

BMJ Open Acceptability of family planning in a changing context in Uganda: a realist evaluation at two time points

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ABSTRACT

Objectives This study sought to understand, during an intervention which integrated family planning (FP) and immunisation, (1) if and how prevailing contextual factors influenced acceptability and use of modern contraceptive methods (MCMs) in a pastoral community in Uganda, (2) what mechanisms were triggered by these contextual factors (3) if these contextual factors changed between two time points 2 years apart and (4) the impact of contextual changes on mechanisms triggered and acceptability and use outcomes.

Design Qualitative realist evaluation over two time points.

Setting Government health facilities in Moroto District, Karamoja, Uganda.

Participants 69 participants involved in the delivery and uptake of integrated FP and childhood immunisation services.

Intervention Integrated delivery of FP and childhood immunisation services offered to women accessing immunisation services in health facilities between January 2016 and December 2019.

Results Four key themes were identified that encompassed context and mechanisms influencing acceptability of MCMs across both time points of the evaluation. These were: (1) fear of side effects of MCMs; (2) preference for natural FP methods; (3) pastoral lifestyles in the community and (4) food insecurity. The context of these themes changed over time leading to the triggering of mechanisms with an overall increase in acceptability of MCMs over time. Key mechanisms of acceptability triggered included: affective attitude, intervention coherence, self-efficacy, perceived effectiveness and opportunity cost, leading to the development of three context-acceptability theories.

Conclusions In this study, social and cultural norms played a strong role in influencing acceptability of the intervention. The context combined with intervention components were found to trigger several mechanisms that mapped to constructs of diffusion of innovations and acted as catalysts for mechanisms of acceptability. The context in which the intervention was implemented changed leading to the triggering of mechanisms and an increase in the perceived value and acceptability of MCM use.

INTRODUCTION

Interventions that use family planning (FP) to mitigate the negative impacts of short interpregnancy intervals, such as maternal

Strengths and limitations of this study

- This study contributes to a growing body of literature that seeks to understand the acceptability of family planning (FP) interventions in sub-Saharan Africa. It also describes the unique contextual factors that influence the successful implementation of FP interventions in a pastoralist community with long held social and cultural norms.
- This study uses a realist evaluation approach to explore how acceptability of FP interventions is influenced by contextual factors. Key themes were identified that encompassed context and mechanisms influencing acceptability of modern contraceptive methods (MCMs) across both time points of the evaluation.
- By mapping outcomes across published theories, this study presents context-acceptability theories that support understanding of the acceptability of FP interventions in different contexts.
- While this evaluation used qualitative methods to explore, understand and generate theories on changes over two time points in the delivery and uptake of an FP intervention, it would further benefit from a robust quantitative data collection component that tests these theories.
- While this evaluation included insights from several categories of stakeholders, discussions with additional stakeholders within each category may have yielded a broader range of opinions and perceptions of the mechanisms driving acceptability of MCMs.

death, third-trimester bleeding and anaemia in mothers, as well as preterm birth and low birth weight in infants,^{1–3} contribute to the Sustainable Development Goal of reducing child mortality and improving maternal health.⁴ Cultural and societal norms can influence acceptability of FP and act as barriers to the delivery and uptake of modern contraceptive methods (MCMs).⁵ Studies have cited several factors including male partner opposition, religious opposition and myths about side effects as influencing uptake of MCMs in low-income and middle-income countries.^{5–8} In Uganda, male partner support for MCMs

has been shown to be influenced by patrilineal traditions that place value on family size and favour large families, as children are seen as a sign of wealth and financial security.⁹ The desire for large families and the influence of this on MCM uptake is echoed in research across sub-Saharan Africa.^{10 11}

There is a wide body of literature that discusses the difficulties of promoting MCM use in contexts where cultural norms and traditional values support the use of natural methods of FP.^{7 12 13} However, there is limited evidence about what influences these social and cultural norms, particularly in populations where traditional lifestyles and livelihoods may influence health seeking behaviours. Studies that have assessed links between rural pastoralist lifestyles in sub-Saharan Africa and health outcomes have found that livelihood practices are among the major social determinants influencing health seeking behaviours, yet these have rarely addressed MCM use.^{14 15} A study from Ethiopia assessing access to tuberculosis treatment among pastoralist communities found that lack of access to formal health services was a barrier to treatment access and that traditional beliefs, leading to self-treatment, were barriers to seeking health services.¹⁶ Research from Sudan suggests that health seeking behaviours among nomadic, pastoralist populations are influenced by the mobile lifestyle of nomads, low levels of education, gender norms and other beliefs and values, and suggests that existing healthcare services are ill-adapted to the nomadic lifestyle.¹⁷ Given the influence of lifestyle on health seeking behaviour among these populations, it is important to understand if and how changes to nomadic and pastoralist lifestyles might lead to changes in health seeking behaviours, particularly in regard to FP and MCM use.

An intervention that integrated the delivery of FP with childhood immunisation services in Moroto, in Uganda's North-eastern region of Karamoja, presented an opportunity to interrogate the uptake and delivery of FP in a community comprised of pastoralist and non-pastoralist populations. An evaluation was conducted to understand (1) if and how prevailing contextual factors influenced the acceptability and use of MCMs in a pastoral community in Uganda, (2) what mechanisms were triggered by these contextual factors (3) if these contextual factors changed between two time points 4 years apart and (3) the impact of any contextual changes on mechanisms triggered and acceptability and use outcomes.

METHODS

This section is divided into six subsections which outline the methods for this study. First, we describe the context in which the study was conducted. We then describe the intervention on which this study is based. Subsequently, we describe the study design and components, including the data collection that took place, the use of realist evaluation approach and the theoretical frameworks that were used to guide our research. We then describe our approach to sampling and data collection, our data

analysis procedures and also briefly describe ethical approvals that were obtained for this study.

Study context

Karamoja, is a vulnerable region of Uganda due to its large distance from urban centres and a harsh climate of low rain fall and periods of drought.¹⁸ This, combined with the proximity and spacing of health facilities among communities has contributed to low access to health services in the region.¹⁹ Moroto is a district in Karamoja, within which Moroto is the largest town. While Uganda as a whole has a food insecurity level classified as serious by the Global World Hunger Index,¹⁸ the northern and eastern regions are particularly affected by food insecurity due to periods of drought, which impact agricultural crops. The poverty rate in Uganda has been steadily declining in recent years, but when coupled with rapid population growth, the number of people living in poverty has remained constant.¹⁸ The decline in the poverty rate has been slower in Northern and Eastern regions of the country compared with others.²⁰

Data from the 2016 Demographic and Health Survey (DHS) in Uganda demonstrate that use of FP in Karamoja is very low. While 98.4% of women and 90.4% of men had ever heard of an FP method (98.3% and 88.4% had heard of any modern method), only 7.3% of women in Karamoja were using any FP method and 6.5% were using a modern method.²¹ These are the lowest rates of use in the country by far, followed by West Nile region, where 21.3% of women were using any FP method. In the urban capital of Kampala, 44.8% of women were using any FP method. In Karamoja, the unmet (Proportion of women who (1) are not pregnant and not postpartum amenorrhoeic and are considered fecund and want to postpone their next birth for two or more years or stop childbearing altogether but are not using a contraceptive method, or (2) have a mistimed or unwanted current pregnancy or (3) are postpartum amenorrhoeic and their last birth in the last 2 years was mistimed or unwanted.) need for FP, was 19.7% among married women and 10.3% among unmarried women.²¹ To respond to the relatively low rates of FP uptake in the country, Uganda set an FP2020 Global Partnership target of increasing the national modern contraceptive prevalence to 50% and the reduction of the unmet need for FP to 10% by 2020.²²

Intervention

Between January 2016 and December 2019, the International Rescue Committee supported the implementation of an intervention, which integrated FP and immunisations in government-run health facilities in Moroto District, including health facilities and hospitals. Three of these facilities were Catholic-founded facilities that only provided counselling on natural FP methods, such as lactational amenorrhoea and abstinence. The intervention aimed to increase access to, demand for and uptake of MCMs by strengthening FP services, improving referral pathways, supporting MCM supply provision and building

capacity among healthcare workers (HCWs). Broadly, the intervention contained several components including (1) training and mentoring of facility-based HCWs on FP counselling and MCM service provision; (2) increasing capacity of members of the Village Health Team (VHTs) to support HCWs in FP counselling; (3) improving immunisation defaulter tracing and (4) developing robust community engagement strategies that included the involvement of community leaders, HCWs and VHTs. The intervention promoted the use of natural FP methods as well as MCMs (condoms, oral contraceptive pills, injectables, implants, the intrauterine device and permanent methods such as tubal ligation and vasectomy). In this study, 'FP services' and 'FP counselling' refer to both natural FP and MCMs.

HCWs and VHTs worked in tandem to provide FP counselling to women and to support their decision-making around FP service uptake. At the community level, VHTs played a key role by leading health talks in the community and by providing counselling and referrals for FP services during household visits and by using expert clients. VHTs were supported by community leaders and role models who were members of the community who engaged with FP services.

In addition to FP counselling provided within the community, HCWs provided counselling in health facilities during antenatal care visits, at birth and during postpartum visits. Postpartum visits took place immediately after birth, 6 days after birth and 6 weeks after birth, and were used to discuss the importance of immunisation, and opportunities for immunisation and FP counselling were offered.

The intervention's routine monitoring data revealed a 42% increase over time in the number of women who accepted a referral for FP services when taking their child for immunisation. Between July 2016 and February 2018, a total of 8933 women took a child for immunisation within the study site. Among these women, 1246 (13.9%) accepted a referral for FP services and 1080 (86.7%) of the women who were referred took up a method on the same day. Between March 2018 and November 2019, a total of 7139 women took a child for immunisation. Among these women, 1711 (24.0%) accepted a referral for FP services and 1598 (93.3%) of the women who were referred took up a method on the same day. These data were collected across all health facilities, including Catholic-founded facilities where only natural FP methods were offered.

Study design and components

The intervention was evaluated using a realist evaluation at two time points (November 2017 and November 2019). The realist evaluation used qualitative methods to understand the mechanisms by which intervention components worked or did not work. This method of evaluation recognises the limitations of using experimental study designs to understand complex interventions in which multiple factors are at play. Realist evaluation seeks to understand what works, for whom and under what

circumstances within a particular intervention, using context-mechanism-outcome (CMO) configurations.²³ In recognition of the impact that different actors and their reactions to intervention components have on intervention outcomes, the standard CMO configuration was expanded where relevant to include context-actor-mechanism-outcome (CAMO) or context-intervention-actor-mechanism-outcome (CIAMO) configurations; this methodology has been used previously to acknowledge the importance of actor reactions to intervention components.^{24 25}

There is limited evidence about the use of qualitative research methods to understand changes over time. It has been suggested that the use of a theoretical framework and multiple methods of analyses can ensure the quality and integrity of longitudinal qualitative studies.²⁶ Grosshoeme and Lipstein (2006) suggest using a trajectory approach to understand changes over time at the individual level, noting that this allows for an understanding of an individual's experiences over time, rather than looking at broad changes across entire populations. This, the authors argue, allows for important nuances to be captured. Looking at population level changes may yield few results, while individual analyses allow researchers to understand factors influencing decision-making or behaviours at the individual level.²⁷ The overarching or prevailing context in which an intervention is implemented influences mechanisms of acceptability.²⁵ A prevailing context is multidimensional, multilayered and fluid. Interventions and their components may also cause shifts in the prevailing context.

Research components

This evaluation employed seven research components (figure 1) used at two time points (round 1 and round 2), which included: (1) the development of an initial programme theory (round 1); (2) the analysis of qualitative data from round 1 in-depth interviews (IDIs); (3) the development of preliminary CMO configurations; (4) development of a revised programme theory (RPT); (5) the analysis of qualitative data from round 2 IDIs; (6) the development of round 2 CAMOs/CIAMOs and (7) the development of a RPT comprised of CAMO/CIAMO configurations ordered against relevant published theoretical frameworks and finally the development of context-acceptability theories (CATs).^{25 28}

An initial programme theory (figure 2) was developed with implementing partners and described factors at the community-level and facility-level that were thought to drive the effective implementation of the intervention. These included the effective delivery of FP services at health facilities and the willingness of women in the community to engage with these services. The initial programme theory was used to inform the development of IDI interview guides.

IDIs with key stakeholders involved in the delivery and uptake of the intervention were conducted in each round to identify contextual factors that triggered mechanisms,

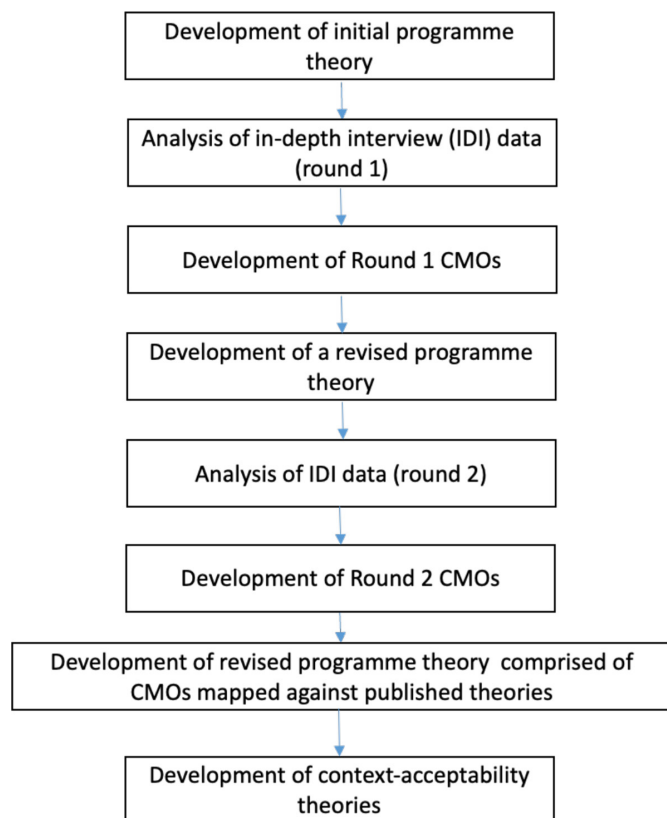


Figure 1 Outline of data sources and study components and process. CMOs, context-mechanism-outcome.

which led to intervention outcomes. All participants were provided a detailed information sheet about the study and signed an informed consent form before participating. The RPT developed at the end of round 1 provided the initial programme theory for round 2.

We used two published theoretical frameworks to provide a structure against which findings could be ordered. These frameworks have been used previously to explore FP acceptability in Ethiopia.²⁴ The first of these was Roger's diffusion (and adoption) of innovations, which provides a framework for examining factors influencing how an intervention is adopted and diffused through a system. This framework consists of five constructs: relative advantage, compatibility, trialability, observability

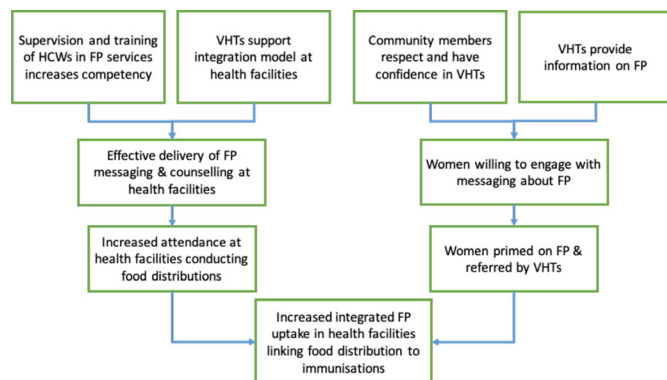


Figure 2 Initial programme theory. FP, family planning; HCWs, healthcare workers; VHTs, Village Health Team.

Table 1 Constructs of the diffusion of innovations framework and the theoretical framework of acceptability

Construct	Definition
Diffusion of innovations framework²⁹	
Relative advantage	The degree to which an innovation is perceived as being better than the idea it supersedes.
Compatibility	The degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters.
Trialability	The degree to which an innovation may be experimented with on a limited basis.
Observability	The degree to which the results of an innovation are visible to others.
Complexity	The degree to which an innovation is perceived as relatively difficult to understand and use.
Theoretical framework of acceptability³⁰	
Affective attitude	How an individual feels about the intervention.
Burden	The perceived amount of effort that is required to participate in the intervention.
Ethicality	The extent to which the intervention has good fit with an individual's value system.
Intervention coherence	The extent to which the participant understands how the intervention works.
Opportunity costs	The extent to which benefits, profits or values must be given up to engage in the intervention.
Perceived effectiveness	The extent to which the intervention is perceived as likely to achieve its purpose.
Self-efficacy	The participant's confidence that they can perform the behaviour(s) required to participate in the intervention.

and complexity.²⁹ The second framework was an adaptation of the Theoretical Framework on Acceptability (TFA)³⁰ consisting of eight constructs including affective attitude, burden, perceived effectiveness, ethicality, intervention coherence, opportunity costs, self-efficacy and unintended consequences.²⁵ Definitions of these constructs are provided in table 1. These two frameworks were used to guide and structure the analysis of data with the aim of matching empirically identified mechanisms to constructs from the frameworks. These linked mechanisms and constructs would then act as middle range mechanisms²⁴ to aid in cumulation of findings. Such middle range mechanisms have recently been used to develop CATs, which theorise what intervention/s will work in what context to trigger mechanisms that increase acceptability.²⁵

Sampling and empirical data collection

Purposive sampling was used to select key stakeholders for IDIs in both rounds of data collection. Stakeholders were selected if they were involved or had an interest in the intervention, which included implementing partners,

government officials, HCWs and community members, including women (both FP users and non-FP users). Sampling ensured a wide range of stakeholders and opinions were sought. HCWs and VHTs that were selected were all directly involved in the delivery of integrated FP and immunisation counselling or service provision. Health facilities were identified based on their performance according to monitoring data and to the implementing partners and included those where the intervention was performing more or less well. Different stakeholders were selected in each round of data collection. Stakeholders were independently selected for each round of data collection and therefore differed across the two rounds.

Interview guides were developed for IDIs. These included a range of themes such as: workload, sociocultural norms and healthcare access. Implementing partners were involved in the development of the interview guides for the first round of data collection. The findings from the first round of data collection informed the development of interview guides for the second round. In addition to questions that addressed key thematic areas described above, the interview guides in the second round of data collection included a presentation of CMOs developed from round 1. At the end of the IDI, each stakeholder was presented with CMOs that were relevant to them and were asked to confirm whether they believed the statement was true at the time of round 1 data collection and, whether it was true now, why or why not in each case.³¹ This was followed by a discussion of each component of the CMO and their linkages. This was done to confirm previous CMOs and to gain a deeper understanding of each component of the CMO. It also allowed for an understanding of if and how participants perceived that these components linked together and whether they had changed between the two rounds of data collection.

Data were collected in English and Karamojong. All interviews were recorded, transcribed *verbatim* and translated into English when necessary. Interviews were conducted by a researcher from the London School of Hygiene and Tropical Medicine (LSHTM) and field-based research assistants, with oversight from a local study coordinator.

Data management and analysis

The IDI transcripts were imported into NVivo V.11.2 for coding and analysis. Quotes were anonymised, but the type of respondent attributable to each quote was retained to aid analyses. Coding and analysis were based on an initial framework of: interventions; actors; context; mechanisms; outcomes and initial CMO configurations. These categories were populated inductively with themes and subthemes as they were identified from the data. Key themes identified from the interviews were presented and supported by quotes from interview transcripts.

For both rounds of data collection, retroductive analysis was used incorporating both inductive and deductive reasoning to explore how outcomes were generated, the mechanisms of this causal generation and the influence

of contextual factors. CAMO/CIAMO configurations were developed for each round of data collection and compared.³² The empirical mechanisms identified were then linked to constructs from the diffusion of innovations framework and the adapted TFA and thus ordered within these frameworks. A RPT was developed from the CAMOs/CIAMOs, at the end of round 1, which then functioned as the IPT for round 2. Mechanisms were linked to framework constructs and CATs were ultimately developed.

Though the initial programme theory included service delivery factors that drove the intervention, this paper focuses solely on the community context.

Patient and public involvement

No patients were involved in this study.

RESULTS

This section includes three subsections. First, we highlight key findings from the analysis of stakeholder IDIs and describe the four broad themes that encompass the context and mechanisms perceived by stakeholders, supported with quotes. We then describe the CAMOs and CIAMOs developed and how the identified mechanisms were linked to constructs of published theories. This subsection is supplemented with a table that describes the CAMOs and CIAMOs in detail. Finally, we present a brief paragraph on the development of context-acceptability-theories, also supplemented with a detailed table.

Perceptions of stakeholders

Sixty-nine stakeholders were interviewed through both rounds of data collection (table 2). MCM uptake was influenced by several factors. Four key themes were identified as important in stakeholders' perceptions and acceptability of MCMs. These were: (1) fear of side effects of MCMs; (2) preference for natural FP methods; (3) pastoral lifestyles of men in the community and (4) food insecurity in Karamoja. We present data (quotes) from

Table 2 Stakeholder in-depth interview (IDI) summary

Type of participant	Number of round 1 IDIs	Number of round 2 IDIs
Woman (FP users and non-users)	5	15
Health worker	10	14
VHT	4	4
Implementer	2	2
Male community member	–	4
Member of the District Health Team	3	2
Community volunteer	3	1
Total	27	42

FP, family planning; VHT, Village Health Team.

each round of data collection relating to each of these themes.

Theme: fear of side effects of MCMs

Round 1: In round 1, fear of side effects, embedded in cultural beliefs, was a clear barrier to MCM uptake. Some women reported hearing stories from other women in the community about excessive bleeding or pain caused by MCMs and this caused fear. These fears led to a reluctance to use MCMs. Hearing about side effects from peers was powerful, and it influenced women's beliefs about MCM side effects. HCWs acknowledged these fears and reported that they could be mitigated if women knew that side effects could be managed. Some women feared that MCMs would lead to several physical side effects:

They talk and say that the medicine is bad it will kill you. They say that the body will shrink, you will become thin and again there is headache and you will die. Then again if you are not careful the headache will disturb you and... the stomach will pain you. Yes, if not the chest will pain you all the time and you will be over bleeding. So that is what we found as rumours. Woman FP user_1_round 1

Round 2: Data from round 2 indicated that, among women interviewed, fear of side effects was reducing. HCWs reported feeling confident that when women told them about their fears of side effects, they could convince them that side effects were minimal and could be managed. Women's knowledge and belief that side effects could be managed empowered them to make choices about MCM uptake:

I also wanted to join family planning like my friends who have joined. I had fear for side effects but I got courage. I discussed and agreed with my husband before I came to get a family planning method. Woman FP user_1_round 2

Theme: preference for natural FP methods

Round 1: In round 1, there were strong beliefs in the effectiveness of natural FP methods, which fit with the pastoral lifestyle in Karamoja. In addition, it was perceived that women felt that spacing between births should occur naturally, which reinforced their preference for natural methods of FP:

When you ask them, they say...they just don't want to block their uterus...And to them they feel that is compatible with their... natural lifestyle. Health worker_2_round 1

Round 2: This reliance on and preference for natural methods was less evident in round 2, where it was perceived that fears of side effects of MCMs were less prominent:

Others use the modern methods... Because now they prefer it more than those other natural ones especially the learned people... Because with the modern, they know in case of any side effects, it can be

managed and it can [space births] for some good time but [for] natural [methods], it is short time... just below 2 years. Health worker_2_round 2

Decreased reliance on natural methods was also influenced by changes to pastoralist lifestyles which meant that men were spending less time in the *kraal* (the field), and more time in the home. Some participants discussed the fact that spending less time in the *kraal* meant that the traditional method of abstinence no longer worked for some couples. Natural birth spacing that occurred when men spent months or years away from the home was no longer reliable, thereby increasing the need for MCMs:

Previously when men are pastoralist, even the woman would delay to more children... children are spaced well, but now because the cows are just within, the place is dry, now you see women are getting a lot of children, you get another one before the other one is even one year, family planning...the natural one is getting affected, that is why we need to emphasize on the artificial one so that they can also have some time to space. Health worker_4_round 2

The natural method they use to say is that when a woman... delivers a man is supposed to stay away for two to three years before they have sex with a woman until the child first runs in the compound that's when they think a woman is now ready to meet with the man and in that process the man is either is in the [kraal] there very far... now they are interfaced with a scenario where they're always with a man, woman and man in the same place, they're no longer very distant they have a negative thinking about the modern methods so we see baby after a baby. Member of District Health Team_1_round 2

... at least some people have embraced family planning and they find it good for them...those years, the only family planning method was to disappear from the home and go to the kraal up to when again the child is like two years so that at least with now with the advantages of family planning that we have told them, I think they are really embracing. Male partner_1_round 2

Theme: pastoralist lifestyles of men in the community

The fact that men in the community were spending less time in the *kraal* carrying out pastoral work meant two things: (1) natural methods of birth spacing that relied on men's absence from home were no longer effective, and (2) men were at home more and observed the need for and benefits of FP. Both of these factors influenced uptake of MCMs.

Round 1: Lack of male support for MCM use was commonly reported as a barrier to MCM uptake by participants in round 1. It was perceived that men in the community believed that it was a woman's duty to produce children and that having a large family and many children was a source of pride among men. Men

believed that, by having a wife, they had the opportunity to produce children and that they should not limit the number of children they had:

They were really very negative about it [FP]. They were like, if God has given me that chance to produce why don't I produce? Why are you telling me about family planning? Health worker_5_round 1

Round 2: In round 2, as mentioned above, many participants noted that men were spending less time in the *kraal* doing pastoral work. Participants discussed how this meant that men could now see the health and economic impacts of having a large family and how it influenced their acceptability of MCMs. This meant that the lack of male support for MCMs seen in round 1 was not as strong, because despite beliefs about family size and the pride associated with having many children, it was perceived that men could see that there were negative impacts of not being able to manage or take care of a large family:

Anyway those days, men used to move they come at night but now since they are seated there together, you find a man also sees, they are very many children, this one is crying, the other one has diarrhoea...this one is what, so that one alone in his mind and say, why don't I take this woman for family planning, because now over producing, there is no food there is no what. At least those days men could move and they could comeback when children are sleeping but now they can stay for some time even they come a bit not so late they first stay with their women and see how the family is so, it has helped somehow. Health worker_2_round 2

Spending less time in the *kraal* also meant that men were able to be engaged in decision-making about FP and MCM use. Because men were in the home more, they could engage in dialogue with their wives about FP and they could benefit from messaging about FP in the community:

It has influenced family planning because right now the family can sit together and they decide maybe we have to have this number of children than us having very many now you see there is poverty, we have few cows, we cannot afford, that means they can share information and you find that people now are trying to embrace family planning. Health worker_3_round 2

Theme: food insecurity in Karamoja

Round 1: The influence of food insecurity was particularly evident from the responses of participants in round 1. Food insecurity influenced health seeking behaviours among women that were interviewed in different ways. Some people sought FP services out of fears they would not be able to feed all their children:

[I] was not going for family planning before [we] had enough animals...had enough cows but because of

the rains so they came and raided all [the] cows they stole all [the] cows so when the cows were over now [I] should go for family planning because now there is nothing that [I] can use for feeding the family. Woman FP user_2_round 1

Others chose to access health services at health facilities that were distributing food rations from the World Food Programme (WFP). Some health facilities that were providing WFP rations were not providing FP services, and so women accessing rations were not receiving FP counselling. HCWs perceived this to mean that uptake of FP services was influenced by women's decisions to access rations.

Yeah it affects very well because when that food is there we have the highest number [of women accessing the health facility] when the food is not there you can get like two mothers for the whole month you can get like 30 and yet when the food is there we can get like two hundred mothers in a month, so you find ... it affects so much and when we don't have food they go to the facility that has food. Health worker_3_round 1

Round 2: In round 2, participants reported that changes to the WFP in Karamoja meant that the provision of food rations at health facilities was less frequent and as such did not have the same level of influence on facility choice as noted previously. At the same time, the lack of access to food rations meant that food insecurity was an even more obvious problem in round 2, and VHTs and District Health Team members perceived that this made it clear to women that managing a large family was a challenge:

Now the food is reducing, they are now realizing that health is very important, them immunising their children is very important and does not mean that there is food because they keep on health educating them that what about tomorrow when that food is not there, will you not take your child for immunisation or won't you go for a service before anything is given. They are trying to pick up now. Member of the District Health Team_2_round 2

Poverty has forced the communities to accept family planning because it has become hard to feed many children. Managing families has become a challenge. There is rapid shift from old cultural practices towards modern family planning. VHT_1_round 2

CAMOs/CIAMOs

CAMOs/CIAMOs were developed for each round of data collection across each of the four themes (table 3). A RPT was then developed to describe changes in the four key themes and how these changes led to different CAMOs/CIAMOs across rounds (figure 3). The RPT describes if and how the intervention was perceived to have contributed to changes in context and mechanisms of acceptability of MCMs. The two theoretical frameworks were useful in understanding the mechanisms that

Table 3 Context-(intervention)-actor-mechanism-outcome configurations across two time points**Theme: fear of side effects of MCMs****Round 1****CAMO1_R1**

Women hear rumours of side effects of modern FP methods (C) and women (A) fear side effects of MCMs (M) so they choose natural methods for birth spacing and have reduced uptake of MCMs (O)

Round 2**CIAMO1_R2**

Where rumours about the side effects of MCMs persist (C), side effects are managed by healthcare workers providing FP services (I) and women (A) understand and believe that side effects can be minimised and managed (M) and choose MCMs (O)

Intervention components that contributed to changes: management of side effects by healthcare workers

Theme: preference for natural FP methods**Round 1****CAMO2_R1**

Women have peers who use natural methods of birth spacing (C) women (A) trust natural methods for birth spacing (M) such that women choose natural methods for birth spacing and have reduced uptake of MCMs (O)

Round 2**CIAMO1_R2**

Where rumours about the side effects of MCMs persist (C), side effects are managed by healthcare workers providing FP services (I) and women (A) understand and believe that side effects can be minimised and managed (M) and choose MCMs (O)

CAMO1_R2

Men spend more time in the home than in the *kraal* (C) and men and women (A) understand and believe that traditional methods for birth spacing no longer work (M) so they choose MCMs over natural FP methods (O)

Intervention components that contributed to changes: management of side effects by healthcare workers

Theme: pastoralist lifestyles of men in the community**Round 1****CAMO3_R1**

Male partners oppose the use of MCMs (C) and women (A) are reluctant (M) to take up MCMs which leads to low MCM uptake (O)

Round 2**CAMO2_R2**

Where pastoralist lifestyles are changing and male partners spend more time in the household (C), men (A) can see the impact of having too many children and believe that MCMs will have a positive impact (M) and support their wives in uptake of MCMs (O)

Intervention components that contributed to changes: N/A

Theme: food insecurity in Karamoja**Round 1 context****CAMO4_R1**

WFP offers food distribution at some health facilities linked to child immunisations (C) and women (A) feel food rations are an immediate priority (M); therefore women attend health facilities that distribute food and may not offer FP services (O)

Round 2 context**CAMO2_R3**

Where food insecurity influences health seeking behaviour (C), women (A) can see the need to limit their family size in order to be able to provide food for all their children (M) and they therefore choose to take up MCMs (O)

Intervention components that contributed to changes: N/A

CAMO, context-actor-mechanism-outcome; CIAMO, context-intervention-actor-mechanism-outcome; FP, family planning; MCMs, modern contraceptive methods; N/A, not applicable; WFP, World Food Programme.

drove intervention uptake; however, they were found to perform different functions with constructs of the diffusion of innovation acting as catalysts that triggered the acceptability mechanisms.

The intervention was perceived to have directly influenced or changed the context in terms of fear of side effects and preference for natural FP methods. By demonstrating to women that side effects could be managed, the intervention was able to contribute to shifting beliefs about potential dangers of MCMs. Furthermore, due to contextual changes that resulted in men spending more time at home, it was possible to demonstrate the usefulness of MCMs in a context where natural FP methods

could no longer be relied on. In both cases, women could observe the management of side effects by HCWs, which aligned with the diffusion of innovations construct of observability.

With fears of side effects being allayed, and with men spending more time in the home, women and men perceived the relative advantage of MCMs over natural methods. They also perceived that MCMs were compatible with their lives, aligning with the diffusion of innovations constructs of relative advantage and compatibility. In both cases, these constructs acted as catalysts for triggering acceptability constructs. Observing the management of side effects led women to feel more positive about

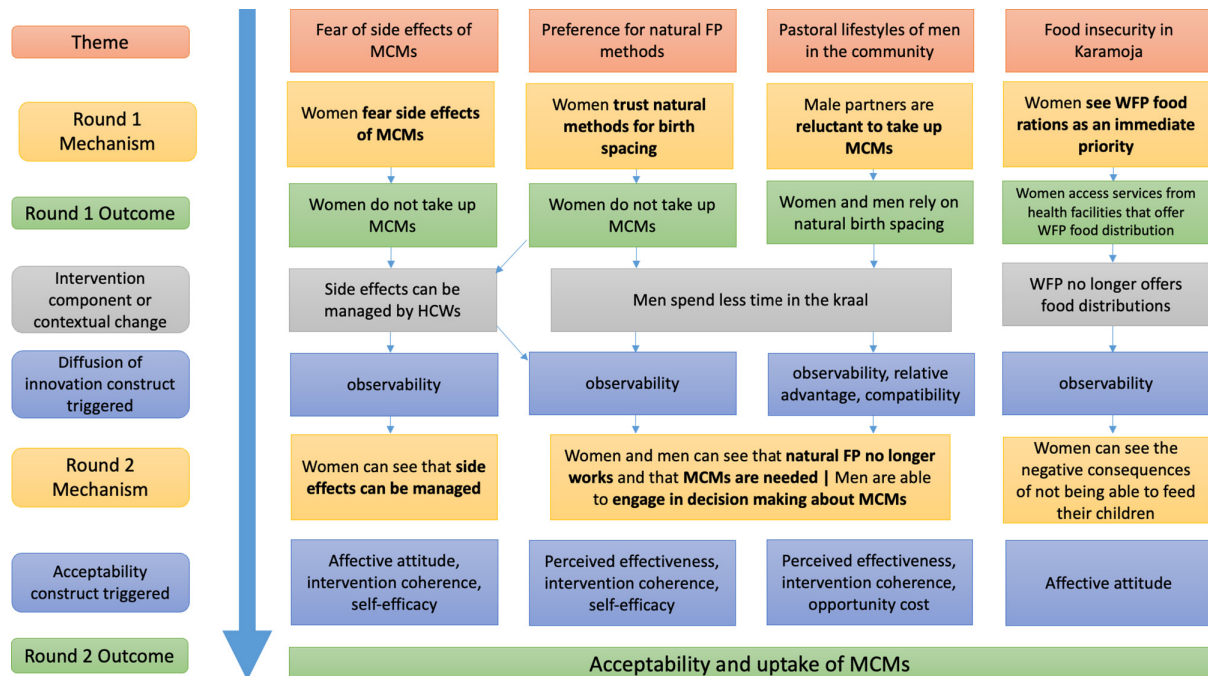


Figure 3 Revised programme theory. Contextual factors influenced intervention outcomes in round 1. Intervention components or contextual changes (in grey) led to the triggering of diffusion of innovation constructs that acted as catalysts for mechanisms of acceptability. FP, family planning; HCWs, healthcare workers; MCMs, modern contraceptive methods; WFP, World Food Programme.

MCMs and gain confidence in their ability to choose MCMs. This greater confidence aligned with the acceptability constructs of affective attitude and self-efficacy. Women were able to observe and understand how MCMs could assist them with birth spacing and achieving smaller family sizes. This shift in their perception of MCMs as useful aligned with the acceptability construct of intervention coherence. Furthermore, both women and men believed that natural birth spacing was no longer a reliable method of FP and could see how MCMs ‘fit’ (or were coherent with) their FP needs given the changed household context. This, combined with the knowledge that side effects could be managed, meant men and women were confident, or felt a high level of self-efficacy, in their ability to use MCMs.

In terms of pastoralist lifestyles and food insecurity, changes unrelated to the intervention influenced acceptability of MCMs in the community. The fact that men in the community were spending less time in the *kraal* meant that they could observe the challenges associated with having a large family and were receptive to the idea that MCMs would have a positive impact on managing family size and thus reducing the financial burden. This observability acted as a catalyst, which led to the triggering of the acceptability construct of affective attitude, as this influenced the way that men felt towards MCMs. Food insecurity also changed across rounds of data collection. When WFP food distributions were no longer available in round 2, it was perceived that women could see the consequences of not having enough food to feed their family even more than they could when rations were

available, and the need to limit their family size in order to be able to provide food for all their children. Again, the fact that women could observe these consequences acted as a catalyst and led to the triggering of the acceptability constructs of perceived effectiveness, intervention coherence, and opportunity cost. Women could see that (1) there was an opportunity cost to not using MCMs; and (2) that MCMs were more effective than natural FP methods at limiting family size.

Context-acceptability theories

By mapping study findings against published theoretical frameworks, this study identified several CATs (table 4). Eight CATs were developed when describing acceptability of FP interventions in five African countries by linking the empirically derived mechanisms of acceptability to TFA constructs.²⁵ One of the middle range theories described in the current study matches with one of these CATs and relates to the acceptability mechanisms of affective attitude, intervention coherence and self-efficacy. This study contributes three new CATs in addition to those that have previously been developed to understand FP acceptability.²⁵ These CATs involve the acceptability constructs of perceived effectiveness, intervention coherence and self-efficacy (theory 2), intervention coherence and affective attitude (theory 3) and perceived effectiveness, intervention coherence and opportunity cost (theory 4) and were triggered by changes in the prevailing context. Two of these CATs relate to changes in pastoralist lifestyles; the other CAT relates to the prevailing context of food insecurity.

Table 4 Context-acceptability theories

	In contexts where there are rumours or experience of MCM side effects women need to feel (understand and believe) that they can manage potential side effects. Ensuring that there are trained HCWs and community health workers that women can talk to about potential side effects will lead to women's acceptability of MCMs. Diffusion of innovation catalysts of acceptability: observability
Theory 1	Acceptability constructs triggered: affective attitude, intervention coherence, self-efficacy
Theory 2	In contexts where there is a preference for natural FP methods but traditional practices of men being away from home are changing, men are more present within the household. Men's understanding and belief that traditional methods for birth spacing no longer work will lead to their acceptability of MCMs. Diffusion of innovation catalysts of acceptability: relative advantage, compatibility, observability Acceptability constructs triggered: perceived effectiveness, intervention coherence, self-efficacy
Theory 3	In contexts where traditional practices of men being away from home are changing, men are more present within the household. Men being able to see the negative impacts of having several children will lead to their willingness to engage in dialogue about MCMs with their partners, and will lead to their acceptability of MCMs. Diffusion of innovation catalysts of acceptability: observability, relative advantage Acceptability constructs triggered: affective attitude, intervention coherence
Theory 4	In a context of food insecurity, women's perceived need to limit their family size in order to provide food for all their children will lead to increased acceptability of MCMs. Diffusion of innovation catalysts of acceptability: observability Acceptability constructs triggered: perceived effectiveness, intervention coherence, opportunity cost

FP, family planning; HCWs, healthcare workers; MCMs, modern contraceptive methods.

DISCUSSION

This evaluation highlights the key mechanisms that drove the implementation of an intervention of integrated childhood immunisation and FP services in Moroto, Uganda and explores how these changed over time. By developing and testing an initial programme theory, refining this theory and then retesting it, this evaluation provides a unique opportunity to understand how prevailing contextual factors change over time and how this influences the acceptability of an intervention. This evaluation contributes to the studies that have sought to understand uptake of FP services.^{33–39} It discusses the influence of social and cultural norms on the acceptability of MCMs. It also discusses how acceptability can shift over time in response to changes in sociocultural norms and to targeted intervention components that address underlying mechanisms of acceptability. Overall, the qualitative data demonstrated that stakeholders perceived an increase in acceptability of MCMs over time. This is reflected in the intervention monitoring data which show an increase in uptake of FP referrals.

Changes over time

Four key themes, which encompassed context and mechanisms, were noted across the two rounds of data collection. These included (1) community-level factors that could be influenced and changed by the intervention itself, and (2) over-arching prevailing factors that affected the delivery and uptake of the intervention. In one case, the combination of the intervention and the prevailing context together resulted in shifting the acceptability of the intervention. These themes, together with constructs of acceptability and diffusion of innovations, led to the development of CAMOs/CIAMOs which help to understand the changes that occurred over time.

First, at the community level, in both rounds of the evaluation, strong sociocultural norms and beliefs influenced the way women viewed MCMs. In the first round, women had strong fears of side effects. Evidence demonstrating fear of side effects and its role as a barrier to MCM uptake is common in the literature. Studies from India, Nepal, Nigeria, Uganda and the Philippines all show that fear of side effects can be a major barrier to MCM uptake.^{40–43} Studies that have assessed community myths about MCMs and how they lead to fears about side effects and resistance to MCMs have suggested that social norms play a large role in influencing individual-level choices about MCM use. In a study assessing MCM use in communities in Kenya, Nigeria and Senegal where negative myths about MCMs persisted, it was found that beliefs in myths, which were embedded within social norms, were negatively associated with MCM use.⁴⁴ An analysis of 2005–2009 DHS data from 21 African countries showed that contraceptive use was associated with community-level fertility and gender norms, and health knowledge,⁴⁵ again demonstrating the important relationship between social norms and choices about FP. This evaluation found that fears about side effects were less prominent in the second round of data collection and that stakeholders perceived the intervention as having contributed to changes or shifts in the context within the community in terms of the management of side effects.

Understanding how and why this shift occurred is complex. Evidence that community attitudes, particularly those relating to MCMs, can shift over time has focused primarily on the use of mass communication, messaging, and dialogue between partners as catalysts for change.^{46 47} *Gueye et al* (2016) suggest that programmes that encourage community-level discussions of myths

related to contraceptive use are needed to overcome fear of side effects.⁴⁴ Findings from studies in Nepal and Uganda demonstrate that interventions that focus on repeated exposure to messages and mass media can increase interpersonal communication and encourage positive changes in attitudes regarding FP.^{46 47} The intervention in Karamoja included counselling and messaging to women about FP, which aligns somewhat with the evidence cited above that exposure to messaging can shift attitudes towards FP. However, the intervention also showed women that the side effects of MCMs could be managed. Observing the effective management of side effects meant that women felt confident to use MCMs. Knowing that they could manage symptoms, is what ultimately led women to accept MCMs. This suggests that the provision of information alone is unlikely to cause a meaningful change and that mechanisms of acceptability can be successfully triggered by observing the intervention in action and by addressing underlying reasons for non-acceptability, in this case, fear of side effects. Indeed, other interventions beyond counselling and clinical management of side effects may be effective in promoting MCMs in a context where fears of side effects persist.

Second, there was a strong preference among women in the community for natural methods of FP which was linked to fears of side effects of MCMs. These natural methods, including lactational amenorrhoea and abstinence, were promoted by Catholic health facilities in the study community, and are often used in pastoralist communities because they are compatible with the lifestyle of men spending months and years away from the home.^{48–50} Because preference for these methods was influenced somewhat by fears of side effects, women's ability to see that side effects could be managed contributed to increased acceptability of MCMs over natural FP methods. However, preference for natural FP methods was also influenced by the fact that natural FP methods fit with the pastoralist lifestyle and that men spending time in the *kraal* meant that birth spacing occurred naturally. Decreased time in the *kraal* meant that the previously relied on methods of abstinence were no longer feasible and that in order to space births, or limit family size, MCMs would need to be considered. While there is very little evidence on abstinence as a method of FP among married couples in sub-Saharan Africa, McCadden *et al*⁴⁹ describe that the change in lifestyle and level of interaction between couples in Karamoja has changed gender roles and dynamics. In their studies the authors found that both women and men reported the need for self-discipline and the need to establish physical separation in order to avoid sex,⁴⁸ given the increased level of interaction. This suggests that MCMs may be perceived as more effective given the changing lifestyle that many pastoralist communities are facing, including the fact that men and women may be spending more time together in the home, and that this need led to increased acceptability of MCMs in the study community. Other important issues such as potential increases in violence in the home, or

women spending time out of the home working in order to supplement household income could be explored in future research.

Furthermore, with the shift in pastoralist lifestyles, men were spending more time at home and were therefore able to observe the challenges associated with having many children. They were also able to receive FP messaging in the community and to engage with their wives in decision-making about FP and MCM use. Evidence suggests that increased dialogue between couples about MCMs can shift social norms surrounding their use. An evaluation of an intervention that promoted community dialogue about MCMs and gender in Kenya found that such interventions can lead to increased uptake of MCMs by shifting social norms, and enabling communication and decision-making among couples.⁵¹ This was similar to conclusions from other studies in Nigeria and Egypt, which stressed the importance of engaging partners and spouses in dialogue about MCMs.^{52 53} While the current study findings align with other evidence on this topic, it is also clear that multiple factors are likely required to facilitate change. In this study, for women to choose MCMs over natural FP methods and to feel confident in being able to choose them, they needed to (1) see that side effects could be managed, (2) perceive that MCMs were more effective in achieving their desired birth spacing and (3) have engagement and support from male partners who recognised the value of MCMs. Again, observability acted as a catalyst for mechanisms of acceptability.

Finally, the broad, over-arching theme of food insecurity, and changes in access to food, was also perceived to drive implementation and uptake of the intervention in the study community. In the first round of data collection, food insecurity influenced the health seeking behaviour of community members. Women often chose to access health services from facilities that were offering food rations even if these facilities did not provide FP services. In this case, food insecurity directly influenced or mediated the effective implementation of the intervention and may have influenced the overall level of FP uptake. There is wide body of evidence that demonstrates links between food insecurity and health seeking behaviour.^{54–57} Much of the evidence focuses on adherence to HIV treatment. One study looking at if and how food insecurity influenced ART adherence found that the competing demands between costs of food and medical expenses led people either to default from treatment, miss clinic visits or give up food and wages to get medications.⁵⁶ Another study found links between food insecurity and ART adherence that were influenced by the exacerbation of hunger or ART side effects in the absence of adequate food and competing resource demands.⁵⁷ This evaluation found that during the second round of data collection, when the WFP had stopped food distributions, lack of access to food meant that community members could see the direct economic impacts of having a large family. This convinced them of the benefits of MCMs. While not directly a change in social norms, the lack of food



distributions changed the context in the community, with some participants perceiving that this highlighted the challenge of food insecurity even further. Looking across both rounds, the findings demonstrate the important role that food insecurity can play in mediating the implementation of FP interventions. They highlight the need for interventions that acknowledge food insecurity and include intervention components that address it.

Context-acceptability theories

By linking the derived mechanisms from the CAMO/CIAMO configurations with acceptability constructs from the TFA, this study contributes to the literature on the use of CATs as applied to FP acceptability.²⁵ This study found one CAT described in previous research relating to FP.²⁵ By deriving three more CATs, this study contributes to a growing body of applicable theories that can be used to describe how context influences the acceptability of FP interventions.

Limitations

While this evaluation provided a unique opportunity to explore changes over time in the delivery and uptake of an FP intervention, it would have been augmented by a robust quantitative data collection component to help describe changes in the uptake of MCMs. Timing constraints made it impossible to carry out quantitative data collection within this study. It might have also been useful to return to the same participants across both rounds of data collection, potentially allowing for the observation of changes within the exact same respondents over time.

Furthermore, while this evaluation included insight from a range of different stakeholders, discussions with additional stakeholders within each of the stakeholder categories might have yielded a broader range of opinions and perceptions of the mechanisms driving implementation and uptake of the intervention.

CONCLUSION

This study sought to understand the key contextual factors that influenced the implementation and mechanisms of uptake of an intervention promoting FP and immunisations and examined if and how these changed over two time points. This evaluation adds to the evidence base on the implementation of FP interventions in sub-Saharan Africa, and particularly in resource limited rural settings. Beyond this, it describes the unique contexts and mechanisms that influence the implementation and outcomes of FP interventions in pastoralist communities with long held social and cultural norms.

In this study, social and cultural norms played a strong role in influencing acceptability of the intervention. Key contexts identified were: strong social and cultural beliefs that favoured natural FP methods over modern ones, changing lifestyles among pastoralist communities which shifted norms within the home and high levels of food

insecurity which influenced health seeking behaviour. Within these contexts, the implementation of intervention components was found to trigger several mechanisms which were mapped to constructs of diffusion of innovations and acted as catalysts for mechanisms of acceptability including affective attitude, intervention coherence, self-efficacy, perceived effectiveness and opportunity cost. The context in which the intervention was implemented changed leading to the triggering of different mechanisms and an increase in the perceived value and acceptability of MCM use.

Contributors SK and JW conceived the idea for this research, wrote the first draft of the study tools and developed the study design and sampling approach with inputs from JKH, JH and NS. SK, ABA, CA and JM oversaw the data collection activities in Uganda with advice from JW, JKH and NS. The data analysis was carried out by JW, JH and SK. SK drafted the manuscript. SK is that guarantor of the paper. All authors made substantial and important contributions to revising the manuscript and provided final approval of the version to be published.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants and ethics approval was obtained from the Mildmay Uganda Research Ethics Committee (approval numbers 0409-2017 and 0705-2019) and the ethics committee of the London School of Hygiene and Tropical Medicine (approval numbers 14432 and 16188). The study was registered with the Uganda National Council for Science and Technology in Uganda. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. Deidentified participant data in the form of interview transcripts are available upon request.

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