

The Impact of Supply-side and Demand-side Interventions on Use of Antenatal and Maternal Services in Western Kenya: A Qualitative Study

Mitsuaki Hirai

Centers for Disease Control and Prevention

Jamae Morris

Georgia State University

Rosebel Ouda

Safe Water and AIDS Project

Nancy Atieno

Safe Water and AIDS Project

Robert Quick (✉ rxq1@cdc.gov)

Research article

Keywords: Maternal and Child Health, Qualitative Research, Antenatal Care, Kenya

Posted Date: November 8th, 2019

DOI: <https://doi.org/10.21203/rs.2.17029/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published on August 8th, 2020. See the published version at <https://doi.org/10.1186/s12884-020-03130-4>.

Abstract

Background : Antenatal care (ANC) and delivery by skilled providers have been well recognized as effective strategies to prevent maternal and neonatal mortality. ANC and delivery services at health facilities, however, have been underutilized in Kenya. One potential strategy to increase the demand for ANC services is to provide health interventions as incentives for pregnant women. In 2013, an integrated ANC program was implemented in western Kenya to promote ANC visits by addressing both supply- and demand-side factors. Supply-side interventions included nurse training and supplies for obstetric emergencies and neonatal resuscitation. Demand-side interventions included SMS text messages with appointment reminders and educational contents, group education sessions, and vouchers to purchase health products. **Methods :** To explore pregnant mothers' experiences with the intervention, ANC visits, and delivery, we conducted focus group discussions (FGDs) at pre- and post-intervention. A total of 19 FGDs were held with pregnant mothers, nurses, and community health workers (CHWs) during the two assessment periods. We performed thematic analyses to highlight study participants' perceptions and experiences. **Results :** FGD data revealed that pregnant women perceived the risks of home-based delivery, recognized the benefits of facility-based delivery, and were motivated by the incentives to seek care despite barriers to care that included poverty, lack of transport, and poor treatment by nurses. Nurses also perceived the value of incentives to attract women to care but described obstacles to providing health care such as overwork, low pay, inadequate supplies and equipment, and insufficient staff. CHWs identified the utility and limitations of text messages for health education. **Conclusions :** Future interventions should ensure that adequate workforce, training, and supplies are in place to respond to increased demand for maternal and child health services stimulated by incentive programs.

Background

High maternal and neonatal mortality remain key public health issues in Kenya. In 2015, the maternal mortality ratio was estimated to be 510 per 100,000 live births, which was higher than that of neighboring countries, including Uganda (343/100,000), Ethiopia (353/100,000) and Tanzania (398/100,000) [1]. In the same year, over 33,000 newborns lost their lives in Kenya during the neonatal period, within 28 days of birth [2].

Antenatal care (ANC) and delivery with skilled birth attendants are known to be effective strategies to improve clinical outcomes [3] and prevent maternal and neonatal mortality [4]. Based on empirical evidence [5], the World Health Organization (WHO) has promoted the focused antenatal care (FANC) model in developing countries where pregnant mothers were encouraged to visit ANC facilities at least four times prior to delivery [6].

ANC and delivery services at health facilities have been relatively underutilized in Kenya [2]. In 2014, only 58% of women visited ANC clinics four times or more during their pregnancy, and 37% of them did not deliver at health facilities [2]. Moreover, 43% of mothers had no postnatal checkup [2].

Under-utilization of ANC services can be influenced by a number of supply and demand-side factors. Supply-side determinants include the availability of healthcare providers, staff training, and medical supplies [7-11]. Demand-side determinants include cost, household wealth levels, maternal education, previous experience of obstetric complications, previous experiences at health care facilities, physical access to healthcare facilities, infectious disease testing, and cultural beliefs on pregnancy [9-16]. In western Kenya, monitoring fetal position, offering vaccinations, and providing medications were found to be major facilitators for ANC visits while clinic staff's negative attitudes and behaviors, long waiting times for services, and cost were identified as barriers [13]. Human immunodeficiency virus (HIV) testing has been identified as both a facilitator and a barrier to obtaining care [13].

One potential strategy to increase the demand for ANC services is to provide effective and desirable health interventions as incentives to motivate service use. In Malawi, the Ministry of Health, the United Nations Children's Fund (UNICEF), and Population Services International (PSI) implemented an antenatal care program in which pregnant women received free water, sanitation, and hygiene (WASH) products (e.g., soap, water treatment supplies) up to four times during pregnancy to incentivize ANC service use [17]. This program contributed to an increase in the percentage of women who visited antenatal care clinics at least four times and delivered in healthcare facilities. A similar program in Kenya also increased ANC service utilization, facility-based delivery, and postnatal checkups among pregnant women [14].

ANC Program in Western Kenya

From November 2013 to October 2014, the Safe Water and AIDS Project (SWAP), a Kenyan non-governmental organization (swapkenya.org), implemented an integrated ANC program in western Kenya in collaboration with the local offices of the Kenyan Ministry of Health, the Rand Corporation, and Centers for Disease Control and Prevention (CDC) to promote ANC visits by addressing both supply- and demand-side factors. Supply-side interventions consisted of two components to improve quality of care: 1) short trainings for nurses and healthcare providers on management of obstetric emergencies, neonatal resuscitation, patient-centered care; and 2) provision of medical and health facility supplies including handwashing stations, blood pressure cuffs, and bulb suction devices and ambu-bags for neonatal resuscitation.

Demand-side interventions also included three approaches: 1) as an incentive for women to attend ANC clinics and deliver at healthcare facilities, pregnant women enrolled in the study received free vouchers (100 Kenyan Shillings or approximately 1 USD) to purchase SWAP products, such as soap and water treatment supplies; 2) pregnant women with the same expected month of delivery were enrolled into cohorts for group education sessions during which nurses discussed a wide range of health topics (e.g., malaria prevention, breastfeeding, water treatment, handwashing, and nutrition) and community health workers (CHWs) facilitated group discussions about the experience of pregnancy; and 3) participants received health education messages and ANC appointment reminders by short message service (SMS) text messages.

During the course of the SWAP intervention, the Government of Kenya, in collaboration with a German bank, implemented an unanticipated program called Output-Based Aid (OBA) in project healthcare facilities in September 2013. This program, which was targeted toward poor and underserved groups, enabled women to receive ANC, free deliveries at the health care facility of their choice (including private facilities), postnatal care, and emergency care free of charge after paying a registration fee of 100 Kenya shillings (about 1 USD).

CDC and PATH, with the assistance of SWAP's research team, conducted a controlled trial of the SWAP intervention in 20 public healthcare facilities, comparing maternal registry data from 10 healthcare facilities in one (intervention) district to 10 healthcare facilities in another (control) district during a baseline period from January through September 2013 and a follow-up (post-intervention) period from January through September 2014 (Harvey R, personal communication). Because of the unanticipated OBA intervention, maternal registry data were also obtained from the 7 private healthcare facilities in the intervention district and the 5 private healthcare facilities in the control district.

Results of the evaluation suggested that, from baseline to follow-up, the change in attendance at 4 or more antenatal clinic visits from baseline to follow-up among mothers was 1.6 times greater in public intervention than public control healthcare facilities, and 1.7 times greater in private intervention than private control healthcare facilities. The change in healthcare facility deliveries from baseline to follow-up was 1.2 times higher in public intervention than public control healthcare facilities and 2.2 times higher in private intervention than private control healthcare facilities. Although results were confounded by the simultaneous implementation of two interventions in the same district, increased use of private healthcare facilities, which were not included in the SWAP intervention, suggests that the OBA intervention stimulated use of these higher-cost healthcare facilities, particularly for deliveries.

We also incorporated focus group discussions (FGDs) into the study at baseline as formative research to help shape interventions and provide a basis of comparison of opinions of quality of care toward the end of the study. At follow-up, we conducted FGDs to query mothers, nurses, and community health workers on how SWAP interventions and OBA program motivated mothers to attend ANC and deliver their children at healthcare facilities.

Methods

Study Sites

This study was conducted in four districts in Nyanza Province, Kenya: Nyando and Nyakach (intervention group), and North Rachuonyo and South Rachuonyo (comparison group). Residents primarily speak DhoLuo and make a living through farming and fishing. Under-five mortality rates in Nyanza Province (82 deaths per 1,000 live births) are the highest in Kenya [2].

Research Team and Reflexivity

Our research team consisted of public health scientists and SWAP staff. At the time of the study, the first author (MH) was a doctoral student at the George Washington University, the second (JM) and the last authors (RQ) were public health scientists at CDC, and the rest of co-authors (RO and NA) were qualitative research assistants at SWAP from the Kisumu area who were fluent DhoLuo and English speakers. Both male and female researchers participated in this study. Before conducting this qualitative study, authors had gained adequate research expertise and experience; MH had been trained in mixed-methods research, anthropology, and global health, JM had been specialized in qualitative methods and anthropological research, RQ had conducted many public health intervention studies in Kenya, and RO and NA had received qualitative research methods training and had established connections with local communities through SWAP.

Study Participants and Data Collection

Study participants were identified and recruited through purposive sampling to specifically explore perspectives of pregnant women, nurses, and CHWs [18]. For the pre-intervention assessment, pregnant women who were 15 years old or older and nurses were recruited at SWAP intervention facilities (see Table 1) in person to participate in this study. The follow-up study recruited new mothers, nurses, and CHWs in SWAP facilities listed in Table 1. Before both the pre- and post-intervention assessments, questions and prompts included in the FGDs were piloted with individuals not included in the study.

Data were collected by trained facilitators who speak both English and DhoLuo. A total of eight FGDs (four for mothers, four for nurses) were held before the intervention was implemented, and 11 FGDs (five for mothers, four for nurses, two for CHWs) were conducted at follow-up. Each focus group consisted of six to 12 participants and lasted approximately 1.5 hours. All FGDs took place at health facilities in locations where interruptions could be minimized. At the beginning of each FGD, a facilitator obtained oral consent from all study participants after explaining the purpose of this study, protection of confidentiality, and use of an audio-recording device for transcription purposes. A written consent was not obtained due to a concern of low literacy in study communities and to protect privacy of participants by having no written records with their personal identifiers and signatures. FGDs were recorded, transcribed verbatim in Luo and translated into English.

Data Analysis

This qualitative study conducted thematic analysis as the main analytical approach [18]. Two authors (MH and JM) read each transcript three to five times prior to data analysis. The authors who analyzed the data (MH and JM) did not moderate the FGDs or transcribe and translate FGD data. Data were analyzed with NVivo 11 through development of codes by constantly comparing them with the content of

transcripts (i.e., open coding) and identifying a key code that represents several open coding categories and creating groups of data (i.e., axial coding). Through the open coding and axial coding, a total of five codebooks were developed by MH and JM for pre- and post-intervention focus groups. Each codebook was applied to raw data, and emerging themes, sub-themes, and categories were identified and summarized. Quotes were selected to highlight a typical statement made by study participants for each theme, representing both majority and minority perspectives.

Ethical Considerations

This study received ethical approval and oversight from the Kenya Medical Research Institute (protocol 2472) and the U.S. Centers for Disease Control and Prevention's Institutional Review Board (protocol 6462).

Results

In total, 27 mothers and 25 nurses participated in the pre-intervention focus groups, and 42 mothers, 31 nurses, and 19 CHWs joined the post-intervention focus groups (Table 1). FGDs were held at healthcare facilities in the communities of Nyang'oma, Katito, Sondu, Masogo, Muhoroni, and Nyakach. Each focus group was well attended despite the late arrival of some participants.

Table 1. Timing, participant category, number of participants, and location of focus group discussions in Western Kenya (2013-2014)

	Number of FGDs	Number of Participants Mean (Range)	Facility Locations
Pre-intervention (2013)			
Mothers	4	6.75 (6-8)	Nyang'oma, Katito, Sondu, and Masogo
Nurses	4	8.75 (7-10)	Katito, Muhoroni, Masogo, and Sondu
Post-intervention (2014)			
Mothers	5	8.4 (8-10)	Muhoroni, Masogo, Nyang'oma, Katito, and Nyakach
Nurses	4	7.75 (7-9)	Muhoroni, Masogo, Katito, and Sondu
CHW	2	9.5 (9-10)	Awasi*, Katito

Note*: One post-intervention FGD was held at SWAP office in Awasi. All other FGDs were held at health facilities.

Table 2 summarizes a list of themes, sub-themes, and categories identified in pre- and post-intervention FGDs for mothers, nurses, and CHWs. Figure 1 illustrates a conceptual model to explain ANC visits and facility-based delivery based on FGDs.

Table 2. Identified themes and sub-themes from focus group discussions (FGDs) with mothers, nurses, and community health workers.

Participant	Timing	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6
Mother	Pre	Perceived quality of care at health facilities -Positive -Negative -Mixed	Perceptions on home delivery -Positive -Negative	Perceived barriers to ANC visits and facility-based delivery -Money -Work -Transport -Safety and Security -Fear of mistreatment -Time -Supply shortage at healthcare facilities	Proposed topics for text messages -ANC appointment reminder -family planning -malaria -water treatment -nutrition - immunization -HIV/AIDS		
	Post	Perceived quality of care at healthcare facilities -Rude attitude and conduct of nurses -Sympathy for nurses	Perceptions on home delivery -Positive -Negative	Perceived barriers to ANC visits and facility-based delivery -fear -lack of supplies and electricity -cultural beliefs	Overall experience with SWAP and OBA -Positive -OBA more valued	Experience with group education -Limited exposure -Beneficial to break cultural myths	Experience with SMS text messages -Literacy issue -Message reaching husband's phone
Nurse	Pre	Challenges with providing quality care -Inadequate training -limited equipment and supplies -workforce shortage	Barriers to ANC visits and facility-based delivery -poor roads -stigma -distance to healthcare facilities -geographic terrains -adverse weather				
	Post	Factors that make nurses better -Training - Specialization -Good	Challenges with providing quality care -Lack of equipment and supplies	Perspectives on mothers and community health workers -Nurses' attitude as a hindrance to	Experience with SWAP and OBA -Positive -Unintended consequences	Sustainability of existing programs -Concerns for the termination of programs	

supervision	-Inadequate	ANC visits	-Remaining
-Adequate	recognition	-Need for	challenges
staff and	-Limited	financial	
supplies	teamwork	incentives for	
-Rewards	-Inadequate	community	
	compensation	health workers	
	-Workforce		
	shortage		

Community Health Worker	Post	Perceptions of training	Experience with SWAP program
		-Satisfied	
		-Not enough	-Increased patients, ANC visits and hospital delivery
			-Challenges with product distribution availability
			-Benefits of health talks
			-Challenges with text messages

Quality of care

Quality of care at healthcare facilities. From pre- and post-FGDs, quality of care emerged as a major theme among mothers. It includes the following sub-themes: perceptions on quality of care at healthcare facilities, challenges with providing quality care at healthcare facilities, factors that make nurses better to provide care, and perceptions on quality of care at home. Mothers shared positive, negative and mixed perceptions on the quality of care provided at ANC and delivery at healthcare facilities:

I was also welcomed so well, and they asked me questions which I answered. Then, there were some drugs that I was given to swallow. Then, I was told to lie on the bed, and they palpated my tummy, and they wrote for me the date in which I was supposed to come back. I can say that I was happy with the way I was handled (positive).

– *Nyang’oma Pre-Intervention FGD, Mother #5* –

I just delivered on my own. They did not help me. I asked them why they are not helping me, and they said that they don’t know about mine (negative).

– *Katito Post-Intervention FGD, Mother #5* –

Hospital delivery is good but only if you get a good nurse. Some of them really mistreat mothers, they insult you, and so it only depends on the nurse that you get (mixed).

– *Katito Pre-Intervention FGD, Mother #3* –

While some participants mentioned nurses' rude attitude, arrogance, and violent behaviors, one mother in a post-intervention FGD shared her sympathy for nurses and described how a nurse strives to complete multiple tasks at once.

There is only one nurse who is doing rounds in the wards, and she also wants to attend to you. If there could be at least more than one nurse, then things could be very easy.

– *Nyakach Post-Intervention FGD, Mother #5* –

Another recurrent topic was that complications from pregnancy and delivery can be managed well at healthcare facilities. Other participants also explained that HIV transmission during delivery can be better prevented at healthcare facilities than at home and that injections are available for bleeding and post-pregnancy pain. Based on these positive perceptions of healthcare facilities, most of the mothers expressed that they want to deliver the next child at healthcare facilities despite the concern of mistreatment.

Challenges with providing quality care at healthcare facilities. Another sub-theme regarding quality of care was addressed by nurses, who described challenges with providing quality care at healthcare facilities. Some of the challenges include inadequate training, limited equipment and supplies, and workforce shortage. Nurses expressed the need and importance of training and updates to provide the most effective care and avoid outdated approaches to care. On resource limitations, nurses also stated:

“Maybe you are in the labor ward, you have no delivery packs, and there is no water. Maybe there is somebody to be referred, and there is no vehicle. Maybe you are in the maternity, and you have no gloves. Those are some of the things that make my work difficult sometimes.”

– *Murohoni Pre-Intervention FGD, Nurse #8* –

“I feel understaffing is the most challenging because if you are alone and you are pressed with a lot of work to do, you cannot really provide your services effectively. You are one person. You want to attend to the mothers. You are attending to the children. There you are giving injections. You are giving the drugs, and you are competing with time.”

– *Katito Pre-Intervention FGD, Nurse #1* –

Post-intervention FGDs for nurses also mentioned resource constraints and additionally highlighted inadequate recognition, teamwork, and compensation as the factors that discourage nurses and lead to

suboptimal care. Furthermore, the discussion emphasized understaffing as the major challenge faced by nurses.

It gives us a burnout, and even anger can flare out because expectation from outside is too much.

– *Katito Post-Intervention FGD, Nurse #9* –

Factors that make nurses better to provide care. FGDs also identified a number of factors that can enhance nurses' productivity at work, such as training, specialization, good supervision, adequate staff and supplies, and rewards (e.g., financial rewards, acknowledgment of efforts). In regards to better work environment, a nurse stated that:

The most important thing is that they should avail the equipment and better conditions for nurses to work. You know there are places where nurses even work without gloves, without instruments, and even without the necessary essential drugs....I think so many nurses are demotivated.

– *Sondu Post-Intervention FGD, Nurse #1* –

Perceptions on home delivery. The majority of mothers shared their recognition of home delivery with traditional birth attendants as unsafe practice or at least suboptimal practice. Yet, a few participants expressed her perspective on the value of using traditional herbs to facilitate delivery at home.

What I saw in a friend is that if the placenta refuses to come out they [traditional birth attendants] can give you traditional herbs of which if you are given, it can easily remove it faster, but in hospital at times they can still want to insert their hands or even want to do you an operation.

– *Masogo Pre-Intervention FGD, Mother #1* –

“At times you have Rariu, and sometimes your delivery becomes complicated, and it's only the TBA [traditional birth attendant] that can help you until the Rariu (i.e., a folk diagnosis where pain is felt by pregnant women in the lower abdomen) goes away since they are the people who know how to manage it.”

– *Katito Post-Intervention FGD, Mother #7* –

In response to participants' concern and experience of mistreatment by nurses, home delivery was also viewed as a favorable option by a few participants. One mother shared,

“It is not safe but at least they don't harass you the way the sisters [nurses] do.”

– *Nyang'oma Pre-Intervention FGD, Mother #4* –

Expressing a similar perspective regarding the kind of care given at home, another mother offered,

“Some women can help you if you give birth at home, the women who are serious. They can help you in that they pamper and tend to be faster, while in the hospital you may get some nurses who don’t mind about you. They take long to even attend to you.”

– *Katito Pre-Intervention FGD, Mother #2* –

Some participants shared negative views on home delivery as it cannot respond to complications quickly and safely. After the concurrent implementation of SWAP interventions and OBA program, participants reported that home delivery is rather costly. A mother stated that:

“What I can say about delivering at home is that it is not good because in the hospital, delivery is free unlike home. TBA wants to be paid. There is also some ashes that they give you when you feel labor to make the baby come out even when the time is not yet. This may make the baby die, and they end up taking your money as well.”

– *Nyang’oma Post-Intervention FGD, Mother #5* –

Barriers to antenatal care and facility-based delivery

Patient perceptions on barriers to antenatal care and facility-based delivery. The second major theme that emerged from FGDs was barriers to antenatal care and facility-based delivery, which addresses the perceptions of mothers and nurses. Mothers in pre-intervention FGDs listed a number of factors that prevent people from visiting healthcare facilities for ANC visits and delivery, including money, work, transportation, security and safety, fear of mistreatment by nurses, time, and supply shortage at healthcare facilities. Participants shared that people may not have money to pay for their first-time hospital fee of 100-150 Kenyan Shillings, and work (e.g., drying maize outside of the home) could prevent them from leaving for ANC. Describing the concerns about traveling to the health facility at night, a mother stated,

“When labor starts in the morning, then I will come and deliver here at Nyang’oma. If it starts at night, it can be very risky. We live next to the road and when it reaches at night, there is a lot of chaos...I would not like to risk. So, if it is during the day, I will just come to the hospital, but if it is at night, then I will have to deliver at home.”

– *Nyang’oma Pre-Intervention FGD, Mother #5* –

Multiple mothers also expressed their fear of mistreatment by healthcare providers. One of the mothers stated that, “I feel I have some fear because I hear rumors that nurses at [a specific facility] sometimes

mistreat you when they know that your delivery time is not ready. Sometimes you know labor can start early and then you take time before delivering.”

– *Nyang’oma Pre-Intervention FGD, Mother #7* –

FGDs also discussed fear, lack of supplies and electricity, and cultural beliefs serve as major barriers to ANC visits and facility-based delivery. Mothers explained that some mothers do not like ANC because many questions will be asked at the first ANC visit. The types of fear include fear of HIV test, injection, language, and walking while being pregnant. A mother spoke about the fear of knowing her HIV status and explained that it delayed her timing of seeking care.

Nurse perceptions on barriers to antenatal care and facility-based delivery. Nurses also identified a list of barriers to ANC visits and facility-based delivery, including poor roads, stigma, distance to healthcare facilities, geographic terrains (e.g., steep hill), and adverse weather. Speaking to how stigma may influence ANC visits, one nurse stated that stigma associated with HIV/AIDS prevents people from returning to ANC visits or delivering at healthcare facilities once they find out their positive status.

SWAP and OBA Interventions

Proposed topics for text messages. The last major theme from FGDs was SWAP and OBA interventions. When pre-intervention FGD moderators asked mothers to suggest topics for text messages, participants expressed their interest in the following topics: reminder of ANC appointments, family planning, malaria, water treatment, nutrition, immunization, and HIV/AIDS. These responses informed SWAP’s intervention to develop health education and reminder messages by text.

Perceptions on intervention effects. Mothers shared their appreciation to and contribution of SWAP interventions and the OBA program. Some participants valued the OBA program more than SWAP interventions because it substantially reduced healthcare costs and provided a sense of ease.

“They [SWAP interventions and OBA] are both important. One helped me because I gave birth free of charge, and the other one, every time I came from the clinic, I could fill my bag with the item that I was given at the shop there.”

– *Masogo Post-Intervention FGD, Mother #9* –

They are both good, but I can say that OBA card was the best because it was catering for a lot of things that if we were to pay cash then maybe we wouldn’t.

– *Nyakach Post-Intervention FGD, Mother #3* –

Nurses identified positive effects and remaining challenges of SWAP interventions and spoke to how SWAP interventions enhanced their work and service utilization:

SWAP was able to see that the last time we didn't have electricity, so they installed for us a solar [system]. So in the night when we have a blackout, we simply use the solar system. So, this has improved our uptake and the clients are able to deliver at night even when we have a blackout.

– *Katito Post-Intervention FGD, Nurse #8* –

At the same time, the discussion uncovered some unintended consequences of SWAP interventions. A nurse shared that mothers come to deliver at healthcare facilities with an expectation that they receive incentives, so they did not come with any baby care package. Another nurse also stated:

The negative part of it [increased clients] is that we have a high workload that sometimes cannot allow us to give quality service because we are struggling to finish the queue, and we miss giving some education to our clients. You find that when it comes to health talks like the danger signs, breast feeding education and other things, you find that time doesn't allow us.

– *Katito Post-Intervention FGD, Nurse #5* –

As an unintended consequence, nurses also shared how they could develop a negative attitude toward mothers at their facilities.

At times, we also have attitude which sometimes really make these mothers not to come and deliver in the hospital. Many times you find that these mothers are saying that they will be slapped.... Sometimes the nurse will ask so many questions that they don't like, and they are going to be intimidated. So, we should be well-staffed, and then as nurses, we should work on our attitude. Like how you talk to them in that situation will also attract the others to the hospital, and we provide the care.

– *Sondu Post-Intervention FGD, Nurse #6* –

Nurses also discussed how the OBA program contributed to reducing their stress level during the night when they have difficult delivery. A participant explained that she can call an ambulance, and it takes care of the challenge. The OBA program also provided additional financial source for the healthcare facilities to conduct outreach activities and benefit people in remote villages. The remaining challenge identified in the discussion was transportation for referral. "For now, OBA is giving us support. They have paid for transport, but still the ambulance is the same one. You call. It's not there."

– *Masogo Post-Intervention FGD, Nurse #6* –

CHWs discussed how SWAP and OBA interventions contributed to increasing patients, ANC visits, and hospital deliveries and revealed that SWAP products were not necessarily available all the time or for

nurses, which created some frustrations for mothers and nurses.

Even if it was getting late, they could still persevere and wait because of the good thing that they were going to get.

– *Awasi Post-Intervention FGD, CHWt #3* –

The ANC turn up was very low but when we started giving mothers vouchers, the deliveries went up, and the number we were seeing in the ANC also went higher. They could come in large numbers, something that was not happening before.

– *Awasi Post-Intervention FGD, CHW #7* –

You find that the products are brought around the fifteenth there. So when it is brought, it takes like only two weeks, and it is finished. When it gets finished on that thirtieth, there are some women who come to the clinic on the first day of every month or second or even third depending on whether those dates fall on a weekday. So ever since this woman came for the products, she has never got or seen any product.

– *Awasi Post-Intervention FGD, CHW #10* –

Perceptions of group education. FGD participants attended health talks only once or never attended them. While the level of exposure could be low, some participants shared the benefits of health talks to break cultural myths and make new friends.

“Before I gave birth to my first-born, I used to hear people telling me that you are not supposed to buy clothes for the unborn baby. If you do that then, it is a taboo, and your child can die before it is born. So, I used not to buy clothes for the baby. When I came for those meetings, I was told that ‘those people are misleading you. Can you try and buy and then let us see if something will happen to the child?’ I bought the clothes, and there is nothing that happened to my baby. I also learnt how to take care of myself and the baby hygienically.”

– *Murohoni Post-Intervention FGD, Mother #4* –

“I also knew one woman the first day that I attended the meeting. So, we left together, and as we were chatting on the way, we exchanged numbers, and we always communicate. Of late she called and asked me whether I still go back to the clinic, and I said yes.”

– *Murohoni Post-Intervention FGD, Mother #1* –

Nurses also shared how group education was useful for organizing mothers. One nurse stated,

“When I came to understand that we were going to book them as per the expected date of delivery, it really made our clinic to be organized. We are handling clients as individuals as per that cohort.”

– *Katito Post-Intervention FGD, Nurse #1* –

CHWs reported that their group education sessions addressed nutrition, birth plans, malaria, and safe water practice (e.g., not carrying large amount of water). While a few challenges including late arrival of mothers and space limitation were noted, the discussions uncovered how health talks benefited women and CHWs.

That health talk really helped the women. You find that when we grouped them, you find that even the school girls who are pregnant are free to share since we make the environment conducive for them. I do make them to have partners and discuss among themselves so they would share freely.

– *Katito Post-Intervention FGD, CHW #2* –

We get to even ask the nurses about certain things that make us as well gain knowledge as they also get knowledge. This is then happiness to both of us.

– *Katito Post-Intervention FGD, CHW #9* –

Perceptions of text messages. Mothers reported that they did not receive text messages for ANC appointment reminders but shared their experience with health education messages. A participant shared that reading in Luo was difficult for her while she could speak the language well. The discussion also revealed that health education messages reached the phone of husbands instead of mothers, and the sender of health education messages was not clear.

I got my phone through my husband's phone. I was at home when the message arrived, and he was away from home. He told me that there was a message that he received from SWAP, but he accidentally deleted the message, so I did not get to read the message.

– *Masogo Post-Intervention FGD, Mother #1* –

When the first time the messages came, I read them, and I thought it came to my phone by mistake. What made me know that it came from SWAP was when I scrolled down, I saw SWAP name down at the end of the message.

– *Masogo Post-Intervention FGD, Mother #4* –

CHWs also shared their experience with text messages. A challenge shared in FGDs accords with mothers' experiences.

The major challenge that I have encountered is that some young women come here. They give us their telephone numbers, and when we give you these numbers, and when they are called, you find that the

husband quarrels claiming that who gave you my number, and so it is not easy to schedule a health talk since they say that the husbands will not agree.

– *Katito Post-Intervention FGD, CHW #2* –

Perceptions of Training. CHWs discussed the training that they received prior to the SWAP intervention, and they mentioned a list of topics including record keeping, importance of hospital delivery, immunization, safe water, danger signs among pregnant women, nutrition, and basic business skills (e.g., reconciliation of voucher). A few participants shared that two days were not enough to understand record keeping practice and reconciliation, but many participants expressed their satisfaction with the training that they received. Nurses expressed their appreciation toward training provided on resuscitation, obstetric emergency response, water and hygiene, and education through listening.

Perceptions on program sustainability. Most of the participants expressed their hope to continue the intervention activities and shared some potential consequences of ending them. A nurse shared that:

“when partners are rolling out activities, they come with support and staff, upon exit, they integrate those services to the system and then the issue of shortage continues...I come to wonder why all services are being integrated, [and] they leave it to nurses.”

– *Murohoni Post-Intervention FGD, Nurse #1* –

Nurses also discussed how CHWs may need financial incentives to continue performing their responsibilities. One of the participants stated:

In other places, you get some donors...paying the community workers, and other places, they are not being paid. Now that is where the challenge comes. You get maybe there is money in other parts, and in other parts there is no money. You know even those people in the community they also have their priorities, the community workers. They have to provide for their families, and some other added duties.

– *Sondu FGD, Participant #4* –

Discussion

Baseline data in this evaluation highlighted the many challenges faced by programs that aspire to increase use, and improve quality, of antenatal and delivery services in public Kenyan healthcare facilities. Several important challenges for mothers included cost of care, distance from health facilities, lack of transport, fear of mistreatment by healthcare workers, safety (particularly during night-time hours), fear of HIV diagnosis, and supply shortages. Challenges faced by healthcare workers included inadequate training, insufficient equipment and supplies, lack of water in healthcare facilities, lack of

emergency transport, and inadequate staffing with the attendant overwork and stress. Healthcare workers also noted barriers faced by mothers in seeking care, including bad roads, terrain, weather, distance to healthcare facilities, and the potential stigma of a new HIV diagnosis. These findings are consistent with other studies in different locations [9-13, 16, 19], and we summarized our findings in a conceptual model (Figure 1).

The supply- and demand-side interventions implemented by SWAP intended to address some of the barriers described above. For example, previous studies have documented that demand-side incentives such as hygiene kits and insecticide treated bed nets contributed to increased antenatal service use among pregnant women by providing in-kind commodities valued by the women [12-14, 16-17, 20, 24]. The findings of this study suggested that the free vouchers for commodities provided by SWAP may have motivated mothers to increase use of antenatal services. In particular, mothers acknowledged that they liked the vouchers, and healthcare workers and CHWs observed an increase in antenatal service use that they attributed to the vouchers.

Other demand-side interventions implemented by SWAP appeared to have beneficial effects on maternal perceptions of antenatal services. Mothers who participated in the group antenatal appointments said that the educational talks were useful and helped them overcome incorrect beliefs, and that they made new friends. Healthcare workers explained that the group appointments helped them organize care, and CHWs reported that they benefitted from the training, which helped them prepare mothers for their pregnancy. It was not clear from these interviews whether the group appointments increased ANC service use. Other research has suggested that group appointments can contribute to increased ANC service use in high-income countries [25-26]. Because of its relatively low cost and high acceptability, this intervention merits further investigation of its utility as a motivator for ANC attendance.

Although the SMS appointment reminders did not reach many women, mothers did express a desire to receive them. Similarly, SMS educational messages had a modest impact for a variety of reasons, including lack of receipt by mothers, an inability by some women to read Luo (the local language), and husbands who did not want wives to share their mobile phone numbers. Nevertheless, some mothers who received them, and some husbands, valued the educational messages. Text messages have been successfully used as m-health interventions (e.g., use of mobile phones for health interventions) in developing countries [21]. More specifically, previous evaluations of programs to send SMS text messages to expectant mothers have shown promise in increasing service use [27-28]. This approach deserves further study as a potential intervention to motivate increased use of care.

Supply-side interventions, which included training on emergency obstetric care, neonatal resuscitation, WASH, and patient centered care, were well-received by healthcare providers, but it was beyond the scope of this study to assess if these interventions increased demand for ANC services among pregnant women. Other studies have found that improved maternal health services have resulted in increased use [11, 23], but the interventions in this project may have been insufficient to motivate a measurable increase in participation by mothers. These interventions were likely insufficient to overcome the baseline

perception by nurses that they had inadequate equipment and supplies. There is still a need to define the minimum package of providers, equipment, and supplies to provide optimal maternal care, and evaluate service use after implementation to assure they had the desired impact.

The OBA Card intervention, which was an incidental finding by our research team in intervention healthcare facilities, was a major confounder because of simultaneous implementation of SWAP vouchers and OBA Cards in the same healthcare facilities that made it impossible to tease out the specific effects of each intervention. Nevertheless, mothers appeared to prefer the OBA Card over the planned SWAP interventions because it lowered costs for obstetric care, permitted use of HCFs that mothers perceived as providing better quality of care, and covered the costs of transporting women to HCFs providing a higher level of care. These considerations were particularly important in western Kenya, where poverty limits mothers' ability to pay for health services. [2] Comments by mothers in the FGDs suggested that, during the period of this project, the OBA Card and SWAP incentives may have complemented each other by motivating expectant mothers to attend ANC to receive vouchers for health products from SWAP and enabling them to obtain free deliveries in better quality HCFs through the OBA Card. A separate review of the OBA Card program suggested that low-income populations benefitted through increased access to both public and private providers, [29] although another study found limited impact on use of postnatal care services. [30]

While mothers in our FGDs appreciated SWAP and OBA Card programs and appeared to be motivated by them to increase service use, the programs also had unintended consequences, in particular, increases in healthcare provider workload in the context of insufficient workforce to meet increased demand for services and low pay. Similar challenges were faced in Kenya following institution of free maternal care in 2013, which resulted in increased use of antenatal and delivery services in public healthcare facilities by mothers [31], and increases in provider workload, inadequate staffing, and concomitant lack of motivation among healthcare workers in the face of inadequate funding and supplies [32]. Healthcare providers in this study also expressed concern about inadequate equipment and supplies, lack of resources, and little or no recognition of their effort. Nurses acknowledged that they were under pressure to manage multiple tasks at once, and that overworked health providers did abuse patients. These findings underscored the importance of increasing HCF staffing to meet increased patient demand for services in response to these interventions.

Despite the reported increase in service use motivated by the SWAP and OBA Card programs, follow-up data suggested that barriers to care persisted for some pregnant women. These included fear of stigma if they were diagnosed with HIV, humiliating care, and abuse by nurses. Some mothers shared that they received inadequate care, or in some instances, did not receive proper attention for their delivery in healthcare facilities. The findings of mothers' mixed experiences with facility-based care accord with previous studies in Ghana, Malawi, and Kenya that suggested that reprimands, social discrimination, and fear of chastisement by nurses at health facilities were factors that discouraged women from attending ANC [33]. Other research identified physical abuse, non-dignified care, discrimination, non-confidential care, abandonment of care, non-consented care, and detainment in facilities as important barriers to care

experienced by pregnant women. [34-35] In recognition of this problem, WHO has updated the Quality of Care Framework for Maternal and Newborn Health, highlighting the experience of patients as a key determinant of quality of care [36], and has developed public health interventions to improve mothers' experience with antenatal care and delivery [37].

Although pregnant women detailed their negative experiences at healthcare facilities, some felt that health facilities were better able to manage complications and pain than traditional birth attendants. A review of qualitative research on facilitators and barriers to facility-based delivery from 17 countries suggested that some women regard healthcare facilities as the most respectable and safe locations for delivery [19].

This study had a number of limitations. First, researcher bias and reactivity among respondents potentially could have influenced the validity of study findings. Data collectors' probes and reactions also may have altered how participants shared their perspectives. To minimize these validity threats, co-authors, including field staff, reviewed the findings to ensure that the major themes from FGDs were captured. Data collectors also received training on qualitative research and data collection to minimize their influence on study participants. Second, this study included few participants who received ANC reminder text messages. Consequently, we could not explore and highlight the experience of mothers who were exposed to all of the intended SWAP intervention activities. Third, because this evaluation was limited to women in one province of Kenya and used purposive sampling, findings may not be transferrable to other settings. Fourth, since recruitment for mothers occurred at healthcare facilities, results do not reflect the perspectives or experiences of mothers who exclusively used home delivery and did not pursue ANC during any point of their pregnancy. The percentage of women who do not seek antenatal care at healthcare facilities is less than 5%, but it is not known whether this group is at higher risk than health care users. Fifth, this study employed FGDs to collect qualitative data because Luo research assistants believed they were more culturally appropriate. We did not, therefore, conduct in-depth interviews, which may have been a more effective approach for eliciting personal experiences. Lastly, unbeknownst to SWAP staff at the time, the OBA Card intervention was introduced concurrently with SWAP intervention in intervention communities, creating confounding that could not be controlled for.

Conclusions

Based on in-depth qualitative data, this study explored the perspectives of mothers, nurses, and CHWs on their experience with SWAP and OBA Card interventions to promote ANC visits and facility-based delivery. Although demand-side interventions can increase service use by offsetting maternal costs of transport, time, and care, poor treatment by providers remains as a barrier to care. A more comprehensive intervention that includes additional workforce and adequate equipment and supplies are likely necessary to increase service use and respond adequately to increased demand for ANC services elicited by incentive programs. Additional research is needed to optimize packages of improved services and incentives to increase use of maternal and child health services, and to develop behavioral interventions to motivate nurses to treat patients with kindness and respect. In view of recent recommendations by

WHO to increase the minimum number of ANC contact times to eight for reducing perinatal mortality [37], such interventions will be essential to motivate women to make the sacrifices necessary to increase the intensity of care.

Abbreviations

AIDS: acquired immune deficiency syndrome

ANC: antenatal care

CDC: Centers for Disease Control and Prevention

CHW: community health worker

FANC: focused antenatal care

FGD: focus group discussion

HIV: human immunodeficiency virus

OBA: Output Based Aid

PATH: US-based non-governmental organization

SMS: short message service

SWAP: Safe Water and AIDS Project

USD: US dollar

UNICEF: United Nations Children's Fund

WASH: Water, sanitation, and hygiene

WHO: World Health Organization

Declarations

Ethics approval and consent to participate

This study received ethical approval and oversight from the Kenya Medical Research Institute (protocol 2472) and the U.S. Centers for Disease Control and Prevention's Institutional Review Board (protocol 6462). Oral consent was obtained from all study participants. No participants were under 16 years old.

Consent for publication

Not applicable.

Availability of data and material

The data used for the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

Funding support for this project was a grant from Saving Lives at Birth: A Grand Challenge for Development, that included the following partners: U.S. Agency for International Development (USAID), the Government of Norway, the Bill & Melinda Gates Foundation, Grand Challenges Canada, and the U.K.'s Department for International Development (DFID). The donors did not participate in data collection, analysis, interpretation of results, or manuscript participation.

Authors' contributions

MH analyzed data and drafted the manuscript. JM contributed to study conceptualization, developed data collection instruments, analyzed data, and reviewed the manuscript. RO and NA assisted with study design and reviewed the manuscript. RQ guided the overall study implementation, study conceptualization, data analysis, and manuscript development.

Acknowledgements

We are grateful to Alie Eleveld, the Country Director of SWAP, the SWAP management team, and the Ministry of Health offices in Nyando, Nyakach, North Rachuonyo and South Rachuonyo Districts in Nyanza Province for their support of this project.

References

1. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: A systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet* 2016; 387: 462–474.
2. Kenya National Bureau of Statistics. Kenya Demographic and Health Survey 2014. Nairobi, Kenya: Kenya National Bureau of Statistics; 2015.
3. Brown CA, Sohani SB, Khan K, Lilford R, Mukhwana W. Antenatal care and perinatal outcomes in Kwale district, Kenya. *BMC Pregnancy Childbirth* 2008; 8: 2.
4. Bhutta ZA, Das JK, Bahl R, Lawn JE, Salam RA, Paul VK, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *Lancet* 2014; 385:

347–370.

5. Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gulmezoglu M, Mugford M, et al. WHO systematic review of randomized controlled trials of routine antenatal care. *Lancet* 2001; 357: 1565–1570.
6. World Health Organization. WHO antenatal care randomized trial: manual for the implementation of the new model. Geneva: World Health Organization; 2002.
7. Nair N, Tripathy P, Prost A, Costello A, Osrin D. Improving newborn survival in low-income countries: Community-based approaches and lessons from South Asia. *Plos Medicine* 2010; 7: e1000246.
8. Manasyan A, Chomba E, McClure EM, Wright LL, Krzywanski S, Carlo WA. Cost-effectiveness of essential newborn care training in urban first-level facilities. *Pediatrics* 2011; 127: 1176–1181.
9. Simkhada B, van Teijlingen ER, Porter M, Simkhada P. Factors affecting the utilization of antenatal care in developing countries: Systematic review of the literature. *Journal of Advanced Nursing* 2008; 61: 244–260.
10. Gabrysch S, Campbell OMR. Still too far to walk: Literature review of the determinants of delivery service use. *BMC Pregnancy and Childbirth* 2009; 9: 34.
11. Brazier E, Andrzejewski C, Perkins ME, Themmen EM, Knight RJ, Bassane B. Improving poor women's access to maternity care: findings from a primary care intervention in Burkina Faso. *Social Science & Medicine* 2009; 69: 682–690.
12. Kawakatsu Y, Sugishita T, Oruenjo K, Wakhule S, Kibosia K, Were E, et al. Determinants of health facility utilization for childbirth in rural western Kenya: Cross-sectional study. *BMC Pregnancy and Childbirth* 2014; 14: 265.
13. Mason L, Dellicour S, Kuile FT, Ouma P, Phillips-Howard P, Were F, et al. Barriers and facilitators to antenatal and delivery care in western Kenya: A qualitative study. *BMC Pregnancy and Childbirth* 2015; 15: 26.
14. Fagerli K, O'Connor K, Kim S, Kelley M, Odhiambo A, Faith S, Otieno R, Nygren B, Kamb M, Quick R. Impact of the integration of water treatment, hygiene, nutrition, and clean delivery interventions on maternal health service use. *Am J Trop Med Hyg* 2017; 96: 1253-60.
15. Nanda P. Gender dimensions of user fees: implications for women's utilization of health care. *Reproductive Health Matters* 2002;10(20):127–134.
16. Fleming E, Gaines J, O'Connor K, Ogutu J, Atieno N, Atieno S, et al. Can incentives reduce the barriers to use of antenatal care and delivery services in Kenya? Results of a qualitative inquiry. *J Health Care Poor Underserved* 2017; 28: 153–174.
17. Sheth AN, Russo ET, Menon M, Wannemuehler K, Weinger M, Kudzala AC, et al. Impact of the integration of water treatment and handwashing incentives with antenatal services on hygiene practices of pregnant women in Malawi. *ASTMH* 2010; 83: 1315–1321.
18. Creswell JW. *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: SAGE Publications; 2013.

19. Bohren MA, Hunter EC, Munthe-Kaas HM, Souza JP, Vogel JP, Gulmezoglu AM. Facilitators and barriers to facility-based delivery in low- and middle-income countries: A qualitative evidence synthesis. *Reproductive Health* 2014; 14: 71.
20. Lindblade KA et al, 2004. Sustainability of reductions in malaria transmission and infant mortality in western Kenya with use of insecticide-treated bednets: 4 to 6 years of follow-up. *JAMA* 291: 2571–2580.
21. Gurman TA, Rubin SE, Roess AA. Effectiveness of mHealth behavior change communication interventions in developing countries: A systematic review of literature. *Journal of Health Communication* 2012; 17: 82–104.
22. Wood S, Foster J, Kols A, 2012. Understanding why women adopt and sustain home water treatment: Insights from the Malawi antenatal care program. *Soc Sci Med* 75: 634-642.
23. Morris SS, Flores R, Olinto P, Medina JM, 2004. Monetary incentives in primary health care and effects on use and coverage of preventive health care interventions in rural Honduras: cluster randomised trial. *Lancet* 364: 2030-2037.
24. Conrad P, De Allegri M, Moses A, Larsson EC, Neuhann F, Muller O, Sarker M. Antenatal Care Services in Rural Uganda: Missed Opportunities for Good-Quality Care. *Qualitative Health Research*. 22(5) 619–629.
25. Klima, C, Norr, K, Vonderheid, S, Handler A. Introduction of CenteringPregnancy in a public health clinic. *Journal of Midwifery and Women’s Health* 2009; 54: 27–34.
26. Patil CL, Klima CS, Steffen AD, Leshabari SC, Pauls H, Norr KF. Implementation challenges and outcomes of a randomized controlled pilot study of a group prenatal care model in Malawi and Tanzania. *International Journal of Gynecology and Obstetrics* 2017; 139: 290–296.
27. Lund, S, Nielsen BB, Hemed, M, Boas IM, Said, A, Said K, et al. Mobile phones improve antenatal care attendance in Zanzibar: A cluster randomized controlled trial. *BMC Pregnancy and Childbirth* 2014; 14: 29.
28. Watterson, JL, Walsh, J, Madeka, I. Using mHealth to improve usage of antenatal care, postnatal care, and immunization: A systematic review of the literature. *BioMed Research International* 2015; 2015: 1–9.
29. Grainger, C, Gorter, A, Okal, J, Bellows, B. Lessons from sexual and reproductive health voucher program design and function: A comprehensive review. *International Journal for Equity in Health* 2014; 13: 33.
30. Warren, CE, Abuya, T, Kanya, L, Obare, F, Njuki, R, Temmerman, M, et al. A cross sectional comparison of postnatal care quality in facilities participating in a maternal health voucher program versus non-voucher facilities in Kenya. *BMC Pregnancy and Childbirth* 2015; 15; 153.
31. Njuguna, J, Kamau, N, Muruka, C. Impact of free delivery policy on utilization of maternal health services in county referral hospitals in Kenya. *BMC Health Services Research* 2017; 17: 429.
32. Wamalwa, EW. Implementation challenges of free maternity services policy in Kenya: The health workers’ perspective. *PanAfrican Medical Journal* 2015; 22: 375.

33. Pell C, Menaca A, Were F, Afrah NA, Chatio S, Manda-Taylor L, et al. Factors affecting antenatal care attendance: Results from qualitative studies in Ghana, Kenya and Malawi. Plos ONE 2013; 8: e53747.
34. Bowser D, Hill K. Exploring evidence for disrespect and abuse in facility-based childbirth. Washington, DC: Harvard School of Public Health and University Research Co., LLC; 2010.
35. Bohren MA, Vogel JP, Hunter EC, Lutsiv O, Makh SK, Souza JP, et al. The mistreatment of women during childbirth in health facilities globally: A mixed-methods systematic review. Plos Medicine 2015; 12: e1001847.
36. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. Geneva, Switzerland: WHO Press; 2016.
37. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva, Switzerland: WHO Press; 2016.

Figures

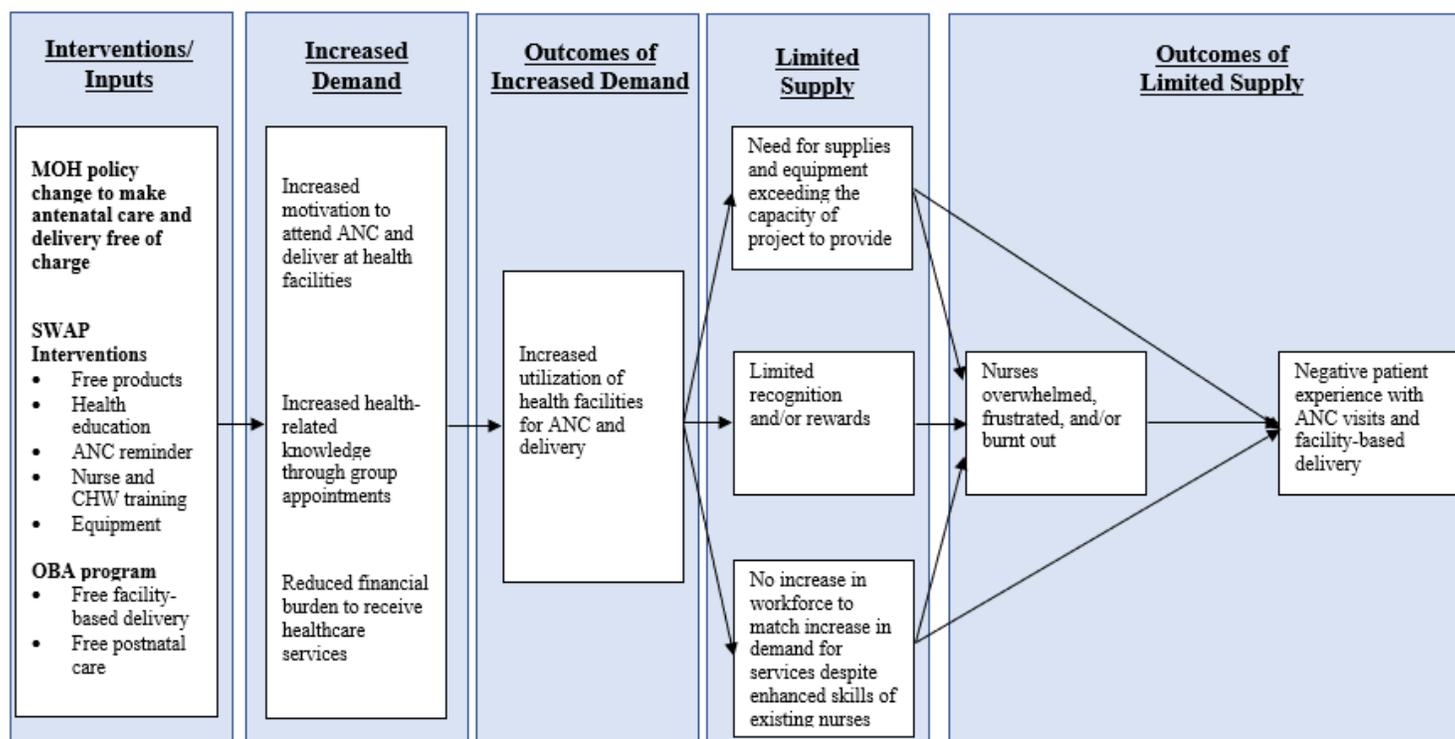


Figure 1

A conceptual model to explain ANC visits and facility-based delivery with increased demand and limited supplies for health services.