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John Snow, Inc.
Integrated Family Health Program

TESTING A SERVICE-DELIVERY MODEL FOR OFFERING LONG-ACTING REVERSIBLE CONTRACEPTIVE METHODS TO YOUTH IN ETHIOPIA

STUDY REPORT

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About E2A

The Evidence to Action Project (E2A) is USAID's global flagship for strengthening family planning and reproductive health service delivery. The project aims to address the reproductive health care needs of girls, women, and underserved communities around the world by increasing support, building evidence, and leading the scale-up of best practices that improve family planning services. A Cooperative Agreement awarded in September 2011, E2A will continue until September 2019. E2A is led by Pathfinder International in partnership with ExpandNet, IntraHealth International, Management Sciences for Health, and PATH.

About IFHP+

Through the E2A field-support mechanism, USAID funded IFHP+, jointly implemented by Pathfinder International and John Snow, Inc. IFHP+ aimed to strengthen integrated contraception, maternal, newborn, and child health (including malaria), and prevention of HIV and AIDS services. The program also sought to improve reproductive health services at the community level, promote gender equality, and support the government's initiatives to strengthen systems and train health care workers. The project was conducted from 2008-March 2017.

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Acronyms

AYSRH	Adolescent and Youth Sexual and Reproductive Health
E2A	Evidence to Action Project
FP	Family Planning
HEW	Health Extension Worker
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IFHP+	Integrated Family Health Program Plus
LARC	Long-Acting Reversible Contraceptive
LMIC	Low- and Middle-Income Countries
M&E	Monitoring and Evaluation
MOH	Ministry of Health
PE	Peer Educator
RH	Reproductive Health
RHB	Regional Health Bureau
RHO	Regional Health Office
SNNPR	Southern Nations Nationalities and Peoples Region (Ethiopia)
SPSS	Statistical Packages for Social Sciences
SRH	Sexual and Reproductive Health
WHO	World Health Organization
YFS	Youth-Friendly Service

Executive Summary

Background

In Ethiopia, the unmet need for family planning (FP) among adolescents (15-19 years) and youth (20-24 years) is relatively high—21% and 19% respectively (EDHS 2016). Only 32% of young women 15-19 years, and 39% of young women 20-24 years, are currently using a modern contraceptive method. A negligible few are opting for long-acting reversible contraceptives (LARCs)—implants and intrauterine devices (IUDs)—yet evidence shows that LARCs are safe for youth and the most effective methods for preventing pregnancies.

The World Health Organization’s *Medical Eligibility Criteria for Contraceptive Use* cites LARCs as safe and suitable for nearly all women, irrespective of age, parity (number of children born alive), or HIV status. Evidence shows that implants are 120 times more effective than injectables, 180 times more effective than the pill, and 360 times more effective than the condom. Compliance among young women for short-acting methods (barrier methods, oral pills, and injectables) is poor—adolescent use is characterized by shorter periods of consistent use, more contraceptive failure, and more stopping for other reasons. On the other hand, adolescents choosing implants over oral pills and barrier methods are less likely to become pregnant and more likely to continue over the long-term.

Study Design

To help address the unmet demand for contraception among Ethiopian youth, the Evidence to Action (E2A) project, in collaboration with the Integrated Family Health Program Plus (IFHP+),^a tested a model that strengthened FP service delivery at youth-friendly service (YFS) sites by readying the sites to provide adolescents and youth full contraceptive choice including LARCs. E2A and IFHP+ conducted a quasi-experimental study to examine the effects of offering adolescents and youth full contraceptive choice at the YFS sites located in health centers, hospitals, and/or university clinics. The study was implemented at 10 intervention and 10 non-equivalent comparison study sites in Amhara and Tigray regions—five intervention and five comparison study sites in each region. At the ten intervention sites, the following model was tested:

- Competency-based skills training on LARCs insertion, removal and infection control, including dispelling myths and misperceptions on safety and effectiveness of LARCs for youth.
- Refresher training for peer educators (PEs) to counsel (dispel myths and misperceptions) clients on safety and effectiveness of LARCs and refer them for services.
- Data quality supervision and mentoring on data collection by the project’s Monitoring and Evaluation (M&E) and Adolescent and Youth Sexual and Reproductive Health (AYSRH) Officers.

The 10 comparison study sites continued offering IFHP+’s routine AYSRH services with no additional trainings or supportive supervision beyond what was routinely scheduled. The study lasted 11 months—3 months pre-intervention (June-August 2014) and 8 months’ post-intervention (September 2014-April 2015).

^a IFHP+ is USAID-funded program implemented by Pathfinder International and John Snow Inc. in Ethiopia.



Study Tools

For a comprehensive assessment of the effect of the service delivery model, five tools were used.

- *Family Planning Client Registers (Study Tool 1)*: The routine national FP client registers maintained at the YFS units were the primary source for measuring acceptor status of all FP clients and choice of contraceptive methods. For project purposes, three additional indicators—parity, marital status, and by whom the FP client was referred—were included as an addendum to the routine FP register.
- *Peer Educator Monthly Register Forms (Study Tool 2)*: The IFHP+ PE register forms were the primary source used to assess PEs' FP outreach activities. The form was revised to include LARCs referrals.
- *Service Providers LARCs Competency Training Assessment Tool (Study Tool 3)*: The nationally administered LARCs competency-based assessment tool was modified to include additional questions on LARCs knowledge and skills including infection prevention.
- *Peer Educator Refresher Training Questionnaire (Study Tool 4)*: The IFHP+ refresher training questionnaire was modified to include additional LARCs knowledge questions.
- *Peer Educator Profile (Study Tool 5)*: This tool tracked demographic characteristics of PEs (age, sex, marital status, education level, number of living children) and reasons for opting and continuing to be a PE.

Data Collection and Data Entry

Data were extracted over the 11-month study period from FP registers and PE register forms from all 20 study sites by the designated M&E Officer recruited for the study. In addition, clinical training assessments for service providers and refresher/LARC training assessments for PEs were administered at three points in time: pre-training, post-training, and six months post-training.

Data Quality Assurance

The study team adopted several quality assurance measures to ensure that the data were of the highest quality. M&E Officers were trained on the project's objectives, transfer of select data from the FP and PE registers to the Excel spreadsheet, coding, monthly data collection, and monitoring and supervision techniques. Data were extracted from the FP registers and PE register forms monthly, entered in the Excel spreadsheets, and submitted to E2A for a second round of quality assurance review.

Data Analysis

The data were exported into SPSS version 22 for data analysis. Percentage tables that showed the distribution of FP clients by demographic characteristics and method mix were generated for all FP clients and disaggregated by intervention and comparison sites. Data analysis explored effect of the training intervention on various outcomes, such as numbers of new LARCs acceptors, as well as referrals made by PEs.

A data analysis plan was developed to demonstrate the following three research objectives of this study report:

- Demonstrate service provider knowledge and competency in FP counseling and service provision;

- Demonstrate PE characteristics and knowledge of FP counseling and service provision;
- Demonstrate characteristics of clients accepting services; and the overall effect of the intervention on new acceptors of FP (LARCs in particular) by comparing uptake of all methods between intervention and comparison sites over time.

This report contains details on the analysis procedures utilized for each of these different objectives.

Study Limitations

The study design was a quasi-experimental study with a non-equivalent comparison group, and therefore, intervention and comparison group facilities may not be entirely comparable at baseline, especially with respect to key unobserved variables. A second limitation is that first-round selection of facilities was purposive due to logistical and budgetary constraints. This means that the research and implementation teams used certain objective criteria and their best judgement to choose facilities. In addition, the total sample size of facilities included in the study is relatively small, increasing the chance that the sites chosen and clients served are not representative, or that selection was biased in some way. Statistical analysis incorporated robust estimates of variance to account for the relatively high design effect typically associated with using small numbers of clusters (in this case, health facilities).

There were region-specific modifications to the intervention approaches; for example, the Tigray IFHP+ regional office and the RHB made the decision to conduct on-site training with five FP/RH service providers (including at least one, often two YFS providers) per facility. By contrast, the Amhara regional office trained only two YFS-certified providers per intervention site; this may have resulted in a YFS-certified LARCs-trained provider not always made available at each of the five intervention sites. Region of implementation was therefore a critical control variable to be included in LARCs uptake in this study.

No additional information was gathered on the supply context of the facilities included in the study, which may have impacted uptake and study outcomes; for example, regular availability (i.e. available and on duty 5 days per week or more) of a YFS-trained provider at the facility or availability of commodities, equipment, or consumables. Similarly, no measures of quality on client-provider interactions were captured (and therefore not included in the analysis). These and other missing variables may have affected client uptake of FP, may explain differences in uptake between intervention and comparison sites over time, and may unintentionally bias the outcome. Finally, the study team collected limited information (parity, marital status, and source of referral) on the clients themselves due to the study instruments used (FP registers). For example, no information on a client's education status (typically one of the most powerful predictors of uptake of FP) was recorded.

Results

Service Provider Training Assessment: The training assessment results were analyzed for the 24 service providers (Amhara=10; Tigray=14) who had completed all three assessments (pre-training, post-training, six months post-training). Average scores significantly improved comparing pre- to post-training with moderate retention six months later for all three modules. The largest improvement and its retention

six months later was observed for Module III (LARCs Knowledge and Skills), reflecting perhaps the emphasis on LARCs in the training curricula.

PE Refresher Training Assessment: The training assessment results were analyzed for 168 PEs (Amhara = 102; Tigray = 66) who had completed all three assessments (pre-training, post-training, six months post-training). Average scores significantly improved comparing pre- to post-training with excellent retention six months later for the first (Reproductive Health/FP Knowledge) and third modules (LARCs Knowledge). Across the three modules, the largest improvement and its retention six months later was observed for Module III (LARCs Knowledge).

PE Group FP Education Sessions: PEs conducted 4,148 group FP education sessions (intervention=2,609; comparison=1,539) during the 11-month study period. A total of 50,083 male (intervention=34,565; comparison=15,518) and 56,329 female (intervention=39,150; comparison=17,179) participants attended the 4,148 FP sessions. Although no statistical analysis was performed on this summative outreach data (total summed numbers only are presented), it appeared that there were more FP sessions reported by PEs at the intervention sites as compared to the comparison sites in each of the time periods. The percentage of the FP counseling sessions held in the intervention sites seemed to decline when comparing the June-August 2014 pre-intervention period (1,153 sessions) to the February-April 2015 post-intervention period (739 sessions; see Table 5), although total participation (for both males and females) seemed to increase in intervention sites. This indicates that later sessions may have included a larger number of participants.

PE Individual Counseling: The PEs, as part of their demand-creation tasks, conducted and reported individual counseling sessions with young men and women. During the 11-month period, there were 34,866 such contacts reported: 15,782 men (intervention=11,821; comparison=3,961) and 19,084 women (intervention=13,893; comparison=5,191). In comparing intervention groups and time periods, the number of individual men and women counseled in FP was higher in intervention areas than in comparison areas for both periods, but declined over time in the intervention sites and increased slightly in the comparison sites.

PE FP Referrals: Despite the large number of individuals counseled during the 11-month study period, the percentage of referrals for FP services was relatively low (around 1-2% for both men and women overall, see Table 5). During the FP individual counseling sessions, PEs referred young men and women to the nearest YFS unit to address their FP needs. During the 11-month period, there were 3,215 referrals reported: 1,125 male (intervention=866; comparison=259) and 2,090 female (intervention=1,419; comparison=671). Of the 2,090 female referrals, 219 were LARC referrals (intervention=139; comparison=80). While the total number of LARCs referrals was higher in intervention sites than in comparison sites during both time periods (26 LARC referrals vs. 12 LARC referrals at baseline; 67 LARC referrals vs. 42 LARC referrals at endline in intervention vs. comparison sites, respectively), the total number of LARC referrals increased over the study period in both groups of sites.

FP Uptake, All Acceptors: Over the entire 11-month study period in the 20 Amhara and Tigray YFS sites, 14,650 female clients accepted a method. Examining just the 3-month pre-intervention and 3-month post-intervention phase, there were 7,539 FP clients, with more clients attending YFS units in the

intervention facilities (n=4,626, 61.4%) than in the comparison facilities (n=2,913, 38.6%). The 7,539 FP clients preferred short-acting methods (82.7%). The two most preferred methods were injectables (69.7%) and implants (15.9%); pills were third (12.4%). Uptake of IUDs at all sites during both time periods remained very low (2.2% and 1.3%). On the contrary, uptake of implants over time more than doubled at both intervention and comparison sites, from around 10% to 21%. A majority of the clients (59.9%) were between 20-24 years, while 39.9% were younger (15-19 years). While the vast majority of clients were married (77.6%), substantial numbers were either living together (8.3%) or single (13.5%). There were statistically significant differences ($p < .01$) in age, marital status and region within the intervention and comparison sites by pre- and post-intervention periods. An interesting finding is the large proportion of nulliparous (those without children) women (60.6%) adopting a method among all FP clients, suggesting that young Ethiopian women are opting to delay their first pregnancy.

FP Uptake, New Acceptors of All Methods: There were 2,827 new female FP acceptors during the three-month pre-intervention phase and the three-month post-intervention phase. Overall, there were more female new acceptors recorded at the intervention sites (n=1,892; 66.9%) than the comparison sites (n=935; 33.1%). This general pattern persisted throughout the 11-month study period. While the majority of the new acceptors were married (67.4%), a considerable proportion was single (22.1%). Nearly half of all new acceptors were younger than 20 (50.5%). Slightly over three-quarters of all new acceptors had not had a live birth (73.7%). As with all female FP acceptors, the preferred method of choice for new female FP clients during the study period were short-acting methods (79.1%). New acceptors most often preferred injectables (62.1%) and implants (19.6%). Uptake of IUDs at all sites during both time periods remained very low (1.4%). On the contrary, uptake of implants over time rose significantly at intervention sites, from around 13.5% to 26.8% ($p < .000$), although this was not the case at comparison sites, where LARCs uptake did not increase significantly.

FP Uptake, New Acceptors of LARCs: There were 592 new acceptors of LARCs. New LARCs acceptors can be characterized as young (55.7% were 10-19 years), ever or currently married or in union (80.9%), having no children (73.0%) and from Amhara (66.0%). Nearly all (94.3%, missing excluded) reported that they were self-referred. Few of these variables significantly changed over time within the intervention group; one exception is the proportion of new LARCs acceptors by region. The proportion of clients in Tigray rose significantly, from 21.7% to 35.3% over time, at intervention sites, and decreased significantly at comparison sites (56.8% to 23.1%), from the pre-intervention period to the post-intervention period.

Contraceptive Switchers and Removals: There were 466 switchers (intervention=292; comparison=174) during the study period, a small fraction of the 14,737 clients at the 20 YFS sites. Slightly over half these FP clients switched to implants (54.5%). Nearly one-third (30.9%) switched to injectables, and 12.4% switched to oral contraceptive pills. Overall, while the majority of switcher clients were married (85.9%); a sizable number are nulliparous (having no children born alive; 45.4%). There were 275 clients who sought LARCs removals (intervention=217; comparison=58) during the project period. The two main reasons for method removal were opting for pregnancy (intervention=34.9%; comparison=12.1%) and product duration^b completed (intervention=38.8%; comparison=53.4%). The implant was the main

^b Either three or five years

method removed (94.9%). There were more married (90.1% vs. 67.3%) and 20-24-year-old (68.5% vs. 53.4%) women seeking removals in the intervention group than the comparison group (respectively).

Conclusion

The combined effect of the tested service delivery model successfully achieved the program's primary objective: increasing LARC uptake among female adolescents and youth. The training assessments indicated improved counseling and skills for LARC insertion and removal including infection prevention among YFS providers and improved LARC counseling skills among PEs, as measured through post-training assessments immediately and six months after training.

Recommendations

The following recommendations can be used for scale-up and future programming:

- Train YFS providers to counsel on and provide all reversible contraceptives, including LARCs, in one location.
- Design programs that examine service providers' attitudes about LARCs for adolescent and youth, and studies which probe client perspectives about services, including client satisfaction.
- Strengthen PE reporting.
- Strengthen supportive supervision for peer education.
- Implement additional evaluation activities that examine PEs' role in creating demand for FP and LARCs.

Introduction

Global: Contraception among Youth

The World Health Organization (WHO) defines young people as those between the ages 10 and 24, including adolescents (10-19 years) and youth (15-24 years). Globally, there are 1.8 billion young people—25% of the world's population of 7.3 billion. In 17 developing countries, half the population is younger than 18.¹ The Population Division of the United Nations Department of Economic and Social Affairs estimates that there will be 2 billion 10-24-year-olds by the middle of this century.¹ In many low- and middle-income countries (LMICs) the growing populations of young people are straining government capacities and resources. However, slight changes in expected birth or death rates over time can easily change this outcome.¹ If investments are made that enable all individuals, including young people, to decide freely and responsibly whether, when, and how often to have children, fertility rates may significantly decline.²⁶

The prevalence of sexual activity among youth varies widely by several factors, including region, country, and age at marriage. However, a recent review from 16 LMICs showed that, irrespective of marital status, a substantial number of young people are sexually active.² Sexually active youth who either do not use a modern contraception or rely on traditional methods account for more than 80% of unintended pregnancies.³ Of the world's births to adolescents, 95% occur in developing countries, and 9 in 10 of these births occur within marriage or union.⁴ Unmet need for family planning (FP) among married and unmarried young women is high— with the highest levels in West and Central Africa (29.3% among married young women and 41.7% among unmarried young women respectively) contributing significantly to high unintended pregnancies.⁵ Women with unmet need for FP account for nearly four out of every five unintended pregnancies.⁶ Other factors contributing to unintended pregnancies include incorrect or inconsistent use of a contraceptive method, which may be due to inadequate counseling or information, and discontinuation of a method without switching to another method.⁶ Rapid repeat pregnancy, occurring within two years of a previous birth, is common (around 35% of recently delivered adolescent mothers in the United States⁷) though the majority want to delay their next pregnancy.⁸ In sub-Saharan Africa, unmet need for spacing pregnancies exceeds that of limiting births⁹—approximately one-third of women interviewed in Demographic and Health Surveys want to wait at least two years before having another child.¹⁰ In sub-Saharan Africa, less than 20% of young women are using a modern contraceptive method: 11% and 18% among the 15-19 and 20-24-year-olds respectively.¹ The majority use either traditional or short-acting methods, a negligible few use long-acting reversible contraceptives (LARCs).

Contraceptive effectiveness is a key determinant in reducing unintended pregnancy. Implants are 120 times more effective than injectables, 180 times more effective than the pill, and 360 times more effective than the condom. Compliance among young women for short-acting methods (barrier methods, oral pills, and injectables) is poor—adolescent use is characterized by shorter periods of consistent use, more contraceptive failure, and more stopping for other reasons.¹² On the other hand, adolescents choosing implants over oral pills and barrier methods are less likely to become pregnant and more likely to continue over the long-term.¹³ In an urban slum, young Kenyan women who were initially seeking short-acting methods readily accepted implants with high continuation rates (80% in 18 months).¹⁴ Consequently, if only 20% of women who currently use oral pills or injectables in sub-Saharan Africa voluntarily switched to implants, approximately 1.8 million unintended pregnancies could be averted in a five-year period.¹⁵

WHO's *Medical Eligibility Criteria for Contraceptive Use* cites implants as safe and suitable for nearly all women, irrespective of age, parity, HIV status, or whether or not they are breastfeeding.¹⁶

Ethiopia: Contraception among Youth

Ethiopia, with an estimated population of around 97 million,¹ has a large youth population. Nearly 20% of its population is aged 15-24 years.¹⁷ Ethiopia^c is administratively structured into nine regional states—Tigray, Affar, Amhara, Oromiya, Somali, Benishangul-Gumuz, Southern Nations Nationalities and Peoples Region (SNNPR), Gambela, and Harari—and two city administrations of Addis Ababa and Dire Dawa Administration Councils. More than 80% of the country's total population lives in the regional states of Amhara, Oromiya, and SNNPR.

The Ethiopia Demographic and Health Survey (DHS) 2011¹⁸ reports that the median age at first marriage among women age 25-49 years is 16.5 years, and 12% of women aged 15-19 have started childbearing. A significantly larger proportion of 15-19-year-olds (34%) are either mothers or are pregnant with their first child by age 19. The unmet need and total demand for spacing among young Ethiopians aged 15-19 is relatively high—30.3% and 52.9% respectively; these levels decline to 20.3% and 49.8% among the 20-24 age group.¹⁸ Some women in both age groups (5.2% and 22.2% in age groups 15-19 and 20-24 respectively) are currently using a modern contraceptive method; a negligible few are opting for either an intrauterine device (IUD) or implant. As evident from this data, young people in Ethiopia experience high unmet need and total demand for FP. Given the large size of the youth population in Ethiopia, addressing their reproductive health by broadening their contraceptive choices will translate to significant improvements in Ethiopia's population health and well-being and economic growth in the future.

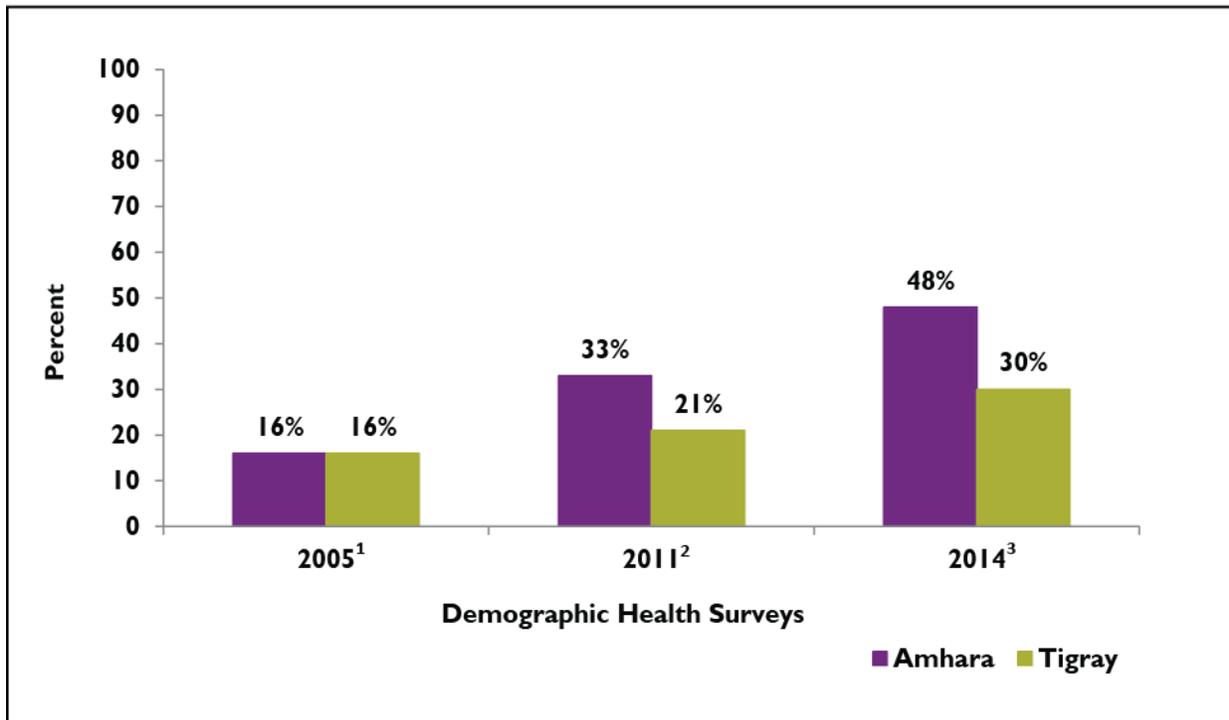
Integrated Family Health Program Plus

The Integrated Family Health Program Plus (IFHP+), a USAID-funded program which was implemented by Pathfinder International and John Snow Inc., from 2011 to early 2017. IFHP+ promoted an integrated model for strengthening reproductive health and maternal, newborn and child health services for rural and underserved populations in Ethiopia. IFHP+'s integrated model operated in 301 districts or *woredas*, in Amhara; Oromia; Southern Nations, Nationalities and People Region's (SNNPR); Tigray; and parts of Beneshangul and Somali regions. There has been a sustained rising trend in modern contraceptive prevalence rates for the Amhara and Tigray regions as noted in the DHS 2006¹⁸, 2011¹⁹ and 2014²⁰ (Figure 1). Though there has been significant improvement in the reproductive health indicators in the IFHP+ *woredas*, improving quality of FP services to include full contraceptive method choice to the growing youth population is key to future progress.

^c Ethiopia is divided into nine regions (*kililoch*) based on ethnic territoriality, which are subdivided into 68 zones and about 770 *woredas* (districts). The regions are the first-level administrative divisions, followed by the zones and the *woredas*. The *woredas* are composed of a number of *kebeles* (wards), or neighborhood associations, which are the smallest unit of local government in Ethiopia.



Figure I. Trends in modern contraceptive prevalence rate among young Ethiopians; 2005-2014, Ethiopia Demographic and Health Surveys¹⁻³



Data Sources:

1. Central Statistical Agency [Ethiopia] and ORC Macro. 2006. Ethiopia Demographic and Health Survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro.
2. Central Statistical Agency [Ethiopia] and ICF International; 2012. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International.
3. Central Statistical Agency [Ethiopia]. 2014. Ethiopia Mini Demographic and Health Survey 2014. Addis Ababa, Ethiopia.

Adolescent and Youth Reproductive Health Program: Youth-Friendly Services

IFHP+ targeted youth with its adolescent and youth sexual and reproductive health (AYSRH) program. A key feature of this program was its youth-friendly services (YFS) initiative, which was successfully scaled up from 20 (2007) to 248 (2015) sites across urban and peri-urban sites in six regions, including parts of Beneshangul and Somali regions. IFHP+’s YFS approach²¹ addressed the complex drivers of adolescents’ poor sexual and reproductive health (SRH) outcomes by targeting the barriers to health care access at individual, social, and structural levels. By addressing these three levels concurrently, IFHP+ strived to ensure high-quality implementation and engagement among key stakeholders through active collaboration with Regional Health Bureaus (RHBs):^d

- **Individual level:** strengthening provider-client counseling to be youth friendly, thus increasing young people’s SRH knowledge, skills, and healthcare-seeking behaviors.
- **Social level:** creating an enabling environment for adolescents through peer-to-peer SRH counseling and life skills.

^d There are 11 Regional Health Bureaus in Ethiopia, which serve as the regional or state level of the Ministry of Health (MOH) and like the Federal MOH, provide health policy and technical support. District, or *woreda*, health offices manage and coordinate primary health care services at an operational level.

- **Structural level:** promoting national, regional, and local YFS-oriented policies, as well as the integration of YFS into national public health systems.

IFHP+'s YFS approach aligned with WHO guidelines and followed a rights-based approach, emphasizing: (1) privacy, confidentiality, and respect; comprehensive and integrated SRH services by a nonjudgmental trained provider; (2) community engagement to foster an enabling environment; (3) youth participation in YFS design, implementation, monitoring, and evaluation; (4) low or no service fees; (5) convenient hours; and (6) easily accessible locations in urban and peri-urban sites. IFHP+ supported the Ministry of Health (MOH) to establish YFS corners^e or units within health centers, hospitals, and university clinics with the aim of providing tailored, confidential, and youth-friendly SRH services in Amhara, Oromia, SNNP, Tigray, Beneshangul, and Somali regions of Ethiopia. The YFS package of services delivered at the YFS units included:²¹

- Counseling and provision of accurate information on SRH, including puberty and sexuality education
- Sexually transmitted infection counseling, and/or syndromic management, and treatment
- HIV counseling and testing, and provision of or referral for antiretroviral therapy and other care and support services
- Prevention of mother-to-child transmission
- Pregnancy testing
- Antenatal and postnatal care and referral for delivery
- Postabortion care
- Contraceptive counseling for all methods
- Provision of short-acting methods and referrals to FP facilities for LARCs
- Sexual abuse and violence counseling, treatment, follow-up and referral
- Nutrition counseling
- Other medical care

This YFS package of services was delivered through healthcare providers (health officers, nurses, or midwives) trained to deliver YFS in the designated YFS unit, and through a volunteer cadre of peer educators (PEs) attached to each unit located within health centers, hospitals, or university clinics. Healthcare providers were recruited by the respective woreda and health facility heads using pre-set selection criteria that included provider interest, motivation, and commitment to work with young people; counseling skills; and patience in accommodating the needs of young people.

YFS providers conducted review meetings and professional updates jointly with the RHBs and IFHP+ regional program office. They were held twice a year for three days. Participants included focal persons from the RHB, zonal health department, woreda health office, a YFS provider, and the health facility (health center, hospital or university clinic) head. The objectives of the review meetings were to review past performance, share best practices, identify problems, and discuss solutions, including refresher training.

Peer education is a popular and versatile approach that aims to improve young people's health-related knowledge, attitudes, and skills as well as their access to health services. As part of the YFS program, PEs

^e A YFS corner is a separate space for young people where they receive friendly, confidential, and tailored SRH services in a private setting.

were recruited and trained to generate SRH awareness, provide condoms, and refer adolescents and youth to the nearest YFS unit for these SRH services. Each YFS unit supervised 25 PEs. The PEs, both young men and women, aged 10-24 years, in or out of school, and were selected by the health facility in collaboration with the respective *kebele* administration (the lowest administrative unit, usually at the village or neighborhood level). PEs were selected using pre-set selection criteria that included an interest in working with young people and providing voluntary services. Additional criteria included having a good reputation in the community and being free from substance abuse or other “risky” behavior.

After recruitment, YFS providers conducted a five-day training with PEs with technical and financial support from IFHP+, using a training manual developed by IFHP+.^f PEs’ training included a wide range of topics, including FP, HIV/AIDS and other STIs, unsafe abortion, harmful traditional practices, early marriage, safe sex practices, puberty/developmental issues, referral, and communication skills. The training also included life skills to help youth make healthy decisions. Each year, refresher trainings were also conducted to fill gaps identified during mentoring and support supervision.

Every day, two PEs were assigned to a YFS unit to educate clients in the waiting areas. They also supported the YFS providers in organizing client cards, counseling and educating clients in the waiting areas, and managing “edutainment” materials in the YFS units. PEs regularly met at their respective health facilities once or twice per month and conducted awareness-raising activities through coffee ceremonies^g, and at schools, to engage adolescents and youth in discussions about sex, sexuality, reproductive health, and other health-related issues and community development. PEs performed outreach sessions at nearby schools to discuss SRH, puberty and physical development, and to perform FP and HIV counseling activities.

PEs, in principle, received a wide network of supervision and mentoring support. For example, YFS providers regularly mentored the PEs, collected monthly reports, and gave feedback. Health Extension Workers (HEWs)^h were linked with the YFS unit in the respective health centers, worked collaboratively with the YFS providers, and also provided technical support to the PEs. For example, HEWs signed off on the respective PE monthly reports before submitting to YFS providers. In addition, the Women’s Development Army was indirectly linked to the PEs through the urban health center HEWs, and worked collaboratively with the HEWs and PEs in performing demand-generation activities.

Regular review meetings were held at facility and district levels to enable the YFS program to effectively continue serving youth. The participants for the half-day, facility-based, review meetings, held on a monthly or quarterly basis, included YFS providers, PEs, head of the health facility, the woreda health office focal person, the nearby youth center representative, the nearby urban HEWs, and other YFS program officers. During the meetings, they reviewed PE performance, shared experiences and lessons learned, and prepared performance improvement plans.

^f Prior to the basic peer education training, YFS providers participated in a training of trainers that prepared them to train the peer educators.

^g A coffee ceremony is an indigenous Ethiopian social platform in which coffee and snacks are cooked and served to guests, in this case, AYRSH meeting participants.

^h HEWs, who are located in urban areas and primarily qualified as nurses, receive a one-day AYSRH training as part of a ten-day integrated FP/RH refresher training. None of the YFS providers trained under the study were HEWs. HEWs receive LARCs training through the task-shifting Ministry of Health Implanon scaling-up program.

From 2009-2015, IFHP and IFHP+ trained 2,421 health providers (primary health care unit nurses, midwives, and health officers) and 16,443 PEs, and provided SRH/HIV information and YFS. The IFHP+ YFS improved knowledge, attitudes, and behaviors related SRH and utilization of SRH services including FP uptake. More than 10.8 million young people received SRH information and around 5 million received health services care at the YFS units.

Evidence to Action and Integrated Family Health Program Plus

At the outset of IFHP+'s support to these sites, providers trained to deliver YFS at the YFS units were *not* specifically trained to provide LARCs—contraceptive implants or IUDs—to their young clientele; nor were the PEs trained to dispel myths and misperceptions about LARCs. IFHP+ and the Evidence to Action (E2A) project collaborated to conduct a study that tested a model for strengthening service delivery for sexually active young persons by offering them full method choice, including LARCs, in one location. The intervention addressed service delivery strengthening of the YFS units, focused on the supply, demand, and supportive supervision domains. The main program objectives included:

1. Improve uptake of LARCs.
2. Improve counseling and skills for LARCs insertion and removal among YFS providers, including infection prevention.
3. Improve LARCs counseling skills among youth PEs.

This report provides a full description of the findings from the study entitled “Testing a Service-Delivery Model for Offering Long-Acting Reversible Contraceptive Methods to Youth in Ethiopia” in Amhara and Tigray regions. This 11-month study, which started in April 2014, assessed the effects of a training intervention for both providers and PEs in providing LARCs and/or counseling and referrals to youth clients aged 10-24 years on increasing uptake of LARCs. This report presents the results of this study and has the following research objectives:

1. Measure providers’ average knowledge and competency scores before, immediately after, and six months after training to assess providers’ acquisition and retention of knowledge of FP and LARCs counseling and service provision;
2. Gather program information about PE characteristics, motivations, and outreach activity;
3. Measure PEs’ average knowledge and competency scores before, immediately after, and six months after training to assess PEs’ acquisition and retention of knowledge of FP and LARCs counseling;
4. Examine trends in FP and LARCs uptake among new acceptors after training and subsequent provision of implants by providers, and to statistically compare uptake rates in intervention vs. comparison sites; and
5. Conduct an exploratory, descriptive analysis to better understand characteristics and motivations of switchers and clients seeking an IUD or implant removal.

This report describes an assessment of the intervention’s ability to meet these research objectives. Findings demonstrate the effect of training YFS providers to provide FP and LARC counseling and services, and training PEs to counsel youth and dispel myths and misperceptions about LARCs and FP. Evidence in this report may be used to guide future scale-up of the intervention in Ethiopia and elsewhere.

Methodology

Study Design

The study was conducted at 10 intervention and 10 *non-equivalent* comparison YFS corners or units (located in health centers, hospitals, or university clinics) in Amhara and Tigray regions in collaboration with IFHP+ and the respective RHBs. This was a quasi-experimental study with a *non-intervention* or *non-equivalent* comparison group that documented the effect of the project's YFS LARC intervention on LARC service provision by YFS providers and LARC referrals made by PEs. Numbers of new youth acceptors of LARCs in the 10 intervention sites were compared to numbers of new youth acceptors of LARCs in 10 comparison sites using the same YFS service delivery model in both groups of sites in the 3 months before the training and during the 11-month study period. The comparison sites received no additional training or supportive supervision in project-supported YFS units beyond what was normally provided; during the study period, YFS-trained providers in comparison sites offered counseling on all contraceptive methods (including short-acting methods and LARCs), offered only short-acting methods on-site, and referred clients to the main on-site FP unit for LARCs. PEs attached to one of each of the comparison sites provided FP counseling during coffee ceremonies and YFS waiting area talks, provided condoms, and referred clients to the YFS unit for all RH/FP and other medical reasons.

The service delivery intervention implemented in the 10 intervention sites was comprised of a three-pronged approach that targeted staff in the supply, demand, and supportive supervision domains, as described below:

- i. **Supply Domain:** competency-based skills training on LARCs insertion, removal and infection control, including dispelling myths and misperceptions on safety and effectiveness of LARCs for youth.
- ii. **Demand Domain:** refresher training for PEs to counsel (dispel myths and misperceptions) clients on safety and effectiveness of LARCs and refer them for services.
- iii. **Supportive Supervision Domain:** supportive supervision on data collection by the project's monitoring and evaluation (M&E) Officers and IFHP+'s AYSRH and M&E officers, as well as supportive supervision for services by IFHP+ technical staff, in addition to the Regional Health Office technical staff.ⁱ

Every month, over the 11-month study period (June 2014-April 2015), data were extracted from the YFS FP registers and from the PE monthly forms maintained at all 20 YFS units. These data were used in the analysis comparing intervention and comparison sites. Additional details on data analysis are described below.

Site Selection

The regions, Amhara and Tigray, were purposively selected based on feasibility and practicality for day-to-day project oversight management¹ from the regions where IFHP+ partners (Pathfinder and John Snow Inc.) maintained fully operational YFS programs (Amhara, Oromia, SNNPR, and Tigray, and parts of Beneshangul and Somali regions). The January-March 2014 quarterly FP register records from 43 and 35 YFS units in Amhara and Tigray, respectively, were reviewed. Fifteen units from each of these two regions that met the FP client load criteria (100 FP clients during the quarter) were selected purposively. Finally, due to budgetary constraints, 10 units in each region were selected from these 15, which had

ⁱ No data are presented on results from supportive supervision in this report.

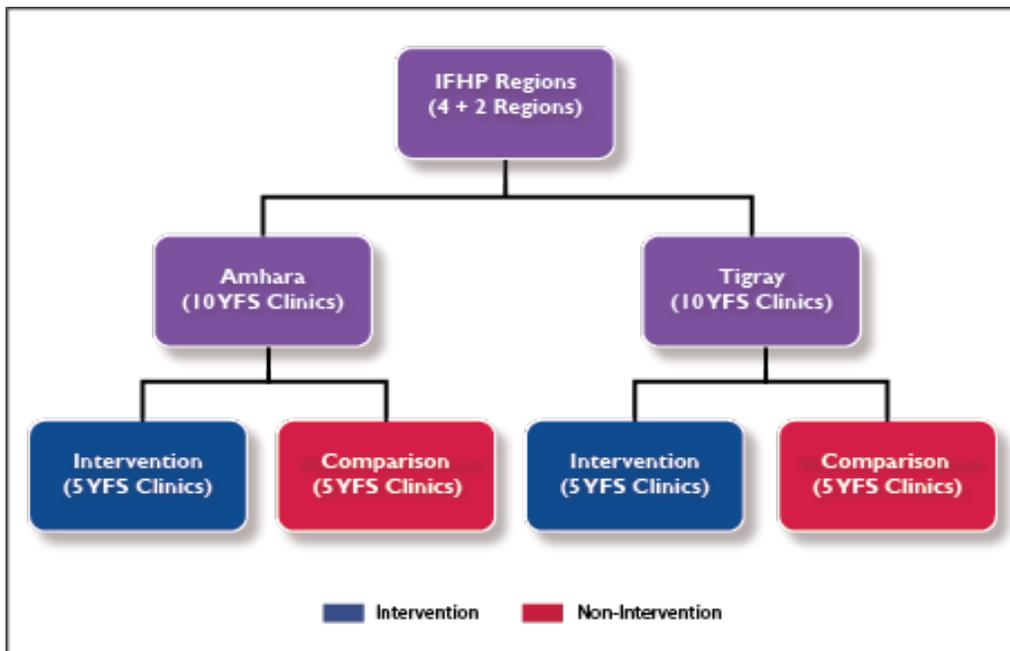
¹ Pathfinder International directly manages IFHP+ programs in Amhara and Tigray regions.

approximately an equal volume of LARCs new acceptors/client load. These 10 units were then randomly designated as intervention (5 per region) and comparison (5 per region) units or sites. Maps showing the geographic location of these units, located in urban or peri-urban health centers, hospitals, or university clinics is available in Appendix A, Figures 1-2.

Facility Catchment Population

The population of 10-24-year-olds in the intervention and comparison facility catchment areas varied by region^k and by location, whether the client catchment area was urban, peri-urban, or rural. Overall, the total catchment area population of 10-24-year-olds around the 10 intervention sites (n=132,487; 51.2%) was greater than the catchment area population around comparison sites (n=126,373; 48.8%; see Appendix B).

Figure 2. Intervention and comparison youth-friendly service study sites, Amhara and Tigray regions



Pathfinder: Amhara, Tigray, and part of Beneshangul Gumz region
 John Snow International: Oromiya, SNNPR, and part of Ethiopian Somali region

^k The projected 2015 population in Amhara was 20 million, and, in Tigray, 5 million.

Five tools were developed and administered to comprehensively assess the effect of the project service delivery intervention:

1. *Family Planning Client Registers (Study Tool 1)*: The routine national FP client registers maintained at the YFS units were the primary tool used to measure acceptance status of all FP clients and their choice of contraceptive methods. For project purposes, three additional indicators—parity, marital status, and by whom the FP client was referred—were included as an addendum to the routine FP register.
2. *Peer Educator Monthly Register Forms (Study Tool 2)*: The IFHP+ PE register forms^l were the primary tool used to assess PE FP outreach activities. The form was revised to include LARCs referrals.
3. *Service Providers LARCs Competency Training Assessment Tool (Study Tool 3)*: The nationally administered LARCs competency-based assessment tool^m was modified to include additional questions on LARCs knowledge and skills, including infection prevention, administered before and after training.
4. *Peer Educator Refresher Training Questionnaire (Study Tool 4)*: The IFHP+ refresher training questionnaireⁿ was modified to include additional LARCs knowledge questions.
5. *Peer Educator Profile (Study Tool 5)*: Demographic characteristics (age, sex, marital status, education level, number of living children), and reasons for opting and continuing to be a PE were collected from each PE.

Study Implementation

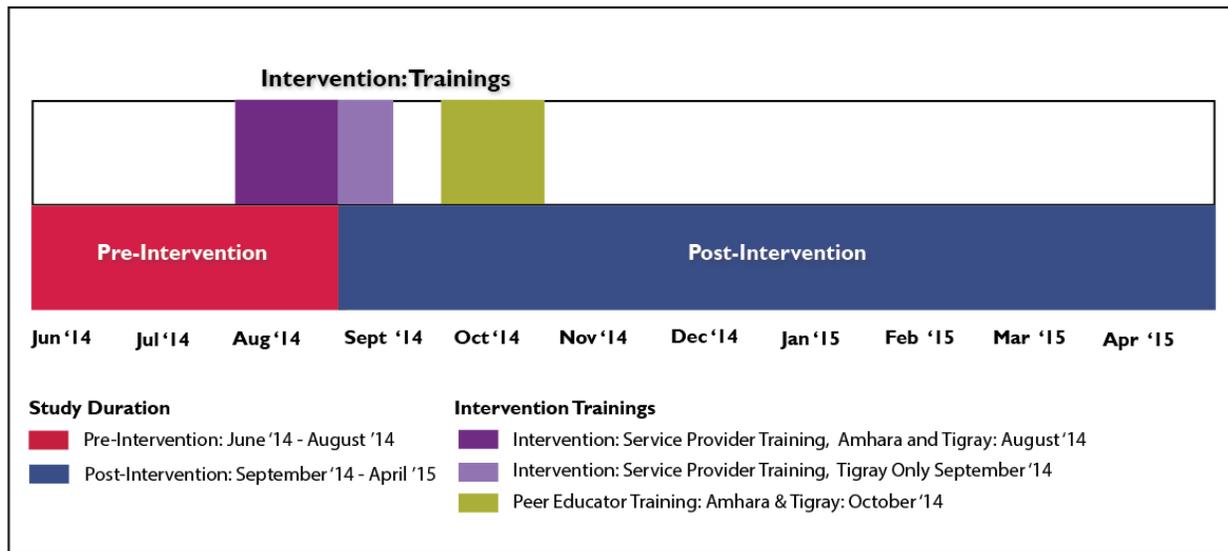
The project was designed to collect data for nine months—two months’ pre-intervention, one month during the service provider LARCs training and PE refresher training, and six months’ post-intervention. However, study implementation was altered by operational delays in project implementation. Trainings were staggered over a three-month period; the two-week service provider training was completed from August-September 2014, and the PE refresher training was conducted in October 2014. The six-month post-intervention phase was therefore extended until April 2015 to comprehensively assess the effect of the full complement of the study intervention approach. Figure 3 graphically illustrates this sequence of events in the intervention.

^l Peer Educator Monthly Register Forms: IFHP+ PE program reporting form is a performance monitoring tool submitted by each PE monthly to their respective YFS unit. The reporting form includes number of FP sessions conducted, number of male and female participants attending the FP sessions, number of IEC materials distributed, number of condoms distributed, number of males and females receiving FP counseling, number of male and female FP referrals.

^m Service Providers LARCs Competency Training Assessment Tool: The national LARCs training program routinely administers a pre- and post-assessment tool as a component of its training program. The assessment tool has three modules: Module I - RH/FP Knowledge; Module II - Family Planning Counseling; Module III - LARCs - Knowledge and Skills.

ⁿ Peer Educator Refresher Training Questionnaire: The IFHP+ PE program routinely administers a pre- and post-assessment tool as a component of its refresher training program. The assessment tool has two basic modules: Module I: RH/FP Knowledge; Module II: Family Planning Counseling; additional modules are added based on the refresher training content.

Figure 3. Study timeline illustrating pre-intervention and post-intervention phases and intervention/training phases



Intervention Approach – Trainings

Trainings to implement the intervention included: (a) training YFS providers^o on LARCs knowledge and skills to enable them to provide a full range of contraceptive methods, including LARCs, at the YFS unit; and (b) refresher training for PEs on LARCs to enable them to dispel myths and misperceptions related to LARCs during their outreach talks or one-on-one FP counseling sessions.

Clinical Training for Service Providers

The LARCs clinical training for service providers was designed as a two-week intensive classroom and practicum training; providers were certified after successfully inserting I5 implants post-training. Regional national trainers, designated by the respective RHBs, conducted the clinical training using the nationally approved curriculum. One of the training sessions entitled “Logistics and Health Management Information Systems in FP” emphasized data quality, and the importance of entering data fully and accurately in the FP registers. The study protocol recommended that two YFS-trained providers from each of the five intervention sites receive the training at an off-site location for two weeks. The implementation of the training program did not follow this study protocol recommendation, though the content, including certification and pre- and post-test assessment questionnaires were analogous for the respective training programs (see Table 1).

^o This intervention trained YFS providers who had previously received a standard five-day MOH YFS training and who were already providing YFS in existing youth corners in designated health facilities.

Table 1: LARCs clinical training program implementation features; Amhara and Tigray, August-September 2014

Implementation Features	Amhara	Tigray
Training venue	Offsite	Onsite
Training duration (weeks)	2 weeks	2 weeks
Total training duration	2 weeks (5 YFS sites)	2 weeks staggered over a 4 week period (5 YFS sites)*
Number of trainees per health facility	2 YFS providers	5 FP/RH providers, including at least one YFS certified provider
Total number of trainees	10	25
Total number of trainees LARCs certified	10	24

*Trainings in Tigray were two weeks in duration, staggered over a four-week period from late August to early September 2014.

Trainees were assessed on the skills learned during the training sessions using the national LARCs training assessment tool modified to include additional LARCs-specific questions on insertion, removal, and infection control (Module III). The assessment tool (Study Tool 3) was administered to all 35 trainees (Amhara = 10; Tigray = 25) prior to and immediately following the two-week clinical training.

The assessment tool covered three modules:

1. Module I: RH/FP Knowledge, 10 questions (5 True/False and 5 multiple choice questions)
2. Module II: Family Planning Counseling, 10 questions (5 True/False and 5 multiple choice questions)
3. Module III: LARCs (Knowledge and Skills), 30 questions (15 True/False and 15 multiple choice)

Refresher Training for Peer Educators

IFHP's YFS program routinely conducts regional quarterly meetings with YFS providers and PEs. The quarterly meetings, held in each of the regions, provided the opportunity for a LARCs one-day refresher training for PEs affiliated with the respective intervention sites. The refresher training was conducted in Amhara and Tigray in October, 2014, by IFHP+'s AYSRH Senior Advisor, who also developed the curricula and assessment questionnaires. The pre- and post-test questionnaires were modified to include LARCs-specific knowledge questions (Study Tool Four). A total of 250 PEs (Amhara 130; Tigray 120) were trained, and completed pre- and post-test questionnaires. The training assessment covered three modules:

1. Module I: RH/FP Knowledge - 6 questions (3 True/False and 3 multiple choice questions)
2. Module II: Family Planning Counseling - 6 questions (6 True/False)
3. Module III: LARCs (Knowledge) - 4 questions (3 True/False and 1 multiple choice)

Intervention Approach – Supportive Supervision

At the YFS unit monthly review meetings, the M&E officers, the YFS provider, the YFS unit head, and health facility FP service provider from the health facility's main FP unit provided supportive supervision.

Data Collection and Data Entry

Two M&E officers were recruited, one per region, and were based at the IFHP+ regional offices in the regional capital—Bahirdar/Amhara and Mekelle/Tigray, respectively. The M&E officers were trained to have a clear understanding of the study objectives, the study design, intervention approach, data-collection instruments, their data collection and supportive supervision roles, and the need for good quality data.

Family Planning Client Registers and Peer Educator Monthly Register Forms (Study Tools 1 and 2)

The M&E officers visited each of the 10 YFS sites in each region every month, reviewed the FP client registers and PE monthly register forms, and provided feedback on data quality. For the intervention sites, they provided feedback on barriers and challenges that the service providers and PEs faced during the past month. Data from the FP client registers (Study Tool 1) and PE monthly register forms (Study Tool 2) were entered in Excel spreadsheets. Pre-testing of data entry in the Excel spreadsheet for FP register and PE forms was conducted over a two-week period in May and revisions were made. Both spreadsheets were reviewed for data quality, and, where necessary, clarification was sought with the respective M&E officers and YFS providers from the intervention and comparison facilities respectively. Over the 11-month study period, the M&E officers submitted a monthly report detailing their activities, and FP register and PE register spreadsheets.

Training Assessment Tools (Study Tools 3 and 4)

The tools were administered at three points in time—pre- and post-training and six months later. The pre- and post-training assessment tools were administered by the respective clinical instructors (Study Tool 3) and the respective M&E officers (Study Tool 4). The assessment tools used six months later were administered by the respective M&E officers. The data were entered in Excel spreadsheets by the respective M&E officers.

Peer Educator Profile (Study Tool 5)

The PE profile tool was administered and entered in Excel spreadsheets by the respective M&E officers. This tool was administered at various points during the study.

Study Duration

The study duration lasted 11 months—from June 2014 to April 2015. The LARCs training for service providers was held in August 2014 and extended into the first two weeks of September 2014 in two health facilities in Tigray. The refresher training for PEs was conducted in October 2014. The study pre-intervention period is therefore considered to be June-August, 2014, and the eight-month post-intervention period is September 2014-April 2015.

Data Quality Assurance

The study team adopted several quality assurance measures to ensure that the data were of the highest quality. The M&E officers were trained on the study's objectives, the transfer of selected data from the FP and PE registers to the respective Excel spreadsheet, coding, monthly data collection and monitoring, and supervision techniques. In addition, the M&E officers were trained to provide supportive supervision to the YFS providers and the PEs on data quality issues during their monthly visits to the intervention sites. They were also trained to review the Excel spreadsheet data for completeness, internal consistency of

data, and out of range values prior to submitting to E2A. The M&E officers, during their monthly site visits, reviewed the FP and PE registers, discussed problems and challenges, and explored ways to improve quality of the FP and PE register records with the YFS providers and PEs respectively.

Data Management

FP and PE Excel spreadsheets were sent to E2A monthly for a second round of review to verify for completeness, inconsistencies, and out-of-range data. Following the training assessments conducted for service providers and PEs at each of the three points in time (pre- and post-training, and six months post-training), the data were also sent to E2A for a second round of review for second verification of the same three elements. The PE profile data were sent to E2A for review. Data entered in text format were reviewed, codes assigned, and re-coded as needed.

Data Analysis

The data were exported into SPSS version 22 for data analysis. Percentage tables that showed the distribution of FP clients by demographic characteristics and method mix were generated for all FP clients and disaggregated by intervention and comparison sites. Graphs and bar charts to explore the outcome of the project intervention service delivery model on new acceptors of LARCs and short-acting methods and referrals for FP and LARCs by PEs over the project lifetime (June 2014-April 2015) were generated as exploratory analysis.

A data analysis plan was developed to demonstrate the objectives of this study report: to demonstrate service provider knowledge and competency in FP, particularly LARC counseling and service provision; to document PE characteristics and demonstrate knowledge of and counseling on LARCs; characteristics of clients accepting services; and the overall effect of the intervention on new acceptors of FP (and LARCs, in particular). Details on the analysis procedures utilized are described below.

Training of Service Providers

To demonstrate service providers' knowledge and competency, provider scores were calculated separately on each of the three modules:

1. Module I: RH/FP Knowledge, 10 questions (5 True/False and 5 multiple choice questions)
2. Module II: Family Planning Counseling, 10 questions (5 True/False and 5 multiple choice questions)
3. Module III: LARCs (Knowledge and Skills), 30 questions (15 True/False and 15 multiple choice)

Each of these modules contained a series of questions. This information was compiled as a score and used to determine whether there was a significant mean difference in LARCs knowledge and competency before and after the provider training, as well as six months after the training. Paired t-tests were conducted to determine whether there was a statistically significant mean difference between pre- and post-training, and pre-training and six months after training.

Training of Peer Educators

To demonstrate PEs' knowledge, PEs' scores were calculated separately on each of the three modules:

1. Module I: RH/FP Knowledge - 6 questions (3 True/False and 3 multiple choice questions)

2. Module II: Family Planning Counseling - 6 questions (6 True/False)
3. Module III: LARCs (Knowledge) - 4 questions (3 True/False and 1 multiple choice)

Each of these modules contained a series of questions. This information was compiled as a score and used to determine whether there was a significant mean difference in FP knowledge before and after the training intervention, as well as six months after the training. Paired t-tests were conducted to determine whether there was a statistically significant mean difference between pre-and post-training, and pre-training and six months after training.

Characteristics of Peer Educators

Data were collected from PEs to ascertain demographic characteristics and motivations to serve as volunteers in both intervention and comparison facility catchment areas. Pearson chi square tests of significance were conducted for all PE characteristics and motivations in intervention and comparison sites.

Facility-Based Uptake of Family Planning

The first set of results presented in this report are a descriptive analysis of the sociodemographic characteristics of women, as well as contraceptive uptake and source of referral in both intervention and comparison samples at baseline (pre-intervention) and endline (post-intervention). Key demographic variables included in this analysis are: age, marital status, parity, and region where the YFS unit was located. Statistical associations were tested using Pearson chi-square and t-tests in making these comparisons. Statistical differences over time within intervention and comparison sites are presented separately for four different groups of clients: all clients, new acceptors of any method of FP, new acceptors of a LARC, and new acceptors of short-acting methods.

Two databases were used in analyzing uptake of FP at facility level. Each record in the “client” database is an individual client, which includes facility variables where the client received services, client characteristic variables, and visit outcome variables for each record. A second “facility-month” database was constructed to perform an ordinary least squares regression and a differences-in-differences (DiD) analysis, with facility-month as the record. These data were used to analyze the trends over time in mean number of clients per facility per month as a measure of client volume in each facility pre- and post- intervention. Only data from the three pre-intervention months (June-August 2014) and last three post-intervention months (February-April 2015) of the entire eight-month post-intervention period are included in the DiD analysis. Therefore, 120 records representing the 20 facilities and their totals for each of the included six months (June 2014, July 2014, August 2014, February 2015, March 2015, and April 2015) of all new acceptors of FP and new acceptors of LARCs comprise this “facility-month” database.

For purposes of the analysis, a variable called “time” was created to reflect the two time-periods for comparison of data over time for both datasets (“client” and “facility-month” datasets). The baseline, or “pre-intervention phase,” was the three-month period before or during the training period, June-August 2014, and coded as “0” in the dataset. The endline, or “post-intervention phase,” was captured as the last three-month period of the study, February-April 2015, and coded as a “1.” This three-month post-intervention phase was selected as it was the same number of months as the baseline (three) and was at the end of the intervention, thus representing a more realistic “snapshot” of the intervention, after any



post-training effect had theoretically subsided (services typically increase immediately after a training and then taper off).

Likewise, a client record was coded “1” if the record came from a facility which was designated an intervention facility (where service providers received the YFS training and supportive supervision to offer LARCs counseling and methods, in addition to the standard package of services) and as a “0” if the record was from a non-equivalent comparison facility where the standard package of YFS was offered. This variable is included in both datasets. Data were also collected on client’s age, marital status, and parity, as these variables are consistently significantly related to contraceptive use in studies conducted in nearly every country context. Geographic data on the facility, region, zone, and *woreda* (district) were also included. Data on client characteristics are only included in the client dataset.

The DiD analysis was a set of two multiple regression analyses to determine whether the training and supportive supervision intervention had an effect on number of new acceptors of any method and new acceptors of LARCs at facility level. At facility level, the primary outcomes of interest were: (1) mean monthly uptake at facility level of any method of FP among new acceptors of FP aged 10-24 years; and (2) mean monthly uptake at facility level of LARCs among new acceptors of FP aged 10-24 years. These two analyses were measured using the facility-month dataset, described above, in two separate regression analyses including:

- Group (treatment-1 vs. comparison-0)
- Time (three-month pre-intervention phase-0 vs. last three-month post-intervention phase-1); and
- Interaction effect of group by time, to understand the pattern of uptake (created by multiplying time by group).

The models for these analyses are shown in Appendix C.

Method Switchers and Contraceptive Removals

The results section of this report also includes an exploratory, descriptive analysis of both clients who were switchers or had contraceptives removed (IUDs and implants) to learn more about their characteristics and reasons for switching or removing. Pearson chi-square statistical comparisons with significance tests between intervention and comparison groups are presented on the variables of interest.

Ethical Considerations and Confidentiality

The study did not include data collection directly from FP clients or individuals counseled through questionnaire administration; all relevant FP client study data were extracted directly from the national Health Management Information System (HMIS) FP register maintained at the YFS facility. The PE register included summary forms of the numbers of individuals that participated and received counseling during the past month, as routinely collected by IFHP+ for its youth monitoring program. The assessment questionnaires for the service providers and PEs were directly related to the trainings received. Finally, the PE profile elicited general information routinely collected during recruitment. The study did not include invasive or medical procedures of any kind. Consequently, inclusion in the study posed no risk as the data extracted were from routine records. However, the M&E officers were trained to protect the privacy of FP clients’ records and the need to keep data confidential.

To protect the confidentiality of records during data transfer and storage, names were not recorded. All study team members with access to the data sets were trained on the importance of maintaining confidentiality and the implications of violating confidentiality. The electronic data sets were stored on a password-secured hard drive of the M&E officers' laptop computers. It is planned that after five years of secure storage, all data will be destroyed: paper records will be shredded, and electronic records will be destroyed by shredding, crushing, or incineration. FP clients' records confidentiality will be protected throughout the destruction processes.

Study Limitations

The study design was a quasi-experimental study, and therefore, intervention and comparison sites may not be comparable at baseline, which may lead to potential problems with internal validity. For example, if clients at intervention sites are more likely to be educated or exposed to compelling demand generation activities as opposed to comparison sites, then this will affect internal validity, which will bias the outcome in favor of the intervention. In a randomized control trial, clients are randomly assigned to intervention and comparison services, and therefore have the same chance of being assigned to the intervention group or the comparison group. This was not feasible or possible in the context of community- and facility-based FP service delivery; clients cannot be randomly assigned to seek services at one facility or another. To compensate for this, the bivariate and multivariate statistical techniques used in this report may correct for some of these differences at baseline in demonstrating whether the intervention had a significant and positive effect on uptake of LARCs.

A second limitation is that first-round selection of facilities was purposive due to logistical and budgetary constraints. This means that the research and implementation teams used certain objective criteria and their best judgement to choose facilities. However, this may have led to unintentional errors in selecting the most representative facilities. It may have introduced a low level of reliability and high level of bias if the facilities have some unique characteristics which are not representative of other similar facilities in the region and in the country, leading to an inability to generalize the findings. In addition, the total sample size of facilities included in the study is relatively small: 10 intervention and 10 comparison sites; this also increases the chance that the sites chosen and clients served are not representative of the catchment population. This sampling approach and small number of facilities selected also increases the design effect and error terms measured at client level, and requires more robust interpretation of statistical significance to make conclusions about the effect of the intervention on the outcomes of the study. Random allocation to intervention vs. comparison sites at the final stage of selection was performed in order to minimize any potential selection bias as mentioned above.

The implementation of the intervention varied by region, and in some cases, facility. The study was designed to align with the routine health facility and YFS program activities and decisions were made by IFHP+ regional offices and its affiliated RHBs that met their needs—an implementation science approach corresponding to field needs. There were region-specific modifications to the intervention approaches; for example, the Tigray IFHP+ regional office and the RHB made the decision to conduct on-site training with five service providers per facility. This might have led to a service provider trained in the clinical provision of LARCs always available at the YFS unit, although the service provider might not have been

trained to provide YFS, resulting in differences in method uptake between the two regional intervention sites post-intervention. By contrast, the Amhara regional office trained only two YFS-certified providers per intervention site; this may have resulted in a YFS-certified LARCs-trained provider not always available at each of the five intervention sites. Region of implementation is therefore a critical control variable to be included in LARCs uptake in this research study.

No additional information was gathered on the supply context of the facilities included in the study, which may have impacted uptake and study outcomes. For example, regular availability of a YFS-trained provider at the facility or availability of commodities, equipment, or consumables were not collected or analyzed. Similarly, no measures of quality or client-provider interactions were captured (and therefore not analyzed), which may affect uptake differently at the various sites. Clients were not interviewed after obtaining services to know their experience in receiving services. In addition, clients who chose not to use services were not interviewed as part of this study, so uptake measured at facility level presents only one side of the “picture” of increasing access to LARCs for adolescents and youth. These and other missing variables may have affected client uptake of FP, may explain differences in uptake between intervention and comparison sites over time, and may unintentionally bias the outcome. Not including service delivery capacity variables (equipment, commodities, consumables, availability of at least one provider on duty each day, etc.) might result in a multivariable regression model that is prone to missing variable bias, and may lead to an over-estimation of the effect of the training and supportive supervision on LARCs uptake among youth. However, the study research team sought to minimize the effect of unobserved variables through random allocation of the final 10 sites in each region to intervention and comparison groups.

Demand for and initiation of FP services can vary drastically from month to month, in part due to agricultural seasons (especially in Ethiopia where women are principally involved in agricultural work); precipitation/rain seasons; or extended holidays and festivals. Supply-side factors can also contribute to large monthly variations in FP service provision, such as commodity or consumable stock-outs or off-site training events for YFS providers, among others. In performing analysis comparing trends over time in uptake of LARCs in intervention and comparison facilities, the statistical methods used in this study required selection and comparison of two time periods, pre-intervention and post-intervention. The three months of facility data recorded before the training intervention were selected to overcome the variability associated with using only one month of data to establish a baseline; selecting a three-month baseline, in turn, required a selection of a comparable three-month end line at some point after the intervention took place in order to perform a comparative analysis of trends in uptake of LARCs. Thus, it is possible that depending on existing seasonal factors, the three-month period selected at the end of the study (February-April 2015) was not “representative” of actual uptake of FP over time in the 10 intervention facilities. As explained in a previous section, the three-month post-intervention phase of February-April 2015 was selected as it was the same number of months as the baseline (three) and was at the very end of the intervention, thus representing a more realistic “snapshot” of the intervention, after any post-training effect had theoretically subsided (services typically increase immediately after a training and then taper off).

Finally, the study team collected limited information on the clients themselves due to the study instruments used (FP registers). For example, no information on a client’s education status, household wealth, or other

important predictors of FP were recorded. Further, the information gathered may have been sensitive to collect (especially for young clients) and subject to reporting bias. Inclusion of marital status as a study indicator in the FP client register might have impacted the marital status results (i.e., the potential stigma associated with being unmarried or not in union and seeking FP services). However, as the service providers in these YFS units were trained to be youth friendly and provide FP services in a 'safe environment,' it is presumed that the marital status reporting might not be biased as anticipated in other service delivery settings where the providers are not trained to provide YFS.

Results

In this section of the report, results are described according to the five research objectives detailed at the beginning of this report. The first objective was: to measure providers' average knowledge and competency scores before, immediately after, and six months post-training to assess providers' acquisition and retention of knowledge of FP and LARCs counseling as well as service provision to ensure that the training was implemented effectively. This first section presents results on the training assessment conducted with trained service providers.

Service Providers Training Assessment

A total of 35 service providers (Amhara = 10; Tigray = 25) received LARCs clinical training. An assessment questionnaire was administered before the training (pre) and immediately after the training (post), as well as six months post-training to the following numbers of service providers:

- **Pre-Training:** Amhara: 10; Tigray: 25
- **Post-Training:** Amhara: 10; Tigray: 24^p
- **Six Months Post-Training:** Amhara: 10; Tigray: 14^q

The training assessment results were analyzed for the 24 service providers (Amhara=10; Tigray=14) who had completed all three assessments. As shown in Table 2, average scores significantly improved comparing pre- to post-training with moderate retention six months later for all three modules. Across the three modules, the largest improvement and its retention six months later was observed for Module III (LARCs Knowledge and Skills). This perhaps reflects the emphasis on LARCs in the training curricula, practice, and supportive supervision by the M&E officers in the ensuing months. This finding is also supported by the increase in new LARCs acceptors at the intervention sites.

The following is a summary of Table 2:

Module I^r (RH/FP Knowledge): Average scores significantly improved comparing pre- (5.7) to post-training (7.5) with moderate retention six months later (6.5).

Module II^s (FP Counseling): Average scores significantly improved comparing pre- (4.8) to post-training (6.3) with marginal retention six months later (5.8).

^p Tigray: one service provider was not certified; post training questionnaire not administered

^q Tigray: Four service providers transferred; four service providers on annual leave and two service providers refused

^r Module I (RH/FP Knowledge): maximum average score = 10

^s Module II (FP Counseling): maximum average score = 10

Module III: (LARCs Knowledge & Skills): Average scores significantly improved comparing pre- (16.0) to post-training (20.0) with moderate retention six months later (18.3).

Table 2: Service Providers Training Assessment (n=24): average scores for Modules I, II, and III by assessment period (pre-, post-, and six months post-training)

Modules	Immediate Assessment			Six Months Post-Training Assessment		
	Pre-Training	Post-Training	Signif	Pre-Training	Six Months	Signif
Module I: RH/FP Knowledge ^u	5.7	7.5	***	5.7	6.5	*
Module II: FP Counseling ^v	4.8	6.3	*	4.8	5.8	*
Module III: LARCs ^w Knowledge and Skills	16.0	20.0	***	16.0	18.3	*

***p<.000; **p<0.01; *p<0.05

Demand Generation

A second objective of this study was to gather program information about PE characteristics, motivations, and outreach activities to ensure that demand-generation activities were implemented effectively. As described previously, IFHP+ spearheaded the PE demand-generation activity as a component of its AYSRH program. The program was designed to support The study used multi-stage convenience purposive sampling per YFS unit. This volunteer cadre of PEs' primary role was demand generation, typically through one-on-one and group informational sessions (mainly at coffee ceremonies), and appropriate referrals of adolescents and youth to the nearest YFS unit. As described previously, each month the PEs met at their respective YFS facility to submit and receive feedback on their monthly activity report by the YFS-trained provider and plan activities for the coming month. During the 11-month study period, the number of PEs reporting per month varied depending mainly on their involvement in other activities, such as income-generation schemes, examinations, and school vacations. Irrespective of intervention or comparison sites, the numbers of PEs reporting to their respective YFS unit varied widely. In some cases, none of the PEs reported to their respective facility in a given month, whereas in other cases, there were small numbers reporting. In still other instances, PEs did not file a report for a month or more and then subsequently filed consistent monthly reports; turnover was moderate.

Peer Educators Profile

Volunteer PEs create an enabling environment for adolescents and youth through peer-to-peer SRH counseling and life skills. Thus, they are selected based on their ability to engage with the program target group and their motivations to serve. Data from 462 PEs (intervention=240; comparison=222) were collected to ascertain their demographic characteristics and learn about their motivations to serve as volunteers, as shown in Table 3. The majority of the 462 PEs interviewed were female (57%), young (55% aged 15-19 years), single (92%), and educated (primary=15%; secondary=49%), with marginal or no differences in these characteristics between the intervention and comparison groups. These data show

[†] Module III (LARCs Knowledge & Skills): maximum average score = 30

^u Module I (RH/FP Knowledge): maximum average score = 10

^v Module II (FP Counseling): maximum average score = 10

^w Module III (LARCs Knowledge & Skills): maximum average score = 30

that they were mainly young, educated and single women, appropriate given that the primary program target was a young female. However, among the 462 PEs, there were also men and older married volunteers.

The main reason to enlist as a PE was '*prior experience*':^x significantly more PEs reported '*prior experience*' in the intervention (50%) as compared to the comparison (39%) sites ($p < 0.01$). '*Creating reproductive health (RH) awareness*' (18%) and '*knowing about RH*' (17%) were other main reasons reported by the PEs. The main motivating factor to continue as a volunteer was '*raising RH awareness*' (58%) and '*observing declining risky RH behavior*' (18%). These statistical differences in reasons to enlist and reasons to continue volunteering with the program are interesting, but highly subjective, and therefore, open to interpretation.

^x Prior Experience included: anti-AIDs club, project, girls club, school, *kebele*, or volunteer

Table 3: Percentage distribution of peer educator profile characteristics

Characteristics	TOTAL %	Intervention %	Comparison %	Signif
Age	n = 462	n = 240	n = 222	
< 15 years	8.2	7.1	9.5	NS
15-19	55.4	51.7	59.5	
20-24	32.5	36.3	28.4	
25+	3.9	5.0	2.7	
Sex	n = 462	n = 240	n = 222	
Male	42.6	41.7	43.7	NS
Female	57.4	58.3	56.3	
Marital status	n = 462	n = 240	n = 222	
Married	5.6	4.2	7.2	*
Living together	0.9	0.0	1.8	
Single ¹	92.2	93.8	90.5	
Divorced/separated/widowed	1.3	2.1	0.5	
Number of living children	n = 462	n = 240	n = 222	
None	93.5	92.1	95.0	NS
1-2	6.0	7.9	4.1	
3+	0.5	0.0	0.9	
Education	n = 451	n = 229	n = 222	
Primary	14.6	13.5	15.8	NS
Secondary	49.0	50.7	47.3	
Technical/Vocational training	11.8	13.1	10.4	
University	2.0	3.1	0.9	
Not attending school	21.7	19.7	23.9	
Others	0.9	0.0	1.8	
Main reason: to enlist	n = 461	n = 239	n = 222	
Prior experience ²	44.9	50.2	39.2	**
To create RH awareness	17.6	19.7	15.3	
To know about RH	16.7	12.6	21.2	
Role model ³	13.4	13.8	13.1	
Others ⁴	7.4	4.7	11.3	
Main reason: to continue	n = 416	n = 211	n = 205	
Continue raising RH awareness	57.5	46.9	68.3	***
Observe declined risky RH behavior	17.5	17.1	18.0	
Observe improved RH knowledge	7.2	13.3	1.0	
Others ⁵	17.8	22.7	12.7	

***p<.000; **p<0.01; *p<0.05; NS=Not significant

Peer Educators Refresher Training Assessment

A third objective of this study was to measure PEs' average knowledge and competency scores before, immediately after, and six months post-training. This measure intended to assess PEs' acquisition and retention of knowledge of FP and LARCs counseling, and ensure that the training was implemented effectively and knowledge was retained. A total of 250 PEs (Amhara=130; Tigray=120) received LARC refresher training. An assessment questionnaire was administered pre- and post-training and six months post-training to the following numbers of PEs by region:

- Pre-Training: Amhara:130; Tigray:120
- Post-Training: Amhara:130; Tigray:120
- Six Months Post Training: Amhara:102; Tigray:66^γ

The training assessment results were analyzed for 168 PEs (Amhara=102; Tigray=66) who completed all three assessments. As shown in Table 4, average scores significantly improved comparing pre- to post-training with excellent retention six months later for the first and third modules. Across the three modules, the largest improvement and its retention six months later was observed for Module III (LARCs Knowledge). This is reflected by the emphasis on LARCs in the training curricula, its practice, supportive supervision by the M&E officers in the ensuing months, and the increased number of new acceptors of LARCs at the intervention sites.

The following is a detailed summary of Table 4:

- Module I^z (RH/FP Knowledge): Average scores improved comparing pre- (5.1) to post-training (5.4) with excellent retention six months later (5.3).
- Module II^{aa} (FP Counseling): Average scores improved comparing pre- (4.0) to post-training (4.7) with significantly declining retention six months later (4.3), indicating a need to retrain volunteers in this area.
- Module III^{bb} (LARCs Knowledge): Average scores improved comparing pre- (2.7) to post-training (3.1) with excellent retention six months later (3.1).

It should be noted that out of the 250 PEs who received refresher training in LARCs, 50 voluntarily stopped serving as PEs. This represents a relatively high, though not unexpected, attrition rate of about 20%. An additional 18 PEs were involuntarily dismissed as not meeting program standards.

^γ Amhara: Resigned = 28; Tigray: Resigned = 22; Dismissed as did not meet standards = 18; Vacation = 14

^z Module I (RH/FP Knowledge): maximum average score = 6

^{aa} Module II (FP Counseling): maximum average score = 6

^{bb} Module III (LARCs Knowledge): maximum average score = 4



Table 4: Peer Educators Refresher Training Assessment: average scores for Modules I, II, and III ((pre-, post-, and six months post-training)

Modules	Immediate Assessment			Six Months Post-Training Assessment		
	Pre-Training	Post-Training	p-value	Pre-Training	Six Months	p-value
Module I: RH/FP Knowledge	5.1	5.4	<.01	5.1	5.3	<.01
Module II: FP Counseling	4.0	4.7	<.000	4.0	4.3	<.01
Module III: LARCs Knowledge	2.7	3.1	<.000	2.7	3.1	<.000

Peer Educators=168 (Amhara=102; Tigray=66)

Family Planning Outreach Activities

FP outreach activities, reported monthly, were:

1. Group SRH and FP education sessions (FP group talks conducted by PEs in the YFS unit waiting areas and in other venues): number of sessions and participants attending (male and female)
2. Individual counseling: male and female
3. Referrals: male and female; including LARCs referrals

Group FP Education Sessions: Table 5 shows that the total number of sessions conducted during the 11-month study period was 4,148 (intervention=2,609; comparison=1,539). In addition, a total of 50,083 male (intervention=34,565; comparison=15,518) and 56,329 female (intervention=39,150; comparison=17,179) participants attended the 4,148 FP sessions during the 11-month study period. Although no statistical analysis was performed on this summative outreach data (total summed numbers only are presented), it appeared that there were more FP sessions reported by PEs at the intervention sites as compared to the comparison sites in each of the time periods. The percentage of the FP counseling sessions held in the intervention sites seemed to decline when comparing the June-August 2014 pre-intervention period (1,153 sessions) to the February-April 2015 post-intervention period (739 sessions; see Table 5). Although total participation (for both males and females) seemed to increase at intervention sites, indicating that later sessions may have included a larger number of participants.

Individual Counseling: The PEs, as part of their demand-creation tasks, conducted and reported individual counseling sessions with young men and women. During the 11-month period, there were 34,866 such contacts reported: 15,782 men (intervention=11,821; comparison=3,961) and 19,084 women (intervention=13,893; comparison=5,191). In comparing intervention groups and time periods, the number of individual men and women counseled in FP was higher in intervention areas than in comparison areas for both periods, but declined over time in the intervention sites and increased slightly in the comparison sites. During the pre-intervention period, PEs attached to intervention sites counseled 4,487 males and 5,050 females, whereas PEs attached to comparison sites counseled 1,371 males and 1,858 females. During the last three months of the intervention, PEs in intervention sites counseled 3,733 males and 4,423 females; during the same period, PEs in comparison sites counseled 1,555 males and 2,037 females (see Table 5).

FP Referrals: Despite the large number of individuals counseled during the 11-month study period, the percentage of referrals for FP services was relatively low (around 1-2% for both men and women overall, see Table 5). The PEs, during the FP individual counseling sessions, referred young men and women to the nearest YFS unit to address their RH/FP needs not met by the PEs. During the 11-month period, there were 3,215 referrals reported: 1,125 male (intervention=866; comparison=259) and 2,090 female (intervention=1,419; comparison=671).

Male FP Referrals among Men Counseled: Table 5 shows that despite the large number of men reported to have received individual counseling in intervention sites at baseline (4,487), relatively few (320, or less than 1%) were referred for FP services; there was a minimal decline in male FP referrals during the post-intervention period (249 male referrals in intervention sites). In comparison sites, male FP referrals were nearly the same: 125 males were referred for FP during the pre-intervention period, and 120 males were referred during the post-intervention period.

Female FP Referrals among Women Counseled: Nearly 11% of women (Table 5) who were reported to have received individual counseling were referred for FP services, with some differences observed in comparing intervention groups and time periods. A minimal decline in female FP referrals in intervention sites was observed from the pre-intervention period (610 referrals) to the post-intervention period (376 referrals). In comparison sites, female FP referrals actually increased slightly: 267 females were referred for FP during the pre-intervention period, and 304 females were referred during the post-intervention period.

LARCs Referrals among Female FP Referrals: A little over 10% of female FP referrals was specifically for LARCs; of the 2,090 female referrals, 219 were LARC referrals (intervention=139; comparison=80). While the total number of LARCs referrals was higher in intervention sites than in comparison sites at both time periods (26 LARC referrals vs. 12 LARC referrals at baseline; 67 LARC referrals vs. 42 LARC referrals at endline in intervention vs. comparison sites, respectively), the total number of LARC referrals increased over the study period in both groups of sites (see Table 5).

Table 5: Total number of family planning outreach activities reported by type of site (intervention and comparison) and phase; June 2014-April 2015

Outreach Activities	TOTAL n	Intervention n %	Comparison n %		
Outreach Activities – Total Project Period (June 2014-April 2015)					
FP group talks	4,148	2,609	62.9	1,539	37.1
Male participants	50,083	34,557	69.0	15,526	31.0
Female participants	56,329	39,149	69.5	17,180	30.5
Individual men counseled	15,782	11,821	74.9	3,961	25.1
Individual women counseled	19,084	13,893	72.8	5,191	27.2
FP referrals - male	1,125	866	77.0	259	23.0
FP referrals - female	2,090	1,419	67.8	671	32.1
LARCs referrals	219	139	63.5	80	36.5
Outreach Activities – Pre-Intervention Phase (June-August 2014)					
FP group talks	1,742	1,153	66.2	589	33.8
Male participants	19,724	11,913	60.9	7,811	39.6
Female participants	22,647	14,313	63.2	8,334	36.8
Individual men counseled	5,858	4,487	76.6	1,371	23.4
Individual women counseled	6,908	5,050	73.1	1,858	26.9
FP referrals - male	445	320	71.9	125	28.1
FP referrals - female	877	610	69.6	267	30.4
LARCs referrals	38	26	68.4	12	31.6
Outreach Activities – Post-Intervention Phase (February-April 2015)					
FP group talks	1,299	739	56.9%	560	43.1%
Male participants	18,720	14,174	75.7	4,546	24.3
Female participants	21,249	15,652	73.7	5,597	26.3
Individual men counseled	5,288	3,733	70.6	1,555	29.4
Individual women counseled	6,460	4,423	68.5	2,037	31.5
FP referrals - male	369	249	67.5	120	32.5
FP referrals – female	680	376	55.3	304	44.7
LARCs referrals	109	67	61.5	42	38.5

Whereas the percentage of the general FP sessions conducted declined at the intervention sites as compared to the comparison sites during the post-intervention phase, male or female participation in these sessions increased. This implies that perhaps that the ‘refresher-trained’ PEs encouraged attendance rather than hosted more FP sessions over time. Although more participants were reached through group sessions in intervention sites over the study period, no corresponding increase in individual counseling sessions or FP referrals (irrespective of gender), was observed. While the total number of LARC referrals increased from baseline to endline in both groups of sites, there was not an appreciable difference in the number of female FP referrals, including LARC referrals between intervention and comparison sites at endline. Immediate demand generation through PEs in terms of LARCs and FP referrals was similar in the two groups during the post-intervention phase. This lack of increase in performance in both sites over time implies that perhaps the refresher training content and/or supportive supervision may have been inadequate, or alternatively, it might simply reflect a relatively high rate of turnover among the volunteer cadre of PEs in all sites during the 11-month study period.

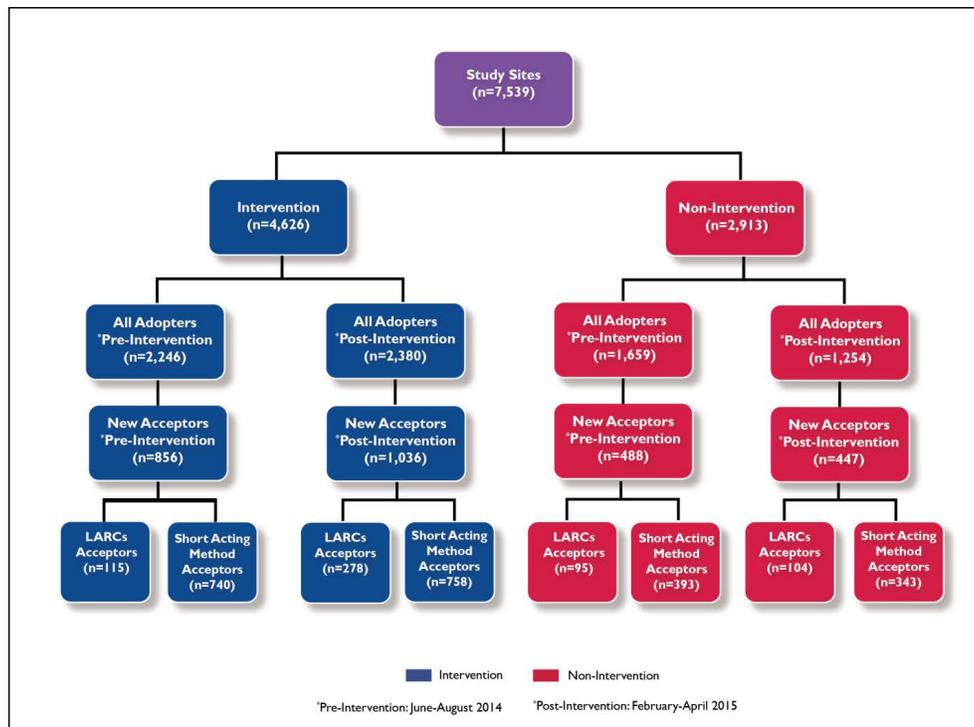
Distribution of Family Planning Clients

A fourth and very critical objective of this study was to examine how the training and subsequent provision of implants by providers affected FP and LARCs uptake among new acceptors. Data were collected on the monthly uptake of condoms, pills, injections, implants, and IUDs for 11 months, from June 2014-April 2015, for the 10 intervention and 10 comparison facilities. As explained previously, the implant-related training intervention was conducted in August 2014. Hence, June, July and August of 2014 are treated as pre-intervention period in the study. The post-training supervision and other elements of intervention continued until the end of April 2015. Hence, February, March and April 2015 are treated as the post-intervention period.

The total database over the entire 11-month study period in the 20 Amhara and Tigray YFS sites includes 14,650 female clients who accepted a method, 78 male clients who accepted condoms, and 191 female clients who had LARCs removed and did not accept another method, for a total of 14,919 valid cases (data not shown).

Figure 4 is a flow chart illustrating the total number of female FP acceptors (7,539) in the 20 Amhara and Tigray YFS sites during the three-month pre-intervention (June-August 2014) and post-intervention (February-April 2015) periods. It also shows the number of various subgroupings of clients, including new FP acceptors, disaggregated by method accepted (LARCs and short-acting methods) during both three-month pre-intervention and post-intervention phases, by intervention and comparison YFS study sites. Overall, there were more clients attending the intervention facilities (n=4,626, 61.4%) than those attending the comparison facilities (n=2,913, 38.6%) during these two phases.

Figure 4. Distribution of female family planning clients (all adopters and new acceptors) at intervention and comparison sites, by time (pre-intervention: June-August 2014 and post-intervention: February-April 2015) and type of method accepted (LARC vs. short-acting method)



All Family Planning Acceptors

Table 6 illustrates the demographic characteristics, method uptake, and acceptor status for the 7,539 female FP clients during the three-month pre-intervention phase as compared to the last three months of the intervention (post-intervention) phase. A majority of the clients (59.9%) were between 20-24 years, while 39.9% were younger (15-19 years). While the vast majority of clients were married (77.6%), some were either living together (8.3%) or single (13.5%).

There were statistically significant differences ($p < .01$) in age, marital status, and region within the intervention and comparison sites by pre- and post-intervention periods. For example, the proportion of FP clients aged 15-19 years receiving services increased significantly over time at both intervention and comparison sites (36.8% to 42.1% at intervention and 37.5% to 44.3% at comparison sites). At intervention sites, the proportion of single clients seeking FP services decreased slightly over time (16.1% to 15.5%). At comparison sites, the proportion of single FP clients increased slightly (9.0% to 11.4%); however, these changes are too small to be programmatically relevant. Likewise, the proportion of clients from Tigray at both intervention and comparison sites significantly increased over time, from 37.9% to 42.8% in intervention sites, and from 18.7% to 26.0% in comparison sites.

An interesting finding is the large proportion of nulliparous (those without children born alive) women (60.6%) adopting a method among all FP clients, suggesting that young Ethiopian women are opting to delay their first pregnancy. An increase in this pattern is evident during the pre-intervention and post-intervention phases for both intervention and comparison sites, though the increase is only statistically significant at comparison sites over time (53.3% at baseline to 59.8% at end line) as shown in Table 6.

The 7,539 FP clients preferred short-acting methods (82.7%). The three most preferred methods were injectables (69.7%), implants (15.9%), and pills (12.4%). Uptake of IUDs at all sites during both time periods remained very low (2.2% and 1.3%). On the contrary, uptake of implants over time more than doubled at both intervention and comparison sites, from around 10% to 21%.

A client visit was categorized as a new acceptor (accepting a method for the first time); a repeat acceptor (second or subsequent visit to the same facility for the same method); a switcher (second or subsequent visit and switched methods); and a removal (client visit to remove either IUD or implant). These categories are presented in Table 6 as mutually exclusive. However, for a few clients, it was possible to be, for example, both a removal client and a repeat acceptor. Among the 7,539 clients with a recorded reason for a visit, most client visits were documented as repeat acceptors (59.0%), although a considerable proportion (38.0%) were new acceptors. The proportion of new acceptors increased over time, from 38.4% to 44.9% at intervention sites, and from 29.6% to 35.8% at comparison sites ($p < .000$ for both comparisons).

Table 6: Percentage distribution demographic characteristics, method uptake, and referral source among all clients, by type of site and time (pre-intervention: June-August 2014 and post-intervention: February-April 2015)

Characteristics	TOTAL (n=7,539)	Intervention (n=4,626)			Comparison (n=2,913)		
		Pre- Interv (n=2,246)	Post- Interv (n=2,380)	Signif	Pre- Interv (n=1,659)	Post- Interv (n=1,254)	Signif
Age	n=7,507	n=2,230	n=2,378		n=1,647	n=1,252	
< 15 years	0.2%	0.3%	0.0%	***	0.5%	0.2%	***
15-19 years	39.9	36.8	42.1		37.5	44.3	
20-24 years	59.9	63.0	57.9		62.1	55.5	
Marital status	n=7,088	n=2,182	n=2,128		n=1,586	n=1,187	
Married	77.6	72.9	78.9	***	82.3	77.4	**
Living together	8.3	10.3	5.5		7.8	10.7	
Divorced/separate d/ widowed	0.5	0.7	0.1		0.9	0.5	
Single	13.5	16.1	15.5		9.0	11.4	
Parity	n=7,088	n=2,184	n=2,128		n=1,588	n=1,188	
Zero	60.6	62.3	64.7	NS	53.3	59.8	**
One	31.0	29.6	28.0		37.3	30.4	
Two or more	8.5	8.1	7.4		9.4	9.8	
Region	n=7,689	n=2,246	n=2,280		n=1,659	n=1,254	
Tigray	33.3	37.9	42.8	**	18.7	26.0	***
Amhara	66.7	62.1	57.2		81.3	74.0	
Method uptake	n=7,539	n=2,246	n=2,380		n=1,659	n=1,254	
Condoms	0.1	0.2	0.0	***	0.0	0.0	***
Oral Pills	12.4	13.8	13.3		10.2	11.0	
Injectables	69.7	73.0	62.8		77.6	66.3	
Emergency Contraceptives	0.6	0.7	0.9		0.3	0.2	
Diaphragm	0.0	0.0	0.0		0.1	0.0	
IUD	1.4	2.2	1.3		1.0	0.5	
Implants	15.9	10.2	21.6		10.8	21.9	
Method uptake (Short-acting vs. LARCs)	n=7,539	n=2,246	n=2,380		n=1,659	n=1,254	
Short-acting methods	82.7	87.7	77.0	***	88.2	77.6	***
IUDs or implants	17.3	12.3	23.0		11.8	22.4	
Reason for client visit	n=7,431	n=2,225	n=2,306		n=1,651	n=1,249	
New acceptor (yes)	38.0	38.4	44.9	***	29.6	35.8	**
Repeat acceptor (yes)	59.0	60.0	50.1	***	69.2	60.5	***
Switcher (yes)	3.0	1.6	5.0	***	1.3	3.7	***

***p<.000; **p<0.01; *p<0.05; **Reason for Client Visit:** *New Acceptor:* all new acceptor clients irrespective of method type; *Repeat Acceptor:* all repeat acceptor clients irrespective of method type; includes clients who came for removal and accepted the same method; *Switcher:* all switchers irrespective of method type; includes clients who came for removal and switched to another method; *Removal:* all clients who came for method removal

New Acceptors

There were 2,827 new female FP acceptors during the three-month pre-intervention phase and the three-month post-intervention phase. Overall, there were more female new acceptor clients recorded at the intervention sites (n=1,892; 66.9%, data not shown) as compared to the comparison sites (n=935; 33.1%). This general pattern persisted throughout the 11-month study period (data not shown).

The demographic characteristics (age, marital status, and parity) for the 2,827 new acceptors are shown in Table 7. While the majority of the new acceptors were married (67.4%), a considerable proportion was single (22.1%). Nearly half of all new acceptors are younger than 20 (50.5%). Slightly over three-quarters of all new acceptors had no live births (73.7%).

As with all female FP acceptors (shown previously in Table 6), the preferred method of choice for new female FP clients during the study period were short-acting methods (79.1%). New acceptors most often preferred injectables (62.1%) and implants (19.6%). Uptake of IUDs at all sites during both time periods remained very low (1.4%). On the contrary, uptake of implants over time rose significantly at intervention sites, from around 13.5% to 26.8% ($p<.000$), although this was not the case at comparison sites, where LARCs uptake did not increase significantly (see Table 7).

To corroborate FP referrals reported by the PEs, referral sources were recorded in the FP registers for all FP clients at the intervention and comparison sites, also shown in Table 7. Most (79.4%) clients stated that they were self-referred, with these proportions actually *increasing* over time at both intervention and comparison groups. Other referrals sources, such as PEs, husbands, and parents, were negligible (under 5%) for both groups (intervention and comparison) and time periods (June-August 2014 and February-April 2015). It should be noted that this variable contains a large number of missing values (from 8.7% missing at comparison sites during the post-intervention period to 25.2% missing in intervention sites during the pre-intervention period), and should be interpreted cautiously.

These clinic records show upward trends in new acceptors of FP despite the low numbers and rates of female FP referrals (specifically LARCs referrals) made by PEs. This indicates that PE activities did not directly influence contraceptive decision-making among new users. Additional research with clients regarding their decision-making to seek FP services is needed to draw further conclusions.

Table 7: Percentage distribution demographic characteristics, method uptake, and referral source among female new acceptors, by type of site and time (pre-intervention: June-August 2014 and post-intervention: February-April 2015)

Characteristics	TOTAL (n=2,827) %	Intervention (n=1,892) %			Comparison (n=935) %		
		Pre-Interv (n=856)	Post-Interv (n=1,036)	Signif	Pre-Interv (n=488)	Post-Interv (n=447)	Signif
Age	n=2,815	n=853	n=1,035		n=481	n=446	
10-19 years	50.5	46.9	51.8	*	45.5	59.6	***
20-24 years	49.5	53.1	48.2		54.5	40.4	
Marital status	n=2,599	n=826	n=924		n=441	n=408	
Married	67.4	62.3	70.5	***	71.0	66.7	NS
Living together	9.7	12.1	6.0		9.1	14.0	
Divorced/separate d/widowed	0.8	1.1	0.1		1.6	1.0	
Single	22.1	24.5	23.5		18.3	18.4	
Parity	n=2,600	n=826	n=924		n=441	n=409	
Zero	73.7	74.0	80.8	**	62.1	69.2	NS
One	21.0	20.5	16.0		30.2	23.5	
Two or more	5.3	5.5	3.1		7.7	7.3	
Region	n=2,827	n=856	n=1,036		n=488	n=447	
Tigray	41.0	43.2	43.2	NS	39.1	33.8	NS
Amhara	59.0	56.8	56.8		60.9	66.2	
Method uptake	n=2,826	n=855	n=1,036		n=488	n=447	
Condoms	0.0	0.1	0.0	***	0.0	0.0	NS
Oral Pills	16.0	17.8	16.3		13.7	14.3	
Injectables	62.1	67.7	56.0		65.6	61.7	
EC	0.8	0.9	0.9		0.8	0.7	
Diaphragm	0.1	0.0	0.0		0.4	0.0	
IUDs	1.4	1.5	1.6		1.6	0.2	
Implants	19.6	11.9	25.2		17.8	23.0	
Method uptake (Short-acting vs. LARCs)	n=2,826	n=855	n=1,036		n=488	n=447	
Short-acting methods	79.1	86.5	73.2	***	80.5	76.7	NS
IUDs or implants	20.9	13.5	26.8		19.5	23.3	
Client referred by	n=2,827	n=856	n=1,036		n=488	n=447	
Self	79.4	63.7	86.8	***	82.0	89.7	**
Health Extension Worker	1.3	4.0	0.0		0.0	0.4	
Peer educator	1.2	2.7	0.3		1.6	0.2	
Husband/partner/boyfriend	0.9	2.9	0.1		0.0	0.0	
Other ¹	1.3	1.6	1.0		2.2	0.9	
Missing	15.8	25.2	11.9		14.1	8.7	

***p<.000; **p<0.01; *p<0.05; ¹Others: mother/father, sister, close relatives, family, friends, service provider (maternal and child health clinic)

New Acceptors of LARCs

The graph below gives an overall view of the trend in new acceptors of LARCs from June 2014-April 2015. A superimposed trendline on the graph appears to suggest that there was greater numbers of new LARCs acceptors at intervention sites than comparison sites. Additional analysis will be presented later in the paper to statistically verify this trend.

Figure 5: Number of new acceptors of LARCs during the study period (June 2014-April 2015)

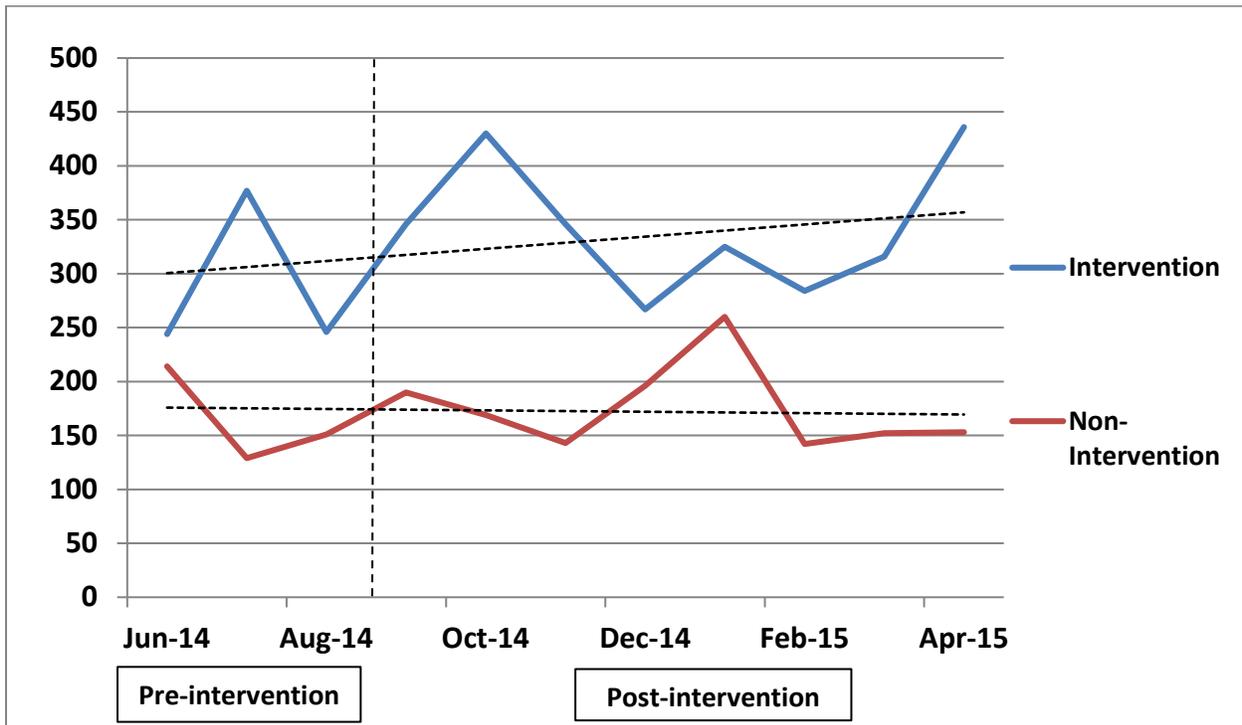


Table 8 presents data on new LARCs acceptors at intervention and comparison sites by time period. New LARCs acceptors can be characterized as: young (55.7% were 10-19 years); ever or currently married or in union (80.9%); having no children (73.0%); and from Amhara (66.0%). Nearly all (94.3%, missing excluded) reported that they were self-referred. Few of these variables significantly changed over time within the intervention group; one exception is the proportion of new LARCs acceptors by region. The proportion of clients in Tigray rose significantly, from 21.7% to 35.3% over time, at intervention sites, and decreased significantly at comparison sites (56.8% to 23.1%) from the pre-intervention period to the post-intervention period.

Table 8: Percentage distribution demographic characteristics, method uptake, and referral source among new acceptors of LARCs, by type of site and time (pre-intervention: June-August 2014 and post-intervention: February-April 2015)

Characteristics	TOTAL (n=592) %	Intervention (n=393)			Comparison (n=199)		
		Pre-Interv (n=115)	Post-Interv (n=278)	Signif	Pre-Interv (n=95)	Post-Interv (n=104)	Signif
Age	n=591	n=115	n=278		n=95	n=103	
10-19 years	55.7	49.6	51.1	NS	57.9	72.8	*
20-24 years	44.3	50.4	48.9		42.1	27.2	
Marital Status	n=549	n=115	n=251		n=84	n=99	
Ever married / in union	80.9	87.0	81.3	NS	75.0	77.8	NS
Single	19.1	13.0	18.7		25.0	22.2	
Parity	n=549	n=115	n=251		n=84	n=99	
No children	73.0	70.4	79.7	NS	61.9	68.7	NS
One or more children born alive	27.0	29.6	20.3		38.1	31.3	
Region	n=592	n=115	n=278		n=95	n=104	
Tigray	34.0	21.7	35.3	**	56.8	23.1	***
Amhara	66.0	78.3	64.7		43.2	76.9	
Method uptake	n=592	n=115	n=278		n=95	n=104	
IUDs	6.6	11.3	6.1	NS	8.4	1.0	*
Implants	93.4	88.7	93.9		91.6	99.0	
Client referred by	n=544	n=115	n=249		n=82	n=98	
Self	94.3	87.8	98.4	***	86.6	98.0	**
Health Extension Worker	0.7	2.6	0.0		0.0	1.0	
Peer educator	0.4	0.9	0.0		1.2	0.0	
Others	4.6	8.7	1.6		12.2	1.0	

New Acceptors of Short-Acting Methods

Table 9 presents data on new short-acting method acceptors at intervention and comparison sites by time. There were 2,234 new acceptors of short-acting methods (intervention=1,498; comparison=736) during the study period. New short-acting method acceptors were quite similar to LARCs acceptors, although unlike LARCs acceptors, a majority of short-acting method acceptors during both pre- and post-intervention periods were older (50.9% were 20-24 years). As with new LARCs acceptors, short-acting method acceptors were more likely to be ever or currently married or in union (77.1%), have no children (73.8%), and to be from Amhara (57.1%). Nearly all (94.3%, n=1,836) reported that they were self-referred.

From the pre-intervention to the post-intervention period (June-August 2014 to February-April 2015), new short-acting method acceptors became significantly younger (both intervention and comparison sites) and without children (intervention sites only). The proportion of 20-24-year-olds significantly decreased over the study period at both comparison (57.5% to 44.3%) and intervention (53.5% to 48.0%) sites. In the intervention group, the proportion of new short-acting method acceptors having no children

significantly increased from pre-intervention (74.5%) to post-intervention (81.3%). These trends are difficult to interpret without collecting additional qualitative information to explain these findings. However, one might conclude that as a result of the LARCs training at intervention sites, no changes were observed over time in either group with respect to type of short-acting method (oral pills, injectables, condoms, etc.) dispensed.

Table 9: Percentage distribution demographic characteristics, method uptake, and referral source among female new acceptors of short-acting methods, by type of site and time (pre-intervention: June-August 2014 and post-Intervention: February-April 2015)

Characteristics	TOTAL (n=2,234) %	Intervention (n=1,498) %			Comparison (n=736) %		
		Pre-Interv (n=740)	Post-Interv (n=758)	Signif	Pre-Interv (n=393)	Post-Interv (n=343)	Signif
Age	n=2,223	n=737	n=757		n=386	n=343	
10-19 years	49.1	46.5	52.0	*	42.5	55.7	***
20-24 years	50.9	53.5	48.0		57.5	44.3	
Marital status	n=2,050	n=711	n=673		n=357	n=309	
Ever married / in union	77.1	73.7	74.7	NS	83.2	82.8	NS
Single	22.9	26.3	25.3		16.8	17.2	
Parity	n=2,051	n=711	n=673		n=357	n=310	
No children	73.8	74.5	81.3	**	62.2	69.4	NS
One or more children born alive	26.2	25.5	18.7		37.8	30.6	
Region	n=2,234	n=740	n=758		n=393	n=343	
Tigray	42.9	46.5	46.2	NS	34.9	37.0	NS
Amhara	57.1	53.5	53.8		65.1	63.0	
Method uptake	n=2,234	n=740	n=758		n=393	n=343	
Condoms	0.0	0.1	0.0	NS	1.5	0.0	NS
Oral Pills	20.2	20.5	22.3		17.0	18.7	
Injectables	78.6	78.2	76.5		81.4	80.5	
Emergency Contraceptives	1.1	1.1	1.2		1.0	0.9	
Diaphragm	0.1	0.0	0.0		0.5	0.0	
Client referred by	n=1836	n=525	n=664		n=337	n=310	
Self	94.3	84.6	98.5	***	97.6	98.4	NS
Health Extension Worker	1.7	5.9	0.0		0.0	0.3	
Peer educator	1.8	4.2	0.5		2.1	0.3	
Others ¹	2.1	5.3	1.1		0.3	1.0	

A second analysis shows the likelihood, expressed as odds ratios, of female new FP acceptors accepting either a short-acting method (male/female condom, pill, injectable, EC) or a LARC (IUD or implant) in intervention vs. comparison facilities at baseline and at post-intervention. Table 10 shows the output of this analysis. These findings show that, among all new female acceptors of FP, those receiving services in a comparison facility during the post-intervention phase were only 1.2 times as likely to be a new LARCs acceptor than at baseline, but twice (2.0) as likely to be a new LARCs acceptor in an intervention facility at post-intervention than at baseline. No difference in odds ratios were observed for new female acceptors of short-acting methods in either intervention or comparison facilities from baseline to post-intervention.

This is consistent with the previous finding; these results present descriptive evidence that the intervention resulted in a greater likelihood or “odds” of a new female FP client accepting a LARC at intervention facilities over time.

Table 10: Percentage distribution and odds of adopting short-acting methods and long-acting reversible contraceptives for new acceptors by type of site and time (pre-intervention: June-August 2014 and post-Intervention: February-April 2015)

Type of Method Adopted	Comparison (%)		Intervention (%)		Odds of adopting a method at end line vs. baseline*	
	Baseline	Post-Intervention	Baseline	Post-Intervention	Comparison	Intervention
Short-acting method	80.5	76.7	86.5	73.2	1.0 ^b	0.9 ^a
LARC	19.5	23.3	13.5	26.8	1.2 ^d	2.0 ^c
Total (n)	488	447	855	1036		

*a: $86.5/80.5 = 0.9$; b: $73.2/80.5 = 1.0$; c: $13.5/26.8 = 2.0$; d: $26.8/23.3 = 1.2$

Analysis of Contraceptive Uptake: All New Acceptors

Tables 10a-b present the descriptive statistics of new FP client uptake at the 20 health facilities (intervention and comparison sites) for any method. A series of t-tests were conducted to assess whether the intervention and comparison facilities were similar to each other during the two time periods in terms of uptake of all contraceptive methods. These tests revealed that intervention sites had significantly greater mean monthly numbers of new FP acceptors than comparison sites for both June-August 2014 and February-April 2015. Overall, intervention sites provided services to 32 new FP acceptors per month, whereas comparison sites offered services to 16 new FP acceptors per month.

Table 10a: T-tests of number of all new acceptors who received family planning services at facilities by group within time

Time period	Group	Number of facility-months	Mean number of new FP acceptors per facility per month	T-test Signif
Jun-Aug 2014	Comparison	30	16.47	*
	Intervention	30	28.90	
	Total	60	22.68	
Feb-Apr 2015	Comparison	30	14.90	***
	Intervention	30	34.53	
	Total	60	24.72	
Total	Comparison	60	15.68	***
	Intervention	60	31.72	
	Total	120	23.70	

However, Table 10b shows that none of the time trends were significant. Even though mean monthly numbers of new FP acceptors increased from 29 to 35, this change was not significant at the $p < 0.05$ level. This means that there was no significant change in mean monthly numbers of new FP acceptors over time at either the intervention or comparison sites.

Table 10b: T-tests of number of all new acceptors who received family planning services at facilities by time within group

Group	Time period	Number of facility-months	Mean number of new FP acceptors per facility per month	T-test
Comparison	Jun-Aug 2014	30	16.47	NS
	Feb-Apr 2015	30	14.90	
	Total	60	15.68	
Intervention	Jun-Aug 2014	30	28.90	NS
	Feb-Apr 2015	30	34.53	
	Total	60	31.72	
Total	Jun-Aug 2014	60	22.68	NS
	Feb-Apr 2015	60	24.72	
	Total	120	23.70	

Multiple regression analysis - uptake of any FP method

As described in the methods section, an ordinary least squares regression with “differences in differences” analysis was conducted to determine if the intervention resulted in a significant increase in new acceptors of any FP method (condoms, oral pills, injectables, emergency contraceptives, diaphragm, IUD, or implant) over time at intervention sites versus comparison sites. In this analysis, we are particularly interested to see if the coefficient for the interaction term “intervention x time” is statistically significant for the uptake of any new acceptor of a method of FP. A significant result at the 0.05 level of this term would mean that the intervention resulted in a greater increase in the overall number of new acceptors per month over time than in comparison sites. Given the different training approaches utilized in the two different regions, region was included in the model as a control variable (and thus no interpretation is offered for the results of this variable). A correlation analysis was conducted to rule out any multicollinearity amongst the dependent variables of either model. None of the dependent variables were strongly correlated with one another (see Appendix D for results of this analysis).

Table 11 shows that there were significantly higher numbers of new acceptors of an FP method per month at intervention sites than comparison sites, irrespective of time. On average, the uptake at intervention health facilities was higher by 12 new acceptors per month (data not shown). There was no statistically significant secular trend of change in the uptake of implants per month (time). And finally, there was no significant interaction effect (intervention x time), meaning that the intervention did not result in an increase of new FP acceptors over time.

While it is possible that these findings may have been compromised by the small number of intervention facilities included in the study (thus resulting in a small sample and limited power in detecting a significant difference), the previous t-tests shown in Tables 10a-b revealed the same pattern of findings.

Table 11: Differences in differences multiple regression analysis of mean monthly number of all new family planning acceptor clients between intervention and comparison health facilities and pre- and post-intervention periods (n=120)

FP uptake (mean number new FP acceptors by facility-month)	Ordinary Least Squares (OLS) Regression Model					
	Unstandardized β Coefficient	Standardized β Coefficient	t	Signif	Confidence Interval	
					Lower Limit	Upper Limit
Intervention group	12.433	.279	2.327	*	1.7	23.2
Time	-1.567	-.035	-.293	NS	-12.3	9.2
Intervention x Time	7.200	.140	.953	NS	-8.0	22.4
Region	8.700	.195	2.303	*	1.216	16.184
Adjusted R ²		.147				
Model F test		6.13		***		

Analysis of Contraceptive Uptake: New Acceptors of LARCs

Table 12a-b and Figure 6 present the descriptive statistics of new monthly LARCs acceptors in the 20 health facilities (intervention and comparison sites). We conducted a series of t-tests to assess whether the intervention and comparison facilities were similar to each other during the two time periods in terms of the uptake of LARCs only. These tests revealed that while intervention and comparison sites had roughly the same number of new LARCs acceptors per month (3.52) at baseline, intervention facilities had significantly greater mean monthly numbers of new LARCs acceptors than comparison sites for February-April 2015. At endline, intervention sites provided services to 9.27 new LARCs acceptors per month, whereas comparison sites offered services to 3.47 new LARCs acceptors per month, a statistically significant difference ($p < .000$).

Table 12a: T-tests of number of LARCs provided at facilities by group within time

Time period	Group	Number of facility-months	Mean monthly number of LARCs	T-test Signif
Jun-Aug 2014	Comparison	30	3.17	NS
	Intervention	30	3.87	
	Total	60	3.52	
Feb-Apr 2015	Comparison	30	3.47	***
	Intervention	30	9.27	
	Total	60	6.37	
Total	Comparison	60	3.32	**
	Intervention	60	6.57	
	Total	120	4.94	

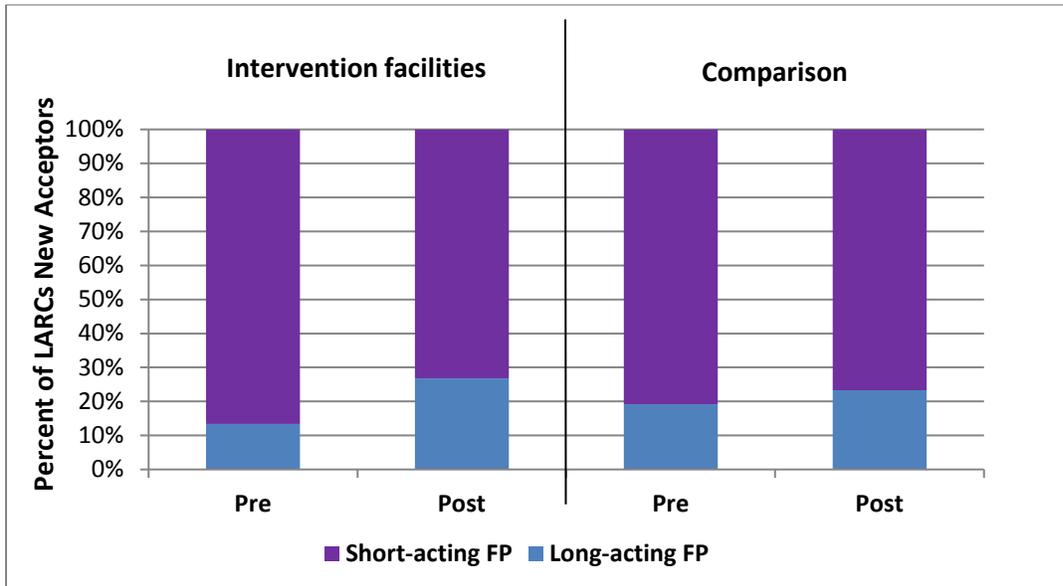
In looking at time trends within each group, there was no significant increase in the monthly mean number of new LARCs acceptors from pre-intervention to post-intervention at comparison facilities. However, there was a significant increase over time at intervention facilities in the mean monthly number of new LARCs acceptors (3.87 to 9.27; $p < .01$). This suggests that the intervention resulted in an increase in the number of new LARCs acceptors over time.

Table 12b: T-tests of number of LARCs provided at facilities by time within group

Group	Time period	Number of facility-months	Mean monthly number of LARCs	T-test
Comparison	Jun-Aug 2014	30	3.17	NS
	Feb-Apr 2015	30	3.47	
	Total	60	3.32	
Intervention	Jun-Aug 2014	30	3.87	**
	Feb-Apr 2015	30	9.27	
	Total	60	6.57	
Total	Jun-Aug 2014	60	3.52	**
	Feb-Apr 2015	60	6.37	
	Total	120	4.94	

Figure 6 offers a graphical representation of these findings. The proportion of new LARCs acceptors (vs. other short-acting methods of FP) increased significantly over time at intervention facilities, but not at comparison facilities.

Figure 6: Percentage of new acceptors who adopted short-acting methods and LARCs, intervention and comparison sites, pre-intervention and post-intervention phases



Multiple regression analysis - uptake of LARCs

As with new acceptors of any method, an ordinary least squares regression with “differences in differences” analysis was conducted to determine if the intervention resulted in a significant increase in new acceptors of LARCs over time at intervention sites versus comparison sites. As with the previous analysis, we are particularly interested to see if the coefficient for the interaction term, “intervention X time” is statistically significant for the uptake by any new acceptor of an FP method, and again, region serves as a control variable. A significant result at the 0.05 level of the interaction term would mean that the intervention resulted in a greater increase in the overall number of new LARCs acceptors per month over time than in comparison sites.

Table 13 shows that there was no significant main effect for the intervention group nor was there a statistically significant secular trend of change in the uptake of implants per month (time). However, there was a significant interaction effect (intervention x time), meaning that the intervention resulted in a monthly mean increase in approximately five (5.1) new LARCs acceptors over time (interpreting the unstandardized beta coefficient).

Table 13: Differences in differences multiple regression analysis of mean monthly number of LARCs clients between intervention and comparison health facilities and pre- and post-intervention periods (n=120)

LARCs uptake (mean number by facility- month)	Ordinary Least Squares (OLS) Regression Model					
	Unstandardized beta Coefficient	Standardized beta Coefficient	t	Signif	Confidence Interval	
					Lower Limit	Upper Limit
Intervention group	.700	.063	.569	NS	-1.737	3.137
Time	.300	.027	.244	NS	-2.137	2.737
Intervention x Time	5.100	.399	2.931	**	1.654	8.546
Region	3.183	.288	3.659	***	1.460	4.907
Adjusted R ²		.264				
Model F test		11.67		***		

Method Switchers

A fifth and final objective of this report is to examine characteristics of switcher and removal clients to better understand characteristics and motivations of switchers and clients seeking an IUD or implant removal. Data were extracted from the FP registers to explore the prevalence of switchers, the method they switched to, and demographic characteristics as an addendum to the intervention study (Table 15).

There were 466 switchers (intervention=292; comparison=174) during the study period. Slightly over half of these FP clients switched to implants (54.5%). Nearly one-third (30.9%) switched to injectables, and 12.4% switched to oral contraceptive pills. Overall, while the majority of switcher clients were married (85.9%), a sizable number were nulliparous (having no children born alive; 45.4%). None of these characteristics were significantly different by intervention group. Region, however, varied by intervention group: switchers were more likely to be from Tigray in the intervention group (58.6%) and Amhara (66.9%) in the comparison group.

Overall, switchers were only a small fraction of the total 14,737 clients at the 20 YFS intervention and comparison sites. Implants were the preferred method to which clients switched, irrespective of intervention group.

Table 14: Percentage distribution of characteristics for switcher clients (demographics and contraceptive provided) by type of site (intervention and comparison); June 2014-April 2015

Characteristics	TOTAL (n=466) %	Intervention (n=292) %	Comparison (n=174) %	Signif
Age	n = 465	n = 291	n = 174	
10-19 years	36.1	37.5	33.9	NS
20-24 years	63.9	62.5	66.1	
Marital status	n = 448	n = 280	n = 168	
Married	85.9	87.1	84.0	NS
Living together	4.2	2.9	6.5	
Single	9.8	10.0	9.5	
Divorced/separated/widowed	0.0	0.0	0.0	
Parity	n = 447	n = 279	n = 168	
No children	45.4	48.4	40.5	NS
One child	41.4	39.1	45.2	
Two or more children	13.2	12.5	14.3	
Region	n = 466	n = 292	n = 174	
Tigray	48.7	58.6	32.2	***
Amhara	51.3	41.4	67.8	
Contraceptive uptake status	n = 466	n = 292	n = 174	
Short-acting methods	43.6	42.5	45.4	NS
LARCs	56.4	57.5	54.6	
Contraceptive provided	n = 466	n = 292	n = 174	
Emergency Contraceptives	0.2	0.3	0.0	NS
Oral Pills	12.4	12.3	12.6	
Injectables	30.9	29.8	32.8	
Implants	54.5	55.1	53.4	
IUDs	1.9	2.4	1.1	

Contraceptive Removals

Data were extracted from the FP registers to explore the prevalence of removals, the method to which the client switched, and selected demographic characteristics of removal clients as an addendum to the intervention study.

There were 275 clients who attended the 20 study health facilities for LARC removal (intervention=217; comparison=58) during the project period. The two main reasons for method removal were opting for pregnancy (intervention=34.9%; comparison=12.1%) and product duration^{cc} completed (intervention=38.8%; comparison=53.4%). The implant was the main method removed (94.9%). There were more married (90.1% vs. 67.3%) and 20-24-year-old (68.5% vs. 53.4%) women seeking removal services in the intervention group as compared to the comparison group (respectively).

^{cc} Either three or five years

Table 15: Percentage distribution of characteristics for removal clients (demographics and reasons for removal) by type of site (intervention and comparison); June 2014 – April 2015

Characteristics	TOTAL (n=275) %	Intervention (n=217) %	Comparison (n=58) %	Signif
Age	n = 274	n = 216	n = 58	
10-19 years	34.7	31.5	46.6	*
20-24 years	65.3	68.5	53.4	
Marital status	n = 264	n = 212	n = 52	
Married	85.6	90.1	67.3	***
Living together	4.5	2.4	13.5	
Divorced/separated/widowed	0.8	0.5	1.9	
Single	9.1	7.1	17.3	
Number of children	n = 257	n = 205	n = 52	
Zero	65.4	67.3	57.7	NS
One	24.5	22.9	30.8	
Two or more	10.1	9.8	11.5	
Region	n = 275	n = 217	n = 58	
Tigray	36.7	34.6	44.8	NS
Amhara	63.3	65.4	55.2	
Method removed	n = 272	n = 214	n = 58	
Implants	94.9	93.9	98.3	NS
IUDs	5.1	6.1	1.7	
Reason for removal	n = 267	n = 209	n = 58	
Three-/five-year duration completed	41.9	38.8	53.4	**
Opted for pregnancy	30.0	34.9	12.1	
Severe/continuous vaginal bleeding	11.2	10.5	13.8	
Others ¹	11.6	9.1	20.7	
No reason given	5.2	6.7	0.0	

¹Others: Husband (complained, disapproved), spotting, misconception, severe vaginal bleeding, arm discomfort or pain, headache, back pain, severe vaginal discharge, change to other method, discomfort, not living together, or religious reasons.

Overall, there were relatively few clients (1.8%, n=14,919) who attended a YFS unit for LARCs removal during the 11-month study period. Of the 275 LARC removal clients, 19% were switchers (intervention=40; comparison=12, data not shown) during the study period, most often to injectables (data not shown). The findings suggest that removal clients, albeit a very small fraction of all FP clients, decided to become pregnant or continue contraception, with implants and injectables being the preferred choices.

Conclusions and Recommendations

The study's underlying assumption was that training which enables non-judgmental YFS providers to provide all reversible contraceptive methods in a one-stop shop with privacy, confidentiality, and respect would result in increased numbers of adolescents and youth who were new LARC new acceptors. The study findings show that the training intervention was successful in increasing the number of young women who sought services and accepted a contraceptive method to delay or avoid pregnancy. During the 11-month study period, there were more new acceptors at the intervention than at the comparison sites.

Findings also indicate improved knowledge and skills related to FP and LARCs among PEs and service providers. Service providers also showed strong retention of their knowledge and skills six months' post-intervention. For PEs, average scores significantly improved pre- to post-training with excellent retention six months later for two out of three training modules. However, these positive training outputs did not result in increased or substantial FP or LARC referrals by PEs.

Despite these conflicting results, the increased uptake of new FP, including LARCs, at intervention sites indicates a positive influence of the training and supportive supervision intervention strategies. The bivariate and multivariate results indicate that enabling YFS providers to counsel on and provide all reversible contraceptives (LARCs and short-acting methods) in YFS units (one-stop shop) has a positive influence on the number of LARC new acceptors.

In conclusion, the combined effect of the tested service delivery model successfully achieved the program's primary objective: increasing LARCs uptake among female adolescents and youth. The training assessments indicated improved counseling on and skills for LARC insertion and removal, including infection prevention, among YFS providers. Likewise, the assessments indicated improved LARC counseling skills among PEs, as measured through post-training assessments immediately and six months after training. Below is a list of recommendations for scale-up and future programming.

Train YFS and other FP providers on LARCs for youth: This study report shows that training YFS providers to counsel on and provide all reversible contraceptives (LARCs and short-acting methods) in one location has the potential to increase LARC uptake among youth. To maximize the benefits of full method contraceptive choice for youth, all FP providers should receive in-service or pre-service training to ensure they are fully ready to offer a full range of contraceptive options to youth. While institutionalizing such trainings might take a long time, a phased approach can be applied. This phased approach might entail: commencing with LARC training for all YFS providers; subsequently, expanding to all service providers during in-service trainings; and eventually, including LARC training as part of pre-service education.

Strengthen PE reporting: The refresher training assessments illustrated improved knowledge in FP and LARC counseling and retention of that knowledge, although data do not substantiate the influence of the refresher training on FP and LARC referrals. Our conflicting findings add to the insufficient global body of robust evidence on the multi-dimensional role that a volunteer PE cadres play in raising RH/FP awareness among the youth population. There needs to be increased research and implementation science programs in this neglected domain.



Strengthen supportive supervision for peer education: PEs are mentored by YFS providers and receive feedback on a monthly or quarterly basis. PEs also conduct quarterly performance review meetings among themselves and in the presence of YFS providers. If feasible, working with HEWs or other community-based health worker cadres to provide more frequent supervision at community level—for example, observing PEs during counseling sessions and administering and recording supportive supervisory checklists for the PEs—may lead to quality improvement and better performance.

Design programs that examine service providers' attitudes about LARCs for adolescent and youth, and studies which probe client perspectives about services, including client satisfaction: This study did not examine service providers' attitudes or client satisfaction with LARCs. A study that examines these elements would provide a much richer assessment of the contribution of various supply-side attributes to improving LARCs uptake.

Implement additional evaluation activities that examine PEs' role in creating demand for FP and LARCs: The study's lack of evidence related to PEs' contribution to generating demand for LARCs referrals is disappointing, but lends itself to the broader need for qualitative and quantitative studies and implementation science programs. This type of evidence generation will allow us to have a better understanding of PEs' multi-dimensional role to enable robust documentation.

Next Steps

The topline results of this study have been shared at several MOH meetings in Ethiopia and globally. E2A is now conducting a case study to explore how the primary health care delivery system at the regional level can integrate and fully support LARCs training for YFS providers. In addition, a national curriculum for service providers at health facilities exists; LARCs training for service providers and Implanon insertion for HEWs have now been included and the national curricula is regularly updated and currently used for ongoing trainings for FP service providers on LARCs. Based on these results, we recommend that the LARCs national training curricula include a one-day session on YFS, and that the MOH continue to scale up LARCs training for YFS providers nationally by including YFS providers in the national LARCs trainings for FP providers.

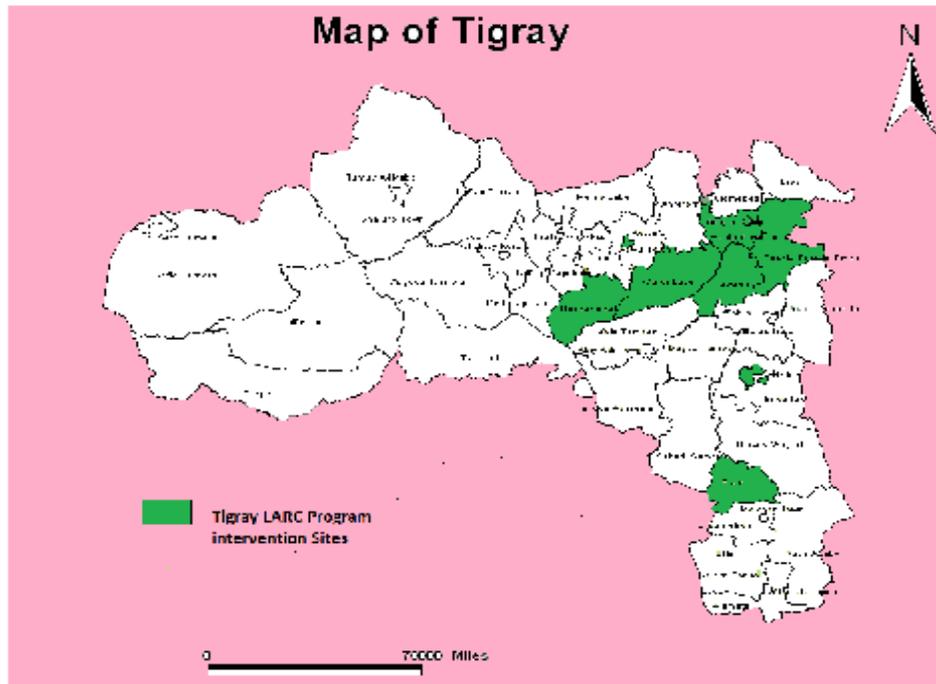
As IFHP+ has ended (and a new phase of this effort begins through Pathfinder's TRANSFORM project), woredas and health centers are being assisted to continue to work with PEs in maintaining their attachment and services through the health centers, using revenues from health centers and woredas, an approach which has already been tested successfully. Finally, TRANSFORM will continue collaborating with the MOH to further transfer monitoring and management of the project to the local government. Staff will continue to work closely with the RHBs, woredas, and facilities to ensure that services are strengthened and that YFS providers continue to offer LARCs. This approach will help to ensure that youth and women in Ethiopia have access to highly effective contraception, can time and space their pregnancies in a healthy way, and prevent unwanted pregnancies.

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Figure 2: Map – Tigray



Appendix B: Amhara and Tigray population disaggregated by intervention and comparison sites

Region	Facility Sites	Population All Ages	Catchment Population (10 – 24 years)	Catchment Location (Urban/Peri-urban/Rural)
Intervention Sites				
Amhara	Addis Zemen	32,556	13,293	Urban
	Debretabor	42,482	14,741	Urban
	Woreta	40,386	15,273	Urban
	Gozamin	29,386	10,197	Rural
	Dabat	41,789	14,501	Peri-urban
Total		186,599	68,005	
Tigray	Tekeli Sewat	41,800	14,212	Semi-urban
	Adwa	32,359	11,002	Urban & Rural
	Mekelle	32,836	11,164	Semi-urban
	Bizet	27,279	9,274	Urban
	Hawzien	55,381	18,830	Urban
Total		189,655	64,482	
Comparison Sites				
Amhara	Amanuel	32,874	11,407	Peri-urban
	Arebegebeya	29,990	10,406	Peri-urban
	Kola diba	42,126	14,617	Peri-urban
	Makesegnet	52,062	18,065	Peri-urban
	Felakit	38,655	13,413	Peri-urban
Total		195,707	67,908	
Tigray	Semema	33,847	11,507	Semi-urban
	Nebelet	25,027	8,509	Semi-rural
	Semien	29,840	10,146	Urban
	Adishehu	31,224	10,616	Urban
	Freweini	52,022	17,687	Urban
Total		171,960	58,465	
Total				
Intervention		376,254	132,487	
Comparison		367,667	126,373	

Data Sources:

Amhara: Amhara National Regional State Bureau of Finance and Economic Development. List of Zones and Woredas with gender and age disaggregate data used for Regional Planning of 2014/2015 Budget Year. http://www.amharabofed.gov.et/PDF_Files/Amhara%20Pop%20Size-2015.xlsx [Accessed on November 2015].

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Appendix C: Difference-In-Differences OLS Regression

The simplest model was employed where an outcome (Y) is observed for two groups for two time periods for all three models. One of the groups (intervention facilities) is exposed to an intervention in the second period but not in the first period. The second group (comparison facilities) is not exposed to the intervention during either period. Since we observe the same facilities within a group in each time period, the average increase in the second group (comparison facilities) is subtracted from the average increase in the first group (intervention facilities). This removes biases in second period comparisons between the two groups that could be the result from permanent differences between those groups (such as differences in age or marital status), as well as biases from comparisons over time in the treatment group that could be the result of trends which started before the intervention as a result of some other separate, undocumented process (eg, a communications campaign or large training initiative by another organization). Important covariates, such as region, are included in these models as well.

There are two outcome variables and type of analysis performed in parentheses:

- (1) Mean number of all female FP new acceptor clients per facility per month (OLS regression)
- (2) Mean number of new LARCs clients per facility per month (OLS regression)

Both outcomes vary by the outcome listed above in an intervention or comparison facility, or *group* (i); and whether the method was accepted during June-August 2014 or February-April 2015, or *time* (t). In other words, the outcome is predicted by one of two time periods, pre-intervention (June-August 2014) and post-intervention (February-April 2015), and one of two groups of facilities, intervention facilities and comparison facilities, and whether there are changes in uptake by type of facility over time (the interaction of the two).

OLS Regression Model

Three key variables used to predict the outcome: $Group_{it}$ (intervention vs. comparison facility), $Time_{it}$ (pre-intervention vs. post-intervention), and $Group_{it} * Time_{it}$. Here is the regression equation employed for the first two outcomes listed above:

$$Y_{it} = \beta_0 + \beta_1 Group_{it} + \beta_2 Time_{it} + \beta_3 (Group_{it} * Time_{it}) + \beta_4 (region) + \epsilon_{it} \text{ where}$$

Y_{it} is the outcome variable, eg, mean number of LARCs clients per facility per month

$Group_{it} = 0$ if observation “i” belongs to the facility that did not receive the training intervention

$Group_{it} = 1$ if observation “i” belongs to the facility that received the training intervention

$Time_{it} = 0$ if the LARC client was served during June-August 2014

$Time_{it} = 1$ if the LARC client was served during February-April 2015

$Group_{it} * Time_{it}$ is the interaction term, where by for an observation (facility-month), $Group$ (0,1) is multiplied by $Time$ (0,1).

β_0 is the intercept in the equation, or where the fitted regression line crosses the y axis.

β_4 is the only covariate, region.

ϵ_{it} is an error term, or the measure of variance in fitting the regression line.

In this analysis, the coefficient of interest is β_3 which multiplies the interaction term, $(Intervention_{it} * Post)_{it}$. β_3 denotes true effect of treatment or the effect of the treatment on the treated.

Appendix D: Correlation Matrices for Difference-In-Differences OLS Regression

To avoid multicollinearity in the OLS regression analysis, the correlation between the dependent variables should be low to moderate. If any of the correlations are .60-.80 or greater, one would consider either combining and creating a composite variable (in which the highly correlated variables were summed or averaged) or eliminating one of the highly correlated dependent variables from the analysis.

Thus, prior to conducting the regression analyses, Pearson correlations were performed between all of the dependent variables in order to test the above assumption. Below are the correlation matrices for (1) mean number of all female FP new acceptor clients per facility per month; and (2) mean number of new LARCs clients per facility per month:

(1) All female FP new acceptor clients per facility per month:

	numberallfp	group	period	interaction	region	
Pearson Correlation	numberallfp	1.000	.359	.046	.280	.195
	group	.359	1.000	.000	.577	.000
	period	.046	.000	1.000	.577	.000
	interaction	.280	.577	.577	1.000	.000
	region	.195	.000	.000	.000	1.000
Sig. (1-tailed)	numberallfp	.	.000	.311	.001	.016
	group	.000	.	.500	.000	.500
	period	.311	.500	.	.000	.500
	interaction	.001	.000	.000	.	.500
	region	.016	.500	.500	.500	.
N	numberallfp	120	120	120	120	120
	group	120	120	120	120	120
	period	120	120	120	120	120
	interaction	120	120	120	120	120
	region	120	120	120	120	120

(2) New LARCs clients per facility per month:

		numberlarcs	group	period	interaction	region
Pearson Correlation	numberlarcs	1.000	.294	.258	.451	.288
	group	.294	1.000	.000	.577	.000
	period	.258	.000	1.000	.577	.000
	interaction	.451	.577	.577	1.000	.000
	region	.288	.000	.000	.000	1.000
Sig. (1-tailed)	numberlarcs	.	.001	.002	.000	.001
	group	.001	.	.500	.000	.500
	period	.002	.500	.	.000	.500
	interaction	.000	.000	.000	.	.500
	region	.001	.500	.500	.500	.
N	numberlarcs	120	120	120	120	120
	group	120	120	120	120	120
	period	120	120	120	120	120
	interaction	120	120	120	120	120
	region	120	120	120	120	120

None of the outcome variables (group, period, interaction, or region) are strongly correlated with one another; all have low to moderate correlation (the highest coefficient of correlation is 0.577). Therefore, all are included as dependent variables in the two OLS regression analyses.



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