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The Mass Media and HIV/AIDS Prevention in Ghana

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Abstract

The study uses logistic regression to examine how exposure to HIV/AIDS information in the mass media influences knowledge of the disease and risk behaviours in Ghana, a West African country at a relatively early stage of the epidemic. It finds that mass media exposure increases awareness of partner fidelity, condom use and avoidance of parenteral threats as ways of preventing infection and promotes condom use and partner fidelity as likely behavioural responses to the epidemic. Exposure to multiple channels reinforces media messages about safe sex and HIV/AIDS. Radio media seem to be the most powerful sources of information about the epidemic. They reach more people than television and print media and have larger effects on individuals' knowledge base and behaviour. However, the mass media influence has limits. Mass media exposure has no impacts on awareness and interest in abstinence and avoidance of commercial sex which means that they fail to address the needs of the poor women and the young who are the core sources of infection in the Ghanaian epidemic. I speculate that the structure of mass media effects observed may suggest that the national response to the campaign has been driven as much by political exigencies as by the logic of epidemiology.

Keywords: HIV/AIDS, STDs, public health campaigns, mass media, Africa

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As they are relatively cheap and can be used to reach large groups of people quickly, agencies involved in the fight against HIV/AIDS on the African continent have made considerable use of the mass media. As components of information, education and communication (IE&C) and social marketing campaigns, governments and nongovernmental organizations have used them to disseminate information about HIV/AIDS, reduce misinformation and induce behavioural changes that would protect against infection. For that reason, there has been considerable research interest in documenting the effectiveness of using mass media in health campaigns. However, much of the available research has dealt with countries and populations with very advanced forms of the epidemic. Although the research tells us a great deal about how effectively public health officials can use mass media in those contexts, it is unclear if their results can be generalized to societies at earlier stages of the epidemic. To help address that limitation in the existing research, this study examines the contributions of mass media exposure to enhancing knowledge of HIV/AIDS and changing risky behaviours in Ghana, a West African country at an early stage of the epidemic. The study assesses the breadth of the mass media's impact with a wide array of indicators of knowledge of HIV/AIDS prevention and behavioural responses.

Ghanaian HIV/AIDS Context

Ghana has an estimated HIV/AIDS prevalence rate of about 4% which, although well below the average levels for Africa, is said to be rising and to have the potential for evolving into a full-blown epidemic unless checked (UNAIDS and WHO 2000). Sero-surveillance data have established that heterosexual activities involving commercial sex workers and the young are playing key roles in fuelling the spread of the disease. Data for 1993 show that about 60% of AIDS and HIV seropositivity cases were females suspected of involvement in the commercial sex industry. A sero-prevalence survey undertaken in 1997 among sex workers in Accra revealed that 73% of them were infected (Awusabo-Asare, Anarfi and Agyeman 1993; UNAIDS and WHO 2000). Other data show the vast majority of infections occurring among teenage women and men in their 20s (Anarfi 2000; Caldwell 1999).

The Ghana government's response to the crisis was very early, initiated even before the first local cases of AIDS were discovered. The government acknowledged the potential public health threats posed by the disease and set up institutional structures within the national and local level health care system to formulate and implement strategies aimed at containing the epidemic. The Ministry of Health set up a National Technical Committee on AIDS and a National AIDS/STD Control Program and established district AIDS committees within the primary health care structure. Information, Education and Communication (IE&C) campaigns began in earnest late 1994 with a three month multimedia campaign based on television and radio spot advertisements and print media aimed at promoting partner fidelity, condom use and AIDS discussions. Since then the national program has worked hard to expand IE&C initiatives and has obtained financial and technical assistance from the international community (National AIDS/STI Control Programme 2001).

Despite its promptness, the program has had many problems. For instance, some analysts have pointed out that the early national response focused too exclusively on the medical aspects of the problem and on disseminating information about parenteral threats infection by blood transfusion, injections, infected needles and blades to the neglect of its behavioural aspects. They argue that too much attention was devoted to maintaining a safe blood supply and ensuring safe use of needles than to using public information campaigns to change attitudes and behaviors (USAID/Ghana 2003). When after 1993, the HIV/AIDS Information, Education and Communication (IEC) programme was expanded to accommodate more closely the local dynamics of the disease, other analysts claim that the focus was still on promoting condom use, HIV/AIDS discussion and fidelity, thereby neglecting the fact that sources of highest risk were outside the context of stable relationships (The World Bank 2000).

The institutional aspects of the Ghanaian HIV/AIDS effort have also had problems. In the early days of the crisis, the effort was limited by a lack of knowledge about the local dynamics of the epidemic as HIV/AIDS surveillance data before 1994 were available only for one major city. Since then the surveillance system has been expanded to cover all the major regions and more data are available on the potential threat to the entire country (UNAIDS and WHO 2000). Other problems at the institutional level emanated from a lack of co-ordination

among the large number of stake holders involved. There have been funding problems as available monies have turned out to be inadequate and procedures for obtaining them too cumbersome. The absence of a national IE&C policy or strategy on HIV/AIDS has also meant that many efforts were designed by the various agencies involved and thus tended to focus only on particular high risk groups that those agencies were involved with. There were thus major gaps in the intensity, geographical coverage and continuity of IE&C effort (Republic of Ghana 2001).

Limits in the Ghanaian IE&C effort suggest that we will observe gaps in the effort and weaknesses in the relationship of Ghanaians knowledge of the disease and their exposure to information in the mass media. By examining the relationship between mass media exposure and knowledge of HIV/AIDS prevention, this study can help show which aspects of HIV/AIDS information have been conveyed well in the mass media and which have not. That kind of information will be useful as Ghana continues to refine its effort to combat HIV/AIDS.

Ghana is a good setting for examining the relationship between the mass media exposure and HIV/AIDS knowledge. Even though a very poor country, the population has considerable access to mass media. There are three government owned television stations and more than 40 radio stations. The 1998 DHS data shows that 55% of women and 59 % of men lived in households with radios while 24% of women and 23 % of men lived in households with televisions. Eighteen percent of women and 38% of men claimed to read newspapers every week.. Forty-seven percent of women and 52% of men watched television every week while 57 % of women and 76 % of men listen to radio every day (Ghana Statistical Services and Macroint 1999).

Review of Mass Media and Health Behaviour Literature

How and why mass media communications influence behaviour is the subject of some theoretical debate. Rationalist models usually claim that use of the mass media in health campaigns is most effective when it enhances the problem solving capabilities of individuals by providing information (Guizzardi et al. 1997). Modernist theories argue the mass media's influences are enhanced when the messages they convey are associated with the symbols of westernization, modernity and consumerism (Faria and Potter 1999). For interactionist theories, the mass media's persuasive powers lie in their ability to provide social support, and the interact ional and training components necessary to sustain behavioural change (Piotrow cited in Awusabo-Asare 1995; Lamptey and Coates 1994).

There is also some debate about which types of mass media are most effective for use by in developing societies for public health campaigns. The consensus is that the radio might be the most effective mass media weapon. Arguments in support of the radio point out that its use of oral communication reduces access barriers arising from illiteracy. Low production costs for radio transmission and programming and the radio receiver's affordability and portability also enhance radio media's ability to penetrate poor societies. The television is also expected to be a powerful medium because it overcomes problems of illiteracy in part because its visual images support vicarious interaction and consumption. But the high costs of television transmission and programming and the television set's expense and limited portability restrict access and relevance to elite and urban groups. Print media have some visual appeal but they are disadvantaged by their limited interactive power, the huge demands made on literacy, and their high production costs. Print media may be the most limited of the three major mass media in developing country settings as mechanisms for transmitting public health information (Faria and Potter 1999).

Although existing theoretical debates indicate that it is not yet clear how they do so, there is considerable empirical evidence showing that the mass media can be used to influence health related ideas and behaviour. Pre and post studies of mass media campaigns represent the most reliable documentation of these effects (Westoff and Rodriguez 1995). Examples of these studies come from Yoder et al. (1996) who find that an AIDS radio drama in Zambia increased assessment of risk, knowledge about AIDS transmission and condom use. Vaughan et al. (2000) have also shown that a radio entertainment program in Tanzania reduced partner numbers and increased condom use. Other pre and post studies report that mass communication systems have positive effects on condom use and/or abstinence in Zimbabwe, Zambia, Uganda and South Africa (Kim et al. 2001; Lewicky et al. 1998; Scheepers 2001; Underwood 2001). In the area of family planning and fertility, Piotrow et al. (1990), Piotrow et al. (1992) and Hindin et al. (1984) have found that mass media exposure increased contraceptive use in Nigeria, Zimbabwe and Ghana.

Cross-sectional studies are another approach to examining mass media effects on behaviour. Most available cross-sectional studies in the African context suggest that mass media can have strong effects on a

variety of health related behaviours even with controls for life cycle, socioeconomic and residential covariates. For HIV/AIDS related behaviours, Cleland's (1995) analyses of the WHO/GPA surveys in the nine hardest hit African countries found that mass media exposure and education were the most important predictors of AIDS awareness and risk behaviour. Gregson et al. (1998) also found that media exposure was a major predictor of AIDS awareness in rural Zimbabwe. In Tanzania, Agha (2002) discovered that mass media exposure significantly increased intentions to use female condoms by first increasing the likelihood that a man or woman would discuss use of the female condom with a partner. In the area of family planning, Westoff and Rodriguez (1995) and Westoff (1999) have shown strong mass media impacts on contraceptive use and family size preferences in Nigeria, Peru, Indonesia and Kenya. Other cross-sectional studies have also demonstrated influences on child immunization, oral dehydration and artificial infant feeding practices (Cohen and Trussell 1996).

A number of studies allow comparisons of elements of mass media campaigns. In Zimbabwe, Kim et al.'s (2001) pre and post analyses found that in a communication campaign to encourage youth to "say no" to sex, launch events, leaflets and dramas had greater reach than components of the campaign that relied on newsletters, radio programs, peer educators and a hot line. Agha's cross-sectional study (2002) found that peer educators and providers had less coverage but stronger impacts on an individual's intention to use the female condom than the mass media. Benefo and Takyi's cross-sectional research (2003) also showed that mass media effects on AIDS related knowledge and behaviour in Ghana were larger than those of interpersonally based communicative channels.

Even though some studies are available for African countries at early stages of the epidemic, most research on mass media effects on HIV/AIDS related behavior has been conducted in Eastern, Central and Southern African areas where the disease is greatly advanced (Cohen and Trussell 1996). The support provided by those studies for the mass media's effectiveness is thus consistent with the experience of using low-cost information based interventions in high risk populations such as gay and intravenous drug use communities in the Western world as well as commercial sex workers in the developing world. In such populations, the impact of the disease was quite formidable and obvious and there was considerable social support for transforming behavior. It is thus not surprising that among such populations the provision of information through the mass media generated tremendous changes in behavior in relatively short periods of time (King 1999). What is not clear however, is whether the results generated for populations ravaged by HIV/AIDS can be generalized to those parts of Africa or to populations at earlier stages of the pandemic where the impact of the disease is not so obvious or readily apparent and where there is not much social support for safe sexual practices. This study attempts to extend the literature by examining mass media impacts in Ghana, a country still at an early stage of the epidemic.

The study uses cross-sectional survey data to examine the mass media's impact on a broad array of the types of knowledge that Ghanaians have of HIV/AIDS and on their risk behaviours. Cross-sectional estimates of mass media effects may be upwardly biased because their measures of mass media exposure are potentially endogenous to health seeking behaviour (Reed, Briere and Casterline 1999)[i]. Notwithstanding that difficulty, because they do not have to be timed close to any health interventions, cross-sectional surveys have the advantage that they can produce estimates of the long term effects of mass media campaigns. In contrast, when the time interval between intervention and pre and post studies is lengthy, observed changes between studies cannot be reliably assigned to specific causes (Yoder et al. 1996)[ii]. Consequently, pre and post studies have to be implemented close to the interventions whose effects they seek to measure, a restriction which means that such studies are better at assessing short term impacts rather than long term effects.

Data, Variables and Measures

Data used for the study come from the 1998 Ghana Demographic and Health survey, a nationally representative probability sample of 4,843 women between the ages 15-49 and 1,546 men aged 15 to 59 (Ghana Statistical Services and Macroint Inc. 1999). The study sample included only 95% of the sampled women and 99% of the sampled men who had heard of AIDS. The data are excellent for this kind of analysis. They were collected about five years after the Ghana Government began AIDS Information, Education and Communication (IE&C) in earnest, and are thus appropriately situated to assess the role of the mass media in these efforts. The survey comes with a large number of variables for the comprehensive measurement of mass media exposure, knowledge of HIV/AIDS prevention and risk behaviours. Attempts to assess the quality of data like those used here have concluded that they are very useful for exploring the knowledge and belief dimensions of the crisis

although they may be relatively weak when it comes to behavioural issues (Cleland 1995; Gregson et al. 1998)[iii].

Responses to two survey questions were used to develop measures of HIV/AIDS prevention knowledge and behavioural response. The measures for AIDS preventive knowledge come from responses to the question *Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS? What are they?* There were six responses indicating awareness of plausible ways in which infection could be avoided. These were sexual abstinence, condom use, partner fidelity (restricting sex to one partner), avoiding commercial sex services, avoiding same sex activity and avoiding parenteral threats. Respondents obtained the value of "1" on the measure for each method they identified. If they failed to mention the method they earned the value "0" for the associated measure. Another survey question - *Has your knowledge of AIDS influenced or changed your decisions about having sex or your sexual behaviour? If yes, how?* was used to construct six binary measures of the behavioural responses made to the AIDS epidemic. Answers to the question included "abstinence (stopped all sex)", "delayed starting sex", "condom use", "partner fidelity (restricted sex to one partner, reduced partner numbers)", "stopped commercial sex" and "reduced homosexual activities".

Responses to the survey question on behaviour are complex. As others have pointed out, they are probably not literal statements of behaviours already undertaken. But they are also not mere restatements of AIDS prevention knowledge. Instead, they appear to represent respondents' perceptions about actions that are socially acceptable as well as desirable and feasible given individual circumstances and they provide useful information about likely behavioural responses to the disease (Cleland 1995). In the case of the Ghana Demographic and Health Survey, there is considerable inconsistency between information on recent sexual activities collected in the marriage and fertility sections of the survey and the self reports produced by the behaviour question, an indication that the behaviour responses cannot be used as literal statements about behavioural changes that had already taken place[iv]. As with similar survey data collected elsewhere, these Ghanaian data on behavioural reactions to the epidemic are best seen as expressions of likely behavioural responses.

Two measures of mass media exposure were used in this study. One, the number of mass media identified by respondents as important sources of HIV/AIDS information is a measure of overall mass media exposure. The second measure, type of mass media identified as a source of HIV/AIDS information, allows the study to compare the relative effects of radio media exposure to those of exposure to television and print media on HIV/AIDS knowledge and behavioural response. The appendix has information about the control variables used in the multivariate analysis. The controls include a measure of dependence on interpersonal communicative channels for AIDS information that was constructed from responses to the survey question about sources of AIDS information and referred to all who relied on friends & relatives, health workers and community institutions for information[v]. Other controls reflected personal, social structural, cultural and contextual impediments to health knowledge and healthy behaviour (Caldwell et al. 1989). These variables were current urban residence, city childhood, education, marital status, occupation, religious denomination, ethnicity, age, children ever born, electrification of home, ownership of radio and television, frequency of exposure to television, radio and newspapers.

Preliminary Analysis

This section presents a preliminary analysis of mass media impacts on HIV/AIDS prevention knowledge. It starts with a discussion of the breadth of Ghanaian HIV/AIDS preventive knowledge and behavioural responses and ends by examining the role of the mass media in disseminating HIV/AIDS information. Table 1 presents the descriptive information.

Table 1. HIV/AIDS Knowledge, Behavioral Responses, and Sources of Information: 1998 Ghana			
A. HIV/AIDS Prevention Knowledge		% Female	% Male
	Average Number of plausible prevention methods known	1.03	1.26
	Partner Fidelity	62.1	61.1
	Condom use	21.1	38.6
	Abstinence	6.4	8.6
	Avoid commercial sex	12.9	17.6
	Avoid homosexual activity	1.2	1.1
	Avoid parenteral threats	31.1	32.4
B. HIVAIDS Behavioral Responses			
	Fidelity	57.3	58.3
	Started condom use	6.4	13.3
	Did not start sex	8.09	14.02
	Abstained	3.97	4.94
	Avoided commercial sex	2.5	4.9
	Reduced homosexual activity	0.35	0.39
C. General HIV/AIDS knowledge			
	Knows about asymptomatic characteristics	72.4	79.3
	Knows about perinatal transmission	86.4	87
	Knows HIV/AIDS can be transmitted at birth	81.6	83
	Knows HIV/AIDS can be transmitted by breast-feeding	79.1	76.8
	Knows that HIV/AIDS can be avoided	78.2	86.7
	Knows implausible prevention methods	4.1	3.9
D. Number of Mass Media Sources of HIV/AIDS Information			
	None	22.7	15.7
	One sources	37.6	33.8
	Two sources	32.82	33
	Three sources	6.9	17.5
	Total	100	100
E. Type of Source of Information About HIV/AIDS			
	Mass Media Sources	76.95	83.94
	a. Radio media	72.71	80.76
	b. T.V./Cinema	41.43	48.09
	c. Print media	11.14	27.01
	Interpersonal Communicative Channels	77.5	72.8
Total Sample Size		4584	1518

The data in panel A reveal marked gaps in the average Ghanaian's prevention knowledge. Out of the six plausible preventive methods considered in this study, the average woman and man knew only of one method. Restricting sex to one partner was reported by more than 60% of women and men, condom use was reported by 21% of women and 39% of men while avoiding parenteral threats was reported by about 30% of women and men. In contrast, avoiding commercial sex was reported by only 13% of women and 18% of men and abstinence was reported by 6% of women and 9% of men as ways in which infection could be avoided. Avoiding homosexual activity was reported by only 1.2% of females and 1.1% of males.

The behaviour data in the second panel of Table 1 show the same skew ness as the distribution of prevention knowledge. Bearing in mind that these data tell us more about likely behavioural responses than about past actions, we can see that limiting sex to one partner is seen by most people in this population as the most

feasible response to the epidemic. Fifty-seven percent of women and 58% of men claim to have made that change in their behaviour. Six percent of women and 14% of men report starting condom use. Two percent of the women and 5% of the men claim to have stopped patronizing commercial sex services and 3.9% of women and 4.9% of men have abstained from sex. Eight percent of women and 14% of men claim to have delayed starting sex. A third of a percent of respondents have stayed away from homosexual activities.

HIV/AIDS prevention knowledge is clearly very limited in Ghana and the behaviour data show that perceptions about what preventive actions are feasible or likely also are very restricted. Despite the apparent limits suggested by the data on prevention and behaviour, other information presented in the panel C of table 1 shows that this population is very knowledgeable about the intricate dynamics of AIDS. More than 70% of respondents understand the disease's asymptomatic character. Almost 90% know about perinatal transmission. Of these, 81.6% of women and 83% of men know that women with HIV/AIDS could have babies with the disease while 79.1% of women and 76.8% of men know that a woman could pass the virus onto a child through her breast milk Seventy-eight percent of women and almost 87% of men in the sample are aware that infection can be avoided. Only 3% of sample members make statements indicating belief in unsubstantiated sources of HIV/AIDS transmission (measured by the percent of respondents who mentioned avoiding kissing, mosquito bites and seeking the protection of traditional healers as ways of avoiding infection).

Clearly, even though Ghanaians have had widespread exposure to HIV/AIDS information, their knowledge of how to prevent infection is heavily constrained and for that reason their perceptions of what behavioural responses are feasible and likely also restricted. The limited knowledge of threats from commercial sex work and the preventive potential of abstinence or delaying sex is especially notable because it ignores the core high risk activities and groups in the Ghanaian context - commercial sex workers and the young. The question for this study is how exposure to HIV/AIDS information in the mass media has shaped Ghanaians' understanding of the disease? To begin an answer to that question, I first examine how important mass media exposure has been as a source of HIV/AIDS knowledge.

Data in Panels D and E of Table 1 show that the mass media have been very important sources of HIV/AIDS information for this population. Panel D shows that almost 7% of women and 17.5% of men claimed that all three mass media were important sources of information while about 30% claimed that two mass media were important sources of information. A little more than 30% of men and women identified only one mass medium as an important source of information. In panel E, radio was most often mentioned as an important source of information. Seventy-two percent of women and 80% of men mentioned the radio while 41% of the women and 48% of the men reported televisions as important sources of information. Print media have played a relatively limited role in Ghana as IEC mechanisms with only 11% of women and 27% of men identifying them as important sources of information. Panel E also shows that over 70% of respondents mentioned interpersonal sources as their most important sources of information.

The important role of mass media in diffusing information about HIV/AIDS suggests that they may have contributed to improving prevention knowledge among Ghanaians. To identify which aspects of prevention knowledge they have been important for and which they have not, I need to examine how exposure to HIV/AIDS information in the mass media has affected Ghanaian's prevention knowledge and behavioural responses within a framework that controls for the influences of interpersonal sources of HIV/AIDS information and the life cycle and socio-demographic background variables known to influence health attitudes and behaviour. In the next section I use logistic regression to further explore the relationship between exposure to HIV/AIDs information in the mass media and individuals' AIDS prevention knowledge and behavioural response.

Logistic Regression

1. Analytical Technique

Logistic regression analysis is used because all the dependent variables are binary. Logistic regressions, depicted generally as, $\text{Log}(Pi/1-Pi) = a + b\,jX\,j$, model the log of the odds that observation i will know or adopt a particular AIDS preventive method (Pi) relative to not knowing or adopting that method (1 - Pi) as a function of a vector of independent variables, Xj, and a matrix of unknown regression coefficients, a and bj. Maximum likelihood procedures were used to estimate the unknown regression parameters. The results of the analyses are presented in the next two sections. The prevention knowledge variable - avoiding same sex activity - and the behavioural response variable - reduced homosexual activities - are excluded from the multivariate analyses

because they had too few cases.

2. Logistic Results for Mass Media Exposure Effects

The first set of analyses examines the effects of overall mass media exposure. The results shown in Table 2 are the predicted knowledge levels and behavioural responses. They were obtained by assigning simulated values to the mass media variable and then predicting the probability of HIV/AIDS knowledge or behavioural response using the estimated model coefficients for all variables and actual data for all variables except the simulated variable. The predicted results were then averaged across the sample to obtain a simulated prediction of HIV/AIDS knowledge level or behavioural response. The results come from equations with the mass media variables and other control variables.

The results in Table 2 show that the effects of mass media exposure vary considerably with type of HIV/AIDS knowledge and behavioural response. In panel A where the results for HIV/AIDS prevention knowledge are presented, the chi square statistics reveal that mass media exposure is significantly associated with awareness of the prevention potential of condoms, partner fidelity and avoiding parenteral threats for both sexes and with avoid commercial sex in the women's sample. In contrast, in both male and female samples, mass media exposure has no influence on awareness that abstinence can prevent infection. It also has no influence on awareness of avoiding commercial sex for the male sample.

Exposure to information through even one mass media source is enough to generate substantial increases in some types of prevention awareness. For instance, there is a 15 % increase in the chance that a respondent who has had exposure to one mass media source will report partner fidelity as a way of preventing infection. This increase is about 10% for condom use, 8 to 15% for parenteral threats and about 3% for avoiding commercial sex among women. On the other hand, mass media exposure increases knowledge of abstinence by a percent or less in both male and female samples. Among men also, avoid commercial sex has a very weak relationship with mass media exposure.

Another result revealed in the table is that multiple mass media channels reinforce messages. For instance, respondents claiming three mass media as important sources of information are 10% more likely to report partner fidelity as a prevention method than those identifying only one source as important. The added advantage provided by three mass media sources is about 20% for condom use and avoiding parenteral threats and about 4% for the female sample's reports of commercial sex.

Table 2. Adjusted Predicted Percentages of AIDS Knowledge Levels and Behavioral Responses by Number of Mass Media Outlets

		Number of Mass Media Outlets				
		None	One Source	Two Sources	Three Sources	Chi-square Statistic (3 d.f)
A. HIV/AIDS knowledge Levels						
Partner fidelity						
	Female	48.2	62.7	71.3	70.49	88.83***
	Male	44.1	60.2	67.4	69.2	26.26***
Condom use						
	Female	8.9	18.1	27.4	37.6	105.1***
	Male	17.1	34.9	44.7	53	43.7***
Abstinence						
	Female	5.4	6.1	6.6	8.44	3.1
	Male	5.8	5.9	9.1	12.2	4.6
Avoid commercial sex						
	Female	9.8	13.2	16.1	17	14.39***
	Male	17.4	20.7	15.6	13	5.3
Avoid parenteral threats						
	Female	15.1	30.2	38.4	52.5	137.3***
	Male	20	28.7	35.5	47	26.5***
B. Behavioral Responses						
Partner fidelity						
	Female	41.2	60.3	65.4	59.4	115.27***
	Male	41.8	56.9	60.5	53.4	21.27***
Started condom use						
	Female	2	5.1	10.2	16.3	58.46***
	Male	4.1	11.1	18.3	25.2	29.4***
Did not start sex						
	Female	9.7	7.9	7.4	7.7	5.28
	Male	15.6	14.3	12.3	14.6	2.33
Abstained						
	Female	3.6	3.9	4.3	3.5	0.97
	Male	2.4	5.4	5.4	5.7	3.5
Avoided commercial sex						
	Female	1.7	2.7	4.2	4.6	8.45**
	Male	5.6	5.3	3.5	5.5	1.52

**p < .05; *** p < .01

Adjusted percentages control for current urban residence, city childhood, marital Status, religious denomination, ethnicity, age, years of schooling, children ever Born, home electrification, ownership of TV. and radio, occupation, intensity of Exposure to mass media and exposure to AIDS information through interpersonal Communicative channels.

The results displayed in panel B of the table lead to roughly similar conclusions as those drawn from panel A. Just

as for knowledge of how to prevent infection, the relationships between mass media exposure and behavioural response vary across dependent variable. The chi square results show significant associations for partner fidelity, started condom use and for the female sample's reports for commercial sex but there are no relationships for did not start sex and abstinence in both male and female samples and avoid commercial sex in the male sample.

Again the differences are obvious even for those claiming that only one medium of mass communication is an important source of HIV/AIDS information. Respondents identifying one mass media source as important are 15% to 20 % more likely to report having increased fidelity than those who did report any mass medium as an important source of HIV/AIDS information. In the case of started condom use, there is an increase of about 3 % (female sample) to 7% (male sample). In the female sample, there is an increase of about 1% for avoiding commercial sex. In contrast, the small percent differences between groups with no exposure and those with one mass medium source for did not start sex, abstinence and avoid commercial sex (male sample) indicate very weak relationships.

Again there is evidence that access to information through multiple mass media channels reinforces a message and makes more respondents likely to see certain behavioural responses as feasible. In the case of partner fidelity, there is a further shift by about 5% as we go from one to two mass media sources for the samples for both sexes. After two sources, there is a decline in the percentage of respondents claiming to have increased partner fidelity. In started condom use, the shift is of the order of about 10% as we go from one to three mass media sources in both samples. In the female sample, there is an increase in those reporting that they avoid commercial sex by about 1.9% as we go from one to three mass media sources.

The analyses in this section confirm that mass media exposure has increased knowledge of prevention and made some behavioural responses come to be seen as likely. It has strongly enhanced knowledge that condom use, partner fidelity and avoiding parenteral threats can prevent infection and made condom use and partner fidelity come to be seen as likely and feasible behavioural responses to the disease. But it has had little influence on promoting knowledge of the prevention importance of avoiding commercial sex and reducing patronage among women. It has also had no impact on increasing recognition of abstinence as a protective strategy - and no effect on the behavioural response variables - avoid commercial sex (among men), did not start sex and abstinence.

The next section examines whether there are differences in the connections between HIV/AIDS knowledge and behavioural response and the types of mass media sources identified as important sources of information. Theoretical arguments discussed early on in this paper suggested that in developing country settings radio media are more effective for changing ideas and behaviour and responding to local concerns than television and print media. Preliminary analyses showed that radio media are most commonly identified as important sources of information about HIV/AIDS. In the next section, I examine the relative effects of exposure to HIV/AIDS information through the radio, television and print media and interpersonal channels on prevention knowledge and behavioural responses.

3. Logistic Results for Type of Mass Media Exposure Effects

Odds ratios are used in this section to show differences between groups in the likelihood of knowing about or reducing a risky behaviour. Ratios smaller than “1" depict negative relationships between independent and dependent variable while those larger than “1" indicate positive effects. The logistic results for type of mass media exposure effects presented in Table 3 make several important points. Firstly, the ratios in Table 3 confirm the conclusions obtained from table 2. In panel A, they reveal that the relationships between type of mass media variables and prevention knowledge vary across dependent variable. The media mass variables have much stronger effects on condom use, partner fidelity, and avoiding parenteral threats than they have on the abstinence and avoid commercial sex. In the case of condom use and avoid parenteral threats, all three type of mass media variables have significant and positive effects. In the partner fidelity equation, the print media's coefficient fails to reach significance in the equations for both sexes but the other two types have positive and significant effects. In contrast in the equations for abstinence and avoid commercial sex, only one type of mass media variable is significant and those variables attain significance only for one of the sexes.

Secondly, the results show that radio media are more important than other mass media in enhancing knowledge of HIV/AIDS prevention. Radio media exposure increases the likelihood that both women and men will correctly identify condom use, partner fidelity, and avoiding parenteral threats as prevention methods and these effects are larger than those for the other type of mass media effects. Female radio listeners are more likely

than others to be aware of the threats from commercial sex where none of the other type of mass media effects are significant. The radio effect fails to reach significance only in the abstinence equation.

Thirdly, the results in the lower panel for the mass media associations with the behavioural responses provide additional support for the main findings from the upper panel. They show that the type of mass media effects are much stronger again for certain behaviours than for others. In the case of condom use, all the type of mass media variables have significant and positive effects. In the partner fidelity equation, the print media variable fails to reach significance in the equations for both sexes while the other two mass media types have significant effects. The radio variable is the only one that is significant in they did not start sex and avoided commercial sex equations. No mass media variable is significant in the abstained equation.

There is again clear evidence in panel B of the relative importance of radio media in the fight against HIV/AIDS. Radio media have been more important than other media in inducing behavioural responses to the epidemic. The radio media's effect on inducing people to increase partner fidelity and start condom use is larger than the effects for television and print media. Radio's ability to get women to avoid commercial sex is significant whereas other mass media variables are nonsignificant in the prostitution equation. On the other hand, the radio media variable has a negative and significant coefficient in the did not start sex equation for females indicating that women who rely on the radio as a major source of information are not more likely than other women to delay sex as a protective strategy. The radio media variable also has no effects on abstinence in the two samples and on did not start sex and avoid commercial sex for men.

Another result shown in the table is that radio media may be as important as interpersonal sources in improving the HIV/AIDS knowledge base and transforming behaviour. In both panel A and B, radio and interpersonal sources are shown to have more influence on a larger number of knowledge items and behaviours than television and print. As radio and interpersonal relations are the most commonly mentioned sources of HIV/AIDS information, this result shows that both are very powerful determinants of HIV/AIDS related knowledge and behavior.

Table 3. Selected Odds Ratios for Logistic Regression of Type of Mass Media Exposure

		Type of Media Exposure				
		Radio Media	Television Media	Print Media	Interpersonal Sources	Chi-square Statistics (19 d.f)
		A. HIV/AIDS Prevention Knowledge				
Condom use						
	Female	2.19***	1.81***	1.57***	1.70***	608.48***
	Male	2.52***	1.50***	1.44***	1.23	192.94***
Partner fidelity						
	Female	1.82***	1.52***	1.06	1.59***	443.64***
	Male	2.04***	1.32	1.19	1.54***	147.67***
Abstinence						
	Female	1.23	1.09	1.23	1.15	181.13***
	Male	0.66	2.35***	1.31	1.02	96.61***
Avoid commercial sex						
	Female	1.51***	1.24	1.12	2.05***	128.31***
	Male	1.18	0.7	0.89	1.62***	69.39***
Avoid parenteral threats						
	Female	2.13***	1.56***	1.78	2.79***	563.72***
	Male	1.60***	1.50***	1.56***	2.85***	154.49***
		B. HIV/AIDS Risk Behavior				
Partner Fidelity						
	Female	2.41***	1.24**	0.82	1.18**	662.95***
	Male	2.91***	0.94	0.9	1.15	428.97***
Started condom use						
	Female	2.49***	1.98***	1.96***	2.61***	164.66***
	Male	3.67***	1.93***	1.45	2.28***	299.11***
Did not start sex						
	Female	.63***	1.03	1.03	.68**	1313.00***
	Male	0.64	1.06	1.28	0.74	546.79**
Abstained						
	Female	1.18	1.08	0.73	0.9	211.28***
	Male	1.73	1.02	1.19	0.99	68.57***
Avoided commercial sex						
	Female	1.83**	1.22	1.45	3.22***	113.35***
	Male	0.97	0.8	1.13	1.64	77.88***

** $p < .05$; *** $p < .01$

Regressions control for current urban residence, city childhood, marital status, religious denomination, ethnicity, age, years of schooling, children ever born, home electrification, ownership of t.v. and radio, occupation and intensity of exposure to mass media.

Discussion and Conclusion

In their fight against the HIV/AIDS epidemic, African governments and organizations have relied heavily on institutions of the mass media to convey information, reduce misinformation and promote transformations in risky behaviours. A number of studies have shown that the public health officials have made effective use of the mass media in those parts of Africa where the epidemic has made substantial inroads. This study extends that literature by examining whether similar effective use of the mass media has taken place in Ghana, a country still at a relatively early stage of the epidemic. It does so by looking at how exposure to HIV/AIDS information in the mass media is related to knowledge of HIV/AIDS prevention and behavioural response.

The study finds that conveying HIV/AIDS information in the mass media has done a great deal to teach Ghanaians about the disease. It has raised awareness of the importance of condom use, partner fidelity and avoiding parenteral threats and made fidelity in sexual relations and condom use come to be seen as feasible and likely behavioural responses to the epidemic. Exposure to multiple mass media channels reinforces messages about safe sex and HIV/AIDS. However, the information has failed to raise awareness of the importance of abstinence and avoiding commercial sex as protective strategies and has had only limited impact on raising interest in avoiding commercial sexual activities, abstaining or delaying sexual activities.

Of the three types of mass media considered in this study, radio is the most commonly mentioned as a major source of information. It is also a more significant source of accurate information about HIV/AIDS and a more powerful source of behaviour transformation than information propagated through television and print media. HIV/AIDS information conveyed through radio media reach as many people as information conveyed through interpersonal networks and are very effective in providing them with accurate knowledge of HIV/AIDS disease and instilling in them ideas about appropriate behavioural responses. Still, I find limitations in the effectiveness about the information conveyed through radio media in that it has not been effective in warning against the importance of avoiding prostitution and persuading Ghanaians about the role of abstinence and delayed sex as ways of preventing infection.

As a consequence of limitations in the HIV/AIDS information conveyed through the mass media, Ghanaians, although very well versed in the intricate dynamics of the HIV/AIDS disease, show marked gaps in their understanding of the mechanisms of transmission and possible behavioural responses. The vast majority of the population is aware of the general characteristics of HIV/AIDS. Many Ghanaians know that partner fidelity, condom use and avoiding parenteral threats are ways for preventing infection but few people are aware that avoiding commercial sex, abstinence and delaying sexual activity are also ways in which the spread of the virus can be contained and even fewer people entertain those options as likely behavioural responses to the disease.

The gaps in Ghanaian knowledge are extremely serious as they encompass those activities and groups at the core of the local epidemic. As was noted at the beginning of the paper, commercial sexual activities and sex among the young are the principal routes through which the epidemic is spreading through the population. Both commercial sex workers and the youth are potential reservoirs for the future explosion of the disease. Commercial sex workers are threatening because so many of them are already infected. Ghana's historically high fertility levels and low ages at sexual onset means that a large number of youth are at great risk of getting infected.

The limitations in Ghanaian knowledge and understanding of the disease are dangerous for another reason. Although there are many unresolved questions about HIV/AIDS, some recent literature indicates that in very small and clearly defined groups with highly motivated members it is possible to curb the spread of the disease by increasing condom use with few other changes in high risk behaviour (Caldwell 1999). However, in larger and more diverse populations, transformations in a broader array of high risk activities are needed for making rapid headway against the disease (Ainsworth 1998; Ainsworth and Teokul 2000; Lamptey and Coates 1994; Hearst and Hulley 1988). By this measure, the highly skewed distribution of knowledge and perceptions of likely behavioural responses indicate that the current Ghanaian HIV/AIDS effort is not set up to produce rapid gains against the spread of the epidemic.

The gaps in the distribution of knowledge and behaviour described in this paper do not seem to be unique to Ghana. Since the 1990s, large scale surveys have shown that in many areas of the African continent widespread awareness of HIV/AIDS co-exists with highly skewed detailed knowledge. The demographic and health surveys conducted during the 1990s in Tanzania, Kenya and Zambia showed that knowledge of the disease was almost universal but very few people were aware of or believed in the protection offered by condoms (Caldwell, 1999). The WHO/GPA studies of nine of the hardest hit African countries also reported that although many respondents

claimed to have reduced risky behaviours most reports involved one or two methods. For instance, over half of all the men in every one of the nine countries surveyed (and up to 90 percent in the Central African Republic and 70% in Cote d'Ivoire) reported having changed their sexual behaviour in response to the HIV/AIDS epidemic. However, most of those claims referred to reducing partner numbers. Far fewer people had implemented other critical measures like condom use, avoidance of commercial sex and abstinence (Cleland and Ferry 1995).

It is not clear what social factors account for the gaps in health communication described in this paper. We know that Ghana's IE&C efforts during the 1990s were limited in many ways and that those limits may have created the deficiencies in Ghanaian's understanding of HIV/AIDs. However, some writers also point out that political exigencies can skew the formulation of national health interventions in ways that create the kinds of gaps seen in Ghana. For instance, Ainsworth and Teokul (2000) state that political demands can confine interventions to activities with mass appeal and yet little effects on the course of epidemics while at the same time excluding high risk activities associated with marginalized and politically powerless groups and Caldwell (1999) has also suggested that governments sometimes create silences around high risk behaviours for fear of alienating the groups involved.

In the Ghanaian context, these political explanations seem plausible. Dealing with the types of sexuality currently implicated in the spread of the Ghanaian epidemic carry political risks. Commercial sexuality is stigmatized, illegal and underground. Sexual activity among adolescents also experience such strong disapproval that most of it is hidden (Bledsoe and Cohen 1993; Awusabo-Asare et al. 1999). The government faces the problem that in attempting to discuss those sexual expressions publicly it may appear to be legitimizing them. The limited political power of commercial sex workers and their clients and the young also could make it relatively easy for the government to create silences around their concerns (Caldwell 1999). Rather than confront these difficult political choices, the Ghanaian government may have preferred to focus on condom use and partner fidelity as the strategies for preventing infection, thus addressing politically powerful adult populations at the normatively accepted level of stable sexual relationships.

At this point discussion of the origins of gaps in Ghana's health communication effort must remain speculative as research beyond the scope of this paper would be required to ascertain the exact reasons why Ghanaian's understandings of HIV/AIDS exhibit the deficiencies described in this paper. However, it is hoped that designers of new IE&C initiatives will bear in mind the failures of previous attempts to educate Ghanaians about HIV/AIDS. Since the early 2000 the Ghanaian government has launched new major initiatives in the fight against HIV/AIDS. A new Ghana AIDS commission has been developed to co-ordinate the struggle on a multi-sect oral effort and a national IEC strategy is in the process of been developed. A major HIV/AIDS awareness campaign, "STOP AIDS - LOVE LIFE" was launched in February 2000 using the mass media, interpersonal programmes and grassroots activities. These initiatives are said to be increasing condom distribution and generating support among the youth for abstinence and delaying sex (USAID/Ghana 2003). It remains to be seen whether they will resolve the gaps in Ghanaian's understandings of HIV/AIDS documented in this paper.

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Appendix Table 1: Means of Control Variables		
Variables	Female	Male
% using interpersonal Communicative Channels	77.5	72.8
% Urban residence	34.2	32.3
% City childhood	17.8	13.4
% Married	71.6	57.6
Religion:		
a. % Catholic	16.4	17.5
b. % Muslim and other	18.6	22.5
c. % [Protestant]	-	-
Ethnicity:		
a. % Akan	48.5	42.1
b. % Ga-Adangbe	22.9	31.3
c. % [Other]	-	-
Age in years	29.4	31.4
Years of schooling	5.7	7.4
Children ever born	2.7	2.5
% Electrification of home	41.5	41.6
% Ownership of t.v. or radio	55.9	60.6
Occupation:		
a.% Professional	3.3	7.1
b. % Sales & service	29.4	5.1
c. % [Other]	-	-
Intensity of exposure to mass media:		
a. % Listens to radio every day	57.4	75.5
b.% Watches t.v. at least once every week	46.8	52.7
c. % Reads newspaper at least once a week	18.3	37.9
Total Sample Size	4584	1518

Endnotes

i. Instrumental variable estimation is a common solution for threats from endogeneity, but there is as yet no clear consensus among econometricians about the benefits of instrumental variable resolutions when sample sizes are small to moderate (Axinn and Barber 2001; Bound, Jaeger & Baker 1995). Even though I fail to deal satisfactorily with the problem of endogeneity, my study includes a control for sources of information about AIDS other than

the mass media. That means I am controlling for some of the sources of information that create endogeneity for the mass media exposure variable.

ii. The Yoder et al. (1996) study illuminates some of the difficulties of determining source of change in pre and post studies separated by long periods. They found an increase in knowledge about AIDS transmission and in awareness of risk both among those who claimed to have listened to the radio drama and those who had not among a population of people who owned and listened to radio. It turned out that exposure to general radio messages other than those contained in the experimental radio drama must have accounted for the general rise in AIDS knowledge in their population.

iii. Critics state that self-reports about changes in behaviour collected by surveys overestimate the amounts of change that have taken place in response to the AIDS epidemic (Caldwell et al. 1998). These critics base their claims on the fact that ethnographic data and STD and HIV prevalence rates obtained by epidemiological surveillance systems rarely confirm the behavioural trends depicted by the survey data. On the other side, defenders of surveys argue that ethnographic data and STD and HIV prevalence data themselves have problems of validity and are not indisputable benchmarks against which to evaluate surveys (Gregson et al. 1998).

iv. For instance, as many as 36% of the men who stated that they had limited sex to one partner in the AIDS section reported multiple partners in the 12 months before the survey in response to questions in the marriage and fertility section. Twenty-six percent of women and 39% of men who reported adopting condoms in response to AIDS also said that they had not used condoms in their most recent sexual episode. Fourteen percent of men who claimed to have abstained in response to the AIDS epidemic reported having had partners in the 12 months prior to the survey.

v. Community institutions include those who claimed to have relied AIDS information through the church/mosque, schools/teachers, community meetings, workplace and slogans/music.