistical noise resulting from small sample sizes. Some may be due to the possible selectivity of the 19-year-olds who

**Table 2** Percentage of girls aged 15–19 who are sexually active, by marital status, Kilifi, Nakuru, and Nyeri, 1998 Kenya DHS and 1996 adolescent survey (weighted)

Variable (sample)	1998 DHS	1996 Adolescent survey
Sexually active (never-married girls)	27 (N = 106)	18 (N = 150)
Premaritally sexually active (all girls)	28 (N = 126)	24 (N = 192)
Ever-married (all girls)	16 (N = 126)	19 (N = 194)

were interviewed (see discussion above). The second and third rows of the table indicate, however, that some of the difference might reflect the greater proportion of the adolescent survey sample that reports being married. Judging from the comparison of the proportion reporting having had premarital sex, the married girls interviewed for the present study appear to be more inclined to report retrospectively that they had experienced sex before marriage than the single girls are to report currently having sex. Also, single respondents in the adolescent survey may be more comfortable reporting themselves as married if they have had sex, a circumstance that would explain the greater proportion ever married, compared with that of the DHS.

In sum, although single adolescent girls in the study sample are less inclined to admit to having had sex than are those in the DHS sample, once married, their reported levels of premarital sex are comparable. But comparability does not imply accuracy. Indeed, underreporting of premarital sex is likely to have occurred in both the adolescent survey and the DHS.

If underreporting of premarital sex occurs, the statistical analysis may be compromised. If the underreporting is systematic, then the parameter estimates and standard errors are biased; if it is not systematic, then the model is unbiased. The assumption is made here that, to the extent that underreporting occurs, it is not related in a consistent fashion to any of the explanatory variables included in the models.

#### *Assumptions and Limitations of Cross-sectional Data*

Although expensive and time consuming, a proper analysis of the effects of primary-school quality on the initiation of premarital sex requires a longitudinal design in which quality is measured at time one and students enrolled are subsequently observed at a later time two. With a cross-sectional survey, used here, school quality must be assumed to change little over time, or, alternatively, if a shift in quality occurs, all schools must be assumed to experience the same magnitude and direction of change.

In addition, implicit in this analysis is the notion that primary-school quality has an enduring impact. Therefore, even if an adolescent is no longer attending primary school when sexual initiation occurs, the primary-school experience is considered to have an effect on decision-making and behavior throughout the transition to adulthood. For those respondents who have engaged in premarital sex, the more likely that he or she was enrolled in school close to the time of the interview, the more defensible is the linking of sexual behavior to school quality. For respondents who have not had sex, the more likely a boy or girl was attending primary school at the time of the interview or the more recently he or she had left primary school, again the more defensible are the assumptions underlying the statistical model. In the matched sample, 80 percent of respondents either (1) had premarital sex and were enrolled in school within two years of the interview; (2) had premarital sex and the sex took place within two years of leaving school; (3) didn't have premarital sex and were enrolled in school at the time of the interview; or (4) didn't have premarital sex and had left school less than two years before the interview.

## **Results**

The outcome variable for the analysis is the hazard of initiating premarital sex. An adolescent was determined to have initiated premarital sex if he or she is unmarried and reported to the interviewer having had sex or, if married, the reported age at first sex is younger than the age at marriage. Thus, for adolescents who are married, marriage is treated as a censoring event.

A discrete time-hazard model of initiation of premarital sex was estimated using logistic regression with the period of observation starting at the earliest age of school entry, namely age six, and continuing at annual intervals until the nineteenth birthday. The few (nine) respondents who reported that they had initiated sex before they started school were omitted from the final analysis, and individuals did not enter the analysis until the age they began attending school. The advantage of the discrete-time model over continuous models is that it makes no assumption about the shape of the hazard function. Because the hazard of having premarital sex was expected to increase with age, a series of dummy variables for age was included to allow the hazard of having premarital sex to vary by age. The only other time-varying variable is puberty; this variable indicates whether at the beginning of each interval the respondent had gone through puberty as we defined it. In contrast to the descriptive analyses, this multivariate analy-

sis is not weighted. Rather, a variable indicating how many adolescents of the same sex are resident in the household is included. In order to account for the expanded sample resulting from the use of a person-year file, the robust standard errors available in the Stata statistical package were employed.

### *The Determinants of the Initiation of Premarital Sex*

Table 3 presents the results for the model of adolescents' experiencing premarital sex. As expected, two of the individual variables that have large effects are the time-varying variables, puberty and age. The odds of an adolescent's experiencing sex are much greater if she or he has reached puberty. Although only significant for boys, the age at which first premarital sex is apparently most likely is 14–16;<sup>14</sup> however, underreporting is likely among girls and possibly, as indicated above, a selectivity effect may exist for boys in that the 19-year-olds who were interviewed are less mobile and less likely to be sexually active than boys of this age usually are. The other significant individual variable for girls is ethnicity. Kalenjin girls and girls who are members of smaller ethnic groups are much more likely to engage in premarital sex than are Kikuyu girls. Because of instabilities in the model that are consistent with a multicollinearity problem, district is not included in the model although large differences are found in behavior in Nyeri, Nakuru, and Kilifi.<sup>15</sup> Because ethnicity is highly correlated with district, with Nyeri being 98 percent Kikuyu, and with all of the Kanlenjins in the sample resident in Nakuru and 98 percent of the Mijikendas resident in Kilifi, the ethnicity dummies undoubtedly capture some of this intradistrict variability.

As the table indicates, not one school variable is significant for boys. For girls, on the other hand, one school variable is significant at  $p < 0.001$ : Girls are less likely to engage in premarital sex if they have attended schools where female students feel they are being treated equitably. This finding is very robust. In the course of estimating the model, many different specifications were investigated. Regardless of the specification, the effect of this variable was always strong and significant.

What is most noteworthy about the analyses of boys' reports is that few variables explain why they engage in sex. Sex for boys who have reached puberty appears to be opportunistic. When they have a chance to engage in sex, they do so. Although the findings for girls are not much more illuminating, they are suggestive, particularly when the small sample size is considered. For girls, the decision to have sex appears to be more complicated than it is for boys. For one thing, sex, according

to studies cited above, is often not volitional for girls; no "decision" is involved. As appears to be the case elsewhere in sub-Saharan Africa, sex for young women in Kenya often involves some sort of bargaining or commercial exchange (Calvès and Meekers 1997; Meekers and Calvès 1997). Girls who are more empowered, therefore, may be more skillful in fending off boys and men. Among those who have some control over when and with whom they have sex but are, nevertheless, in conflict about doing so, what sort of school they attend may matter. Attendance at schools that are supportive of girls may encourage a delay in sexual initiation.

### *Timing of Premarital Sex and Pregnancy with Dropout*

As noted earlier, "schoolgirl pregnancy" is frequently discussed in Kenya. Generally, the problem is mentioned in connection with girls who drop out of school, and in such cases, the usual assumption is that pregnancy precedes and causes school leaving (Meekers et al. 1995). Policymakers interested in increasing the number of girls who remain in school have, therefore, been led to focus on ways of discouraging school-age girls from becoming pregnant.

Another possible explanation for the perceived connection between school dropout and adolescent pregnancy, however, is that girls, finding school an unsatisfactory environment, are discouraged from continued attendance and leave, and that such girls subsequently become pregnant. In such circumstances, the effort to make schools more congenial to girls would suggest itself as a course of action, rather than focusing on efforts to prevent them from becoming pregnant. The authors' earlier work on the effects of school quality on dropout using this data set identified several characteristics of schools that appear to influence girls to leave school early. We found that girls are discouraged from remaining in schools where boys are provided with a more supportive environment in terms of advisors, where teachers believe that demanding subjects such as math are less important for girls than for boys, and in which boys harass girls and do not recognize that girls are treated inequitably (Lloyd et al. 2000).

In the present study, we focus on the relationship between pregnancy and dropout among Kenyan schoolgirls. One complication is that the girls interviewed may have underreported the incidence of pregnancy.<sup>16</sup> Generally, those who believe that surveys such as this one underreport pregnancy assume that such underreporting applies primarily to miscarriages and abortions—that is, to pregnancies that may not have come to public attention. Once a girl's pregnancy is known to her community—when it has continued to the point that it is vis-

**Table 3** Logistic regression model of adolescents' experiencing premarital sex, by individual, family, and school characteristics, Kenya, 1996

Variable	Girls	Boys
	Odds ratio	Odds ratio
Individual and family characteristics		
Have reached puberty (time-varying) (omitted category: no)		
Yes	12.26**	5.54***
Age (time-varying) (omitted: <14 years)		
14–16	3.21	2.06*
17–19	2.29	0.97
Ethnicity (omitted: Kikuyu)		
Kalenjin	19.36**	1.10
Mijikenda	0.65	1.12
Other	29.64*	0.98
Female-headed household (omitted: no)		
Yes	0.43	1.30
Living with both parents (omitted: no)		
Yes	0.77	1.43
Total number of same-sex adolescents resident in household	1.41	1.22
Household-possessions index	0.97	0.96
Mother's education (omitted: <primary)		
Completed primary	1.60	1.45
Completed secondary	2.45	1.76
Missing	1.48	0.90
Religion (omitted: Muslim; other)		
Christian	0.41	0.78
School characteristics		
Head of school		
Favors severe response to teacher–student sex (omitted: no)		
Yes	1.63	1.94
Approves of family planning and sex education in school (omitted: no)		
Yes	2.14	1.04
Believes pregnant girls should be allowed to stay in school (omitted: no)		
Yes	1.92	1.16
Favors serious response to male student's impregnating female student (omitted: no)		
Yes	0.40	1.04
Percent of teachers who believe that math is important for girls <sup>a</sup>	0.82	1.03
Percent of teachers who do not express a preference for teaching boys <sup>a</sup>	1.09	0.89
Classroom observation		
Average number of positive teacher–student interactions	1.01	0.98
School inventory		
Number of family-life education subjects taught (0–3)	1.25	0.82
Percent of students of either sex who report that an adult at school talks with students about their problems <sup>a,b</sup>	1.20	0.98
Percent of students of either sex who report that the sexes are treated equally at school <sup>a,b</sup>	0.33***	0.94
Percent of girls checked for pregnancy after last Easter break <sup>a</sup>	1.42	1.25
Average percent of correct answers given by students of either sex to series of questions concerning knowledge of reproductive health	1.62	1.11
Percent of students of either sex who participate in school clubs <sup>a</sup>	0.82	0.92
Percent of students of either sex who participate in school sports <sup>a,b</sup>	1.63	1.10
Log likelihood	–112.27	–357.80
Chi square	103.74	106.88
Pseudo R <sup>2</sup>	0.28	0.11
Person–years	1,969	1,786
(N)	(243)	(257)

\*Significant at  $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two-tailed test).

<sup>a</sup>The scales of these variables have been adjusted to run from 0–10 instead of from 0–100 as in Table 1; in other words, the odds ratio assumes an increment of 10 percentage points in the independent variable. <sup>b</sup>Variable measured separately for boys and girls.

ible or when the girl has given birth—she would appear to have little reason to conceal the pregnancy from researchers. In the present study, however, the focus is not on pregnancy per se, but rather on pregnancy that may

be connected with school dropout. Because a pregnancy that leads to dropout is less likely to be a concealed pregnancy (the fact of its leading to dropout would call attention to it), the point that other (less public) pregnan-

cies may have gone unreported in this survey may not be of great concern.<sup>17</sup> Pregnancies leading to dropout are more likely to be known, and known pregnancies are probably likely to be reported. Even if the study did not fully record pregnancies overall, therefore, it is likely to have registered most pregnancies of interest.

Of the girls in the sample who have ever been to school, 8 percent report ever having been pregnant.<sup>18</sup> Among these girls, the association between pregnancy and school leaving is strong: All have dropped out of school.

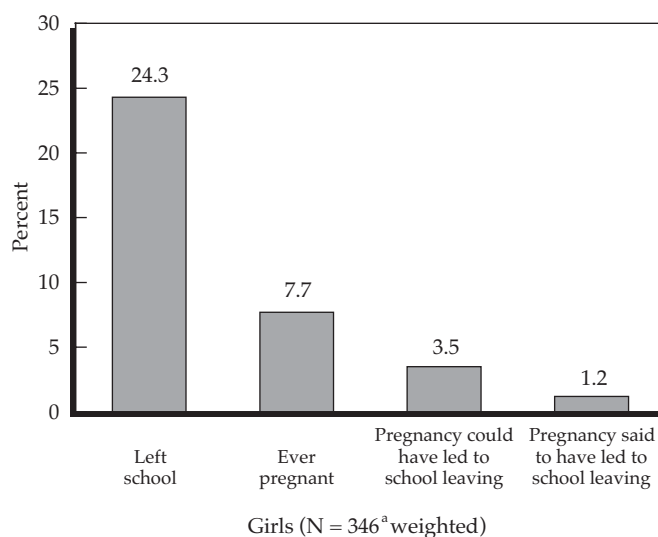
A look at the timing of pregnancy and of school leaving, however, makes clear that the simple statement “pregnancy leads to dropout” is far from accurate for this small sample. Of the 27 girls who have ever been pregnant and have left school, all but one gave a valid age at which they left. Among those who list a valid age, 16 (60 percent) became pregnant at least one year after leaving school, seven (28 percent) became pregnant at the same time that they left school, and only three (12 percent) became pregnant before leaving school. Thus, even when girls who have become pregnant are considered independently of the large majority of girls who have not, pregnancy could have been a cause of school leaving in a maximum of 40 percent of these cases. In all probability, the proportion of school-leavers that can be attributed directly to pregnancy is much smaller than this (see Figure 2).

Furthermore, when the 27 girls who ever attended school and who ever became pregnant were asked why they left school, only four listed child-care responsibili-

ties and two listed marriage as the main reason. By far, the primary reason indicated for leaving school is “could not pay fees” (14 girls gave that response). Overall, of the 84 girls in the sample who had stopped attending school, only four (5 percent) listed support of children as the main reason for leaving school, which is consistent with the proportion of school leavers who reported a pregnancy date before the time of school-leaving. Although this figure probably represents a low estimate of the proportion of those who left school as a consequence of becoming pregnant, if those who became pregnant at the same time that they left school were included, the proportion of school dropouts attributable to pregnancy would rise to only 12 percent. The majority of girls who left school, therefore, did not do so because of pregnancy. Respondents cited several other reasons for leaving school more frequently than pregnancy, including the inability to pay fees (37 girls), having finished primary or secondary school (14 girls), poor performance (nine girls), and lack of interest (eight girls). Despite the small sample size for this analysis, on a purely descriptive level the data suggest that, although pregnancy and discontinuation of school are strongly associated, pregnancy is not a central cause of girls’ leaving school.<sup>19</sup>

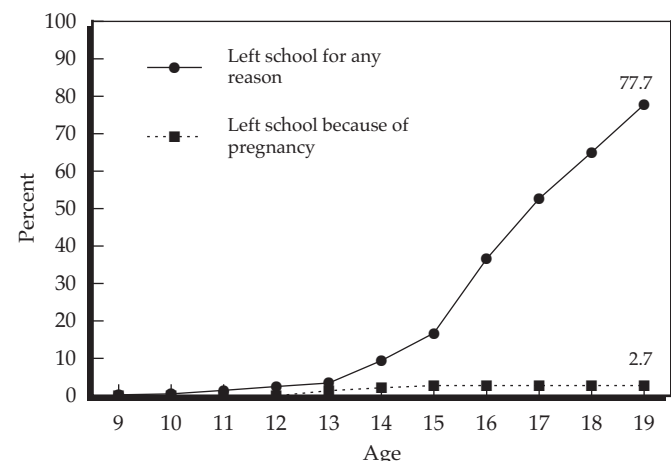
Because the data are censored, life tables were run to predict the overall likelihood of leaving school for girls, followed by cause-specific life tables to predict school-leaving for various specific reasons. Although nearly 80 percent of the girls in the model would be expected to have left school by the end of age 19, less than 3 percent are projected to have left as a result of pregnancy, a conclusion based on the reasons the girls gave for leaving (see Figure 3). Again, the data suggest that

**Figure 2** Relationship between pregnancy and leaving school, reported by girls who ever attended school, Kenya, 1996



<sup>a</sup> Excludes one girl who attended school and became pregnant, but who did not list a valid age for pregnancy.

**Figure 3** Projected relationship between pregnancy and girls’ leaving school before completing secondary school, Kenya (N = 361, weighted)



pregnancy is not a principal cause for leaving school among girls.

As noted above, because girls appear to be more likely to leave school and become pregnant afterward than to become pregnant and, as a result, leave school, efforts focused on making schools more affordable, effective, and inviting for girls may do more to keep them in school than will efforts directed at preventing adolescent pregnancy, however important and valuable such efforts may be.

## Conclusion

In light of this study's small sample size, the findings are by no means definitive. They are, however, suggestive of some interesting patterns of behavior that should be investigated in future research: Boys—for whom early sexual experience has relatively few hazards and many potential benefits, including gratification and social prestige—appear to engage in premarital sex largely independent of the influence of their environment. The sexual activity of girls, on the other hand—for whom early sexual relations are attended by a number of dangers, physical as well as social—may be more subject to environmental influences. A school characterized by a gender-neutral atmosphere appears to help minimize premarital sexual behavior among girls.

Finally, although the data do not permit conclusive statements about the association between pregnancy and school dropout, they suggest that even if certain school characteristics place girls at heightened risk of engaging in premarital sex, pregnancy is not the primary reason that girls in this Kenyan sample leave school early.

## Appendix

The initial fieldwork for this study took place in May and June of 1996. Two developments during this period threatened to reduce the size of the adolescent sample below acceptable levels. The first was the loss of households that had been categorized erroneously as having an adolescent in residence during the initial listing. The field team determined that no one between the ages of 12 and 19 resided in these households.<sup>20</sup> The second was poor response in certain clusters. Whereas the aggregate completion rate was between 76 and 78 percent for all three districts (as shown in Appendix Table A1), in three clusters out of seven in both Nyeri and Nakuru, the completion rate was below 70 percent! As a result, in August another attempt was made to interview selected adolescents who had not been at home during earlier vis-

**Table A1** Household interviews, by survey characteristics, according to district, Kenya, 1996

Characteristic	Kilifi	Nakuru	Nyeri
Number of adolescents originally listed	329	329	295
Number of adolescents out of age range	13	12	28
Duplicate of adolescent interview	1	3	2
Number of adolescents after subtracting those out of age range and duplicates	315	314	265
Number of adolescents initially interviewed	247	240	206
Completion rate (percent)	78	76	78
Number of adolescents added to sample in August 1996	0	53	28
Total sample	247	293	234

its (either because they attended boarding school, were working, or were absent temporarily). The sample was expanded by visits to the perimeter of each cluster with a low preliminary response rate in Nakuru and Nyeri and by sampling one household deep along the perimeter. In this way, 53 households and adolescents were added in Nakuru and 28 in Nyeri to yield a final sample of 774—247 in Kilifi, 293 in Nakuru, and 234 in Nyeri.

## Notes

- 1 According to two population-based epidemiological studies in Tanzania and Uganda, HIV prevalence rates among females aged 15–24 were 13–17 percent, compared with 5 percent among boys in the same age group. The differential between males and females is considered to result from adolescent girls' sexual partners usually being considerably older than they are, whereas boys and their sexual partners are closer in age (Borongo et al. 1992; Nunn et al. 1994; see also Konde-Lule et al. 1997). The UNAIDS database indicates a similar pattern for Kenya. The low estimate for HIV prevalence among girls aged 15–24 is 11 percent and among boys is 4 percent. The high estimate is 15 percent among girls and 9 percent among boys (see [www.unaids.org](http://www.unaids.org)).
- 2 In an analysis of ten-year-old DHS data from Botswana, Meekers and Ahmed (1999) note that, although the risk of dropping out of school as a result of pregnancy is low for girls in primary school, it is much more common among those in secondary school. In choosing to focus on the "irresponsible sexual behavior of today's adolescents," Meekers and Ahmed ignore other causes of school dropout, which their own analysis indirectly shows are increasingly important. Indeed, because pregnancy-related dropout declined in Botswana among those aged 15–34 in 1988 compared with those aged 35–49, clearly dropout due to pregnancy is quantitatively less important today.
- 3 This estimate is based on a 1987 survey of primary and secondary schools in Kenya intended to gather data on dropouts resulting from pregnancy. Because the report based on that survey provided no data on total dropouts or dropouts due to other causes, calculating what proportion of dropouts can be attributed to pregnancy is not possible (Ferguson 1988).

- 4 Computations were performed by the authors of this study. The survey, which was undertaken in 1992 under the auspices of the African Medical and Research Foundation, was conducted with technical assistance from the Population Council. For more information, see Youri (1994).
- 5 Kenyatta was from Kiambu District, south of Nyeri, in Central Province, and most of his cabinet ministers were from Kiambu. Although the Kikuyu in Nyeri likely had advantages relative to other ethnic groups, they "did not enjoy the patronage available to those having close access to Kenyatta" (Tartter 1984: 206).
- 6 Prior to conducting the adolescent survey, schools were selected based on a preliminary household listing in which adolescents and the schools they attended were identified by a resident adult.
- 7 The presence of outsiders during the interview was assessed several times during the interview; the analysis here is based on the question about "others present" that was asked of interviewers shortly before they administered the section on sexual behavior.
- 8 Alternatively, household members or interviewers displace respondents out of the group eligible for the interview, although such is not likely to be the case here, because the selection of candidates for the interview took place several months before the interview was conducted. Those who responded to the listing were never told that a survey that targeted 12–19-year-olds would be conducted eventually.
- 9 The supervisors' notes clarified this point.
- 10 Adolescents who attended the three single-sex schools were excluded from the sample because the authors wanted to include variables that compared boys' and girls' experiences at the same schools.
- 11 Although "age at nocturnal emission" is included, this event is less salient for boys than is first menses for girls and may have been more likely to be misreported. (The questions to elicit this information were: "Have you ever had a wet dream?" If yes, "At what age did you get your first wet dream?") An alternative variable, age at male circumcision, might have been a better choice had circumcision been universal and had it always occurred during puberty, because for some groups, circumcision has considerable cultural significance, and boys are pressured to have sex soon after it takes place. However, of the 254 boys in the sample who had been circumcised (including those who did not attend the schools visited), 35 percent had undergone the procedure before age 12.
- 12 Each household's score is calculated by giving a value of one for possession of each of the following items: a metal or tile roof; five minutes' distance or less from a water source; an improved pit or flush toilet; a radio; a television; at least one sleeping room for every two people in the household; a bicycle; ownership of land; ownership of livestock; and ownership of a market stall or shop.
- 13 All clubs and activities in mixed schools are assumed to be open to students of both sexes.
- 14 Figure 1 shows clearly that there is no increase in the risk of having premarital sex after age 17 for girls and 18 for boys.
- 15 By means of the "fit" and "vif" commands in the Stata program (StataCorp 1997), the problem was determined to center on the dummy variables for district of residence.
- 16 Pregnancy rates among girls in the sample are similar, however, to those reported among the comparable subsample of the 1998 Kenya DHS (21 percent among the 195 girls aged 15–19 in our sample, compared with 19 percent among the 126 girls in the DHS resident in the same three districts). As indicated earlier in the comparison of the sexual activity data, however, the DHS subsample on its own (separated from the DHS as a whole) may not be representative. Moreover, problems with underreporting may have occurred in the DHS. Thus, despite the similarity to the DHS data, the authors of the present study are not entirely confident that they received a full accounting of pregnancy from the girls surveyed.
- 17 If, however, the pregnancy is terminated and the abortion leads to complications and hospitalization, it may not be reported, although the girl may have dropped out of school as a result.
- 18 This analysis is based on weighted data.
- 19 We conducted a similar analysis of the 1998 Kenya DHS data. Among the 344 adolescents aged 15–19 nationwide who had ever been pregnant and left school, 13 percent indicated that they had left because of marriage, 26 percent because of pregnancy, 42 percent because they could not afford school fees, and 8 percent left because they did not like school. Therefore, although pregnancy is cited more often in the DHS than in the data presented here, it is not the most common reason girls give for leaving school. (Because the number of pregnant 15–19-year-olds in the three districts was small as reported in the DHS data, this analysis was performed for the entire sample, not just those resident in Kilifi, Nakuru, and Nyeri.)
- 20 Moreover, although only one adolescent was designated to be interviewed per household, for six households, interviews were conducted with two adolescents.
- 21 The initial completion rate was computed as follows: First the "out of the age range" and duplicate adolescents were subtracted from those originally listed in order to determine the denominator. Then the number interviewed was divided by the denominator.

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## Acknowledgments

The authors gratefully acknowledge the statistical advice provided by John Casterline and Mark Montgomery and the helpful comments of Carol Kaufman and Parfait Eloundou-Enyegue. Funding for this study was provided by a research grant from the National Institutes of Child Health and Human Development and by cooperative agreement with the United States Agency for International Development (USAID). Donors who supported the field research include the Ford Foundation, USAID, the Wallace Global Fund, the Compton Foundation, and the United Nations Population Fund, Nairobi. An earlier version of this paper was presented at the 1999 annual meeting of the Population Association of America, New York, 25–27 March.