



Health Provider Perspectives of Health Facility Preparedness and Organization in Implementation of Option B+ among Pregnant and Lactating Women in Central Uganda: A Qualitative Study

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Abstract

Introduction: Uganda adopted Option B+ for prevention of mother-to-child transmission (PMTCT) of HIV in 2012. However, there is limited data on preparedness and organization of Option B+ services. These data are critical in informing PMTCT programs and provision of universal antiretroviral therapy (ART) for all populations. This study explored health providers' experiences of preparedness and organization of Option B+ services in Central Uganda. **Methods:** Key informant interviews with 54 health providers from 6 health facilities in 3 districts were conducted. Thematic approach was employed to analyze data. **Results:** Themes identified on preparedness were training of frontline health providers and provision of Option B+ guidelines, supervision and mentorship, and provision of essential medicines and medical health supplies, whereas those concerning organization were HIV counseling and testing, ART initiation, follow-up, and patient support mechanisms. Innovations like use of expert clients, assessing women's readiness to start Option B+, and retaining women in antenatal care clinic depending on the need are important in provision of Option B+. **Conclusion:** This study provides insights into preparedness and organization of Option B+ services which are important in provision of Option B+ and universal ART for all populations. Research around models of follow-up is recommended.

Keywords

PMTCT, Option B+, health providers, preparedness, organization

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What Do We Already Know About This Topic?

Effectiveness of Option B+ strategy in prevention of mother-to-child transmission (PMTCT) is well established; however, data on preparedness and organization of services is not well-documented, yet organization of services has implications for the quality of services and treatment outcomes (eg, retention and viral suppression) for the women and HIV transmission to their infants.

How Does Your Research Contribute to the Field?

This study provides vital data on preparedness and organization of Option B+ services in Uganda through description of innovative approaches used by health providers to offer services and informs programs and future research in the field particularly on health system approaches and interventions to enhance PMTCT outcomes.

What Are Your Research's Implications toward Theory, Practice, or Policy?

Regular training, support and mentorship, midwives, informal health providers, and use of context-specific models of follow-up are critical in improving implementation of Option B+ services.

Introduction

In 2012 and 2013, World Health Organization issued new guidelines toward virtual elimination of mother-to-child transmission (e-MTCT) of HIV including Option B+, where HIV-positive pregnant and breastfeeding women are initiated on lifelong antiretroviral therapy (ART) irrespective of their CD4 or clinical staging.^{1,2} Option B+ offers many advantages: health benefits of early treatment for the mother, avoiding risks of interrupting ART, protection against MTCT in future pregnancies, and protects HIV-negative partners in discordant couples.^{3,4} Option B+ was recommended for high HIV burden and high fertility countries.⁵

Uganda started implementing Option B+ in September 2012 and rapidly scaled it up to all the 112 districts by the end of 2013.^{3,6} The number of health facilities offering Option B+ increased to 2130 in September 2013.⁷ In an evaluation focusing on lessons learned from early implementation of Option B+ among 11 African countries, the number of HIV-positive women accessing ART during antenatal care (ANC) increased tremendously.⁸ Drawing from this study, increase in number of women who seek prevention of mother-to-child transmission (PMTCT) services could overwhelm the staff in health facilities and subsequently affect quality of Option B+ services if adequate preparations and organization are lacking.⁸⁻¹¹

In Malawi, a number of key steps were undertaken before and during implementation of Option B+. Some of the steps

taken were national consultations, review of PMTCT policies and guidelines, mobilization of funds, procurement of essential commodities, and capacity building for health workers. In addition, continuous program evaluations and reviews were done to ensure successful implementation of Option B+ strategy.¹²⁻¹⁴

Pregnant and breastfeeding women have unique challenges which require special interventions to ensure that they utilize Option B+ services. For example, previous studies show that pregnancy, childbirth, and postpartum-related obligations and stress have a negative impact on ART adherence and retention in HIV care.^{15,16} Furthermore, challenges faced during implementation of Option B+, such as stigma, nondisclosure of HIV status, nonadherence, and nonretention in HIV care, are anticipated to occur in the implementation of universal ART for all populations and may slow achievement of the Joint United Nations Programme on HIV and AIDS 90-90-90 targets. Lessons learned from Option B+ experience in Malawi have been used by countries that are adopting the universal ART strategy for all populations.¹³

In Uganda, data on preparedness and organization of Option B+ services are scarce. Current studies have focused on effectiveness of the Option B+ strategy.¹⁷⁻¹⁹ Preparedness and organization are crucial in ensuring uptake of Option B+ services, retention in care, and adherence to ART. To address the research gap, we conducted this study to explore perspectives of health providers on facility preparedness and organization of services in implementation of Option B+ in Central Uganda. Findings from this study will inform provision of HIV services for Option B+ and universal ART for all populations.⁹

Methods

The research described in this article is part of a larger mixed-methods study titled "Implementation of Option B+ for PMTCT in Uganda: Service Uptake and Retention of Mothers and their Infants into PMTCT Services." The main goals of the whole study were to determine the uptake of ART and other PMTCT-related services by HIV-positive pregnant women and their infants and to assess retention in care and adherence to ART. The study also qualitatively explored factors affecting the health-care system, perceptions, and experiences in delivery of Option B+ for pregnant women. This article focuses on preparedness and organization of Option B+ services from the health providers' perspective. Preparedness in this study meant all activities that were undertaken to ensure readiness of health providers and health facilities to deliver Option B+ services. Organization referred to how Option B+ services were offered. Organization entailed the following: cadre of health providers who offered the services, where and how services were provided, linkages, and patient support as well as follow-up mechanisms.

Study Design

A descriptive qualitative study approach was adopted so as to elicit experiences of providers, their opinions, and suggestions

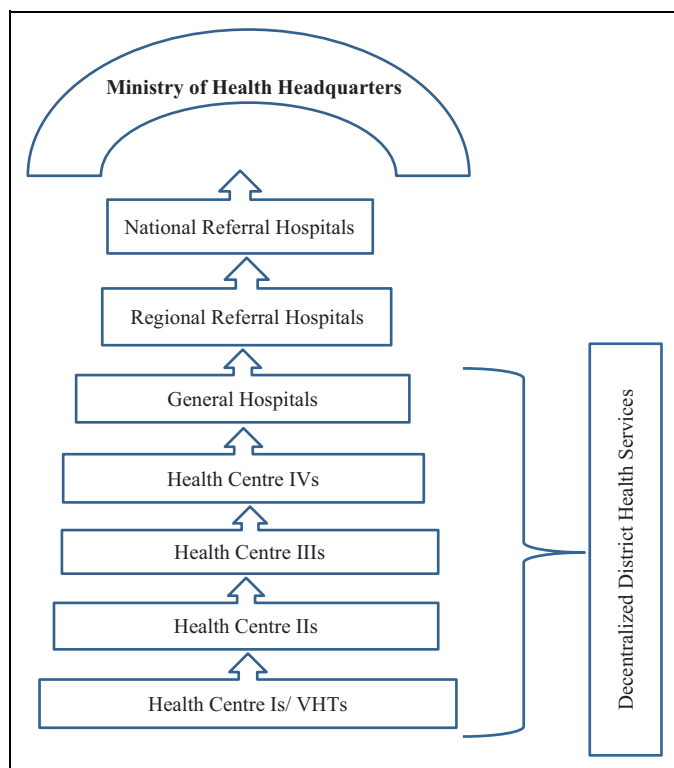


Figure 1. Structure of the public health care system in Uganda.

on preparedness and organization of services during implementation of Option B+ strategy. Use of key informant interviews (KIIs) enabled health providers to give honest descriptions²⁰ of what was done before and during the implementation of Option B+ strategy.

Study Context

Health services in Uganda are provided by public and private sectors in a decentralized referral system. Ministry of Health (MOH) provides leadership for the health sector to ensure provision of all health services in Uganda.²¹

Figure 1 illustrates the structure of the Uganda public health-care system. There are 7 levels of health care in the public health sector in Uganda, organized from lower to higher levels in a hierarchy. Village Health Team (VHT)/Health Center (HC) I is the first contact for health services. This level has no physical structure. Village Health Team members work voluntarily to advice, educate, and distribute essential medicines and refer patients to the next level, HC II. Health Center IIs serve a few thousand people at parish level, run an outpatient clinic, treat common diseases, and offer ANC services. Next in hierarchy is a HC III. This is located at the subcounty level and runs a general outpatient clinic and a maternity ward. A HC III provides support and supervision to the community and HC IIs. The next level is a HC IV which serves a county or a parliamentary constituency (Health sub-district). In addition to offering services that HC IIIs give, HC

IVs provide in-patient health services, surgery, blood transfusion, laboratory, and medical imaging services. Health Centre IVs also supervise and support community-based health-care programs and HC IIIs. At the district level, general hospitals (GHs) offer services given at HC IVs in addition to providing in-service training, consultation, and operational research in support of community-based health-care programs. Regional referral hospitals (RRHs) serves several districts (subregion), with general, consultant, and specialist clinical services. They are also involved in teaching and research, in addition to offering services provided by GHs. The district health structure is responsible for service delivery in the district except for the RRHs where they exist. National referral hospitals are at the national level, offer comprehensive specialist services, conduct health research, and teach. Option B+ services are mainly offered at HC IIIs and higher level health facilities.²²

Study Site

The study was conducted in 3 predominantly rural districts of Luwero, Mityana, and Masaka. The districts and health facilities were purposively selected because they were among the first to implement Option B+ in Uganda and were the most experienced at the time. Health facilities were Katikamu and Ssunga HC IIIs, Luwero and Kyanamukaka HC IVs, Mityana GH, and Masaka RRH.

The US President's Emergency Plan for AIDS Relief works through several organizations, often referred to as "implementing partners," to implement various HIV services and provide technical assistance to the MOH and public health facilities.^{23,24} At the time of implementing this study, the Uganda MOH predominantly worked in collaboration with 2 PMTCT implementing partners within the central region including Protecting Families Against HIV/AIDS (PREFA)-Uganda and Mildmay Uganda to support district service delivery.

Study Participants

The participants were grouped into formal and informal health providers. Formal providers are health workers who have received recognized training with a defined curriculum. Formal health providers included in this study were midwives, nurses, counselors, nursing assistants, store assistants, dispensers, laboratory assistants, clinical officers, and medical doctors. Some of the services provided by this category of health workers include HIV testing, posttest counseling, assess eligibility for antiretroviral (ARV) medications, prescription of drugs, dispense drugs, carry out laboratory tests, monitor, counsel, and support mothers who are on Option B+.

Informal health providers are health workers who have not received formally recognized training and are typically not mandated by any formal institution. Instead, they have some level of training through apprenticeships, seminars, and workshops.²⁵ Informal participants enrolled in the study were expert clients (peer mothers and fathers) and VHTs. Expert clients are

people living with HIV who have disclosed their HIV status and are willing to support other HIV clients on a voluntary basis. Informal health providers offer services such as health education, registering, tracking, and escorting women who are on Option B+ within the health facilities and giving support during family support groups (FSGs). Family support groups are psychosocial groups that offer peer support to HIV-positive, pregnant, or lactating mothers in care. Use of FSGs was one of the interventions used to support women on Option B+, their children, and partners. The purpose of FSGs is to create a structured support group for the mother and enhance access to and uptake of PMTCT services, retention, adherence, and follow-up of mother–baby pairs. Each health facility holds FSG meetings once a month.

Selection of Participants

Participants were purposively selected based on their roles, workstation/department, and experience. The aim was to select a broad and varied sample of health providers and departments in order to get a comprehensive perspective on experiences of preparedness and organization of services in implementation of Option B+. To adhere to our proposed varied sample, a total of 54 participants were identified and enrolled across the study sites. Table 1 shows the details of study participants.

Data Collection, Management, and Analysis

Based on our research question of preparedness and organization of Option B+ services, we developed an interview guide. The research team discussed the issues/topics to be explored based on the gaps in the literature. The topics included roles of the health providers in provision of Option B+, preparedness of health providers who offer PMTCT services, health providers' experience of preparing women to initiate Option B+ (counseling), when and how provision of ART started, organization of Option B+ services, and support provided to women receiving Option B+. From the topics that the investigators identified, the team developed an interview guide which spelt out how the interviews were to be conducted. We developed a list of questions or issues in a semistructured format to be explored during the interview and the sequence to be followed. In addition, follow-on questions or probes were included where necessary. The initial tool was pretested by all key investigators and subsequently discussed. Concurrences and discrepancies were noted and resolved through consensus to ensure consistency in administration of the interview guide and interpretation of the questions. Interviews were conducted by 5 of the lead investigators (A.M., R.W., E.B., R.N., and F.M.) between April and May 2014. On average, each interview lasted 1.5 hours and was audio recorded. Majority of interviews were conducted in English. A few KIIs with expert clients were conducted in their local language (Luganda) which they were more comfortable to use.

Table 1. Characteristics of Study Participants.^a

Characteristic	Number
Health facility	
Masaka RRH	12
Mityana GH	10
Luwero HC IV	10
Kyanamukaka HC IV	10
Katikamu HC III	7
Ssungu HC III	5
Sex	
Male	13
Female	41
Category	
Facility manager	20
Clinic staff	34
Cadre	
Midwife	22
Nursing assistant	8
Expert client	7
Doctor	4
Store assistant	4
Clinical officer	3
Nurse	3
Counselor	1
Dispenser	1
Laboratory Assistant	1
Received training in provision of Option B+	
Yes	27
No	27
Number of years working in HIV care	Median (IQR) = 5 (1-8); Mean (SD) = 5.4 (4.5)

Abbreviations: GH, general hospital; IQR, inter quartile range; RRH, regional referral hospital; SD standard deviation.

^a n = 54.

All data were transcribed verbatim; data in Luganda were concurrently translated and transcribed into English. On average, transcription of each interview took 2 to 3 days. Each transcript was reviewed by A.M. and one other coinvestigator for content and completeness. Additional reviews of selected transcripts were done by R.W. for quality control and to ensure reflexivity. Final transcripts were exported to Atlas software (Atlas.ti, version 7 software, Berlin, Germany) for analysis. Thematic analysis approach as described by King and Horrocks²⁶ was taken. We used the interview scripts as an initial guidance to the analysis. A.M. read through all transcripts several times and marked relevant information so as to be familiar with the data. Relevant features of data related to the study aim were coded using descriptive and interpretive approaches. H.B. and R.W. cocoded the first interviews that were analyzed. Coding was discussed and adapted. A.M. analyzed the remaining transcripts using the adapted codes. Codes were collated into themes. A.M., H.B., and R.W. reviewed and discussed identified themes to support reflexivity on analysis process and the interpretation of data. Finally, defining and naming of themes was agreed upon by all researchers. Typical quotes were

Table 2. Summary of Identified Themes.

Focus	Theme
Preparedness to offer Option B+	(i) Training of frontline health providers and provision of Option B+ guidelines (ii) Supervision and mentorship of health providers (iii) Provision of essential medicines and medical health supplies
Organization of Option B+ services	(i) HCT (ii) ART initiation (iii) Follow-up/linkage of mothers on Option B+ (iv) Support mechanisms for women to remain in care and adhere to ART (family support groups, expert clients, midwives, nurses, VHTs, and some counsellors)

Abbreviations: ART, antiretroviral therapy; HC, Health Centre; HCT, HIV counseling and testing; VHT, Village Health Team.

identified and used to emphasize identified themes. An overview of themes is available in Table 2.

Ethical Considerations

This study was approved by Makerere University School of Public Health Higher Degrees Research and Ethics Committee (approval number: IRB00011353) and Uganda National Council for Science and Technology (Registration Number: SS3153). Permission was also obtained from districts and health facilities involved in the study. Participants were assured of anonymity and confidentiality. Written informed consent was obtained from each study participant. Interviews were conducted in a private environment and transcripts did not bear participant names. Each participant received compensation of 10 000 Uganda Shillings (equivalent to US\$4 at the time of the study) for their time. Final transcripts were stored securely on password-protected laptops and external drives.

Results

Characteristics of Study Participants (Health Providers)

A total of 54 interviews were conducted: 34 with clinic staff category (solely provided patient care) and 20 with facility managers (largely played a supervisory role and provided minimal patient care in their respective health facilities). Twenty-three midwives, 8 nursing assistants, 7 expert clients, 4 medical doctors, 4 store assistants, and other cadres were interviewed as shown in Table 1. Half (27) of the overall participants had received training in Option B+. More than a third (20) were working at HC IVs. The minimum experience in providing HIV care was half a year with a maximum of 17 years. All health facilities reportedly started implementing Option B+ between October and December 2012.

Preparedness and Organization of Health Providers and Facilities for the Implementation of Option B+

The results on health providers' perspectives are presented in 2 foci: preparedness and organization of services for Option B+. Three themes were identified regarding preparedness: training of frontline health providers and provision of Option B+ guidelines, supervision and mentorship, and provision of essential medicines and medical health supplies. Meanwhile, 4 themes were identified concerning organization of services for Option B+: HIV counseling and testing, ART initiation, follow-up, and support mechanisms. A summary of themes that were identified is presented in Table 2.

Preparedness to Offer Option B+

Training of Frontline Service Health Providers and Provision of Option B+ Guidelines. Participants reported that key PMTCT health providers were trained prior to their involvement in provision of Option B+. Participants reported that the training was offered by MOH in collaboration with 2 implementing partners: PREFA-Uganda and Mildmay Uganda. Training was conducted at one central place that had been identified by MOH and implementing partners. The 6-day-long training was reported to have comprised both practical and theoretical sessions on definition of and rationale for Option B+, HIV counseling and testing (HCT), introduction to e-MTCT, care for HIV-positive pregnant and breastfeeding women, assessment and ART initiation, management of HIV-exposed infants, ART adherence, quality improvement, community support for Option B+, and communication skills.

Participants described the training as very informative and enriching based on the topics that were taught and the vast experience of the trainers. The practical aspect of training involved use of role-plays and sharing experiences. Participants recommended that training should be offered to all health providers involved in giving care to pregnant and breastfeeding women. Participants echoed that they were able to offer option B+ services comfortably compared to their colleagues who had not received the training.

They acknowledged that after being trained, they were able to give health education, counsel, initiate ART, use different PMTCT registers, and monitor women without difficulty. One of the participants shared her experience as follows:

We had to go for training somewhere in Mukono (a central place where training took place) for a week; we were trained on all the details of Option B+. That is why we find it easier to give option B+ services. (Health Provider, HC IV)

Most participants felt that the training they had received was adequate, but noted that they had received the training more than one and a half years ago and needed refresher courses to keep up-to-date with current trends. Most of those trained were midwives because of their forefront role of offering maternal, neonatal, and child health services. Most study participants stated that they had Option B+ guidelines in their health

facilities. Health providers who had not received training on Option B+ read the guidelines to enable them provide PMTCT services. All participants who had used guidelines said that they were easy to understand and use to explain to clients. Besides, they used internal consultations to aid management of HIV-positive women whenever necessary.

We were given quite a number of guidelines on how to prescribe the drugs, and we use the guidelines now and then. Of course, one thing I believe [in is that] with medicine, consultation is inevitable; you can't avoid consulting a colleague. (Health Provider, HC IV)

Supervision and Mentorship of Health Providers. There was a general agreement among all participants that supervisory and mentorship mechanisms were in place to enhance their performance. Supervision was mainly received from MOH, PREFA, Mildmay Uganda, and district health team. Mentorship was reported to be done by the implementing partners. Participants noted that supervision and mentorship took place on different dates, and it was done by different teams. Both activities were done once every 3 months throughout the implementation of all HIV programs. However, most participants indicated that supervisory support was sometimes characterized by accusation and fault finding which they described as discouraging. On the other hand, majority of participants reported that they received mentorship which they expressed as beneficial—because they were conducted in a nonaccusatory manner and they acquired practical skills in providing Option B+ services.

Supervisors look for faults only and don't see the good things that we do; but mentors, tell us both the good and bad practices. Mentors do it very well. They [mentors] tell us what we should do; we actually spend almost the whole day here with them and they don't abuse us. That is one thing that I like about the mentors, they don't abuse us like those people who do supervision. I would suggest that it replaces supervision. (Health Provider, HC III)

Provision of Essential Medicines and Medical Supplies. In all study sites, MOH through National Medical Stores (NMS) and implementing partners provided essential medicines and medical supplies including ARV medications, cotrimoxazole, HIV and early infant diagnosis (EID) testing kits, PMTCT registers, referral books, maternal, and child ART cards. Study participants specifically noted that mothers were very happy to take a single ARV tablet daily in comparison to other HIV-positive patients who took more than one pill daily. Participants noted that this reduced the pill burden. All participants pointed out that their health facilities had never run out of ARV medications for women.

For Option B+ medicines and supplies, NMS has been supplying them and we didn't get stock outs of ARVs for the women. (Health Provider, Hospital)

Organization of Option B+ Services

Participants' experiences with the organization of offering ART services could be grouped into 4 themes: (i) HIV

counseling and testing, (ii) ART initiation, (iii) follow-up/linkage, and (iv) support mechanisms for women.

i) *HIV counseling and testing*

Across all study sites, women were prepared for Option B+ through health education and counseling. This was done before starting ART through group and individual sessions. Interviews revealed that group counseling entailed providing Option B+ information to women during group sessions. Participants pointed out that counseling covered various topics such as importance of HIV testing, benefits of Option B+, duration of treatment, when and who to start ART, and adherence. Other topics mentioned were HIV disclosure and stigma, what happens during pregnancy, birth and breastfeeding, family planning, EID, infant feeding and immunization, cervical cancer screening, and HIV partner testing. Women who had never tested for HIV received individual HCT after group sessions. However, those who required retesting were not taken through the detailed counseling processes. Thereafter, both HIV-positive and negative women received individual or couple post HIV test counseling.

We give group counseling; after getting [receiving] the results, we do individual or couple counseling. (Health Provider, HC IV)

Both facility managers and clinic staff noted that mostly midwives and expert clients did counseling. Participants reported that both midwives and expert clients had been trained to counsel women in preparation for and during the implementation of Option B+. However, in some health facilities where trained counselors were available, they supported the midwives and expert clients to carry out counseling.

HIV testing was done mostly by midwives in ANC clinics, labor wards, and postnatal care (PNC) clinics as opposed to being done in facility laboratories. This was intended to reduce movements of mothers within facilities and waiting time for HIV test results. The mothers received HIV results on the same day of testing. Participants also indicated that using actual perinatal care facilities for testing of HIV could reduce stigma.

HIV testing is done in ANC clinic and labor suit. Initially, we used to do it in the laboratory, but, we realized that there was need to minimize patients' movements and also avoid HIV stigma related challenges. (Health Provider, HC IV)

ii) *ART initiation*

Most women were started on ART in the ANC clinics. A few women were initiated on ART in the labor ward or PNC clinic after they tested HIV positive. Participants observed that at the start of the Option B+ strategy, HIV-positive pregnant women were counseled to start ART on the same day they were diagnosed. They noted that this was accepted by most women. However, some women refused to start same day ART initiation because of refusal to accept HIV positive results or denial, feeling healthy, fear of ART side effects, and to first disclose to

their partners. Indeed some participants acknowledged that it was the woman's right to refuse to start ART that same day bearing in mind that the treatment was lifelong.

When a mother tests HIV-positive, she is given the results by the counsellor; she undergoes posttest counseling. Once she accepts the results—[because she has the right to refuse them—we have these mothers that reject the results] the mother is initiated on Option B+. There is no time lag. (Health Provider, HC IV)

Study participants also stated that some health facilities devised strategies such as assessing for readiness of mothers before ART initiation because they noticed that some mothers who were started on Option B+, did not come back for follow-up. Some health providers felt that women who tested HIV positive in ANC for the first time needed more time to fully comprehend the positive results and Option B+.

Comparing today and the time we had just started this Option B+, in November 2012, we had a lot of mothers we started on ARVs. At that moment, you could start a woman on drugs whether she was ready or not. [In the past], mothers would start on these drugs but they would not come back for refills [while] others would provide wrong telephone numbers because they were not ready to start treatment. So, we had many women being lost to follow-up. We changed and started giving mothers time to become ready. (Health Provider, Hospital)

iii) *Follow-up of women on Option B+*

Health facilities used different models to follow up women on Option B+. Interviews revealed that the models of follow-up were agreed upon by the health providers and implementing partners. The models were chosen depending on what worked best for each health facility and these did not necessarily fully align with the guidelines. Participants noted that follow-up was done either in the ANC or general HIV clinic. The general clinics provided only HIV services, which raised concerns about stigma and subsequently loss to follow-up. On the other hand, some women preferred the ANC clinics which provide services to both HIV-positive and negative pregnant women and could thus mask their HIV status.

At 2 of the 6 health facilities, newly identified HIV-positive pregnant mothers were started on Option B+ during ANC and were followed up during PNC at the same location for one and a half years. Thereafter, they were transferred (linked) to the general HIV clinic for follow-up. This model of follow-up was adopted after health providers and implementing partners realized that many women were lost to follow-up if they were transferred to the general HIV clinic early. This model worked well for the 2 health facilities to reduce the number of women lost to follow-up. Participants attributed the loss to follow-up to HIV-related stigma. Women on Option B+ feared being seen by other patients and especially relatives and friends who attended the general HIV clinic.

We realized that we enroll so many mothers, yet many are lost to follow-up. So, together with the implementing partners, we came up with another model where mothers and their babies continue to receive care in the ANC clinic up-to when the baby is one and a half years old; mothers had been dropping out of care because of fear to go and get drugs from the general HIV (chronic care) clinic due to stigma. (Health Provider, Hospital)

At another facility, newly identified HIV-positive pregnant mothers were started on Option B+ during ANC and followed up during PNC at the same location. They were later on transferred to the general HIV clinic, after the infant had made the age of 1 year.

We let the mothers and their babies to continue receiving care from the ANC clinic up-to when the baby under goes a second PCR HIV test on dried blood spot (DBS), then we transfer them to the general ART (HIV) clinic. (Health Provider, HC III)

At 2 health facilities, newly identified HIV-positive pregnant mothers were initiated on ART and followed up at the ANC clinic until they gave birth. The mothers were followed up in the general HIV clinic from the time they came back for PNC when the baby was 6 weeks old. These 2 facilities had large volumes of women on Option B+ and chose the model of transferring women who had delivered to the general HIV clinic as soon as possible to avoid congestion in the ANC clinics.

One health facility reportedly registered fewer women on ART. On average they initiated 2 women on option B+ every month and 16 women were followed up every week. Participants also noted that there was no need for a general HIV clinic. All women were initiated on Option B+ and followed up in the ANC clinic.

... the mothers continue getting treatment from here, we don't transfer [link] them. The babies [exposed babies] also remain here because after the mother has delivered, the baby is given nevirapine and has to be followed up to ensure that child services are given. So, they just continue coming to the ANC clinic, we don't transfer them. (Health Provider, HC III)

iv) *Support mechanisms for women on Option B+*

All 6 health facilities had mechanisms to support women on ART both at facility and community levels. The support was given by midwives, nurses, expert clients, and VHTs during routine clinical care and FSGs. This support is meant to ensure that women take up Option B+, remain in care, and are adherent to ART.

Family Support Groups. Five of the 6 health facilities had FSGs for HIV-positive pregnant and breastfeeding mothers at the time of the study, which were supported by health providers and implementing partners.

They (women) get familiar to everything in regard to Option B+ through the family support group; they have a specific day in a

month when they are supposed to come to meet so as to be supported. (Health Provider, Hospital)

The facility that did not have FSGs cited delayed funding as the reason for not running them. It was hoped that as soon as money is secured, FSGs would be operational.

Expert Clients and VHTs. Expert clients play a key role in giving peer education and HIV counseling to women on Option B+. Participants noted that expert clients share the lived experience on various HIV-related issues such as benefits of testing for HIV, benefits and of and adherence to ART, importance of retention in care, HIV disclosure, and so on, which are helpful to the women. In addition, together with VHTs, they tracked women who had been initiated on Option B+. Expert clients and VHTs worked together to support the formal health workers, keep a record of attendance lists to community events, and refer pregnant and lactating mothers to appropriate health facilities. All health facilities in our study had expert clients and VHTs. Majority of study participants acknowledged the great role played by expert clients and VHTs. They reported that they strengthened follow-up and retention of mother–baby pairs. Expert clients did this through recruiting peer mothers and fathers, following up pregnant and lactating mothers who missed appointments. They also counseled women on adherence, family planning, and nutrition and made reports to health facilities on adherence of pregnant and lactating mothers.

Expert clients have helped us a lot, they talk very well to the mothers and encourage them to start and adhere to ARVs. They share their experiences on HIV testing, treatment, care, and positive living. When you are faced with a patient who is in HIV denial, experiencing side effects or HIV disclosure challenges; it's the expert client to help out because, surely, it sometimes gets too hard for you as a health worker to put yourself into the shoes of an HIV-positive patient. So, the expert clients assist in counseling. Some expert clients come from the same villages where mothers on Option B+ reside. Expert clients therefore remind those mothers to come back to the facility for follow-up. (Health Provider, HC IV)

Midwives, Nurses, and Counsellors. Participants emphasized the pivotal role of midwives and nurses in implementation of Option B+. In addition to managing pregnant and lactating mothers at health facilities, they supported HIV-positive women through a number of ways: organizing other actors (VHT, FSG, expert clients, peer mothers, and fathers), calling mothers to remind them of their appointments or following up those who had not honored their appointment, and conducting home visits with peer mothers/fathers and expert clients. In some instances, health providers followed up women who had missed clinic appointments via telephone reminders. They also received referrals from communities and made communication plans to encourage mothers to bring their partners to health facilities for ANC.

Mostly midwives and nurses carry out ANC and that is where PMTCT comes in because we do HIV counseling, testing, and when we diagnose one to be HIV positive, we enroll her, start on treatment, and follow-up. (Health Provider, HC IV)

Discussion

This study explored health facility preparedness and organization for the implementation of Option B+ from the health provider perspective in selected health facilities in Central Uganda. The study found that health providers and facilities were reasonably prepared before and during implementation of Option B+. Health providers were trained, supervised, and mentored. Health facilities were stocked with necessary essential medicines and health supplies such as ARV medications, HIV and EID testing kits, new e-MTCT registers, and drugs for opportunistic infection prophylaxis by MOH and implementing partners. In terms of organization of Option B+ services, HCT and ART initiation for pregnant women was being done in ANC clinic mostly by midwives. There were linkages right from ANC clinic, mother–infant pair care point (EID) clinic, up to the general HIV clinic. Mothers were followed up and supported by formal and informal health providers.

Preparing health providers and facilities is very critical to ensure that Option B+ strategy is integrated in the health-care system without distorting already existing programs.^{27,28} Training of forefront personnel who provide Option B+ services was undertaken to ensure readiness for implementation and service delivery standards.⁹ However, despite initial training, regular support, and supervision, mentorship and refresher trainings are required to maintain adequate numbers of skilled and motivated health providers. Supervision should be positive and motivating other than fault finding, to enable open discussion and resolution of challenges faced by health providers and provide feedback on opportunities for improvement. Countries that have adopted Option B+ ensured that health providers were trained to offer this service. Regular trainings should be provided to enable health providers improve skill acquisition. Ongoing training is crucial, especially where the turnover of health providers is high.^{9,13} Indeed previous studies show that repetitive learning interventions, rather than single interventions, were superior for achieving desired learning outcomes.²⁹ In a study by Lipira et al, training at least one health provider in HIV care and support was associated with a lower risk of loss to follow-up from Option B+ services.³⁰ In another study, health worker trainings enabled roll out of Option B+ to more health facilities.¹⁴ Unlike in our study where training was in a residential and central location, the centers for training in other countries were in different geographical locations.^{31,32} Training in a central location enabled the trainees to remain focused and avoid disruptions from routine service activities. Health facilities had Option B+ clinical guidelines for reference and used internal consultations to aid proper management of HIV-positive pregnant and breastfeeding women and their infants. Clinical guidelines have the potential to improve the quality

and process of care and patient outcomes.³³ The guidelines should be available and accessible to health providers.

Initial counseling was done for several women in groups and later individually. This is similar to what was done in Malawi.³⁴ Adequate counseling and support around the time of Option B+ initiation has shown to improve treatment uptake, adherence, and retention in care.⁸ All women who were found to be HIV positive were encouraged to start on ART that same day as per the national (MOH) policy recommendation. However, health facilities were innovatively flexible. Women who were not ready to start ART were given an opportunity for continual counseling until they were ready. If women are started on ART hurriedly, such challenges as nonuptake, non-adherence, and loss to follow-up are bound to occur. For example, in Malawi, most women on Option B+ who were lost to follow-up started therapy on the day they tested HIV positive.³⁵ Individual tailored counseling and support is critical in keeping women and their infants on Option B+. Testing for HIV and initiating ART within ANC and PNC clinics and labor wards enabled women to stay in same clinic which avoided a lot of movements and long waiting time. Women got their HIV results on the same day; this prevented missed opportunities. It is an important finding that health facilities never ran out of ART for women which dispelled fears that had been anticipated at the start of Option B+ strategy. This is similar to what was found in Malawi.^{12,36}

This study identified 4 models that were being used to follow up women and their infants. This shows context flexibility in study sites which allowed health facilities to implement a model or combination of models, which best suited their daily operations. Health facilities worked collaboratively with the implementing partners to choose the best model of follow-up depending on what worked best for them based on their context rather than following guidelines. A study done in Malawi found 4 models of care and 3 were different from those identified in our study.³⁷ In their study, the model of care chosen influenced uptake of HIV testing in ANC and retention in HIV care. This highlights the importance of understanding models of HIV care that are being used and their impact on uptake of HIV services, adherence to ART, and retention in care. One particular model of follow-up that our study identified was retaining women in the same clinic without linkage to the general HIV clinic. This is beneficial because it ensures retention; however, with time, it might lead to congestion and overload of women in ANC clinic as the number of women on Option B+ increases. Depending on the context such as level of facility, volume of women served, number of health providers, or challenges experienced, there were variations in adaptation of service organization across study sites. Ministry of Health should provide guidance on service organization including models of follow-up as ultimately women cannot be kept in ANC clinic forever. Women preferred to stay in ANC clinic longer due to HIV-related stigma. However, retaining the women longer in ANC facilities creates congestion in large volume clinics and could also raise more suspicion for women who are kept longer than usual in these clinics. This calls for rigorous evaluations of the different

models of follow-up and their impact on patient outcomes and the health facilities.

Although midwives provided most of the Option B+ services, informal health providers, especially expert clients, were crucial in providing certain services such as counseling, tracking, registering, escorting women who were on Option B+ within the health facilities, and giving support during FSG meetings. Expert clients have the potential to provide Option B+ services since they share the lived experience on various issues with women on Option B+ such as non-HIV disclosure, HIV-related stigma, and nonadherence to ART.³⁸ This is similar to what other countries have found and adopted.³⁹⁻⁴¹ This cadre of informal health providers should be equipped with standard and well-structured training on provision of Option B+ services. It is also important to ensure that the informal health providers are well integrated in the existing health-care system and receive adequate support and supervision from the formal health providers. The informal providers will subsequently offer quality Option B+ services and reduce the workload on the formal health providers. These informal health providers offer various services and are critical in counseling, follow-up of women, and their infants to ensure retention in care and adherence to ART.⁴² This is even more so in the current era of universal ART for all populations where many patients are being enrolled into HIV care.^{9,13}

Strengths and Limitations

We used structured interviews to explore experiences of preparedness and organization of Option B+ services from a broad range of health providers working in health facilities that were among the first implementers. Findings from this study are important and could be transferable to other health facilities, regions, and countries in similar contexts since there is a detailed description of how health facilities were prepared and organized to implement Option B+ services.

The limitations with this study are we did not interview staff from MOH, district headquarters, and implementing partners who supervise and mentor health providers to get their views. Secondly, there was potential for social desirability bias in the participants' responses; however, this was minimized through use of probes.

Conclusion and Recommendations

Health facilities and providers were prepared in various ways for implementation of Option B+ services. Option B+ services were organized to suit health facility settings. In this regard and the current era of universal ART for all populations, we recommend that all health providers offering HIV treatment services should be regularly trained, supervised, and mentored in a nonaccusatory manner. Informal health providers should have standardized training and algorithms that are tailored to their work. In addition, appropriate and effective context-specific models of service delivery and follow-up mechanisms in health facilities offering Option

B+ services are recommended. Future research to generate evidence-based implementation strategies is recommended to rigorously assess the models of service delivery that result into higher levels of Option B+ uptake, adherence, and retention in care in a cost-effective manner.

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Author Contributions

A.M., R.W., E.B., J.M., and F.M. were involved in development of the proposal. A.M., R.N., R.W., E.B., and F.M. carried out field work. A.M., R.W., and H.B. undertook data analysis. A.M. conceptualized the research question and wrote the first draft of the manuscript. R.W., H.B., J.P., J.M., and F.M. revised the draft manuscript to strengthen its intellectual content. A.M., R.W., R.N., E.B., F.M., J.M., J.P., and H.B. approved the final draft.


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