Determinants of extramarital sex in the Philippines*

Dennis A. Ahlburg[a], Eric R. Jensen[b] and Aurora E. Perez[c]

[a]*Industrial Relations Center and Center for Population Analysis and Policy, University of Minnesota*

[b]*Economics Dept., PO Box 8795, College of William and Mary, Williamsburg, VA23187-8795 USA*

[c]*Population Institute, University of the Philippines*

Abstract

Understanding the factors associated with sexual behaviour is critical in slowing the spread of HIV in the Philippines, where sexual transmission accounts for most HIV infections, with the majority from heterosexual activity. Further, unprotected sex is common, as is sex with prostitutes. These factors increase the risks associated with extramarital sex. From an analysis of a nationally representative sample of women, we found that a number of factors were related to women's reports of their husbands' sexual activity outside their current relationship: women report that partners who are more educated, have been in the current relationship longer, and who had sex before marriage are more likely to be engaging in sex outside the marriage. Further, men who are older, who are farmers, who live at home, and who have more educated wives, were believed to be less likely to be having extramarital sex.

Creating an effective strategy for AIDS risk reduction necessitates the identification of causes of behaviour that favours the spread of infection or speeds the progress of HIV. Heterosexual transmission is the dominant mode of transmission worldwide (Brown, Mulhall and Sittitrai 1994:S174). Since HIV is not spread in monogamous relationships between uninfected partners, the level of casual sex largely determines the risk of heterosexual transmission of HIV. Casual sex is sex outside a stable relationship, and may be either premarital or extramarital, and either with prostitutes or not. Together with the extent of condom use, the levels of sexually transmitted diseases, and the incidence of male circumcision, sexual behaviour is probably 'responsible for much of the differences in heterosexual epidemics among countries, as well as for the equally large differences among regions and demographic groups within countries' (Bongaarts 1995:9).

Most of the information known on risk behaviour and its correlates is based on convenience samples and samples of individuals thought to be at particularly high risk (prostitutes, transport workers, military personnel), rather than rigorous behavioural studies of

the general population (Brown et al. 1994:S174; Ainsworth and Over 1994:205-206; Tan and Dayrit 1994:s128), and much of it is based on attitudes rather than behaviour (Brown et al. 1994).[1] Even when representative samples are available, they often have fairly limited socio-economic detail that can form the basis for behavioural investigation.

The risk factors that foster each of the forms of transmission of HIV are all present in the Philippines although sexual transmission is by far the most important (Manaloto et al. 1991; Tan 1993a; Tan and Dayrit 1994). Fully 95 per cent of all known infections have been transmitted sexually, with 70 per cent due to heterosexual activity (HIV/AIDS Registry 1995). While some surveys give us insight into the extent of sexual behaviour, to the best of our knowledge there has been only one study that attempted to yield information on the factors associated with sexual behaviour. Unfortunately, this study was unable to shed much light on sexual behaviour in the Philippines in general, since the sample was only from Manila (Carael, Cleland and Ingham 1994).

This paper attempts to identify correlates of extramarital sexual behaviour, which places individuals and their spouses and other sex partners at heightened risk of becoming infected with HIV. To do so we constructed a data set on wives' reports of their husband's sexual behaviour by linking two nationally representative sample surveys from the Philippines. While it would have been preferable to have data on the husbands' own reports of their sexual activity, such data are not available. The one study of males' self-reported sexual behaviour, from metropolitan Manila, is a small sample which lacks detailed socio-economic information. We believe that while wives' reports of husbands' extramarital sex may have several shortcomings, they nonetheless provide a useful indicator of extramarital sex. In the first sections of the paper we briefly discuss the current HIV/AIDS situation and what is known about the extent of sexual activity. Next we discuss a number of data and statistical issues that arise when modelling sexual behaviour is attempted. After specifying our empirical model we present and discuss our findings. We close with a discussion of the conclusions of the paper.

The HIV/AIDS situation in the Philippines

The first AIDS cases in the Philippines were detected in 1984 and the first HIV infections were documented in 1985 among prostitutes in Angeles and Olongapo (Tan and Dayrit 1994:s125). Since then, the number of reported cases has grown steadily. By July 1995, 659 HIV infections had been reported, of which 212 were AIDS cases (HIV/AIDS Registry 1995). Estimates of the actual number of HIV infections varied from 15,000 to 50,000 (Tan and Dayrit 1994:s127).

Concern has been expressed that the Philippines may be in a similar position to Thailand before the Thai government initiated active surveillance programs (Solon and Barrozo 1993:115). However, there is some debate over whether the Philippines epidemic will be as severe as that in Thailand. Tan and Dayrit (1994:s127) have argued that Filipino female prostitutes may have fewer sex partners than Thai prostitutes, and that intravenous drug use appears to be lower in the Philippines than in Thailand. These factors should lead to a slower increase in infections. There are, however, factors operating in the opposite direction. The large number of Filipino contract workers abroad, possibly as many as 1.2 million (Tan 1993a:285) in a population of a little over 60 million, and their low level of awareness of their HIV/AIDS risk are important factors affecting the possible size of the epidemic in the

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[1] A notable recent exception is Carael, Cleland, and Ingham 1994.

Philippines.[2] About 13 per cent of HIV/AIDS cases reported by 1993 were among overseas contract workers (calculated from data reported in Tan and Dayrit 1994). Also contributing to the potential for the epidemic is the conservative religious culture of the country which reduces the possibilities for open discussion of sex, and *machismo* and other values of male domination over women, which affect a woman's ability to adopt risk-reducing behaviour (Tan 1993a:284). While empirical evidence is scant, it is likely that in the Philippines, the ideology of female domesticity contributes to the stability of cultural prescriptions that allow premarital and extramarital sex among men. Female sex roles are associated with appropriate concepts of femininity and traits such as submissiveness and modesty; male sex roles are associated with concepts of masculinity and traits like dominance, assertiveness, and instrumentality (Rodriguez 1990; Sobritchea 1990).

Sex in the Philippines

In the sample used in this study, 30 per cent of wives reported that their husbands had had sex before marriage and 8.4 per cent reported that the husbands had had extramarital sex[3]. The estimate for premarital sex is considerably lower than that reported by men aged 25-49 in a 1990-91 survey carried out in Manila: about 70 per cent of men reported that they were sexually experienced at the time of first marriage or partnership (Tiglao, Conaco, and Sevilla 1990 cited in Carael et al. 1994:159). Eight per cent of currently married men 15-49 years of age in the Manila survey reported one or more non-regular sexual partners, reasonably close to the figure reported by wives in the data used in the current study. This close correspondence between percentage of wives reporting that their husbands are engaging in extramarital sex and husbands' reports in the Manila survey increases our confidence in the usefulness of our data.[4]

The incidence of extramarital sex reported by married men in the Philippines is a little higher than that reported in Singapore and Sri Lanka (6% and 5% respectively) but lower than the figure for Thailand (17%) (Carael et al. 1994:161). The incidence of premarital sex reported in the Manila sample was close to the level reported in Thailand (70%) but exceeded levels reported in Singapore (36%, Carael et al. 1994:159) and Malaysia (55%, Brown et al. 1994:S174).[5]

The HIV-risk of extramarital sex is increased if it is with a prostitute or it is unprotected sex. Prostitutes are at particularly high risk because of their high rate of partner exchange and their exposure to and infection with other STDs; consequently, they have played a significant role in the rapid development of epidemics in Thailand and India (Brown et al. 1994:S175). About half of the non-marital sex reported in the Manila study was with prostitutes. A recent survey of 11,000 youths aged 15 to 24 by the University of Philippines Population Institute

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[2]Tan (1990) reported that in 1989 among overseas contract workers, only 22% of males and 18% of females perceived themselves to be at risk of AIDS although 70% of the males and 52% of the females admitted that while overseas they engaged in sexual activities they would never consider at home.

[3]The survey questions ask 'As far as you know, has [your current partner] had sex with other women or with men while being your partner?' and 'As far as you know, has [your current partner] had sex with other women or with men before becoming your partner?'.

[4]The report of premarital sex in our data may be considerably lower because the survey question asks the respondent if their partner had sex with **other** women or men before their current relationship whereas most sex surveys ask the respondent about sex with anyone (including the respondent) before marriage.

[5]The figure for Malaysia includes some individuals who are at high risk and so probably exceeds a true national estimate.

found that by age 24, 25 per cent of men had paid for sex, and condom use was minimal (P. Xenos, 1995, personal communication). Male prostitutes reportedly are a growing segment of the Filipino population: a recent study of them found that a large proportion of their clients are male, most do not identify themselves as homosexual, many have wives or live-in partners and children, and they have protected and unprotected sex with multiple partners (Health Action 1992).

In 1993, 0.6 per cent of female prostitutes tested in two locations in Metro Manila were HIV-positive (Tan and Dayrit 1994:s127). Although this was lower than in many other countries, it was a significant increase over levels recorded five years earlier. Manaloto et al. (1990) reported that most HIV-positive prostitutes in their study continued to work as prostitutes even after they became aware of their HIV status and after counselling. A study of 350 female prostitutes in Metro Manila found that AIDS is perceived as the least threat in their work life and is therefore given the lowest priority among their concerns (Pernito 1993). This is not particularly surprising, since although these women have heard about HIV/AIDS, they know very little about contraception or STDs including HIV/AIDS. This lack of knowledge is also found in the general population (Tan and Dayrit 1994:s128). For example, in a survey of 1,200 urban men aged 15 to 45 years, almost half believed there were measures other than condoms that would protect them from AIDS. The top three measures were antibiotics, keeping fit and healthy, and prayer (Balgos 1995).

Most of the premarital and extramarital sex is probably unprotected since there is low condom availability throughout the Philippines (Tan and Dayrit 1994). Before 1991 condoms were considered a medical device and were only sold in pharmacies; after 1991 distribution outlets were broadened significantly and sales increased from one million in 1991, to three million in 1992, and six million in 1993 (Calica, Darden and Llapitan 1994). Fully 80 per cent of men in Manila who reported having commercial sex never used a condom (Carael et al. 1994:166). In a study of prostitutes in a rural community, Gacad et al. (1993) found that 73 per cent never had a partner using a condom and only 1.3 per cent had partners who always used a condom.[6] Calica et al. (1994) found that among female prostitutes in two cities in the Philippines, about half of the women knew that AIDS could be prevented by condom use but only 26 per cent reported using condoms all of the time. After an intervention, almost 90 per cent of women knew that condoms could offer protection against AIDS but after a year condom use rose to only 44 per cent in one site and 62 per cent in the other. In other studies, interventions among female and male prostitutes were found to be unsuccessful in increasing the knowledge of women with less than primary education (Health Action 1992; Tan and Dayrit 1994:s128).[7] These low use rates are related to a number of economic and social factors, including the power dynamics in sexual relations.

Several studies of prostitutes have also found considerable levels of STDs among them. For example, Monzon and Bagasao (1991) found that more than 40 per cent of the female prostitutes in their samples in Metro Manila had STDs and that there was no correlation between STD infection and condom use with clients, non-customers or regular sexual partners. The presence of a high level of STDs presents an independent health threat to the prostitutes and their sexual partners, as well as increasing the likely incidence and spread of HIV in these groups.

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[6]This study found an HIV seroprevalence rate of 1.16 per 1000. The prostitutes were also mobile: the average length of stay in the present worksite was a little over 11 months.

[7]This is the opposite of findings reported in a study of the effect of an AIDS mass media program on knowledge (Academy for Educational Development 1991), which reported that those with less education demonstrated the most positive change in AIDS-related beliefs.

Modelling extramarital sex

Most micro-data, particularly data related to sensitive subjects such as sexual relations, are subject to non-response or a 'don't know' response. Usually, these observations are simply dropped, on the assumption that they are more or less random. However, if non-response or 'don't know' is related to other variables in the analysis, the coefficients may be subject to sample selection bias. Non-response was unimportant in our sample: only one per cent of women did not respond to the question about extramarital sex. However, 9.3 per cent responded that they did not know if their husbands engaged in extramarital sex (8.4% responded 'yes' and 81.3% responded 'no').

One statistical approach to dealing with this issue is Heckman's two-step procedure: a woman first decides whether to give a decisive response to the interviewer; then she answers 'yes' or 'no'. One problem with this approach in our case is that the second stage of the Heckman procedure is linear while our dependent variable, whether or not the wife reports that the husband engages in extramarital sex, is non-linear.[8] Another problem is that the decision process underlying the Heckman procedure is assumed to be composed of two steps. The phrasing of the questions on sex in the Safe Motherhood Survey leads us to believe that a one-step decision process is more likely. That is, the respondent is faced with four choices: do not answer, answer 'don't know', answer 'yes', or answer 'no'. The modelling strategy that we use assumes a one-step decision process with three choices: 'yes', 'no', or 'don't know'. We attempted to model the process as four decisions (adding non-response as a choice) but there were too few cases of non-response to get meaningful estimates. The multinomial choice approach has the added advantage that the appropriate non-linear estimation procedure can be used.

Another issue to deal with is: can we believe the responses? It is sometimes argued that sex is such a sensitive topic that individuals will either not answer questions or not give truthful or accurate answers. As we have mentioned, non-response was not a problem in this data set so our primary concerns are with data quality, specifically, validity and reliability, although the validity that is of primary concern here is the extent to which wives' reports of husbands' sexual behaviour accurately measures that behaviour. The issues of reliability and validity in survey data on AIDS have been addressed by Dare and Cleland (1994). After surveying evidence on these issues they concluded 'the balance of evidence on validity and reliability serves to reassure rather than to condemn....very few checks of data quality reveal error of such magnitude that would suggest a need to abandon the survey approach' (Dare and Cleland 1944:106).[9] This evidence is primarily on self-reports of sexual behaviour rather than on a spouse's report of her or his partner's sexual behaviour. Alano (1994) found that fewer women reported their husbands to have had an affair than the number of husbands who stated that they had an affair. If women's reports of their husbands' sexual behaviour are similarly systematically biased in our data, then our estimates of the behavioural correlates will be biased. While we cannot reject this possibility with the data available to us, it seems likely that husbands' behaviour and wives' perceptions are positively correlated. Therefore, our estimates should probably best be viewed as first approximations to the underlying behavioural coefficients (of husbands' behaviour).

Another potential problem is our use of reports of premarital sex as an independent variable (to control for unobserved heterogeneity). This variable is potentially correlated with

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[8]Van de Ven and van Praag (1981) presented a model with simultaneous probits and discuss the difficulties in estimating standard errors in this model correctly. Thanks to Bill Greene for bringing this to our attention.

[9]A study of reliability in the Philippines found very high levels of test-retest reliability for self-reports of sexual behaviour (Baltazar et al. 1993 cited in Dare and Cleland 1994:105).

the error term in the extramarital sex equation. However, it turns out that our findings are robust to the inclusion or exclusion of this variable and to the specific method of estimation used.

The model

Previous studies of extramarital sex have tended to be descriptive or exploratory, attempting to examine 'variations [in extramarital sex] in relation to social, economic, marital , and community characteristics' (Carael et al. 1994:154). Our study follows this exploratory tradition although we try to bring some order to our set of independent variables by viewing extramarital sex through the lens of utility maximization. Following Philipson and Posner (1995), we assume that extramarital sex is a function of the perceived benefits (sexual satisfaction) and the costs of extramarital sex (cash and cost of gifts, normative costs of disclosure, and HIV risk).[10]

Table 1 reports descriptive statistics and the expected signs on the independent variables in the model. Again, since we are modelling extramarital sex by men, our hypotheses are from a 'male perspective'. On the basis of factors discussed in the literature and the constraints presented by the data set, we posit the following:

1. As the duration of marriage increases, other sexual partners increase in attractiveness and extramarital sex increases.
2. We assume the wife's bargaining power and economic value to the husband increase with education. As the education level of the wife increases, extramarital sex decreases because costs to the husband increase.
3. As husband's education increases, so too does extramarital sex because the husband's power in the relationship increases.[11]
4. As the wife ages, she may appear less desirable to the husband and his perceived benefits from extramarital sex may increase. Conversely, the wife's bargaining power may increase with age and her ability to impose costs on her husband may decrease extramarital sex.
5. Age may decrease extramarital sex if search costs increase as the male becomes less attractive to potential partners, or if his libido or stamina decreases with age.
6. Farmers may face higher normative costs of extramarital sex since the closeness of farm communities may increase the probability of detection of extramarital sex.

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[10]The Philipson and Posner model is a model of unsafe sex rather than extramarital sex *per se.* Their model is $EU = B - C(1-Pm)Pf$, where EU is the expected utility of unsafe sex, B the benefits, C the costs, and Pm and Pf are respectively the perceived probabilities that the male and the potential partners are HIV-positive. In the case of extramarital sex we specify the model as $EU = B - [Ch(1-Pm)Pf + (Ce)Pe]$, where EU is the expected utility of extramarital sex, B the benefits, Ch the costs of becoming infected with HIV, Ce other costs of being found engaging in extramarital sex, and Pe the probability of being discovered to be engaging in extramarital sex. The survey data for the Philippines indicate that the perceived probabilities of HIV infection approach zero for most Filipinos. In addition, very little is known of the socio-economic correlates of HIV infection in the Philippines or of the possible partners of the men covered in our survey. For these reasons, we assume that extramarital sex is driven primarily by calculations of benefits and costs other than those of contracting HIV. That is, $EU = B - (Ce)Pe$.

[11]There is also a potentially offsetting effect. If knowledge of HIV is positively associated with education, then more educated men may have a lower demand for riskier sex, that is, they have a larger perceived probability that the female is HIV-positive (Philipson and Posner 1995: 837). This assumes that education and the probability that the male is himself HIV-positive are not positively correlated.

7. Men in urban areas have a potentially larger number of alternative partners and a lower probability of being detected by their wives. Urbanization may also favour the transgression of more restrictive sexual traditions that exist in rural areas (Carael et al. 1994:161). Thus, the costs of extramarital sex are lower in urban areas.

8. Children represent highly valued products of the marriage (marriage-specific capital) that may be lost if a wife objects to her husband's extramarital sex and leaves the marriage, taking the children with her. This increases the cost of such sex to the husband.

9. The smaller the interval since the last birth, the more the wife may be involved with childrearing and the more likely the husband may be to look elsewhere for sex.

10. If the wife reports medical problems, this may decrease the likelihood of marital sex and increase the perceived benefits of extramarital sex to the husband.

11. If the husband does not live at home the benefits of extramarital sex (perhaps the only kind possible) are higher and the normative costs lower because detection is less likely.

12. As income rises, the husband can purchase more extramarital sex (since cash or gifts often change hands, mostly in one direction). As Philipson and Posner (1995:841) noted, 'in a society where women are very poor, prosperous men have ready access to multiple sexual partners because the "price" of women's sexual services, both in the prostitution market and in the less explicit sex market, is very low'. Lacking a measure of income, we used factor analysis to construct indices of economic wealth. The items in the data set reduced to two underlying factors.[12]

In general, women were not alone when answering the survey questions. Fully 37 per cent of women had children under ten years with them, seven per cent had their husbands present, eight per cent had other males present, and 31 per cent had females present when answering. It is possible that the presence of these persons may influence the woman's response. To controls for this we added four control variables: children present; husband present; male (other than husband) present; and females present.

A final variable in the equation is whether the respondent reports that her husband engaged in premarital sex with a person other than herself. If the husband engaged in premarital sex, then the husband is assumed to be more likely to engage in extramarital sex. The variable is basically a control for unobserved heterogeneity. For whatever reason (sex-drive, *machismo*, etc.) some men may be more predisposed to sexual activity than others.[13] This predisposition is observed before marriage and within marriage, even controlling for other factors. In some modelling contexts, for example studies of unemployment, such a variable controls for state dependence. That is, if an individual is in a particular state (here, engaged in sex), then that individual is more likely to be in the same state in the next period. Although Carael et al. (1994:166) note that in Asian populations commercial sex is concentrated among single men, because of the HIV incubation period of about ten years people can be placed at risk because of the sexual practices of their spouses before marriage.

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[12]The items that loaded on the first factor were ownership of a television, ownership of a refrigerator, main building material used for floor, and provision of electricity to the house. The items that loaded on the second factor were ownership of an automobile, possession of a gas or electric range for cooking, and the number of sleeping rooms in the house. Although this procedure introduces measurement error, the resultant bias is very likely to be less than if we had omitted a measure of economic resources (Aigner 1974).

[13]It is also possible that a woman who thinks her husband is engaging in extramarital sex also thinks he engaged in premarital sex, irrespective of the true behaviour.

This is a direct risk that is in addition to the heightened risk through extramarital sex captured in this paper.

Table 1
Descriptive statistics

Variable	Mean	SD	Expected sign
Duration of marriage (years)	12.85	7.85	+
Education of wife (years)	8.73	4.89	-
Education of husband (years)	7.88	3.66	+
Age of wife (years)	33.62	7.86	?
Age of husband (years)	36.84	9.00	-
Husband a farmer (Equals 1 if yes)	0.32	0.47	-
Live in urban area (Equals 1 if yes)	0.48	0.50	+
Children ever born	3.91	2.47	-
Years since last birth	4.52	4.72	-
Wife reports any health problems (Equals 1 if yes)	0.42	0.49	+
Husband resides with wife (Equals 1 if yes)	0.94	0.23	-
Children present during survey (Equals 1 if yes)	0.37	0.48	
Husband present during survey (Equals 1 if yes)	0.07	0.26	
Other males present during survey (Equals 1 if yes)	0.08	0.27	
Females present during survey (Equals 1 if yes)	0.31	0.46	
Husband had premarital sex (Equals 1 if yes)	0.31	0.46	+
Economic assets (factor 1 see text)	0.13	1.01	+
Economic assets (factor 2 see text)	0.01	1.07	+

The data

The data come from the 1993 Philippines National Demographic Survey (Philippines National Statistics Office 1994a) and the 1994 Philippines National Safe Motherhood Survey (Philippines National Statistics Office 1994b). The National Demographic Survey is a nationally representative survey in the Demographic and Health Surveys series, in which 15,029 women were interviewed. There were 8,803 births to respondents in the five years preceding the survey, and the estimated total fertility rate for women aged 15 to 44 is 4.05. The Safe Motherhood Survey reinterviewed ever-pregnant women from the National Demographic Survey, collecting more detailed information on pregnancy and women's health: 89.8 per cent of eligible respondents were interviewed for the Safe Motherhood Survey, for a total of 9,441 respondents. Our data were created by merging the two data sets. Basic household and demographic information comes from the National Demographic Survey, while information on sexual behaviour comes from the Safe Motherhood Survey. The sample was reduced to 5,502 when the variable for premarital sex was included in the model.[14] The strength of these data sets is the detailed information they yield on demographic, social, and economic characteristics of individuals. The weakness is that we have wives' reports of their perceptions of husbands' behaviour rather than direct reports from the husbands themselves.

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[14]The signs and significance of the other independent variables are unaffected by whether the larger or smaller sample is used.

Empirical results

The empirical results, shown in Table 2, largely support the hypotheses put forward above. We found that men whose wives believed that they engaged in extramarital sex were more educated, had wives of lower education, had been married for a longer time, were more likely to be in an occupation other than farmer, were younger, were living away from home at the time of the survey, and had had sex with someone other than their wives before marriage. We posit that these men, and their sex partners, including their spouses, were at higher risk of contracting STDs including AIDS. This is the case because of the presence of STDs including AIDS in the Philippines, the fact that at least some of the extramarital sex is with prostitutes, and because unprotected sex is common.

Table 2
Multinomial logit regressions of extramarital sex

Variable	Equation	
	Yes/No	Don't know/No
Duration of marriage (years)	0.004 (4.73)***	0.001 (0.27)
Education of wife (years)	-0.03 (3.52)***	-0.0001 (0.19)
Education of husband (years)	0.003 (2.84)***	0.0003 (0.35)
Age of wife (years)	0.0002 (0.37)	0.0003 (0.37)
Age of husband (years)	-0.002 (3.20)***	-0.0001 (0.15)
Husband a farmer (Equals 1 if yes)	-0.022 (3.11)***	-0.016 (2.0)**
Live in urban area (Equals 1 if yes)	0.011 (1.92)*	0.006 (0.86)
Children ever born	0.001 *0.31)	-0.001 (0.31)
Years since last birth	0.001 (1.39)	-0.001 (0.54)
Wife reports any health problems (Equals 1 if yes)	0.006 (1.20)	0.006 (0.94)
Husband resides with wife (Equals 1 if yes)	-0.035 (3.59)**	-0.030 (2.99)***
Children present during survey (Equals 1 if yes)	-.008 (1.29)	-0.007 (1.07)
Husband present during survey (Equals 1 if yes)	-0.010 (0.87)	0.007 (0.60)
Other males present during survey (Equals 1 if yes)	0.014 (1.36)	-.005 (0.48)
Females present during survey (Equals 1 if yes)	-0.0003 (0.06)	0.023 (3.69)***
Husband had premarital sex (Equals 1 if yes)	0.107 (18.78)***	0.037 (6.27)***
Economic assets (factor 1 see text)	0.002 (0.66)	0.004 (1.03)
Economic assets (factor 2 see text)	0.003 (1.02)	0.001 (0.39)
Constant	-0.136 (6.03)***	-0.142 (6.01)***

$-2 \ln(L_1/L_0)$ 589.37

Women whose husbands were farmers or who lived at home were more likely to respond that their husbands did not engage in extramarital sex than to answer that they did not know, while women who reported that their partners had had sex before their current relationship were more likely to report that they were unsure whether they were having extramarital sex.

In general, the women in our sample did not appear to be influenced by the presence of other persons when they were being interviewed. The only statistically significant coefficient was on the dummy variable for the presence of other women, indicating that wives were more likely to respond that they did not know whether their husbands were engaging in extramarital sex rather than responding 'no'. The fact that the women's responses were not influenced by who was present during the interview, including their husbands, may indicate that the women's responses to the questions are not systematically biased by their own or their husbands' characteristics.

The sizes of some of the effects reported in Table 2 are notable. One measure of the strength of association between two variables is the elasticity, which is the proportional change in the one variable per proportional change in the other variable.[15] Elasticities greater than one imply a more-than-proportionate response in the dependent variable. For instance, an increase in the wife's education by one per cent reduces the probability of the husband engaging in extramarital sex by three per cent. In contrast, a similar increase in the husband's education increases his probability by 0.3 per cent. One per cent increases in duration of marriage and in age of the husband have even less effect on the probability of extramarital sex. Since the average probability of extramarital sex is 0.084, the effects of premarital sex and residing at home are quite large. Although smaller, the effect of occupation is also sizeable.

Discussion

Our results based on wives' reports support the rather limited findings of earlier multivariate studies of self-reported sexual behaviour in developing countries. As in these studies by Ingham and Holmes (1992; reported in Carael et al. 1994), we found that reports of sexual activity declined with age and increased with own education. In these studies, the effect of urban residence, which was present in the simple correlations, was greatly reduced or disappeared when other variables such as education were controlled for. This was also the case in our study where urban residence is significant only at the 0.10 level in the multivariate regressions. The lack of significant urban-rural differences in reports of extramarital sex is similar to findings for Thailand (Sittitrai et al. 1992). As we did, these previous studies also found a significant positive relationship between premarital and extramarital sex, although they seem not to have explored the relationship in the multivariate context.

The effect of wife's education is notable, particularly so because it is much stronger than that of husband's education. Education is an indicator of women's status: it can be the means to desirable outcomes or statuses in life (Mason et al. 1995:3). Our findings indicate that one desirable outcome is a reduction in the risk of a woman contracting HIV because of her husband engaging in extramarital sex. Tan (1993b) observed that a KAP gap or discrepancy exists between knowledge and actual behaviour among Filipino men who have sex with men. If education increases knowledge of HIV risk (Philipson and Posner 1995), then our results indicate that this KAP gap may hold for all Filipino men.

Our findings of systematic variation in the risk of extramarital sex stand in direct contrast to those of an earlier study of sexual relations in the Philippines. In the Manila study, Carael et al. (1994:170) reported that marital status alone accounted statistically for variations in frequency of casual sex, and stated: 'This reinforces the impression that patterns of risk behaviour may be different in some Asian countries compared with African sites'. Our findings dispute this conclusion, at least for the Philippines.[16] Certainly, the notion that sexual mores, institutions and other factors differ widely between Africa and an Asian country like the Philippines is reasonable. But we find no statistical support for the much stronger claim that in the Philippines, extramarital sexual behaviour is influenced only by marriage.

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[15]Elasticities can be calculated from the partial derivatives of Tables 2 and 3 by multiplying the partial derivative for covariate x_i by the ratio of the mean of x_i to the mean of the dependent variable.

[16]The findings of the two studies could also reflect differences in the data used in the studies. Carael et al. used data from men, 15-59 years of age, in Manila, and referred to behaviour in the 12 months before the survey. Our data are from married women 15-44 years of age from across the nation, and are wives' reports of husbands' lifetime behaviour.

We have maintained that the multinomial logit model is appropriate for modelling the behaviour under study. But how important is the choice of modelling strategy to the findings of the study? It turns out that the results are quite robust to different statistical assumptions. In the multinomial model, dropping the controls for who is present during the interview has no effect on the results. When the variable for premarital sex is dropped, the variables for economic assets and wife being ill become statistically significant. Other results are essentially the same. When the sample is limited to those who answered the questions about sex before and during marriage, OLS, logit, and probit estimation of the extramarital sex equation (yes/no) yield qualitatively identical results to those from the multinomial logit model. When we use a Heckman two-step estimation strategy, the results are qualitatively identical to results from the other approaches and the selection term is statistically significant.

Conclusion

Understanding the factors associated with sexual behaviour is critical in slowing the spread of HIV in the Philippines. As we have noted, sexual transmission accounts for most HIV infections, with the majority from heterosexual activity. Further, unprotected sex is common, as is sex with prostitutes. These factors increase the risks associated with extramarital sex in the Philippines. We found that a number of factors were related to women's reports of their husbands having sex outside their current relationship: women report that partners who are more educated, have been in the current relationship longer, and who had sex before marriage are more likely to be engaging in sex outside the marriage. Men who are older, who are farmers, who live at home, and who have more educated wives, are less likely to be thought to be having extramarital sex.

If wives' perceptions of husbands' behaviour are accurate, then these findings suggest some potential for targeting of STD interventions, including AIDS education programs. Such targeting seems essential since the health sector in the Philippines is under duress and there are limited funds available for AIDS programs (Hernandez and Villanueva 1993). Because our data rely on wives' reporting, it is probably premature to recommend specific interventions on the basis of our findings alone. A reanalysis of the Manila survey of husbands, to examine how closely wives' reports and husbands' behaviour coincide, would be a useful next step, but what is critically needed is a survey of sexual behaviour with the socio-economic detail commonly found in demographic surveys such as the National Demographic Survey. Analysis of the recent Young Adult Fertility Survey carried out in the Philippines should yield useful information on the determinants of premarital sexual activity, an important risk factor in itself and, as shown in this study, one that increases the probability of extramarital sex, further increasing the risk of STDs. But because of its focus on youth, the Young Adult Fertility Survey can tell us relatively little about sexual behaviour in marriage.

Quantitative studies such as those we have suggested can significantly increase our understanding of sexual behaviour but they must be complemented with other social and psychological studies. Successful interventions require a knowledge of the dynamics of sexual behaviour which such studies can yield. But, as Tan (1994) has noted, such studies need to go beyond the analysis of individual personality characteristics to an understanding of how these are shaped by society. Such social forces appear to be important in the Philippines.

References

Academy for Educational Development. 1991. *Report on AIDS Public Health Communication Project.* Washington DC.

Aigner, Denis J. 1974. MSE dominance of least squares with errors of observation. *Journal of Econometrics* 2:365-372.

Ainsworth, Martha and Mead Over. 1994. AIDS and African development. *World Bank Research Observer* 9:203-240

Alano, Marianette G. 1994. Infidelity: the querida system in the Philippines. *Philippines Journal of Psychology* 27:59-103.

Balgos, Cecile C.A. 1995. Brazen machos put women at risk of AIDS. *Philippine Star* 1 December:1, 6.

Bongaarts, John. 1995. Global trends in AIDS mortality. Research Division Working Paper No.80. New York: Population Council

Brown, Tim, Brian Mulhall and Werasit Sittitrai. 1994. Risk factors for HIV transmission in Asia and the Pacific. *AIDS* 8 (supplement):s173-s182.

Calica, C.L., C. Darden and A. Llapitan. 1994. Condom promotion through social marketing: Philippine experience. *International Conference on AIDS August 7-12 1994*, 10,2:286.

Carael, M.J., J. Cleland and R. Ingham. 1994. Extramarital sex: implications of survey results for STD/HIV transmission. Pp. 153-172 in *AIDS Impact and Prevention in the Developing World: Demographic and Social Science Perspectives*, ed. John Cleland and Peter Way. Supplement to *Health Transition Review* 4. Canberra: Australian National University.

Dare, O.O. and J.G. Cleland. 1994. Reliability and validity of survey data on sexual behaviour. Pp. 93-110 in *AIDS Impact and Prevention in the Developing World: Demographic and Social Science Perspectives*, ed. John Cleland and Peter Way. Supplement to *Health Transition Review* 4. Canberra: Australian National University.

Gacad, E., N. Maclang, F. Paladin and O. Monzo. 1993. HIV seroprevalence and associated risk factors among female sex workers in entertainment establishments in Bulacan Province, Philippines. *International Conference on AIDS June 6-11 1993* 9,2:702.

Health Action Information Network. 1992. *Final Report: HIV Prevention Project among Male Sex Workers*. Quezon City.

Hernandez, E.R. and J.H. Villanueva. 1993. The Philippine National AIDS Prevention and Control Program: 1988-1993. *International Conference on AIDS August 7-12 1994* 10,2:37.

HIV/AIDS Registry. 1995. *Monthly Update. July.* Manila: Department of Health.

Manaloto, C.R., C.G. Hayes, M.L. Caringal, et al. 1991. HIV-1 seropositive women in the Philippines: pregnancy outcome and perinatal transmission of HIV-1. *Southeast Asian Journal of Tropical Medicine* 22:317-322.

Manaloto, C.R., C.G. Hayes, L.P. Padre, et al. 1990. Sexual behavior of Filipino female prostitutes after diagnosis of HIV infection. *Southeast Asian Journal of Tropical Medicine* 21:301-305.

Mason, Karen Oppenheim, with the assistance of Amy Cardamone, Jill Holdren, and Leah Retherford. 1995. 20 pp. Is the situation of women in Asia improving or deteriorating? *ASIA-Pacific Population Research Reports* 6, September.

Monzon, O. and M.T. Bagasao. 1991. Inadequacy of condom use history in assessing risky sexual practices. *International Conference on AIDS June 16-21 1991* 7,1:403.

Pernito, V. 1993. Women and AIDS. *International Conference on AIDS June 6-11* 9,2:829.

Philippines National Statistics Office and Macro International. 1994a. *National Demographic Survey 1993*. Manila and Calverton MD.

Philippines National Statistics Office and Macro International. 1994b. *National Safe Motherhood Survey 1993*. Manila and Calverton MD.

Philipson, Tomas and Richard A. Posner. 1995. On the microeconomics of AIDS in Africa. *Population and Development Review* 21:835-848.

Rodriguez, Luz L. 1990. Patriarchy and women's subordination in the Philippines. *Review of Women's Studies* 1:15-25.

Sittitrai, W., P. Phanuphak, J. Barry and T. Brown. 1992. *Sexual Behavior and Risk of HIV Infection: A Report of the 1990 Survey of Partner Relations and Risk of HIV Infection in Thailand*. Bangkok: Program on AIDS, Thai Red Cross.

Sobritchea, Carolyn. 1990. The ideology of female domesticity: its impact on the status of Filipino women. *Review of Women's Studies* 1:26-43.

Solon, O. and A.O. Barrozo. 1993. Overseas contract workers and the economic consequences of HIV and AIDS in the Philippines. Pp. 111-134 in *Economic Implications of AIDS in Asia*, ed. D.E. Bloom and J. Lyons. New Delhi: UNDP.

Tan, Michael. 1990. Synthesis of an AIDS KAP survey among sentinel groups in Metro Manila. Report to AIDSCOM Project and Department of Health, Manila.

Tan, Michael L. 1993a. Socioeconomic impact of HIV/AIDS in the Philippines. *AIDS Care* 5:283-288.

Tan, Michael L. 1993b. An analysis of the data from the Library Foundation's workshop surveys. Mimeo.

Tan, Michael L. 1994. *A Review of Social and Behavioral Studies Related to HIV/AIDS in the Philippines*. Manila: Health Action Information Network.

Tan, Michael L. and Manuel M. Dayrit. 1994. HIV/AIDS in the Philippines. *AIDS* 8 (supplement):s125-s130.

Van de Ven, Wynand P. M. M. and Bernard M. S. van Praag. 1981. The demand for deductibles in private health insurance: a probit model with sample selection. *Journal of Econometrics* 17,2:229-252.