Impact of Integrated Family Planning and HIV Care Services on Contraceptive Use and Pregnancy Outcomes: A Retrospective Cohort Study

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Objective: To determine the impact of routine care (RC) and integrated family planning (IFP) and HIV care service on family planning (FP) uptake and pregnancy outcomes.

Design: Retrospective cohort study conducted between October 10, 2005, and February 28, 2009.

Setting: United States Agency for International Development—Academic Model Providing Access To Healthcare (USAID-AMPATH) in western Kenya.

Subjects: Records of adult HIV-infected women.

Intervention: Integration of FP into one of the care teams.

Primary Outcomes Measures: Incidence of FP methods and pregnancy.

Results: Four thousand thirty-one women (1453 IFP; 2578 RC) were eligible. Among the IFP group, there was a 16.7% increase ($P < 0.001$) [95% confidence interval (CI): 13.2% to 20.2%] in incidence of condom use, 12.9% increase ($P < 0.001$) (95% CI: 9.4% to 16.4%) in incidence of FP use including condoms, 3.8% reduction ($P < 0.001$) (95% CI: 1.9% to 5.6%) in incidence of FP use excluding condoms, and 0.1% increase ($P = 0.9$) (95% CI: −1.9% to 2.1%) in incidence of pregnancies. The attributable risk of the incidence rate per 100 person-years of IFP and RC for new condom use was 16.4 (95% CI: 11.9 to 21.0), new FP use including condoms was 13.5 (95% CI: 8.7 to 18.3), new FP use excluding condoms was −3.0 (95% CI: −4.6 to −1.4) and new cases of pregnancies was 1.2 (95% CI: −0.6 to 3.0).

Conclusions: Integrating FP services into HIV care significantly increased the use of modern FP methods but no impact on pregnancy incidence. HIV programs need to consider integrating FP into their program structure.

Key Words: HIV care, integrating family planning services, retrospective cohort study, USAID-AMPATH partnership

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INTRODUCTION

Two-thirds of people living with HIV/AIDS reside in sub-Saharan Africa, 60% of whom are women.[1] This pattern is reflected in Kenya, where 60% of the estimated 1.4 million HIV-infected adults are women.[2] Before the era of combination antiretroviral therapy, lack of treatment increased morbidity and early mortality among HIV-infected patients.[3,4] HIV has now become a chronic illness due to availability of combination antiretroviral therapy.[5–7] With HIV-infected women living longer, there is increased need to address their family planning (FP) needs. The World Health Organization (WHO) and the United Nations regards FP as a cost-effective HIV prevention strategy and an important prong to Prevention of mother-to-child transmission of HIV/AIDS, hence their recommendation for the integration of HIV and FP services.[8–11] This recommendation was based on a cochrane review of literature on reproductive health and HIV linkages, which found that, integrating FP and HIV services was feasible.[12] The problem facing the majority of HIV care programs, in resource-poor settings however, is how to successfully provide reproductive health services including FP in a feasible, sustainable, and cost-effective manner.

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The WHO defines modern contraception to encompass the use of any of the following methods for pregnancy prevention: female sterilization, oral contraceptive pill, intrauterine contraceptive device, implants, injectable depo provera, or condoms.[13] The uptake of modern contraceptives in Kenya among married women is 39%[14] and the unmet need for FP is estimated at 24%[2] in the general population and approaches 30% among HIV-infected women.[15] It is believed that the greater unmet need in HIV-infected women is related to provider perception that infected women are unable to use many of the modern contraceptives available. Contrary to this perception, it is now known that with individualized care, HIV-infected patients can use any contraceptive method.[16,17] Studies have found that when provided with access and information about FP, HIV-infected patients increase their use of contraception.[18–23]

The WHO, World Bank, and the European Union support the integration of FP services and HIV care.[8–11] Despite this support, most HIV programs focus on HIV treatment, with little or no emphasis on FP services. Such integration is further impeded by funding restrictions[24]; separate funding for these 2 programs result in vertical organization of the 2 services. This undermines coordination between departments and limits providers' ability to address the contraceptive needs of HIV-infected patients.[25]

To address the reproductive health needs of HIV-infected women, the United States Agency for International Development—Academic Model Providing Access To Healthcare (USAID-AMPATH) Partnership (known as AMPATH hereafter) started a pilot program integrating FP services into one of its HIV clinics. We carried out an operations research study among HIV-infected women cared for within USAID-AMPATH partnership accessing integrated family planning services (IFP) and routine care (RC), to determine the impact of integrated FP services and HIV care on use of new contraceptive methods and pregnancy rates.

METHODS

Study Site and Setting

The AMPATH program[26–29]opened its initial HIV care program in 2001. At the end of February 2009, the program was caring for more than 78,000 HIV-infected adult patients (70% female) in 23 Kenya Ministry of Health facilities across Western Kenya. This study was conducted at the AMPATH Centre (Main Clinic), Moi Teaching and Referral Hospital, Eldoret, Kenya. At the end of February 2009, there were more than 17,000 adult patients enrolled in the AMPATH Centre with 65% of them being female. Within the AMPATH Centre, there are 3 clinical teams caring for adult patients. These teams function as independent practices with patients enrolled for care in 1 of the 3 teams (I, II, and III) and consistently returning for care within the same clinical team.

Nonintegrated Care Model (RC)

In the original AMPATH care model, the only FP service offered routinely in the HIV clinic is condom counseling with the primary goal of reduction of HIV transmission and not family planning. Condoms are strategically placed in the waiting bay, check in/out rooms, and consultation rooms for patients to access. Patients who need FP services beyond condom access are referred to maternal child health and family planning (MCH/FP) clinic after their appointment in the HIV clinic. The MCH/FP clinic is administrated by the departments of reproductive health and pediatrics and the HIV clinic administrated by the department of internal medicine. These departments are all independently run.

In this model, it is the patients' responsibility to ensure that they attend their FP appointment after referral from the HIV clinic. Unlike HIV care, which is provided free of charge, services in the MCH/FP clinic require a patient's co-pay. Based on this model, 2 challenges were anecdotally observed. Patients who require FP at MCH/FP had an increased burden of hospital visits. Second, there was a relative underutilization of FP services by HIV-infected patients due to the fact that getting a FP appointment is patient dependent not provider initiated.

Family Planning Services and HIV Care Integrated Model

Integration of FP services into HIV care pilot study started in October 1, 2007, in the AMPATH center clinical team I. Teams II and III continue to offer original care model type of care described above. In the integrated model, nurses experienced in offering FP services were relocated to team I HIV clinic. The Reproductive Health room is integrated into the patient flow in the HIV clinic. Some degree of independence for both FP and HIV care is maintained to ensure that the focus and specific nature of these 2 service provisions is not weaken by a complete integration. The link between the 2 services forms the integrated nature of the 2 services run under the same in charge. Services that are integrated are as follows: routine offer of same-day "one-stop-shopping" appointments with a central check in/out, the use of same patient charts, and consistent messaging. Patients are counseled in a consistent and structured manner and are allowed to make informed choices on which modern FP methods to use. The study used the WHO definition of modern FP, which is the use of any of the following methods for pregnancy prevention: female sterilization, oral contraceptive pill, intrauterine contraceptive device, implants, injectable depo provera, or condoms.[13] All FP methods except surgical sterilization are offered through the HIV clinic. Patients who request surgical sterilization are referred to MCH/FP clinic.

Study Design

This is a retrospective cohort study approved by the Moi University/Moi Teaching and Referral Hospital Institutional Research and Ethics Committee and the Indiana University School of Medicine Institutional Review Board. For the purpose of this study, exposure to IFP was defined as care within the AMPATH clinic providing integrated FP and HIV services (team I). The RC group consisted of patients receiving care in modules without integrated FP services (teams II and III).

Study Population

Adult HIV-infected women being cared for in the AMPATH Centre HIV clinic formed the study population. Patients were included in this analysis if they were aged 15–49 years at enrollment, enrolled on or after October 1, 2005, and attended 1 of the 3 clinical teams on or after October 1, 2007. Patients were excluded from this analysis if they had no follow-up visits after initial exposure or if they only had 1 visit on or after October 1, 2007.

Patients were also excluded if they were missing 1 or more of the following covariates collected at enrollment into AMPATH: years of school completed, sexual activity in the last 6 months, number of pregnancies, number of live births, number of children in household, and status of HIV disclosure. We have a relatively large cohort of several thousand patients; hence the main concern is possible bias than with precision in our inference of the effect of IFP service on contraceptive methods and pregnancy events. Therefore, we consider matching on baseline characteristics key in bias reduction. To match a patient under intervention and a control patient, we need to have complete data on baseline variables. This is the reason that we excluded patients with incomplete data.

Data Collection and Management

Data for this study was collected between October 1, 2005, and February 28, 2009. All data used in this study were derived from existing clinical data collected prospectively on encounter forms during routine patient care. All the data from paper forms were subsequently entered by trained data entry clerks into the AMPATH Medical Records System.

Data Analysis

Continuous variables are summarized as mean (standard deviation) or median (interquartile range). Categorical

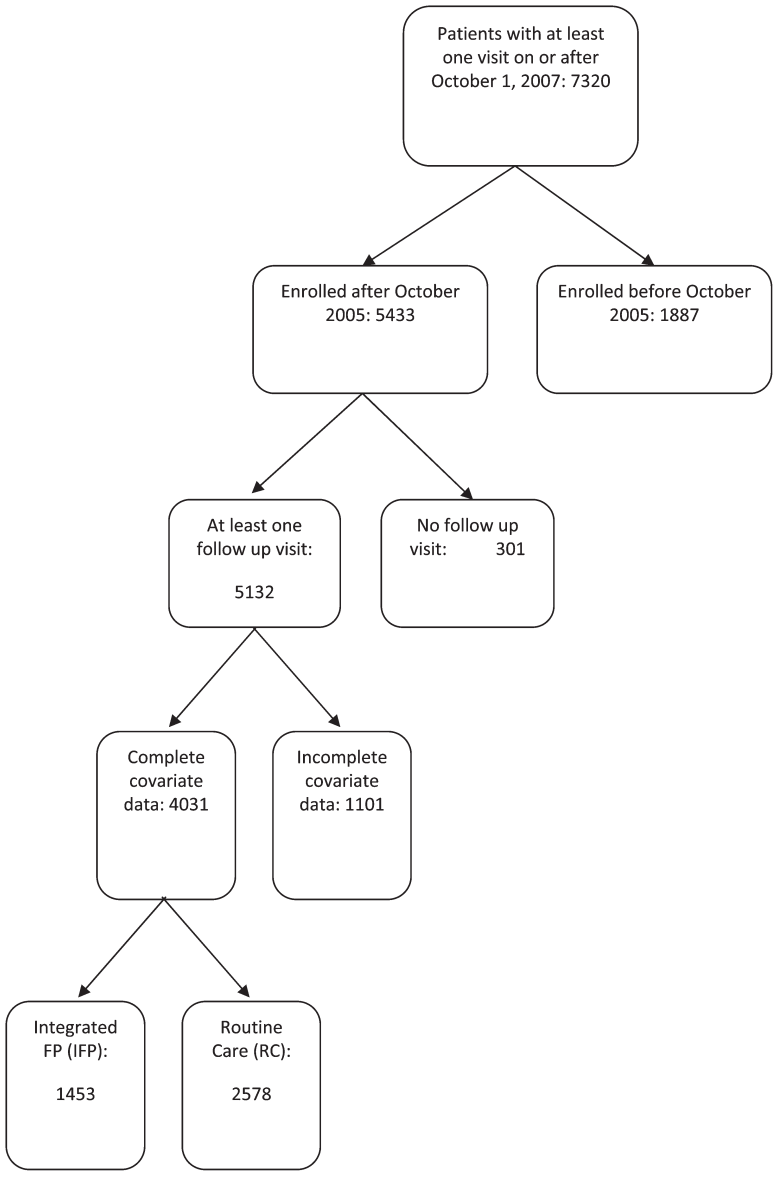

FIGURE 1. Eligibility criteria for HIV-infected women accessing IFP and RC enrolled in the AMPATH Centre, western Kenya.

TABLE 1. Characteristics of Women Accessing IFP Services and Routine Care in the AMPATH Centre Western Kenya

	Integrated FP (n = 1453)	Routine Care (n = 2578)	*P*
At enrollment			
Age (mean, SD)	32.7 (7.2)	33.4 (7.2)	<0.001*
Years of school (mean, SD)	9.2 (3.1)	8.8 (3.1)	<0.001*
Sexually active last 6 months n (%)	1015 (70%)	1640 (64%)	<0.001*
Number of pregnancies (median, IQR)	3 (2–4)	3 (2–4)	0.002*
Number of births (median, IQR)	2 (1–4)	3 (2–4)	<0.001*
Number of Children in household (median, interquartile range(IQR)	2 (1–3)	2 (1–3)	0.019*
HIV disclosed to anyone n(%)	1036 (71%)	1777 (69%)	0.120*
Partner n (%)	588(41%)	943 (37%)	0.020*
Friend n (%)	70 (5%)	134 (5%)	0.650*
Healthcare provider n (%)	22 (2%)	21 (1%)	0.060*
Family n (%)	296 (20%)	604 (23%)	0.030*
Household n (%)	14 (1%)	25(1%)	0.880*
Other n (%)	160 (11%)	207 (8%)	0.002*
Days enrolled before October 1, 2007 (mean, SD)	162 (310)	174 (303)	0.260*
At start of follow-up			
On ARV	566 (39%)	899 (35%)	0.010†
Pregnant	207 (14%)	241 (9%)	<0.001†
CD4 cells/μL (median, IQR)	329 (206–527)	330 (168–543)	0.480*

*Kruskal–Wallis Test.
†χ^2.

variables are summarized as frequency and percentages. Primary outcomes include the following: corrected estimate of differences, incidence rate per 100 person-years, and the attributable risk between those accessing IFP and HIV care service and RC in new use of FP and new cases of pregnancies.

A match-with-replacement strategy[30] was used to infer the effect of exposure (integrated FP and HIV services) by matching each exposed subject to 1 unexposed subject and each unexposed subject to 1 exposed subject on key baseline variables. We chose the method of matching to avoid parametric assumptions in conventional regression, so that bias induced by model misspecification can be reduced. The reduction in bias is at the cost of inflated variance. However, since we have a large cohort with several thousands of patients, the inflation in variance is not a big issue.

The Poisson model was used to estimate incidence rate of the primary outcomes. A *P* value (2-sided) of less than 0.05 is considered statistically significant. All analyses were conducted using SAS 9.2 (SAS Inc, Cary, NC) and *R*.

RESULTS

During the 16-month pilot period between October 1, 2007 (commencement of integrated model) and February 28, 2009, 4031 patients met the eligibility criteria for study; 1453 accessed integrated FP and HIV services (IFP) and 2578 accessed RC (Fig. 1). The mean (SD) length of follow-up was 342 (155) and 361 (147) days *P* value <0.001 for the IFP and RC groups, respectively. At enrollment, there were statistically significant differences between the IFP and RC groups in the following: age, years of school, sexual activity in the previous 6 months, number of pregnancies, number of live births, number of children in household, HIV disclosure to partner, HIV disclosure to family, and HIV disclosure to others. At the start of follow-up, there were statistical differences between the IFP and RC groups in the following: ARV status and those pregnant (Table 1). Though statistically significant, most of these differences are small and are unlikely to be clinically relevant.

After adjusting for potential confounders, among the IFP group, there was a 16.7% increase $P < 0.001$ [95%

TABLE 2. Incidence of Use of Modern FP Methods and New Cases of Pregnancies Among Women Accessing Integrated FP Services and Routine Care in the AMPATH Centre western Kenya

	Integrated FP (n = 1453)	Routine Care (n = 2578)	Incidence*	*P*	95% CI
New condom use	726 (50.0%)	942 (36.5%)	16.7%†	$P < 0.001$	13.2% to 20.2%
New FP use including condoms	791 (54.4%)	1140 (44.2%)	12.9%†	$P < 0.001$	9.4% to 16.4%
New FP use excluding condoms	65 (4.5%)	198 (7.7%)	3.8%‡	$P < 0.001$	1.9% to 5.6%
New cases of Pregnancies	112 (7.7%)	179 (6.9%)	0.1%†	$P = 0.9$	−1.9% to 2.1%

*Based on analysis that matches 1 exposure with 1 nonexposure and1 nonexposure with 1 exposure.
†Increase among those accessing integrated FP.
‡Decrease among those accessing integrated FP.

TABLE 3. Incidence Rate Per 100 Person-Years and Attributable Risk of Use of Modern FP and Pregnancies Among Women Accessing Integrated FP Services and Routine Care in the AMPATH Centre Western Kenya

	Integrated FP Incident Rate (95% CI)	Routine Care Incident Rate (95% CI)	Attributable Risk (95% CI)
New condom use	53.4 (50.7 to 56.0)	36.9 (35.0 to 38.8)	16.4 (11.9 to 21.0)
New FP use including condoms	58.1 (55.5 to 60.8)	44.7 (42.7 to 46.6)	13.5 (8.7 to 18.3)
New FP use excluding condoms	4.8 (3.7 to 6.0)	7.8 (6.8 to 8.9)	−3.0 (−4.6 to −1.4)
New cases of pregnancies	8.2 (6.8 to 9.8)	7.0 (6.1 to 8.1)	1.2 (−0.6 to 3.0)

confidence interval (CI): 13.2% to 20.2%] in the incidence of new condom use, 12.9% increase $P < 0.001$; (95% CI: 9.4% to 16.4%) in the incidence of new FP use including condoms, 3.8% reduction $P < 0.001$ (95% CI: 1.9% to 5.6%) in the incidence of new FP use excluding condoms, and no statistically significant increase in new cases of pregnancies of 0.1% increase $P = 0.9$; (95% CI: −1.9% to 2.1%) (Table 2).

The incidence rate per 100 person-years of: new condom use was 53.4 (95% CI: 50.7 to 56.0) versus 36.9 (95% CI: 35.0 to 38.8) for the IFP and RC groups, respectively, with an attributable risk of 16.4 (95% CI: 11.9 to 21.0), new FP use including condoms was 58.1 (95% CI: 55.5 to 60.8) versus 44.7 (95% CI: 42.7 to 46.6) for the IFP and RC groups, respectively, with an attributable risk of 13.5 (95% CI: 8.7 to 18.3), new FP use excluding condoms was 4.8 (95% CI: 3.7 to 6.0) versus 7.8 (95% CI: 6.8 to 8.9) for the IFP and RC groups, respectively, with an attributable risk of −3.0 (95% CI: −4.6 to −1.4), and new cases of pregnancies was 8.2 (95% CI: 6.8 to 9.8) versus 7.0 (95% CI: 6.1 to 8.1) between IFP and RC groups with an attributable risk of 1.2 (95% CI: −0.6 to 3.0) (Table 3).

The proportions of ever: used condoms, used FP including condoms, and got pregnant are 41.4%, 47.9% and 7.2% for the 4031 among study participants with complete covariates included in this analysis. Corresponding proportions for the 1101 subjects with incomplete covariates values are 34.9%, 39.7%, and 5.7%. The difference is significant for ever-used condoms and ever-used FP including condoms.

DISCUSSION

Integration of FP into HIV care model as described in this article is in accordance with recommendations by WHO, World Bank, and the European Union.[8–11] Previous studies demonstrated presence of policy commitment to such integration.[31] Few care programs have integrated FP into HIV care due to funding restrictions, separate funding, independent running of both care programs and reluctance to integrate FP into HIV/AIDS funding.[24,25,32,33] The AMPATH program has been able to demonstrate the feasibility of integrating FP services into HIV care, by providing same-day "one-stop shop care" service provision of both FP services and HIV care in its integrated model.

This study demonstrates that integration of FP services into HIV care is associated with an increase in new use of modern FP methods among HIV-infected women. Similar findings have been reported in the past.[18–22] The following factors may have led to this increase as follows: sensitivity of health care providers to FP needs of this group of patients; "one-stop-shopping" same visit service provision; accessibility and reproductive health room being part of the patient flow.

Ultimately, the goal with increased FP is a decrease in unwanted pregnancy and improved pregnancy spacing. However, we found no reduction in the incidence of pregnancy in the group accessing integrated FP services. This finding may be a result of the following 2 reasons. First, the increase in FP use in this study was driven by an increase in condom use, which is a less effective contraceptive method and prone to reporting bias. The study did not evaluate adherence to the contraceptive methods. Second, patient desires regarding whether the pregnancy was planned or unplanned was not determined due to the retrospective nature of the study.

There are 2 major limitations to this analysis: (1) enrollment to the intervention group was not randomized hence the outcomes may have been affected by possible confounding due to unmeasured factors (retrospective nature of the study) such as number of times the patients had vaginal intercourse during follow-up, adherence to contraceptive methods, differences in HIV treatment modalities, and patient desires regarding whether the pregnancy was planned or unplanned; and (2) multiple filtering steps to exclude subjects could have introduced selection bias. Examination of the outcomes between those included and excluded shows that the 4031 subjects included in the analysis tend to have higher rates of condom and FP use. Therefore, the intervention effect found for this group of patients may represent the effect of those who are more engaged in family planning instead of the total patient population.

The strength of this analysis is that, it took place in the real-world setting of a busy HIV care and treatment program. Our pilot study clearly demonstrates the feasibility of integrating FP into routine HIV care within a busy program.

CONCLUSIONS

Integrating FP services into HIV care is feasible and significantly increases the uptake of modern FP methods. No reduction in the incidence of pregnancy occurred. HIV programs need to consider integrating primary care services such as FP into their program structure.

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