***Title*: Sex Education and the Timing of Sexual Initiation among Jamaican Young Women**

Abstract: *Purpose: The sexual and reproductive health of youth has been identified as one of the most important health and development problems facing developing countries. Consequently, this study aimed to investigate factors surrounding sexual debut among 15-24 year old females in Jamaica. The aim was twofold-- first to investigate whether receiving information about sex, prior to first sex, has an effect on sexual delay among females 15-24 in Jamaica. Second, we examine whether there is a difference in effect by source of information about sex. Methods: The study uses data from the 2002 Reproductive Health Survey in Jamaica. Multivariate Cox proportional hazards models were used to assess factors that predict the timing of sexual debut. Results: Receiving information from parents was not significantly associated with the timing of sexual debut, but receiving information from school about sex was significantly associated with a delay in sex (HR=0.55, p=0.001). Non-regular religious service attendance and non-religious service attendance was associated with sex at earlier ages, while females in middle and high wealth categories were significantly less likely to have early sex. Conclusions: School-based sex education for girls is an important tool in the delay of sex.*

Introduction

One in every five persons in the world is considered a 'youth' aged 15- 24 and almost 85% live in developing countries (UN, 2010). Youth, particularly those in developing countries, face increased exposure to risks associated with early sexual initiation and unprotected sex such as contraction of human immunodeficiency virus (HIV) and sexually transmitted infections (STIs), and unwanted or unplanned pregnancies. Most recently, special attention has been given to young females because they currently bear the highest prevalence for HIV (UNFPA, 2005). Further, young females endure most of the immediate and long-term impacts of an unintended pregnancy such as increased maternal and child mortality, school dropout and lower chances of being gainfully employed (Albert et al., 2003; Zabin et al., 1998 and Buvinic, 1998). Poor knowledge about sex and

contraception, high risk of sexual violence (Jejeebhoy et al., 2005) and limited independence as it relates to deciding on the timing of births or the use of contraception (UNFPA, 2005) are just a few of the reasons why young women in developing countries are especially vulnerable to these risks and especially in need of protection. As a result, the United Nation's 'World program of Action for Youth to the Year 2000 and beyond' has identified the situation of women and girls as one of the top ten issues of highest priority for governments worldwide. Additionally, research efforts have focused on the identification of factors associated with early sexual initiation and finding strategies that work to change sexual behavior in an effort to improve sexual health outcomes for young females.

Early sexual initiation and high-risk sex continues to be a trend among Jamaican youth. Age of sexual initiation has been reported as 13 for boys and 16 for girls (Friedman et al., 1999; McFarlane et al., 2005). However, other studies have placed mean age at first sex among Jamaican youth as 14 for boys and 15 for girls (Norman & Uche, 2002; Baumgartner et al., 2009). The outcomes of early sexual initiation are the same in Jamaica as they are in the rest of the developing world. Jamaica ranks third among Caribbean islands for adult (aged 15-49) HIV prevalence, 1.6%, (USAID, 2008). Women account for approximately half of all HIV infections in Jamaica and the HIV prevalence is elevated among adolescent and young women (USAID, 2008; MOH 2007). Despite somewhat high HIV prevalence rates, contraceptive prevalence remains fairly low, 67% (2002 estimate), among females aged 15-24 (McFarlane et al., 2005).

Adolescent pregnancy in Jamaica, 79 live births per 1000 women aged 15-19, remains one of the highest in the Caribbean at 20% (PAHO, 2007), and more than 80% of these pregnancies are unplanned (Wyatt et al., 1999). Because so many of the pregnancies are unplanned, young women often turn to abortions as a way to terminate the pregnancy. A report by the UNFPA (2002) indicated that despite the fact that abortion was illegal in Jamaica, youth, 15-19 years old, were the ones most frequently accessing abortions and the abortion incidence ratio in this age group was 21

per 100 pregnancies. Infections and complications from these illegal and often unsafe abortions have been cited as a possible cause of maternal morbidity and mortality (Kapilashrami et al., 2004).

Numerous studies have been done investigating the sexual health, knowledge, attitudes, behaviors and outcomes of youth in Jamaica. However, the majority of these studies have focused on determining factors that predict sexual debut, while only a few have examined factors that work to delay sexual debut. In a study by Ohene and colleagues (2004), factors such as attendance at religious services, liking school and family connectedness were found to be positively associated with a delay in early sex among Caribbean youth. Findings from primarily US based research have indicated that parent communication, and sexual education (Aspy et al., 2007; Aggleton & Warwick, 2002) were also positively associated with delayed sex. Since Jamaican youth cited parents and teachers as two of their primary sources of information on sex (Kempadoo & Dunn, 2001), it would behoove us to investigate whether these factors could have similar effects on sexual debut among Jamaican youth.

Parent communication about sex is thought to delay sexual initiation and reduce sexual risk by way of influencing adolescent decision-making (White, 1996) and by increasing the likelihood that the adolescent will have a discussion with their partner about sexual risk (Whitaker et al., 1999). Though a specific study examining the impact of parental information about sex on sexual debut of Jamaican youth was not found in a study on factors contributing to HIV risk among Jamaican adolescents, Hutchinson and colleagues (2007) concluded that parental influences in Jamaica were being mediated through behavioral and normative beliefs. The authors found low levels of parent-adolescent sexual risk communication, and varying levels of parental monitoring due to the high rates of single parent households. Given the literature on parent-communication about sex, it would appear that Jamaican parents would either have a decreased or negative influence on a youth's sexual debut. Results from one published longitudinal study evaluating a sexuality education program for young adolescents (11-14) in Jamaica (Eggleston et al., 2000)

indicated that sexuality education had positive short-term influence on the adolescent's knowledge of and attitudes about sexuality and pregnancy. However, school-based sexuality education had no effect on sexual initiation for young adolescents in this study.

This study attempts to fill some of the gaps outlined above by examining the pathways through which sex information (from parents and school) influence the Jamaican female's sexual debut. It uses data from the Reproductive Health Survey (McFarlane, 2005) to assess factors that predict sexual initiation among females aged 15-24 living in both urban and rural areas in Jamaica.

Study Setting and Sample

The RHS is a joint collaboration between the Jamaica National Family Planning Board and the Statistical Institute of Jamaica (STATIN). The RHS used a three-stage stratified sample design. The first stage was the selection of 659 enumeration areas, using the 2001 census sectors as the sampling frame. This selection was done with probability proportional to the number of households and was accomplished using a systematic sample with a random start. The first stage selection resulted in 521 primary sampling units (PSU) which were then used for the independent female samples. In the second stage of the sample design, clusters of households were randomly selected in each PSU. Lastly, in the third stage, in each of the households in the female sample, one female aged 15-49 years was selected at random (using a random selection table) for interviewing.

Of the 17,878 households selected in the survey of women, there were 7,805 eligible female respondents (aged 15–49 years) identified, of whom 7,168 (91.8%) were successfully interviewed. The total sample for 15-24 females in the 2002 Reproductive Health survey is 1,915. Examinations of the data revealed that there were inconsistencies in the reports of partner age at first sex. After excluding instances where partner's age at first sex was reported as less than five, the sample size was reduced to 1914.

For this analysis, the amount of missing data ranged from 2-11% for most predictors, while total missingness was substantial at 10-20%. Approximately eight (8%) percent of the females who

reported having sex provided no information about age at first sex; while twelve (12%) percent of partner's age at first sex was missing from the dataset. Attempts were made to determine whether age at first sex was missing at random (MAR) or missing not at random (MNAR). Small to moderate correlations were found between missingness on 'age at first sex' and the other variables in the dataset, which is consistent with the MAR assumption. Excluding observations with missing predictor or outcome information reduced the final sample to 1771.

Definition of primary outcome variable

The primary outcome variable is 'time to first sex', defined as the period between receipt of information about sex from parents/guardians or school and first sex. Respondents were asked, "In what month and year they first had sexual intercourse".

Key Independent Variables

In this analysis, the key independent variables are related to receipt of information about sex from parents/guardians or school. Receipt of information from a parent or guardian before sex was defined as a 'yes' response to the question "Before you had sex, did you ever receive any information from your parents or guardians about pregnancy and how it occurs?" This phrase "before you had sex" was omitted from the question for respondents who reported never having sex at the time of the survey. As a result, information on sex (from parents or guardians) consists of both respondents who had sex and respondents who had not had sex at the time of the survey. Receipt of sex education in school before sex was defined in this study using two variables; respondents were asked to report if they had "ever had a class or course about family life or sex education in school" and "the age at which they received this information". Respondents who reported receiving sex education before their reported age at first sex were categorized as having received information (from school) before sex and vice versa. Among respondents who had never had sex, those who reported receiving sex education were included with the information receiving group while those who reported not receiving sex education were included with the non-information receiving group.

Other Independent Variables

Respondents living in the Kingston metropolitan area were defined as living in an urban area, while respondents living in all other areas in the country were defined as living in a rural area. Wealth was measured through several variables: how many persons live in the household, number of rooms in the house, and number of household assets, which consists of an additive score of the number of eight selected items in the household: telephone (landline and cellular), radio, television, vcr, refrigerator, computer and a working motor vehicle. Respondents were grouped into three wealth categories based on these variables: low, middle and high.

Frequency of church attendance was measured as regular (attended church at least once a week or month), non-regular (attended church less than once a month or only for special occasions) and does not attend (does not attend church at all). Norms about early sex was a three-item scale that assessed the female's attitude towards early sex and teenage pregnancy (e.g., "If a woman doesn't have sex, she'll get sick"; "A girl must have a baby by the time she is 18" and "A boy must have sex to show he is a man"). Response options ranged from 0 (no) to 1(yes). A variable based on the sum of scores on these three items was developed to determine female's attitudes towards early sex. A high score reflects a liberal attitude towards early sex and negative sexual outcomes.

Data Analysis

First, we estimated the proportion of 'information (parent or school) receivers' and 'non-information (parent or school) receivers' who experienced first sex at different ages, using Kaplan Meier survival estimates. Unadjusted differences in the probability of experiencing first sex between 'information receivers' and 'non-information receivers' was tested using a log rank test. Second, we described characteristics of the study population, considering age at first sex, by sociodemographics and sexual beliefs. Third, we used Cox proportional hazards models to predict factors associated with first sex. Cox proportional regression was chosen because first sex is a

discrete, non-repeatable event. Respondents who report never having sex at the time of the 2002 were censored at their current age, while those who report having sex were considered to have experienced the event.

A block modeling strategy was employed to build the Cox proportional hazards models. In this strategy, each group of variables was entered into the model separately, resulting in three different multivariate models. In the first model, we examined whether the source of sex information (parent or school sex education) alone was significantly associated with time to first sex. In the second model, sociodemographic variables were added to see if the association remained after adjusting for possible confounders. Finally, in the third model, the sexual belief index was added to determine whether the association was explained by prevailing beliefs. If after adding the sexual belief index to the model, the 'source of sex information' variable changes, it will indicate that sexual beliefs work to mediate the relationship between source of sex information and time to first sex. All analyses were conducted using STATA release 11 (Stata Corporation, 2009).

Results

Characteristics of the study population

There were 1771 female respondents aged 15-24 in the analytic sample. These respondents originated predominantly (84%) from the rural parishes in the island. At the time of the survey, approximately 59% reported having 13+ years of education and 36% reported having 10-12 years of education. Additionally, approximately 40% reported being in a visiting union, 23% were either legally married or in a common law union and 37% had never been in a union. Forty-six percent (46%) of female respondents fell in the middle wealth category. Of the remaining 54%, 30% of the respondents fell in the high wealth category and 24% fell in the low wealth category. More than 50% of females reported attending church regularly, while only 9% reported not attending church at all.

Approximately 71% of the respondents reported ever having sex. The median age at first sex for females was 16 years old. Approximately 65% reported that they had received some information from a parent about pregnancy and how it occurs, prior to having had sex. Of those reporting that they had a conversation with a parent/guardian about pregnancy before sex, 59% reported that it was easy to discuss the subject with a parent/guardian. Parents were considered the preferred source, 46%, for information about family life/sex education topics out of nine possible options (including siblings, peers etc).

Approximately 83% of females reported that they had received sex education in school prior to having had sex. Most respondents reported that the family life/sex education class/course included information on topics such as the human reproductive system, women's menstrual cycle, 'pregnancy and how it occurs', condoms, and abstinence. The majority of females in the sample held conservative attitudes towards early sex (85% scored 0 on the belief index). The median age of the partner at first sex was 20 years. Approximately, 82% of those respondents reported that they were in a steady partnership meaning their partner was a boyfriend or husband/common law partner (see Table 1). Females excluded from the analytic sample (144) bore very similar characteristics to the females in the sample.

Table 1: Demographic Characteristics of Females in and out of the Analytic Sample

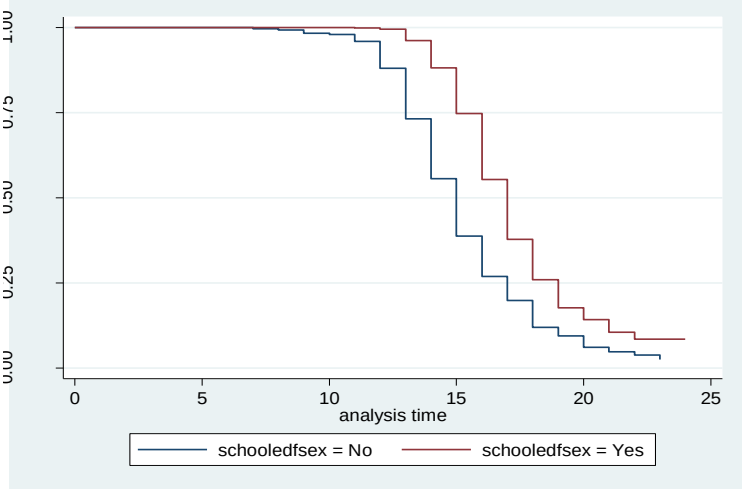
Variables	**N=1771**	**(sample)**	**N=144**	**(missing)**
Information from Parents/Guardians	n	Percentage	n	Percentage
***Parental Conversation* (key)**				
No	628	35%	44	35%
Yes	1143	65%	81	65%
Level of difficulty having conversation with parents				
Easy	666	59%	45	55%
Somewhat Difficult	358	32%	28	35%
Extremely Difficult	107	9%	8	10%
Preferred Source of Sex Information				
Parents	806	46%	50	38%
Teachers	217	12%	17	13%
Peers/Friends	216	12%	16	12%
Information from School				
School Sex Education (key)				
No	294	17%	24	19%

Yes	1477	83%	100	81%
Median age at which school sex education received		13		13
Sex Education Class covered the following topics:				
Human and reproductive system	1434	94%	93	95%
Woman's menstrual cycle or period	1507	96%	96	97%
Pregnancy and how it occurs	1165	77%	74	74%
Condoms	1325	86%	84	84%
Abstinence	1189	78%	69	73%
Demographics				
Education				
0-9 yrs	86	5%	17	12%
10-12 yrs	631	36%	48	35%
13+ years	1043	59%	73	53%
Union Status				
Never Union	571	37%	22	18%
Husband/Common Law	363	23%	40	34%
Visiting	629	40%	57	48%
Residential Area				
Kingston metro area	292	16%	28	19%
Rural	1479	84%	116	81%
SES Index				
Low	428	24%	38	26%
Middle	822	46%	69	48%
High	521	30%	37	26%
Freq. Church Attendance				
Regular	949	54%	58	46%
Non-regular	653	37%	58	46%
Doesn't attend	169	9%	11	9%
Sexual Belief Index (scored 0-3)				
Sexual Belief Score (0)	1423	85%	94	80%
Sexual Belief Score (1)	191	11%	17	14%
Sexual Belief Score (2-3)	57	4%	7	6%
First Sex Factors				
Ever Sex				
No	516	29%	14	10%
Yes	1255	71%	130	90%
Median Age at First Sex		16		16
Median Partner Age at First Sex		20		19
Partner Relation at first sex				
Steady partner (Husband/boyfriend)	1033	82%	90	75%
Non-steady partner (casual etc)	220	18%	30	25%

Preliminary Analyses

Kaplan Meier survival estimates were used to determine the proportion of 'parental information receivers' and 'non-parental information receivers' who experienced first sex at different ages. The curves revealed similar probabilities for sexual initiation among 'parental information' receivers and 'non-parental information' receivers. Log rank tests for equality revealed non-significant differences for sexual initiation between the two groups (p=0.10). In contrast, the probability of female 'school sex education' receivers surviving to age 24 without initiating sex was significantly higher than for females who did not receive information about sex from school(see Figure 1). Log rank tests for equality revealed significant differences for sexual initiation between the two groups (p=0.0001).

Figure 1: Kaplan Meier Survival Estimates by School Sex Education



Bivariate Analyses: Age at First Sex

Females who received information about sex from parents/guardians were slightly less likely, but not significantly, to have first sex at an earlier age than females who received no information about sex from parents/guardians within the time interval (HR=0.90, p=0.07). Females who received information about sex from school were significantly less likely to have first sex within the time interval (15-24) than females who did not receive this information (HR=0.48, p=0.0001). Rural residence was not significantly related to the age at first sex. As compared to

females in the lowest wealth category, females in the middle and highest wealth categories experienced significantly delayed first sex (HR=0.76, p=0.0001 and HR=0.53, p=0.0001 respectively). Females who reported attending church only occasionally were significantly more likely to have sex at an earlier age than females who attended church regularly (HR=1.80, p=0.0001). Females who reported not attending church at all, experienced an even faster progression to early sex than females who reported regular attendance (HR=2.13, p=0.0001). Finally, holding liberal attitudes towards early sex and negative sexual outcomes were positively associated with earlier sex (HR=1.47, p=0.0001).

Table 2: Factors associated with Age at First Sex among Females 15-24 (n=1771)

Covariates	Haz. ratio	95% Confidence Interval	P value
Key Variables			
Parental Conversation			
Had Conversation	0.90	0.80-1.01	0.069
School Sex Education			
Had Sex Education in School	0.48***	0.42-0.55	0.0001
Demographics			
Residential Area			
Kingston metro area (reference)	1.0	--	
Rural	1.09	0.94-1.27	0.252
SES Index			
Low (reference)	1.0	--	
Middle	0.76***	0.66-0.86	0.0001
High	0.53***	0.45-0.61	0.0001
Freq. Church Attendance			
Regular (reference)	1.0	--	
Non-regular	1.80***	1.60-2.03	0.0001
Doesn't attend	2.13***	1.77-2.57	0.0001
Sexual Belief Index	1.47***	1.34-1.62	0.0001

Multivariate analysis of factors that predict time to first sex

While we initially tried a block modeling approach, there was limited attenuation across models. Therefore, we focus on the full model for parents as a source of information about sex (Table 3). After multivariate adjustment, there was no significant association between receiving sex information from parents and the time of first sex. Furthermore, the addition of covariates further weakens the association (HR=0.98, p=0.74). Middle and higher categories of wealth were associated

with later age at first sex (HR=0.82, p=0.001 and HR=0.61, p=0.001 respectively). While not attending church regularly was associated with an increased likelihood of early sexual debut (HR=1.73, p=0.001), non- church attendance was significantly associated with an increased likelihood of early sexual debut (HR=1.91, p=0.001). A higher score on the sexual belief index was significantly associated with earlier sex initiation (HR=1.32, p=0.001).

Receipt of sex information from school prior to sex was significantly associated with delayed sex after multivariate adjustment (HR=0.55, p=0.0001) with females who received information about sex being significantly less likely to have early sex (see Table 3). The school education variable wasattenuated with the addition of the variables representing church attendance and socioeconomic index, but remained the same with further additions to the model; therefore, we only present the full model. As compared with the bivariate models, the associations with wealth, church attendance, and sexual beliefs were attenuated in the school model.

When information about sex from parents and school were placed into a model, we observed that receipt of information about sex from parents/guardians was further attenuated and remained non-significant (HR=1.05, p=0.41). All other variables in the model retained the same magnitude and significance level as observed in the school model.

Table 3: Multivariate hazard models predicting risk of sexual initiation by source of information about sex, sociodemographics and sexual beliefs.

	Parent Model			*School Model*			*Combined Model*		
	Haz. ratio	95% C.I.	p-value	Haz. ratio	95% C.I.	p-value	Haz. ratio	95% C.I.	p-value
Parent Conversation	**0.98**	0.87-1.10	0.74				**1.05**	0.93-1.18	0.41
Sex Education in School				**0.55**	0.47-0.62	0.001	**0.54**	0.47-0.62	0.001
Sociodemographics									
Rural residence	1.08	0.93-1.26	0.30	1.05	0.90-1.22	0.56	1.05	0.90-1.22	0.55
Low SES (reference)	1.0			1.0			1.0		
Middle SES	0.82	0.72-0.94	0.01	0.87	0.76-1.0	0.05	0.87	0.76-0.99	0.04
High SES	0.61	0.52-0.71	0.001	0.64	0.55-0.75	0.001	0.64	0.55-0.75	0.001
Regular church attendance	1.0			1.0			1.0		

(reference)									
Non-regular church attendance	1.73	1.53-1.95	0.001	1.68	1.49-1.89	0.001	1.68	1.49-1.89	0.001
Doesn't attend at all	1.91	1.57-2.31	0.001	1.79	1.48-2.17	0.001	1.80	1.49-2.18	0.001
Sexual Belief Index	1.32	1.19-1.46	0.001	1.30	1.18-1.44	0.001	1.31	1.18-1.44	0.0001
Sample size (n)	1771			1771			1771		
-Log Likelihood	-8445.30			-8412.75			-8412.41		
Chi square from Log likelihood ratio test	199.19***			171.45***			172.11***		

Discussion

We investigated factors associated with sexual delay among 15-24 year old females in Jamaica. Special attention was paid to the role 'receiving sexual information before sex' played in sexual initiation and whether the source of that information made a difference in effect. Overall, we found that receiving information about sex, prior to sex had a negative effect on early sexual debut. Females were significantly more likely to delay sex, if they had received information about pregnancy and sexual intercourse. This finding has implications for prevention of adolescent pregnancy as it provides evidence that sexual education programs (such as sex education in schools) are an important tool in the prevention of early sex.

An interesting finding was that the source of information about sex appeared to matter for females aged 15-24. Females who received information about sex from schools were significantly more likely to delay sex than those who received information about sex from parents/guardians. This difference in magnitude and significance of effect may be explained by findings from Smith and Mosby on Jamaican childrearing practices and findings on the details of parent discussions about sex. Smith and Mosby (2003) in a study of Jamaican childrearing practices concluded that the dominant parenting style was authoritarian and that this form of parenting was not conducive to open parent-child communication. This finding is counter to the findings of White (1996), which state that adolescents who perceived their communication as open and problem-free were more likely to nominate their parents as the source of influence for decision making. Though the majority

of females in this study reported having problem free discussions about sex with parents/guardians, it does not mean that these discussions were open.

Only a few studies report on parental influence among Jamaican females. Findings from these studies suggest that sex information from parents may have a lesser effect on sexual initiation because the messages are not contextually relevant and are not as substantive as that received from school. As an example, Wyatt and colleagues (1999) and Kempadoo & Dunn (2001) noted that women tended to recall being told to delay intercourse until marriage, despite the fact that only about 22% of Jamaican women of reproductive age are legally married, (McFarlane et al., 2005). Further, the sexual information being provided from parents did not often include the facts they needed in order to understand their bodies, the consequences of sexual activity and the importance of healthy decisions.

Similar to reports from previous studies (Ekundayo et al., 2007), our study found associations between having liberal attitudes towards early sex and negative sexual outcomes, such as pregnancy and early sexual debut. Driving this association may be the finding that female adolescents were not as disapproving of boys having sex during adolescence (Eggleston, 1999) and may have a weakened fear of the negative consequence of pregnancy because of the cultural context (Wyatt et al., 1999). Despite the fact that females, in general, viewed adolescent pregnancy as unwelcome and burdensome (Eggleston, 1999), their reality during pregnancy is one of familial support and more 'adult' treatment (Wyatt et al., 1999). In this setting, the female is left with little motivation to choose behaviors that would prevent the risks of pregnancy, such as delayed sex.

Our finding that religious attendance was negatively associated with early sexual debut was in keeping with findings from a study done specifically with Caribbean youth by Ohene and colleagues as well as other country studies (Kiragu & Zabin, 1993; Fitzjohn et al., 2000; Murray et al., 1998). We found that non-regular attendance and 'no attendance' were significantly associated with greater likelihood to initiate sex early. Females who reported not attending church at all

experienced much faster progression towards early sexual debut than females who attended church occasionally. It would appear that among females who regularly attend services, messages such as abstinence until marriage carries more weight in sexual decision-making.

Females in the middle and high wealth categories were significantly more likely to experience a delay in sex. This may be due in part to lesser exposure to factors that are associated with sexual debut and commonly associated with poverty. Factors such as household instability, household composition (often single parent households) (Wyatt et al., 1999) and lack of resources (monetary and other) (Chevannes & Gayle, 2000; Wyatt et al., 1999; Kempadoo & Dunn, 2001). Additionally, females in the middle and higher wealth categories will most likely have parents with higher educational levels and these parents may place a higher value on educational attainment. Thus, females in these wealth categories may have greater motivation to choose behaviors that will prevent risk of pregnancy and further their educational aspirations.

Finally, contrary to what was expected, females living in rural areas were no more likely to initiate sex early than females living in the urban area. This may be due to issues related to peculiarities of rural and urban areas. Technically, parishes considered rural, will have a peri-urban area. These areas have resources similar to that of the country capital but on a smaller scale. Additionally, exposure to sexually explicit images on media, sex information etc will be similar between the two areas.

Limitations and Implications

The first limitation to this study is the fact that cross-sectional data was used to assess factors associated with sexual debut. Ideally, longitudinal data would be used to determine factors along the pathway between receiving sex information and initiating sex. Additionally, causal inferences cannot be drawn from cross-sectional data. The second limitation is the structure and number of questions used on the survey. These questions limit and reduce the strength of the associations that can be drawn between source of sexual information and sexual behavior. A third

limitation is the fact that we are unable to gauge how much time passed between discussion of sex with parents/guardians and sexual initiation. Further, we have no way of telling whether the information from parents/guardians about sex was substantive. Fourth, previous studies have pointed to the influence of peers (Kempadoo & Dunn, 2001) and media (Holder-Nevins and Bain, 2001) however, the current dataset does not allow for adequate exploration of that issue.

Lastly, the study could be vulnerable to two main types of bias. Recall bias could be at work, since the outcomes (sexual initiation) are dependent on females recalling when they first engaged in sexual behavior and specifics around the time of that engagement. However, given that the females are aged 15-24, the range of possible years for first sex is narrowed somewhat, which could work to reduce this bias. Social desirability bias could also be at work, because of the sensitive nature of the questions.

Despite these limitations, this study does offer a unique opportunity to examine the role information about sex plays in sexual debut. The study uses nationally representative data to assess youth behaviors, which means that the study findings can be generalized to all female Jamaican youth. This will be particularly useful to policy makers and health educators trying to address female sexual and reproductive needs. The findings indicate not only that school-based sex education helps delay female sexual debut but that receiving information about sex from school has more of an effect on sexual debut than receiving information from parents/guardians. Since informed youth display protective behaviors, it is essential that Jamaica increase its numbers of informed youth. Instituting school sex-based education at earlier ages may help do just that.

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