Improving the Reproductive Health of Youth In Mexico

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ACRONYMS

AMES	Associación Mexicano de Educación Sexual
CIJ	Centers of Juvenile Integration
CONAPO	National Population Council
CORA	Centro de Orientación para los Adolescentes
Demysex	Red Democracia y Sexualidad
FLE	Family Life Education
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IEC	Information, Education, and Communication
IMIFAP	Instituto Mexicano de Investigación en Familia y Población
IMSS	Mexican Social Security Institute
MEXFAM	Mexican Foundation for Family Planning
NGO	Non-Governmental Organization
OR	Operations Research
RH	Reproductive Health
STI	Sexually Transmitted Infection
YPC	Young People Coordinator
YPP	Young People Program

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SUMMARY

This project assessed the impact of the Mexican Foundation for Family Planning's (MEXFAM's) Young People Program (YPP) on: a) the attitudes of community stakeholders (such as parents, school teachers, and health service providers) towards informing youth about reproductive health issues and towards making reproductive health services available for sexually-active youth; b) the sexual and reproductive health knowledge, attitudes, and behaviors of adolescents; and c) the way that providers offer reproductive health services to adolescents. In addition, the project determined whether adding a school-based sex education component increased the impact of community interventions on the knowledge, attitudes, and behaviors of adolescents.

To evaluate these effects, MEXFAM used a quasi-experimental design with two experimental groups and one non-equivalent control group. Four cities were randomly assigned to each experimental group; four cities where no activities were conducted were assigned to a control group. In each of the experimental group cities, MEXFAM placed a Young People Coordinator (YPC) who trained community volunteers (multipliers), and with their help disseminated sexual and reproductive health information through community events. The YPC and the multipliers also helped service providers to improve their services for adolescents (in the 2-intervention group). In addition, in one of the experimental groups, the YPC conducted school-based activities to strengthen sex education activities (in the 3-intervention group).

During the 21-month intervention, YPCs and their multipliers conducted 256 14-hour courses at schools for students, parents, and teachers. In communities, they conducted 594 14-hour courses for over 14,000 beneficiaries, as well as 13, 40-hour courses for 439 multipliers in project areas. In addition, over 6,600 talks were given, and hundreds of different community activities were implemented, such as video and film screenings, plays, health fairs, sport events, graffiti and rally contests, distribution of brochures, posters, and condoms. Affiliated service providers reported providing over 35,000 medical services to adolescents.

The endline survey conducted in June 2002 showed that around 40 percent of adolescents in the two experimental groups had heard of the YPP, and about 12 percent knew the YPP coordinator. Around seven percent of the adolescent respondents knew a peer promoter, and around eight percent had participated in a YPP event in the last year. Nearly 70 percent of the respondents in both groups had received sex education at school in the last year, and nearly 15 percent in the 3-intervention group (3-Int) said they had received a talk or course at school from a MEXFAM agent. Data also showed that exposure of other community stakeholders (such as parents, schoolteachers, service providers, and pharmacists) was higher than for adolescents.

Survey results showed that the reproductive health knowledge and attitudes of adolescents were quite positive to begin with, and that they improved between October 1999 and June 2002. Awareness of contraception increased from 57 percent to 66 percent, and among those who were aware of contraception, knowledge of the condom was almost universal. The mean number of methods known increased from 5.7 to 6.1, with the highest increases observed in knowledge of emergency contraception. Of those who had heard of contraception, more than 80 percent

approved the use of contraceptives by youth. The proportion that believed that adolescents who go to pharmacies to obtain contraceptives are treated in a respectful way increased from 45 percent to 68 percent. Nevertheless, few changes in behaviors were observed. The proportion of youth who had had a sexual relationship changed from 9.9 percent in 1999 to 10.7 percent in 2002, with most of the increase observed in the control group. Nearly all of those who had been sexually active were between 15 and 19 years of age. Of those who had been sexually active, the proportion that used a method in the first sexual intercourse (about 40 percent) remained nearly the same, with the condom increasingly becoming the method of choice.

Positive trends were observed in both the experimental and control groups, suggesting that the improved attitudes, and behaviors were due to additional factors other than the project's interventions. Multivariate analysis showed that although there were several significant changes across time, few of these could be attributed to the interventions. Other analysis suggests that part of the problem may have been assigning too large areas to program coordinators, making it difficult to assess the impact of the interventions. Analysis showed that those who had been exposed to program interventions had significantly better knowledge, attitude, and behaviors.

Other results showed that community stakeholders also had quite positive attitudes at the beginning of the project regarding the delivery of information and services to adolescents. These attitudes often improved over time, with changes observed in both the experimental and control groups.

Several suggestions to improve the YPP are made, such as decreasing the turnover of YPCs, peer-promoters, and multipliers; focusing on the populations most in need; increasing the proportion of information and supply-giving activities; improving the management information system; and improving the focus of the catchment areas.

BACKGROUND

Youth and Reproductive Health in Mexico

Twenty-one percent (20.1 million) of the population in Mexico is between 15 and 24 years of age, and about 75 percent of them live in urban areas. More than one-half of Mexican homes have at least one adolescent living there. In 2000, 92 percent of those aged 6-14 and 55 percent of those aged 15-17 attended school (1). Many of those in school also work (10.2 percent of men and 6.3 percent of women). About 85 percent of females aged 15-19 years living in urban areas have never been married or lived with a partner (2).

Most young people in Mexico know and value family planning. Nearly 90 percent can mention at least one advantage of family planning and believe that they can plan and control different events, such as when to marry and have children, the number of children they will have, and the quantity and kind of education they will receive. Nearly 96 percent of men 15-19 living in urban areas approve of contraceptive use (3). About 45 percent of married women 15-19 years of age use a contraceptive method. The unmet need for contraception in this age group is estimated at 26.7 percent, the highest of all age groups (4).

Over the last 25 years, Mexico has experienced a slight increase in age at first marriage, an increase of use of contraception among married women 15-19 (5), and decreasing age-specific fertility rates (from 105/1,000 in 1975 to 72/1,000 in 1995) (6). There has also been an increase in age at first intercourse (the proportion of women who had their first sexual relation before age 16 decreased from 20.2 percent among women born in 1940-49 to 10.9 percent in the cohort born 1965-1969). Nevertheless, the proportion of women who had had premarital sexual relationships before age 25 increased from 11.5 percent in the 1940-49 birth cohort to 23.3 percent in the 1965-69 birth cohort (7). A study in Mexico City found that 33 percent of males and 21 percent of females aged 15-19 had had at least one sexual relationship. Only about one-third had used a contraceptive method in their first sexual experience, and 58 percent of these had used rhythm or withdrawal. Among those who had had more than one sexual relationship, 70 percent said they had used a method in their last relationship, and nearly one-third of these had used a traditional method (8). Between 1976 and 1987, the proportion of children conceived before marriage increased from 16.9 percent to 34.6 percent among women aged 15-19 years, and from 19.3 percent to 29.7 percent among women aged 20-24 years (9).

Unwanted pregnancy is not the only reproductive health problem faced by Mexican youth. Mexico has the third highest number of reported AIDS cases in the Americas after the United States and Brazil, with 47,617 reported cases as of December 2000 and an estimated cumulative number of 64,000 cases. The estimated number of HIV infected persons is between 116,000 and 177,000 (10). According to the Mexican Ministry of Health, “The advent of the illness in people aged twenty-five to thirty-four years clearly shows that its transmission frequently occurs in adolescence. For this reason, young people should constitute the target population” (11). The incidence of other sexually transmitted infections (STI) such as syphilis remain low in the country, below 2.2 cases per 100,000 people. However, the incidence of chlamydia increased

from 50 to 120 cases per 100,000 between 1988 and 1994. Other available data also suggest an increase in abortions and drug use among adolescents.

Adolescent Health and Sexual Education Programs in Mexico

Adolescent sexual and reproductive health has been a public health priority in Mexico during the past decade (12), evidenced by the inclusion of a section regarding adolescents in the reproductive health service delivery guidelines, and by the fact that all major service delivery organizations carry out adolescent health programs. Both the Ministry of Health and the Mexican Social Security Institute (IMSS) have trained service providers at health centers and clinics in information, education, and counseling for adolescents, and have established adolescent service modules in at least one clinic in cities with populations over 100,000 inhabitants. They also provide pre-marital counseling and advise delaying of the first birth. The National Population Council (CONAPO) often broadcasts radio and TV spots to motivate young adults to use contraception, delay their first birth, and space the second birth.

Despite the priority assigned to adolescent sexual and reproductive health services, a few studies have suggested that service providers often do not comply with guidelines that request them to routinely assess the need of all their adolescent clients for counseling on contraception and STIs/HIV/AIDS. For example, a study in which 596 provider-client interactions were observed found that contraception was mentioned only when adolescents directly requested a family planning service, and the use of condoms to prevent HIV/AIDS was not mentioned in any consultation for adolescents (13).

Although in the 1980s and 1990s a variety of sex education programs were developed and incorporated in different state school systems, it was not until September 1999, just as this project was beginning, that sex education contents were formally included in the federal primary and secondary school education curricula.

In primary school, sex education is included in the natural science course for fifth and sixth grade (attended by children between 10 and 12 years of age). The fifth grade natural science textbook includes topics such as physiology, equality of opportunities for males and females, and tobacco and alcohol as risks for health. From a developmental and gender perspective, the sixth grade natural sciences textbook provides an excellent introduction to topics such as the physiology of the male and female sexual organs and reproduction, as well as key concepts of sexual relations, abortion, masturbation, sexual pleasure, sexually transmitted diseases, and contraception (although specific contraceptives are not discussed).

In secondary schools (attended by children between 12 and 15 years of age), family life and sex education is included in the civics and ethical formation course in the seventh, eight, and ninth grades. In all three years, a gender and developmental perspective is used. Syllabi for the first two years focus on physical, physiological, and emotional changes that occur, as well as on the new types of relationships that are established at this age, such as dating, love, sexual attraction, and sexual relationships. In the ninth grade, the syllabus also discusses different risks, such as types of sexual abuse, unwanted pregnancy and STIs/HIV/AIDS, and ways to avoid these risks, including contraception and condom use. Complete information on the different contraceptive

methods is provided. Other relevant family life education themes are also included in the three grades, such as prevention of addictions and other risk behaviors, individual decision making, social and individual violence, respect for individual and sexual orientation differences, and self-esteem. In addition to governmental programs, several non-governmental organizations implement adolescent health and sex education programs. A few of these include MEXFAM's *Gente Joven* [Young People] Program (YPP), and those offered by IMIFAP, Demysex, AMES, CORA and the Centros de Integración Juvenil.

MEXFAM's *Gente Joven* [Young People] Program

The Fundación Mexicana para la Planeación Familiar, A.C. [Mexican Foundation for Family Planning] (MEXFAM) is the Mexican affiliate of the International Planned Parenthood Federation. MEXFAM offers family planning and primary health care services to low-income populations not reached by government programs. It currently works in 28 (out of 31) states in Mexico and in the Federal District through 32 operations centers in the country. An operations center covers a given geographical area (ranging from part of a large city to a whole state) in which different programs are coordinated by the operations manager, including the *Gente Joven* [Young People] Program (YPP).

Founded in 1986, the YPP is currently implemented in 56 regions in 32 operations centers (i.e., more than one YPP may be conducted in one operations center, targeting different geographical areas). Each YPP is coordinated by a Young People Coordinator (YPC) who conducts activities in a defined geographic area and reports to the manager of the operations center. The YPCs are paid employees who are at least 21 years of age, have completed high school (although they often are college graduates), and have been trained by MEXFAM to conduct different activities targeting youth.

The most important activity of the YPP is training community volunteers (multipliers) who are expected to carry out activities that improve the sexual and reproductive health of adolescents. MEXFAM has developed a set of different courses to prepare volunteers, such as service providers in health institutions, schoolteachers, other professionals, and adolescent peer promoters. These courses are taught by the YPC, the operations center manager, and previously trained paid collaborators and volunteers. The YPCs and their multipliers also organize events to disseminate sexual and reproductive health information and to increase access to contraceptive and other reproductive health services. A wide variety of formats is used to disseminate this information, including household visits, individual interactions, talks to groups, video showings, theater plays, parades, health and community fairs, rock concerts, graffiti sessions, treasure hunts and rallies, sport events, and contests. The YPC and multipliers also distribute contraceptives and information, education, and communication (IEC) materials.

PROBLEM STATEMENT

In 1998 the Population Council's Frontiers in Reproductive Health Program (FRONTIERS) proposed a multi-country operations research (OR) study of the effects of adolescent sexual and reproductive health programs. The rationale for this global study was that youth around the world often lack information about their bodies and their sexuality, how to protect themselves from unplanned pregnancy, HIV/AIDS and STIs, and where to obtain contraceptives. They also lack skills to protect themselves from unwanted and unsafe sexual encounters, and are at risk from abuse of alcohol, drugs, and tobacco. Common means of educating youth such as Family Life Education (FLE) often are not offered or are inadequate, and they are rarely linked to services for those who need them. Other potential sources of information about sexual and reproductive health topics, such as parents and teachers, usually maintain a policy of silence regarding these issues. The wider environment (e.g., media and community leaders) is also unsupportive of youth acquiring reproductive health knowledge and services. Services available for youth are often not responsive to their particular needs, and demand from them a confidence and self-assurance that few of them have achieved.

Given that the YPP had already developed and was implementing a set of strategies to address these problems, Mexico was selected as one of the countries where this global study would be conducted. The other countries were Bangladesh, Kenya, and Senegal (14). The research questions for the Mexico project were: can the YPP foster a more supportive environment for the dissemination and discussion of reproductive health topics at home, at schools, and in the streets? Can it directly provide adolescents the information they need to make decisions? Can the YPP train and motivate service providers to change their practices to offer friendlier services for adolescents, to make them feel more at ease when attending the services and, by so doing, increase their use of services and decrease their unmet need for them? And, lastly, can it introduce or improve sex education at schools?

OBJECTIVES

This OR project tested the feasibility, cost, and effect of a systematic intervention to foster a supportive environment, provide reproductive health information, and make existing services more accessible to youth in order to improve their reproductive health, knowledge of reproductive health issues, sexual behavior, gender attitudes, and utilization of reproductive health services. These three elements (i.e., environment, information, and services) were included in the global study because it was believed that they would be mutually reinforcing and would increase the impact of the intervention. As discussed earlier, MEXFAM had arrived also at this same conclusion and implemented a program that encouraged the active participation of youth, parents, health service providers, schoolteachers, and other decision-makers in the community.

The objectives of the study were:

1. To determine the feasibility, cost, and effect of a community-based educational campaign on the attitudes of community stakeholders towards informing youth about reproductive health issues and the availability of services for sexually-active youth.

2. To determine the feasibility, cost, and effect of a multi-pronged strategy to provide information to youth on sexual and reproductive topics and to assess the impact on their knowledge, attitudes, and behaviors.

3. To determine the feasibility, cost, and effect of improving the youth-friendliness of existing reproductive health services (or adding reproductive health services to programs reaching youth) on the willingness and ability of service providers to offer quality counseling and services to youth, and on the number of youth using these services when needed.

4. To determine whether there is an additional contribution from the technical assistance provided by MEXFAM to a school-based program on reproductive health for youth to their reproductive health knowledge, attitudes towards gender relations, and knowledge and use of reproductive health services.

METHODOLOGY

Study Design

Small cities with populations between 27,000 and 90,000 inhabitants were selected as units of study. This was done in order to avoid the problem of contamination of effects as much as possible and at the same time to have similar conditions to those in which the program normally operates. Small population size was selected as a criterion because adolescent reproductive health programs are not often implemented in these small cities. Other criteria for inclusion were that these cities were not further than two hours away from a city where MEXFAM had a clinic, or that they were cities where MEXFAM had a clinic but few YPP activities had been conducted. These conditions were established to facilitate providing support to program staff through local or nearby offices or clinics.

To assess the effects of the multi-component intervention, the study used a quasi-experimental design with two experimental groups and one control group. In the 2-intervention group (2-Int), interventions included technical assistance and training of providers to offer youth-friendly services, and community promotion activities to foster a more supportive environment for reproductive health information and services for adolescents. In the 3-intervention group (3-Int), a school-based component was added to the two other interventions. In the control group, MEXFAM did not conduct any activities. The quasi-experiment used a non-equivalent control group design with before and after measurements, as follows:

		Time ----------→		
	Experimental group 2-Int	O1	X	O4
RA	Experimental group 3-Int	O2	X	O5
	Non-equivalent control group	O3		O6

Where RA indicates random assignment of cities to the experimental or control group, X are the program interventions, and O is an observation measurement.

Eight cities that met the inclusion criteria were identified and randomly assigned to each of the two experimental groups. In addition, four cities that had similar populations, socio-economic characteristics, geographic location, and ease of access as the experimental group cities were identified and included as the control group cities. Table 1 shows the allocation of cities to the different groups.

Table 1: Cities Participating in the Project and their Populations by Intervention Group

GROUP					
3-Int	**Pop**	**2-Int**	**Pop**	**Control**	**Pop**
La Barca, Jalisco	57,000	San Luis de la Paz, Guerrero*	90,000	Apaseo, Guanajuato	61,924
Naranjos, Veracruz*	27,000	Maravatío, Michoacán	66,000	Teloloapan, Guerrero	53,946
Tepeji, Hidalgo*	62,000	Zacapuaxtla, Puebla	45,000	Zinapécuaro, Michoacán	49,937
Huitzuco, Guerrero	38,000	San José Iturbide, Guanajuato	51,000	Tula, Hidalgo	89,354

* Cities with a MEXFAM clinic

Sampling Strategy and Data Collection

The main sources of information to evaluate the effects of this project were baseline and endline household probability surveys of adolescents in project areas. The baseline questionnaire was developed using a list of 50 core indicators (representing approximately 130 dependent variables) common to the four global studies. The core variables include items on knowledge of contraception and STIs including HIV/AIDS; reproductive ideals; attitudes towards contraception, gender roles, service providers, and sex education; and behaviors such as communication with others, sexual, contraceptive, and reproductive behavior, use of services and other risky behaviors.

In addition to the adolescent surveys, three other sources of information were used to prepare this report: 1) the YPP management information system (MIS); 2) baseline and endline surveys of stakeholders (parents, service providers, and schoolteachers) conducted during July-September 1999 and June-August 2002; and 3) accounting records. The YPP MIS includes data on the number of different activities conducted (such as courses, visits, talks, materials and

contraceptives distributed), the demand for services at participating health service outlets, and the number of beneficiaries.

The surveys of adolescents and parents used multistage probability sample procedures. Two of the four cities in each experimental group were randomly selected (Tepeji del Río, Huitzuco, Maravatío, and San José de Iturbide). Within each city, eight areas (similar to the census tracts in the USA) were selected. In each area five blocks were selected. In these blocks, two segments were selected, each comprising five households, and all households in the segments were included. In each household, all adolescents (10-19 years of age) and one parent were interviewed. The same procedures were followed in the four control group cities, except that in the last stage, only one segment (each comprising five households) was selected. The aim was to interview 2,400 adolescents (800 in each group), 1,200 parents (400 in each group), and visit 2,500 households. In the baseline survey a total of 2,191 adolescents and 950 parents were interviewed, whereas in the endline survey, 1915 adolescents and 850 parents were interviewed.

All other surveys employed convenience samples that used lists of schools, clinics, private providers, and pharmacies developed by the YPCs as the sample framework. In each case, a possible number of interviews was identified, and then that number was randomly sampled from the lists.

Baseline and endline surveys were conducted with service providers. In each city included in the sample interviews with public health providers, private physicians, and pharmacists were conducted in addition to an inventory of clinics. In the baseline survey, a total of 12 service delivery units were visited (two in the 2-Int group, six in the 3-Int group, and four in the control group), whereas in the endline survey, visits were made to 14 clinics (four in both the 2-Int and 3-Int groups and six in the control group). Of those service delivery units visited in the endline survey, seven were hospitals (one in the 2-Int group and three in each of the 3-Int and control groups).

In the case of individual service providers, a total of 51 service providers from public institutions and 91 providers from the private sector were interviewed in the baseline survey, compared to 128 and 62, respectively, in the endline survey. Seventy-eight pharmacists were interviewed in the baseline survey and 80 in the endline survey.

The survey at schools was conducted only in 2002, and only in the 3-Int and control groups. The plan was to select two schools (one primary and one secondary) in each city included in the sample, and to interview three teachers and 60 students in each school. In practice, a total of 38 primary and 29 secondary school teachers, and 1031 primary and 971 secondary school students were interviewed in the endline survey.

Interventions

New MEXFAM Interventions

To achieve the goals of having good quality sex education at schools, friendlier adolescent services, and community promotion of adolescent sexual health information and services, MEXFAM established a YPP and implemented different activities in each experimental city:

1) A YPC for each city in the experimental group was hired and trained. Whenever a YPC left the program, he or she was replaced and trained.

2) A YPP space was opened in each city. The space was a room used to hold meetings and conduct activities such as showing videos and films. In cities with clinics, this space was usually located in MEXFAM's clinic. Each space was provided the necessary equipment and materials (e.g., IEC materials, contraceptive supplies, VRC, and TV monitor).

3) Multipliers were trained. They included schoolteachers, service providers, peer promoters, and other adult community volunteers (multipliers). MEXFAM used a set of different courses that were offered to people interested in promoting adolescent sexual and reproductive health regardless of the particular place where they worked. MEXFAM expects that those who take the courses will replicate them and help conduct promotional activities, hence the term "multiplier". For example, schoolteachers who take the courses are expected to teach them at their school, and service providers are expected to replicate the courses or improve the quality of services offered for adolescents. The various courses offered are described in Appendix 1.

4) Schools and clinics in each city were provided with a set of materials that included a sex education training manual, seven videos, six flipcharts, brochures, and pamphlets. Private service providers (e.g., physicians and pharmacies) were provided with brochures and posters and invited to attend courses.

5) Community activities were implemented. A project goal was to train at least 30 adolescent peer promoters in each city and have them disseminate information on contraception, HIV/AIDS and STI prevention, and services available for adolescents. These promoters also distributed IEC materials and contraceptives. Desired characteristics of peer promoters were that they would be between 15 and 20 years old, interested in sexual health, and willing to conduct volunteer work. Another project goal was to identify adult promoters to implement activities in the communities.

There are a wide number of creative promotional activities implemented by YPP staff and collaborators. These included:

- Individual orientations that took place during household visits or other events

- Talks to groups specifically organized by the multipliers or YPCs, or talks that make use of on-hand opportunities (for example, a meeting of teachers in which a YPP talk is included)

- Messages through mass media (i.e., print media, radio, or TV) in any format, such as spots, participation in round tables, interviews, and other programs

- Screening of videos and films with a debate at the end

- Plays with reproductive health messages

- Participation in community events, such as health fairs, cultural, and inter-institutional events

- Other types of entertainment for adolescents, such as sports events, graffiti sessions, participation in parades and rock concerts

- Distribution of posters, brochures, fliers, and contraceptives

6) Technical assistance to providers to make adolescent services friendlier, including patient flow analysis, special schedules, or devoting a particular space for activities with adolescents.

Program Activities

Service statistics from the YPP show that the intended activities could indeed be implemented. The statistics are presented by period and include activities conducted both by MEXFAM's staff as well as by peer promoters and other multipliers who reported their activities to MEXFAM.

Table 2 presents the different community-based activities. The table includes six panels with different types of activities. Both experimental groups were successful in achieving large mean monthly numbers of condoms distributed, 14-hour courses, and talks given to adolescents and other multipliers, and implementation of various community events. The recruitment of peer promoters and other adult multipliers easily surpassed original project goals. The mean monthly number of courses and community events were similar, although the program in 2-Int cities gave almost twice as many talks as in 3-Int cities. This implies that adding the school-based program (in the 3-Int cities) may have diverted effort and resources from the other activities.

Table 2: Courses, Talks, and Activities of the Community Component, by Intervention Group and Period

Activities per Period	Subtotal 3-Int			TOTAL	Monthly average	Subtotal 2-Int			TOTAL	Monthly average
	Oct 99 Sep 00	Oct 00 Sep 01	Oct 01 Mar 02			Oct 99 Sep 00	Oct 00 Sep 01	Oct 01 Mar 02		
Condoms distributed	60,735	5,006	7,262	73,003	2,433	12,658	17,667	15,934	46,259	1,542
Active promoters per month	70	178	58	178		86	128	100	128	
Multipliers with Diploma course	12	12	9	33		13	13	13	39	
14 hour courses for adolescents	105	51	71	227	8	128	48	28	204	7
Beneficiaries	3,032	1,579	1,230	5,841	195	2,674	1,862	1,023	5,559	185
14 hour courses for multipliers[1]	18	20	20	58	2	43	48	14	105	4
Beneficiaries	413	344	273	1,030	34	1,108	631	218	1,957	2,261
Total 14 hr courses	**123**	**71**	**91**	**285**	**9.5**	**171**	**96**	**42**	**309**	**10.3**
Beneficiaries	**3,445**	**1,923**	**1,503**	**6,871**	**229**	**3,782**	**2,493**	**1,241**	**7,516**	**251**
40-hr courses for Multipliers	**4**					**9**			**13**	
Beneficiaries	**85**			**85**		**354**			**439**	
Individual orientation for adolescents	1,360	2,134	647	4,141	138	2,605	2,769	2,760	8,134	271
Individual orientation for multipliers	141	151	387	679	23	582	689	648	1,919	64
Total Individual Orientations	**1,501**	**2,285**	**1,034**	**4,820**	**161**	**3,187**	**3,458**	**3,408**	**10,053**	**335**
Talks for adolescents	794	496	316	1,606	54	1,749	1,309	291	3,349	112
Beneficiaries	21,729	9,717	11,170	42,616	1,421	31,723	9,034	12,587	53,344	1,778
Talks for multipliers	306	165	117	588	5	712	232	136	1,080	8
Beneficiaries	6,276	2,648	1,103	10,027	334	8,566	4,126	1,782	14,474	482
Total Talks	**1,100**	**661**	**433**	**2,194**	**73**	**2,461**	**1,541**	**427**	**4429**	**148**
Beneficiaries	**28,005**	**12,365**	**12,273**	**52,643**	**1,755**	**40,289**	**13,160**	**14,369**	**67,818**	**2,261**
Meetings to organize community activities	742	543	17	1,302	109	575	585	34	1,194	40
Films and videos with debates	78	33	7	118	10	231	29	252	512	17
Beneficiaries	1,813	1,302	209	3,324	277	7,492	893	8,074	16,459	549

Table 2: Courses, Talks, and Activities of the Community Component, by Intervention Group and Period (continued)

Activities per Period	Subtotal 3-Int			TOTAL	Monthly average	Subtotal 2-Int			TOTAL	Monthly average
	Oct 99 Sep 00	Oct 00 Sep 01	Oct 01 Mar 02			Oct 99 Sep 00	Oct 00 Sep 01	Oct 01 Mar 02		
Radio, TV and press presentations	24	31	182	237	20	1247	629	420	2296	77
Beneficiaries	324,500	58,159	93,157	475,816	39,651	248,522	322,037	68,761	639,320	21,311
Theater presentations	17	50	38	105	9	19	50	39	108	4
Beneficiaries	1,309	6,286	7,718	15,313	1,276	1,472	3,187	3,641	8,300	277
Community activities (general)[2]	22	113	484	619	52	102	365	217	684	23
Beneficiaries	9,658	24,824	25,400	59,882	4,990	10,228	16,520	22,104	48,852	1,628
Community Activities (adolescents)[3]	49	53	77	179	15	58	61	60	179	6
Beneficiaries	2,677	14,047	8,287	25,011	2,084	3,849	19,187	8,180	31,216	1,041
Information/contraception modules	205	89	52	346	29	258	179	109	546	18
Beneficiaries	11,842	17,605	7,706	37,153	3,096	23,377	20,723	27,478	71,578	2,386
Total community activities	**395**	**369**	**840**	**1604**	**134**	**1,915**	**1,313**	**1,097**	**4,325**	**144**
Beneficiaries	**339,957**	**122,223**	**142,477**	**616,499**	**51,375**	**271,563**	**382,547**	**138,238**	**815,725**	**27,191**
Total city population (2000 census)	184,140	184,140	184,140	184,140		251,932	251,932	251,932	251,932	
Population exposure index	1.85	0.66	0.77	3.35		1.08	1.52	0.55	3.24	
Posters distributed	978	375	92	2,822	235	1,844	803	217	2,822	94
Brochures and flyers distributed	13,523	11,414	5,783	24,231	2,019	10,708	26,582	18,000	24,231	808

[1]Including community leaders, active multipliers, doctors, others, youth promoters and promoters.
[2] Including participation on health fairs, inter-institutional and cultural events.
[3] Including graffiti, recreational activities, environmental protection and sport activities.

Table 3 presents adolescent-friendly services provided by physicians who reported their activities to MEXFAM. During the course of the project, 100 providers attended the comprehensive adolescent health course given by MEXFAM, 50 in each intervention group, about 12 per city. A slightly larger number of physicians were trained during the first year of activities. While not all of the physicians reported their activities, using the total number of trained physicians as the denominator, each 3-Int group physician provided services to a monthly mean of 17 adolescents, compared to 25 adolescents attended by 2-Int providers. Unfortunately, MEXFAM did not keep separate records on the number of health providers who received the different training courses (40-hour or 14-hour; see Appendix I), or talks and individual orientations, but it is likely that a large number of multipliers trained as reported in Table 2 were also health providers.

Table 3: Services Provided by Collaborating Medical Personnel by Intervention Group and Age

Services per Period	3-Int Subtotal			TOTAL	Monthly Average	2-Int Subtotal			TOTAL	Monthly Average
	Oct 99-Sep 00	Oct 00-Sep 01	Oct 01-Mar 02			Oct 99-Sep 00	Oct 00-Sep 01	Oct 01-Mar 02		
No. of trained physicians that reported activities	24	17	9	50	0.7	6	20	19	50	1.7
FP counseling	727	1,531	2,133	4,391	146	1,775	1,375	7,207	10,357	345
Contraceptive methods	1,851	642	4,107	6,600	220	549	1,429	6,925	8,903	297
STIs, HIV/AIDS	390	478	314	1,182	39	115	135	154	404	13
Pregnancy and complications	702	584	1,198	2,484	83	1,158	510	1,196	2,864	95
Gynecology, andrology	272	275	807	1,354	45	163	128	205	496	17
Urology	247	360	509	1,116	37	161	128	243	532	18
Psychology, addictions	0	871	909	1,780	59	0	21	188	209	7
Respiratory consultations and others	2,907	1,450	2,761	7,118	237	5,327	4,436	4,298	14,061	469
Total medical services	**7,096**	**6,190**	**12,738**	**26,024**	**867**	**9,248**	**8,162**	**20,416**	**37,826**	**1,261**

Table 4 shows the number of activities conducted in schools. Although these activities should not have been conducted in 2-Int cities, during the project's first year of activities MEXFAM volunteers and staff often responded to requests for courses from schools. Although in later years these courses were curtailed to a large degree, both volunteers and paid staff occasionally responded to requests for talks on specific issues for teachers, parents, and students. Local staff often hesitated not to respond to these requests, given that they felt they would jeopardize MEXFAM's reputation. In 3-Int group cities, about five 14-hour courses for teachers were given per city during the duration of the project, as well as three courses for parents and 40 courses for students (about 16 courses per year in each city for students). In total, it is estimated that 381 teachers, 359 parents, and 6581 students attended the 14-hour courses in the four cities.

Table 4: Number of Courses and Talks for Teachers, Parents, and Students by Intervention Group and Period

Courses and Talks per Period	**3- Int Subtotal**			**TOTAL**	**Monthly Average**	**2-Int Subtotal**			**TOTAL**	**Monthly Average**
	Oct 99-Sep 00	**Oct 00-Sep 01**	**Oct 01-Mar 02**			**Oct 99-Sep 00**	**Oct 00-Sep 01**	**Oct 01-Mar 02**		
14 hr courses for teachers	5	7	8	20	1	13	5	0	18	1
Beneficiaries	95	168	118	381	13	438	165	0	603	20
14 hr courses for parents	1	8	6	15	1	7	0	0	7	0
Beneficiaries	18	208	133	359	12	166	0	0	166	6
14 hr courses for students	57	73	32	162	5	32	2	0	34	1
Beneficiaries	2,422	2,715	1,444	6,581	219	1,024	25	0	1,049	35
Total courses at schools	**63**	**88**	**46**	**197**	**7**	**52**	**7**	**0**	**59**	**2**
Beneficiaries	**2,535**	**3,091**	**1,695**	**7,321**	**244**	**1,628**	**190**	**0**	**1,818**	**61**
Talks for teachers	46	99	8	153	5	0	7	0	7	0
Beneficiaries	394	2,783	58	3,235	108	0	233	0	233	8
Talks for parents	73	165	56	294	10	158	49	18	225	8
Beneficiaries	1,364	2,187	1,784	5,335	178	2,239	1,120	342	3,701	123
Talks for students	218	327	345	890	30	665	29	90	784	26
Beneficiaries	5,008	7,447	14,639	27,094	903	9,543	716	3,600	13,859	462
Total talks at schools	**337**	**591**	**409**	**1,337**	**45**	**823**	**85**	**108**	**1,016**	**34**
Beneficiaries	**6,766**	**12,417**	**16,481**	**35,664**	**1,189**	**11,782**	**2,069**	**3,942**	**17,793**	**593**
Individual orientation for teachers and parents	**0**	**383**	**223**	**606**	**20**	**0**	**121**	**195**	**316**	**11**

Exposure of Adolescents to Interventions

A second way to assess the feasibility of conducting interventions is by the degree to which target audiences reported having been exposed to them in the endline surveys. Table 5 shows that in the endline survey, around 40 percent of the adolescents in the two experimental groups said they had heard of the YPP, compared with eight percent in the control group. About the same proportion of females and males in each group had heard about the program. Of those who had heard about the YPP, 36 percent in the 3-Int group (about 15% of the total sample) and 25 percent in the 2-Int group (about 9% of the total sample) knew the YPP coordinator. Similarly, 23 percent in the 3-Int group and 10 percent in the 2-Int group knew a YPP peer promoter. Only around 30 percent (less than 3% of the interviewees in the two experimental groups) of those who knew a peer promoter said they had requested advice from him or her, and less than two percent said they had ever been an YPP peer promoter themselves. Of those who had heard of the YPP in the two experimental groups, about 17 percent said they had attended an YPP activity in the last year. A slightly higher proportion of the older adolescents versus younger age group had heard of the YPP. The older adolescents were also more likely than younger adolescents to know the YPP coordinator.

Other data showed that in both experimental groups, the respondents who were in school were about three times more likely to know a peer promoter than those out of school, and they were also much more likely to have participated in an YPP event.

Seventy percent of those in the 3-Int group that were still at school said they had received sex education in the last year, compared with around 65 percent in the 2-Int and control groups. Of these, 66 percent in the 3-Int group had received talks or courses from an agent who was not from the school, compared to 40 percent in the 2-Int group, and 43 percent in the control group. Of these, in the 3-Int group 30 percent identified the person, who gave the talk as a MEXFAM agent, compared fewer than two percent in the other groups.

Table 5: Exposure of Adolescents to YPP Interventions by Intervention Group and Sex (2002)

	3 Interventions			2 Interventions			Control			Total		
Total Number	**M**	**F**	**Total**	**M**	**F**	**Total**	**M**	**F**	**Total**	**M**	**F**	**Total**
	283	**320**	**603**	**308**	**343**	**651**	**309**	**352**	**661**	**900**	**1,015**	**1,915**
Have heard of the YPP (%)	40.2	42.2	41.3	36.9	38.6	37.8	8.7	7.6	8.1	25.0	24.6	24.8
Of these, % who know YPP coordinator	32.3	38.7	35.7	22.7	26.1	24.5	12.3	27.1	20.0	25.1	31.5	28.5
Of those who have heard of YPP, % who know a YPP peer promoter	21.3	23.9	22.8	12.2	8.7	10.3	19.5	12.7	16.0	17.6	17.1	17.3
Of these, % who have requested advice from peer promoter	29.6	39.0	35.1	27.1	30.7	28.7	26.4	68.4	44.1	28.5	40.2	34.8
Of those who know YPP, % who have attended a YPP activity in last 12 months	19.8	17.2	18.4	15.7	16.4	16.1	4.4	13.4	9.1	16.2	16.4	16.3
Proportion of respondents who have heard of MEXFAM	50.9	60.0	55.7	11.5	13.3	12.5	0.7	1.1	0.9	16.8	18.8	17.8
Of these, % who have attended a MEXFAM clinic	37.5	35.7	36.5	15.5	3.7	8.8		18.7	12.5	32.5	28.9	30.5
Number Aged 10 to 14	**169**	**201**	**370**	**194**	**202**	**396**	**182**	**186**	**368**	**545**	**589**	**1,134**
Have heard of the YPP (%)	33.1	40.5	37.1	30.9	39.3	35.2	1.8	4.7	3.3	18.4	24.7	21.7
Of these, % who know YPP coordinator	37.5	30.8	33.5	19.1	20.6	20.0	45.8	10.1	19.5	28.7	24.3	26.1
Of those who have heard of YPP, % who know a YPP peer promoter	16.3	19.2	18.0	13.6	9.7	11.4	45.8	7.4	16.8	16.2	14.6	15.3
Of these, % who have requested advice from peer promoter	15.1	32.5	25.8	43.5	37.0	40.3	100		66.7	33.2	32.4	32.8
Of these, % who have attended a MEXFAM clinic	31.2	31.9	31.6	23.6	2.1	13.3				29.6	26.8	28.0
Number Aged 15 to 19	**113**	**119**	**232**	**114**	**141**	**255**	**127**	**166**	**293**	**354**	**426**	**780**
Have heard of the YPP (%)	50.7	45.3	48.0	46.3	37.7	41.6	18.2	10.5	13.6	34.4	24.5	28.9
Of these, % who know YPP coordinator	27.6	50.8	38.4	26.5	33.8	30.1	7.8	34.7	20.1	22.3	40.3	30.8
Of those who have heard of YPP, % who know a YPP peer promoter	26.3	29.5	28.0	10.7	7.5	9.1	16.2	15.2	15.7	18.8	19.7	19.3
Of these, % who have requested advice from peer promoter	38.6	44.0	41.7	6.8	19.9	12.1		83.6	37.4	25.2	46.6	36.3
Of those who know YPP, % who have attended a YPP activity in last 12 months	25.8	20.3	22.9	12.3	15.7	14.0	5.0	18.6	11.3	16.7	18.5	17.6
% of respondents who have heard of MEXFAM	63.1	77.5	70.2	13.4	19.4	16.7	1.6	1.7	1.7	20.9	21.4	21.2
Of these, % who have attended a MEXFAM clinic	43.3	39.9	41.5	5.7	4.7	5.0		24.1	14.7	35.2	30.9	32.8

Exposure of Other Stakeholders to Interventions

Parents

In the endline survey, 31 percent of the 850 parents surveyed said they had heard of the YPP (44% in the 3-Int group, 34% in the 2-Int group, and 22 percent in the control group) (see Table 6). Of those who had heard of the YPP, 16 percent knew an YPP promoter (20% in the 3-Int group, 15% in the 2-Int group, and 12% in the control group). Of those who had heard of the YPP in the experimental groups, two percent said one of their children had been an YPP peer promoter. In addition, about 12 percent said their children had attended YPP events, and eight percent said they had also done so. Nearly all of those who had heard of the YPP were in favor of events in their city to provide sexual and reproductive health information for youth. Finally, 19 percent said they had heard of MEXFAM (58% in the 3-Int group, 13% in the 2-Int group, and 1% in the control group). Of those who had heard of MEXFAM, 53 percent in the 3-Int group and 20 percent in the 2-Int group had attended a MEXFAM clinic.

Table 6: Exposure of Parents to and Perceptions of the YPP by Intervention Group, 2002

	2002			
	Intervention Group			Total
	3-Int	2-Int	Control	
Number of Cases	**279**	**280**	**291**	**850**
Proportion who had heard of the YPP	43.8	34.0	22.0	30.9
Of those who know YPP, proportion knowing a YPP promoter	19.8	15.1	11.9	15.8
Of those who know a promoter, proportion believing promoter is well trained	80.0	76.1	68.5	76.0
Of those who know YPP, proportion having a child who has been a YPP peer promoter	3.7	1.2	1.1	2.1
Of those with a child who has been a YPP promoter, proportion who agree with child being a YPP promoter	79.3	100	100	86.4
Of those who know YPP, proportion who attended event organized by YPP	6.5	8.7	8.6	7.9
Of those who know YPP, proportion who is in favor of events in their city to provide RH information	99.8	93.3	96.8	96.9
Of those who know YPP, proportion who say their child has attended a YPP event	9.6	14.2	5.3	9.5
Proportion who have heard of MEXFAM	58.3	13.0	1.2	19.4
Of those who have heard of MEXFAM, proportion who has attended a MEXFAM clinic	53.1	20.3	_	45.7

Teachers and Students

Over 90 percent of primary school teachers in the 3-Int group had heard about MEXFAM and about 76 percent knew of the YPP, compared to 11 percent and 22 percent respectively in the control group. Of the 16 teachers who had heard of the YPP in the 3-Int group, three had participated in YPP activities and events, compared to none in the control group. In the case of secondary school teachers, all the respondents in the 3-Int group had heard of MEXFAM, 58 percent of the YPP, and 29 percent had participated in an YPP event, compared to 29 percent, 47 percent, and 12 percent, respectively, of teachers in the control group.

In the 3-Int group, 83 percent of primary students said someone besides their teacher had given a sex education talk or course at their school, and 49 percent said this had been a MEXFAM agent. In the case of secondary students, 84 percent in the 3-Int group received a talk or course from an out of school agent, and in 52 percent of the cases this had been a MEXFAM agent. In the control group, 52 percent received a talk from an outside agent and three percent identified the agent as a MEXFAM promoter.

Seventy-two percent of the students in the 3-Int group and 23 percent in the control group had heard of the YPP. Of these, 28 percent in the 3-Int group and 15 percent in the control group had been invited to participate as a YPP promoter in their schools. Fourteen percent in the 3-Int group and 11 percent in the control group knew a YPP promoter in their school.

Service Providers

In the endline survey, all clinics and health centers visited in the 3-Int and 2-Int groups reported that they had collaborated either with MEXFAM or the YPP, whereas no clinic in the control group reported doing so. The most frequent types of collaboration had been receiving IEC materials or contraceptives and conducting talks at schools. In 2-Int clinics, 75 percent or more of the clinics had MEXFAM IEC materials on contraception, emergency contraception, HIV/AIDS, and STIs, whereas in the 3-Int group, only 33 percent had materials on most of these topics. In the control group, none of the clinics visited had MEXFAM materials on these topics.

About 40 percent of the providers in the 2-Int and 25 percent in the 3-Int groups had received training from the YPP. The most frequently mentioned courses were the basic course on sexuality of young people, medicine for adolescents, HIV/AIDS, violence prevention, and contraceptive technology. Around 14 percent of providers in the two experimental groups (and none in the control group) had given courses or talks at events organized by the YPP, and a similar proportion said they had participated in other types of events. Eighty-six percent of the providers in the 2-Int group and 69 percent in the 3-Int group said their clinic or office collaborated with MEXFAM in different ways, with nearly 90 percent saying they used MEXFAM materials.

Pharmacists

Over 90 percent of the pharmacists in the two experimental groups reported they had heard of MEXFAM and over three-fourths said they had heard of the YPP, compared to less than 18 percent in both cases in the control group. Of those who had heard of the YPP, 92 percent said they had received at least one visit by an YPP staff member in the previous two years. The mean number of visits reported in the 2-Int group was ten, compared to three in the 3-Int group. During these visits, the most frequent activities of the YPP staff members had been to offer IEC materials on contraceptive methods (90%), STIs (80%), and to extend an invitation to assist with a talk on contraceptive methods (63%). However, only two pharmacists in the 2-Int group reported having participated in an YPP activity, and only three pharmacists in the 3-Int group reported having attended a course or talk given by the YPP.

EFFECTS ON KNOWLEDGE, ATTITUDES, AND BEHAVIOR OF ADOLESCENTS

Characteristics of the Respondents

Socioeconomic Characteristics

Table 7 shows that in both surveys a slightly higher proportion of females than males was interviewed. About 57 percent of the respondents were 10-14 years of age, and 43 percent were 15-19 years of age. Respondents in the baseline survey seemed to have been slightly more educated than those in the endline survey. In general terms, around 50 percent had some primary school education (1-6 years), 35 percent had some secondary school education (7-9 years), and 14 percent some preparatory school education (10 or more years of education). Nearly all were single, slightly less than three-fourths were still attending school, 92 percent were Catholic, slightly more than one-fifth worked, and 68 percent lived with both parents. A slightly higher proportion of females than males was married, not living with parents, not working, and out of school, but differences between these variables are small. Differences between surveys and between groups also tend to be small.

Table 7: Number of Study Participants and Weighted Prevalence or Means of Selected Characteristics by Intervention Group and Time of Interview

	1999				2002			
	Intervention Group			Total	Intervention Group			Total
	3-Int	2-Int	Control		3-Int	2-Int	Control	
Number of cases	**653**	**842**	**696**	**2191**	**603**	**651**	**661**	**1915**
% male	48.5	49.6	48.9	48.9	47.9	47.0	44.8	46.2
% female	51.5	50.4	51.1	51.1	52.1	53.0	55.2	53.8
% aged 10-14	52.0	58.9	60.1	57.5	60.4	59.2	53.3	56.7
% aged 15-19	48.0	41.1	39.9	42.5	39.2	40.8	46.7	43.2
% with no formal education	0.6	0.8	0.1	0.4	0.9	0.9	0.7	0.8
% with 1-6 years of education	43.4	53.6	45.2	46.8	57.1	54.6	51.0	53.6
% with 7-9 years of education	36.7	34.1	41.0	38.1	30.8	29.2	34.5	32.1
% with 10 years of education or more	19.3	11.5	13.7	14.7	11.2	15.3	13.8	13.6
% Single	93.6	97.8	95.9	95.7	94.7	96.9	93.3	94.7
% Married/Cohabitating	5.0	1.7	3.3	3.4	4.6	3.0	6.4	5.0
% Separated/Divorced or Widowed	1.3	0.3	0.8	0.8	0.7	0.1	0.3	0.3
% Living with both parents	68.8	71.5	69.6	69.9	61.4	68.9	68.5	66.8
% Living with one parent	19.3	21.9	21.2	20.8	29.7	23.5	23.2	24.9
% Living with guardians	11.8	6.5	9.2	9.3	9.0	7.6	8.3	8.3
% Catholic	91.8	95.7	91.3	92.5	82.7	96.6	93.0	91.4
% Other Christian	4.1	2.9	5.1	4.3	10.5	2.2	3.9	5.1
% Other religion	1.9	0.3	0.5	0.8	1.2	0.2	0.1	0.4
% No religion	2.1	1.0	3.0	2.2	5.7	0.9	3.0	3.1
% Working	24.3	25.2	15.8	20.5	17.2	26.6	19.5	21.0
% Not working	75.7	74.8	84.2	79.5	82.8	73.4	80.5	79.0
% Currently attending school	74.1	77.9	81.3	78.4	77.2	76.8	70.9	74.2
% Currently not in school	25.9	22.1	18.7	21.6	22.8	23.2	29.1	25.8
Mean years of schooling	7.2	6.5	7.0	6.9	6.1	6.4	6.7	6.5

Knowledge of Contraception

Respondents were asked in both the surveys if they had heard of methods or means to avoid having children or to delay a pregnancy, and those who had were asked which methods they knew. (If a method was not mentioned, then the respondent was prompted by the interviewer.) Table 8 shows that a higher proportion of respondents in the endline survey (66%) had heard about contraception than in the baseline survey (57%). This increase in knowledge was observed for both males and females in both age groups. Unprompted, males mentioned a mean of 5.5 methods in the baseline and 5.8 in the endline, compared to 6 and 6.3 respectively among females. More than twice as many of the older adolescents had heard of contraceptives than had the younger ones.

The better-known methods among adolescents in project areas were condoms, then contraceptive pills. In the endline survey, almost all had heard of the condom, and 88 percent of males and 92 percent of females had heard of pills. Even among younger respondents, nearly all of them had heard of the condom and over 80 percent had heard of the pill.

Table 8: Proportion of Respondents Knowing of Contraception and Methods Known (Prompted and Unprompted) by Sex, Age, Intervention Group, and Time of Interview

	1999			Total	2002			Total
	Intervention Group				Intervention Group			
	3-Int	2-Int	Control		3-Int	2-Int	Control	
All Respondents	**653**	**842**	**696**	**2191**	**603**	**651**	**661**	**1915**
Have heard about contraceptives	64.5	49.7	55.5	56.6	69.8	64.1	66.0	66.4
Of those hearing of contraceptives:								
% who know pills	91.7	87.3	82.4	86.5	89.3	88.2	91.5	90.0
% who know IUD	60.4	54.6	55.4	56.8	60.2	51.9	65.2	60.3
% who know injectables	72.1	60.8	64.6	66.2	72.0	77.2	72.6	73.7
% who know condoms	97.6	93.8	97.4	96.7	98.1	97.6	98.0	97.9
% who know suppositories, jellies, foam	47.5	42.1	43.9	44.7	39.3	46.5	41.8	42.4
% who know rhythm, other periodic methods	42.9	33.0	38.7	38.8	42.7	43.1	38.0	40.6
% who know withdrawal	33.5	23.5	22.7	26.3	28.7	34.0	24.1	28.0
% who know female sterilization	75.8	63.9	73.0	71.9	66.6	70.5	70.6	69.5
% who know vasectomy	71.1	60.0	63.4	65.1	63.6	61.5	66.4	64.3
% who know emergency contraception pills	19.6	13.2	25.6	21.0	37.1	45.9	38.8	40.3
Mean number of methods mentioned (unprompted)	6.1	5.3	5.7	5.7	6.0	6.2	6.1	6.1

All Males	**293**	**401**	**328**	**1022**	**283**	**308**	**309**	**900**
Have heard about contraceptives	64.4	47.0	53.5	54.9	68.2	60.3	65.7	64.8
Mean number of methods mentioned (unprompted)	5.8	4.9	5.5	5.5	5.7	6.1	5.7	5.8
All Females	**360**	**441**	**368**	**1169**	**320**	**343**	**352**	**1015**
Have heard about contraceptives	64.6	52.3	57.4	58.2	71.3	67.4	66.2	67.8
Mean number of methods mentioned (unprompted)	6.4	5.7	5.8	6.0	6.2	6.2	6.4	6.3
Males 10-14	**166**	**246**	**197**	**609**	**169**	**194**	**182**	**545**
Have heard about contraceptives	41.3	23.1	35.1	33.4	48.5	43.1	50.3	47.7
Mean number of methods mentioned (unprompted)	4.3	3.4	4.6	4.3	4.6	5.3	4.6	4.8
Males 15-19	**127**	**155**	**131**	**413**	**113**	**114**	**127**	**354**
Have heard about contraceptives	88.1	85.2	79.7	83.7	96.5	87.3	86.8	89.5
Mean number of methods mentioned (unprompted)	6.6	5.5	6.1	6.1	6.6	6.8	6.6	6.6
Females 10-14	**202**	**238**	**209**	**649**	**201**	**202**	**186**	**589**
Have heard about contraceptives	42.0	26.9	36.5	35.7	61.6	52.4	44.0	51.3
Mean number of methods mentioned (unprompted)	5.4	4.4	5.3	5.2	5.4	4.5	5.0	5.0
Females 15-19	**158**	**203**	**159**	**520**	**119**	**141**	**166**	**426**
Have heard about contraceptives	90.3	85.0	90.5	89.1	87.7	87.9	88.1	88.0
Mean number of methods mentioned (unprompted)	6.9	6.3	6.2	6.4	7.1	7.5	7.0	7.2

Female sterilization, vasectomy, and injectables are known by about two-thirds of the males and a slightly higher proportion of females. The least known methods were withdrawal (28 percent), rhythm (41 percent), and vaginal suppositories, tablets and foams (about 42 percent). Although emergency contraception is also among the least known methods, awareness increased from 24 percent to 40 percent among males, and from 18 percent to 41 percent among females, the greatest changes seen for any method. This increase was more pronounced in the experimental groups than in the control group.

In both surveys, questions were asked to assess knowledge of correct use of the different methods. Few differences were found between the experimental and the control groups. Females were slightly more knowledgeable than males, and those 15-19 years of age more so than those 10-14 years of age. However, differences between these two age groups were not as large as could be expected. Of those who were aware of each of the methods mentioned:

- Twenty percent knew that pills are taken each day, and about nine percent knew that if one forgets to take the pill, two should be taken the following day
- Forty-nine percent knew that the IUD was placed in the uterus, and 73 percent knew that the IUD needs to be placed by a physician

- Twenty-five percent knew that injections are given every one, two, or three months
- Eighty-four percent had seen a condom, 88 percent knew the condom is placed on the penis, and 84 percent knew condoms could be used only once
- Forty-one percent knew vaginal foams, tablets and suppositories had to be in place before sexual relations took place
- Fifty-seven percent knew that the rhythm method implies abstaining from sexual relations during the fertile period
- Fifty-five percent knew that withdrawal meant withdrawing the penis from the vagina before ejaculation
- Eighty-four percent knew that a woman could not have children after sterilization
- Ninety percent knew that a man cannot have children after vasectomy
- Thirty-five percent knew that emergency contraception pills need to be taken in the first three days after unprotected intercourse to be effective

Knowledge of STIs including HIV/AIDS

Questions exploring the knowledge of sexually transmitted infections (STIs) were included in the endline survey. Less than one-half of the respondents had heard about STIs. Slightly more females than males knew about them. No differences between groups were observed. Less than one-quarter of those 10-14 years had heard of STIs, compared to four-fifths of those aged 15-19.

Those who had heard of STIs were asked about the ways that a person could become infected. Sex with an infected person was mentioned by 47 percent, sex with several persons by 25 percent, not using protection during sexual intercourse by 26 percent, and other incorrect prevention means by 15 percent. There were only slight differences between females and males. There were no consistent differences in favor of the experimental groups over the control group. Surprisingly, those in the 10-14 year age group were almost as knowledgeable as those in the 15-19 years age group about STI prevention.

Eighty-five percent of the respondents had heard of HIV/AIDS (76% of those aged 10-14 and 96% of those aged 15-19). When they were asked about means of transmission, 83 percent mentioned sexual relations, more than 30 percent mentioned blood transfusions, 22 percent mentioned use of unsterilized needles, and three percent mentioned mother to infant transmission during pregnancy and birth.

Since condoms are the cornerstone of protection strategies among the sexually active, it is interesting to see that of those who know about condoms (47% of the full sample and over 90% of those who said they had heard of contraceptives), about 87 percent of males and 75 percent of females said they had seen a condom, and little change in these proportions was observed between the baseline and the endline surveys. Among younger male respondents, however, the proportion that said they had seen a condom increased from 68 percent in the baseline to 76 percent in the endline, mostly as a consequence of the strong increase observed in the 2-Int group. Over 92 percent of males and 80 percent of females could say where the condom is placed, and a slightly lower proportion knew that the condom could be used only once. Table 9 shows that among those who had heard of HIV/AIDS, the proportion who mentioned use of

condoms as a means to prevent infection increased from 56 percent to 77 percent between the surveys, and that this increase was observed both in the experimental and control groups. Even among those 10-14 years of age who have heard of HIV/AIDS, more than 60 percent mentioned the use of condoms as a means of prevention.

Table 9: Proportion of Respondents who Know about Condoms and Other Means to Avoid HIV/AIDS by Sex, Age, Intervention Group, and Time of Interview

	1999				2002			
	Intervention Group			Total	Intervention Group			Total
	3-Int	2-Int	Control		3-Int	2-Int	Control	
All Respondents	**653**	**842**	**696**	**2191**	**603**	**651**	**661**	**1915**
Of those who have heard of contraceptives:								
Proportion that have seen a condom	84.1	79.0	76.1	79.3	79.1	83.3	79.2	80.3
Proportion that know where a condom is placed	92.4	81.8	89.7	88.8	87.1	84.2	83.6	84.6
Proportion that know that the condom can be used only once	85.9	80.3	80.5	82.2	83.0	75.2	82.1	80.5
Proportion that have heard of HIV/AIDS	68.2	60.3	62.2	63.4	86.4	84.7	83.6	84.6
Of those who have heard of HIV/AIDS, mention use of condoms as a means to avoid STI	62.8	50.9	53.5	55.7	77.7	74.9	77.3	76.7
Of those who have heard about HIV/AIDS, mention to have sexual relations only with one person as a means to avoid STI	18.4	15.5	17.8	17.4	5.4	3.5	3.6	4.0

Of those who have heard about HIV/AIDS, request fidelity from partner as a means to avoid STI	2.9	1.3	3.2	2.7	0.8	1.6	0.5	0.9
Males 10-14	**166**	**246**	**197**	**609**	**169**	**194**	**182**	**545**
Have heard of HIV/AIDS	38.2	29.0	39.4	36.3	74.9	77.8	75.7	76.1
Of those who have heard about HIV/AIDS, mention use of condoms as a means to avoid STI	71.3	39.0	38.8	47.4	75.6	59.5	63.2	65.2
Males 15-19	**127**	**155**	**131**	**413**	**113**	**114**	**127**	**354**
Have heard of HIV/AIDS	97.5	100.0	93.2	96.1	96.0	95.7	94.9	95.4
Of those who have heard about HIV/AIDS, mention use of condoms as a means to avoid STI	74.1	67.5	66.7	69.3	88.2	94.2	89.4	90.4
Females 10-14	**202**	**238**	**209**	**649**	**201**	**202**	**186**	**589**
Have heard of HIV/AIDS	42.4	39.2	41.6	41.2	85.3	75.3	70.9	76.2
Of those who have heard about HIV/AIDS, mention use of condoms as a means to avoid STI	25.3	23.5	47.4	36.0	66.7	60.2	58.5	61.5
Females 15-19	**158**	**203**	**159**	**520**	**119**	**141**	**166**	**426**
Have heard of HIV/AIDS	98.9	96.5	96.6	97.3	96.1	97.5	95.6	96.2
Of those who have heard about HIV/AIDS, mention use of condoms as a means to avoid STI	66.7	55.2	53.3	58.1	85.8	90.5	93.2	91.0

Attitudes Toward Contraception and Toward Service Providers

One of the objectives of the interventions tested in this project was to create a more conducive environment that allowed adolescents to make informed choices to protect their sexual and reproductive health. This implies that adolescents themselves, as well as their parents and the community in general, approve of prevention practices and service delivery activities that facilitate these behaviors.

Table 10 shows that the proportion of adolescents who approved of contraceptive use by youth decreased between the baseline and endline surveys from 64 percent to 58 percent (from 67% to 58% in the case of males, and from 61% to 58% in the case of females). Most of this decline was a result of the decline observed in the 10-14 age group for both males (from 53% to 39%) and females (from 46% to 38%), since the proportion of those 15-19 who approved remained around 86 percent for males and 82 percent for females. Other results showed that greater proportions of males and females out of school approve of contraceptive use by youth than those still at school.

Another indicator measured the perception of whether pharmacies would treat young people seeking contraceptives respectfully. The proportion of youth that agreed with this statement increased between surveys (from 39% to 48%). Larger increases were observed in the experimental than in the control groups. The proportion of those aged 10-14 who agreed with the statement remained the same (around 36%), while the increase in the older age group was nearly 20 percentage points.

In the endline survey, several questions were added to further assess the attitudes of respondents. Fifty-eight percent of the respondents agreed with the use of contraceptives by unmarried youth, and 83 percent agreed with use of condoms by sexually active youth to prevent pregnancies and infections. In both cases, only slight differences between males and females and between groups were observed. However, about twice as many older adolescents than younger approved of contraceptive use by unmarried youth. In the case of condoms for preventing infections and pregnancies, the approval rates were about 97 percent and 72 percent, respectively.

Table 10: Proportion of Respondents Who have Positive Attitudes Towards Contraceptive Use by Youth by Sex, Age, Intervention Group, and Time of Interview

	1999				2002			
	Intervention Group			Total	Intervention Group			Total
	3-Int	2-Int	Control		3-Int	2-Int	Control	
All Respondents	**653**	**842**	**696**	**2191**	**603**	**651**	**661**	**1915**
Agree with use of contraception by youth	73.6	54.0	63.5	64.0	63.2	56.5	56.5	58.1
Of those who have heard of contraceptives, approve of contraception by adolescents	83.2	83.6	80.3	81.9	86.3	84.4	82.7	84.1
Think that young people who go to pharmacies to get contraceptives are treated respectfully	42.9	32.9	40.0	39.0	51.9	45.8	47.1	47.9
Of those who have heard about contraceptives, think that young people who go to pharmacies to get contraceptives are treated respectfully	47.0	41.8	45.5	45.2	68.7	68.1	68.7	68.5
Males 10-14	**166**	**246**	**197**	**609**	**169**	**194**	**182**	**545**
Agree with use of contraception by youth	63.4	40.9	54.9	53.2	45.7	39.1	36.1	39.4
Think that young people who go to pharmacies to get contraceptives are treated respectfully	35.5	33.2	39.0	36.6	41.9	36.4	35.9	37.6

Males 15-19	**127**	**155**	**131**	**413**	**113**	**114**	**127**	**354**
Agree with use of contraception by youth	94.6	83.7	80.9	86.0	91.3	88.1	81.6	85.9
Think that young people who go to pharmacies to get contraceptives are treated respectfully	62.7	45.9	47.9	52.3	77.5	72.7	64.4	70.1
Females 10-14	**202**	**238**	**209**	**649**	**201**	**202**	**186**	**589**
Agree with use of contraception by youth	50.9	30.4	51.1	46.1	49.0	33.9	34.0	38.1
Think that young people who go to pharmacies to get contraceptives are treated respectfully	33.2	22.6	41.8	34.9	41.1	30.2	32.0	34.0
Females 15-19	**158**	**203**	**159**	**520**	**119**	**141**	**166**	**426**
Agree with use of contraception by youth	88.7	76.6	77.7	80.9	84.3	83.5	80.5	82.0
Think that young people who go to pharmacies to get contraceptives are treated respectfully	41.7	34.4	30.5	35.1	59.3	57.0	60.6	59.4

The endline survey also assessed perceptions and attitudes about clinic-based reproductive health service delivery for adolescents. Table 11 shows that slightly less than half of the respondents believed that young people who go to clinics seeking contraceptives are treated respectfully. Slightly less than 60 percent believed they would be treated respectfully if they requested information on STIs. A similar proportion believed that clinics should provide contraceptives to youth who request them. Differences between sexes were small, and slightly more positive perceptions were found in the 3-Int group than in the 2-Int and in the control groups. Those in the older age group were twice as likely to expect respectful treatment than the younger adolescents, to believe clinics should provide contraceptives to youth, and to believe that if they requested information on STIs they would be politely treated. There were very small differences between those out of school and those in school, with the former having more positive perceptions.

Regarding attitudes towards service delivery in pharmacies, slightly less than half of the respondents believed they would feel shy about asking for a condom in a pharmacy, and only about one-third felt they would be confident to ask the pharmacist how to use the method. Less than one-third believed pharmacy staff is well trained to provide services to adolescents. Females were more likely to report that they would feel shy to ask for a condom in a pharmacy than men, and they were also less likely to feel confident requesting information or to believe staff is competent to serve adolescents. Surprisingly, those in the older age group were more likely to state they would feel shy asking for a condom in a pharmacy than those in the younger age group and less likely to believe that pharmacist staff is well trained. This may reflect either more liberal attitudes or less experience in actually approaching pharmacy staff.

Table 11: Attitudes Related to Reproductive Health Service Providers by Intervention Group and Sex, 2002

	2002											
	3 Interventions			2 Interventions			Control			Total		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Total Respondents	**283**	**320**	**603**	**308**	**343**	**651**	**309**	**352**	**661**	**900**	**1015**	**1915**
Think that young people who go to clinics to get contraceptives are treated respectfully	56.9	51.7	54.2	42.6	38.6	40.5	45.6	47.3	46.6	47.7	46.0	46.8
Think that young people who go to clinics to get STI information are treated respectfully	62.9	62.0	62.4	54.3	54.7	54.5	58.0	57.7	57.9	58.2	57.9	58.0
Proportion in favor of sex education	81.7	85.8	83.8	81.0	87.2	84.3	84.4	90.5	87.8	82.7	88.5	85.8
Believe clinics should provide contraceptives to youth who request them	64.4	59.7	62.0	51.5	50.1	50.7	49.9	51.0	50.5	54.1	52.9	53.4
Believe s/he would feel shy to ask for a condom in a pharmacy	28.3	59.1	44.3	40.4	58.0	49.7	43.3	59.3	52.1	38.6	58.9	49.5
Believe would have confidence in pharmacy to request information on how to use it	41.6	31.8	36.5	35.4	18.3	26.3	33.0	23.8	27.9	35.9	24.2	29.6
Believe pharmacy staff is well trained to provide services to adolescents	37.1	23.0	29.8	32.5	23.6	27.8	40.4	24.5	31.6	37.3	23.9	30.1

Gender-Related Attitudes

Baseline respondents were asked under what circumstances was a man justified in hitting a woman, whereas endline respondents were first asked if they believed there were circumstances which justified a man hitting his partner, and if so, which were these circumstances. To compare the first question with the endline data, those who responded in the baseline with any reason that justified violence were coded as if they had answered that there were circumstances that justified violence. The way that the questions were phrased had a strong impact on the responses, since 22 percent in the baseline offered a reason that justified violence, whereas only three percent in the endline responded that there were such reasons. In fact, the high percentage observed in the baseline makes us wonder if respondents answered "under which circumstances was a man more likely to hit his partner", not "under which circumstances was this violence justified". Males were more likely than females to name circumstances that justified violence. By far, the most frequently mentioned justification was infidelity.

In the endline survey, questions were included to assess other gender-related attitudes. About one-fifth agreed with women or men having sex before marriage. Men were slightly more likely to agree with premarital sex. Differences across age were much stronger: eight percent of those aged 10-14 agreed with women having premarital sex, compared to about 30 percent of those 15-19. Nevertheless, the proportions in both age groups are low.

To assess gender relations at home, adolescents were asked about different aspects of interactions between their parents. Nearly half of the respondents said their mothers asked their fathers permission for any of four reasons. The most frequent was to visit other relatives (36%), followed by going out alone or with her children (about one-third) and making day-to-day expenditures (25%). Again, there were small differences between intervention and sex groups.

Reproductive Ideals

Data on three reproductive ideals for the respondents were collected in both surveys (see Table 12). The mean ideal number of children was 2.4 children in the baseline and 2.6 in the endline. Ideals in the 3-Int group were lower than in the 2-Int or the control groups. The ideal number of children for males was about 0.3 children higher than for females, and the standard deviation for males was nearly one child more than for females, implying that the latter have much more consistent ideals.

The mean ideal age at marriage was close to 22 for both males and females in the baseline survey and higher (by 0.9 and 0.4 years, respectively) in the endline survey. The largest increase in the ideal age between surveys was observed in the control group. The ideal age of marriage for males was higher than for females in both surveys, but differences across age groups are not consistent.

Finally, the mean ideal age for having a first child was 23.2 for males and 22.9 for females in the endline, with standard deviations of about 3.5 years. In the two experimental groups, this ideal age remained similar between surveys, while in the control group it decreased by 1.3 years, to 22.4 in the endline. The ideal number of children, and the ideal ages for marriage and first child were higher for those out of school than those in school.

Table 12: Mean Ideal Number of Children and Mean Ideal Ages at Marriage and at First Birth by Sex, Age, Intervention Group, and Time of Survey

	1999								2002							
	Intervention Group						Total		Type of Intervention						Total	
	3-Int		2-Int		Control				3-Int		2 -Int		Control			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
All Respondents	**653**		**842**		**696**		**2191**		**603**		**651**		**661**		**1915**	
Mean ideal number of children	2.3	2.3	2.6	2.0	2.4	2.9	2.4	2.2	2.4	1.0	2.6	1.2	2.6	1.4	2.6	1.3
Mean ideal age at marriage	22.2	22.2	21.7	4.5	21.9	4.9	21.9	4.5	22.9	4.0	22.6	4.5	22.2	3.9	22.5	4.1
Mean ideal age at first birth	23.5	23.5	23.6	3.5	23.7	3.6	23.6	3.5	23.3	3.5	23.4	3.3	22.7	3.3	23.0	3.4
Males 10-14	**166**		**246**		**197**		**609**		**169**		**194**		**182**		**545**	
Mean ideal number of children	2.4	1.1	2.8	3.3	2.4	1.1	2.5	1.9	2.5	1.2	2.7	1.5	2.8	2.0	2.7	1.7
Mean ideal age at marriage	21.9	3.9	21.7	3.9	21.5	4.5	21.6	4.2	23.1	3.6	23.1	5.4	22.4	4.3	22.8	4.5
Mean ideal age at first birth	23.6	3.5	24.0	4.1	23.4	4.1	23.6	3.9	23.3	3.5	23.5	3.5	22.9	3.2	23.2	3.4
Males 15-19	**127**		**155**		**113**		**413**		**113**		**114**		**127**		**354**	
Mean ideal number of children	2.4	0.6	2.8	1.0	2.3	1.0	2.5	0.9	2.5	0.8	2.6	1.3	2.6	1.1	2.6	1.1
Mean ideal age at marriage	23.3	3.4	22.9	4.3	21.8	5.8	22.5	4.9	23.1	3.3	23.2	4.4	22.9	4.3	23.1	4.1
Mean ideal age at first birth	23.8	2.8	24.5	3.0	24.0	3.2	24.0	3.0	23.2	3.2	23.6	3.4	23.2	3.1	23.3	3.2
Females 10-14	**202**		**238**		**209**		**649**		**201**		**202**		**186**		**589**	
Mean ideal number of children	2.1	0.8	2.4	1.0	2.1	1.0	2.2	1.0	2.3	0.9	2.5	0.9	2.4	1.0	2.4	1.0
Mean ideal age at marriage	21.9	4.8	20.5	5.4	21.8	5.3	21.5	5.2	23.1	4.5	22.1	4.1	22.4	3.5	22.5	4.0
Mean ideal age at first child	23.5	3.9	23.2	3.8	23.6	3.5	23.5	3.7	23.5	3.9	23.4	3.2	23.0	3.6	23.3	3.6
Females 15-19	**158**		**203**		**159**		**520**		**119**		**141**		**166**		**426**	
Mean ideal number of children	2.2	0.8	2.6	0.9	2.9	6.0	2.6	4.0	2.3	0.9	2.7	0.9	2.8	1.2	2.6	1.1
Mean ideal age at marriage	21.9	3.4	22.0	2.9	22.8	3.6	22.3	3.4	22.3	4.2	22.3	3.9	21.5	3.5	21.9	3.7
Mean ideal age at first birth	23.0	3.0	23.0	2.7	24.0	3.3	23.4	3.1	23.0	2.9	23.2	3.3	21.9	3.0	22.4	3.1

Communication Behavior

It was hypothesized that if the community environment became more accepting of sexual and reproductive health information and services for adolescents, the frequency of communication between adolescent partners and between adolescents and their parents would increase. A greater proportion of respondents in the baseline than in the endline survey reported talking with their partner about sexual relations (from 35% to 50%). However, in the control group this increase was much higher (24 percentage points) than in the two intervention groups for both males and females. In both surveys, similar proportions of males and females reported talking with their partner about sexual relations. A strong increase was observed in communication about contraception for all groups, including the control group.

Communication with fathers about sexuality issues increased between surveys from about 15 percent to 20 percent, with a slightly higher increase for females than for males, and more for the control group than for the experimental groups. Communication with mothers remained around 50 percent in both surveys, with more than half of females reporting communication with their mother, compared with only one-third of males. Older adolescents have more frequent communication with either parent than younger adolescents. For both males and females, the proportion reporting communication with either father or mother is very close to the proportions reporting communication with the mother. This implies there are three segments of youth: those who do not talk about these topics with their parents; those who talk with both parents; and those who talk only with their mother.

Sexual and Contraceptive Behavior

The ultimate objective of adolescent programs is that youth make appropriate decisions to preserve their health and life plans. Table 13 shows changes in sexual and contraceptive behaviors that the interventions tried to affect.

Table 13: Sexual and Contraceptive Behavior by Sex, Intervention Group, and Time of Interview

	1999				2002			
	Intervention Group			Total	Intervention Group			Total
	3-Int	2-Int	Control		3-Int	2-Int	Control	
Total Respondents	**653**	**842**	**696**	**2,191**	**603**	**651**	**661**	**1,915**
Had sexual relations	11.7	7.9	9.8	9.9	11.3	7.7	12.3	10.7
Of those who have had sexual relations:								
Age at first intercourse	15.9	15.6	15.3	15.6	15.7	15.7	15.8	15.8
% who used a method in first sexual intercourse	33.0	48.3	42.5	40.5	44.9	48.5	35.5	40.6
% who used a method in last sexual intercourse	59.9	63.8	48.2	55.2	51.4	37.0	62.1	54.2
% have had sex in last 6 months	_	_	_	_	47.4	42.7	66.2	56.6
% that had had sex in last 3 months	44.2	33.7	36.6	38.6	28.2	30.5	56.8	44.0
Of those who had sex in last six months, proportion who had one sexual partner	_	_	_	_	83.1	91.7	91.0	89.4
Of those who have had sex, mean number of sexual partners ever	1.9	1.8	2.1	1.9	2.8	2.9	1.7	2.2
Of those who had sex in last 6 months, mean number of relations	_	_	_	_	6.6	12.7	15.4	13.4
Of those who have had sexual relations, proportion who had sex with a prostitute	11.5	7.8	_	5.4	4.7	2.3	1.4	2.4
Of these, % that used condom with prostitute	88.2	100.0	_	91.6	68.8	100.0	100.0	84.2
Of those who have had sexual relations, proportion who have been pregnant / made partner pregnant	41.7	22.5	37.6	36.0	44.5	29.1	37.9	37.9
Of those who have had sexual relations, proportion who is currently pregnant / partner pregnant	10.6	_	5.9	6.3	20.4	9.1	5.5	10.2
Males	**293**	**401**	**328**	**1022**	**283**	**308**	**309**	**900**
Have had sexual relations	12.0	10.2	11.9	11.5	14.6	9.6	13.4	12.6
Of those who have had sexual relations:								
Age at first intercourse	16.1	15.6	15.2	15.5	15.8	15.5	15.6	15.6
% that used a method in first sexual intercourse	40.9	68.0	53.7	53.2	62.3	64.3	49.7	56.6
% who used a method in last sexual intercourse	79.3	81.3	49.6	65.4	70.5	51.2	78.2	70.0
% who had sex in last 6 months	_	_	_	_	43.5	29.7	45.9	41.7
% who had sex in last 3 months	45.9	20.8	23.7	29.5	21.7	12.7	28.4	23.0

Of those who had sex in last 6 months, % that had one sex partner	–	–	–	–	70.2	83.7	73.5	74.1
Of those who have had sex, mean number of sexual partners ever	2.6	2.0	2.7	2.5	3.8	3.3	2.4	3.0
Of those who had sex in last 6 months, mean number of relations last 6 months	–	–	–	–	3.5	3.5	4.2	3.9
Of these, proportion who used a condom	88.2	100.0	–	91.6	68.8	100.0	100.0	84.2
Of those who have had sex, % who have been pregnant / made partner pregnant	1.1	3.9	8.3	5.2	21.5	3.1	5.6	9.8
Of those who have had sex, % currently pregnant / partner pregnant	–	–	3.4	1.7	10.8	3.1	0.8	4.3
Females	**360**	**441**	**368**	**1169**	**320**	**343**	**352**	**1015**
Have had sexual relations	11.4	5.7	7.8	8.3	8.3	6.0	11.4	9.1
Of those who have had sexual relations:								
Age at first intercourse	15.7	15.8	15.5	15.6	15.7	16.0	16.1	16.0
% who used a method in first sexual intercourse	25.3	13.6	26.2	23.7	16.8	26.1	22.0	21.6
% who used a method in last sexual intercourse	40.7	33.0	46.2	41.8	20.6	16.8	46.7	35.5
% who had sex in last six months	–	–	–	–	53.6	61.1	85.7	74.2
Of those who have had sexual relations, have had sex in last three months	42.5	56.5	55.4	50.5	38.7	55.7	84.0	68.9
Of those who had sex in last 6 months, % who had one sex partner	–	–	–	–	100.0	97.1	100.0	99.6
Of those who have had sex, mean number of partners ever	1.1	1.2	1.2	1.1	1.1	2.3	1.1	1.3
Of those who had sex in last 6 months, mean number of relations in last 6 months	–	–	–	–	10.8	24.0	20.9	19.9
Of those who have had sex, % who have been pregnant / made partner pregnant	81.7	55.5	80.2	76.6	81.5	65.8	68.8	71.1
Of those who have had sex, % currently pregnant / partner pregnant	21.0	–	9.4	12.4	36.0	17.6	10.0	17.1

None of the respondents under age 13 acknowledged having had sexual relations in either survey. This is not surprising given the low levels of sexual activity overall within this population. In the baseline, 9.9 percent of the respondents 10-19 years of age said they had had sexual relations, compared to 10.7 percent in the endline. A slight decrease in the proportion that had had sex was observed between surveys in the two experimental groups. However, in the control group this proportion increased from 9.8 percent to 12.3 percent.

The proportion of all males who reported having had sexual relations increased between from 11.5 percent to 12.6 percent between the baseline and the endline. The proportion of all females increased from 8.3 percent to 9.1 percent. However, a decline was observed among females in the 3-Int group compared to an increase among females in the control group.

In the endline survey, only one percent of males less than 15 years of age had been sexually active, compared to 29 percent of those 15-19 years of age. Likewise, only 0.4 percent of females aged 10-14 years said in both surveys they had ever had sex, compared to 20 percent of those aged 15-19. Besides age, the largest differential in sexual experience was produced by attendance in school. In both surveys, about 30 percent of those out of school had had sex, compared to 4 percent of those currently in school.

Of those who had had sex, about 41 percent in both surveys said they had used a method in their first sexual relation. The proportion who reported use in the first intercourse increased from 33 percent to 45 percent in the 3-Int group, remained at 48 percent in the 2-Int group, and decreased from 42 percent to 35 percent in the control group. Of those who had used a method, 76 percent in the baseline and 93 percent in the endline reported having used a condom. The second modern method most frequently used was pills.

While about half the males were likely to report using some method at first sexual relation (54% in the baseline and 50% in the endline) only about one-quarter of the females did so (24% and 22%, respectively). The method most frequently used by both males and females was the condom, and the proportion reporting this method in their sexual debut increased between surveys in both cases. Use of methods in the first sexual relationship was lower among those out of school than those currently in school. Among those out of school, about 30 percent used a method, compared to over 60 percent of those still studying.

The proportion that reported using a method in their last sexual relationship remained unchanged between surveys at around 55 percent. However, this proportion declined substantially in the intervention groups while it increased in the control group. Of those who used a method in their last sexual relationship, about three-fourths used a condom. Males were also more likely to use a method in the last sexual relationship (65% in the baseline and 70% in the endline) than women (42% and 35%, respectively). The condom was by far the method most frequently used, followed by the pill, IUDs and injectables. About 45 percent of those out of school reported in both surveys that they had used a method in their last sexual relationship. However, a decline was observed in the two experimental groups and an increase in the control group. Among those in school, an increase in use of methods was observed between surveys, from 74 percent to 82 percent.

Of those who had ever had sex, 39 percent in the baseline and 44 percent in the endline said they had had sex in the last three months. This proportion declined in the two intervention groups, whereas it increased in the control group. In the endline survey, 57 percent reported they had had sex in the last six months (about 44% in the experimental groups and 66% in the control group). The vast majority (89%) of those who had had sex in the last six months reported having had only one sexual partner during this period, and a mean of 13 sexual relations during this period. Among sexually active youth, females were more likely to have had sex in the last three and six months than males. In the baseline, 29 percent of males and 50 percent of females had had sex in the last three months, whereas in the endline 23 percent of males and 69 percent of females did so. In the endline, 74 percent of males and nearly all females who had ever had sex had sexual relations in the last six months. The mean number of sexual relations in the last six months was four for males and 20 for females, suggesting that females have much more stable relationships

than males. Of those who had had sexual relations in the last six months, 99 percent of females and 74 percent of males said they had had only one sex partner during that period.

Of those who have had sex, about 50 percent of those out of school and 21 percent of those in school said they had sex in the last three months in both surveys, whereas in the last six months the proportions were 60 percent and 46 percent, respectively. Ninety-two percent of those out of school and 81 percent of those in school said they had had only one sex partner during that time. Those out of school reported a mean of 17 sexual relations in the last six months, compared to three for those in school. Thus, those out of school seem to be engaged in more stable relationships than those in school, and perhaps forging these stable relationships led to abandonment of school.

In the endline survey, about four percent of those who had been sexually active had had sex with a prostitute in the last six months, of whom 84 percent used a condom. In the control group both a lower proportion reported having had sex with prostitutes (2.8%) and a higher proportion reported using a condom (100%).

Of those who had had sex, around 36 percent in both surveys said they had been pregnant or made their partner pregnant, and six percent in the baseline and 10 percent in the endline were themselves or their partners currently pregnant. In the endline, 10 percent of males had ever made their partner pregnant compared to 71 percent of females who had been pregnant. The proportion of males who reported their partners were currently pregnant was 1.7 percent in the baseline and 4.3 percent in the endline, compared to 12.4 percent of females in the baseline and 17.1 percent in the endline. Among those out of school, 48 percent reported having ever made their partner pregnant or being pregnant, compared to about 11 percent of those currently in school. In the endline, 14 percent of those out of school said they or their partners were currently pregnant, compared to 1.5 percent of those in school.

Other analysis showed that of those who used a method in their first sexual relation, 85 percent obtained it from a pharmacy and six percent from government clinics, with no differences between sexes. In 46 percent of the cases, the decision to use a method had been his, and in 47 percent the decision had been made by both partners. Respondents reported different reasons for using a method in their first sexual relation: to avoid pregnancy (97%); avoid STIs/HIV/AIDS (74%); and to avoid both (97%).

Table 14 shows that marital status and gender are crucial variables to understand adolescent sexual behavior. Only 5.9 percent of all single adolescents 10-19 years of age (and only 13.8% of those 15-19 years) have been sexually active. Single males (10.8%) are ten times more likely than single females (1.4%) to have been sexually active. Single males and females who have been sexually active are also more likely to say they used a contraceptive method in the first and in the last sexual relationship than those who are married or who have broken a previous union. On the other hand, they are less likely to report being sexually active in the last three or six months, having a larger number of lifetime sex partners, or having had sex with prostitutes. As expected, those currently married are much more likely to have been pregnant or to be currently pregnant than those that are single. Nevertheless, almost half of single females who have been sexually active have been pregnant (although the number is small, only six cases). Other variables, such as

the proportion that have been sexually active, the frequency of intercourse, and the mean number of partners in the last six months suggest that these women live in more stable sexual relationships.

Table 14: Sexual and Contraceptive Behavior by Marital Status and Sex, 2002

	Married, Cohabiting			Separated, Divorced, Widowed	Single		
	(N=82)			(N=9)	(N=1824)		
	All	Female	Male	All	All	Female	Male
% who have had sex	**96.8**	**98**	**91.4**	**100**	**5.9**	**1.4**	**10.8**
Of those who have had sex							
Age at first intercourse	16	16.1	15.8	16.2	15.5	15.6	15.5
% who used a method at first sex	23	21.2	32.4	43.6	55.5	28.5	59.4
% who used a method in last sex	35.8	35.8	35.8	42.2	70.8	35.2	75.9
% who have had sex in last six months	80.8	79.2	89.2	42.5	36.6	57.9	33.5
Of those who had sex in last 6 months, % who had one partner	96.8	100	82.1	100	74.6	96.1	69.4
Of those who had sex in last 6 months, mean number of sex relations	19.1	21.1	7.3	4.4	4.8	13.6	2.9
% who have had sex in last three months	74.1	74.7	70.9	42.5	18.3	46.7	14.3
Mean number of lifetime sex partners	1.6	1.3	3.4	1.4	2.8	1.3	3
% who has had sex with a prostitute	0	n.a.	0	0	4.7	n.a.	5.4
Of those who had sex with prostitute, proportion who used a condom	n.a.	n.a.	n.a.	n.a.	84.2	n.a.	84.2
% who have been pregnant/made partner pregnant	74.4	75.5	68.6	42.9	6.2	45.6	0.6
% who are currently pregnant/partner pregnant	19.8	18.2	28	0	2.5	15.9	0.6

Note: n.a. means not applicable.

Other analysis showed that among the sexually active, 14 percent in the baseline and 20 percent in the endline survey said their first sexual relationship had been with their husband or wife. The most common type of relationship with first sexual partner was boyfriend/girlfriend (60%) and friend (15%).

Use of services

One of the purposes of the interventions tested was to make the available reproductive health services for adolescents friendlier, to make adolescents feel more confident when requesting services, and to motivate those who needed the services to use them more frequently. Table 15 explores the use and perception of services. In both surveys, adolescents were asked if they had visited a nurse or a physician for any reason in the last 12 months. The proportion that had visited a provider decreased from 58 percent at baseline to 47 percent at endline, with a similar decline observed in all three groups. Of those who visited a service provider, the mean number of visits in the baseline survey was 3.1, compared to 2.9 in the endline survey. Although differences were small, a smaller proportion of males than of females visited health agents in both surveys. Males also had a lower mean number of visits than females. In terms of age and sex, the proportion of males aged 10-14 years who visited a physician or nurse in the last 12 months decreased from 58 percent to 47 percent between surveys, whereas among females it decreased from 59 percent to 42 percent. Among those aged 15-19, the declines between surveys were from 53 percent to 38 percent for males, and from 60 percent to 58 percent for females. In this age group, more females than males use health services, and they do so more often. Of those 15-19 years of age who received a health service, women were more likely to have received a reproductive health service (36%, compared to 13% of males). In the 10-14 years age group, the proportion that received reproductive health services was three percent of males and 10 percent of females.

Forty-four percent of the out of school adolescents reported a visit to a physician or nurse in the last 12 months in both surveys, compared to those in school: 61 percent at the baseline and 47 percent at the endline. Those out of school were much more likely to have asked for a reproductive health service (38%) than those in school (9%).

Table 15: Use of Health Services and Satisfaction with Services by Intervention Group and Time of Interview

	1999				2002			
	Intervention Group				Intervention Group			
	3-Int	2-Int	Control	Total	3-Int	2-Int	Control	Total
Number of Respondents	**653**	**842**	**696**	**2,191**	**603**	**651**	**661**	**1,915**
Proportion who visited physician or nurse	54.7	58.0	59.3	57.7	51.7	44.3	45.3	46.6
Number of visits to physician or nurse	3.3	2.6	3.2	3.1	3.1	2.6	2.9	2.9
Proportion who asked for RH services	4.8	0.5	0.6	1.7	18.3	9.6	18.9	16.2
Proportion who asked for service other than RH	95.2	99.5	99.4	98.3	81.7	90.4	81.1	83.8
Of those who received RH service, felt trust	71.9	82.4	74.1	75.6	75.8	73.6	81.9	77.9

Of those who received RH service, felt privacy	78.7	86.0	78.1	80.2	80.5	85.0	81.4	82.1
Of those who went to physician and asked for RH services, felt trust	82.0	47.6	68.2	77.0	88.7	62.8	85.1	82.7
Of those who went to physician and asked for RH services, had privacy	79.5	100.0	100.0	84.5	86.4	88.3	67.6	76.7
Of those who went to physician and did not ask for RH services, felt trust	71.4	82.6	74.2	75.6	76.2	77.0	83.5	79.6
Of those who went to physician and did not ask for RH services, had privacy	78.6	85.9	77.9	80.1	82.9	86.7	87.1	85.8

In the endline survey, those who had made a visit to a physician or nurse in the last 12 months were asked the reason for their visit. Only 6.2 percent of the respondents (6.7% of females and 1.1% of males) mentioned a reproductive health service. However, only 0.6 percent of these visits had been for family planning or STI care. Other services mentioned by women were prenatal and birth care (1.5% and 1.3%, respectively), the Pap test (0.3%), and other reproductive health services (6.4%)

To ensure that the use of reproductive health services was detected in the endline survey, adolescents were asked if they had requested reproductive health information or services in any place in the last 12 months. Contraception was the most common reason for reproductive health visits, with 2.8 percent mentioning it (2.7% of females and 2.9% of males). Other reasons mentioned were prenatal, birth, or postnatal care (2.5%), Pap test (1.4%), gynecological exam (1.9%), and STIs (1.9%). Differences between groups were small.

Those that had attended a health service in the last year were asked if they had been treated respectfully and kindly, and if they were satisfied with the services they received. Most of those who received a reproductive health service felt comfortable enough to ask questions that clarified their doubts (78%) and received the service in a private manner (92%). Eighty-five percent said they had been very satisfied or satisfied with the service they received. Of those who received a reproductive health service, 22 percent said the provider had talked about contraception, STIs, or adolescent pregnancy, and 34 percent said they had seen a family planning poster, received an information brochure, or been invited to a reproductive health talk.

Other Risk Behaviors

Substance abuse is included in the curricula of the courses taught by MEXFAM to multipliers, and it is also taught in the federal school curricula. For this reason, the baseline and endline questionnaires included questions on these health risk behaviors. In the endline survey, 26 percent of the respondents said they had smoked at least once in their lives. A higher proportion of males (37%) than females (16%) reported having smoked. The proportion of respondents who

had smoked decreased between surveys by three percentage points, with the highest decrease observed in the 3-Int group. The number of cigarettes smoked per day also decreased, from four to two. Among males the decrease occurred in all three groups, for females, the decrease was observed mostly in the control group. Eighteen percent of younger males and seven percent of younger females reported having ever smoked. In the case of older adolescents, 63 percent of males and 27 percent of females reported having ever smoked. Attendance in school was also a strong predictor of not smoking, with those out of school nearly twice as likely as those still in school to have ever smoked.

About 29 percent said they had drank alcoholic beverages (36% of males and 23% of females), but nearly no one reported having used alcohol in the last three months. These proportions remained nearly the same between surveys, but the differences between groups were not consistent. There was an increase in the proportion of younger males (from 13% to 18%) and females (from 8% to 11%) who said they had used alcohol. In the case of older adolescents the proportions remained nearly the same, around 60 percent for males and 37 percent for females.

EFFECTS ON THE KNOWLEDGE, ATTITUDES, AND BEHAVIORS OF COMMUNITY STAKEHOLDERS

One project objective was to determine the effect of a community-based educational campaign on the attitudes of community stakeholders towards informing youth about reproductive health issues and the availability of services for sexually active youth. This section presents data related to the changes in attitudes of parents and teachers.

Effects on Parents

The baseline and endline surveys showed that almost all parents had heard of contraception, and that they knew on average more than seven methods. Nearly 86 percent of the parents had used contraception, and nearly 70 percent were using it at the endline survey. Over two-thirds had heard of at least one STI, and 98 percent had heard of HIV/AIDS. Of these, nearly 73 percent mentioned the use of condoms as a means to avoid STIs, compared to 60 percent in the baseline survey. Little change was observed in the attitudes of parents in the two experimental groups compared to the change in the control group, mostly because attitudes were very favorable towards adolescent sexual and reproductive health information, education, and services.

Table 16 shows that in the endline survey, 78 percent of the respondents said that they approved of contraceptive use by youth who have premarital sexual relations, 89 percent agreed with condom use by youth to avoid unwanted pregnancies, and 91 percent agreed with condom use to avoid STIs including HIV/AIDS, with little differences between groups.

In the endline survey, 79 percent of parents said that clinics should provide contraceptives to any young person requesting them, 81 percent believed that pharmacies should sell contraceptives to youth who request them, and 92 percent agreed with MOH guidelines requiring service providers to give information on contraception to any young person receiving any type of service. In all cases, there were little differences between groups. The question on agreement with contraceptive service delivery for youth in clinics was also asked in the baseline. The proportion that agreed with this increased from 67 percent at the baseline to 78 percent at the endline. The proportion agreeing in the 3-Int group remained the same, whereas it increased by 22 percentage points in the 2-Int group and by 12 percentage points in the control group.

Table 16: Parents' Attitudes About Adolescent Reproductive Health Behavior and Access to Services (Number and Weighted Percent) by Intervention Group and Time of Interview

	1999				2002			
	Intervention Group			Total	Intervention Group			Total
	3-Int	2-Int	Control		3-Int	2-Int	Control	
Number of Respondents	**291**	**362**	**297**	**950**	**279**	**280**	**291**	**850**
% who agree with contraceptive use by youth who have premarital sexual relations					75.1	81.1	77.2	77.7
% who agree with condom use by sexually active youth to avoid pregnancies					89.1	90.8	87.6	88.9
% who agree with condom use by sexually active youth to avoid sexually transmitted infections					90.6	92.8	90.9	91.3
% who believe clinics should provide contraceptives to any young person requesting them	75.6	61.6	64.8	67.2	76.3	83.4	77.0	78.5
% who believe that pharmacies should sell contraceptives to youth who request them					82.3	82.2	79.7	81.0
% who agree with MOH guidelines requiring service providers to give information on contraception					91.8	91.4	93.6	92.5

Only 12 percent agreed with a daughter having premarital sex and slightly more (17 percent) with a son's premarital sex. Whereas the proportions agreeing with a son's premarital sex remained stable between surveys, the proportion agreeing with a daughter's premarital sex increased from seven percent in the baseline to 12 percent in the endline survey. The largest increase was observed in the 3-Int group, and the increases in the 2-Int and control groups were very similar. Parents believed that the mean ideal marriage for men was 23.2 years and 21.4 years for females. Only slight differences were found between groups.

In both surveys, parents were asked if they agreed with their children being taught about how the body functions, menstruation, ejaculation, dating, sexual relations, unwanted pregnancies, contraceptive methods, and HIV/AIDS. Table 17 shows that except for ejaculation, with which 91 percent agreed, 95 percent or more of the parents agreed with their children being taught these topics, with few differences between surveys and groups. This table also shows only six percent of parents were against sex education.

Table 17: Parents Who Agree That Young People Should Be Taught Reproductive Health Topics (Number and Weighted Percent) by Intervention Group and Time of Interview

	1999				2002			
	Intervention Group				Intervention Group			
	3-Int	2-Int	Control	Total	3-Int	2-Int	Control	Total
Number of Respondents	**291**	**362**	**297**	**950**	**279**	**280**	**291**	**850**
% who agree that young people should be told about the way the body functions	96.8	97.6	98.4	97.7	94.9	96.9	97.1	96.5
% who agree that young people should be told about menstruation	97.3	97.6	98.0	97.7	95.5	97.5	96.8	96.6
% who agree that young people should be told about ejaculation	89.7	95.0	93.8	92.9	86.0	95.1	91.9	91.2
% who agree that young people should be told about dating	98.0	98.5	97.8	98.0	94.5	98.7	97.1	96.8
% who agree that young people should be told about sexual relations	94.9	97.2	96.7	96.3	92.8	97.1	96.3	95.6
% who agree that young people should be told about unwanted pregnancies	97.4	94.8	96.3	96.3	90.7	97.5	95.6	94.8
% who agree that young people should be told about contraceptive methods	96.1	96.1	95.4	95.8	92.6	96.8	96.1	95.3
% who agree that young people should be told about HIV/AIDS	98.6	98.0	98.4	98.4	94.8	98.0	97.0	96.7
% who are in favor of students receiving education on sexual and reproductive themes at school					91.3	92.2	94.2	92.9
Mean grade at which this education should start to be provided					5.0	5.3	5.3	5.2
Of those who are in favor, mean age at which this education should begin					5.4	5.8	5.6	5.6
% who have children in 5th and 6th grades					46.4	51.6	38.9	44.3
Of those who have children in 5th and 6th grades, % who know that sex education is provided in the natural science course					87.6	84.7	90.1	87.8
Of those who know that sex education is provided, % who reviewed the sexual and reproductive health contents					79.6	82.2	80.8	80.9
% who have children in secondary school					44.2	50.9	43.2	45.5
Of those who have children in secondary school, % who know that sex education is provided in the natural science course					76.4	72.4	83.7	78.5
Of those who know that sex education is provided, % who reviewed sexual and reproductive health contents					58.3	71.6	64.0	64.7

Forty-four percent of the parents had children attending the fifth or sixth grades, and of these, 87 percent were aware that sex education was given in the natural science course. Four-fifths said they had reviewed the sexual and reproductive health contents in the schoolbooks, and more than ninety percent thought these contents were good. Nearly half the parents reported having children in secondary school and of these, 78 percent were aware that sex education was given in the civics class. Two-thirds said they had reviewed the sexual and reproductive health contents in the class books, and were nearly unanimous in evaluating these contents as good. There were slight differences between groups.

In the endline survey, parents were asked about their communication with their children on sexual and reproductive health topics. Two-thirds said they had spoken with their children about them, with minimal differences between groups. When those who had spoken with their children were asked about specific topics, 92 percent mentioned dating, 85 percent mentioned sexual abuse/rape, and between 72 percent and 79 percent said they had spoken with their children about menstruation, sexual relations, and unwanted pregnancies. Between 54 percent and 66 percent mentioned sexually transmitted diseases, contraception, use of condoms, and abortion. The least frequent topics of discussion had been ejaculation (34%) and masturbation (29%). There were few differences between groups.

Parents who had talked with their children about sexual and reproductive health topics were asked how easy or difficult it was for them to speak about these topics. Thirty-one percent said it was difficult or very difficult and 17 percent said it was neither easy nor difficult. Again, few differences were found between groups.

Effects on Teachers

The endline survey in schools provided insight on the effects of the interventions on teachers regarding informing youth about reproductive health issues and services. A total of 38 primary and 29 secondary schoolteachers were interviewed in the endline survey. Results show that teachers in schools in the 3-Int group had better attitudes than teachers in schools in the 2-Int group, where school activities were supposedly not conducted.

Nearly 70 percent of the teachers believed that sex education should begin before the fifth grade. None reported receiving complaints from parents for teaching sex education, and 90 percent said parents approved of the course. Eighty-five percent said they were in favor of sex education and 77 percent said that school authorities supported sex education. In all these cases, teachers in the 3-Int group had a more positive view than those in the control group.

Over 90 percent of primary school teachers thought that sex education helped avoid unwanted adolescent pregnancies. Only 23 percent believed it produced negative attitudes in students, and only one teacher believed it encouraged students to have sexual relations.

A high proportion of teachers (especially when compared with parents) agreed with females (44%) and males (53%) having sexual relations before marriage. Nine of ten teachers believed that both clinics and pharmacies should give contraceptives to any youth who requested them. In

all these cases, primary school teachers in the 3-Int group had more liberal attitudes than those in the control group.

Nearly all of the secondary school teachers reported having given sex education courses during the year prior to the endline survey. Those teachers in the 3-Int group were more likely to teach controversial topics, such as contraception, use of condoms, abortion, and HIV/AIDS, and were also less likely (8%) than teachers in the control group (19%) to say that teaching sex education had been difficult or to say they had felt uncomfortable teaching it. All the teachers interviewed agreed with sex education in school. Only two teachers (12%) in the control group reported having received complaints from parents for teaching sexuality topics at school, and about 72 percent believed that parents agreed with sex education. In addition, about 80 percent believed that most teachers in their school were in favor of sex education and reported that school authorities had supported sex education. In all these cases, it was more likely that those in the 3-Int group had a more positive attitude and perceived more support towards sex education than those in the control group. Four-fifths believed sex education helped avoid unwanted pregnancies. However, a large proportion (45%) believed it produced negative attitudes in students, and 14 percent believed that it encouraged students to have sexual relationships. Surprisingly, those in the 3-Int group were more likely to perceive negative consequences than those in the control group.

Fifty-eight percent agreed with premarital sexual relations by women, and 62 percent with premarital sexual relations by males. Almost all agreed with contraceptive use by sexually active unmarried adolescents. Seventy-six percent believed that clinics should provide contraceptives to any youth who requested them, and 83 percent believed that pharmacies should. In all cases, teachers in the 3-Int group were more likely to have a more liberal view than those in the control group.

In conclusion, primary and secondary school teachers had very positive attitudes towards providing information to their students and perceived that parents and school authorities supported sex education. In the areas where the school activities were conducted (3-Int group), there seemed to be more positive attitudes than in those without a school component (2-Int group).

YOUTH-FRIENDLY REPRODUCTIVE HEALTH SERVICES

The final project objective was to determine the feasibility and effect of improving the youth-friendliness of existing reproductive health services and the willingness and ability of service providers to offer quality services to youth. This section reviews attitude changes of service providers towards making available information and services for adolescents. Evidence for these effects comes from the inventory study in clinics, and the surveys of service providers, and pharmacists.

Availability of Services in Clinics and Offices

Social security clinics and MOH health centers and hospitals were visited during the baseline and endline surveys to determine whether MEXFAM had been able to help them make their services more adolescent-friendly. In both the baseline and endline surveys, all the health clinics and centers visited offered family planning and counseling services. In the baseline survey only 25 percent (three of the 12 clinics visited) had specific modules or mobile teams to provide adolescent services; in the endline survey, all the 14 clinics visited had these components, including the six clinics in the control group. In both surveys all service delivery units, including those in the control group, reported offering the full range of methods that public health clinics are supposed to provide, including pills, condoms, IUDs, and monthly injectables. The only methods that were out of stock in one half of the clinics were spermicides and injectables.

Clinics in both the experimental and control groups improved their capacity to provide laboratory services to diagnose STIs and HIV/AIDS. The availability of IEC materials on reproductive health topics also improved. In the endline survey, more than half of the clinics in the 2-Int group and about one-fourth of the clinics in the 3-Int group had MEXFAM materials on these topics, however only a small proportion of the materials directly addressed adolescents. The availability of services and IEC materials in control group units were similar to those found in experimental group outlets.

Table 18 shows that clinics in the two experimental sites were more likely than those in the control sites to have staff trained in counseling and service delivery for adolescents, have an office to provide services for adolescents, have a space where they could conduct meetings with them, conduct out-of-clinic activities, have special schedules to provide services for them, and have signs indicating where services were provided. They were also more likely to display posters on reproductive health and brochures targeting adolescents and to conduct group talks.

Table 18: Adolescent Services Available in Clinics, 2002

Number of Clinics	Intervention Group			
	2-Int	3-Int	Control	Total
	(N=4)	(N=4)	(N=6)	(N=16)
Proportion that have staff trained in counseling and service delivery for adolescents	75	75	33.3	57.1
Proportion that have a service delivery office for adolescents	50	25	0	21.4
Proportion that have a space to conduct meetings with adolescents	25	50	0	21.4
Proportion that have a mobile unit to provide adolescent services	0	25	0	7.1
Proportion that have special schedule for adolescents	25	25	0	14.3
Proportion that have preferential channeling for adolescents	0	0	16.7	7.1
Proportion that provide contraceptives to adolescents without requiring prior medical review	75	25	50	50
Mean number of condoms provided to adolescents who request them	7	7.2	8.2	7.6
Proportion that have signs indicating location of adolescent services	25	50	0	21.4
Proportion that have on display reproductive health posters addressing adolescents	50	50	0	28.6
Proportion that have brochures for adolescents	75	50	33.3	50
Proportion that conduct group talks on sexual and reproductive health	75	75	50	64.3
Of those that give talks, mean monthly number of talks	5	9.7	12.3	9

Visits to seven hospitals showed that all of them provided postpartum/postabortion contraceptive services, and two-thirds had special postpartum or postabortion programs for adolescents, such as talks for groups of adolescents, additional information and counseling sessions for adolescents, counseling by staff specialized in adolescents, psychological services for both adolescents and their families, and follow-up visits after discharge from the hospital. However, hospitals in the control group were just as likely to have these special services for adolescents as those in the experimental groups.

Skills, Attitudes, and Behaviors of Service Providers

One hundred forty-two service providers were interviewed in the baseline survey, and 190 providers were interviewed in the endline survey. In the baseline survey, 64 percent of those interviewed were service providers at public health clinics and hospitals, and 36 percent were physicians in private offices; these proportions were nearly the same at the endline. Of those

working at public health institutions, the largest proportion of the interviewees in both surveys were physicians and medical student interns or social service positions (56% in the baseline and 41% in the endline survey), followed by nurses (22% in the baseline and 32% in the endline survey), and promoters (13% and 9%, respectively). All private providers were physicians.

In the endline survey, over 80 percent of the respondents said they had received training on family planning counseling, sexually transmitted diseases, and HIV/AIDS counseling. Between 55 percent and 70 percent said they had received training on IUD insertion and removal procedures, emergency contraception, and postabortion care. Fifty-six percent said they had received training on adolescent care, and 45 percent said they had received training on gender perspectives. Differences between groups were not very large. The proportion that reported having been trained in the different topics remained the same, except for such "new" topics as emergency contraception and gender perspectives, in which larger proportions in the endline than in the baseline survey said they had training on the topic, including in the control group. In all three groups, over 90 percent of the providers thought they needed additional training in all these topics.

Over 90 percent of the respondents said they provided family planning and STI/HIV/AIDS counseling, and prenatal, birth, and postnatal services, 85 percent said they treated STIs, 75 percent conducted gynecological exams, and nearly 50 percent provided postabortion care. About three-fourths or more of the providers said they routinely screened female adolescents for risks of pregnancy, STI symptoms, and desire for contraceptives, and slightly more than 40 percent said they also screened for physical or emotional violence. Screening of male clients was similar. Although there are some differences between groups in terms of the frequency of different screening practices, these were not consistently in favor of the experimental groups.

Table 19 shows that about 65 percent of providers agreed with unmarried adolescents having sex, and nearly all agreed with use of contraceptives by sexually active unmarried adolescents. Nearly all respondents believed that contraceptives should be provided to adolescents who request them in clinics or through private physicians, but only about one-fourth believed they should have access to contraceptives in pharmacies, and less than one-half believed they should have access to contraceptives in supermarkets and stores. In these last cases, providers in the experimental groups were marginally more likely than providers in the control group to have a more liberal opinion.

Table 19: Attitudes of Service Providers toward Adolescent Sexual Behavior and Approval of Sources of Contraceptives by Intervention Group, 2002

	Intervention Group			
	2-Int	3-Int	Control	Total
Number of Providers	(N=45)	(N=56)	(N=89)	(N=190)
Proportion that agree with unmarried adolescents having sexual relations	75.6	53.6	66.3	64.7
Proportion that agree with use of contraceptives by sexually active unmarried adolescents	100	100	97.8	98.9
Clinics are an appropriate source of contraceptives	100	98.2	97.8	98.4
Private physicians are an appropriate source of contraceptives	100	94.6	93.3	95.3
Pharmacies are an appropriate source of contraceptives	86.7	78.6	69.7	76.3
Supermarkets are an appropriate source of contraceptives	46.7	66.1	40.4	49.5
Stores are an appropriate source of contraceptives	37.8	53.6	37.1	42.1

To explore biases for or against particular contraceptive methods, providers were asked which methods they believed to be the most appropriate for adolescents and which they would never recommend to an adolescent. In all three groups, condoms, pills, and injectable contraceptives were considered the most appropriate methods. Spermicides were mentioned in the two experimental groups, and emergency contraception in the 2-Int group as among the most appropriate. However, about 21 percent mentioned the IUD, 17 percent injectable contraceptives, and 10 percent the pill as methods they would never recommend to adolescents.

When providers were asked in the endline survey what method they would recommend to a woman who did not want to get pregnant and had had unprotected sex three days ago, 58 percent mentioned emergency contraception, with larger proportions in the experimental than in the control groups mentioning the method. The most frequently mentioned emergency contraceptive method was emergency contraception pills. Awareness of emergency contraception increased substantially between surveys, from 20 percent to over 80 percent in the two experimental groups, and from 43 percent to 75 percent in the control group. Providers in the two experimental groups were also more likely to know that emergency contraception pills are most effective if taken in the first three days, that two doses are needed, and to know the correct number of pills taken in each dose.

To explore attitudes towards service delivery to adolescents, providers were asked if they would provide contraceptives to a 14-year-old girl without the consent of her parents. Table 20 shows that slightly less than 80 percent would. There are few differences between groups in the proportions who would implement other positive actions, like giving information on HIV/AIDS prevention, providing condoms or inviting partner, and of other actions, such as informing parents and advising not to have intercourse. The proportion of providers in the two experimental groups that believed adolescents were very confident to request methods in their clinics and offices more than doubled, whereas in the control group it remained the same. Nearly all

providers felt comfortable asking adolescents about their sexual behavior if they suspected an STI.

Table 20: Attitudes of Service Providers on the Delivery of Reproductive Health Services for Adolescents by Intervention Group and Time of Interview

	Intervention Group and Survey						Total	
	2-Int		3-Int		Control			
	1999	2002	1999	2002	1999	2002	1999	2002
Number of Providers	(N=28)	(N=45)	(N=41)	(N=56)	(N=73)	(N=89)	(N=142)	(N=190)
Proportion who would provide contraception to a 14 year old female without parents knowing	85.7	82.2	78.0	82.1	74.0	76.4	77.5	79.5
Of those saying yes, proportion mentioning these practices:								
Information on STI/HIV/AIDS prevention	60.7	28.9	26.8	33.9	23.3	33.7	31.7	32.6
Provision of condoms	0	2.2	4.9	7.1	2.7	7.9	2.8	6.3
Advise not to have intercourse	14.3	11.1	9.8	7.1	12.3	5.6	12.0	7.4
Would tell parents	7.1	0	9.8	1.8	5.5	3.4	7.0	2.1
Would invite to bring partner	0	4.4	2.4	16.1	0	13.5	0.7	12.1
Proportion who would request parental consent to provide a given method	35.7	40.0	22.5	42.9	23.3	44.9	25.5	43.2
% who believe adolescents have trust to request methods in clinic/office	23.1	50.0	17.1	35.7	42.5	22.7	31.4	33.0
% who feel comfortable asking adolescents about sexual behavior to explore STIs	100	97.8	95.1	100	100	92.1	98.6	95.8

Knowledge and Attitudes of Pharmacists

Seventy-nine pharmacists were interviewed in the baseline survey and 80 in the endline survey (see Table 21). The endline respondents were older (mean of 34 years versus 29 years), more likely to be married, to have children (60% in contrast to 43%), and to have used contraceptives than baseline respondents. Endline respondents also had a higher mean number of years of schooling and had been pharmacists for a longer time, but they were not more likely to have received training to be pharmacists.

Only two pharmacies did not sell contraceptives at the time of the endline survey. Over 87 percent of the respondents said they sold pills, injectable contraceptives, and condoms, and nearly 60 percent also mentioned spermicides. Few changes were observed between groups or over time. A decline occurred between surveys in the proportion of pharmacies that displayed

contraceptive methods or had publicity about methods, from 80 percent to 69 percent of the pharmacies, but few differences between groups were found.

Table 21: Pharmacists' Attitudes Regarding Contraceptive Service Delivery for Adolescents by Intervention Group and Time of Interview

	Intervention Group and Survey						Total	
	2-Int		3-Int		Control			
	1999	2002	1999	2002	1999	2002	1999	2002
Number of Pharmacists	**(N=14)**	**(N=20)**	**(N=24)**	**(N=18)**	**(N=40**	**(N=40**	**(N=78)**	**(N=80)**
Of those who sell pills, proportion who believe pills are an appropriate method for adolescents	64.3	50	41.7	50	66.7	40.6	58.1	45.7
Of those who sell condoms, proportion who believe condoms are an appropriate method for adolescents	92.9	100	91.7	89.5	95	92.1	93.6	93.5
Proportion who believe pharmacists should inform any female who requests information about EC	100	95	84	89.5	72.5	79.5	81	85.9
Proportion who would advise an adolescent who asked about which method to use	85.7	80	72	78.9	40	64.1	58.2	71.8
Proportion who said they would do the following if an adolescent requested information on contraceptives								
Would advise not to have sex		25.0		20.0		50.0		36.3
Would inform parents		0		0		7.5		3.8
Would scold her/him		5.0		0		2.5		2.5
Would not give information		0		10.0		12.5		8.8
Would treat just like any other client		90.0		25.0		62.5		60.0
Would provide information discretely		75.0		60.0		50.0		58.8
Proportion who believe male adolescents feel trust coming into pharmacy to buy contraceptives	71.4	68.4	52.0	68.4	87.5	56.4	73.4	62.3
Proportion who believe female adolescents feel trust coming into pharmacy to buy contraceptives	42.9	65.0	68.0	63.2	87.5	41.0	73.4	52.6
Proportion who believe male adolescents feel trust asking advice about methods in pharmacy	21.4	55.0	32.0	57.9	47.5	35.9	38.0	46.2

Proportion who believe female adolescents feel trust asking advice about methods in pharmacy	71.4	70.0	64.0	73.7	65.0	46.2	65.8	59.0
Proportion who believe adolescents prefer to buy contraceptives in pharmacy than in a clinic	92.9	95.0	60.0	94.7	95.0	94.9	83.5	94.9

Pharmacists were assessed on their knowledge about contraception. Less than half of the respondents knew what a woman should do if she forgets to take the pill for one, two or three or more days. Few differences were found between groups regarding trends in knowledge of how the different methods are used. However, awareness of emergency contraception increased strongly between surveys and more substantially in the two intervention groups than in the control group. Nevertheless, though large proportions knew that pills should be taken in the first three days, much smaller proportions knew that two doses should be taken 12 hours apart, or the number of pills to be taken. None of the respondents were aware of using IUDs as emergency contraception.

Table 21 shows that there was little change in the already positive attitude among pharmacists in the two experimental groups. Half of those who sold pills thought that they were a good method for adolescents, and more than 93 percent of those who sold condoms thought they were a good method. About 85 percent believed that pharmacists should provide information on emergency contraception to any female who requested information, and 72 percent said they would give advice if asked to recommend a method. In the endline survey, pharmacists were asked what they would do if an adolescent requested information on contraceptives. The two most common responses were that they would provide the information discreetly and that they would treat the adolescent like any other client, and these responses were somewhat more likely in the two intervention groups. About one-third also said they would advise him or her not to have sex, and a few, especially in the control group, also mentioned that they would inform parents, scold her or him, or not give them information.

A final set of questions explored items related to the perceived friendliness of services for adolescents at their pharmacies. Over half of the respondents believed that both males and females felt confident to come into the pharmacy to buy contraceptives and to ask advice about methods. Pharmacists in two experimental groups were more likely than those in the control group to believe this. More than 90 percent of the pharmacists believed that adolescents prefer to buy contraceptives in pharmacies than in clinics, with few differences between groups.

Table 22 shows that nearly all the pharmacists consider adolescent pregnancy an important problem. About half agreed with premarital sex by either male or female adolescents. A larger proportion in the two experimental groups agreed compared with the control group. Between surveys the proportion increased in the experimental groups and decreased in the control group.

Table 22: Pharmacists' Attitudes Regarding Adolescent Sexual Behavior by Intervention Group and Time of Interview

	Intervention Group and Survey						Total	
	2-Int		3-Int		Control			
	1999	2002	1999	2002	1999	2002	1999	2002
Number of Pharmacists	(N=14)	(N=20)	(N=25)	(N=19)	(N=40)	(N=39)	(N=79)	(N=78)
Proportion who believe adolescent pregnancy is an important problem	100	100	100	100	62.5	94.9	81.0	97.4
Proportion who agree with adolescent women having sex before marriage	35.7	65.0	48.0	57.9	65.0	35.9	54.4	48.7
Proportion who agree with adolescent men having sex before marriage	64.3	75.0	64.0	68.4	77.5	35.9	70.9	53.8

In the endline survey, pharmacists in the 2-Int (95%) and 3-Int (37%) groups were more likely to say they usually had brochures or written materials on contraceptive methods than those in the control group (8%). In the 2-Int group, 55 percent had materials on hand on the pill, 20 percent had materials on injectable contraceptives and spermicides, and 30 percent had materials on condoms. The method most frequently displayed was the condom, in 80 percent of the pharmacies. In the 3-Int group, materials on the condom were the most frequently available, but found only in 15 percent of the pharmacies. Only 10 percent of the pharmacies had materials available on other methods. In the control group, only one pharmacy (2.5%) had written materials on the different methods.

MULTIVARIATE ANALYSIS OF INTERVENTION EFFECTS

The previous sections described results without formal statistical testing to assess the significance of changes attributable to the interventions. To assess the impact of interventions on adolescents, a multivariate analysis was conducted using the following dependent variables measured in both the baseline and endline surveys. Continuous dependent variables are marked with a plus sign (+), and variables without are dichotomous:

- Proportion of youth who had ever had sex+
- Among the sexually active:
    - Age at first intercourse+
    - Proportion who had sex in last three months+
    - Use of contraception in first and last coital act
    - Proportion who are currently pregnant or partner is pregnant+
- Prevalence of exposure to reproductive health messages about how the body works, dating, unwanted pregnancies and HIV/AIDS
- Awareness of contraception and number of methods known (unprompted mentions and unprompted plus prompted mentions over full sample and unprompted plus prompted mentions over those who had heard of contraception)+
- Knowledge of the condom: proportion who have seen condoms, knowledge of where a condom is placed, and knowledge of how many times a condom can be used
- Knowledge of means to avoid STIs/HIV/AIDS: proportion who mention condoms, proportion who mention fidelity, and proportion who mention sex with only one person
- Approval of contraceptive use by youth
- Perception of respectful treatment at pharmacies if a youth requests a contraceptive method
- Communication with partner on sexual relationships and use of contraceptives
- Communication with father, mother, or either parent on sexual and reproductive health issues.
- Proportion who have ever smoked and number of cigarettes smoked per day+
- Proportion who have ever drank alcoholic beverages and number of drinks in last three months among drinkers+
- Visits to health providers in the last 12 months for any reason and number of visits+
- Trust providers to clarify doubts and the privacy of services received

Appendix 2 presents the methodological procedures used to compare the sample populations and assess the statistical effect of interventions on these dependent variables by means of multivariate statistical methods. In this section, we present a summary of results.

To ensure that the appropriate multivariate model was used to test the hypothesis that the interventions had changed the dependent variables, it was necessary to first determine if the three experimental groups (3-Int, 2-Int, and control) were equivalent at baseline and over time in terms of 11 socio-economic variables (age, sex, literacy, current attendance to school, years of schooling, interest in continuing studying, ever work, current work, religion, marital status, and living with one or both parents or guardian). Appendix Table A1 shows that, when compared to

the control group sample in 1999, all the other groups in both surveys were similar in terms of age, sex, literacy, marital status, and interest in continuing studying. There were differences in current attendance of school, years of schooling, work status, religion, and the proportion that lived with both parents.

Given these significant differences, an adjusted multivariate model was used to test the project's hypothesis. For continuous variables we used multiple regression models and for dichotomous variables, logistic regressions were used. In both cases, we dichotomized each group and survey using as a reference the control group in 1999, and used them as independent variables along with the socio-demographic variables by which the three groups in the two surveys differed.

Table 23 presents a summary of the results of this analysis. The first three columns highlight significant statistical changes in the dependent variables over time in each of the experimental groups with respect to the same group (i.e., change in the control group, the 2-Int group, and in the 3-Int group between 1999 and 2002). These coefficients do not assess the effects of the interventions; they only tell us that there was a change between surveys. The fourth and fifth columns help assess significant intervention changes by comparing changes that occurred in each intervention group over time in comparison to the changes in the control group over time. The sixth column presents the relation in changes over time between the two intervention groups, which helps us to assess if the school activities added to the activities conducted in the group with two interventions created additional change. Tables A2 and A3 in Appendix 2 present the full estimates obtained by applying the multivariate statistical models.

Table 23: Summary of Significant Coefficients in Logistic or Multiple Regressions Using Interaction Terms to Assess Effects on Dependent Variables, Controlling for School Attendance, Years of Schooling, Current Work, Religion, and Residence with Parents

Dependent Variable	Type of Coefficient and Interpretation					
	Exp (b3) Control group change between 99 and 02	Exp (b3+b4) 3-Int change between 99 and 02	Exp (b3+b5) 2-Int change between 99 and 02	Exp (b4) Change between 99 – 02 in 3-Int sig different than change in control group	Exp (b5) Change between 99 - 02 in 2-Int sig different than change in control group	Exp (b4)/Exp (b5) Change between 99-02 in 3-Int compared with change 99-02 in 2-Int
Age at first intercourse+	Increase					
Proportion who had had sex in the last three months						
Use of contraception in the first coital act						
Use of contraception in last coital act	Increase		Decrease	Decrease	Decrease	
% ever been pregnant						
% currently pregnant/partner						

pregnant						
Of those who have had sex, % ever pregnant/partner pregnant		Increase				
Prevalence of exposure to reproductive health messages about:						
How the body functions			Increase			
Dating	Increase					
Unwanted pregnancies	Increase	Increase	Increase			
HIV/AIDS	Increase	Increase	Increase			
Awareness (have heard) of contraception	Increase	Increase	Increase			
Awareness of the different methods (unaided mention):						
Pills						
IUD	Increase	Increase	Increase			
Injectables	Increase	Increase	Increase			
Condom			Increase			
Spermicides		Increase	Increase			
Rhythm/Other periodic abstinence						
Withdrawal						
Female sterilization						
Vasectomy						
Emergency contraception pills	Increase		Increase			
Awareness of the different methods (unprompted + prompted):						
Pills	Increase	Increase	Increase			
IUD	Increase	Increase	Increase			
Injectables	Increase	Increase	Increase			
Condom	Increase	Increase	Increase			
Spermicides			Increase			
Rhythm/Other periodic abstinence		Increase	Increase			
Withdrawal		Increase	Increase			
Female sterilization		Increase	Increase			
Vasectomy	Increase	Increase	Increase			
Emergency contraception pills	Increase	Increase	Increase		Increase	
Number of methods known+:						
Unprompted mention full sample	Increase	Increase	Increase			
Unprompted + aided full sample	Increase	Increase	Increase			
Unprompted + aided of those who have heard of contraception	Increase	Increase	Increase			

Knowledge of the condom:						
% that have seen condoms	Increase	Increase	Increase			
Knowledge of where a condom is placed	Increase	Increase	Increase			
Knowledge of how many times a condom can be used	Increase	Increase	Increase			
Knowledge of means of to avoid STIs/HIV/AIDS:						
% mention condom						
% mention sex with one person	Increase	Increase	Increase			
% mention fidelity	Decrease	Decrease	Decrease			
Approval of contraceptive use by youth						
Perception of respectful treatment at pharmacies if a youth requests a contraceptive method		Increase	Increase			
Communication with partner on:						
Sexual relationships	Increase			Decrease		
Use of contraceptives	Increase	Increase	Increase			
Communication on sexual and reproductive health topics with:						
Father						
Mother	Increase	Increase				
Both parents						
% who have ever smoked	Decrease					
Number of cigarettes smoked per day+						
% that have ever drank alcoholic beverages						
Number of drinks in last three months among drinkers+						
Visits to health providers in the last 12 months for any reason	Decrease		Decrease			
Number of visits+						
Trust to clarify doubts	Decrease	Decrease	Decrease		Decrease	
Privacy of services received	Decrease	Decrease	Decrease			

+ Continuous dependent variables

Table 23 shows there were very few statistically significant effects that can be attributed to the interventions, and these tend to be in the "opposite" or unexpected direction. These significant changes include a decrease in the proportion using a contraceptive method in the last sexual relationship in the two intervention groups, an increase in the proportion aware of emergency contraception in the group with two interventions, a decrease in the proportion that talked with partner about sexual relations in the 3-Int group, and a decrease in the proportion that felt trust to clarify doubts in the 2-Int group. In sum, there was no significant change in the desired outcomes when school activities were added to community and adolescent-friendly services.

In contrast to the few effects that can be attributed to the interventions conducted as part of this project, the first three columns in Table 23 show that many variables changed significantly between 1999 and 2002. Significant change was observed in some variables over time in all three groups, suggesting overall changes in the country as a whole, as an effect of the media or other national programs present in both the intervention and control groups. These changes include receiving information on unwanted pregnancy, awareness of contraceptive methods in general, and of the different contraceptive methods, the number of methods known, knowledge of three different aspects related to condom use, knowledge of condom use as a means to prevent HIV/AIDS, communication with partner about contraceptive methods, and two variables related to quality of care (i.e., trust to clarify doubts and privacy), although in the latter case a negative trend was observed.

There are significant changes between surveys when the intervention groups are compared to each other, but no significant changes with respect to changes in the control group. These changes suggest an effect of local forces not related to the intervention. This change was observed for dependent variables such as the decrease in the use of a method in last sexual relationship in the 2-Int group, the increase in the proportion of adolescents who have been pregnant in the 3-Int group, the proportion who received information on how the body works, or on HIV/AIDS, knowledge of some methods such as injectables, condoms, spermicides, rhythm, withdrawal, female sterilization, vasectomy, perception of respectful treatment in pharmacies, and communication with father about sexual and reproductive health topics.

ECONOMIC ANALYSIS

Objectives of the Economic Analysis

The economic analysis of the MEXFAM youth interventions was designed with two objectives: 1) to calculate the incremental costs of each of the three interventions, so that an incremental cost-effectiveness analysis could be performed; and 2) to provide guidance to Mexican health authorities on the incremental costs of replicating these interventions in other areas of the country. As the study progressed, it became clear that performing a cost-effectiveness analysis was not feasible for two reasons. First, the design of the study allowed us to isolate the effect of just two intervention sets: the school-based intervention alone, and all three interventions combined.

During the course of the study MEXFAM responded to requests for support in developing school-based activities in experimental areas that were supposed to include only clinic and community-based interventions; this effectively contaminated the research design. Second, in the comparison of the baseline and endline questionnaires there was little evidence of impact attributable to any of the interventions. In the absence of measurable effectiveness, it makes little sense to calculate incremental cost-effectiveness, since the small change in the denominator ensures a very high incremental cost-effectiveness ratio. Therefore, this analysis focuses on identifying the costs to MEXFAM and to public-sector institutions of designing and carrying out each of the three interventions (i.e., community, clinic, and school).

Methods

The FRONTIERS study sites for the Mexico youth study included a total of 12 cities: four control cities, and two experimental groups of four cities each. Data for the economic component were collected in four cities, two in 2-Int sites (where the community-based and clinic-based interventions were implemented) and two in 3-Int sites (where all three interventions were implemented). Not all of the costs incurred by FRONTIERS were included in the economic analysis. We distinguish between resources used to *develop and implement* youth-related interventions (i.e., the program costs), and those used to *measure the impact* of the interventions (i.e., the research costs). The economic analysis includes only those resources used to develop or implement the interventions because research costs are not relevant to decisions about replication or scaling-up. In other words, any replication of the interventions in Mexico would not likely include research-related activities carried out in the FRONTIERS global study.

Customized spreadsheets were used to collect information on the various inputs (i.e., labor, materials, and capital) used in each intervention. We identified the inputs, measured the quantity of each input used, assigned a unit cost to each input, and calculated total cost by multiplying the quantity used by the unit cost. Measures were developed to allow costs to be allocated to the appropriate intervention (i.e., community, clinic, or school). Inputs were also classified as financial (i.e., those requiring an actual payment) and non-financial (i.e., resources which had already been purchased by other entities but were redirected to the intervention).

Problems Encountered During Data Collection

The original design of the economic component emphasized prospective data collection. The spreadsheet-based forms were developed to collect information on the incremental costs of designing and implementing the interventions, including service delivery and monitoring. Direct service delivery costs of the interventions included labor, materials, space, and equipment to carry out the new services. The time spent on the new services in clinics and schools was to be measured through monthly interviews of physicians and teachers, focusing on new activities (such as reproductive health courses) and existing activities that would be expected to change as the result of the interventions (for example, counseling of individual students). Also, information was collected on supplies (such as contraceptives and drugs) used pre- and post-intervention, the wage rates for staff providing the services, and the costs of space and equipment. Overhead costs for service delivery were excluded because the interventions were not expected to be large enough to make an appreciable impact on the magnitude or the allocation of administrative resources.

Several circumstances required changes in the data collection strategy. First, the design of interventions and much of the physician and teacher training had already taken place before instruments and procedures were in place to collect economic data. For this reason it was not possible to pursue a purely prospective approach, thus a blend of retrospective and prospective data collection approaches were used. From the beginning of the project in July 1999 through August 2000, retrospective data on program expenditures as extracted from project financial records. In September 2000, the MEXFAM accountant responsible for economic data collection worked with local youth program coordinators in each of the four sites to put into place

procedures for data collection. Therefore, starting in September 2000, expenditure data were collected and reported monthly in all four sites.

Second, the original approach for estimating the opportunity cost of time of teachers and physicians (monthly interviews conducted by the YPC) proved to be unsuccessful. High staff turnover among YPCs resulted in several months of missing data in all sites. Moreover, interviews conducted by replacement program coordinators produced flawed data. For example, some physicians reported spending more hours serving youth than would be possible within a normal work schedule, even though the number of youth-related consultations reported during those months was low. In another case, a teacher reported having provided 1-hour individual counseling sessions to more than 400 youth during a single month. Because of these problems the monthly interview data was discarded, and the opportunity costs of teacher and physician time were estimated using service statistics produced by the youth program project (see the following section on personnel costs for more detail).

Calculation of Planning Costs

Prospective data collection for the economic component began approximately one year after the project began. All planning activities had been completed, and service delivery was underway. To approximate planning costs, we assumed that service delivery activities began in earnest at the beginning of 2000, and all expenditures incurred in the last six months of 1999 were assumed to be related to project planning.

Calculation of Costs Related to Service Delivery and Supervision

Personnel Costs

Two salaried staff supported youth program activities in each MEXFAM youth center. The YPCs in each site were responsible for directing and carrying out intervention activities. Thus their salaries and benefits were charged entirely to the youth project. In order to allocate YPC costs to interventions, each coordinator was asked to fill out a timesheet for two one-month periods. The timesheet had four columns, one for each of the three interventions and one for activities not related to a specific intervention. Coordinators were asked to list in the corresponding column all activities carried out during the day, and the number of hours spent on each activity. These data were used to calculate a percentage distribution of coordinator time dedicated to each intervention, which was then used to allocate joint costs to the interventions (i.e., salary of the youth program coordinator, capital costs not directly identified with a particular intervention, among others).[1]

In addition, the MEXFAM youth center director in each city provided overall supervision to the youth interventions, in addition to his/her other tasks. MEXFAM directors were asked to estimate

[1] Originally, each YPC was asked to provide two months of self-reported data on time use. These instructions apparently were misunderstood and many more months worth of data were collected in some clinics. Over all four centers, we collected a minimum of three months of data and a maximum of 13 months.

the percentage of time spent working on youth program activities, and these self-reports were used to calculate the cost of the director's time. When the position of youth program coordinator was vacant, directors assumed that they spent 25 percent of their time supervising youth program activities; when a program coordinator was present, directors assumed that 10 percent of their time was spent in direct supervision of youth program activities.[2]

Opportunity costs of teacher and physician time were estimated by adding up the number of hours spent providing services to youth, and then multiplying the number of hours by an estimated hourly wage rate. Information on the number of hours spent was extracted from statistics reported routinely by the youth program (i.e., courses taught, individual orientations conducted, and clinical consultations provided). For example, teachers delivering 14-hour courses in schools required 14 hours of actual classroom time, as well as preparation time, while an "informal talk" delivered by a teacher or multiplier was estimated to have an average duration of two hours. Likewise, total time spent by clinicians serving youth was estimated by multiplying the number of youth served by an estimate of the average time per consultation, plus time spent by physicians making visits to schools. This approach implicitly assumes that no school and clinic-based services were provided prior to the interventions, which may not be a correct assumption; therefore, our estimates of opportunity costs of teacher and clinician time may be overstated. Estimated hourly wage rates for teachers and clinicians were calculated using information provided by the MEXFAM financial office.

Other Costs

All other expenditures incurred for the youth activities were recorded monthly and either directly charged to the relevant intervention, or distributed to interventions using the time allocation of the youth program coordinator as the allocation variable.

Training Costs

During the project the youth program provided training to physicians, schoolteachers, multipliers, and peer promoters. Some of the financial costs of training (e.g., transport, per diem, and honoraria paid to instructors) were directly charged to the local youth program center, but others were paid from a training budget administered by the central MEXFAM office. We reviewed financial records at MEXFAM to determine the costs of trainings that directly benefited physicians, teachers, multipliers, and promoters that were connected to the four centers included in the economic component. These costs were added to youth program expenditures for the month in which they were incurred, and were assigned directly to the corresponding component.

[2] The youth project used two other types of personnel whose costs were not paid by the project. Peer promoters and multipliers were volunteers who received training from project staff to enable them to carry out a variety of youth-focused activities, mainly in informal settings. The main difference between them was that multipliers were adult professionals (mainly teachers interested in improving their counseling skills); whereas peer promoters were youth who were still in school or were no longer attending school. We did not include the opportunity costs of time of peer promoters and multipliers. This decision was based on the assumption that if a government were to replicate this project, the Ministries of Health and Education would provide resources to pay clinicians and teachers, while it is doubtful that government resources would be used to pay peer promoters or multipliers.

Opportunity costs of teacher and physician time spent attending trainings were calculated in the same manner as described in the previous section.

Estimation of Capital Costs

Resources with an expected useful life of more than one year are called capital resources. Normally these costs are annualized, which spreads the acquisition cost of an item over its expected useful life. In this study, with its focus on reporting costs of designing and carrying out interventions, costs of capital were included simply as expenditures. Buildings housing youth program centers are technically capital resources, since they have an expected useful life of more than one year.

The rental value of a building can be used as a proxy for its capital cost. In the two cities where the youth program center was leased (Maravatio and Huitzuco), we multiplied the monthly rental cost of the youth center by the proportion of the center's floor space used for intervention activities. In the other two cities (Tepeji del Rio and San Jose Iturbide) space was donated or lent by other entities, and therefore no rental payments were made. In these cases, an "equivalent rent" was estimated by multiplying the monthly rental cost per square meter of similar buildings in the same rental market by the number of square meters used for intervention-related activities.[3]

Adjustment of costs to constant 2002 pesos

In order to compare the costs over time, all costs were converted to the prices prevailing in the year 2002 (constant 2002 Mexican pesos) The Mexican core inflation rate was used to convert current pesos from each study year to constant 2002 pesos. The inflation factors used were 13percent for costs incurred in 1999 and 2000[4], and 5.1 percent for costs incurred in 2001.

Results of the Economic Analysis

Table 24 presents information on the costs of the school, clinic, and community-based interventions in the two experimental groups. Costs in the three-intervention group reflect total costs incurred in the cities of Huitzuco and Tepeji del Rio, while costs in the two-intervention group represent total costs in cities that implemented just the clinic and community-based interventions included Maravatio and San Jose Iturbide. Total economic costs (including financial and non-financial costs) of all interventions in the four cities were slightly more than 4.3 million pesos (approximately US$470,000).[5] Total costs were remarkably similar for the two

[3] Measurement of costs of physical space was complicated by the differences in timing, size, and payment. The youth program in Huitzuco did not have office space assigned to the program until May, 2001, at which time office space was rented and payments began to be made. In Maravatio, the youth program began renting a small space in November 2000. Meanwhile, programs in Tepeji del Rio and San Jose Iturbide did not make actual rental payments, hence we estimated rental payments based on the cost per square meter of similar space in the same rental market.
[4] For simplification purposes, the same factor is used for 1999 and 2000 because very few costs were incurred in 1999.
[5] The exchange rate was US$1=9.15 pesos.

experimental groups; the total cost for the three intervention sites (3-Int., Huitzuco and Tepeji del Rio) was 2.13 million pesos (US$233,000), while in the two-intervention sites (2-Int., Maravatio and San Jose Iturbide) the corresponding figure was 2.17 million pesos (US$237,000). Proportions of financial and non-financial costs were also similar; in the three-intervention group, financial costs accounted for 36 percent of total costs, while in the two-intervention group financial costs made up 40 percent of the total.

Table 24: Total Costs of Interventions, by Intervention Group and Type of Cost, July 1999 – June 2002, Mexican pesos

Cost Element	3 Intervention		2 Intervention		Total
	Financial Cost	Non-Financial Cost	Financial Cost	Non-Financial Cost	
School-based					
Planning	15,883	0	7,068	0	22,951
Training	27,774	573,609	0	658,354	1,259,737
Service Delivery and Supervision	212,418	405,176	16,491	161,627	795,712
Subtotal	**256,074**	**978,785**	**23,558**	**819,981**	**2,078,399**
Clinic-based					
Planning	8,201	0	18,298	0	26,499
Training	27,736	23,196	20,608	17,481	89,020
Service Delivery and Supervision	124,221	323,389	226,959	447,616	1,122,186
Subtotal	**160,158**	**346,584**	**265,865**	**465,097**	**1,237,705**
Community-based					
Planning	14,537	0	35,524	0	50,061
Training	73,705	0	67,735	0	141,439
Service Delivery and Supervision	270,237	31,279	473,614	19,303	794,433
Subtotal	**358,479**	**31,279**	**576,873**	**19,303**	**985,933**
Total	**774,711**	**1,356,648**	**866,296**	**1,304,381**	**4,302,037**

A comparison of the economic costs of the three interventions shows that the school-based intervention was the most costly. School-based activities were implemented in both intervention groups (despite the study design that only the three-intervention group was to implement activities in schools). In fact, non-financial training costs for teachers were highest in the intervention group that lacked a school-based component. According to anecdotal accounts, school officials in the cities in the two-intervention group became aware of the school-based activities MEXFAM was carrying out in other cities and requested that they be made available in their cities. In both intervention groups, non-financial costs of teacher training were higher than

service delivery costs, indicating that teachers spent more time receiving training than giving courses and talks.

Focusing on financial costs only, these costs were higher overall in the two-intervention group than the three-intervention group, even though the former did not include a school-based intervention. The highest-cost intervention (in terms of financial costs) was the community-based intervention, reflecting the costs of the varied and frequent community activities, including planning meetings, informal and formal talks to community groups, production and presentation of messages delivered through various media outlets, street festivals, and theater, among others. The wide difference in financial costs between the two intervention groups would suggest that the interventions were implemented at different levels of intensity across the four sites. It is possible that financial resources for the study were divided up by city rather than by intervention; if so, this could explain why the clinic and community-based interventions in the two-intervention group were better-funded than in the three-intervention group.

Observations on Costs of Replicating Interventions

One of the main objectives of the economic component was to provide guidance to the Ministry of Health and the Ministry of Education on the costs of replication and scaling up. In this regard, first it is important to highlight differences between the community-based intervention, which incurred the bulk of financial costs, and the clinic and school-based interventions in which the majority of costs were non-financial. Replicating the community-based intervention will require additional budget allocations to pay for staff to organize and supervise all of the activities conducted. Meanwhile, replicating the school and clinic-based interventions will require re-assignment of existing staff resources from one set of activities to another. Thus, it may be easier to replicate the school-based and clinic-based interventions when budgets are tight. Second, results showed that the average cost per city was approximately one million pesos for two different sets of interventions that ran for nearly three years. But it must be pointed out that MEXFAM implemented these interventions through its existing Gente Joven program, which undoubtedly resulted in lower costs per city than if the Gente Joven program had not existed.

SUMMARY AND CONCLUSIONS

This project aimed to assess the feasibility, cost, and effect of a project seeking to change: a) the attitudes of community stakeholders towards informing youth about reproductive health issues and towards making available services for sexually-active youth; b) the knowledge, attitudes, and behaviors of adolescents; and c) the way that providers offer reproductive health services to adolescents. In addition, the project sought to determine if the addition of adding sex education through a school-based component would increase the impact of community interventions on the knowledge, attitudes, and behaviors of the adolescents.

In terms of the feasibility of implementing activities, service statistics showed that program staff and volunteers were able to give a large number of courses and talks to adolescents and other community stakeholders, and that a large number of community activities had been implemented

to disseminate information, IEC materials, and contraceptive supplies. In addition, there were few problems in obtaining the collaboration of schools and service delivery sites.

Regarding the effects of the interventions on adolescents, knowledge and attitudes related to different aspects of adolescent sexual and reproductive health often improved across time. However, these improvements also occurred in the control group, and therefore could not be attributed to the project's interventions. In the case of sexual and contraceptive behavior, few changes were observed, and these were not statistically significant. However, the exception was the proportion of youth reporting using a method in their last sexual relationship where the change was contrary to expectations; there was a decline in the intervention groups and an increase in the control group.

Surveys showed that the YPP were able to establish strong collaborative links with service providers and school teachers, and that these stakeholders had made their services more adolescent-friendly in terms of availability of services, having received training, and availability of IEC materials. Attitudes did not improve substantially over time, but they were already very positive to begin with. However, since these conclusions were based on surveys using convenience samples, the results must be taken with some reserve.

Several factors might have limited or influenced the effects of the interventions. One hypothesis is that because levels of knowledge already are very high, a further increase would require a much greater effort. As we have seen, knowledge of sexual and reproductive health issues in Mexico is quite high, as a consequence of strong family planning in the last 25 years, and more recently, HIV/AIDS prevention programs extensively emphasizing use of condoms through the mass media. Other recent advances have included the inclusion of sex education in the federal curricula for the last two years of primary school and the three years of secondary school, at a time when school enrollment rates have continued to increase. All major health service providers have also implemented adolescent health programs over the last few years. As with many other programs, the higher the proportion who have adopted the desired knowledge, attitudes or behavior, the more difficult it is to increase the proportions of adolescents with the desired outcomes.

A second hypothesis is related to the catchment areas that were established for the program in each city; in this project activities were evaluated using a geographical point of reference. YPCs were advised that they should restrict their activities to the pre-determined geographical areas because the evaluation would include only those areas and any improvements outside them would not be detected. Nevertheless, given the opportunistic nature of the YPP, activities were often conducted outside the project areas. In addition, catchment areas were very large (entire cities) and realistically could not be covered by a single staff member. Rather than of lack of effect of the program, one might consider lack of planning abilities in estimating impact areas. The argument is that in the entire city the effect is diluted and difficult to establish statistically, but perhaps those who are exposed to project activities would have more positive outcomes than those who were not. To test this hypothesis, we compared the adolescent sample across different measures of exposure to the program, such as having heard of the YPP, knowing the coordinator, knowing a peer promoter, and having participated on YPP events. As can be seen in Table 25, measures of exposure to the YPP program are consistently associated with knowledge, attitude,

and some behavior variables. This simple analysis would need to be complemented by more stringent statistical tests. For example, controlling for current attendance to school, we observed that although most associations remain for both those in and out of school, the effects seem to be stronger among those in school. However, even if these tests were used, methodological questions regarding the selectivity of respondents and other issues would remain.

A third hypothesis relates to adolescents who did not identify YPP multipliers as part of the YPP, but of other institutions. Given that volunteer multipliers conducted the largest number of activities, and that the number of multipliers is very large, then the program effects would appear diluted in our evaluation. This would be especially true if we consider that the results present evidence that there was some degree of contamination in control group cities, and that in these cities probably only volunteer multipliers conducted all activities.

Beyond these possible explanations, qualitative interviews with program stakeholders and supervision data suggest several things that could be done to improve the effectiveness of the Young People Program. A list of problems and potential solutions to achieve this increased effectiveness are as follows:

- ***High turnover of YPP Coordinators (YPCs).*** The average tenure of a YPP local coordinator in the eight participating cities was about eight months. Only one of the YPP coordinators remained with MEXFAM for the full duration of the project (21 months). The average number of YPP coordinators per city was three, ranging from one to five. This staff turnover implies little continuity in the work conducted, and the need to retrain new staff members and reconstruct the alliances and contacts that had been made. Apparently, the main cause of the turnover is the low salary (usually between $200 and $300 per month). Since the coordinators are usually young professionals in their first job, the organizations they have to contact as part of their work often perceive the opportunity to inexpensively recruit a well trained professional and successful promoter of social development activities. Although MEXFAM is aware of this situation, solving the problem is not easy, since it involves revising the full salary scale used by the institution.

Table 25: Summary of Significant Statistical Associations Between Measures of Exposure to the YPP by Variables Related to Reproductive Health Knowledge, Attitudes, and Behaviors, 2002

DEPENDENT VARIABLES	EXPOSURE VARIABLES								
RH Knowledge, Attitudes, and Behaviors	Has heard of YPP	Knows Coordi-nator	Knows Peer Pro-moter	Requested Informatio n from Peer Promoter	Attended YPP Event	Attended MEXFAM Clinic	Sex Education Last Year	Received School Talk from	
								Outside Agent	MEXFAM Agent
Have heard of contraceptive methods	×				×		×	×	x
Knows eight or more methods	×				×		×	×	x

Knows emergency contraception	×						×	×	x
Has seen a condom	×						×	×	x
Knows where a condom is placed	×			×	×		×	×	x
Knows how many times a condom can be used	×		×			×	×	×	x
Knows when it is likelier that a woman gets pregnant	×				×	×	×	×	
Has had sexual relationships						×	×	×	
Used a method in last sexual relationship						×	×		
Talks with partner about sexual relationships	×				×	×		×	
Talks with partner about contraception	×				×	×		×	
Talks with partner about STIs	×		×		×	×		×	
Mentioned condom as a way to avoid HIV/AIDS	×						×	×	x
Requested reproductive health services or information last 12 months	×	×	×	×				×	x
Agrees with contraceptive use by young people	×						×	×	x
Believes would be treated respectfully if requested method in clinic	×						×	×	x
Believes would be treated respectfully if requested method in pharmacy	×						×	×	x
Believes would be treated respectfully if requested STI information in clinic	×					×	×	×	x
In favor of sex education at schools	×						×	×	x

Has talked with father during last year about RH topics	×	×			×		×	×	x
Has talked with mother during last year about RH topics	×						×	×	x
Agrees with contraceptive use by youth before marriage	×						×	×	x
Agrees with condom use by youth	×						×	×	x

× Chi square p < .01

A second problem seems to be the demanding nature of the job. YPCs are expected to coordinate several activities per month, to follow-up with their multipliers, and to provide technical assistance to other health providers, among other things. This involves a level of effort greater than what is reasonable to expect and a range of skills that many YPCs do not necessarily have.

- ***High turnover of peer-promoters and multipliers.*** Although the YPP trains a very large number of adolescents and adults, few of them collaborate as multipliers after the training. Even those who later collaborate with the YPP remain in the program for only a few months, with only a very small proportion remaining in the program after one year. In fact, MEXFAM does not seem to have any reasonable data on the permanence and level of effort of volunteers, a crucial piece of information to begin improving the situation. In addition, some of those who collaborate do not report their activities. There is a need to improve the retention of people trained and of collaborators, else, to assume from the beginning that only a few of those who are trained will collaborate and then only for a few activities. Logistical coordinators often believe that the fluctuating participation of peer promoters and multipliers is inherent to adolescent programs; although they believe their continuity could be increased by providing them with more frequent moral and material support, they are unable to specify how this could be done, though they recognize that current incentives (e.g., t-shirts, caps, and education) are insufficient.

- ***Lack of support to YPC by logistic coordinators.*** As mentioned above, YPCs are usually young professionals in their first jobs. In several instances, such as when trying to provide technical assistance to large service providers, they do not have the expertise or credibility demanded by their counterparts. To achieve the objectives, the YPCs need the support of the logistical coordinators, who supervise a large number of programs and tend to delegate all responsibilities to the coordinators of these programs. Another problem related to the supervision of YPCs is the assignment of different tasks other than those strictly related to the YPP. Often, when other MEXFAM programs need a special effort, the logistical coordinators focus all their resources towards that objective, at a cost to the other programs. However, it should be recognized that the YPP also occasionally benefits from this teamwork approach.

- ***Insufficient focus on the populations in most need.*** The baseline survey data showed that the population in most need of sexual and reproductive health information and services are those youth who are out of school and, often, also out of work. Nevertheless, for YPCs, the easiest component to implement is the school component. Even though all YPCs enjoy the community component, to achieve the expected results they often try to reach out of school youth by means of other organizations that conduct associated work with youth. However, to a large degree, this is also a subset of the population that is connected to services and institutions. Reaching those truly in need remains a challenge.

- ***Balance of activities.*** Generally, youth sexual and reproductive health programs consist of four different types of activities: enabling, trust-generation, informative, and service oriented activities. *Enabling activities* are those that allow MEXFAM to conduct the different activities, and that imply obtaining the consent and participation of the community, schools, and other authorities. *Trust-generation activities* are those that the program conducts to allow for a space to get in contact with youth and obtain their goodwill, such as rock concerts, organization of sport events, graffiti sessions, and poetry bulletins, among others. *Informative activities* are conducted to meet the information needs of adolescents. S*ervice delivery activities* are those conducted to fill particular service needs. A casual glimpse at the activities conducted by the YPCs suggests that they devote a very large proportion of their efforts to conducting enabling and trust-generation activities. Particularly in the case of the latter, more emphasis should be given to include informative components.

- ***Recording of activities and incomplete management information system (MIS).*** During the course of the project, MEXFAM conducted three revisions of its management information system. Nevertheless, to a large degree, the YPP component of the MIS remained oriented towards meeting the information needs of donors, emphasizing the number of activities conducted rather than being a decision-making tool. Most of the revisions to the MIS consisted of decreasing or changing a very large number of different types of activities, which are difficult to differentiate between, into a smaller, more mutually exclusive list of categories. These revisions made little progress in terms of facilitating decision-making. Given the large staff turnover, the existing information system needs to be complemented by local record keeping in which activities are related to the local infrastructure, so that any new staff member can easily assess what has been done and what remains to be done in each particular school, clinic, pharmacy, or institution in the city, who the peer promoters and multipliers are that can be reached by the program when planning particular activities, and the duration they have been with the program. The limited utility of the data provided by the MIS is underscored by the weak follow-up of the monthly reports of YPCs, who often fail to report activities. During the course of this project, technical assistance was provided to improve these conditions, but much remains to be done.

- ***Lack of clearly defined models and goals to provide technical assistance to providers.*** The YPP basically interacts with other service provider institutions by offering training

for their service providers and IEC materials. Although the expectations are that these service providers will offer better quality services for adolescents and that they will conduct activities targeting them, little effort has been made to try to specify and measure indicators that would allow YPP to see if they are achieving their goals. Similarly, perhaps more thought should be given to the different components that adolescent-friendly services may have, and to see which of these areas can be amenable to technical assistance to providers. Finally, MEXFAM should try to be more strategic in their work with providers, focusing on providers who reach a larger proportion of the target adolescent populations. For example, even though the baseline data showed that nearly 80 percent of the adolescents obtained their contraceptives from pharmacies, it was not until the last year of project that an effort was made to work with pharmacies. Even then, many YPCs were unclear about the kind of activities they should conduct, emphasizing sales of contraceptives over the goal of making their services friendlier for adolescents.

REFERENCES AND NOTES

(1) Other more recent statistics show that at the national level, 92 percent of those aged six to 14 years and 55 percent of those aged 15-17 attended school in the year 2000 (see http://www.conapo.gob.mx/m_en_cifras/principal.html).

(2) See Consejo Nacional de Población. 1997. "Los Jóvenes de México," in *La Situación Demográfica de México.* México City: CONAPO; Consejo Nacional de Población. 1998. "La Población Joven," in *La Situación Demográfica de México*, México City: CONAPO.

(3) Ibid.

(4) Ibid.

(5) Consejo Nacional de Población. 1996. *Indicadores Básicos de Salud Reproductiva y Planificación Familiar.* México City: CONAPO.

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APPENDIX 1

MEXFAM Courses

1. A six-month diploma course on human sexuality. This course, which is usually offered in coordination with universities and other academic institutions**,** consists of 280 hours - 180 hours of theory and 100 hours of practice – and enables graduates to prepare trainers in sex education. Participants may include schoolteachers or any other professional who works with adolescents, such as physicians, psychologists, social workers. This course typically was offered in a city nearby to those included in this experiment.

2. A 40-hour course, usually given in 20 two-hour sessions. This course is based on a manual developed by MEXFAM that was updated and published as part of project activities. The contents include family communication, anatomy of reproduction, human sexual response and dysfunctions, mass media and sexuality, STIs/HIV/AIDS, contraceptive methods, gender and sexuality, violence and sexuality, sexual and reproductive rights, and attitudes of the counselor towards human sexuality. Participants were mostly schoolteachers and service providers, but other professionals and volunteers who work with adolescents also enrolled. The course enabled participants to teach 14-hour courses, give talks and provide individual orientation to others. The courses were offered in the same city where the participants lived or in a nearby city. Project goals were to have three teachers in each primary and secondary school attend this course, to have at least two service providers in each public health clinic attend the course, and to offer the course to other professionals in project areas.

3. A 14-hour course, usually given in seven sessions. This is the basic course offered to peer promoters, but a large number of teachers, service providers, other professionals, and volunteers also attended it. The course summarizes the contents of the 40-hour course and is also based on a manual published by MEXFAM. This course enabled participants to replicate the course, give talks and provide individual orientation. Project goals were to offer this course to all primary and secondary schoolteachers in the city, to parents of students in each school, to all service providers in the city (including pharmacists), and to have at least 30 youth take this course and be prepared as peer-promoters.

4. A 4-day (24-hour) course for health providers on comprehensive health care for adolescents. This course focuses on the illnesses and conditions most frequently affecting adolescents, as well as on basic preventive health care, including contraception and prevention of STIs. As with other courses, professionals usually travel to a nearby city where MEXFAM offers the course. During the project, MEXFAM finished an interactive compact disc that is used as a teaching aid. The goal was to have at least two providers in each city take this course, but it was offered to all physicians and nurses in the city.

APPENDIX 2

Multivariate Analysis Methodology to Assess the Impact of Interventions on Knowledge, Attitudes, and Behaviors of Adolescents in Mexico

Introduction

Two steps taken to assess the effects of the interventions on selected dependent variables. The first involved determining if the experimental groups were similar in terms of 11 social and demographic variables, in order to decide if an unadjusted or an adjusted multivariate model should be used. The second involved using the selected model to test for differences in proportions and means between groups (controlling for other background characteristics, if needed).

Comparing Means and Proportions of Background Variables between Groups and Surveys

To assess if the two intervention groups and the control groups in the baseline and endline surveys were equivalent in terms of basic socio-demographic variables, five dichotomous variables were constructed using the 1999 control group as reference, as follows:

- Let G2 be 1 for cases in the 2-Int group in 1999, 0 for all other cases
- Let G3 be 1 for cases in the 3-Int group in 1999, 0 for all other cases
- Let G4 be 1 for cases in the control group in 2002, 0 for all other cases
- Let G5 be 1 for cases in the 2-Int group in 2002, 0 for all other cases
- Let G6 be 1 for cases in the 3-Int group in 2002, 0 for all other cases

In addition, each socio-demographic variable was coded in categories, as follows:

- Age:10-14 and 15-19 years of age: yes=1; other=0 (for each category)
- Sex: male=1; other=0
- Literacy: yes=1; other=0
- Current attendance of school: yes=1; other=0
- No formal education, 1-6, 7-9, 10 or more years of education: yes=1; other=0 (for each category)
- Interest in continuing studying (yes=1; other=0)
- Ever work and current work: yes=1; other=0 (for each variable)
- Religion: Catholic, other Christian, other religion, no religion: yes=1; other=0 (for each category)
- Marital status: single, married/cohabiting, separated/divorced/widowed: yes=1; other=0 (for each category)

- Living with parents: living with both parents, living with one parent, living with guardian; yes=1; other=0 (for each category)

A logistic regression model was used to assess the equivalence between groups and surveys for each socio-demographic variable and category where the variable had more than two categories. The following illustrates the model used for the variable sex:

$$\ln\left(\frac{p(male)}{1-p(male)}\right) = c_0 + c_2 G2 + c_3 G3 + c_4 G4 + c_5 G5 + c_6 G6$$

For each model, an overall F-test was used to test the hypothesis that all coefficients were simultaneously equal to zero against the alternative hypothesis that at least one coefficient was different than zero. In a second step, a t-test was conducted to determine whether a specific coefficient was equal to (or different from) zero. A 0.05 significance level was used to identify those coefficients statistically different than zero, i.e., different than the control group. Appendix 3 (and Table A1) presents the results of these tests. Groups differed in five variables: current attendance of school; years of schooling; current work status; religion; and residence with parents.

The STATA statistical package was used to conduct these tests, and that the tests considered the design effect, given the complex sample design employed for the study.

Comparing Means with Linear Regression Models

As there were significant differences across groups and surveys in several socio-demographic characteristics, it was deemed appropriate to use adjusted multivariate models to assess the effects of selected outcomes.

The general approach for comparing proportions and means between groups and surveys involves estimating the proportion or mean of a given variable for each group in each survey. Let the mean of key outcomes by experimental groups and time of interview be as specified in the following table:

	Baseline (0)	**End line (1)**
Experimental Group 1	A	B
Experimental Group 2	C	D
Control Group (0)	E	F

The overall test statistics for testing the effect of interventions using the above notation is as follows:

H_{01}: = (B-A) - (F-E) = 0 and
H_{02}: = (D-C) - (F-E) = 0

Let observations in experimental group 1 be coded as 1 and those in all other groups be coded as zero; call this variable group1.

Let observations in experimental group 2 be coded as 1 and those in all other groups be coded as zero; call this variable group2.

Let observations at endline survey be coded as 1 and those at baseline be coded as zero; call this variable time.

Let two interaction variables be coded as follows:

group1tm=group1*time
group2tm=group2*time

A regression model of outcomes for the above design can be fitted with the following equation:

$$y = a + b1*group1 + b2*group2 + b3*time + b4*group1tm + b5*group2tm \quad (1)$$

where y is the mean value of any selected item.

The mean of observations by experimental group and baseline/endline surveys can be expressed in terms of the coefficients of the fitted line, as follows:

	Baseline (0)	**End line (1)**
Experimental Group 1	A=a + b1	B=a + b1 + b3 + b4
Experimental Group 2	C=a + b2	D=a + b2 + b3 + b5
Control Group (0)	E=a	F=a + b3

Recalling the measure of effect of intervention cited above, the hypothesis are that:

H_{01}: = (B-A) - (F-E) = 0 and that
H_{02}: = (D-C) - (F-E) = 0

Therefore, an estimate of the effect of the experimental treatment for group 1 on a specific outcome can be calculated by taking the difference of (B-A), and this is equal to (b3+b4). Similarly, we take the difference of (F-E) and this is equal to b3. Taking the difference of (B-A) - (F-E) is equal to b4. Following the same argument, the effect of treatment 2 on outcome is estimated by the coefficient b5 of the regression line.

A test of statistical significance of coefficients b4 and b5, separately, was done using t-statistics with a two-sided statistical significance of 0.05. In addition, a joint test of the statistical significance of b4 and b5 coefficients was conducted.

Comparing Proportions with Logistic Regression Models When the Outcome is Dichotomous and There Are No Covariants

While a linear regression line may be fitted when an outcome is dichotomous, such a model may yield a predicted outcome that is outside the 0-1 range of the original outcome. An alternative approach is to fit a logistic regression model to the 0-1 outcome. In such a model, the probability of occurrence of an event is transformed to its logit. For example, suppose that we want to estimate the effect of the interventions on the proportion of study participants who had sexual intercourse during the six months prior to the interview. Let this proportion be equal to θ. If we take this proportion θ and its complement $1-\theta$ (e.g., proportion of study participants with no sexual intercourse), take the ratio of θ and$1-\theta$ and take its natural logarithm, then the log-odd of having sexual intercourse in the six months prior to the interview is defined. The logistic regression model in this case consists of fitting the following model:

$$\text{Logit}(\theta/(1-\theta)) = a + b1*\text{group1} + b2\ \text{group2} + b3\ \text{time} + b4*\text{group1tm} + b5*\text{group2tm} \quad (2)$$

In this model, variables group1, group2, time, group1tm and group2tm are coded as in equation 1 above. However, the coefficients a, b1, b2, b3, b4, and b5 have different numerical values as well as a different interpretation.

The odds of any given dependent dichotomous variable for each of the six groups, defined by the experimental groups and time of interview, is obtained by exponentiating the sum of the coefficients. For example, the odds for a variable in the control group at baseline is given by exp(a), while at the endline the odds is exp(a+b3). If the odds ratio for the variable at the endline and baseline surveys in the control group, that is exp(b3), is equal to 0.3, this means that study participants in the control group at endline are about one-third less likely to report the outcome at the endline survey than in the baseline survey. Among those in the experimental group 1, the odds ratio for the given variable is exp(b3+b4) and among those in experimental group 2, the odds ratio is exp(b3+b5).

As in the linear model for continuous data, an estimate of the interaction term may be initially considered to assess the effects of interventions.

Comparing Proportions with Logistic Regression Models When the Outcome is Dichotomous and There Are Covariates

Given that the background characteristics of study participants differed between intervention and control groups at baseline and endline surveys, we decided to estimate adjusted measures of the effects of interventions. To make such an adjustment, we expanded the regression models for the unadjusted estimate by including the characteristics for which we found significant differences: current attendance of school, years of schooling, current work status, religion, and residence with parents. Thus, the model adopted the following form:

$$f(y) = a` + b1`*\text{group1} + b2`*\text{group2} + b3`*\text{time} + b4`*\text{group1tm} + b5`*\text{group1tm} + b6*\text{age} + b7*\text{working} + b8*\text{educational attainment} + \ldots + bk*k^{th}\text{covariate}$$

where f(y) is the logit function of the respective dependent variable. The measure of intervention remains the coefficients associated with time by interaction terms b4 and b5 as discussed above.

Taking Into Account the Complex Sampling Procedures in Estimation

The target population for both the baseline and endline survey consisted of young adults (10-19 years) in the geographic areas randomized to each of the three intervention groups. The study participants were selected using a multi-stage, clustered design with varying probabilities of selection. Variance estimates from such samples must consider whether the multiple stages of sampling, clustering, and unequal probabilities of selection have increased the variance of the estimates. A summary measure of the effect of complex sampling procedure on variance of estimate is the design effect. The design effect is the ratio of the variance taking into account the complex sampling procedure to the variance of the estimate calculated as if observations had been selected by using a simple random sampling procedure of the same size. In most clustered samples, the design effect is greater than one, indicating that the variance of estimates in complex survey samples is larger than the variance from simple random samples. Ignoring the complex sampling structure in hypothesis testing or confidence interval estimation may lead to inferring statistical significance when in fact there is none, and to estimating narrower confidence intervals than there should be. We used the STATA option to consider the design effect.

Table A1: Comparison of Socio-demographic Variables Between Groups and Surveys

pweight:	**pondrel5**						
Strata:	**estrato**						
PSU:	**ageb**						
	Coefficient	**Standard Error**	**t**	**P>|t|**	**95% Confidence Interval**		
Sex	sexod						
Group_2	0.0291	0.1545	0.1880	0.8510	-0.2796	0.3378	F(5,59)=0.4600
Group_3	-0.0143	0.2575	-0.0550	0.9560	-0.5289	0.5003	Prob > F = 0.8045
Group_4	-0.1632	0.1402	-1.1640	0.2490	-0.4434	0.1170	
Group_5	-0.0759	0.1802	-0.4210	0.6750	-0.4361	0.2843	
Group_6	-0.0385	0.1532	-0.2510	0.8020	-0.3447	0.2677	
_cons	-0.0453	0.1175	-0.3860	0.7010	-0.2802	0.1895	
Literate	p14d						
Group_2	-0.2335	0.7164	-0.3260	0.7460	-1.6652	1.1982	F(5, 59) = 1.3800
Group_3	0.3495	0.5867	0.5960	0.5530	-0.8229	1.5219	Prob > F = 0.2447
Group_4	0.1865	0.5287	0.3530	0.7250	-0.8700	1.2431	
Group_5	-0.0320	0.5608	-0.0570	0.9550	-1.1527	1.0886	
Group_6	1.2339	0.7076	1.7440	0.0860	-0.1802	2.6479	
_cons	4.2569	0.4108	10.3620	0.0000	3.4359	5.0778	
Currently attending school	vaesc						
Group_2	-0.2067	0.2493	-0.8290	0.4100	-0.7048	0.2914	F(5, 59) = 2.6000
Group_3	-0.4155	0.1939	-2.1430	0.0360	-0.8030	-0.0280	Prob > F = 0.0342
Group_4	-0.5773	0.1666	-3.4660	0.0010	-0.9101	-0.2444	
Group_5	-0.2694	0.2026	-1.3300	0.1880	-0.6742	0.1354	
Group_6	-0.2463	0.1618	-1.5220	0.1330	-0.5697	0.0771	

_cons	1.4679	0.1209	12.1390	0.0000	1.2263	1.7096	
No formal education	escol1						
Group_2	1.8119	1.0026	1.8070	0.0760	-0.1916	3.8154	F(5, 59) = 1.3800
Group_3	1.5005	0.9172	1.6360	0.1070	-0.3324	3.3334	Prob > F = 0.2455
Group_4	1.6926	0.6696	2.5280	0.0140	0.3546	3.0306	
Group_5	1.8517	0.7995	2.3160	0.0240	0.2540	3.4493	
Group_6	1.9085	0.8706	2.1920	0.0320	0.1688	3.6481	
_cons	-6.5996	0.7049	-9.3630	0.0000	-8.0081	-5.1910	
1-6 years education	escol2						
Group_2	0.3371	0.1810	1.8620	0.0670	-0.0247	0.6988	F(5, 59) = 3.4900
Group_3	-0.0709	0.2078	-0.3410	0.7340	-0.4862	0.3445	Prob > F = 0.0079
Group_4	0.2357	0.1385	1.7020	0.0940	-0.0410	0.5125	
Group_5	0.3803	0.1839	2.0690	0.0430	0.0129	0.7477	
Group_6	0.4820	0.1970	2.4470	0.0170	0.0884	0.8756	
_cons	-0.1944	0.1155	-1.6840	0.0970	-0.4251	0.0363	
7-9 years education	escol3						
Group_2	-0.2972	0.1686	-1.7630	0.0830	-0.6341	0.0397	F(5, 59) = 4.8000
Group_3	-0.1827	0.1504	-1.2150	0.2290	-0.4831	0.1178	Prob > F = 0.0010
Group_4	-0.2798	0.1346	-2.0780	0.0420	-0.5488	-0.0107	
Group_5	-0.5255	0.1881	-2.7940	0.0070	-0.9014	-0.1497	
Group_6	-0.4475	0.1411	-3.1710	0.0020	-0.7295	-0.1655	
_cons	-0.3621	0.1057	-3.4260	0.0010	-0.5733	-0.1509	
10+ years education	escol4						
Group_2	-0.1948	0.1681	-1.1590	0.2510	-0.5307	0.1411	F(5, 59) = 2.0300
Group_3	0.4115	0.2438	1.6880	0.0960	-0.0757	0.8987	Prob > F = 0.0874
Group_4	0.0074	0.1577	0.0470	0.9630	-0.3077	0.3225	
Group_5	0.1358	0.1898	0.7160	0.4770	-0.2434	0.5151	
Group_6	-0.2317	0.2366	-0.9800	0.3310	-0.7045	0.2410	
_cons	-1.8435	0.0960	-19.1940	0.0000	-2.0355	-1.6516	
Ever worked	p111d						
Group_2	0.5367	0.1500	3.5770	0.0010	0.2369	0.8365	F(5, 59) = 4.8500
Group_3	0.2187	0.1647	1.3280	0.1890	-0.1104	0.5477	Prob > F = 0.0009
Group_4	0.1056	0.1404	0.7520	0.4550	-0.1750	0.3861	
Group_5	0.2868	0.1398	2.0520	0.0440	0.0075	0.5662	
Group_6	-0.0571	0.1420	-0.4020	0.6890	-0.3408	0.2267	
_cons	-0.3565	0.1026	-3.4750	0.0010	-0.5616	-0.1515	
Working at time of interview	p114t						
Group_2	0.5824	0.2106	2.7650	0.0070	0.1615	1.0034	F(5, 59) = 6.7500
Group_3	0.5353	0.2435	2.1980	0.0320	0.0487	1.0219	Prob > F = 0.0000
Group_4	0.2570	0.2072	1.2400	0.2190	-0.1570	0.6709	
Group_5	0.6593	0.1702	3.8740	0.0000	0.3192	0.9994	
Group_6	0.1036	0.1755	0.5900	0.5570	-0.2471	0.4543	
_cons	-1.6722	0.1332	-12.5510	0.0000	-1.9385	-1.4060	
Catholic religion	p117dca						
Group_2	0.7437	0.4231	1.7580	0.0840	-0.1018	1.5892	F(5, 59) = 8.5100
Group_3	0.0613	0.4719	0.1300	0.8970	-0.8818	1.0043	Prob > F = 0.0000

Group_4	0.2357	0.2919	0.8080	0.4220	-0.3475	0.8190	
Group_5	1.0100	0.4935	2.0460	0.0450	0.0237	1.9962	
Group_6	-0.7858	0.3357	-2.3400	0.0220	-1.4567	-0.1148	
_cons	2.3488	0.2943	7.9800	0.0000	1.7606	2.9369	
Other Christian	p117dcr						
Group_2	-0.5959	0.4716	-1.2640	0.2110	-1.5383	0.3465	F(5, 59) = 3.4300
Group_3	-0.2335	0.5677	-0.4110	0.6820	-1.3680	0.9009	Prob > F = 0.0086
Group_4	-0.2911	0.3726	-0.7810	0.4380	-1.0356	0.4534	
Group_5	-0.8622	0.6157	-1.4000	0.1660	-2.0927	0.3682	
Group_6	0.7716	0.4541	1.6990	0.0940	-0.1359	1.6790	
_cons	-2.9153	0.3624	-8.0440	0.0000	-3.6395	-2.1910	
Other religion	p117dot						
Group_2	-0.4520	0.9388	-0.4810	0.6320	-2.3280	1.4241	F(5, 59) = 3.2700
Group_3	1.3588	0.7243	1.8760	0.0650	-0.0885	2.8061	Prob > F = 0.0113
Group_4	-1.2741	1.2083	-1.0540	0.2960	-3.6888	1.1406	
Group_5	-0.8367	1.2044	-0.6950	0.4900	-3.2434	1.5700	
Group_6	0.8545	0.8161	1.0470	0.2990	-0.7763	2.4853	
_cons	-5.3036	0.6650	-7.9760	0.0000	-6.6325	-3.9748	
No religion	p117dno						
Group_2	-1.1280	0.5279	-2.1370	0.0370	-2.1829	-0.0731	F(5, 59) = 6.2500
Group_3	-0.3745	0.6054	-0.6190	0.5380	-1.5843	0.8353	Prob > F = 0.0001
Group_4	-0.0064	0.3994	-0.0160	0.9870	-0.8046	0.7917	
Group_5	-1.2155	0.5993	-2.0280	0.0470	-2.4130	-0.0180	
Group_6	0.6648	0.4163	1.5970	0.1150	-0.1670	1.4967	
_cons	-3.4757	0.3843	-9.0450	0.0000	-4.2435	-2.7078	
Single	p463resd						
Group_2	0.6560	0.3335	1.9670	0.0540	-0.0104	1.3224	F(5, 59) = 2.3600
Group_3	-0.4557	0.3511	-1.2980	0.1990	-1.1573	0.2458	Prob > F = 0.0513
Group_4	-0.5055	0.3539	-1.4280	0.1580	-1.2127	0.2017	
Group_5	0.3162	0.3533	0.8950	0.3740	-0.3899	1.0222	
Group_6	-0.2495	0.2119	-1.1770	0.2440	-0.6729	0.1740	
_cons	3.1415	0.1760	17.8520	0.0000	2.7898	3.4932	
Married / Cohabit	p463remd						
Group_2	-0.6559	0.3938	-1.6650	0.1010	-1.4429	0.1312	F(5, 59) = 2.2500
Group_3	0.4340	0.3902	1.1120	0.2700	-0.3458	1.2138	Prob > F = 0.0609
Group_4	0.6898	0.4731	1.4580	0.1500	-0.2555	1.6352	
Group_5	-0.1160	0.4081	-0.2840	0.7770	-0.9316	0.6995	
Group_6	0.3393	0.2856	1.1880	0.2390	-0.2314	0.9100	
_cons	-3.3763	0.2465	-13.6990	0.0000	-3.8688	-2.8837	
Separate/ Divorced/ Widowed	P463redd						
Group_2	-1.0020	0.7187	-1.3940	0.1680	-2.4381	0.4342	F(5, 59) = 1.8900
Group_3	0.4459	0.6830	0.6530	0.5160	-0.9190	1.8107	Prob > F = 0.1091
Group_4	-0.9784	0.8789	-1.1130	0.2700	-2.7347	0.7779	
Group_5	-2.0960	1.1213	-1.8690	0.0660	-4.3366	0.1447	
Group_6	-0.1871	0.8033	-0.2330	0.8170	-1.7924	1.4183	
_cons	-4.8026	0.5370	-8.9430	0.0000	-5.8758	-3.7294	
Living with both parents	both						

Group_2	0.0912	0.1738	0.5250	0.6020	-0.2561	0.4385	F(5, 59) = 1.1500
Group_3	-0.0403	0.2215	-0.1820	0.8560	-0.4829	0.4023	Prob > F = 0.3431
Group_4	-0.0547	0.1971	-0.2780	0.7820	-0.4487	0.3392	
Group_5	-0.0323	0.2084	-0.1550	0.8770	-0.4487	0.3841	
Group_6	-0.3676	0.2136	-1.7210	0.0900	-0.7945	0.0593	
_cons	0.8300	0.1433	5.7930	0.0000	0.5437	1.1164	
Living with one parent	one						
Group_2	0.0426	0.1938	0.2200	0.8270	-0.3446	0.4298	F(5, 59) = 1.7300
Group_3	-0.1157	0.1910	-0.6060	0.5470	-0.4973	0.2659	Prob > F = 0.1410
Group_4	0.1166	0.2024	0.5760	0.5670	-0.2879	0.5211	
Group_5	0.1326	0.2016	0.6580	0.5130	-0.2702	0.5355	
Group_6	0.4513	0.2078	2.1710	0.0340	0.0359	0.8666	
_cons	-1.3138	0.1332	-9.8650	0.0000	-1.5800	-1.0477	
Living with guardian	guardian						
Group_2	-0.3709	0.3329	-1.1140	0.2690	-1.0362	0.2944	F(5, 59) = 0.8700
Group_3	0.2818	0.3132	0.9000	0.3720	-0.3440	0.9076	Prob > F = 0.5081
Group_4	-0.1055	0.3335	-0.3160	0.7530	-0.7720	0.5609	
Group_5	-0.2108	0.3188	-0.6610	0.5110	-0.8478	0.4263	
Group_6	-0.0265	0.3011	-0.0880	0.9300	-0.6283	0.5752	
_cons	-2.2919	0.2191	-10.4620	0.0000	-2.7297	-1.8541	

Table A2: Measure of Intervention Effects on Selected Outcomes, by Type of Intervention

	Measures of Intervention Effects, by Type of Intervention					
Selected Outcome	**3 Interventions**			**2 Interventions**		
	Coefficient b4	**95% Confidence Interval**		**Coefficient b5**	**95% Confidence Interval**	
Proportion of youth who ever had sex	0.349	-0.567	1.266	-0.348	-1.210	0.513
Of those who have had sexual relations, proportion who had had sex in last three months	-1.094	-2.240	0.052	-1.106	-2.398	0.186
Of those who have had sex, proportion who used a method in first intercourse	0.529	-0.716	1.774	0.327	-0.950	1.604
Of those who have had sex, proportion who used a method in last intercourse	-1.715*	-2.902*	-0.528	-2.378*	-3.772	-0.984
Ever been pregnant	0.810	-0.118	1.737	0.187	-1.074	1.448
Of those who have had sexual relations, proportion who have been pregnant / made partner pregnant	0.342	-0.224	0.908	-0.026	-0.597	0.546
Currently pregnant	1.842	-0.423	4.106	19.195	.	.
Prevalence of exposure to reproductive health messages						
Has been spoken to about how the body works	-0.519	-1.082	0.044	-0.180	-0.850	0.489
Has been spoken to about dating	-0.312	-0.924	0.301	-0.269	-0.915	0.378
Has been spoken to about unwanted pregnancies	-0.294	-1.023	0.435	-0.114	-0.860	0.633
Has been spoken to about HIV/AIDS	0.128	-0.786	1.043	-0.115	-0.974	0.744
Has heard about contraceptives	-0.013	-0.840	0.815	0.103	-0.740	0.946
Aware of FP methods (unprompted)						
Knows of pills	-0.015	-0.697	0.667	-0.418	-1.053	0.218
Knows of IUD	0.038	-0.653	0.730	-0.347	-1.123	0.429
Knows of injectables	-0.020	-0.797	0.757	-0.197	-0.699	0.304
Knows of condoms	0.103	-0.545	0.751	0.161	-0.453	0.775
Knows of suppositories, jellies, foams	0.020	-0.848	0.888	0.202	-0.609	1.013
Knows of rhythm, other periodic methods	-0.251	-1.084	0.581	0.105	-0.792	1.003
Knows of withdrawal	-0.164	-1.949	1.621	0.240	-1.610	2.090
Knows of female sterilization	0.024	-0.779	0.828	-0.075	-0.941	0.791
Knows of vasectomy	-0.031	-0.952	0.891	-0.176	-0.993	0.641
Knows of emergency contraception pills	-1.420	-4.630	1.790	-0.561	-3.297	2.175

Aware of methods (umprompted+prompted mention)						
Knows of pills	-0.430	-1.128	0.268	-0.281	-0.951	0.389
Knows of IUD	-0.119	-0.808	0.570	-0.545	-1.211	0.122
Knows of injectables	-0.162	-0.767	0.444	0.299	-0.355	0.953
Knows of condoms	-0.007	-0.833	0.819	0.195	-0.649	1.038
Knows of suppositories, jellies, foams	-0.163	-0.821	0.495	0.231	-0.405	0.867
Knows of rhythm, other periodic	0.254	-0.385	0.893	0.416	-0.278	1.109
Knows of withdrawal	-0.123	-0.777	0.532	0.448	-0.288	1.184
Knows of female sterilization	-0.184	-0.809	0.441	0.293	-0.365	0.951
Knows of vasectomy	-0.282	-0.982	0.419	-0.125	-0.878	0.628
Knows of emergency contraception pills	0.308	-0.368	0.984	1.053*	0.369	1.738
Knowledge of the condom						
Has seen a condom	-0.247	-1.083	0.589	0.110	-0.858	1.079
Knows where a condom is placed	-0.025	-0.632	0.583	0.328	-0.340	0.997
Knows a condom can be used once	-0.168	-0.830	0.493	-0.282	-0.940	0.376
Knowledge of means to avoid STI/HIV/AIDS						
Use condoms	-0.010	-0.537	0.518	0.019	-0.562	0.601
Have sexual relations only with one person	0.609	-0.511	1.728	0.134	-0.950	1.218
Request fidelity from partner	0.504	-1.893	2.900	1.950	-0.004	3.905
Agrees with use of contraception by youth	0.069	-0.666	0.805	0.428	-0.166	1.021
Thinks that young people who go to pharmacies to get contraceptives are treated in a respectful manner	0.192	-0.419	0.802	0.234	-0.269	0.736
Talks with partner about: sexual relations	-0.865*	-1.657	-0.073	-0.569	-1.492	0.355
Talks with partner about: contraceptive use	0.185	-0.716	1.085	0.095	-0.869	1.058
Have talked with father about sexual and reproductive health topics (total sample)	0.014	-0.550	0.579	-0.295	-0.772	0.181
Have talked with mother about sexual and reproductive health topics (total sample)	0.156	-0.412	0.723	-0.039	-0.431	0.353
Have talked with father or mother about sexual and reproductive health topics	0.028	-0.527	0.583	-0.106	-0.513	0.302
Have ever smoked	-0.347	-0.855	0.160	-0.290	-0.939	0.359

Proportion who drank alcoholic beverages	-0.551	-1.269	0.167	-0.123	-0.884	0.638
Proportion who visited physician or nurse	0.447	-0.090	0.985	-0.048	-0.462	0.366
Proportion who felt trust to clarify doubts	0.044	-0.379	0.467	-0.783*	-1.347	-0.220
Proportion who felt privacy	0.097	-0.342	0.536	-0.600	-1.216	0.015
Of those who have had sex, age at first intercourse	-0.647	-1.462	0.167	-0.545	-1.363	0.273
Number of methods known (spontaneous - total sample)	-0.006	-0.389	0.378	-0.112	-0.411	0.188
Number of methods known (spontaneous+information - total sample)	-0.151	-0.929	0.626	0.171	-0.621	0.964
Number of methods known (spontaneous+information - of those who have heard about contraceptives)	-0.268	-0.849	0.312	0.418	-0.269	1.105
Number of cigarettes smoked per day	0.874	-1.886	3.633	1.551	-1.013	4.116
Number of drinks in last three months among drinkers	3.202	-3.130	9.534	1.250	-5.394	7.8941

* $p<0.05$

Table A3: Odds Ratios to Estimate Changes in Selected Outcomes Between Surveys in Experimental Groups and Changes with Respect to 1999 Control Group

Odds Ratios						
	exp(b3)	**exp(b3+b4)**	**exp(b3+b5)**	**exp(b4)**	**exp(b5)**	**exp(b4) / exp(b5)**
Selected outcomes	**Change over time in control group**	**Change over time in 3-Int group**	**Change over time in 2-Int group**	**Change over time in 3-Int group in relation to change over time in control group**	**Change over time in 2-Int group in relation to change over time in control group**	**Change over time in 3-Int group in relationship to change over time in 2-Int group**
Proportion of youth who ever had sex	1.116	1.582	0.788	1.418	0.706	2.009
Of those who have had sexual relations, proportion who had had sex in last three months	1.867	0.625	0.617	0.335	0.331	1.012
Of those who have had sex, proportion who used a method in first intercourse	0.931	1.581	1.291	1.698	1.387	1.224
Of those who have had sex, proportion who used a method in last intercourse	3.017*	0.543	0.280*	0.180*	0.093*	1.941
Ever been pregnant	0.840	1.888	1.013	2.247	1.206	1.864
Of those who have had sexual relations, proportion who have been pregnant / made partner pregnant	1.283	1.807*	1.251	1.408	0.975	1.445
Currently pregnant	0.625	3.939	135531385.667*	6.306	216961396.638	0.000
Prevalence of exposure to reproductive health messages						
Has been spoken to about how the body works	2.321*	1.381	1.938*	0.595	0.835	0.713
Has been spoken to about dating	1.758*	1.287	1.344	0.732	0.764	0.958
Has been spoken to about unwanted pregnancies	2.375*	1.769*	2.120*	0.745	0.893	0.835
Has been spoken to about HIV/AIDS	1.784	2.029*	1.591*	1.137	0.892	1.275
Has heard about contraceptives	2.399*	2.369*	2.660*	0.988	1.109	0.891
Aware of FP methods (spontaneous)						
Knows of pills	2.665*	2.625*	1.755*	0.985	0.659	1.496

Knows of IUD	1.642	1.706*	1.160	1.039	0.707	1.470
Knows of injectables	1.826*	1.790	1.499*	0.980	0.821	1.194
Knows of condoms	1.572	1.742*	1.845*	1.109	1.174	0.944
Knows of suppositories, jellies, foams	1.303	1.330	1.594*	1.021	1.224	0.834
Knows of rhythm, other periodic	1.148	0.893	1.276	0.778	1.111	0.700
Knows of withdrawal	0.685	0.581	0.871	0.849	1.271	0.668
Knows of female sterilization	1.291	1.323	1.198	1.025	0.928	1.105
Knows of vasectomy	1.309	1.269	1.098	0.970	0.839	1.156
Knows of emergency contraception pills	16.055*	3.881	9.165*	0.242	0.571	0.423
Aware of FP methods (umprompted+ prompted mention):						
Knows of pills	3.224*	2.096*	2.433*	0.650	0.755	0.861
Knows of IUD	2.446*	2.171*	1.419*	0.888	0.580	1.530
Knows of injectables	2.245*	1.910*	3.029*	0.851	1.349	0.631
Knows of condoms	2.441*	2.424*	2.966*	0.993	1.215	0.817
Knows of suppositories, jellies, foams	1.489	1.265	1.876*	0.850	1.260	0.674
Knows of rhythm, other periodic	1.559	2.010*	2.363*	1.289	1.515	0.851
Knows of withdrawal	1.647	1.457*	2.578*	0.885	1.565	0.565
Knows of female sterilization	1.689	1.405*	2.263*	0.832	1.340	0.621
Knows of vasectomy	2.157*	1.627*	1.903*	0.755	0.882	0.855
Knows of emergency contraception pills	2.617*	3.561*	7.502*	1.361	2.867*	0.475
Knowledge of the condom:						
Has seen a condom	2.503*	1.955*	2.795*	0.781	1.117	0.699
Knows where a condom is placed	1.740*	1.698*	2.417*	0.976	1.389	0.703
Knows a condom can be used once	2.370*	2.002*	1.787*	0.845	0.754	1.120
Knowledge of means to avoid STI/HIV/AIDS						
Use condoms	7.194*	7.125*	7.335*	0.990	1.020	0.971
Have sexual relations only with one person	0.243*	0.446*	0.277*	1.838	1.143	1.608
Request fidelity from partner	0.229	0.379	1.611	1.655	7.031	0.235
Agrees with use of contraception by youth	0.734	0.787	1.126	1.072	1.533	0.699
Thinks that young people who go to pharmacies to get contraceptives are treated respectfully	1.417	1.716*	1.789*	1.211	1.263	0.959

Talks with partner about: sexual relations	3.016*	1.270	1.708	0.421*	0.566	0.744
Talks with partner about: contraceptive use	2.056*	2.474*	2.261*	1.203	1.100	1.094
Has talked with father about sexual and RH topics (total sample)	1.667*	1.691*	1.240	1.014	0.744	1.364
Has talked with mother about sexual and RH topics (total sample)	1.118	1.307	1.075	1.168	0.961	1.215
Has talked with father or mother about sexual and RH topics	1.171	1.205	1.054	1.029	0.900	1.143
Has ever smoked	1.059	0.748	0.792	0.707	0.748	0.944
Proportion who drank alcoholic beverages	1.401	0.807	1.239	0.576	0.884	0.652
Proportion who visited physician or nurse	0.586*	0.917	0.559*	1.564	0.953	1.641
Proportion who felt trust to clarify doubts	0.391*	0.408*	0.179*	1.045	0.457*	2.287
Proportion who felt privacy	0.306*	0.337*	0.168*	1.102	0.549	2.008
Of those who have had sex, age at first intercourse	1.036*	0.998	0.992	0.964	0.957	1.007
Number of methods known (spontaneous - total sample)	1.239*	1.146*	1.193*	0.925	0.963	0.961
Number of methods known (spontaneous+ prompted- total sample)	1.258*	1.327*	1.176*	1.054	0.935	1.128
Number of methods known (spontaneous + prompted of those who have heard about contraceptives)	1.108*	1.204*	1.050*	1.087	0.948	1.147
Number of cigarettes smoked per day	0.439*	0.707	0.563	1.608	1.282	1.254
Number of drinks in last three months among drinkers	1.181	1.391	1.667	1.178	1.412	0.834

* $p<0.05$