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An Evaluation of the Effectiveness of Targeted Social Marketing to Promote Adolescent Reproductive Health in Guinea

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Abstract

This study examines the reach and impact of an adolescent reproductive health intervention in Guinea. Over a period of roughly 8 months, the program used peer education and mass media to reach youths, nested within a larger nationwide social marketing program. The results suggest that short-term youth-targeted social marketing programs (in this case eight months) may be able to improve reproductive health knowledge, but that changing behavior requires a longer intervention, and further indicate that low-budget peer educator interventions will, by definition, have a limited reach, unless they are supplemented by intensive large-scale mass media activities.

Introduction

Adolescent and Young Adult Reproductive Health in Guinea

This study examines the effectiveness of a targeted adolescent reproductive health intervention in Conakry and Kankan. The intervention aimed at increasing youths' knowledge of STD/AIDS, their knowledge and use of condoms and other modern contraceptives, and to encourage them to postpone sexual initiation and practice abstinence. The intervention used peer educators and mass media information and advertising to reach youths. Since the youth-targeted intervention was nested within a larger nationwide social marketing program, this evaluation demonstrates the effect of adding on a short, highly targeted intervention.

Data from the 1992 Demographic and Health Survey (DHS) indicate that intercourse and childbearing start at an early age in Guinea (Keita et al. 1994). The median age at first intercourse for women is 15.6 years. Over one third of women have had intercourse by the time they reach their fifteen birthday, and over eighty percent by their eighteenth birthday. Thirty-one percent of women aged 15-19 had one or more live births, and an additional 7 percent of women in this age group were pregnant at the time of the survey. Among women aged 19, 60% have at least one child, and 7% percent are pregnant. By contrast, men generally do not start having children until after age 20, or even later.

Knowledge of modern methods of contraception is poor. The 1992 DHS data only among married people aged 15-19, only 22% know a modern method of contraception, after probing. Knowledge of a method did not vary by gender. Only 7% of married women aged 15-19 knew where to obtain a modern method (Keita et al. 1994). Given that youths have very low levels of knowledge of modern contraceptives, it is not surprising that levels of use are also very low. Only 0.4 percent of married women and 0.6 percent of married men aged 15-19 report currently using a modern method. Research further shows that Guinean adolescents have high levels of abortion-related complications (Hyhazi and Diallo 1994) and maternal mortality (Cantrelle and Garenne 1991; Diallo, Sidebe and Keita 1989; Thonneau et al. 1994; Thonneau, Xu and Toure 1994).

The DHS data further indicate that as of 1992, youths' knowledge of AIDS and other sexually transmitted diseases remained poor (Keita et al 1994: 155-77). When asked which STDs they knew, only one third of young women (34%) mentioned AIDS, and only 10% mentioned one or more other STDs. Among those women who know about at least one STD, 36% did not know how STDs can be prevented. Among young men knowledge of STDs was considerably higher, with 58% spontaneously cited AIDS, and 41% other STDs. Only 9% of these men could not name a method to prevent STDs. When specifically probed about their knowledge about AIDS, 70% of young women and 85% of young men reported hearing about the disease. However, 47% of these women and 26% of these men did not know how AIDS was transmitted. Among young people who had heard about AIDS, 38% of women and 29% of men did not think there was a way to protect oneself from infection. Knowledge of condoms and condom sources was

very poor. Only 15% of young women knew about condoms and only 9% knew where to obtain them. Among young men, this is the case for 47% and 36% respectively.

Although it is reasonable to assume that the situation has improved since 1992, it is clear that Guinean youths have a large need for reproductive health information and services. Until recently, clinics were the main source of family planning services and information. This delivery system tends to be ill equipped for young people, who value discretion and anonymity when obtaining reproductive health products or services. This study examines the impact of an reproductive health program in Conakry and Kankan that specifically targets adolescents.

The OSFAM/PSI Adolescent Reproductive Health Program in Conakry and Kankan

The Conakry and Kankan Adolescent Reproductive Health program was implemented by Options Santé Familiale (OSFAM)/Population Services International (PSI). The objectives of the OSFAM/PSI adolescent reproductive health program included to increase youths' knowledge of STDs and AIDS, to increase knowledge and use of condoms and other modern contraceptives, and to increase delayed sexual initiation and sexual abstinence. The intervention was also designed to increase access to affordable condoms.

The adolescent intervention was integrated into the larger nationwide contraceptive social marketing program, which started in 1991. OSFAM/PSI tries to achieve a sustainable partnership between the private and public sector. By working with the Ministry of Health and the l'Association Guinéenne pour le Bien Etre Familiale (AGBEF), OSFAM/PSI integrates family planning and STD prevention activities into primary health care centers (Hess 1993; Population Services International 1996). The OSFAM/PSI program provides family planning information, products, and services through both public and private sector outlets. The project distributes and promotes Prudence Plus condoms, Planyl oral contraceptives, and Depo-Provera injectables. A network of over 3500 outlets, including bars, hotels, boutiques, pharmacies, supermarkets, and private clinics, ensure the availability of Prudence Plus brand condoms. Prudence Plus brand condoms are promoted through jingles broadcast on radio and television. Information about the role of condoms in preventing AIDS is further disseminated through radio call-in shows, billboards, and other media.

In Conakry and Kankan, youth-oriented activities were added to this general social marketing program.

Youth-Oriented Project Activities in Conakry and Kankan

To reach adolescents and young adults, the OSFAM/PSI program recruited and trained 36 peer educators in Conakry, and 22 in Kankan. The intervention activities in Conakry were implemented by OSFAM, while the activities in Kankan were implemented by AGBEF. As such, there were some variations in the intervention activities conducted in the two locations, even though they had the same broad objectives (OSFAM and Stat-View Association 1997: 43-45; OSFAM 1997b).

In Conakry, peer educators were selected from male and females who were active members of youth associations, or who were volunteers. An equal number of male and female peer educators were recruited. These peer educators participated in a training program from May 19- June 1, 1997. Training focused on topics related to family and STD/HIV, and on communication techniques.

Most youth-oriented activities started during the second quarter of 1997. During this period, adolescents developed the project logo, "*Mon Avenir d'Abord*" ("My Future First"). This logo was used to identify youth-friendly retail outlets where youths could purchase condoms and other contraceptives. Peer educators handed out informational materials on family planning and STD/AIDS specifically adapted for adolescents, including posters and flyers, as well as promotional materials such as T-shirts, stickers, badges, and caps. Billboards with information on family and STD/AIDS were also installed in the intervention neighborhoods (OSFAM and Stat-View Association 1997: 43-45; OSFAM 1997b: 7, 1997c: 6).

The peer educators also organized discussion groups on adolescent reproductive health issues with youths. Discussion groups were scheduled each month, for the life of the project. For example, in June 1997, peer educators held 12 sessions, reaching a total of 173 young women and 30 young men. In the 3rd quarter of 1997, 201 sessions were held,

reaching 4,361 youths; in the 4th quarter, another 205 sessions were conducted reaching 4,210 youths (OSFAM 1997c: 6, 1997d: 6). Peer educators also organized educational theater on reproductive health, as well as dances and soccer tournaments sponsored by OSFAM/PSI.

The preparation of additional adolescent-oriented materials experienced considerable delays. For example, it was not until the fourth quarter of 1997 that the adolescent flip chart and the youth "passport" sampler (designed by the adolescent project leaders) were send to the printer.

The adolescent project in Kankan was conducted under the direction of AGBEF (OSFAM and Stat-View Association 1997: 43-45; OSFAM 1997b: 7). The Kankan intervention started in August 1997 and ended in January 1998, thus covered a period of roughly six months (Sow 1999). As was the case in Conakry, peer educators in Kankan distributed informational flyers and posters. In addition, they conducted condom demonstrations using wooden penis models, and distributed free samples of contraceptives. The Kankan peer educators also organized discussion groups on reproductive health issues, and dances, athletic events, and soccer matches. This was supplemented with film presentations on reproductive health. Most of these activities were conducted at locations frequently visited by youths, including hair salons, schools, sport fields, and video clubs. In addition, community health agents provided advice to youths, and referred them to health centers when necessary.

Youth-Oriented Health Services and Distribution

Since one of the program goals was to increase use of reproductive health services by youths, local health centers were made adolescent-friendly by having certain hours of the day dedicated for seeing adolescents. A series of open-houses were conducted at clinics in order to increase consultations by adolescents. Contraceptives were made available in all health centers, all private pharmacies, as well as in bars, hotels, and in the markets (OSFAM and Stat-View Association 1997: 45; OSFAM 1997c: 6).

Data and Methods

Sample

The data for this study were collected using a pre- and post-intervention survey design in two regions, each containing both experimental sites where the intervention program was held, and control sites where no such intervention took place. The pre-intervention assessment took place during January and February 1997, and the post-intervention assessment in March 1998 (OSFAM and Stat-View Association 1997; OSFAM 1997a; Donald 1999). Given that most adolescent-oriented activities were not fully operational until the 3^{d} quarter of 1997 and that the intervention ended in February, 1998, this evaluation covers an intervention period of roughly 8 months (roughly from July 1997 through February 1998).

The sample population consists of adolescents between ages 12 and 19 in the city of Conakry and the city of Kankan. Conakry is the capital of Guinea, with a 1983 population of over 700.000 (DNSI 1989, cited in Keita et al. 1994). Kankan is located inland, in the eastern part of the country. Located in a mining area, Kankan is a large commercial center, which a large migrant population. However, even though it is Guinea's second largest city, its infrastructure is considerably more limited than that of Conakry.

Within each of these two cities, intervention and control sites were selected. Since the intervention planned on using youth organizations, the intervention sites with active youth organizations were purposively selected (Sow 1999). The criterion for selecting the control sites was that intervention and control sites should be in the same area, but geographically distant from one another. In addition, for the intervention sites preference was given to locations that had active youth associations and sports infrastructure. In Conakry, the neighborhoods ("quartiers") of Matam and Dixinn were selected as the intervention sites, and Ratoma and Kamoun as the control sites. In Kankan, the intervention sites comprise Sogbè, Kabada and Banankoroda, and the control sites include Moribaya, Boula, and Tokounou. It is important to note that the control site sin Kakan are rural, while the intervention sites are urban.

To select the sample a multistage sampling technique was used: first enumeration areas were selected, then households, and finally the individual adolescents. All enumeration areas in the intervention and control sites were included in the sample. Two households were randomly selected per enumeration area, and one adolescent per selected household was included in the sample. Enumeration areas and households were randomly chosen using list used by the Planning Department for demographic surveys. In households with more than one adolescent, one respondent was randomly selected using a random number table.

The resulting 1997 baseline survey includes 1,512 adolescents in living Conakry and 504 living in Kankan, both evenly distributed between the control and intervention sites. The 1998 follow-up survey includes 1,500 youths in Conakry (of whom 743 in the control sites and 757 in the intervention sites) and 505 in Kankan (of whom 253 in the control sites and 252 in the intervention sites). Data collection for both surveys was done by l'Association Stat-View.

It is noted that the pre- and post-intervention samples were drawn independent of one another. Since this is not a panel study, only aggregate changes in behavior of the intervention model can be examined. We assess program impact by comparing all respondents living in the intervention sites (independent of their level of exposure to the intervention) with those living in the control sites.

Measures

Theoretical model and outcome measures

The theoretical model used for this evaluation is the revised Health Belief Model (HBM). The HBM model attributes behavioral change to five factors: 1) perceived severity of sexual risks; 2) perceived susceptibility to those sexual risks; 3) perceived benefits of preventive/protective action; 4) perceived barriers to preventive action; and 5) self-efficacy (Bandura 1977; Becker 1974; Janz and Becker 1984; Mantell, DiVittis and Auerbach 1997; Rosenstock, Strecher and Becker 1988). We recognize that this is a cognitive model and that cognition does not necessarily cause behavior change. However, the components of the revised Health Belief Model closely correspond with the main focus of the intervention. Hence, an HBM-based evaluation is appropriate because it can help identify specific weaknesses in the intervention.

Outcome variables

The outcome variables in this study (see Table 1) are proxies for the various components of the model, measures of the exposure to the intervention, and measures of the actual sexual and preventive behaviors.

The intervention effect itself was operationalized using two variables: intervention status and the time of assessment. Intervention status measures whether a respondent is part of an experimental or a control site, and assessment indicates whether the respondent was interviewed during the pre-intervention (1997) or post-intervention (1998) survey.

Control variables

To compensate for differences in the composition of the different samples, the following control variables will be included: sex, age of the respondent, school enrollment status (attends school or not), type of school (none, koranic, primary, secondary, lyceum, university, technical, other); employment status (housewife, self-employed, worker, health worker, no employment, other); religion (Muslim, Catholic, Protestant, no religion, other), marital status (single, married, divorced-widowed, cohabiting, other) and number of children desired.

Table 1: List of outcome variables

Program exposure	
	Participated in program (general)
	Participated in specific activities
	Reported behavior change due to program
	Type of reported behavior changes
	Heard of Prudence Plus
Perceived severity and susceptibility of sexual risk	
	Self-assessed AIDS risk
	Sexual risk awareness index
	Awareness of specific risks of sexual activity
Perceived benefits of prevention	
	Ever heard of contraception
	Knowledge of condom for FP
	Knowledge of other forms of contraception
	Knowledge of condom for HIV prevention
Perceived barriers to prevention	
	Ever heard of contraceptives
	Reasons for not using contraceptives
	Reason respondent usually doesn't use condoms
	Reasons respondent did not use condom during last encounter
Self-efficacy	
	Discusses sexuality often
	Visited a health center in the past year
Sexual behavior	
	Sexually experienced
	Started sex by age 15 (among those aged 15+)
	Two or more sexual partners during past 4 weeks
Preventive behavior	
	Usually uses condoms
	Used condom during last sexual encounter
	Protected oneself from sexual risks by using condoms
	Bought prevention method
	Which method was bought

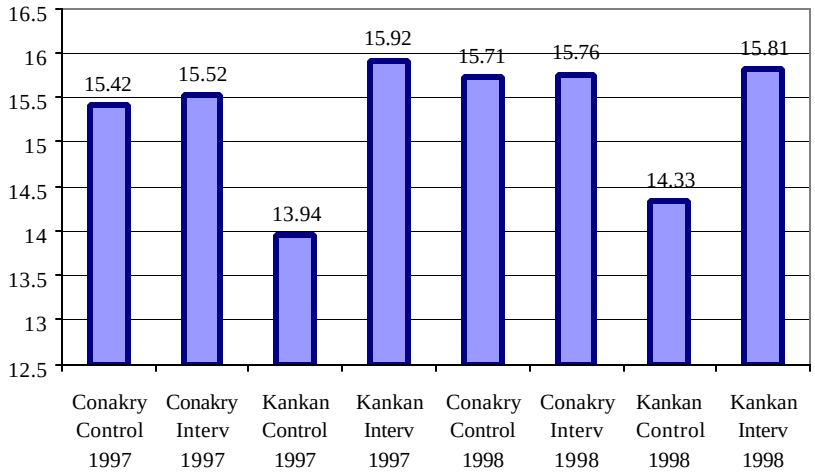
Comparability of samples

For the purpose of comparability it is preferable that the four samples are similar with respect to potentially relevant socio-demographic characteristics. However, the results indicate that there are substantial socio-demographic differences between the different groups. In particular, the Kankan control sites are substantially different from the other sites. Figure 1 shows that these respondents are significantly younger than those in the other sites (1997: $\chi^2(21) = 144.948$, $p = 0.00$; 1998: $\chi^2(21) = 482.728$, $p = 0.000$). On the average the respondents in the Kankan control sites are about 1.5 years younger than those in the other sites (see Figure 1). The Kankan control groups are also less educated than the other groups. Only 28% of them reported to be in school in 1997, while in 1998 this number had further declined to 19%. This compares poorly to the other sites where about 70% of respondents report to be in school. More than half of the respondents in the Kankan control sites say to have no education at all while a relative large number also report to have attended only Koranic schools.

The results shown in Appendix A further indicate that the Conakry sites (including both the intervention and control sites) contain a significantly higher proportion of female respondents than the Kankan sites.

Smaller but still significant differences between the groups were also found for marital status and religion. Although all sites are overwhelmingly Moslem, the Conakry control sites contain significantly more Catholics than the other sites. More than 90% of the respondents report to be still single, although this trend is slightly greater for the Conakry intervention sites than for the others.

The two regions also differ significantly in ethnic composition. Kankan is overwhelmingly Malinké, while Conakry has a mixture of ethnic groups, mainly Sosso, Peul and Malinké. However, the ethnic composition of the control and intervention groups differs substantially in Conakry.



$F(7, 4012) = 32.83$, $p = 0.000$

Figure 1 : Mean age of respondents by city and intervention status

Statistical analysis

The goal of this paper is to evaluate the effectiveness of a community based intervention program. As substantial socio-demographic differences between pre- and post-intervention assessments and between control and intervention sites were observed (see previous section), it is essential to control for these differences. Logistic regression will be used to evaluate the effects of the intervention on the components of the intervention model and the sexual and protective behaviors, after controlling for differences in age, religion, marital status, school enrollment status, type of school, ethnic group, and desired number of children. Introducing these controls resolves the problem of having samples that are not fully comparable.

As the main interest of this paper is the effectiveness of the intervention, the results of these analyses are presented as adjusted proportions. These adjusted proportions are the expected proportions of the outcome variable after controlling for differences in the background variables. Using adjusted proportions allows us to compare the indicators for the control and intervention locations at the pre- and post-intervention assessments.

The adjusted proportions are calculated from the adjusted logodds, which were calculating using the following formula:

$$\hat{y}_{ij} = a + \sum_{k=1}^{m} b_k m_k + g_A A_i + g_X X_j + g_{AX} A_i X_j$$

where $\hat{y}_{ij}$ is the estimated value for the logodds for a respondent at assessment i and intervention status j; a is the intercept for the linear model, and b_k and m_k the regression coefficient and mean for the k-th control variable, respectively. The γ-coefficients are the regression coefficients for the variables of interest, assessment and intervention status, and their interaction. The assessment variable A took a value of 0 for the 1997 assessment and a value of 1 for the 1998 assessment, while the intervention variable X took a value of 0 for the control sites and a value of 1 for the intervention sites. The effectiveness of the intervention is indicated by the interaction term between the assessment variables A and intervention site variable X. From this estimated adjusted logodds the adjusted proportion can be calculated as:

$$\hat{Y}_{ij} = e^{\frac{\hat{y}_{ij}}{1+\hat{y}_{ij}}}$$

where $\hat{Y}_{ij}$ is the adjusted proportion. z-tests based on the standard errors of the estimated logodds were performed to test the significance of observed trends in the intervention and control sites. For the continuous outcome variable, the sexual risk awareness index, adjusted means were calculated and tested in a manner analogous to the one described for the dichotomous outcome variables. To test for the significance of the intervention effect, i.e. the interaction between assessment and intervention status a χ^2-test was used. This statistics tests if the trend in the intervention sites differ significantly from the trend in the control sites.

All analyses were run separately for the Conakry and Kankan sites. However, since the results proved very similar, we ran the analyses again for both sites combined. Only the latter results are shown in this report.

Results

Program exposure

Program participation

The success of the intervention program in reaching the youth of the intervention site is evaluating using the post-intervention assessment (1998). The results presented in Figure 2 shows that 27.8% of the 1009 respondents in the intervention sites reported to have participated in the program. And although the program had not been organized in the control sites, still about 1.5% of the 996 of the respondents there also reported to have participated in the program. As shown in Figure 2 there was also a considerable gender difference in program participation. While 38.9% of the young men in the intervention sites participated, only 14.5% of young women did ($\chi^2(1) = 73.95$, $p = 0.000$). A smaller but still significant difference in participation rates in the interventions sites in Conakry and Kankan for men (36.1% vs. 46.3%, $\chi^2(1) = 4.77$, $p = 0.029$) but not for women.

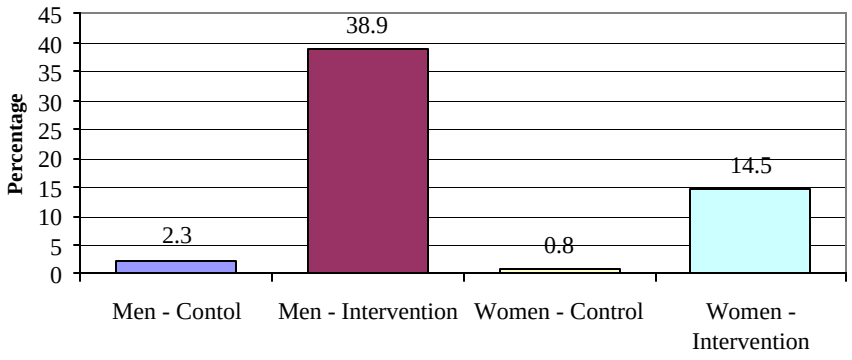


Figure 2: Program participation by intervention status and gender

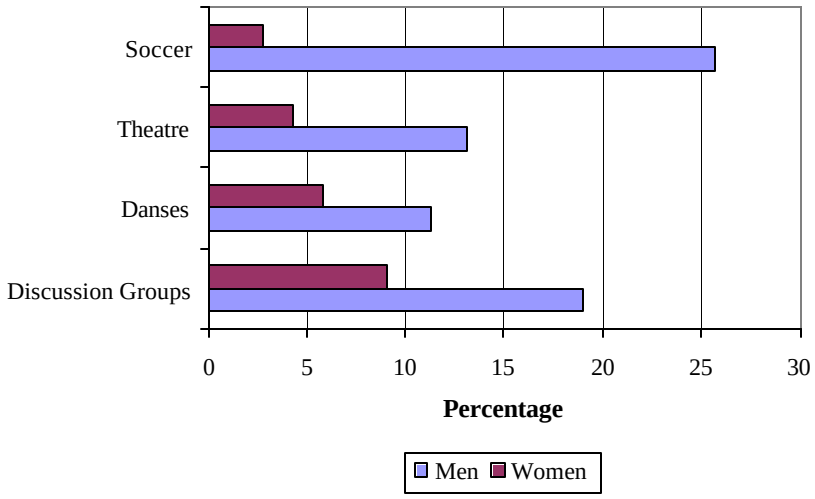


Figure 3: Participation in different types of program activities, by gender, intervention sites only

Soccer was the most popular of the program activities, 15% of the respondents in the intervention sites reported to have attended soccer games sponsored by the OSFAM/PSI program, while 14% reported participation in discussion groups, 9% attended theatre and 9% in attended the project sponsored dances. As illustrated in Figure 3 gender differences did exist for all types of program participation, with men participating significantly more men than women in all types of activities (all $p < .010$).

In sum, these findings indicate that program exposure was quite low. Moreover, among young men the project-sponsored soccer games provided the highest levels of project exposure, but such edu-tainment is less intensive than discussion groups on reproductive health. Among young women, such discussion groups are the main source of exposure to the project, but less than one in ten women had attended them.

Self-Reported Behavior changes in Response to the Program

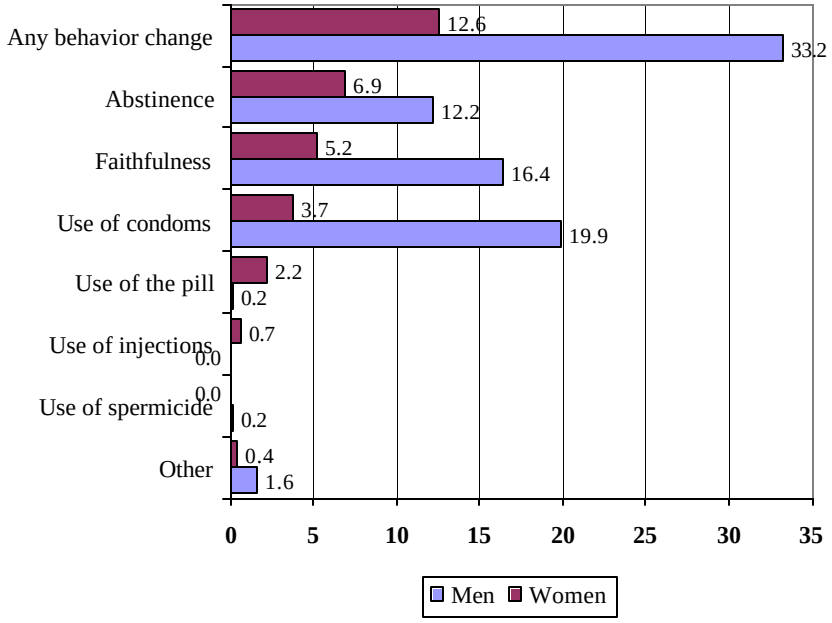


Figure 4: Reported behavior changes due to program by sex, intervention sites only

A considerable number of the 1009 respondents living in the intervention sites reported during the post-intervention interview that they did change their sexual behavior due to exposure to the intervention program (24%). The most frequently reported behavior changes were the use of condoms (13%), faithfulness (11%) and abstinence (10%), while other behavior changes were only rarely reported. Again sex differences were observed in the reported behavior changes. Men were more likely to report any behavior change ($\chi^2(1) = 58.78$, $p = 0.000$). More specifically, young men were more like to report use of condoms ($\chi^2(1) = 60.15$, $p = 0.000$), fidelity ($\chi^2(1) = 31.44$, $p = 0.000$) and abstinence ($\chi^2(1) = 7.90$, $p = 0.005$), while young women were somewhat more likely to report the use of the pill as behavior change ($\chi^2(1) = 9.16$, $p = 0.002$).

Knowledge of "Prudence Plus" condoms

Whether the intervention improved knowledge of the "Prudence Plus" was only ascertained for the Conakry sites. The results indicated that the overwhelming majority (94.5%) of the respondents in Conakry were familiar with the "Prudence Plus" condom brand. The difference observed between the intervention and control groups (see Figure 5) in familiarity with "Prudence Plus" condoms was not significant among the men ($\chi^2(1) = 3.17$, $p = 0.075$), but was significant among the women in the sample ($\chi^2(1) = 6.08$, $p = 0.014$). Women in the intervention group thus were more familiar with PP condoms than those in the control group. The observed differences in familiarity with PP condoms between men and women were also significant for both intervention ($\chi^2(1) = 5.98$, $p = 0.014$) and control ($\chi^2(1) = 8.88$, $p = 0.003$) sites. Men were more familiar with the PP condoms than women.

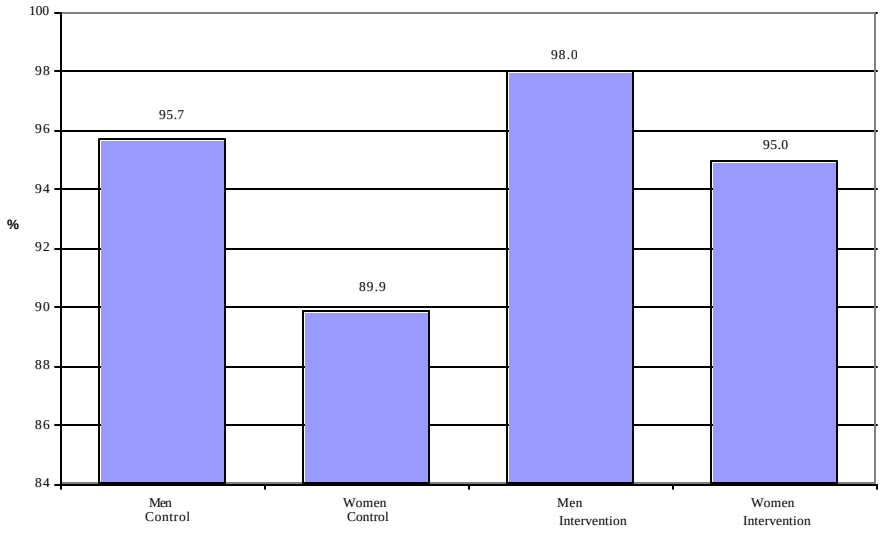


Figure 5: Proportion of respondents who had heard of "Prudence Plus" condom brand, by gender and intervention status (Conakry only, 1998)

Perceived severity and susceptibility of sexual risk

The proportion of male respondents who considered themselves at higher risk for AIDS than their peers diminished from 1997 to 1998, in both the control and intervention sites (see Table 2). However, for women no significant downward trend was observed. There is no evidence that the intervention affected young people's perception of their risk for AIDS.

Table 2: Adjusted probabilities for perceived AIDS risk, by assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
At high risk for AIDS						
Men	0.080	0.009	0.004	0.051	0.010	0.052
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 0.71$, p = 0.399		
Women	0.038	0.006	0.125	0.012	0.001	0.826
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 1.14$, p = 0.285		

Neither can we say that the intervention improved the awareness of sexual risk, as indicated by the awareness of sexual risk index[1] shown in Table 3. However, the interaction effect was contrary to what was expected. Although awareness of sexual risk increased from 1997 to 1998 in both control and intervention sites, the increase was greatest in the control sites, and by 1998 the control sites had reached the same levels of awareness as the intervention sites.

Table 3: Adjusted means for sexual risk awareness index, by assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
Sex risk awareness index						
Men	1.096	1.388	0.000	1.370	1.429	0.390
	340	388		466	547	
				Intervention effect: F(1,1718) = 11.73, p = 0.001		
Women	1.036	1.335	0.000	1.293	1.394	0.000
	387	384		518	458	
				Intervention effect: F(1,1720) = 7.78, p = 0.005		

The two best known dangers of sexual activity were the risk of STDs or AIDS and the risk of pregnancy (not shown). Overall, awareness of the risk of STD/AIDS increased from about 60% to 64%, and awareness of the risk of pregnancy increased from 45% to 60%. A significant intervention effects were found only for awareness of pregnancy as risk of sexual activity for both men ($\chi^2(1) = 28.20$, p = 0.000) and women ($\chi^2(1) = 38.01$, p = 0.000). However, this intervention effect was caused by the fact that awareness that sexual activity can lead to pregnancy in the control locations increased to the same level as in the intervention sites.

[1] The sexual risk awareness index is defined as the total number of sexual risks mentioned by the respondent (including STD/AIDS, pregnancy, school dropout, and other risks).

Perceived benefits of prevention

One of the goals of the intervention was to increase adolescents' awareness of methods of protection against unwanted pregnancies, STDs, and AIDS. The proxy indicators for the perceived benefits of prevention measure the respondents' familiarity with contraceptive methods to prevent pregnancy, and with condoms in particular, as a method to prevent both pregnancy and HIV infection. The results shown in Table 4 indicate that the intervention did not improve adolescents' perception of the benefits of prevention.

Table 4 shows that knowledge of methods of protection was much lower in the control sites than in the intervention sites at the start of the intervention period in 1997. The intervention effects for the outcome variables all indicate a catch-up effect by the control sites between 1997 and 1998. Although there also were some improvement in awareness of the protective methods in the intervention location, the improvements in the control location were significantly more rapid.

Table 4: Adjusted probabilities for the knowledge of family planning (FP) and its advantages, by sex, assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
Ever heard of contraception						
Men	0.425	0.710	0.000	0.811	0.812	0.939
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 20.86$, p = 0.000		
Women	0.346	0.522	0.000	0.667	0.641	0.003
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 12.52$, p = 0.000		
Knowledge of condoms as contraception						
Men	0.384	0.672	0.000	0.699	0.759	0.000
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 12.64$, p = 0.000		
Women	0.297	0.431	0.000	0.438	0.497	0.000
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 2.28$, p = 0.131		
Knowledge of other forms of contraception						
Men	0.131	0.160	0.288	0.238	0.287	0.130
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 0.01$, p = 0.920		
Women	0.202	0.304	0.002	0.381	0.383	0.966
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 5.41$, p = 0.020		
Knowledge of condom as means of protection against AIDS						
Men	0.446	0.641	0.000	0.747	0.745	0.942
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 10.13$, p = 0.002		
Women	0.222	0.429	0.000	0.456	0.477	0.641
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 13.54$, p = 0.000		

Perceived barriers to prevention

Table 5: Adjusted proportion of respondents who had heard of contraceptives, by assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
Has ever heard of contraceptives						
Men	0.425	0.710	0.000	0.811	0.812	0.981
	341	466		390	547	
				Intervention effect: χ^2 (1) = 20.86, p = 0.000		
Women	0.346	0.522	0.000	0.667	0.641	0.520
	387	518		385	458	
				Intervention effect: χ^2 (1) = 12.52, p = 0.000		

A major barrier to preventive behaviors is the lack of knowledge of the existence of contraceptive methods. This lack of knowledge was a major problem among Guinean adolescents, as 46% of all respondents (N=4021) had never heard of contraceptives. As shown in Table 5, the proportion of respondents in the control sites who had heard of contraceptives increased rapidly from 1997 to 1998, almost catching up with the respondents in the intervention sites. In the intervention sites, the proportion who had heard about contraceptives did not change.

Among those who had heard of contraceptives but did not use any, the most frequently mentioned reason for the non-use of any method of contraceptive is that the respondent was not sexually active (56% out of 1437). Among the sexually active in this group, as indicated in Figure 6, no clear reason exists for not using any method. The two main reasons for not using any contraceptives were "Other reasons" and "No reason", with 37% and 30% (out of 627) respectively. Other frequently mentioned reasons for not using contraceptives were that the respondent was awaiting marriage (13%), lacked information (8%), and that he or she desired a child (5%). Clear gender differences were observed ($\chi^2(6) = 40.3$, p = 0.000). Women were more likely than men to mention that they awaited marriage (16% out of 338 vs. 9% out of 289) or desired a child (9% out of 338 vs. 1% out of 289).

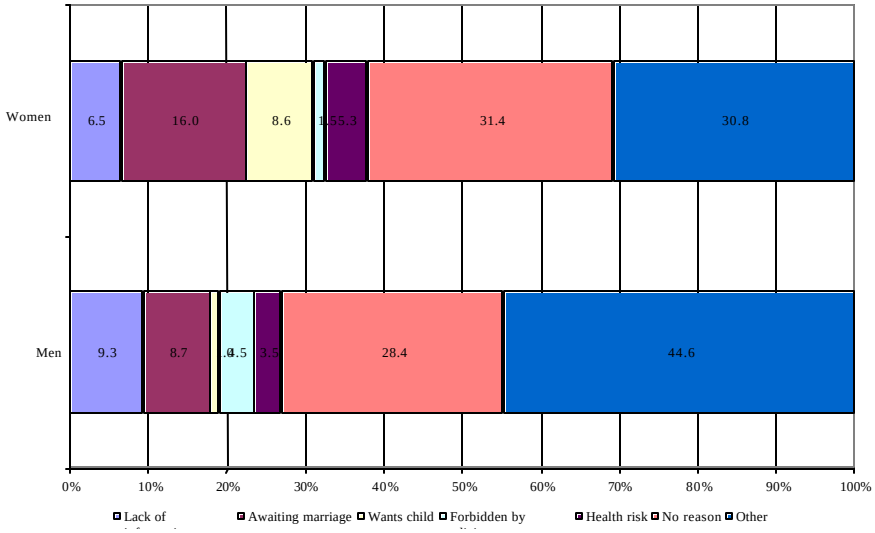


Figure 6: Reasons given for not using contraceptive methods, by sex, (only sexually active respondents who knew of contraception and did not practice any)

That most people cannot give a good reason why they don't use protection is further confirmed when the respondents were asked why they do not usually use condoms during

sex, and why they did not use them during their last sexual encounter (see Figure 7). The most common reason given was they didn't like condoms. This reason was given by 57% of the 706 respondents who said that they usually did not use condoms, and by 51% of the 802 who said they did not use a condom during their last encounter. Another important reason, mentioned by 9% of those who usually did not use condoms and by 15% of those who did not use a condom during their most recent encounter, was that condoms were not available. No significant differences in reasons provided were found by intervention status, although some differences by sex did exist. Women were less likely than men to say that they did not use condoms because they were not available, and more likely that it was because they didn't like to use them. These differences held for both the reasons why people usually didn't use condoms ($\chi^2(5) = 27.3$, $p = 0.000$) and why they didn't use them during the last encounter ($\chi^2(5) = 56.7$, $p = 0.000$).

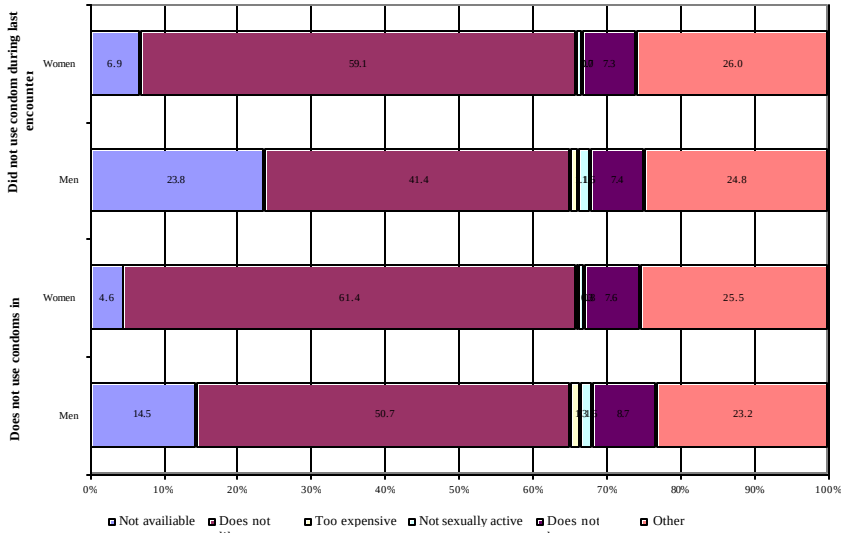


Figure 7: Reasons for not usually using condoms and for not using during last encounter, by sex (only respondents who were sexually active)

Self-efficacy

Table 6: Adjusted probabilities of having visited a health center in the past year, and of often discussing sex, by assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
Visited a health center in past year						
Men	0.329	0.397	0.000	0.394	0.422	0.000
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 0.76$, $p = 0.385$		
Women	0.423	0.390	0.000	0.367	0.431	0.000
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 3.94$, $p = 0.047$		
Discussed sex often						
Men	0.135	0.068	0.000	0.058	0.062	0.721
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 6.32$, $p = 0.012$		
Women	0.044	0.079	0.012	0.034	0.044	0.577
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 0.92$, $p = 0.336$		

Table 6 shows the adjusted proportion of respondents who visited a health center in the past year, and the proportion who report often discussing sex with someone. The results show that there is little evidence that the self-efficacy of the respondents was enhanced by the intervention. A significant intervention effect was found for visiting a health center among the women. A small but statistically significant increase in the proportion of women in the intervention sites who visited a health center during the past year was observed, compared to a slight decline of this proportion of women in the control sites who did so.

The observed intervention effect for discussing sex among men is caused by the fact that the proportion of men in the intervention group who often discuss sex remained stable, while this proportion in the control sites decreased. In the control site, this proportion decreased from 14% in 1997 to 7% in 1998, i.e., to the same level as in the intervention sites.

Sexual behavior

As shown in the first panel of Table 7, the intervention did not affect the proportion of youths who are sexually experienced. Although a slight decline in the proportion of sexually experienced young men was observed in the control sites, the rate of sexual activity among men in the intervention sites remained stable. Among women, a slight but significant decline in the proportion who are sexually experienced was observed in the intervention sites, while the control sites remained stable. However, the differences in trends between intervention and control sites were non-significant.

The data in the second panel of Table 7 show that there is a slight delay in the onset of sexual activity between 1997 and 1998 among men in the control sites, and among women in the intervention sites. However, in the intervention sites, the onset of sexual activity remains earlier than in the control sites. Twenty-six percent of the men in the control sites and 21% of the women in 1998 had been sexual active by age 15, compared to 41% and 24% of men and women in the intervention sites, respectively.

The third panel in Table 7 shows the adjusted proportion of sexually active respondents who had two or more partners during the past four weeks. There is no evidence that the intervention in Guinea lead to reductions in risky sexual behavior among the sexually active. However, the data show that these adolescents do not have high rates of sexual activity. Of the sexual active only 6.2% (82/1328) reported to have had two or more partners during the past four weeks.

Table 7: Adjusted probabilities of being sexually experienced, having become sexually active by age 15, and of having had two or more partners during the past four weeks, by assessment and intervention status

	Control			Intervention		
	1997	1998	p(trend)	1997	1998	p(trend)
Sexually experienced						
Men	0.278	0.232	0.000	0.447	0.449	0.782
	341	466		390	547	
				Intervention effect: $\chi^2(1) = 1.00$, $p = 0.317$		
Women	0.187	0.176	0.321	0.302	0.237	0.000
	387	518		385	458	
				Intervention effect: $\chi^2(1) = 0.97$, $p = 0.324$		
Onset sexual activity by age 15 or earlier						
Men	0.382	0.255	0.000	0.409	0.409	0.990
	180	209		241	327	
				Intervention effect: $\chi^2(1) = 4.29$, $p = 0.038$		
Women	0.183	0.208	0.145	0.287	0.244	0.005
	195	244		220	226	
				Intervention effect: $\chi^2(1) = 1.36$, $p = 0.244$		
Had 2 or more partners during past 4 weeks (sexually active only)						
Men	0.044	0.023	0.214	0.034	0.050	0.254
	122	127		200	274	
				Intervention effect: $\chi^2(1) = 3.05$, $p = 0.081$		
Women	0.035	0.016	0.291	0.017	0.038	0.228
	103	143		154	136	
				Intervention effect: $\chi^2(1) = 2.89$, $p = 0.089$		

Preventive behavior

Trends in preventive behavior are shown in Table 8. The results show that there is some evidence of an intervention effect on preventive behavior. The overall rate of condom use among the sexually active was very high. While the proportion of sexually active men in the control sites who usually used condoms declined significantly, in the intervention sites it increased significantly, from 53% to 65%. The difference in trends between control and intervention sites was found to be significant at $\alpha = 5\%$. However, among the sexually active women no intervention effect was found, as significant declining trends in condom use were observed for women the control as well as intervention sites. As is found in many studies, the percentage who usually use condoms is much higher among men than among women, namely 59.1% vs. 30.9% ($\chi^2(1) = 104.1$, $p = 0.000$).

Similar trends were found for the use of condoms during the last sexual encounter. Again, among the sexually active men in the intervention site the adjusted proportion reporting condom use during last sexual encounter increased from 42.5% in 1997 to 53.4% in 1998, while among the sexually active men in the control site this proportion declined from 62.3% to 50.9%. Among the women, both groups reported a decline in condom use during the last encounter, but the decline was significantly greater in the control sites than in the intervention sites.

Table 8: Adjusted proportion who usually use condoms, who used condoms during their last sexual encounter, and who use condoms as protection against sexual risks, by assessment and intervention status (only respondents who are sexually active)

	Control	Intervention

	1997	1998	P(trend)	1997	1998	p(trend)
Usually uses condoms						
Men	0.684	0.608	0.004	0.533	0.648	0.000
	122	127		201	274	
				Intervention effect: $\chi^2(1) = 5.29$, p = 0.022		
Women	0.367	0.165	0.000	0.333	0.227	0.000
	106	143		155	135	
				Intervention effect: $\chi^2(1) = 1.72$, p = 0.190		
Used condom during last sexual encounter						
Men	0.623	0.509	0.000	0.425	0.534	0.000
	122	127		201	274	
				Intervention effect: $\chi^2(1) = 7.18$, p = 0.007		
Women	0.293	0.097	0.000	0.267	0.200	0.011
	106	143		154	135	
				Intervention effect: $\chi^2(1) = 4.76$, p = 0.029		
Protected oneself from sexual risks by using condoms						
Men	0.008	0.598	0.000	0.012	0.661	0.000
	122	127		201	274	
				Intervention effect: $\chi^2(1) = 0.01$, p = 0.904		
Women	0.064	0.156	0.042	0.074	0.205	0.004
	106	144		155	136	
				Intervention effect: $\chi^2(1) = 0.12$, p = 0.731		

Respondents were also asked what they did, if anything, to protect themselves from sexual risks. Table 8 reveals a remarkable increase in the proportion of respondents protecting themselves against risks associated with sexual activity by using condoms. While in the 1997 survey only 5% of the 654 sexually active respondents mentioned using condoms with this purpose, in the 1998 survey this proportion had risen to 48% (out of 681). Although this increase is significant it does hold for both control and intervention sites.

During the 1998 survey, the respondents were also asked which forms of protection against STDs, AIDS, or unwanted pregnancies they had bought during the past seven months. 43% of the 401 sexually active men reported to have bought some form of protection, against only 16% of the 280 women ($\chi^2(1) = 53.1$, p = 0.000). As show in Figure 8 the most frequently mentioned product was 'Prudence Plus' condoms. It was mentioned by 41% of the men and 9% of the women ($\chi^2(1) = 87.3$, p = 0.000). Other condom brands were mentioned by only 3% of the men and by none of the women. Other methods of contraception were reported to have been bought by only 1% of the men and by 10% of the women ($\chi^2(1) = 31.3$, p = 0.000).

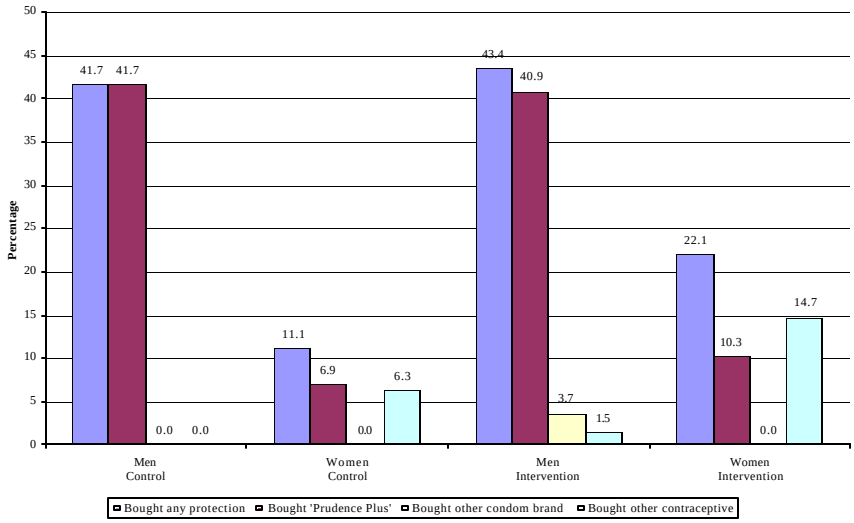


Figure 8: Proportion of respondents who bought a contraceptive during past seven months, by sex and intervention status

Discussion

This study has evaluated the reach and impact of the OSFAM/PSI adolescent reproductive health intervention that was implemented in the cities of Conakry and Kankan in 1997 and 1998. Similar adolescent-targeted social marketing interventions have recently also been conducted in urban areas in Botswana (Lobatse), South Africa (Soweto), and Cameroon (Edéa). While there are differences in the way these four interventions were implemented, they are based on similar principles.

Each of these interventions specifically targeted adolescents and young adults, and was nested within a nationwide condom social marketing program implemented by PSI or one of its affiliates. To reach adolescents, the interventions used various combinations of peer education and mass media. Depending on the program, these included radio shows and ads, specially developed posters, leaflets, stickers, T-shirts and other items. To gain youths' interest, the projects sponsored youth clubs, sports events, dances, and concerts. To make affordable condoms available to youths, the inventions distributed subsidized condoms through adolescent-friendly outlets, and sometimes through peer educators/distributors.

Despite the similarities in the intervention, their impact on adolescents' reproductive health knowledge, beliefs, and behavior, varied considerably (see Meekers, Stallworthy and Harris 1997; Meekers 1998; Van Rossem and Meekers 1999). Of the four interventions, the Guinea one clearly had the least impact. Even though the intervention significantly increased adolescents' knowledge of Prudence Plus brand condoms, there was no evidence of any impact on perceptions of HIV risk, on the benefits of prevention, on self-efficacy, or patterns of sexual behavior. Among young men, there was some evidence that the intervention increased condom use to a level comparable to that of the control sites.

These findings contrast sharply with those for the other three targeted social marketing programs. Even though the intervention in Botswana was very short, there was evidence that the intervention significantly improved youths' perceptions about risk of HIV infection, increased awareness of the benefits of abstinence and condom use, and reduced several barriers to condom use (although these effects varied for males and females). There was, however, no evidence of changes in behavior. In South Africa the intervention significantly improved awareness of the risks of pregnancy, of the benefits of condoms for family planning and STD/HIV prevention, and increased discussion about contraceptives. The South African intervention also significantly increased the percentage of youths who have used condoms, even though this improvement was not yet reflected in condom use in last intercourse. Research on the Cameroon adolescent reproductive intervention shows that it increased awareness of the risk of HIV infection, awareness of the benefits of condoms and other modern methods for family planning, discussion of sexuality and contraceptives. Because of the intervention, young women delayed the onset of sexual activity and increased condom use for family planning; men reduced their number of partners, and increasingly relied on pills, IUD and injectables for family planning.

These differences in project impact can at least partially be attributed to the fact that the Guinea adolescent reproductive intervention had much lower reach than the Botswana and Cameroon interventions (data for South Africa are not available). In Guinea, only 38% of young men and 15% of young women in the intervention sites participated in any project-organized activities. By contrast, in Botswana, 71% of men and 68% had heard about the intervention, and 41% of men and 33% of women had direct involvement in the program (Meekers, Stallworthy and Harris 1997). Likewise, in Cameroon, over 90% of all adolescents had heard about the intervention, and 66% of men and 68% of women reported having direct contact with the intervention (Van Rossem and Meekers 1999).

In part, the low reach of the Guinea adolescent reproductive health intervention can be attributed to the short duration of the intervention. Even though the funding period covered a little over one year, due to the project startup time, the intervention activities had only been operating for about 8-9 months at the time of the follow-up survey. This is similar to the duration of the intervention in Botswana (8 months), but considerably shorter than in Cameroon (13 months).

However, it is clear that the limited reach and impact of the Guinea program cannot be explained solely by the short duration of the intervention. For example, it is noteworthy that the reach of the Guinea program was much lower for women than men, while the Botswana and Cameroon interventions achieved roughly equal level of project exposure and participation for males and females.

There are also important differences in the type of participation in project activities across countries. In Guinea, where participation was low, the majority of participants only attended the project-sponsored soccer games, which do not have a strong educational component. By contrast, many Cameroonian and Batswana adolescents participated in activities that did have a strong educational component. For example, In Botswana, the most common type of project involvement was to attend project-organized educational sessions or condom demonstrations. In Cameroon, 50% of men and 44% of women attended meetings of the project-organized youth clubs, where reproductive health issues were discussed (Van Rossem and Meekers 1999).

Although it cannot be determined with certainty, it seems likely that the design of the Guinean program constrained its reach. In Botswana, South Africa and Cameroon, the interventions were all conducted in one city, while another city was selected as a control location for project evaluation. To avoid that adolescents in control locations would also be exposed to the intervention (contamination), the selected control sites were located far away from the intervention site (often several hundreds of miles). In Guinea, on the other hand, two cities were selected for the intervention. Rather than implementing the intervention throughout these cities, specific neighborhoods ("quartiers") were selected as intervention sites, while other neighborhood within the same cities were selected as control sites. Since adolescents in the control neighborhoods were not to be exposed to the intervention, the Guinea intervention had to be restricted to activities that were very localized. This implied that it was not possible to use mass media that have a large reach, such as radio, for educating youths about reproductive health issues, or for advertising upcoming project events.

These findings have important implications for program management. First, the results suggest that youth-targeted social marketing programs that have a short intervention period may be able to improve reproductive health knowledge, but that changing behavior requires a longer intervention. Second, peer educator interventions are likely to have a limited reach (and hence limited overall impact), unless they are supplemented by intensive large-scale mass media activities. The latter in turn implies that it is not effective to restrict such an intervention to specific neighborhood within a city, and that it is better to use a wide variety of approaches in order to reach all adolescents in a wider intervention location.

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Appendix A: Comparison of the socio-demographic characteristics of the respondents by city, intervention status, and assessment

	Conakry		Kankan		
	Control	Interv.	Control	Interv.	Total
Sex					
1997 survey					
N	756	755	252	253	2016
Women	57.9%	56.0%	44.1%	47.0%	54.1%
					$\chi^2(3) = 20.950$, p = 0.000
1998 survey					
N	743	757	253	252	2005
Women	56.0%	47.3%	43.5%	40.9%	49.2%
					$\chi^2(3) = 25.109$, p = 0.000
Attends school					
1997 survey					
N	756	755	252	253	2016
Yes	70.1%	70.6%	27.8%	64.0%	64.2%
					$\chi^2(3) = 170.440$, p = 0.000
1998 survey					
N	743	757	253	252	2005
Yes	72.8%	77.0%	19.0%	70.6%	67.3%
					$\chi^2(3) = 312.655$, p = 0.000
Educational attainment					
1997 survey					
N	756	755	252	253	2016
No education	13.1%	11.4%	54.8%	15.8%	18.0%
Koranic only	6.1%	6.2%	17.1%	12.7%	8.3%
Primary school	44.4%	48.2%	24.2%	45.5%	43.5%
College	28.2%	28.2%	4.0%	22.9%	24.5%
Lyceum	7.0%	5.0%	0.0%	2.8%	4.9%
University	0.4%	0.3%	0.0%	0.4%	0.3%
Technical/ Professional	0.7%	0.5%	0.0%	0.0%	0.5%
Other	0.1%	0.1%	0.0%	0.0%	0.1%
					$\chi^2(21) = 360.081$, p = 0.000
1998 survey					
N	742	757	253	252	2004
No education	14.2%	10.2%	59.3%	15.1%	18.5%
Koranic only	2.2%	1.5%	13.8%	6.8%	3.9%
Primary school	40.7%	47.2%	23.3%	43.3%	41.3%
College	34.9%	36.7%	3.6%	31.8%	31.2%
Lyceum	7.0%	4.0%	0.0%	2.4%	4.4%
University	0.1%	0.3%	0.0%	0.0%	0.2%
Technical/ Professional	0.8%	0.3%	0.0%	0.8%	0.5%
Other	0.1%	0.0%	0.0%	0.0%	0.1%
					$\chi^2(21) = 482.728$, p = 0.000

Appendix A (continued)

	Conakry		Kankan		
	Control	Interv.	Control	Interv.	Total
Religion					
1997 Survey					
N	756	754	252	253	2015
Muslim	90.9%	96.4%	96.8%	98.4%	94.6%
Catholic	8.2%	3.2%	2.0%	1.6%	4.7%
Protestant	0.7%	0.4%	0.8%	0.0%	0.5%
No religion	0.0%	0.0%	0.4%	0.0%	0.1%
Other	0.3%	0.0%	0.0%	0.0%	0.1%
					$\chi^2(12) = 46.985$, p = 0.000
1998 survey					
N	743	757	253	252	2005
Muslim	91.9%	97.8%	98.4%	98.8%	95.8%
Catholic	7.5%	2.3%	1.6%	1.2%	4.0%
Protestant	0.3%	0.0%	0.0%	0.0%	0.1%
No religion	0.3%	0.0%	0.0%	0.0%	0.1%
					$\chi^2(9) = 46.510$, p = 0.000
Marital status					
1997 survey					
N	755	755	252	253	2015
Single	94.8%	96.8%	94.1%	95.7%	95.6%
Married	4.0%	1.5%	4.4%	4.0%	3.1%
Divorced/ Separated	0.3%	0.0%	0.4%	0.4%	0.2%
Widowed	0.0%	1.7%	0.4%	0.0%	0.7%
Other	0.9%	0.0%	0.8%	0.0%	0.5%
					$\chi^2(12) = 41.161$, p = 0.000
1998 survey					
N	743	757	253	252	2005
Single	96.6%	98.8%	91.7%	97.6%	97.0%
Married	3.4%	0.5%	7.9%	2.4%	2.7%
Divorced/ Separated	0.0%	0.4%	0.4%	0.0%	0.2%
Widowed	0.0%	0.3%	0.0%	0.0%	0.1%
					$\chi^2(9) = 47.526$, p = 0.000
Ethnicity					
1997 survey					
N	756	755	252	253	2016
Sosso	34.9%	50.2%	2.8%	3.6%	32.7%
Peul	34.4%	15.9%	1.2%	7.5%	19.9%
Malinké	16.8%	22.0%	92.9%	85.8%	36.9%
Forestier	7.5%	3.8%	1.6%	1.6%	4.7%
Other	6.4%	8.1%	1.6%	1.6%	5.8%
					$\chi^2(12) = 909.238$, p = 0.000
1998 survey					
N	743	756	253	252	2004
Sosso	40.9%	54.4%	0.0%	2.4%	36.0%
Peul	33.2%	18.4%	0.8%	6.8%	20.2%
Malinké	16.6%	22.8%	97.6%	88.5%	38.2%
Forestier	7.1%	3.0%	1.6%	2.0%	4.2%
Other	2.2%	1.5%	0.0%	0.4%	1.4%
					$\chi^2(12) = 952.030$, p = 0.000