A MIXED-METHODS STUDY OF FACTORS ASSOCIATED WITH IMPLANON REMOVAL IN ETHIOPIA

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FINAL REPORT

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LIST OF ABBREVIATIONS

CSA	Central Statistical Agency
FMOH	Federal Ministry of Health
FP	Family Planning
HEW	Health Extension Workers
HP	Health Post
ID	Identification Number
IDI	In-depth Interview
IUCD	Intrauterine Contraceptive Device
LAFP	Long Acting Family Planning
MNCH	Maternal, Neonatal and Child Health
PPS	Probability Proportional to Size
PROGRESS	Program Research for Strengthening Services
SAS/SWAT	Statistical Analysis Software
SNNP	Southern Nations, Nationalities and Peoples
SPSS	Statistical Package for the Social Sciences
USAID	U.S. Agency for International Development

A mixed-methods study of factors associated with Implanon removal in Ethiopia

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EXECUTIVE SUMMARY

Introduction

In 2009 the Government of Ethiopia initiated the Implanon scale-up initiative, which facilitated greater Implanon access by allowing health extension workers to insert the implant. There is still little known about what percent of users were getting Implanon removed at the recommended three-year post-insertion date, however, or what barriers women may be facing to removing their implants. The FMOH requested FHI 360 to conduct this study to answer some of these questions. The main goals of this research study were to assess whether women who obtained Implanon implants experienced barriers to having them removed and based on the findings to develop recommendations for ways in which to improve Implanon service delivery with post-insertion follow-up mechanisms. With these goals in mind, the three main objectives of this study were to:

- Describe the socio-demographic characteristics of women in Ethiopia who had an Implanon implant inserted between three and six years prior to the time of the interview.
- Identify barriers associated with Implanon removal.
- Develop recommendations to address and alleviate identified barriers to implant removal.

Methods

This was a mixed-methods study that included both quantitative and qualitative data. The quantitative data were collected from 1,860 women of reproductive age who had an Implanon implant inserted between three and six years prior to the time of the interview. These women may or may not have kept the implant in for three years. Some may have kept it longer than three years and some may have removed it prior to the three years. The qualitative data were collected using semi-structured interviews with 38 service providers (29 HEW, four midwives, four nurses and one “other” health professional).

Key Findings

- More than half of the Implanon users surveyed were between the ages of 25 and 34 (55 percent), had no education (55 percent) and were engaged in farm work (59 percent). The majority of these women were also married (91 percent) and lived in a rural area (90 percent).
- Seventeen percent of the women reported having removed their Implanon before the recommended three-year post insertion removal date, 61 percent removed it on time (i.e, three years post-insertion) and 21 percent kept it longer than prescribed (17 percent longer than 36 months and 4 percent still had it inserted at the time of the survey).
- The study indicates that the absence of service providers at the time of their visits and the distance needed to travel to a facility for the removal were key barriers to women having their Implanon implants removed in a timely fashion.
- The study also demonstrated that unmarried women and women who had their Implanon inserted at a health post were more likely to be delayed in getting their Implanon removed.
- Approximately one-quarter of women who reported issues with getting their Implanon removed, reported that when they went for removal services the providers were unable to remove their

Implanon. Service providers noted that this inability to provide removal services was due in large part to stock outs of appropriate supplies.

- Both survey participants and service providers indicated that women forgetting their removal date or not having the time to get the implant removed were barriers to timely removal of their implants.

BACKGROUND

The Ethiopian government has identified these Millennium Development Goals as focus areas to accelerate the country's development: decreasing child mortality and improving maternal health. To achieve the ambitious goals, the government, in 2003, launched a program that aimed to increase access for preventive and curative health care services for the rural community through the use of health extension workers (HEWs). HEWs are government employees who are assigned to health posts; family planning is one of several services that they provide to health post patients.

In 2009, in an effort to increase the national contraceptive prevalence and reduce unmet need for contraception, the FMOH made a strategic decision to launch an implant scale-up initiative. The goal of the initiative was to expand the family planning (FP) method mix and increase voluntary access to long-acting family planning (LAFP) methods. To achieve this goal, the FMOH decided to make one brand of implants, Implanon, available at the community level through HEWs since Implanon was a single rod implant and easy to administer. Implanon is a sub-dermal, progesterone-only LAFP method. According to the manufacturer, the implant can be used for up to three years and then should be removed. Currently the manufacturer is reviewing the expiration date and this could be extended to five years; however, we followed the manufacturer-recommended removal date of three years at the time of the study and this is also the recommended date in Ethiopia.

As part of the Implanon scale-up initiative, expansive work has been done in demand creation, capacity building and ensuring the logistics of Implanon. Under the auspices of FMOH, partner organizations trained HEWs and health center providers in Implanon insertion. They also trained health center providers, but not HEWs in Implanon removal.

Service statistics on insertion and removal of long-acting methods collected as part of an FHI 360 midterm evaluation of intrauterine contraceptive devices (IUCD)[1] indicated that Implanon was the most widely used long-acting method in both hospital and health center settings (56 percent and 48 percent of long-acting methods being utilized, respectively). In addition, it is the only implant that has been approved to be provided at the community level at health posts by the HEWs. Other implants are only provided at hospitals and health centers. The FMOH is interested to find out whether women who have implants have encountered any difficulties in getting their implants removed, especially those who received the implant at the community level. In 2013, FHI 360 conducted an evaluation of the FMOH's initiative to scale up Implanon. The evaluation found that among survey respondents, Implanon was the third most commonly reported method used and 40 percent of the respondents had used it more than once. In the same study over 90 percent of the providers surveyed had inserted Implanon, of which over 95 percent had inserted Implanon in the past year.

As the Implanon scale-up initiative is celebrating its seventh year, there is still little known about what percent of users are getting Implanon removed at the recommended three-year post-insertion date or what barriers women may face to removing their implants. Another FHI 360 evaluation tried to investigate the length of time users had retained their Implanon before removal in the Southern Nations, Nationalities and Peoples (SNNP) region. The result showed that, at the time of interview, 78.2 percent still used

[1] The Intra-Uterine Contraceptive Device Revitalization Initiative, Results and Lessons from the Initial Phase, FMOH Ethiopia.

Implanon and 21.6 percent had had it removed. Of those who had removed Implanon, the majority (66.8 perdent) had kept it for the recommended three-year period, whereas 18 percent had kept the Implanon for one to two years and 3.6 percent kept it for more than three years. The reasons why removals were performed either before or after the recommended period was not assessed.

To inform future planning of FP service provision in Ethiopia, and to address the concern and associated lack of data regarding whether women who received Implanon from HEWs have experienced any barriers to having their implants removed, the FP case team at FMOH requested that FHI 360 conduct this study of Implanon users in regions where the Implanon scale-up initiative using HEW was implemented and barriers women in these regions may face to implant removal. The findings from this study will provide critical planning data on the timing of and factors associated with Implanon removal. In addition, it is hoped that the findings will be utilized by the FMOH to develop strategies for further improvement, scale-up and sustainability of the Implanon initiative.

This report describes the methods and findings of the study together with recommendations for consideration by the FMOH.

STUDY GOALS AND OBJECTIVES

The main goal of this research study was to assess whether women who received Implanon implants since the inception of the Implanon scale-up initiative have experienced any barriers to having them removed. Findings from this study will be used to develop recommendations for ways in which to improve Implanon service delivery and suggest effective post-insertion follow-up mechanisms. With this goal in mind, the three main objectives of this study were to:

- Describe the socio-demographic characteristics of women in Ethiopia who had an Implanon implant inserted between three and six years prior to the time of the interview.
- Identify barriers associated with Implanon removal.
- Develop recommendations to address and alleviate identified barriers to implant removal.

METHODS

Study Design

The study employed a mixed-methods approach comprising both qualitative interviews and a quantitative survey. The quantitative data from Implanon users were collected through a carefully designed structured questionnaire. Opinions and attitudes of health providers were gathered through semi-structured interviews. In total, surveys were collected from 1,860 Implanon user women and semi-structured interviews were carried out with 38 health service providers (29 HEW, four midwives, four nurses and one “other” health professional). The study took place in four regions in Ethiopia: Amhara, Oromia, Tigray and SNNP. These four regions were selected since they were the regions in which the Implanon scale-up initiative using HEWs initially took place. The other regions started the scale-up initiative at a later date and, therefore, did not have adequate study populations for the survey.

Sampling Design

A stratified three-stage cluster sample design was employed to identify a stratified systematic random sample of Implanon users. We first stratified by urban and rural places of permanent residence. Subsequently, woredas, health facilities and Implanon users were chosen at the first, second and third stages of sampling respectively. Stratification of woredas within each region was accomplished based on their similarities with respect to key socio-demographic characteristics. Pre-determined sample sizes were chosen from each stratum and it was determined that 12 woredas per domain/region, four to five health facilities per woreda, and a total of 200 health facilities and 48 woredas throughout the four domains/regions would be needed to reach these sample sizes. In addition, since it was not possible to obtain data on the number of women 18–49 years who had had an Implanon inserted three to six years prior the date of interview, proportional allocation of the number of women of reproductive age found in each stratum was used to allocate the sample across urban and rural areas and the different regions.

From the Central Statistical Agency (CSA), we obtained lists of the regions and woredas within each of our four study domains along with the estimated number of women of reproductive age in each. We subsequently obtained lists from each of these woredas' health offices of all their health facilities (health post [HP] and health centers), along with lists of the estimated number of Implanon users of reproductive age who were associated with each health facility. This list did not contain identifying information, just numbers of users. From these lists, a probability proportional to size (PPS) sample selection scheme, taking number of women of reproductive age within woreda (Health facility) as a measure of size, was used to select woredas. The same PPS selection scheme was used to select health facilities within woredas using the number of Implanon users as the measure of size.

Finally, from the sampled health facilities, we obtained anonymized lists of all of their Implanon users (who currently have or had Implanon inserted between three and six years prior to the date of the interview) listed only by a confidential client identification number (ID). The list of Implanon users' client IDs was arranged primarily according to the geographical location of Implanon users. Implanon users then were chosen using an equal probability systematic sample selection procedure.

Sampling Size Determination

Sample size is usually determined based on the required precision, variability of the characteristics to be measured and the resources available. Required key indicators of the survey are proportions (e.g., percentage of women who have had Implanon removed before three years and one day from the day of her insertion). In determining sample size, with no prior information about the variability of the population proportion, which is going to be measured, the variance of the population proportion is often guessed by taking the population proportion to be equal to 0.5. In sample designs like this, it is usually recommended to assume a design effect of 2 to compensate for the loss due to the introduction of complex design. Therefore, with the population proportion (p) equal to 0.5 and assumed a design effect of 2, a sample of 455 Implanon users was calculated to be sufficient to obtain precise information per domain with 95 percent confidence level and an absolute error of 6.5 percent. In studies like this, however, it is usually expected that some sample individuals may decline to participate or refuse. This, however, will not often be

more than 10 percent.[2] Thus, we included a 10 percent compensation for possible non-response or refusal and introducing minor adjustments for operational convenience; a sample of 500 Implanon users per domain/region and a total of 2,000 users across the four domains/regions was determined to be sufficient to achieve the desired objectives.

Sampling and Recruitment

For this study, therefore, we had targeted enrollment of approximately 2,000 Implanon user women to enroll in the survey. In the end, we enrolled 1,860 women who met our eligibility criteria of currently having or having had an Implanon inserted between three to six years prior to the date of the interview. The women were identified in each health facility from the facility records, family planning registers and family folders at health posts and health centers. Health facility records were only accessed by clinic employees. To identify potentially eligible women for this study, the clinic employees first generated a list of all women who met the study eligibility criteria in terms of age, residence and timing of implant insertion. Each of these women had an associated client ID. An anonymized list of just client IDs with no associated identifying information was then created for the data collectors to sample a subset of women to be interviewed. The health providers then contacted the women to come to the health post or health center on a specific day for the interview.

The study team also conducted semi-structured interviews with 38 HEW/health providers. The service provider was approached on the day the data collectors were at the facility and was asked to participate in the interview.

Survey

We conducted a survey designed to describe the socio-demographic characteristics of women in Ethiopia who had an Implanon implant inserted between three and six years prior to the time of the interview, as well as to identify barriers associated with Implanon removal. The survey was conducted from June to July 2016 and included approximately 36 questions divided into four sections. The sections pertained to facility information, demographics, client Implanon use, client reproductive health situation and family planning use.

Sampling Weights

We constructed sampling weights to apply to the survey data to reduce biases introduced by factors beyond our control, such as the lack of reliable sampling frames and interviews refused or lost by primary sampling unit and strata. Specifically, to obtain unbiased estimates from the survey data, the results should be affected by raising factors (sampling weights) equal to the inverse of the corresponding probabilities of selection, which include a component from each sampling stage. We were unable to obtain complete and up-to-date sampling frames critical for us to draw our second stage samples, however. That is, we were unable to obtain reliable sampling frames on the number of Implanon users of each health facility within sample woredas that FMOH initially confirmed to us. No complete and up-to-date list was found either at

[2] UN (2005): Designing Household Survey Samples: Practical Guidelines (page 44-45). United Nations Department of Economics and Social Affairs.

regional health bureaus, zonal health offices or woreda health offices. We, therefore, were obliged to conduct our second-stage sample selection using an equal probability systematic sample selection scheme.

Semi-structured Interviews

The semi-structured interviews with service providers were digitally audio recorded and transcribed. Transcripts were analyzed by the study team members using Dedoose [3] and a thematic analysis approach was utilized that consisted of structural and content coding, structured codebooks and inter-coder agreement checks throughout the data analysis process[4]

[3] Dedoose Version 7.5.9, web application for managing, analyzing, and presenting qualitative and mixed method research data (2016). Los Angeles, CA: SocioCultural Research Consultants, LLC (www.dedoose.com)

[4] Guest, G., MacQueen, K.M., and Namey, E.E. (2011). Introduction to applied thematic analysis. In Sage, Inc., *Applied thematic analysis* (pp. 3-20). Retrieved from http://www.sagepub.com/upm-data/44134_1.pdf

RESULTS

Data presented in this section are derived from all sources and are presented with survey findings interwoven with the qualitative findings. The quantitative data presented below in Tables 2–10 utilize weighted data to account for study design.

Demographic Characteristics of Study Participants

A total of 1,860 Ethiopian women Implanon users completed the survey and 38 health care providers (female) completed the key informant interviews (Table 1). Due to the security issues in Amhara during data collection, only 10 woredas were sampled instead of 12.

Table 1: Distribution of Implanon Users and Health Care Providers Interviewed by Region

Region	IMPLANON® Users	Health Care Providers
Amhara	400	8
Oromia	509	10
SNNP	471	10
Tigray	480	10
Total	**1860**	**38**

Table 2 shows the distribution of Implanon users by age, religion, marital status, place of permanent residence, level of education and employment status. More than half of the surveyed Implanon users were ages 25–34 (55 percent) though there were some significant differences across the regions with SNNP having the largest percentage of women under 34 and Amhara having the largest percentage of women 35 and above. Religion varies greatly among the regions with Tigray respondents being predominately Orthodox (93 percent) whereas Amhara, Oromia and SNNP had fewer Orthodox respondents—57 percent, 23 percent and 35 percent, respectively). Muslim respondents were highest in Amhara and Oromia (41 percent and 31 percent). SNNP was the only region with over half the respondents being Protestant (55 percent). Across all regions, the majority of women surveyed were married (90 percent) and lived in rural settings (90 percent); although there were significant variations across regions in these characteristics with Tigray having the largest percentage of divorced and urban women. More than half of the women had no education (55 percent) and reported farm work as their occupation (59 percent). There was significant variation across regions in both characteristics with Oromia having the largest percentage of women who had completed primary school education and the largest proportion of women engaged in farm work (89 percent) whereas less than a quarter (23 percent) of women in SNNP engaged in farm work.

Table 2: Demographic Characteristics of Survey Participants						
	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Age (N = 1,857)						
18–24	10	16	15	14	14	
25–34	47	52	63	50	55	
35–44	37	31	22	28	29	
45–49	6	1	0	8	2	
Total	100	100	100	100	100	< 0.001
Religion (N = 1,860)						
Orthodox	57	23	35	93	40	
Protestant	2	44	55	0	38	
Muslim	41	31	6	7	20	
Catholic	0	0	4	0	1	
Other	0	2	0	0	1	
Total	100	100	100	100	100	< 0.0001
Marital Status (N= 1,860)						
Married	91	91	93	78	90	
Divorced	5	3	3	12	4	
Widowed	2	2	1	3	2	
Separated	0	1	2	3	1	
Never married	2	3	2	4	3	
Total	100	100	100	100	100	0.0119
Place of Permanent Residence (N = 1,860)						
Rural	83	97	91	66	90	
Urban	17	3	9	34	10	
Total	100	100	100	100	100	< 0.0001
Level of Education (N = 1,860)						
No education	61	52	57	53	55	
Read and write	13	6	4	1	6	
Primary	17	39	30	33	32	
Secondary	8	3	7	12	6	
Tertiary	1	0	1	1	1	
Total	100	100	100	100	100	< 0.0001
Employment Status (N = 1,860)						
Farm work	68	89	23	64	59	
Housewife	18	4	49	7	22	
Merchant	8	4	16	22	11	
Public servant	2	1	4	2	3	
Other	3	1	1	2	1	
Student	0	0	3	0	1	
Not employed	1	1	5	3	3	
Total	100	100	100	100	100	< 0.0001

Family Planning and Reproductive Health Practices

Although the study population consisted exclusively of women who had used Implanon as a family planning method in the past three to six years, at the time of the survey, only 68 percent of women surveyed were

currently using family planning of which 40 percent were using injectables and 50 percent were using Implanon (Table 3). Across the regions, there were no significant differences in the percent of women using family planning generally although the differences in the percent of women using Implanon were borderline significant at the $p < 0.10$ level.

Table 3: Current Use and Method of Family Planning (n=1,786) [a]						
	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Currently using FP	73	72	63	63	68	0.2600
IMPLANON®	42	62	42	44	50	0.0894
Other Implant	2	4	3	0	3	
Injectable	49	29	48	49	42	
Pills	4	3	4	7	4	
IUD	2	3	3	2	3	
Condom	1	0	0	0	0	
Calendar	1	1	0	0	0	
Other	0	0	2	0	1	

[a] Percents can add to greater than 100% since participants were able to choose more than one method of family planning.

Implanon Use

According to survey results, the main reason women chose to get Implanon was for spacing between pregnancies (81 percent) and there were no significant differences across the regions in the reasons reported for getting Implanon (Table 4).

Table 4: Reasons Given for Getting Implanon (N = 1,859)						
	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Spacing	86	81	79	86	81	
No more children	15	19	19	11	18	
Other	3	< 1	2	2	1	
Total	100	100	100	100	100	0.4242

Almost all of the women surveyed reported that they were told when the Implanon should be removed and where to have it removed (96 percent and 93 percent respectively). Three-fourths reported that they were informed about the use of the implant and side effects of Implanon (77 percent). The majority reported that they received Implanon at a health post (62 percent) (Table 5). There were significant differences at the $p < 0.05$ level across regions in the percent of women who reported each of these characteristics. Most notably, there were significant regional differences in the percent of women who had their Implanon inserted at a health post, ranging from 39 percent in Oromia to 85 percent in Amhara, and the percent of women who were informed about use and side effects of Implanon, 68 percent in SNNP to 87 percent in Tigray.

Table 5: Characteristics of Implanon Insertion and Counseling						
	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Where Implanon was inserted (N= 1,860)						
Health post	85	39	81	58	62	
Health center	15	61	19	42	38	
Total	100	100	100	100	100	0.0059
Informed about use and side effects of Implanon (N= 1,856)						
Yes	84	80	68	87	77	
No	13	20	31	12	22	
Can't remember	3	< 1	1	1	1	
Total	100	100	100	100	100	0.0005
Told when Implanon should be removed (N = 1,860)						
Yes	97	96	94	98	96	
No	1	4	5	1	4	
Can't remember	1	< 1	1	< 1	< 1	
Total	100	100	100	100	100	0.0447
Advised where to have Implanon removed (N = 1,857)						
Yes	97	91	93	97	93	
No	3	9	7	3	7	
Can't remember	< 1	< 1	< 1	< 1	< 1	
Total	100	100	100	100	100	0.0122

Implanon Training

When asked to recall the training they received on Implanon insertion, many service providers indicated their training included pre- and post-insertion instructions and techniques. Some respondents also mentioned receiving training around the benefits, risks and side effects of Implanon though it is unclear as to whether, or how frequently, this information was communicated to Implanon users.

"Before inserting the Implanon, we should inform the mothers about the side effects. We inform the mothers that, sometimes they may feel headache, bleeding, etc. after they take it. We also advise them to visit a health institution earlier if they had heavy bleeding. This was included in the training. We have been told also that Implanon removal will be performed in health center. We could not perform removal in health post. They told us about the conditions in pre-insertion and post-insertion" (Tigray in depth interview [IDI] participant)

Implanon Acceptability

Service providers interviewed were asked if Implanon was accepted among women, men and the community. Although explanations of acceptability were not clearly defined, several service providers indicated some willingness of women and/or the community to use Implanon.

"In previous times our community's Implanon acceptance was poor due to lack of awareness... but nowadays awareness creation has been done among the women and it has good acceptance in our community" (Oromia IDI participant)

The service providers reported that Implanon was generally accepted among many women receiving Implanon services at their respective health facilities and mostly accepted among men and the general community.

"Today the attitude of husbands is not the same as the previous time. Now the couples come together for contraceptive services. Husbands support the removal when there is a complaint from the woman." (Amhara IDI participant)

Lack of acceptability, however, seemed mostly associated with reports of other preferred contraceptives or complaints surrounding Implanon, particularly side effects.

"they prefer injection (DEPO). Most women prefer it since DEPO doesn't cause bleeding like Implanon. There are also women who need to increase their weight, claiming DEPO helps for weight gain" (Oromia IDI participant).

Implanon Availability

In addition, service providers were asked if Implanon was always available at their facility. Some respondents indicated that Implanon was generally available, but acknowledged instances in which Implanon provision was interrupted. In general, in Tigray, Oromia and Amhara the majority of the service providers indicated that Implanon was always available.

"Yes, Implanon is always available in our health post. We only had experienced shortage of Lidocaine in the last month" (Tigray IDI Participant).

For SNNPR, most of the service providers indicated that Implanon was not always available in their health facility, however. Stock-outs in all regions seemed mostly associated with poor planning for stocking Implanon or other materials either at the local level or at the larger health center/distribution level. This included local clinics' poor timing in requesting additional stock, or underestimating the amount of Implanon to request at a given time. Rarely, were stock outs reported as being due to high demand of Implanon.

"… there is stock out rarely, I observe our weakness to make timely check whether sufficient Implanon is available or not besides that it also disappears at health centers too" (SNNPR IDI participant).

Implanon Removal

Of the respondents, 61 percent of the women surveyed kept the Implanon inserted as prescribed, 17 percent removed early and 21 percent had either kept Implanon longer than 36 months (1,095 days) or still had it inserted (Table 6). This varied slightly across regions with SNNP having 23 percent who kept Implanon longer than 36 months followed by Oromia (15 percent), Amhara (17 percent) and Tigray (9 percent). These differences were borderline significant at the $p < 0.10$ level.

Table 6: How Long Ago was Implanon Inserted (N= 1,860) [a, b]						
Months	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Less than 6 months	< 1	< 1	< 1	1	1	
6–11 months	2	< 1	1	1	1	
12–23 months	6	6	5	7	5	
24–35 months	12	6	14	13	10	
36 months	58	69	53	64	61	
Greater than 36 months	17	15	23	9	17	0.0710
Still inserted [b]	4	4	4	4	4	
Total	100	100	100	100	100	

[a] This number includes two participants who reported that their Implant was missing.
[b] Still inserted refers to women whom we interviewed who had not removed the implant at the time of the interview.

Women gave different reasons for keeping Implanon longer than the recommended 36 months (Table 7). The main reasons given were either the service provider not being available on the day of their visit (32 percent) or not knowing their removal date (28 percent). Time and distance were also commonly reported barriers to removal (13 percent and 10 percent respectively). Notably, the percent of women who reported that their service provider refused or was unable to perform the removal or that they did not have the time or forgot or did not know their removal appointment date varied across regions. It is not clear why providers refused to remove this implant, however, this could have been due to a provider or supplies not being available at the clinic at that time or for other reasons that were not clear to the client. The highest percentage of women who reported that their service provider refused to perform the service (9 percent) was in Oromia. Women in this region were also more likely than women in other regions to report they did not have time to get their implants removed (29 percent). Women in SNNP were more likely than women in other regions to report forgetting or not knowing their removal appointment date (41 percent) with as little as 11 percent of women in Tigray reporting this as reason for late removal. Finally, while over a third of women in Tigray were reported distance to the health facility (33 percent) as the reason for keeping their implant in more than 36 months, less than 1 percent of women gave distance as a reason for late removal in SNNP.

Table 7: Reasons Given for Late Removal (greater than 36 months) (N = 276) [a, b]						
Reasons	Amhara %	Oromia %	SNNP %	Tigray %	Total %	p-value
Forgot or did not know removal date	18	17	41	11	28	0.0065
Service provider unavailable during visit day	36	35	30	18	32	0.7202
Service provider unable to perform removal [a]	1	9	4	3	5	0.1659
Service provider refused to perform service [a]	3	9	2	3	4	0.0361
Time	4	29	2	20	13	<0.0001
Distance [a]	9	19	< 1	33	10	<0.0001
Fear [a]	< 1	6	0	6	2	0.0006
Transportation [a]	0	0	2	2	< 1	0.2309
Cost [a]	0	0	0	1	< 1	0.1848
Other reason	28	21	27	12	24	0.7408

[a] Due to small expected cell counts for this variable, we used Fisher's Exact Test, which does not account for sampling design. Otherwise Rao-Scott Chi Square Test was used.
[b] Percents can add to greater than 100% since participants were able to choose more than one response.

Five percent of survey respondents reported still having their Implanon inserted although it was past the removal date. The calculated days past removal date ranged from five to 1,377 days. These women gave various reasons for not having had their Implanon removed yet including that they were planning to get it removed soon (23 percent), barriers on getting it removed (14 percent), did not know removal date (22 percent) and miscellaneous other reasons (41 percent) (Table 8). There were no significant differences by region for these reasons. Some of the common barriers mentioned by participants who still had Implanon inserted were fear, time and service provider unavailable during the visit day.

Table 8: Reasons for Not Removing among Those Who still had Implanon Inserted (N = 92)[a, b]

Reasons	Amhara %	Oromia %	SNNP %	Tigray %	Total %	Chi-Square p-value
Did not know removal date	15	15	28	34	22	
Barrier to getting it removed	22	21	2	16	14	
Other reason	20	31	71	19	41	
Planning to get it removed soon	43	34	0	32	23	0.7365

[a] These are women who still had Implanon inserted at the time of the interview.
[b] Percents can add to greater than 100% sinces participants were able to choose more than one response.

Survey respondents who had their Implanon removed early, on time or still had it inserted were also asked if they had faced any barriers to getting to the Implanon removed. Of the participants who had it removed early or on time, 37 percent of these women reported that no service provider had been available when they went to have it removed and 22 percent mentioned distance to a facility as a barrier to removal (Table 9). Twenty-four percent indicated that service providers had refused to perform the removal service. Again as mentioned above, it is difficult to know exactly why the services were refused. It could have been due to the absence of a provider or supplies that was not communicated to the client. Notably the percent of women who reported that a service provider had refused to perform the removal service was the only reported barrier that varied significantly by region with as much as 43 percent of women reporting this as a barrier in the Oromia region and as little as 8 percent of women reporting it as a barrier in SNNP.

Table 9: Barriers to getting to the health facility for removal of Implanon for those who had it removed early or on time (N = 342[a])[b,c]

Reasons	Amhara %	Oromia %	SNNP %	Tigray %	Total %	p-value
Service provider unavailable during the visit day	28	31	51	29	37	0.1006
Service provider unable to perform removal	4	3	11	3	6	0.5592
Service provider refused to perform removal	31	43	8	24	24	0.0197
Time[b]	7	0	2	3	3	0.0652
Distance	18	22	17	43	22	0.2849
Fear[b]	8	1	6	6	6	0.6244
Transportation	8	4	11	12	9	0.6733
Cost[b]	1	0	6	0	3	<0.0001
Other[a]	6	6	16	6	10	0.2336

[a] 23% (342/1,492) of women who had their Implanon removed early or on time reported facing barriers getting it removed.
[b] Due to small expected cell counts for this variable, we used Fisher's Exact Test, which does not account for sampling design. Otherwise Rao-Scott Chi Square Test was used.
[b] Percents can add to greater than 100% since participants were able to choose more than one response.

In bivariate logistic regression analyses (Table 10), participants who had some level of education (p = 0.018), were married (p = 0.033) and had their Implanon inserted at a health center (p = 0.0003) were significantly less likely to have kept their Implanon in for more than 36 months. Alternately, participants who reported that they did not have a service provider available (p < .0001), their service provider was unable to remove the Implanon (p = 0.0024), they did not have the time to get the implant removed (p < .0001) or that the distance to a facility to get the implant removed was too great (p = 0.0016) were significantly more likely to have kept their Implanon in for more than 36 months. When all of the factors with a significant bivariate association at the p < 0.05 level were added to a multivariate logistic regression model (Table 10), all of these variables, with the exception of having an education and the service provider being unable to remove the implant, continued to have a significant association at the p < 0.05 level with having kept the Implanon in for more than 36 months.

Table 10: Unadjusted and Adjusted Odds Ratios of the Relationship between Factors Hypothesized to have an Impact on having kept the Implanon Inserted more than the Recommended 36-month Timeframe. (N = 1,842) [a]

	Unadjusted Odds Ratio	(95% CI)	p-value	Adjusted Odds Ratio	(95% CI)	p-value
Demographic Characteristics						
Peak fertility years (ages 20–34)	1.05	0.62–1.77	0.8517			
Having education	0.68	0.50–0.93	0.0180	0.88	0.61–1.27	0.4799
Doing farm work	0.71	0.40–1.24	0.2157			
Orthodox religion	0.95	0.51–1.76	0.8576			
Married	0.68	0.47–0.97	0.0330	0.43	0.27–0.68	0.0006
Urban	0.81	0.45–1.45	0.4707			
Service Provider and Facility Issues						
No service provider available on visit day	10.17	4.74–21.80	<.0001	11.88	5.86–24.07	<.0001
Service provider refused to perform removal	1.05	0.44–2.49	0.9089			
Service provider unable to remove	5.40	1.88–15.49	0.0024	2.16	0.36–12.99	0.3923
Was advised where to have it removed	1.09	0.39–3.10	0.7861			
Place inserted was health center	0.40	0.25–0.64	0.0003	0.41	0.26–0.65	0.0004
Other Barriers to Removal						
Fear of getting it removed	2.21	0.47–10.37	0.3048			
Time needed to get removed	45.11	13.95–145.08	<.0001	69.42	19.58–246.16	<.0001
Distance to go to get removed	3.94	1.74–8.93	0.0016	3.10	1.23–7.84	0.0179
Transport needed to get removed	1.85	0.69–4.92	0.2130			
Cost	3.64	0.91–14.52	0.0668			

[a] The variable "forgot or did not know removal date" was not added to the logistic regression because this variable was not asked in a consistent way across all study participants.

Service Providers' Perspectives on Removal

In the interviews, service providers were asked to indicate whether or not they believed (or observed) that clients were having Implanon removed as instructed at the time of having Implanon inserted. Service providers were subsequently probed to provide their response in terms of whether Implanon removal was occurring on time, early or delayed/late. When describing women who removed Implanon on time, or "as prescribed," service providers sometimes described techniques utilized by HEWs and/or the clients themselves, such as reminding clients of the removal date or ensuring someone in the family can read the appointment card if the client cannot read. Similarly, indications of late removal were often related to actions or behaviors associated with either the clients, the HEWs/providers or both.

Service providers observed many of the same reasons reported by the survey participants for women not returning to have Implanon removed on time. In addition to noting that women forget their removal date and have issues with the inaccessibility of the removal clinic, providers also indicated that some women complained that when they did arrive on time removal sites lacked trained staff to remove Implanon.

"And the common reason for post removal is being not knowledgeable /informed when the appointment date will be. They also drop the appointment card. If once they drop the appointment card, they fear to come immediately and communicate with us at health post" (SNNPR IDI Participant).

"The health professionals delay them (make them come on other days) due to work overload. The clients are not 100 percent satisfied in the health centers with their expectation" (Tigray IDI Participant).

"For late removal, the main reason was the problem of lack of adequate numbers of health professionals trained on Implanon removal. Besides, sometimes the trained ones also may not be around and women suffer frequent visits. Women are worried when the Implanon stays unremoved after three years of use; however, some proceed as if it will still prevent pregnancy" (SNNPR IDI Participant).

Many service providers (n=28) interviewed also indicated that some clients were removing Implanon early due mainly to Implanon side effects.

"heavy bleeding, allergy like itching, weight gain and melasma are the reasons raised by the users" (Tigray IDI Participant).

Twelve service providers also observed that an early removal of Implanon was due to a woman's desire for pregnancy and six of them mentioned it could be due to pressure from their husbands.

"Generally, the reasons for early removal include: side effects like bleeding, Their husband became aware of it and forced them to remove, [or] They want to give birth" (Tigray IDI Participant).

Many service providers (n=25) indicated that clients were removing Implanon on time or "as prescribed." According to some providers interviewed, timely removals were facilitated by reminders given by either service providers or women themselves.

"Mothers have an appointment card with them to follow the date of removal for Implanon. I also have a copy of the removal dates for all the mothers who have inserted Implanon in the family planning registration. When I went in to site, I took the list of mothers whose removal date was approaching to remind them about the removal

date; however, the mothers also ask me whether their date of removal is approaching or not" (SNNPR IDI Participant).

A little over half (n=22) of the service providers indicated some clients were delayed/late in Implanon removal and that these delays were due largely to clients' forgetting their appointments.

"The main reason for removing earlier than the recommended period is unusual bleeding Implanon causes and the main reason for coming later is forgetting their appointment date" (Oromia IDI participant).

When asked about complaints they have heard regarding Implanon use within their region, service providers indicated hearing complaints associated with Implanon removal services as well as Implanon itself. Of these complaints, most complaints described were associated with Implanon itself and these were mostly related to side effects of the contraceptive method.

"the clients are complaining about unusual bleeding during menses, arm pain at the insertion site and the users are always complaining about not being able to performing their routine work" (Oromia IDI participant).

When asked specifically if there were some accessibility issues to removal over half of the service providers interviewed mentioned some accessibility problems. This is primarily due to lack of supplies or trained staff at the facility on the clients' day for removal.

"…Yes, Some clients couldn't access the service at health center when they needed. It is due to the shortage of trained providers. Only one health provider who received the training is working in our health center. If he is absent from health center due to various reasons, the removal service is not functional" (Oromia IDI participant).

Recommendations from Service Providers

In the key informant interviews, service providers were asked what they would recommend to improve Implanon services delivery. Many of the respondents (n=27) recommended providing removal training to HEW and many mentioned providing refresher training.

"The government should train enough health professionals in both insertion and removal of Implanon, especially the health extension workers" (Tigray IDI participant).

"What is needed to be improved is, there are individuals who had training on Implanon insertion in 2009; on the other hand we had training recently in 2014. This training must be refreshed every time. Skill/knowledge may be forgotten from time to time so it should be refreshed from time to time" (Oromia IDI participant).

Regarding recommendation for service provision, a lot (n=28) of the respondents recommended providing services (particularly removal of Implanon) at the health posts.

"It will be very nice if health extension workers received training on Implanon removal in addition to Implanon insertion and able to provide the service at the health post level, which avoids users' long distance walking by foot to access the service at the health centers" (Oromia IDI participant).

Some service providers (n = 12) noted that health workers and government should improve, or make concerted efforts to maintain, supply of Implanon or other materials necessary to provide Implanon services.

"What is needed to be done from the government side is assuring adequate materials supply. There are many materials that are needed for Implanon insertions; table must be available and there should be a comfortable couch to work on" (Oromia IDI Participant). "… Ensure adequate supplies" (Amhara IDI Participant).

Many of the service providers (n = 26) also recommended improving community awareness as a way to improve Implanon uptake.

"*Additionally, media coverage on long term methods to increase awareness should be done. For example, IUCD has got some coverage but I did not see any media coverage about Implanon" (SNNPR IDI participant).*

"Rather than coming repeatedly to the health post for short acting it is better to take Implanon, therefore, emphasis should be given to providing adequate information to the community to raise public awareness about Implanon" (Amhara IDI Participant).

DISCUSSION AND RECOMMENDATIONS

Providing community-based health services in Ethiopia has helped the FMOH to scale up long-acting family planning. Implanon insertion by the HEWs is major part of this scale up and the majority of women participating in this study reported that they received Implanon at a health post by a HEW (62 percent). There were, however, significant regional differences in the percent of women who had their Implanon inserted at a health post, ranging from 39 percent in Oromia to 85 percent in Amhara. The majority of the women who participated in this study were also from rural areas (90 percent), therefore, were more likely to have had difficulty accessing a health center. Encouragingly, almost all of the women surveyed reported that they were told when the Implanon should be removed and where to have it removed (96 percent and 93 percent respectively). Despite having received this information, however, only just over half (61 percent) reported having had it removed on time (i.e., three years post-insertion), and 21 percent reported having kept it longer than prescribed (17 percent longer than 36 months and 4 percent still had it inserted at the time of the survey).

In terms of identified barriers to timely removal, results of our multivariate analysis indicate that the absence of service providers at the time of their visits and the distance needed to travel to a facility for the removal were key barriers to women having their Implanon implants removed in a timely fashion. The multivariate model also demonstrated that unmarried women and women who had their Implanon inserted at a health post were more likely to be delayed in getting their Implanon removed. Service providers similarly recommended providing removal of Implanon at the health posts.

In the survey, over a quarter of women who reported a barrier to removing their implant (32 percent in Table 7 and 37 percent in Table 9) reported that when they went for removal services the providers were unable to remove their Implanon. Service providers noted that this inability to provide removal services was due in large part to stock outs of appropriate supplies. Women and service providers also indicated that barriers for late removal were women forgetting their removal date or not having the time to get the implant removed.

Our study was not without limitations. For one, we had difficulty obtaining an accurate sampling frame of woredas that had started providing Implanon at the community level three to six years prior to the study. The lists of woredas that we obtained from the regional health bureaus were not always accurate. Heavy rains washed out some roads and bridges thus making some sites inaccessible and in a few instances, the sites did not have enough clients that met the study eligibility criteria. Under all of these circumstances, we had to select new sites. We maintained a detailed list of sites and reasons for changes. Another challenge we faced was security issues that arose in Amhara during the course of the study and curtailed our data collection in that region. As a result, we were only able to collect data in 10 woredas in Amhara instead of 12. Therefore, the precision in the Amhara data are slightly reduced. Finally, as with any study that relies on respondents' recollection of events that occurred in the past, there is always a concern about potential recall bias. We have no reason to believe that issues with recall rendered our survey particularly challenging for any of the survey participants, however, nor that recall biases would have affected any portion of our population differentially.

Based on the key findings from the survey and in-depth interviews, the study team developed the following recommendations to address and alleviate identified barriers to implant removal.

- Expand access to Implanon removal services by training HEWs on removal as well as insertion.
- Schedule health center staff to regularly come to the health posts on specific days for removal services.
- Develop staff scheduling strategies so that trained health workers are always available for removal services. These strategies could include training more health providers on removal services to ensure proper coverage when someone is out.
- Give additional counseling around the need for implant removal to unmarried women who receive an Implanon insertion.
- Upgrade the health posts to accommodate removal services with trained staff and appropriate supplies.
- Improve supply chain management to ensure that there are no stock-outs of supplies needed for removal services.
- Develop strategies to ensure women know their removal date, such as HEWs giving regular reminders or developing new tools that will help remind the women.
- Incorporating discussion of the removal being a quick procedure into the counseling that women will receive when they get their implant inserted.
- Offer regular refresher training on removal and insertion.