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A couple-focused, integrated unplanned pregnancy and HIV prevention program in urban and rural Zambia

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Abstract

Background—Zambia’s total fertility rate (5 births per woman) and adult HIV prevalence (11.5%) are among the highest in the world, with heterosexual couples being the most affected group. Jointly counseling and testing couples for HIV has reduced up to 58% of new HIV infections in Zambian clinics. Married women using contraceptives in Zambia have a high (20%) unmet need for family planning and low (8.6%) uptake of cost-effective long-acting reversible

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contraceptives. We present an integrated counseling, testing and family planning program to prevent HIV and unplanned pregnancy in Zambia.

Objective—To integrate effective HIV prevention and family planning services for Zambian couples.

Study Design—A three-year program (2013–2016) progressively integrated the promotion and provision of couples’ voluntary HIV counseling and testing and long-acting reversible contraceptives. The program was based in 55 urban and 215 rural government clinics across 33 districts. In the first year, a couples’ family planning counseling training program was developed and combined with existing couples HIV counseling training materials. To avoid congestion during routine clinic hours, joint counseling services were initially provided on weekends, while nurses were trained in intrauterine device and hormonal implant insertion and removal during weekday family planning services. Demand was created through mutual referral between weekend and weekday programs and by clinic staff, community health workers and satisfied family planning clients. When the bulk of integrated service training was completed, the program transitioned services to routine weekday clinic hours ensuring access to same-day services. Performance indicators included number of: staff trained, clients served, integrated service referrals, HIV infections averted and unplanned pregnancies averted.

Results—A stepwise approach trained high-performing service providers to be trainers, and used high-volume clinics for practicum training of the next generation. In total, 1201 (391 urban, 810 rural) counselors were trained and served 120,535 urban and 87,676 rural couples. In urban clinics, 236 nurses inserted 65,619 long-acting reversible contraceptives, while in rural clinics, 243 nurses inserted 35,703 implants and intrauterine devices. The program prevented an estimated 12,869 urban and 8279 rural adult HIV infections, and 98,626 unintended urban pregnancies. In the final year, the proportion of clients receiving joint counseling services on weekdays rose from 11% to 89% with many referred from within clinics including HIV testing and treatment services (32%), outpatient department (31%), family planning (16%) and infant vaccination (15%). The largest group (45%) of clients requesting long-acting reversible contraceptives did so after joint fertility goal-based counseling, confirming the high impact of this couple-focused demand creation approach. Remaining family planning clients responded to referrals from clinic nurses (34%), satisfied implant/intrauterine device users (13%) or community health workers (8%).

Conclusions—Integrated HIV and unplanned pregnancy prevention can be implemented in low-resource public sector facilities. Combination services offered to couples mutually leverage HIV prevention and unplanned pregnancy prevention. The addition of long-acting reversible contraceptives is an important complement to the method mix available in government clinics. Demand creation in the clinic and in the community must be coordinated with a growing supply of well-trained providers.

Condensation

We present the results of a successful program to integrate the prevention of HIV and unintended pregnancy among Zambian couples.
Introduction

In Zambia, the total fertility rate and HIV prevalence are among the highest in the world. Most HIV infections and unplanned pregnancies in Zambia occur in married or cohabiting heterosexual couples. This context calls for a two-pronged approach, addressing both HIV prevention and family planning needs of couples.

The 2018 Demographic and Health Survey indicates that, though the use of contraceptives is on the rise, married Zambian women still have a 20% unmet need for family planning. Among the married Zambian women who use modern contraceptive methods, 76% opt for short-term methods, which include male condoms, injectables and oral contraceptive pills (OCP). The uptake of long-acting reversible contraception (LARC) methods, namely the implant and intrauterine device (IUD), is still very low (8.6%) among married contraceptive users. Reasons for low uptake of LARC include shortages of family planning equipment at the facility level, inadequate training and bias in favor of short-term methods at the provider level, and concerns or misconceptions about LARC among end-users. This is despite LARC being more cost-effective than short-term methods and having superior failure rates of less than 1%.

Policy-makers have advocated integration of HIV and family planning services for couples but few large-scale programs have demonstrated successful models. Couples voluntary HIV counseling and testing (CVCT) is an effective HIV prevention strategy that increases the knowledge of partner status, reduces risky sexual behavior and prevents sexually transmitted infections. In Zambia, CVCT has been shown to reduce 58% of new HIV infections when implemented in government clinics, and the impact is sustained. Integrating CVCT with family planning services enables male involvement in the decision-making process, which could increase uptake and limit discontinuation of contraception methods.

Despite heterosexual couples being the largest risk group for HIV and unplanned pregnancy in sub-Saharan Africa, integration efforts have largely not focused on couples. In Zambia, government clinics typically offer HIV testing and family planning as stand-alone services. Integrating these services could simultaneously prevent horizontal HIV transmission between partners, unplanned pregnancy and vertical transmission from mother to child.

Here, we present the operational aspects of a program to integrate the prevention of HIV and unplanned pregnancy in 55 Zambian government clinics, and to equip these clinics to provide training to staff from 215 underserved rural areas. We will present the program’s key achievements and discuss implications for policy and practice.

Methods

Integrated HIV and Family Planning Program

From 2013 until 2016, the United Kingdom Department for International Development (DFID) funded an integrated HIV and family planning counseling program to prevent HIV infections and unwanted pregnancies in couples and women in Zambia. To implement
this program, DFID partnered with the Zambia-Emory HIV Research Project (ZEHRP)— which has been providing CVCT services since 1994\textsuperscript{21–23}— in urban Zambian government clinics across Lusaka, Southern and Copperbelt provinces (Figure 1).\textsuperscript{24} The main aims of the integrated program were to: 1) develop couples’ family planning counseling (CFPC) services and incorporate them into existing CVCT services; 2) provide clinics with two LARC methods— the Paragard copper T IUD and the Jadelle hormonal implant.

ZEHRP staff were charged with training, mentoring and monitoring and evaluation. Government clinic staff were charged with providing CVCT+CFPC and with LARC insertion and removal. Given the heavy workload in the clinics and the existing duties of government staff, these services were provided when staff were off duty from their government job and the project paid them the equivalent of government overtime.

Community health workers (CHW) were entrepreneurs who worked for a variety of health programs but were not employed by the government. In keeping with historic reimbursement traditions, CHW were paid for each client who presented with a numbered invitation requesting CVCT+CFPC or LARC.

Additional demand creation in the clinic was provided by staff in other departments, who were not trained in CVCT+CFPC or LARC but were trained to promote the services and distribute numbered invitations as the CHW did. As staff conducted these promotions while on duty, they were paid a nominal sum for each client who responded to their invitation. Importantly, nurses and counselors were paid by the hour, and not incentivized, if clients chose to be tested or requested a LARC method after counseling. Similarly, promoters were paid for clients who attended services whether or not they chose to be tested or requested a LARC method.

**Service Provision Training**

To deliver all integrated services, ZEHRP trained staff from 55 urban Zambian health facilities in promotion and provision of couples’ HIV and family planning counseling. Based on the results of our prior research, family planning counseling was adapted from the model used by the Zambian Ministry of Health to allow the order in which methods were discussed to be determined by fertility goals expressed by couples after joint discussion,\textsuperscript{21} or by women if seen alone. In this model, for women and couples wishing to limit or delay pregnancy for at least 2 years, LARC options were mentioned first (reversing the traditional hierarchy that begins with barrier methods followed by oral contraceptive pills (OCP) and then injectables with LARC methods coming last).\textsuperscript{22} This was particularly helpful with couples as Zambian men’s knowledge about LARC methods was poor.\textsuperscript{23} For discordant couples, dual method use was emphasized with barriers methods for HIV prevention and a LARC method for added protection against unplanned pregnancy.\textsuperscript{24} Recognizing that concerns about availability of LARC removals was a deterrent to uptake, reversibility and access to trained nurses was highlighted during counseling and nurse training.

Initially, experienced ZEHRP staff conducted the trainings. High performing clinic staff were eventually offered the opportunity to become certified as trainers, and trainers of trainers in order to increase capacity as the program expanded. For both CVCT+CFPC and
LARC trainings, a critical component was practical, with brief didactic sessions lasting 2–3 days, followed by practicum supervision by ZEHRP staff. Counselors and nurses completed CVCT+CFPC training, and nurses also completed didactic and practicum LARC insertions (five of each method inserted correctly under supervision) and removals (five implant and two IUD removals completed correctly under supervision). To ensure high quality LARC skills, two senior obstetrician-gynecologists, respectively the heads of department at the University Teaching Hospital in Lusaka and the Central Hospital of Ndola personally certified LARC trainers.

During the first year of the program, CVCT+CFPC and LARC insertions and removals proceeded independently; CVCT+CFPC occurred on weekends to avoid overwhelming clinics during routine hours, while the majority of LARC clients were received in weekday family planning clinics. CVCT+CFPC clients interested in LARC were referred to weekday family planning services, and family planning providers were encouraged to refer women and their partners for weekend CVCT+CFPC.

Promotions Training

To create demand for integrated services, CHW and clinic staff received training in promotions. CHW performed door-to-door visits within their designated neighborhoods, inviting eligible couples to the nearest clinic for CVCT+CFPC and LARC. Staff in other clinic departments (outpatient, infant vaccination, antiretroviral treatment, and voluntary HIV counselling and testing) also referred eligible patients for integrated services. To further the demand for LARC, a novel promotion model was developed. Known as the “Happy Clients” model, it employed satisfied LARC clients to promote the IUD and hormonal implant to clinic attenders and CVCT+CFPC clients. Women were deemed eligible to be trained as Happy Clients if they had used a LARC method for at least six months, were satisfied with it and were planning to continue using it. Identified and willing participants were trained for one day in promotions strategies around LARC use. They accompanied nurses and counselors during clinic hours and supplemented the nurses’ LARC talks with their personal experiences.

Coordination of Supply and Demand and Progressive Expansion

Fifty-five clinics were selected to add CFPC to CVCT and to add LARC to available contraceptives. A needs assessment of essential equipment was conducted. In each district, two high volume clinics were selected, staff and promoters trained, and promotions calibrated to ensure maximum attendance without overwhelming staffing or space constraints. As the flow of patients stabilized at maximum capacity, trainees from other clinics were brought in for their practicums. Once certified, they would return to their clinics where promotions would be initiated and client attendance would increase. In this stepwise fashion, each clinic would be in a position to serve as a training center after a few months, and a snowball effect fostered dissemination.

Performance was measured in an ongoing fashion by monitoring the number of CVCT+CFPC clients per counselor, LARC insertions and removals per nurse, and written
referrals from CHW and clinic staff resulting in uptake of services. Mentoring, re-training, and training of additional promoters and providers was provided as needed.

**Transition to Weekday Services**

As clinic and promotion teams became proficient with their duties, CVCT+CFPC were transitioned into regular weekday clinic hours to ensure sustainability and facilitate same-day CVCT+CFPC and LARC. Although space to accommodate couples remained a constraint, counseling couples jointly required less time than serving two individuals.

**Training Promoters, Counselors and Nurses in Rural Clinics**

Once adequately trained, urban clinics hosted trainees from rural health facilities in areas designated by the Ministry of Health as underserved. In total, 215 health facilities in 27 underserved districts were trained to promote and provide CVCT+CFPC and LARC. Trainees record their activities in provided logbooks.

**Monitoring and Evaluation Tools**

Before the integrated program, family planning and HIV counseling and testing government clinic logbooks were separate and did not record couple level data. As the program evolved, data collection tools were developed to allow tracking of couple-focused services and of mutual referrals between CVCT+CFPC and LARC. Unique, anonymous IDs were assigned for each service and recorded in logbooks, and referral slips that were provided to eligible couples in CVCT+CFPC or LARC services.

**Infections and Pregnancies Averted**

The number of HIV infections averted by the program were calculated as described in detail by Wall et al.\textsuperscript{14} Briefly, to estimate heterosexual HIV prevention, a compartmental mathematical model was developed using HIV incidence observed in 207, 428 concordant HIV-negative and discordant couples before and after CVCT in Zambian clinics, and stratifying by ART use in the HIV-positive partner in discordant couples. To calculate perinatal HIV infections averted, we used the HIV prevalence (17%) among women in clinics, the perinatal transmission rate (5%) and the percentage of pregnancies resulting in live births (53%) in Zambia.

Unplanned pregnancies were calculated based on the difference in typical use failure rates observed in our previous cohort studies in Zambia. Specifically, the difference between LARC and OCP failure rates were used for urban women who upgraded from OCP to LARC and the same was done for injectable users and for non-method users who chose a LARC method. (Method use at the time of LARC uptake was not available for rural women and couples) (manuscript under review). We assumed that all pregnancies among women using contraception were unplanned.

**Targets**

The program’s objectives were to prevent 100,000 unintended pregnancies and 11,600 HIV infections among Zambian couples. Secondary targets were to train: 255 urban and 780 rural CVCT+CFPC counselors; and 153 urban and 272 rural LARC nurses. The project was also
expected to provide: 86,000 urban and 82,000 rural couples with CVCT+CFPC; and 48,000 urban and 35,000 rural couples with LARC.

This service program received an Emory Institutional review board non-research waiver.

Results

Achievements and Impact on Incidence of HIV and Unplanned Pregnancy

As shown in Table 1, the program exceeded training targets for CVCT+CFPC staff by 53% and exceeded LARC nurse training targets by 68%. The program surpassed the target numbers of couples receiving CVCT+CFPC and LARC services by 40% and 36% respectively. The program averted 98,626 unintended pregnancies, falling 1% short of the urban target. In addition to exceeding the target of averting 11,600 adult HIV infections, the program averted 892 perinatal HIV infections (Table 1).

Although reporting from rural trainees was less robust, we were able to confirm 87,676 couples receiving CVCT+CFPC from rural staff trained in our urban clinics. This resulted in an additional 8279 HIV infections averted. Additionally, 35,703 women received LARC from rural clinic nurses. As we lacked information about the contraceptive method women switched from (if any), we could not calculate unplanned pregnancies averted.

CVCT+CFPC Promotions and Service Delivery in Urban Clinics

Six months after the initiation of the program, all counselors had been trained in joint CVCT+CFPC, ensuring that all couples received the integrated counseling package. In the final months of the program, CVCT+CFPC services were gradually transitioned from weekend to weekday in the 55 participating government clinics, with 91% of clients in November 2015 hosted during the weekday (Figure 2). The sources of referral during this time changed markedly, with 15% of clients referred by a clinic-based staff member in January 2015 increasing to 88% in November 2015, and corresponding referrals from CHW decreasing from 85% in January to 12% in November. Among clinic departments, the sources of referrals included HIV testing and treatment services (32%), outpatient department (31%), family planning (16%), and infant vaccination (15%). Referrals varied widely by district (Figure 3).

LARC Service Delivery in Urban Clinics

LARC clients included those who were not using a modern non-barrier contraceptive method as well as those ‘upgrading’ from OCP or injectable hormonal contraception. The proportion of these gradually shifted over time: in the first year, 55% were non-method users, 28% were injectable users and 17% switched from OCP to LARC (Figure 4). In the last year, corresponding percentages were 43% non-users, 33% injectable users, and 23% OCP users (Figure 4). The increase in LARC insertions over time was not linear (Figure 5). The best fit to the data is with the power trend line, reflecting a steady increase in acceleration of insertions over time.
Integration and Mutual Referrals between CVCT+CFPC and LARC in Urban Clinics

In the last year of the program when transition of all services to weekdays was underway, 45% of LARC clients had been referred from CVCT+CFPC. Nurses (34%), happy LARC clients (13%) or CHW (8%) referred additional LARC clients. To illustrate the impact of mutual referral between the services, the proportion of CVCT+CFPC clients who reported already having a LARC method increased from 4% at the beginning of the program to 21% in the last quarter.

COMMENT

Principal Findings

Results show that the program successfully integrated CVCT+CFPC and LARC services in urban and rural government clinics in Zambia. The program exceeded all training and service provision targets, and surpassed its key objectives of adult HIV infections and unplanned pregnancies averted. Furthermore, the rate of increase in LARC insertions was more exponential than linear, reflecting efficient expansion. This shows the critical need for demand creation, and the significance of thorough and practical training for nurses and counselors. Our findings demonstrate that all of these elements can be crafted into a feasible and impactful integrated HIV and unplanned pregnancy prevention program delivered in front-line government clinics in resource-constrained areas of Africa.

Results

From the literature and from WHO Guidelines,\textsuperscript{26} we know that CVCT on its own is an effective HIV prevention intervention,\textsuperscript{14,27} and that fertility goal-based counseling can increase the uptake of LARC methods among couples.\textsuperscript{28} When integrated in our three-year program, CVCT+CFPC and LARC averted an estimated 12,847 urban and 8,279 rural HIV infections and 98,626 urban unplanned pregnancies. This achievement was due to a combination of factors. Firstly, ZEHRP employed a snowball approach that trained counselors and nurses a few clinics at a time, and used high performers from earlier clinics to train peers from subsequent clinics. This gradual expansion strategy ensured that any eventual demand created for integrated services would be met by a steady supply of well-trained providers. Once government staff was adequately trained in integrated service provision, clinics transitioned from off-duty weekend CVCT+CFPC to routine weekday service provision.

Demand creation was a vital aspect of the program’s success, complementing the training of integrated service providers with promotion of services in communities and clinics. Most of the demand creation literature has highlighted the role that community workers and social influence networks play in promoting CVCT.\textsuperscript{29,30} In Rwanda, CHW were shown to increase demand for LARC.\textsuperscript{31} In our integrated program in Zambia, CHW and clinic-based counselors distributed invitations that resulted in clients receiving CVCT+CFPC and LARC. This shows that integrated sexual and reproductive health services can be successfully promoted at the community and facility levels.
Also at the facility level, Happy Clients created demand for LARC. Research in Zambia shows that fears and misconceptions around side effects from LARC can discourage uptake.\textsuperscript{5} Hence, having LARC users describe their experience with the IUD and implant – including the presence (if any) or severity of side effects – could have eased potential concerns about the methods. Furthermore, Happy Clients were women who lived in the same communities and attended the same family planning clinics as the women with whom they shared their experiences of using LARC. Thus, in relation to the undecided women they spoke to about LARC, there was less of a hierarchical barrier, which may be present when medical professionals deliver information.

No LARC program can ignore the potential for coercion by health care staff or male partners. Our program did not incentivize providers for couples’ tested or LARC methods inserted. Training emphasized that the goal of joint HIV and family planning counseling is to encourage dialogue, facilitate negotiation of mutually acceptable plans and provide the skills and tools to enact those plans. In the rare cases when one partner wanted HIV testing or a LARC method while the other did not, counselors were trained to send the couple home to discuss further and advised of clinic hours when services would be available. In particular, under no circumstances would a LARC method be inserted without full cooperation from the woman client. Conversely, if a woman wanted LARC despite her husband’s lack of endorsement, she could return at any time and request a method as the man’s permission was not required.

**Implications for Policy and Practice**

In collaboration with ZEHRP and other partners, the Zambian Ministry of Health adapted its data collection tools in the provider-initiated HIV counseling and testing, and family planning departments. Government-approved logbooks nationwide now include couple level indicators to allow integration of CVCT+CFPC and family planning services to be captured and monitored. This achievement can serve as an example for ministries of health in other sub-Saharan African countries where heterosexual HIV transmission is high and LARC uptake is low.

**Strengths and Limitations**

Government health facilities in sub-Saharan Africa regularly encounter stock-outs that hinder service provision.\textsuperscript{32–35} During the first year of our program, LARC services were hampered by the unavailability of gynecology examination tables, autoclaves, implants, IUDs and insertion kits in all clinics. ZEHRP addressed this issue by procuring the necessary equipment for its affiliated clinics.

Unlike previous studies in Africa, our program did not interview couples who had received integrated services to find out their views on service quality.\textsuperscript{36–38} Indicators on client satisfaction would have allowed us to better measure integrated service quality vis-à-vis waiting times, privacy, information received, provider friendliness and services received.

Data reporting in rural clinics was often hindered by untimely and incorrect submission of reports by undertrained clinic staff. To counteract this, ZEHRP oriented rural district health
managers to better track CVCT+CFPC and LARC services in their respective districts. This
collaboration strengthened the reporting of key program indicators in underserved areas.

Despite its limitations, the program was able to build capacity on a large scale among
Zambian community and health workers to promote and provide an integrated CVCT+CFPC
and LARC package. The program was well received and highly impactful. In low resource
settings such as Zambia, growing local capacity can reinforce health systems in their effort
to combat HIV infection and unplanned pregnancy.

Conclusions

In an endemic HIV setting with a high unmet need for family planning, our three-
year program successfully integrated CVCT+CFPC and LARC provision in urban and
rural government clinics. A well-coordinated supply and demand strategy, which trained
integrated service providers and promoters, underlined the program’s success. By providing
CVCT+CFPC and LARC to heterosexual couples, who represent the largest risk group
for HIV infection and unplanned pregnancy in sub-Saharan Africa, our program prevented
adult and perinatal HIV transmission, and unintended pregnancies. These achievements
demonstrate that it is possible to implement large-scale integrated HIV and family planning
services in low-resource settings. We appeal to policy-makers in other endemic settings to
replicate and scale-up such efforts.

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BIBLIOGRAPHY

2. UNAIDS. Miles to Go: Closing Gaps, Breaking Barriers, Righting Injustices. Geneva, Switzerland:
or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. Lancet.
5. Bellows BNM, Jaramillo L, Fanaaiyan R, Dennie M, Hardee K. Scaling Up Family Planning in
6. Stoddard A, McNicholas C, Peipert JF. Efficacy and Safety of Long-Acting Reversible


Why was the study conducted?
To integrate the provision of HIV prevention and family planning services in government clinics for couples, who are the largest risk group for HIV infection and unplanned pregnancy in sub-Saharan Africa.

What are the key findings?
The program trained 1,201 healthcare workers to provide integrated HIV and family planning counseling services with access to long-acting reversible contraceptives. A promotions strategy in clinics and surrounding communities created demand, which reached 208,211 couples and prevented an estimated 21,148 adult HIV infections, 98,626 unintended pregnancies, and 892 perinatal HIV infections.

What does this study add to what is already known?
This was a large-scale, couples-focused program in sub-Saharan Africa, which systematically combined HIV and unplanned pregnancy prevention with access to long-acting reversible contraceptives. The program confirmed that coordinating demand creation with a steadily increasing supply of trained service providers resulted in a feasible, sustainable program.
Figure 1:
Administrative map of Zambia
Figure 2:
Transition of CVCT+CFPC service provision from weekends to weekdays

Feb 2015:
To ensure the sustainability of the program, ZHHP began to integrate CVCT+CFPC with weekday service provision in various departments. By the end of 2015, the majority of clients were being served during weekdays.
Figure 3:
Proportion of clinic services’ referrals resulting in uptake of CVCT+CFPC by urban district
Figure 4:
Proportion of users switching to LARC from injectables, oral contraceptive pills (OCP) and no previous method
Figure 5:
Number of LARC insertions during the program fitted with power and linear trend lines
### Table 1:

Urban targets and achievements of integrated program to prevent HIV infection and unwanted pregnancies in Zambian couples

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
<th>Actual</th>
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</thead>
<tbody>
<tr>
<td>Number of counselors trained in CVCT+CFPC</td>
<td>255</td>
<td>391</td>
</tr>
<tr>
<td>Number of nurses trained in LARC insertion and removal</td>
<td>153</td>
<td>257</td>
</tr>
<tr>
<td>Number of couples receiving CVCT+CFPC</td>
<td>86,000</td>
<td>120,535</td>
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<tr>
<td>Number of couples receiving LARC insertions</td>
<td>48,000</td>
<td>65,619</td>
</tr>
<tr>
<td>Number of adult HIV infections averted</td>
<td>11,600</td>
<td>12,869</td>
</tr>
<tr>
<td>Number of unplanned pregnancies averted</td>
<td>100,000</td>
<td>98,626</td>
</tr>
</tbody>
</table>

CVCT= couples voluntary HIV counseling and testing; CFPC= couples family planning counseling

LARC= long-acting reversible contraception
Table 2:
Rural targets and achievements of integrated program to prevent HIV infection and unwanted pregnancies in Zambian couples

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of counselors trained in CVCT+CFPC</td>
<td>780</td>
<td>810</td>
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<tr>
<td>Number of nurses trained in LARC insertion and removal</td>
<td>272</td>
<td>243</td>
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<tr>
<td>Number of couples receiving CVCT+CFPC</td>
<td>82,000</td>
<td>87,676</td>
</tr>
<tr>
<td>Number of couples receiving LARC insertions</td>
<td>35,000</td>
<td>35,703</td>
</tr>
<tr>
<td>Number of adult HIV infections averted</td>
<td>11,600*</td>
<td>8,729</td>
</tr>
</tbody>
</table>

* Joint target for urban and rural clinics, therefore it was achieved.

CVCT= couples voluntary HIV counseling and testing; CFPC= couples family planning counseling
LARC= long-acting reversible contraception