The Impact of Regional AIDS Prevalence on Sexual Practices in Jamaica

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Abstract

This paper investigates whether the choice of sexual practices is influenced by the prevalence of AIDS within the Jamaican population using a nationally representative sample of 1,498 individuals, 15 to 49 years of age. It was found that regional variations in AIDS prevalence affect condom use consistency among unmarried individuals. Individuals were more likely to use condoms always during intercourse if they resided in high-prevalence areas. AIDS prevalence also has a statistically significant effect on the number of sexual partners. The statistically significant relationship between choice of sexual practices and AIDS prevalence remains after controlling for the level of current and past prevention activity.

Introduction

One of the main public health concerns in developing countries is the spread of HIV within the human population, especially among the young, economically active population. Many developing countries, including Caribbean countries, face a growing AIDS epidemic that is likely to reduce the potential for long-term economic growth as the labour force is impacted by morbidity and mortality and additional resources are diverted to the treatment of infected individuals (Barnett and Whiteside 2001; Dixon, McDonald and Robert 2001; Bonnel 2000; Nicholls et al. 2000; Cuddington and Hancock 1994; Cuddington, Hancock and Rogers 1994).

The threat posed by AIDS to economic activity and individual well-being makes it imperative that policy makers understand the factors that influence individual choice regarding sexual practices. Each country faces the question of how to create a message about HIV and AIDS that its population finds relevant to its decision-making process. An understanding of the factors that influence choice of sexual practices is a precursor to devising programs that can stimulate modifications in behaviour.

This paper seeks to determine whether one of the factors that influence the choice of sexual practices in the Jamaican population is the regional prevalence of AIDS. As the AIDS epidemic

grows or matures within a country, regional differences in AIDS prevalence are likely to emerge. As regional differences in AIDS prevalence emerge, individuals who continue to engage in unsafe sexual practices (e.g., intercourse with multiple partners and inconsistent condom use) face differences in the risk of contracting the HIV virus (Ahituv et al. 1996).

Two specific questions are posed in this paper. (1) Do individuals incorporate regional differences in the risk of contracting the HIV virus into their decision-making process regarding sexual practices? (2) If yes, to what extent does the regional prevalence of AIDS influence the choice of sexual practices?

This investigation is important for several reasons. First, while it is theoretically possible that individuals are choosing their sexual practices after incorporating the level of risk of contracting the HIV virus, the extent to which that occurs, or whether it occurs at all, remains an empirical question. Second, if the choice of sexual practices shows sensitivity to regional HIV risk, then the HIV prevention message should include information on the risk of contracting HIV in different regions. Third, if individuals who are not yet infected respond to the risk of contracting HIV by adopting safer sexual practices, their behavioural response could limit the spread of HIV.[1] From a macroeconomic standpoint, if individuals adopt sexual practices that reduce their risk of contracting HIV, the effects of HIV and AIDS on economic activity will be less than what would be expected if behaviour were completely inelastic with respect to risk (see, for example, Nicholls et al. 2000).

Theoretical Consideration

Standard economic theory of consumer choice offers a sufficient theoretical framework to analyze the choices faced by individuals in the context of the AIDS epidemic.[2] In a disease-free environment, unprotected sex with more than one partner might be the utility maximizing choice. However, in the presence of a growing AIDS epidemic, sexual risk-taking could be costly, with the price dependent upon the prevalence of AIDS within the population.

During any act of partnered sex, an individual's risk of contracting a sexually transmitted disease depends on the infectious status of one's partner, the infectivity of the disease, if the partner is infected, the sexual practices in which the individuals engage and the individuals' role in the sex act (Michael 2004). Since the infectivity of the disease and the individuals' role in the sex act are largely predetermined in heterosexual intercourse, the level of sexual risk really depends on the probability of having an infectious partner and the choice of sexual activity. Sexual practices could include, for example, whether sex occurs with or without a condom, the number of sexual events an individual engages in and whether the events occur with the same or different partners.

If we ignore, for now positive, assortative mating,[3] the theory and evidence that one's sexual partners tend to be drawn from a population with whom one has similar characteristics, and assume rather that individuals are coupling in a random manner, then in each region the probability of having an infectious partner is simply equal to the proportion of the adult population that is infected. Hence the "price" of engaging in unprotected sexual relations in any act of sexual intercourse is proportional to the regional AIDS prevalence.

According to economic theory of individual choice, the quantity of risk demanded is inversely related the price of risk. The choice of sexual practices (which reflects the demand for risk) should therefore reflect differences in the probability of having an infectious partner; that is to say, should reflect differences in the regional AIDS prevalence. It is therefore hypothesized that regional AIDS

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1 For example, Cuddington, Hancock and Rogers (1994), using data for a representative sub-Saharan country, show that a rise in condom use from 0 to 10% reduces steady-state AIDS prevalence by nearly one-half.

2 The health belief model (Becker 1974; Fisher and Fisher 2000) is an alternative theoretical approach to individual health choices.

3 Random coupling is not meant to be taken literally, but rather as a theoretical simplification. To the extent that positive assortative mating occurs, not everyone in the same region faces the same risk of contracting HIV. Hence one is not likely to observe a perfect correlation between AIDS prevalence and sexual practices. It is also necessary to control for the characteristics on which individuals are likely to sort.

prevalence will be inversely related to the number of sexual partners and positively related to the consistency of condom use.[4]

Methods

There are several ways of applying this basic economic model of behaviour to choices regarding sexual risk-taking. One is to assess whether condom use is sensitive to AIDS prevalence. Condoms are generally recognized as a reliable way of reducing the risk of becoming infected with the HIV virus (Ghys et al. 2002). But one can substitute away from risk by adopting other behaviours; for example, by reducing the number of sexual partners and eliminating sexual contact with casual partners. It has been shown elsewhere that the risk of an HIV infection is positively associated with having multiple sex partners (Wiggers et al. 2003; Meerkers et al. 2003; Hargreaves et al. 2002; Messersmith et al. 2000). It is reasonable to expect that individuals have more information about the sexual behaviour of a regular partner than about the behaviour of multiple regular or multiple casual partners.

In this paper an assessment of how closely behaviour conforms to the theory outlined above is carried out by investigating whether the frequency of condom use and the number of short-term partners are related to geographical variations in AIDS prevalence using cross-sectional data from a household survey of the Jamaica population.

We estimate an equation of the form:

$$SB = f(BG,SC,BH,RY)$$

This equation is estimated for two dependent variables of sexual choice (see Table 1.) The first dependent variable, "ALWAYS," is equal to 1 if the respondent says condoms are always used during sexual intercourse, and zero otherwise. The second dependent variable, "PARTNERS," is the number of partners with whom the respondent reportedly had sexual relations within the last three months.

The independent variables capture elements of the individual's background, BG (age, sex, skill level and education), social factors, SC (relationship status, residential stability, and whether the respondent knows someone who has been infected with the HIV virus or has died from AIDS), behavioural factors, BH (age at first sexual intercourse and frequency of alcohol consumption) and risk, RY (regional HIV prevalence, and location of residence). These variables are discussed below.

The dependent variable "ALWAYS" is a binary variable. The regressions were estimated assuming a normal density function (probit) using the Limdep statistical software. Individuals who said they were virgins were omitted in all instances. The condom use equation was estimated using all sexually active unmarried individuals and the subsample of sexually active individuals who are less than 30 years old.[5]

The variable "PARTNERS" is an integer variable, which typically means least squares would not be efficient. Therefore maximum likelihood estimates were obtained using the Poisson density function (Greene 2000). The marginal effects and statistical significance produced by the Poisson regression were not significantly different from the least squares estimates. Hence the least squares results are reported. All sexually active individuals for whom complete data were available were used in these regressions.

The main justification for performing the subsample analysis is that in Jamaica about one-half of

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4 One possibility that arises but is not addressed directly in this study is the possibility that an individual who wishes to reduce the risk of contracting HIV substitutes one type of risk for another. For example, an individual might reduce the number of partners and at the same time decrease condom use. One could therefore find an inverse relationship between AIDS prevalence and the number of sexual partners, along with no statistical association between AIDS prevalence and condom use.

5 Condom use is almost universally absent among married or cohabiting couples.

Table 1: Variables and Definitions

Variable	Definition
Dependents	
ALWAYS	1- always use condoms, 0 otherwise
SHORT-TERM PARTNERS	Number of partners in last three months
Background	
Age	Current age
Sex	1- male 0- female
Hied	1-person educated above primary level, 0 otherwise
Social	
Married	1- person married or lives with partner, 0 otherwise
Reg. partner	1- person has a visiting partner, 0 otherwise
Dating	1- person has boyfriend/girlfriend, 0 otherwise
Stability index	Years living in community/Age
Know	1- person knows someone HIV positive or has died from AIDS
Behavioural	
Drinker	Consumes at least 1 alcoholic drink per week
Age first sex	Age at which first had sexual intercourse
Risk	
Prevalence	Parish rank by AIDS prevalence
High prevalence	Prevalence about sample median
KSA	Kingston and St. Andrew Region (major metropolitan area)
Prevention Activity	
Workshop	1-person attended HIV/AIDS education workshop in last year, 0 otherwise
Score	Number of correct answers on 10 true/false questions on how one can prevent an HIV infection

AIDS cases have been discovered among persons who are between the ages of 25 and 39 years. Given the typical length of the gestation period of the HIV virus, individuals seem especially vulnerable during their late teens to age 30. It is of interest to see whether the factors that influence the choice of sexual practices among this younger group of individuals are substantially different from factors that influence choices among older individuals.

Data and Variables

Data
The data for this study were collected in 2000 as part of the Ministry of Health's HIV/AIDS/STD Survey in Jamaica. The target population was adults aged 15 to 49 years. The sample was designed as a stratified multistaged sample. The first stage is the selection of census Enumeration Districts (EDs). Enumeration districts are fully contained within each administrative region (parishes). The EDs are selected with probability proportional to their size (measured by the number of dwellings in each ED). The second stage is the selection of dwelling units within each ED. From each ED an equal number of dwellings were selected using systematic sampling with a random start. At the household level, respondents were selected from a random number grid using anyone drawn within the specific age range.

Interviewers told potential respondents they were from a research company in Kingston collecting data on behalf of the Ministry of Health (MOH). Respondents were also told that the MOH

wanted to learn what individuals understand about certain illnesses. Same sex interviewing was the technique used. Same sex interviewing is regarded as favourable to promote respondent complacency and validity of information. Once a respondent from the survey household was randomly selected to be interviewed, individuals were told that the answers they provide to a series of personal questions would be kept confidential, that their names would not be recorded on the questionnaire and that they only had to answer those questions that they wanted to. There were a total of 1,498 respondents, of whom 1,277 were no longer virgins. The survey nonresponse rate is 15%. The variables used in this study are defined in Table 2.

The survey asked for limited background information, including sex of respondent, date of birth, educational attainment and religious affiliation. However, a wide range of behavioural data were collected, including drug use and alcohol consumption. The survey also asked respondent detailed questions on sexual history, including age at first intercourse, number of partners and condom use frequency. It was also ascertained whether the respondent had a history of sexually transmitted infections (STIs), their knowledge of STIs, HIV and AIDS, their attitude towards HIV/AIDS and persons living with AIDS, and whether they had been tested for the HIV virus.

Variables

Descriptive statistics are presented in Table 2. As Table 2 indicates, consistent condom use with regular sex partners is low in the population. Less than one in three respondents report consistent condom use. The proportion of respondents who use condoms consistently is similarly low among individuals who are less than 30 years of age. The typical individual has more than one sex partners. The average number of partners is 1.4.

The regional prevalence of AIDS was used as an indicator of the level of sexual risk within the population. Regional AIDS prevalence was measured by the cumulative number of AIDS cases in each parish as reported by the MOH. The MOH reports number of cases per 100,000 individuals. These prevalence rates are not used directly; rather, they are used to rank parishes in increasing order of prevalence. This method was adopted because it was thought that while respondents may not know HIV prevalence rates, they are likely to have a sense of the relative impact of the disease in different regions based on media health reports or anecdotal information. Furthermore, the ranking of regions by AIDS prevalence is virtually constant from year to year.[6]

A dummy variable was created equal to one if the respondent knows an individual who is infected with the HIV virus or has died from AIDS. Knowing someone with the HIV virus could change behaviour for two reasons. First, that knowledge may dispel misconceptions that HIV is only a health risk in certain populations (for example, among white homosexual males). Second, individuals who know how to prevent HIV transmission might regard that information as being irrelevant for their own choices. Knowing someone infected with the HIV virus could raise one's subjective assessment of risk. Almost 40% of individuals in the sample say they know someone who is infected with the HIV virus or has died from AIDS.

Other background variables used in the study includes the respondents age, sex and education and training. Most respondents (75%) either have completed secondary education or are currently enrolled. About 7% of respondents have a college degree; another 8% have been trained in a skill. Individuals with secondary education, skilled individuals and persons with a college degree were combined to form one education variable, "HIED." In preliminary estimation there appears to be little gain from using three categorical education variables.

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6 Cumulative AIDS prevalence as of December 2003 ranges from about 100 per 100,000 to over 700 per 100,000, according to the Ministry of Health (2003). Twenty-seven percent of individuals who live in low prevalence areas report using condoms always. On the other hand, 35% of individuals who live in high prevalence areas use condoms always. With respect to the number of partners, unmarried men under the age of thirty in low prevalence areas are twice as likely to have three or more sex partners (22.3%) as their counterparts in high prevalence areas (11.3%).

Table 2: Descriptive Statistics

Variable	All respondents who have ever had sex		Persons less than 30 years of age who have ever had sex	
	Mean	Std Dev	Mean	Std Dev
Dependents				
ALWAYS	0.31	0.46	0.31	0.46
SHORT-TERM PTNRS	1.43	1.15	1.47	1.24
Background				
Age	24.99	7.86	21.35	3.76
Sex	0.53	0.50	0.55	0.50
Hied	0.89	0.31	0.92	0.28
Social				
Married	0.24	0.43	0.16	0.37
Regular (visiting) Partner	0.34	0.47	0.37	0.48
Dating	0.19	0.39	0.23	0.42
Stability index	0.61	0.39	0.63	0.40
Know	0.38	0.48	0.36	0.48
Behavioural				
Drinker	0.24	0.43	0.24	0.43
Age first sex	15.05	2.84	14.70	2.62
Risk				
Prevalence	5.26	2.13	5.16	2.17
High prevalence	0.54	0.50	0.51	0.50
KSA	0.37	0.48	0.34	0.47
Prevention Activity				
Workshop	0.32	0.47	0.35	0.48
Score	7.70	1.83	7.61	1.84
Sample size	1277		978	

Twenty-four percent of the respondents are either married or living with a partner, while another 34% have a regular sexual partner, which in Jamaica is called a visiting union. Visiting unions are separated from "dating" because in Jamaica dating is more likely to be among younger individuals, while visiting unions tend to be among adults. Importantly, visiting unions are distinguished from dating because even though the individuals do not live together there are established financial obligations. In many cases individuals in visiting unions have children together. Individuals who are less than 30 years of age are less likely to be married or cohabiting.

Alcohol consumption and drug use (crack-cocaine) have been associated with sexual risk-taking in previous studies (Sly and Riehman 1999; VanLandingham 1993). There is a very low rate of reported drug use in this sample so the relationship between drug use and sexual risk-taking is not investigated. On the other hand, alcohol consumption is more prevalent. Twenty-four percent of respondents consume at least one alcoholic drink per week.

The main thesis of this paper is that individuals in high AIDS prevalence regions will adopt safer sexual practices in response to the greater risk of contracting HIV from a sex partner. However, it is possible to observe safer sexual practices in high-prevalence areas as a result of greater prevention efforts in high-prevalence areas. To control for the effect of recent prevention activity, the regressions

include the dummy variable "WORKSHOP," which is equal to 1 if the respondent attended an HIV/AIDS education workshop within the last 12 months. The effect of past prevention activity is controlled for using the respondent's score on 10 true/false questions that test the person's knowledge of HIV prevention. If high AIDS prevalence areas benefited from greater levels of prevention activity in the past, it should be reflected in better knowledge of how to prevent an HIV infection, which should be reflected in safer sexual practices.[7]

Results

In Table 3 multivariate probit results for frequency of condom use are reported. Columns two and three of the table report results for all unmarried individuals who were sexually active in the 12-

Table 3: Probit Marginal Effects for Consistent of Condom Use During Last Year

Variable	All sexually active unmarried respondents		All sexually active unmarried respondents under 30 years of age	
	b	t	b	t
Intercept	-0.92**	-6.17	-0.84***	-5.08
Background				
Teen	0.17***	4.78	0.17***	4.69
Sex	0.14***	3.72	0.13***	3.05
Hied	0.09	1.58	0.06	0.94
Social				
Dating	0.07*	1.78	0.07	1.57
Single	0.07*	1.73	0.10**	2.27
Stability index	-0.06	-1.46	-0.06	-1.34
Behavioural				
Drinker	-0.06	-1.45	-0.07	-1.51
Age first sex	0.03***	3.68	0.02***	3.04
Risk				
Prevalence	0.02**	1.98	0.02*	1.82
KSA	-0.12***	-2.83	-0.12***	-2.67
Prevention Activity				
Workshop	0.08**	2.29	0.08**	2.21
Score	0.01	1.24	0.01	0.82
Model Stats				
Chi-squared	78.70		66.48	
Log-L	-479.86		-420.09	
Restricted Log-L	-519.21		-453.33	
Sample size	843		728	

*** indicates significance at the 1% level
** indicates significance at the 5% level
* indicates significance at the 10% level

7 The two variables are not collinear. Workshop attendance and knowledge of HIV prevention score have a statistically significant correlation ($p < 0.03$). However, the correlation between the two variables is a mere 0.06.

month period prior to the survey for whom complete data are available. Columns four and five report results for unmarried persons less than 30 years of age. All results are marginal effects, which are partial derivatives at the means of the right-hand-side variables. Marginal effects have the same interpretation as least squares coefficients.

The results reported here show a clear association between regional AIDS prevalence and frequency of condom use. In both subsamples, the coefficient on the regional AIDS prevalence variable is positive and statistically significant. The coefficient indicates that on average an individual who resides in the region that is ranked 5 in AIDS prevalence is 10% more likely to use condoms always during intercourse than an individual who resides in the region that is ranked the lowest.

Several other variables show positive association with consistency of condom use. These variables include age, sex, the age at which the individual commenced sexual intercourse, and recent participation in an HIV/AIDS education workshop. First, teenagers are more likely to use condoms consistently during intercourse than older adults. The composition of the sample makes no difference to this result. Similar results are obtained regarding males versus females. Males are more likely to report that condoms are used consistently during intercourse than females. Similar results have been reported elsewhere (Meekers and Klein 2002) and probably reflect that in heterosexual intercourse men have significant control over whether a condom is used.

The age at which the individual commenced sexual relations has a positive and statistically significant effect on condom use consistency. On average, individuals begin sexual intercourse at age 15. Condom use consistency increases by three percentage points on average for each year that the start of sexual intercourse is delayed. Finally, individuals are more likely to use condoms always during sexual intercourse if they participated in an HIV/AIDS education workshop within the year prior to the survey. Education, while positively associated with condom use, is not statistically significant. Also, HIV prevention knowledge score, while positively associated with condoms use consistency, is not statistically significant. A similar finding has been reported in other settings (Magnani et al. 2001; Gray and Saracino 1989; Baldwin and Baldwin 1988).

Three variables show negative relationships to condom use. These variables are regular alcohol consumption, location stability and residence within the capital city. The first two variables (alcohol consumption and location stability) do not have statistically significant coefficients. However, on average, persons who reside in the capital region are 12% less likely to use condoms consistently than individuals who live elsewhere.

Number of Sex Partners

In this section we turn to the relationship between the number of sexual partners in the last three months and AIDS prevalence. The regression results are reported in Table 4. The workshop attendance variable was eliminated from the final model reported in the table because the t-ratio on the coefficient was almost zero. Also, in these regressions AIDS prevalence is entered as a binary variable equal to one if the individual lives in a high-prevalence region. High prevalence is defined as a region having AIDS prevalence above the sample median. This specification provides a better fit to the data than the linear specification.

As was the case with condom use consistency, the data show a clear relationship between AIDS prevalence and the number of sex partners. Not only is high AIDS prevalence negatively associated with the number of sex partners, the coefficient is 50% larger in the regression using the subsample of adults who are less than 30 years of age. Two other variables have a negative and statistically significant relationship with number of partners, the age at which the individual first started sexual intercourse and the knowledge of HIV prevention. Knowledge of how to prevent an HIV infection is only statistically significant among younger individuals.

Men tend to have more sex partners than women. The coefficient is relatively large and statistically significant. Persons who are educated above primary level have more sex partners than individuals with only a primary education. Unmarried persons also have more sex partners that married persons, with little variation by relationship type. In other words, individuals who are single, all else

equal, have as many sex partners as individuals who have a regular visiting partner. Regular alcohol consumption is also positively associated with number of sex partners.

Table 4: Regression Results: Number of Partners with Whom Had Sexual Intercourse in Last Three Months

	All sexually active respondents		All sexually active respondents under 30 years of age	
Variable	b	t	b	t
Intercept	1.64***	5.34	2.11***	5.23
Background				
Teen	-0.07	-0.84	-0.10	-1.02
Sex	0.40***	4.84	0.39***	3.79
Hied	0.24**	2.15	0.32**	2.08
Social				
Reg. partner	0.32***	3.65	0.33***	2.82
Dating	0.25**	2.29	0.26*	1.84
Single	0.34***	2.76	0.37**	2.33
Know	0.10	1.32	0.10	1.13
Behavioural				
Drinker	0.18**	2.11	0.19*	1.80
Age first sex	-0.04***	-3.03	-0.07***	-3.69
Risk				
High prevalence	-0.15**	-2.09	-0.22**	-2.58
Prevention Activity				
Score	-0.03	-1.30	-0.04*	-1.67
Model Stats				
R2	0.11		0.12	
F	11.11		9.49	
Log-L	-1468.35		-1162.83	
Restricted Log-L	-1526.59		-1212.30	
Akaike Info Crt.	3.03		3.16	
Sample size	978		744	

Discussion

The previous sections of this paper described multivariate regression results that show that choices regarding sexual intercourse in this sample of Jamaicans reflect concerns for the risk associated with unprotected intercourse and intercourse with multiple sex partners. The level of risk in the population was measured by the cumulative prevalence of AIDS in each region. Higher AIDS prevalence is associated with a higher probability that condoms are used always during sexual intercourse and with individuals having fewer sex partners. Hence the main hypothesis of the paper receives some support from the data.

In section two the possibility was suggested that when individuals react to the prevalence of AIDS by reducing the number of partners condom use could decrease simultaneously. Even if that is the case, it appears that AIDS prevalence has an independent effect on condom use.

The positive relationship between AIDS prevalence and condom use and the negative relationship between AIDS prevalence and number of sex partners show that even within a developing country the spread of HIV will be limited by the response of rational individuals to the degree of risk that the disease poses. Although the results were derived from a sample of the Jamaican population, Jamaica shares some characteristics with other middle-income countries that might suggest these results will not be unique. One of the important characteristics of this population is the high level of educational attainment. Over 80% of the population has achieved at least a secondary level education, and educational attainment is similarly high for men and women. Education raises the chance that individuals properly interpret and internalize information on AIDS prevalence, and increases the likelihood that the information is incorporated in decisions about sexual intercourse.

The relationship between AIDS prevalence and safer sexual choices offer some insights that may be useful for HIV health promotion and prevention. Discussing rates of AIDS prevalence might help individuals improve their assessment of the risk of contracting HIV in their local region, as well as areas outside their region. Individuals are shown in this paper to be adept at using information in their decision-making process.

From a prevention point of view, it is also important to point out that more recent participation in AIDS education and prevention workshops was more strongly associated with condom use than knowledge of HIV prevention. Knowledge of HIV prevention is high, averaging 7.7 correct responses of a possible total of 10. In low-prevalence areas, the average is 7.4. The lesson here is that even when individuals are aware of how to reduce or eliminate their risk of contracting HIV, continuous AIDS prevention education is necessary to remind individuals that the possibility of contracting HIV is always present.

At this point a few comments about the credibility of the key results described above might be in order. One potential concern is that the answers respondents provided to questions about sexual choices are influenced by the answers they gave to other questions. For example, reminding an individual that they know someone who has AIDS or reminding them of the existence of AIDS in general might prompt them to report condom use. In this survey such a possibility is significantly reduced, if not eliminated, by the ordering of the items on the questionnaire. All background questions, as well as questions on sexual choices, occurred well in advance of the questions on HIV and AIDS. Furthermore, respondents would not know in advance that questions on HIV and AIDS would occur later in the survey.

A second concern is whether the results described could be explained by differences in HIV prevention activity in different regions due to differences in AIDS prevalence. Controlling for the effect of current and past prevention activity on sexual choices by including current workshop participation and data on HIV knowledge significantly reduced this possibility. Those variables had independent effects on sexual choices, but did not eliminate or even reduce the estimated effects of AIDS prevalence on choices regarding consistency of condom use and number of sex partners.[8]

Conclusion

In this paper it was shown that local AIDS prevalence plays an important role in decisions regarding choice of sexual practices in Jamaica. Regional AIDS prevalence, measured by cumulative AIDS prevalence, had a significant, positive effect on condom use consistency among unmarried individuals. At the same time, individuals who reside in high-prevalence areas have fewer sexual partners than individuals who reside in areas with lower AIDS prevalence. The main importance of these findings is that the choice of sexual practices is sensitive to the level of risk that individuals face during sexual intercourse. Hence the spread of AIDS could be limited by the incentive that individuals have to adopt practices to protect themselves.

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8 It should also be noted that in this survey individuals were not shy about buying condoms. They knew where to purchase them and there was little concern over affordability. I also explored the possibility that the number of partners is related to differences in religious affiliation, but did not find a significant relationship between religious affiliation and number of partners.

These results show individuals making rational choices to substitute away from risk as the level of risk increases. These results are remarkable because of the social context of West Indian populations, particularly the need for young men to prove their virility to peers by producing children, which could negate the effect of the higher cost of risk-taking.

These results also suggest that programs that aim at increasing the proportion of individuals who use condoms in a consistent manner are more likely to be effective if they focus on increasing awareness of the prevalence of AIDS in the local region, as well as the prevalence of AIDS outside the local region. Emphasizing the prevalence of AIDS might also be an effective strategy in encouraging individuals to reduce the number of sex partners. Focusing on AIDS prevalence could strengthen the perception of vulnerability and lead to safer sexual choices.

Finally, the need for individuals to be continuous involved in AIDS education workshops and discussions were brought out by this study, even though knowledge of how to prevent HIV infection is fairly high within this population. Knowledge of how to prevent infection appears to be less potent than recent participation in AIDS education workshops in encouraging condom use. On the other hand, recent workshop participation was unrelated to the number of sex partners. Therefore the way in which limited resources are applied to prevention efforts depend on the goals of the public health administrator. There is a clear need to increase the percentage of persons who use condoms consistently. Increasing condom use consistency appears to be best accomplished by a combination of continuous education and a focus on the risk of HIV infection by emphasizing the prevalence of the disease.

References

Ahituv, A., J.V. Hotz and P. Tomas. 1996. "The Responsiveness of the Demand for Condoms to the Local Prevalence of AIDS." *The Journal of Human Resources* 31(4): 869–97.

Baldwin, J.D. and J.I. Baldwin. 1988. "Factors Affecting AIDS-Related Sexual Risk-Taking Behaviour Among College Students." *Journal of Sex Research* 26: 181–96.

Barnett, T. and A. Whiteside. 2001. The World Development Report 2000/01: "HIV/AIDS Still Not Properly Considered!" *Journal of International Development* 13: 369–76.

Becker, M.H., ed. 1974. "The Health Belief Model and Personal Health Behaviour." *Health Education Monographs* 2:324–473.

Bonnel, R. 2000. "HIV/AIDS and Economic Growth: A Global Perspective." *The South African Journal of Economics* 68(5): 820–55.

Cuddington, J.T., J.D. Hancock and C.A. Rogers. 1994. "A Dynamic Aggregate Model of the AIDS Epidemic with Possible Policy Interventions." *Journal of Policy Modeling* 16(5): 473–76.

Cuddington, J.T. and J.D. Hancock. 1994. "Assessing the Impact of AIDS on the Growth Path of the Malawian Economy." *Journal of Development Economics* 43: 363–68.

Dixon, S., S. McDonald and J. Roberts. 2001. "AIDS and Economic Growth in Africa: A Panel Data Analysis." *Journal of International Development* 13: 411–26.

Fisher, J.D. and W.A. Fisher. 2000. "Theoretical Approaches to Individual-level Change in HIV Risk Behaviour." In J.L. Peterson and R.J. DiClemente, eds., *Handbook of HIV Prevention* (pp.3–55). New York, NY: Kluwer Academic/Plenum Publishers.

Ghys P.D. et al. 2002. "Increase in Condom Use and Decline in HIV and Sexually Transmitted Diseases Among Female Sex Workers in Abidjan, Cote d'Ivoire, 1991–1998," *AIDS* 16:251–58.

Gray, L.A. and M. Saracino. 1991. "College Students Attitudes, Beliefs, and Behaviours About AIDS: Implications for Family Life Educators." *Family Relations* 43(3): 258–63.

Greene, W.H. 2000. Econometric Analysis, 4th ed. Englewood Cliffs, NJ: Prentice Hall.

Hargreaves, J.R. et al. 2002. "Socioeconomic Status and Risk of HIV Infection in an Urban Population in Kenya." *Tropical Medicine and International Health* 7(9): 793–802.

Magnani, R. J. et al. 2001. "Correlates of Sexual Activity and Condom Use Among Secondary-School Students in Urban Peru." *Studies in Family Planning* 32(1): 53–66.

Meekers, D. et al. 2003. "Patterns of HIV Risk Behaviour and Condom Use Among Youth in Yaounde and Douala, Cameroon." *AIDS and Behaviour* 7(4): 413–20.

Meekers, D. and M. Klein. 2002. "Determinants of Condom Use Among Young People in Urban Cameroon." *Studies in Family Planning* 33(4): 335–46.

Messersmith, L.J. et al. 2000. "Who Is at Risk? Men's STD Experience and Condom Use in Southwest Nigeria." *Studies in Family Planning* 31(3): 203–16.

Michael, R.T. 2004. "Sexual Capital: An Extension of Grossman's Concept of Health Capital." *Journal of Health Economics* 23: 643–52.

Nicholis, S. et al. 2000. "Modelling the Macroeconomic Impact of HIV/AIDS in the English Speaking Caribbean." *The South African Journal of Economics* 68(5): 916–32.

Sly, D.F. and K.S. Riehman. 1999. "Substance Use, Multiple Substance Use, Sexual Risk Taking and Condom Use Among Low Income Women." *Population Research and Policy Review* 18: 1–22.

VanLandingham, M.J. et al. 1993. "Sexual Activity of Never-Married Men in Northern Thailand." *Demography* 30(3): 297–313.

Wiggers, L.C.W. et al. 2003. "Risk Behaviour and Social-Cognitive Determinants of Condom Use Among Ethnic Minority Communities in Amsterdam," *AIDS Education and Prevention* 15(5): 430–47.