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Integrating reproductive health services into HIV care: strategies for successful implementation in a low-resource HIV clinic in Lilongwe, Malawi

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ABSTRACT

Background Lighthouse Trust operates two public HIV testing, treatment and care clinics in Lilongwe, Malawi, caring for over 26 000 people living with HIV, 23 000 of whom are on antiretroviral treatment (ART). In August 2010, Lighthouse Trust piloted a step-wise integration of sexual and reproductive health (SRH) services into routine HIV care at its Lighthouse clinic site. The objectives were to increase uptake of family planning (FP), promote long-term reversible contraceptive methods, and increase access, screening and treatment for cervical cancer using visual inspection with acetic acid.

Methods and results Patients found integrated SRH/ART services acceptable; service availability appeared to increase uptake. Between August 2010 and May 2014, over 6000 women at Lighthouse received FP education messages. Of 859 women who initiated FP, 55% chose depot medroxyprogesterone acetate, 19% chose an intrauterine contraceptive device, 14% chose oral contraceptive pills, and 12% chose an implant. By May 2014, 21% of eligible female patients received cervical cancer screening: 11% (166 women) had abnormal cervical findings during screening for cervical cancer and underwent further treatment.

Conclusions Several lessons were learned in overcoming initial concerns about integration. First, our integrated services required minimal additional resources over those needed for provision of HIV care alone. Second, patient flow improved during implementation, reducing a barrier for clients seeking multiple services. Lastly, analysis of routine data showed that the proportion of women using some form of modern contraception was 45% higher at Lighthouse than at Lighthouse's sister clinic where services were not integrated (42% vs 29%), providing further evidence for promotion of SRH/ART integration.

Key message points

- Integration of reproductive health, including family planning (FP) and cervical cancer screening, into HIV care is achievable, well received by patients, and can lead to increased uptake.
- Success was based on several key steps including provision of certified FP training to HIV clinic staff, incorporation of FP services into HIV care patient flow, using multiple modalities and messages for patient education, and ensuring adequate management of other gynaecological problems.
- Success also requires implementation of a monitoring and evaluation strategy.

INTRODUCTION

As HIV care expands in developing countries, momentum to scale up comprehensive care strategies is growing. The integration of sexual and reproductive health (SRH) services, in particular, family planning (FP), into HIV clinical care is a key area of interest. Studies show that integration of FP and HIV services is feasible and results in improved behavioural and health outcomes, including increased acceptance of FP methods,¹ increased condom use,² and an expanded range of services available for people living with HIV (PLHIV).³ Governments and funding agencies agree that HIV, sexually transmitted infections (STIs) and FP services should be integrated.⁴ However, a recent review of SRH/HIV services shows that the majority of these programmes integrate only HIV testing and counselling services into existing maternal and child

health services; few programmes integrate FP/SRH into comprehensive HIV care and treatment.⁵

Despite recognition that service integration is important for patient care and that integration reinforces HIV prevention and FP goals, the literature is unclear on how best to integrate SRH and HIV services, leaving service providers with uncertainty regarding the most effective model. Although a single best model may not exist, several facilitators and challenges to service integration have been identified including: clear, written guidelines on how and what to integrate;⁶ adequate staff training and supervision; simple, low-cost interventions; on-site provision of FP; flexibility in clinic scheduling; male partner involvement; and electronic patient records.⁵ Barriers to successful integration include: long waiting times for services;⁷ user fees; staff turnover; staff burnout;⁸ stock shortages; and lack of privacy for counselling.⁹

In addition to a relative lack of guidance on how to integrate, the importance of inclusion and promotion of long-acting reversible contraceptive (LARC) methods such as intrauterine devices (IUDs) and contraceptive implants, the most effective birth control methods, is also largely missing. Although LARCs are extremely safe and considered advantageous for many individuals with HIV,¹⁰ they remain underutilised in many regions where HIV is prevalent.¹¹ Integrating and increasing uptake of LARCs require overcoming additional obstacles in training of health care workers, supply chain management, and patient education. Lastly, only a few studies examine inclusion of cervical cancer screening within their HIV-related services,^{12–14} suggesting that this critical component of comprehensive care may be overlooked despite HIV-positive women's increased risk of persistent cervical dysplasia and cervical cancer.¹⁵

In Malawi, the high fertility of 5.7 births per woman, low modern contraceptive usage (35.4%) and high HIV prevalence of 10.7%¹⁶ indicate the importance of service integration. Evidence from recent studies suggests that SRH/HIV service integration would be acceptable and desired. First, the fertility rates of women on antiretroviral treatment (ART) in urban areas are similar to those of the general population¹⁷ even though several studies found that both HIV positive men and women in Malawi desire decreased fertility after being diagnosed.¹⁸ Also, few HIV-infected women use contraception despite expressing lack of desire for more children,¹⁹ reinforcing the need for integration of FP services into HIV care.

Therefore in August 2010, Lighthouse Trust, an innovator in HIV prevention, treatment and care in Lilongwe, Malawi, piloted the integration of SRH and FP services into one of its two ART clinics, the Lighthouse Clinic (Lighthouse) at Kamuzu Central Hospital. Together with its sister clinic Martin Preuss Clinic (MPC) at Bwaila Hospital, Lighthouse Trust clinics provide free ART to more than 23 000 patients

and primary care services to over 3000 additional HIV-infected patients. Lighthouse's family-centered clinics both already provide several integrated services, including diagnosis and treatment of tuberculosis, Kaposi sarcoma and STIs; both male and female condoms are offered at every visit. Through this expanded integration initiative at Lighthouse, we aimed to assess the overall acceptance and uptake of FP methods, including LARC methods, and increase the screening for and detection of cervical cancer using visual inspection with acetic acid (VIA).

In this descriptive article we provide an overview of our efforts to integrate SRH services, including LARC and VIA, into routine ART care for HIV-infected women at Lighthouse. We present the results of our integration and share experiences from the first 2 years of implementation. We present five key lessons learned: for each, we discuss several best practices and describe our implementation of these practices at Lighthouse. A comparison of uptake of FP in women attending Lighthouse to its sister clinic, MPC, where integration was not implemented, is suggestive of increased uptake in the setting of integrated services. We hope that this information will help similar clinics in low-resource settings learn from our successes and avoid the pitfalls we encountered in our efforts. As the data used for this paper are from routine service delivery and do not contain information that can be used to identify individuals, no formal ethical review was sought.

METHODS

Integration planning

Prior to initiation of any additional services, key clinical and administrative staff met to identify overall clinic needs, citing reproductive health services as a key, largely missing, service that could greatly benefit clients. The decision was made to pilot integration at Lighthouse only, as MPC is located adjacent to an existent Ministry of Health (MoH) FP and reproductive health clinic. After identifying the need for FP and cervical cancer screening, we acquired two gynaecological couches, completed a small building remodel to create private examination and counselling rooms, and installed appropriate signs. A US\$70 000 one-time contraceptive research grant^{20 21} enabled some minimal building renovation and clinic supplies. Other FP and VIA services and training were provided without additional funding. As with other public clinics in Malawi, the MoH largely funds infrastructure and personnel costs while the donor community provides drugs and commodities.

We discussed various scenarios of patient flow and rotating provider roles to ensure input and buy-in from clinic staff. We developed detailed protocols to minimise the effect of new services on the quality or efficiency of existing services. Moreover, we developed a strategy for monitoring and evaluation (M&E)

of integration, including development and testing of forms for routine data and linking FP data with the existing, clinic-wide electronic data system (EDS). Interested readers may view a sample page from the Malawi National Family Planning Program Register (see online Supplementary Figure S1) and an example of the Lighthouse Physical Exam Form (see online Supplementary Figure S2). To ensure consistent availability of materials and commodities, we worked with the MoH to become an official site for FP distribution as part of the public health system. Lastly, we implemented a series of comprehensive FP skills trainings for all clinicians and some staff, focusing on classroom learning, practical training, and subsequent supportive supervision.

While our facility planning and medical training efforts were underway, we worked with our education team to assess how best to impart knowledge to patients. Given that the literacy rate in Lilongwe is 66.7% for women and 85.1% in men,¹⁶ we used oral, visual and written methods. We tailored counselling to the concerns and needs of PLHIV,²² hoping to further improve the use of modern FP methods, specifically LARC.

The Lighthouse integration occurred in a step-wise fashion. Prior to integration, condoms were available. We initially focused on three methods. Oral contraceptive pills (OCPs) and depot medroxyprogesterone acetate (DMPA) were familiar to Lighthouse patients and clinicians. We then added the copper intrauterine device (IUD) as this LARC method required the most initial oversight for training and initial equipment investment. In 2011, we succeeded in receiving a donation of 200 contraceptive implants to initiate implant services. After the initial implant donation, we established a supply chain for future implants with the Reproductive Health Directorate of the MoH. VIA for cervical cancer services was added in early 2012. At each step, we assessed patient and provider satisfaction, quality of services, and financial viability through our routine M&E.

RESULTS

Integration pilot

Currently, Lighthouse routinely delivers patient education sessions in clinic waiting areas. These sessions inform Lighthouse patients about in-house FP services, method options, and VIA. Lighthouse offers women OCPs, DMPA, IUDs, contraceptive implants, male and female condoms, and referrals for male and female sterilisation. Condoms continue to be promoted at every visit as dual protection for both men and women. Lighthouse's SRH services, including VIA, are fully integrated into ART care; clients who seek both services are seen by an FP/ART-trained nurse or clinician during one visit. As all clinical staff are trained and certified as FP providers using MoH guidelines, patients do not need to seek a specific

provider for integrated care. Follow-up FP/ART visits are coordinated for ease in client scheduling and to reduce patient visits.

Between August 2010 and May 2014, FP messages were provided to over 6000 women of reproductive age: 859 women were initiated on some form of modern FP at Lighthouse. Of these women, 475 (55%) chose DMPA, 165 (19%) chose an IUD, 117 (14%) chose OCPs and 102 (12%) received an implant. Overall, during the period August 2010 to May 2014, there were 4148 service provision visits for women who were either newly initiating FP methods or were continuing on FP. The average monthly workload incurred was 94 service provision visits per month.

From February 2012 to the end of May 2014, 1495 women were screened for cervical cancer using VIA, representing 21% of eligible female patients at Lighthouse. Eleven per cent (166 women) had abnormal cervical findings, demonstrating a clear previously unmet need among this patient population. Of the 166 women who tested positive with VIA screening, 39 were provided with on-site cryotherapy treatment and 106 were referred to other facilities for further treatment.

We performed a cross-sectional comparison of contraceptive prevalence rates between Lighthouse and MPC clinics using data from August 2010 and February 2013, before FP service integration was rolled out to include MPC. Lighthouse had 45% more FP users than MPC. At Lighthouse, 42% of all non-pregnant women of reproductive age were using a modern method, while at MPC the figure was considerably lower at only 29%. As VIA was not available at MPC, rates for cervical screening among patients at MPC are unavailable. Data on FP were not routinely collected before August 2010.

Lessons learned

Lesson 1: Provide certified FP training to HIV clinic staff

Adequate training for staff, including refresher training with any new service, plays a key role in integration success. Programmes must decide who will be trained in FP, based on the existing clinic structure and personnel. Important considerations are: ensure that integration does not overburden existing services and compromise quality care; employ task-shifting to better distribute workload; and provide enough education and support for staff. In many settings, it may be more efficient to have a few key staff members perform more complicated tasks such as IUD and implant fitting or sterilisations while other, lesser-skilled, staff concentrate on patient screening or counselling. When possible, use existing MoH training opportunities. Finally, prior to initiating any services at a clinic, it is important to openly discuss and dispel myths about FP with all staff, even if they may not be directly involved with FP service provision.

At Lighthouse, prior to integration, all clinicians and nurses attended MoH training followed by in-house sessions to ensure accurate and current knowledge of FP methods, provide refresher training on STI diagnostics and treatment, and help providers translate clinical information into client-appropriate language. This combination training helped ensure a consistent, correct message from all providers. Lighthouse staff also received follow-up staff refresher training including: appropriate messaging for condoms as dual protection, management of irregular bleeding after IUD insertion, appropriate FP in HIV-positive populations, and LARC-specific training. Prior to the introduction of each new service (contraceptive implants, cervical cancer screening and cryotherapy), all staff members were trained.

Lesson 2: Incorporate FP services into the HIV care patient flow

The strategy for integration must maximise the impact of new FP services while not impeding routine clinic operations, slowing the patient flow, or affecting the quality of other services offered. Prior to beginning services, clinic operations must be reviewed by a team of staff and various strategies explored. For example, all women may be triaged to the FP clinic area for some basic FP education prior to their HIV clinic visit as part of an opt-out strategy. This strategy may increase client participation but also disturb flow. Alternatively, a clinic may introduce the FP services during the ART clinic visit and direct individuals who are interested to an additional service area within the clinic, an opt-in strategy that is likely to reduce the burden on clinic operation but likely reduce FP uptake.

At Lighthouse, although all women are exposed to FP messages and made aware of all services during routine visits, only clients who express interest during their ART review are referred to the FP room. For all follow-up visits, women enrolled for FP go directly to the FP area where they also receive their standard HIV care, including ART, therefore reducing visit time. Follow-up FP/ART visits are coordinated to ease client scheduling. VIA services are received only in the FP clinic area as standard ART review rooms are not equipped to perform pelvic examinations. Lastly, in 2013 the national electronic data system (EDS) for HIV services, employed at Lighthouse and MPC, included a new module for provider-initiated screening for risk of unintended pregnancy and active promotion of FP within routine HIV care. The FP module ensures that all HIV-positive women and men of reproductive age are screened for interest in and awareness of FP. This module reinforces our integration efforts and should positively influence FP interest and uptake in the near future.

Lesson 3: Use multiple modalities and messages for patient education

Educational messages should be carefully crafted to support pregnancy prevention and simultaneously emphasise available pregnancy care for HIV-positive

women for prevention of mother-to-child-transmission (PMTCT). Also, dual-method promotion (male/female condoms together with another highly effective FP method) should be emphasised to prevent unintended pregnancy, decrease STI/HIV transmission, and reduce cervical cancer risk. Educational efforts and messaging should discuss group norms, gender and power issues, and be personalised to meet clients' needs. It is critical to avoid messages that actively dissuade HIV-positive women from choosing to become pregnant as some HIV-positive women still desire children²³ and may be fearful of discussing this intention with their health care providers for fear of negative reactions.²⁴ Specifically targeting those in stable, long-term relationships and employing different uptake strategies for men and women may be useful in increasing dual-protection acceptance.²⁵

At Lighthouse, we provide an open environment for discussion of FP issues and cancer screening through sensitisations, flipcharts and posters for both male and female patients in waiting areas. More in-depth education is available from any provider, and a specific FP counsellor is available during all clinic hours for one-to-one counselling. The multi-modality approach aims to increase understanding of the importance of FP, give an overview of the available contraceptive methods, emphasise dual-method use, stress the importance of cancer screening, provide support for those who desire children, and promote the importance of FP to improve wellness for men, women and families. Sufficient staff training also ensures that staff are actively engaged in consistent encouragement of FP services uptake and adherence, including message creation and delivery. Lastly, for women expressing a desire to have children or who are pregnant, staff members provide counselling to aid a healthy pregnancy and implement comprehensive PMTCT services according to MoH guidelines.

Lesson 4: Ensure adequate management of other gynaecological problems

In low-resource settings where routine health checkups and screenings are largely absent, many individuals with HIV never receive a complete gynaecological examination outside of antenatal care. Considering that PLHIV comprise a high-risk population, it is important that gynaecological issues including maternal and newborn health, STIs and reproductive tract infections, gynaecological malignancies, gender-based violence, prevention of unsafe abortion and management of post-abortion care are addressed in-house or through referral. Although FP services may be aimed primarily at increasing access to and uptake of contraceptives, it is imperative to include as many comprehensive reproductive health services as human and financial resources make feasible. All providers at Lighthouse are trained on other common reproductive

health problems among HIV-positive women which can be diagnosed during VIA or FP reviews and referred, if necessary.

At Lighthouse, the package of reproductive health services increased in a step-wise fashion to incorporate services as finance and personnel resources allowed. The services available at the start of the integration included management of STIs as well as encouragement of treatment-seeking behaviours by partners. In addition to the FP services, in early 2012 cervical cancer screening using VIA and cryotherapy treatment were added. All clinical staff were trained using MoH standard modules on VIA and cryotherapy via a week-long training course. Information and referral are available for services such as tubal ligation and complex gynaecological care such as fibroid management, not available at Lighthouse.

Lesson 5: Implement a monitoring and evaluation strategy

Any new service must incorporate M&E from the programme planning stage to ensure quality care. For integration of services it is important to determine how services are implemented, how well clients and providers accept these activities, and identify areas where improvements can be made. Baseline statistics on contraceptive use and pregnancy rates among women at the clinic are important indicators of programme success when monitored over time. Quality assurance efforts such as direct observation, periodic facility assessments on FP uptake, and conducting exit satisfaction surveys with patients can help identify additional needs and guide efforts for improvement. Dissemination of results to staff is crucial.

At Lighthouse, M&E efforts emphasise high-quality data collection, data use and information dissemination. Routine data collection at Lighthouse combines standardised national tools (i.e. FP registers, STI registers) paired with the real-time patient-level EDS. For evaluation of Lighthouse quality of care, initial patient encounters were observed and each chart was reviewed by an FP-trained physician; concerns were then addressed through one-to-one staff meetings and staff group sessions. Informal FP client discussions were conducted after clinic visits to gauge patient perception and satisfaction. Patient and provider feedback was shared through weekly staff meetings to help identify and create solutions to obstacles encountered, delays in care, and staffing issues.

Lastly, as noted previously, in 2013 the EDS incorporated three questions about FP into routine patient management: (1) any current contraceptive use; (2) if yes, type of method(s); and (3) administration of DMPA as promoted in national guidelines. We use the EDS responses to monitor fluctuations in uptake, identify patient groups who may benefit from focused FP education, and better understand the preferred method mix of our clients. This routine information

also provides insight into patient access, uptake, and method maintenance over time, allowing for evaluation of service quality.

CONCLUSIONS

Overall, our efforts to integrate SRH/FP services into HIV care at Lighthouse appear successful. Lighthouse's modern contraceptive rate of 42% is higher than that of the nation as a whole at 35.4%, suggesting impact of the Lighthouse integration initiative. We employed several best practices including comprehensive staff training, ease in scheduling FP/ART visits and use of electronic records, at low additional cost over routine care. As a result, FP method uptake, including LARC methods such as IUDs and implants, increased as did cervical cancer screening using VIA, and subsequent treatment for those in need. We believe our efforts are likely to help reduce both unintended pregnancy and vertical transmission of HIV, as well as improve the wellness of HIV-positive women enrolled in care at Lighthouse clinic.

Our successes are not without challenges. First, although our planning phase identified several unmet SRH needs beyond contraception and VIA, both staff and financial limitations prevent additional service expansion at present. Second, although current guidelines from the Malawi MoH encourage use of DMPA for all HIV-positive women and reinforce our FP efforts,²⁶ routine stock shortages continue to hamper efforts. Additional concerns regarding the potential for hormonal contraceptive methods to increase HIV transmission and disease progression²⁷ may lead to revision of this national policy, affecting Lighthouse FP programming. FP uptake is increasing but is still suboptimal. Additional innovative messages and counselling are needed to further encourage contraceptive use, especially LARC methods. Lastly, we have not yet rigorously evaluated our integrated service delivery. In the future, we plan to undertake a quantitative evaluation study, including components of cost-effectiveness to better understand our programme outcomes and impact.

Our experience refutes several initial concerns presented before integration. First, our integrated services required minimal additional resources over those needed for HIV services alone, suggesting that costs may not present a barrier. Also, no additional staff members were hired to provide integrated services. Although some additional funding was needed for initial infrastructure and building costs, FP and VIA services and training were provided without additional funding. As with other public clinics in Malawi, the MoH largely funds infrastructure and personnel costs while the donor community provides drugs and commodities. Moreover, patients appear interested in receiving these services in an integrated setting, suggesting that there will be patient acceptance and uptake in other similar clinics. Furthermore, our patient flow was not adversely affected as we see the

same number of clients as before integration without noting any changes in clinic waiting time, suggesting that provision of additional services may not significantly slow client visits overall. Lastly, overall contraceptive prevalence rates were considerably higher in 2013 at Lighthouse (42%) than at the sister clinic at MPC (29%) where SRH services were not provided on site nor in conjunction with HIV-related visits at that time. Given the similarities between the Lighthouse and MPC patients, this finding provides compelling evidence that in-house integration of FP services into HIV care leads to greater uptake. Patients appear to seek needed services if they are convenient and directly linked to current care. We aim to expand integrated services to our MPC clinic, increasing access and uptake of FP and cervical cancer screening among eligible patients at both clinics.

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REFERENCES

- Kosgei RJ, Lubano KM, Shen C, *et al.* Impact of integrated family planning and HIV care services on contraceptive use and pregnancy outcomes: a retrospective cohort study. *J Acquir Immune Defic Syndr* 2011;58:e121–e126.
- McCarragher DR, Vance G, Gwarzo U, *et al.* Changes in contraceptive use following integration of family planning into ART services in Cross River State, Nigeria. *Stud Fam Plan* 2011;42:283–290.
- UNAIDS (Joint United Nations Programme on HIV/AIDS). *Thematic Segment: Sexual and Reproductive Health (SRH) Services with HIV Interventions in Practice. Background Paper.* 26th Meeting of the UNAIDS Programme Coordinating Board, Geneva, Switzerland, 22–24 June 2010.
- Cates W Jr, Abdoool Karim Q, El-Sadr W, *et al.* Global development. Family planning and the millennium development goals. *Science* 2010;329:1603.
- Lindgren ML, Kennedy CE, Bain-Brickley D, *et al.* Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services. *Cochrane Database Syst Rev* 2012;9:CD010119.
- Mayhew SH, Lush L, Cleland J, *et al.* Implementing the integration of component services for reproductive health. *Stud Fam Plann* 2000;31:151–162.
- Liambila W, Askew I, Mwangi J, *et al.* Feasibility and effectiveness of integrating provider-initiated testing and counselling within family planning services in Kenya. *Aids* 2009;23(Suppl. 1):S115–S121.
- van den Akker T, Bemelmans M, Ford N, *et al.* HIV care need not hamper maternity care: a descriptive analysis of integration of services in rural Malawi. *BJOG* 2012;119:431–438.
- Maharaj P, Cleland J. Integration of sexual and reproductive health services in KwaZulu-Natal, South Africa. *Health Policy Plan* 2005;20:310–318.
- Chibwesa CJ, Li MS, Matoba CK, *et al.* Modern contraceptive and dual method use among HIV-infected women in Lusaka, Zambia. *Infect Dis Obstet Gynaecol* 2011;2011:261453.
- Yen S, Saah T, Hillard PJ. IUDs and adolescents – an under-utilized opportunity for pregnancy prevention. *J Pediatr Adolesc Gynaecol* 2010;23:123–128.
- Mwanahamuntu MH, Sahasrabudhe VV, Pfaendler KS, *et al.* Implementation of ‘see-and-treat’ cervical cancer prevention services linked to HIV care in Zambia. *AIDS* 2009;23: N1–N5.
- Huchko MJ, Bukusi EA, Cohen CR. Building capacity for cervical cancer screening in outpatient HIV clinics in the Nyanza province of western Kenya. *Int J Gynaecol Obstet* 2011;114:106–110.
- Coyne KM, Hawkins F, Desmond N. Sexual and reproductive health in HIV-positive women: a dedicated clinic improves service. *Int J STD AIDS* 2007;18:420–421.
- Ahdieh L, Klein RS, Burk R, *et al.* Prevalence, incidence, and type-specific persistence of human papillomavirus in human

- immunodeficiency virus (HIV)-positive and HIV-negative women. *J Infect Dis* 2001;184:682–690.
- 16 National Statistical Office (NSO) and ICF Macro. *Malawi Demographic and Health Survey 2010*. Zomba, Malawi, and Calverton, MD, USA: NSO and ICF Macro, 2011.
 - 17 Tweya H, Feldacker C, Breeze E, *et al*. Incidence of pregnancy among women accessing antiretroviral therapy in urban Malawi: a retrospective cohort study. *AIDS Behav* 2013;17:471–478.
 - 18 Taulo F, Berry M, Tsui A, *et al*. Fertility intentions of HIV-1 infected and uninfected women in Malawi: a longitudinal study. *AIDS Behav* 2009;13(Suppl. 1):20–27.
 - 19 Anand A, Shiraishi RW, Bunnell RE, *et al*. Knowledge of HIV status, sexual risk behaviors and contraceptive need among people living with HIV in Kenya and Malawi. *Aids J* 2009;23:1565–1573.
 - 20 Haddad LB, Feldacker C, Jamieson DJ, *et al*. Medical eligibility, contraceptive choice, and intrauterine device acceptance among HIV-infected women receiving antiretroviral therapy in Lilongwe, Malawi. *Int J Gynaecol Obstet* 2014;126:213–216.
 - 21 Haddad LB, Cwiak C, Jamieson DJ, *et al*. Contraceptive adherence among HIV-infected women in Malawi: a randomized controlled trial of the copper intrauterine device and depot medroxyprogesterone acetate. *Contraception* 2013;88:737–743.
 - 22 Lopez LM, Hilgenberg D, Chen M, *et al*. Behavioral interventions for improving contraceptive use among women living with HIV. *Cochrane Database Syst Rev* 2013;1: CD010243.
 - 23 Hoffman IF, Martinson FE, Powers KA, *et al*. The year-long effect of HIV-positive test results on pregnancy intentions, contraceptive use, and pregnancy incidence among Malawian women. *J Acquir Immune Defic Syndr* 2008;47:477–483.
 - 24 Cooper D, Harries J, Myer L, *et al*. “Life is still going on”: reproductive intentions among HIV-positive women and men in South Africa. *Soc Sci Med J* 2007;65:274–283.
 - 25 Maharaj P. Obstacles to negotiating dual protection: perspectives of men and women. *Afr J Reprod Health* 2001;5:150–161.
 - 26 Chinkonde-Nkhoma JR, Hosseinipour M, Mofolo I, *et al*. A review of the ‘Option B Plus’ roll-out in the five districts of Malawi. AIDS 2012: International AIDS Conference, Washington, DC, USA, 22–27 July 2012.
 - 27 Heffron R, Donnell D, Rees H, *et al*. Use of hormonal contraceptives and risk of HIV-1 transmission: a prospective cohort study. *Lancet Infect Dis* 2012;12:19–26.