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Benefits and challenges of voucher-based transport for skilled birth attendance in Kitui County, Kenya: the health stakeholders' perspectives

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Abstract

Background Reducing maternal, newborn and child mortality remains one of the top global public health priorities. Each year, approximately 303,000 mothers, globally, die during delivery. Stillbirths and neonatal deaths within the first 28 days of life are estimated at 2.6 million and 2.7 million, respectively. Rural residents face challenges in accessing health care due to difficulties in transportation. Given the voucher-based transport's potential to address inaccessibility to health services, this study explored the health stakeholders' perspectives on the benefits and challenges of this intervention.

Methods Using an exploratory qualitative design, this study was conducted in Kitui County located in the lower Eastern part of Kenya. The study was conducted from July to August 2023, with data collection occurring over a two-week period in August 2023. Participants were purposively drawn from the six wards in Kitui South Sub County. The interview guide included questions on views, experiences, challenges, and perspectives on voucher-based transport system for skilled birth attendance. Data triangulation was ensured through audio-recorded Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). All audio recordings were transcribed verbatim, coded and thematically analyzed, using a holistic approach.

Results Perceived benefits of Skilled Birth Attendance (SBA) champions model included improved access to delivery services, improved health outcomes and socioeconomic and awareness benefits. The perceived challenges and concerns of the SBA model included economic and sustainability challenges, infrastructure and connectivity challenges, as well as administrative and logistical challenges.

Conclusions Overall, the SBA Champions model has proven effective in improving access to maternal services within the community, but prevailing challenges and sustainability issues need to be addressed. Additionally, the study provided strategic information to inform policy makers about the model and strengthen MCH policy.

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Keywords Health stakeholder, Skilled birth attendance, Voucher-based transport, Maternal health, Rural healthcare access, Qualitative study

Background

Reducing maternal, newborn and child mortality remains one of the top global public health priorities, with the third Sustainable Development Goal (SDG 3) focusing on ensuring healthy lifestyles and well-being for everyone, with target 3.1 specifically aiming at reducing the maternal mortality ratio to 70 per 100,000 live births or less globally by 2030 [1].

Each year, approximately 303,000 mothers, globally, die during delivery, with stillbirths and neonatal deaths within the first 28 days of life estimated at 2.6 million and 2.7 million, respectively [2, 3]. Eight hundred and ten women die daily due to causes related to childbirth and pregnancy that are avoidable [3]. Low- and middle-income countries (LMICs) are leading, with approximately 99% of all maternal deaths occurring in these countries, while only less than 1% occur in high-income countries (HICs) [4]. From the year 2000 to 2017, the maternal mortality rate in Sub-Saharan Africa (SSA) was said to have decreased by 2.6% each year, much less than the yearly drop of 5.5% required to meet SDG 3 target [5].

From 2015 to 2021, approximately 64% of births were attended by skilled health personnel in SSA; suggesting that many women that needed life-saving interventions during childbirth were still not accessing these services [6]. Utilization of skilled birth attendance is a critical indicator for tracking progress towards achieving the target of reducing maternal mortality ratio to 70 per 100,000 live births [6]. However, income and geographical setting still play a role in the death rates and/or access to the skilled health personnel, which in turn, negatively affects maternal and newborn outcomes. Most maternal and neonatal deaths can be avoided if women can access appropriate skilled maternal services during pregnancy, labor, and postnatal care [7].

Rural residents face increased challenges in accessing health care, due to poor transport access [8, 9]. Compounding transport access challenges are long distance to facilities, as well as poor road network and costs associated with transportation. For example, in a study conducted in Afghanistan, distance and nature of terrain were identified as barriers to accessing skilled birth attendance by pregnant women [10]. Similarly, long distance to health facilities significantly reduced the proportion of women accessing skilled birth services in Ghana [11].

Some countries have designed interventions to address poor access to health facilities. For example, in Bangladesh, the use of voucher program enhanced the continuum of maternal care, especially for the most vulnerable women [12], while in Cameroon, a similar system

increased the utilization of skilled birth by 57% [13], and pregnant women's access to skilled delivery services was improved in rural Samburu County, Kenya [14].

Evidence has revealed low utilization of skilled birth attendants for mothers during birth in East African Countries, mainly due to factors related to wealth index, and accessibility of health care services [15]. Between 2011 and 2016, Uganda and Zambia implemented the Saving Mothers, Giving Life initiative in efforts to improve the uptake of maternal care services in their countries [16]. These interventions reduced distance to health facilities through increasing the number of health facilities providing basic emergency obstetric and newborn care near where people live. Consequently, the proportion of deliveries that were attended by the skilled birth attendants increased from 46% to 67% and 63% to 90% in Uganda and Zambia, respectively. In Uganda, there was a 258% increase in facility deliveries supported through transport vouchers and increased number of health facilities [16].

In Kenya, efforts to address maternal health challenges can be traced back to the adoption of the country's constitution in 2010, which recognized the reproductive health as a basic human right, as enshrined in article 43(1a), and the subsequent passing of free maternity health services policy in June 2013 in all public health facilities [17]. The creation of an enabling environment culminated in the introduction of 'Linda Mama' initiative in 2016 and the roll-out of universal health care coverage (UHC) across the country in 2022 [17]. Despite these efforts, maternal mortality rate of 362 per 100,000 live births in Kenya is by far higher than the thresholds set by the third SDG, which is 70 per 100,000 live births, and this is partly due to inadequate access to the services of skilled birth attendants [17]. According to the 2015 Kenya Bureau of Statistics and the demographic health survey (DHS) program, approximately 61% of births took place in a health facility [18].

According to the 2022 Kenya Health Demographic Survey Report, Kitui County recorded 18 maternal deaths translating to a maternal mortality ratio of 122 deaths per 100,000 live births, and 184 newborn deaths per 1000 live births [19]. Additionally, the 2022 data from the Kenya Health Information System (KHIS) [20] shows that 65.2% of women delivered under skilled care in Kitui county and 75.4% in Kitui South sub county where the voucher transport system was piloted. However, this was still below the target of 90% of women delivering under skilled care in Kenya [17].

Through its signature project, titled: “Children and Mother Partnerships” (CHAMPS), in 2020, the Catholic Medical Mission Board (CMMB) investigated the barriers and challenges pregnant women face in accessing and utilizing antenatal care services and skilled deliveries in Kitui South Sub County [21]. Findings of this unpublished study indicated that, although many women knew about the importance of skilled deliveries and had the intention of going to health facilities at the time of delivery, travel costs and distance remained a major deterrent to reaching and delivering at the health facilities under skilled care. To address these barriers, CMMB piloted the Skilled Birth Attendant (SBA) Champions model in Kitui County – a voucher-based transport system – from the fiscal year 2020/21 to 2022/23.

The SBA champions were local motorbike riders identified by community health committees (CHCs) and community health promoters (CHPs) to provide pregnant women with transport for timely access to health facilities, when called to do so. They were expected to own a roadworthy motorbike and possess a valid driving license. The riders were given vouchers which they would submit to CMMB office for reimbursement after transporting mothers for hospital delivery. Of the 47 counties in Kenya, Kitui County is ranked as seventh most expansive county with an average distance of 19 km from a household to the nearest health facility [22], often on difficult terrain, including rocky mountainous paths. Many areas can only be accessed through motor bikes other than vehicles, hence the initiation of this voucher-based transport system.

The use of vouchers in Kitui County was aimed at reducing financial and logistical barriers to accessing health care, while increasing the demand for facility delivery services [23]. While several voucher-based interventions have increased utilization of skilled birth attendance and reduction in inequalities to accessing health care elsewhere in Africa, benefits and challenges to voucher system usage in Kitui County have barely been qualitatively explored, at least from the perspectives of health stakeholders. The study explored the health stakeholders’ perspectives on the benefits and challenges of the voucher-based transport system in Kitui County. The findings will inform how similar programs are tailored, so that they are aligned to the policy and responsive to community needs. The findings are also anticipated to inform the best practices in order to make voucher-based transport model scalable beyond the Kitui County context.

The theory of change underlying the voucher-based transport system (SBA Champions model) is built on the understanding that transport-related barriers such as long distances, poor infrastructure, high costs, and lack of timely options significantly limit access to skilled birth attendance in rural Kenya. The model assumes that

by providing pregnant women with reliable, affordable transport through community-based motorbike riders (SBA Champions), and reimbursing these riders via a voucher system, more women will be able to reach health facilities in time for delivery (Fig. 1).

This intervention is expected to lead to increased facility-based deliveries, reduced home births and delays in reaching care, and ultimately, improved maternal and neonatal health outcomes. It also contributes to raising awareness about the importance of skilled birth attendance and offers economic benefits to the riders and financial relief to families. In the long term, the model aims to sustainably reduce maternal and neonatal mortality and strengthen the link between communities and the formal health system, offering a scalable solution for similar rural contexts.

Materials and methods

Study setting and design

The study was conducted in Kitui South Sub County, Kitui County in the lower Eastern part of Kenya. The county is located approximately 170 km from Nairobi, the country’s capital. It is classified as semi-arid with the main socioeconomic activities being agricultural and livestock farming. The residents majorly speak *Kamba* language. Kitui South Sub County is divided into six administrative wards. The population of the Sub County is approximately 196,320 with 45,000 being women of reproductive age [19]. The area is vast with difficult terrains hindering access to skilled birth attendance.

The study adopted an exploratory qualitative design because it enabled an in-depth understanding of the context-specific experiences, perceptions, and insights of diverse stakeholders regarding the voucher-based transport model. This approach was particularly suited for identifying views, social dynamics, and implementation challenges that are not easily captured through quantitative methods. Additionally, the design was appropriate given the limited prior research on voucher-based transport systems for skilled birth attendance in rural Kenya. It provided flexibility to explore emerging themes and generate insights grounded in data, in order to inform future program refinement and policy adaptation.

Utilizing focus groups discussions (FGDs) and key informant interviews (KIIs) allowed the research team to explore and further understand different actors’ perspectives of the voucher-based transport model (Skilled Birth Attendance champions’ approach). The study was conducted from July to August 2023, with data collection occurring over a two-week period in August 2023.

Study population and sampling

Participants were purposively drawn from the six wards in Kitui South Sub County: Athi, Ikutha, Ikanga,

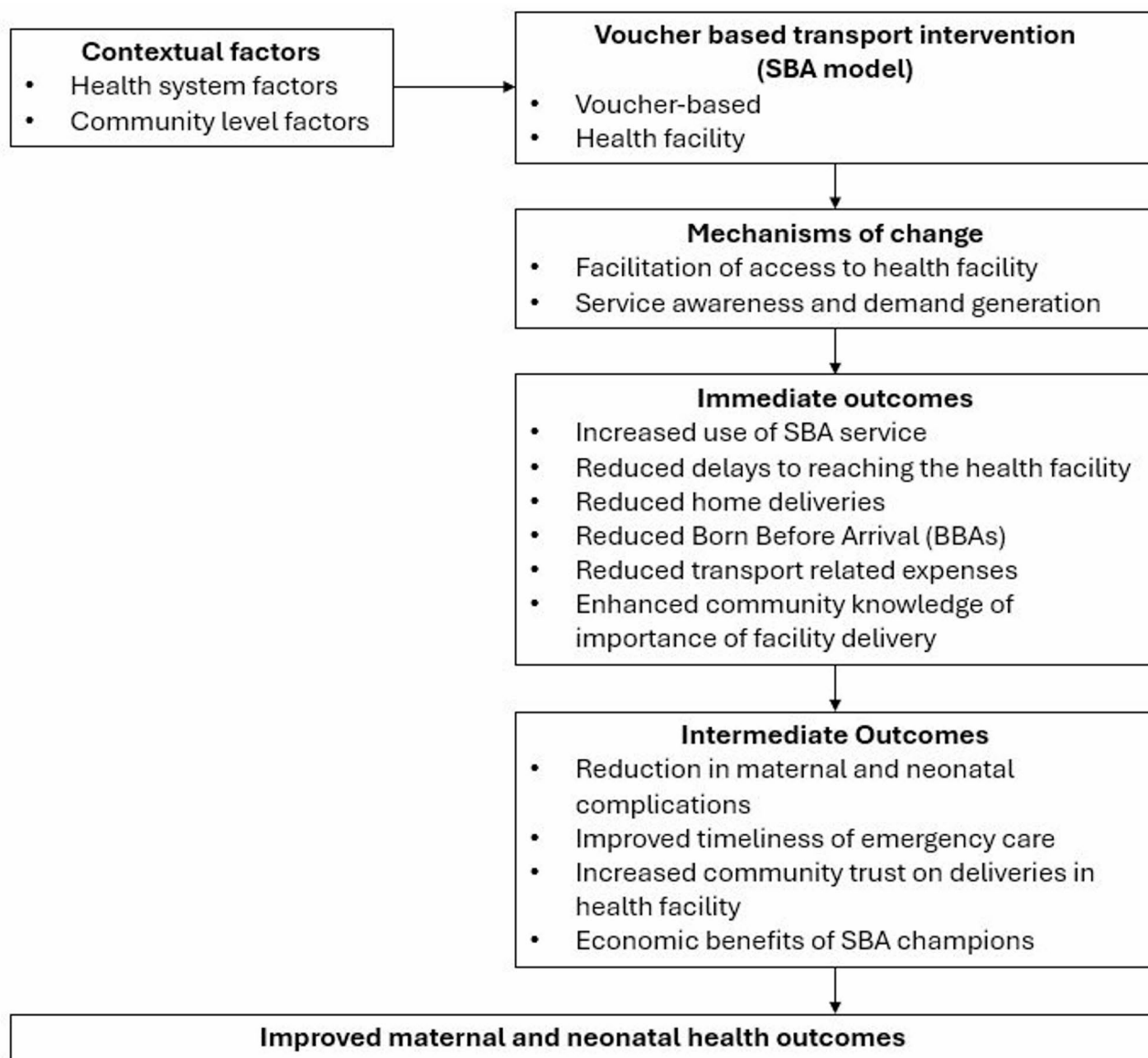


Fig. 1 Conceptual framework illustrating voucher-based transport system for skilled birth attendance. Source: creative work developed by authors

Mutomo, Mutha, and Kanziko, based on the set criteria for each stakeholder. For the beneficiaries and SBA champion interviews, the participants were identified with the help of community health promoters, through being either having benefited or being active champions in the SBA model. The key informants were drawn from six facilities offering skilled birth attendant services. All eligible potential participants were invited to participate in the study via phone call. The researcher explained the purpose of the study to all potential participants, including the reasons they were considered eligible for the study, and what their involvement would entail.

Data collection and procedures

We collected data using interview guide approach to capture the health stakeholders' perspectives on voucher-based transport system for skilled birth attendance in Kitui South Sub County. The interview guides used were developed specifically for this research based on literature review and expert consultations. The data was collected by a qualitative expert through key informant interviews targeting health care workers, Community Health Committee members and Sub County health management team members. A total of 12 Focus Group Discussions (FGDs) were conducted with each group of stakeholders in separate sessions. The number of FGD sessions were 6 for beneficiaries, 3 for Community Health Promoters and 3 for SBA champions. Each session had an average of 6–8

participants and were moderated using FGD guides. Data collection was carried out in a private and quiet place to maintain confidentiality. FGDs were conducted in social halls, while KIIs were conducted in health facilities and did not exceed two hours. The field guide included questions on views, experiences, challenges, and perspectives on voucher-based transport system for skilled birth attendance. All interviews were audio recorded for transcription, to supplement notes taken during interviews. The study was conducted in two languages. Key informant interviews were conducted in English as individuals in the KIIs were proficient in English, while all focus group discussions were conducted in *Kamba* (local language in Kitui South). Consequently, the FGD guide was translated from English to Kamba and then translated back to English for quality assurance by independent research assistants. The interviewer introduced the study, and participants gave voluntary written consents before participating in the KIIs and FGDs. All sessions were audio-recorded, with participants' permission.

Data quality control

Data triangulation was ensured through FGDs and Key informant interviews. Audio recordings were complemented with hand-written field notes. There was at least one discussion moderator and one note taker per interview or FGD. The interviewers intentionally built rapport with the participants by familiarizing themselves with participants' background, work and interest, listening actively and asking open-ended questions to enhance honesty among participants as they shared their views. Credibility was also enhanced through prolonged engagement with participants during data collection to improve capture of their experiences and triangulation [24]. All interviews were transcribed in verbatim to improve dependability of the findings and to ensure that verbatim quotes were used to support findings. Transferability was enhanced through thick descriptions of the study context, participants and the research methodology used. Audit trails and peer debriefing were used to increase the confirmability of the findings through comprehensive and transparent records and team critique of all the research processes. The researchers engaged in reflexive process to account for their roles in the research process.

Data management and analysis

All the data were de-identified and stored safely and in accordance with national and international data safety standards. Signed consent forms were securely stored in a locked cabinet to ensure confidentiality. As part of data familiarization, transcripts were read multiple times before initiating data coding. Data analysis was managed using the NVivo software (version 12). HK and

ZM coded the data using the initial codebook and analyzed thematically to generate themes. Differences arising from the coding were resolved through consensus. A holistic approach to analysis combining both inductive and deductive coding was used. Initial Codes and categories were formed from the topics that emerged from the preliminary analysis. New codes were assigned to paragraphs that could not be coded with previous codes. Themes and sub-themes were created from the emerging codes. Data on audio-recorders was deleted after they were transferred to a password-protected computer.

Ethical consideration

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval and research permit for conducting the study were obtained from the Amref Health Africa Ethics and Scientific Review Committee (protocol No. ESRC-P1448/2023) and the National Commission for Science and Technology (NACOSTI), respectively. All study participants signed informed consent forms before participating in the study. Given that the study pertained to the intervention that CMMB was providing, participants were assured that their participation or refusal would not impact their relationship with CMMB or the services they receive. Participants were made aware of the pre-arranged psychological support in cases of need.

Results

In total, 41 beneficiaries, 20 CHPs, and 20 SBA champions participated in the focus group discussions. A total of six CHC members, six health care workers and four health care managers participated in key informant interviews. While participants in various categories were exclusively or dominantly female, SBA Champions were notably all males. Participants' ages and educational levels varied widely (Table 1).

Analysis of the FGDs and KII data revealed 2 major themes and six sub-themes, namely: (1) Benefits of SBA champions model (Improved access to delivery services, Improved health outcomes, and Socioeconomic and awareness benefits) and (2) Challenges and concerns of SBA model (Inequitable remuneration and economic sustainability, Infrastructure and connectivity issues, and Administrative and logistical challenges) (Table 2).

Benefits of the SBA champion's model

Improved access to delivery services

The participants were consistent in highlighting the transformative impact of the SBA Champions model on transportation services for maternal healthcare.

The view that Voucher-Based Transport for Skilled Birth Attendants significantly reduced home deliveries was pervasive across the different stakeholders, reflecting

Table 1 Social demographic characteristics of the study participants

Participant category	Characteristics	N	Type of data collection	Social demographic	N (%)				
Beneficiaries (BEN) (n = 41)	Women who delivered within the past one year in the Sub County and utilized the SBA champions model	6	FGDs	Age					
				19–24	14(34)				
				25–34	19(46)				
				35–49	8(20)				
				Gender					
				Female	41(100)				
				Education level					
				Primary	19(46)				
				Secondary	15(37)				
				College and above	7(17)				
				Marital status					
				Married	33(80)				
				Single	8(20)				
Community Health Promoters (CHPs) (n = 20)	Community health workers who live in the community and serve and link community members to health care services	3	FGDs	Age					
				35–49	15(75)				
				50+	5(25)				
				Gender					
				Male	2(10)				
				Female	18(90)				
				Education level					
				Primary	12(60)				
				Secondary	7(35)				
				College and above	1(5)				
				Skilled Birth Attendants (SBA) Champions (n = 20)	These are motorcycle riders recruited to ferry passengers (pregnant mothers due for delivery) at a fee in form of a voucher	3	FGDs	Age	
								20–24	1(5)
								25–34	7(35)
35–49	8(40)								
50+	4(20)								
Gender									
Male	20(100)								
Education level									
Primary	7(35)								
Secondary	13(65)								
Community Health Committee (CHCs)	A governance structure in a community health unit	6	KII						
Health Care Workers (HCWs)	Health workers within the health facilities (both public and private)	6	KII						
Health Care Managers (HCMs)	Health managers and supervisors at Sub County level	4	KII						

a positive shift towards utilizing health facilities for child-birth. This shift underscored the program's success in reducing the proportion of home deliveries.

So, one of the things that we have noted is, we have been able to reduce the home deliveries. Yes, we reduced the mothers who could have delivered at home because they've lacked transport or maybe

because of the distance to get to the healthcare facilities. You'll find that if that mother was supposed to give birth at home, they are able to access the healthcare facilities through the SBA champions KII, HCM, 01

One importance is that, when we didn't have the champions, women used to give birth at home. One

Table 2 Theme, sub-themes and categories

Theme	Sub-theme	Categories	A	B	C	D	E	F
Benefits of SBA champions model	Improved access to delivery services	Reduced home deliveries	X	X	X	X	X	X
		Reduced delays in accessing delivery services	X	X		X	X	
		Reduced cost of transport to the facility				X	X	X
		Efficient mode of transport		X	X	X	X	X
	Improved health outcomes	Reduction of infections and complications				X	X	X
		Perceived reduced mortality rate				X	X	X
Socioeconomic and awareness benefits	Source of livelihood and employment	Enhanced awareness on importance of skilled birth attendance		X	X	X	X	X
					X		X	X
Challenges and concerns of SBA champion's model	Inequitable remuneration and economic sustainability	Economic challenges		X	X	X		
		Sustainability challenges	X	X	X	X	X	X
	Infrastructure and connectivity challenges	Poor road network			X	X		X
		Network connectivity challenges				X		X
	Administrative and logistical challenges	Complex reimbursement and claim process	X	X	X	X	X	X
Availability and reliability of SBA Champions		X	X	X	X			

* A- BENs, B - CHPs, C- SBA, D- CHCs, E- HCWs, F- HCMs

would go into labor, and you find they don't have transport means and they end up giving birth at home but now, since the inception of SBA Champions program, all deliveries are being conducted at the facilities FGD, CHP, 01

This program helps to prevent a situation where the child can die along the way if the mother does not get a quicker means of transport to the hospital, rather than leaving the mother with labor pains at home KII, CHC, 02

These quotes show that the absence of reliable transport options especially during emergencies or at night, resulted in unintentional home deliveries, which SBA Champions model sought to address. By providing free or voucher-supported transport, the model made it feasible for women to reach health facilities even from remote locations, thereby significantly reducing home deliveries.

The participants also noted an increase in facility-based deliveries.

We have observed that the number of skilled birth attendance have increased in Kitui South, as we compare the data from when it [SBA champions program] started because most of the mothers are now able to be ferried to the nearest health facilities KII, HCM, 02

It has really helped, because it has increased facility deliveries like you could find long ago, a mother would deliver at home, and she would say she doesn't have transport, or the home is far away and there is no vehicle. But now with the champions it has really helped and now you find deliveries in the facility have increased because the boda-boda riders bring them in time for delivery KII, HCW, 06

Participants emphasized the program's effectiveness in minimizing delays in reaching health facilities for delivery services.

Furthermore, the reduction in home deliveries and born before arrivals (BBAs) was consistently noted, as a program success.

We've seen a reduction, in home deliveries, which mostly occur at night because of lack of transport or deliveries, we call them BBAs [Born Before Arrival], people deliver before arriving to the facility, because some of them have to walk from far... I've had a woman walk for around 15 kilometers. So, this woman who decides that I want to deliver in the facility and doesn't have transport, that has been sorted by the SBA. So, we've not had home deliveries or born before arrivals because of a challenge with transport KII, HCW, 01

Additionally, the provision of free or reduced-cost transport to delivery facilities eased the overall cost of transport, contributing to improved accessibility to health facilities for delivery services.

...financially some of them [Pregnant women] are not well, probably they may not be to pay the cost of reaching to the dispensaries, but the SBA champions model has paid for them hence reaching the dispensaries in good time KII, HCW, 05

SBA champions model has been of great help because, sometimes you visit some homes and you

find they are not well up financially; they don't have a motorbike or vehicle, they lack money also to cater for transport cost, but as SBA champions, it comes in handy. We will pick that woman and ferry her to hospital immediately and they deliver successfully FGD, SBA, 03

SBA champions model has necessary resilience that enables motorbikes to navigate areas with poor road networks and challenging terrains, as noted below:

...you know bodaboda [motorcycle] is faster and in most cases for example our roads are also impassable but there is nowhere a bodaboda can't go. And so, another advantage is that these bodaboda they can reach anywhere where you are, even when it is in a hilly place, rocky place it can just reach you there, and they take you to hospital KII, CHC, 01

Participants also acknowledged that the SBA Champions model effectively bridged the ambulance gap in the area through ensuring prompt access to health facilities.

...if it were not for the bodadoda people, first, we don't have an ambulance in this area. I can say that they are the ambulance of the local people. Because let's say if there is a mother in an area say [name of a place], and the other one is in this area, [name of a place], when the time comes, these bodadoda riders, everyone in that section, they are called, they take the mother, and they take her to the hospital before the time is up. So, I can say it has helped a lot KII, CHC, 04

Improved health outcomes

The contributions of the SBA Champions model in reducing complications and minimizing infections due to the improved access to skilled birth attendant deliveries as highlighted by the participants was a recurring view.

...it has led to decreased perinatal deaths since most of the complications are prevented. You find a mother comes to the hospital early not like long ago, they took long at home upon realizing that they are unable to deliver now it's the time they brought the mother, unlike these days any pain felt they just call the riders, and she is brought. So, you find most of the complications are prevented so the perinatal deaths have gone down. Also reduced transmission of HIV because like long ago TBAs [Traditional Birth Attendants], you could get HIV from like you may be called to do a delivery to a mother whom you do not know her HIV status and when called

you must. So, with the boda-boda a mother will say let me get to the hospital for delivery KII, HCW, 06

Notably, the program improved access to emergency services at health facilities during complications, which, in turn, reduced mortality associated with childbirth.

If a child is born with complications in a facility, the doctor knows how to manage the conditions unlike in the case of unskilled delivery at home. In the hospital, the child is well managed. In the community, people are aware of importance of SBA deliveries and children are no longer dying in the hands of TBAs who are not skilled because you can't compare services from a skilled person and one who is not skilled... FGD, SBA, 01

Mothers were giving birth at home, and many were dying. But if you take the mother to the hospital on time, she is helped, and you avoid death. Also, the death of a child. They take them to the hospital, again you see that the hospital midwives are good, they are good KII, CHC, 03

On the side of the mother, it has reduced mortality. Because clients' lives are in danger if it gets complicated at home, and they have no means to go to the facility. So, it [SBA champions model] has reduced the mortality and they improved the outcome of the baby. So, chances of getting perinatal deaths have been minimized KII, HCW, 02

In summary, SBA Champions model has contributed to a reduction in maternal and newborn complications by ensuring that pregnant women reach health facilities early and receive skilled care during delivery. Home deliveries and BBAs have also been reduced.

Socioeconomic and awareness benefits

The participants consistently emphasized the economic and social impact of the SBA Champions program. This included the creation of employment opportunities, which provided much-needed income for the SBA Champions.

Personally, as a champion, I have benefited through this program. The money I have received in the voucher, as little as it may seem, we always appreciate because we are able to service our motorcycles, we feed our families, and we are able to support our siblings and those near us FGD, SBA, 02

Okay, it has empowered even the bodaboda the ones earning. Yes, it is a form of earning to them or a form

of employment because probably somebody would transport four women to the hospital in a month, that translates to some money KII, CHC, 05

...for the SBA it has created an income for the boda-boda now SBA champions. It's a source of income for them. Meaning now his or her family is benefiting directly from their income. Because they are assured at the end of the week if I ferry four mothers, I'll get a certain amount. So, it's a source of income KII, HCW, 02

Furthermore, participants noted that the program allowed mothers to redirect funds initially allocated for transport towards other essential needs.

We have had low poverty levels, for example you might find the head of the family is not working or they are earning very little. Some would prefer to save that money and have the woman give birth at home. With the voucher-based transport, people can save that money and buy the newborn clothes because, in the past, newborn would come out of the hospitals without clothes and well-wishers would just come through for such cases but right now we have a lot of change FGD, CHP, 03

...the money that they [pregnant mothers] were supposed to pay for the transport, they are able to put it in use for other things like maybe buying food or medicine or something else that will cater for the family of the mother and the baby KII, HCM, 01

Apart from economic relief, the SBA Champions model created a platform for building awareness and sensitizing the community on the importance of skilled birth attendant (SBA) deliveries, thereby actively promoting safe childbirth practices.

It brings awareness to the community. You see, these champions are branded with jackets with writings 'I'm an SBA champion' on the back or at the front. And others have got that message in our vernacular language. So, because this SBA interacts with so many people in a day, like in a market day, you'd find that the same SBA is a bodaboda rider, not only ferrying these pregnant mothers, but he is also carrying his normal customers. So, with the kind of message in his jackets, that message is going to be absorbed by a lot of people. And being absorbed by a lot of people is giving continuous education every day. And making the sensitization and awareness to the community and making them aware that it is important to deliver at hospital KII, HCM, 03

This led to increased sensitization efforts within the community, contributing to a broader understanding and acceptance of the importance of skilled birth attendance.

SBA Champion program has helped the community at large. People are aware and they have the notion that it is important to have SBA deliveries. The project has sensitized the community that it is good and important to have skilled birth deliveries, and everyone now sees the importance of SBA delivery FGD, SBA, 03

Furthermore, the program offered a valuable opportunity for health education to mothers when delivering in a healthcare facility, empowering them with essential knowledge during a critical period.

...when someone delivers in the facility you can encourage them on immunizations, you can give family planning, you can maybe advise them on the family planning of maybe this baby, after getting this one maybe you wait for another period, you can give advice accordingly. Even on feeding, breast attachment of the child, you know those mothers when they deliver at home you have some conditions at home we have some conditions whereby the mother, the baby cannot be able to suck, so once they deliver in the facilities immediately after birth the baby will be breastfeeding so maybe when we notice a problem of the breast, the nipple has a problem, we can assist the mother KII, HCW, 05

The program also enhanced engagement between community health promoters (CHPs) and pregnant women, ensuring timely transportation to health facilities.

... since the inception of voucher-based transport, we have been helped as CHPs because we are able to collaborate with the pregnant women. Because when a woman is in labor, they often called us so that we can connect them with the motorcycle riders to rush them to the hospital FGD, CHP, 03

Challenges and concerns of the SBA champion's model **Inequitable remuneration and economic sustainability**

A concern raised by participants involved the perceived lack of fair compensation for distance and effort. This issue was compounded by the high cost of transportation, attributed to increased fuel costs and the overall high cost of living, posing financial challenges for SBA champions.

Another challenge that these riders get is sometimes they are called at night, and we have some places

which are very far, but they are all paid the same amount regardless of the distance and you understand how fuel prices have gone high. So, when they are called, some will ignore because of the long distance. This can be checked, because some have lost interest. When SBA model came first to Mutomo, they used to pay them KES 1500 but when they came for the second round, they started paying them KES 1000, that's a big challenge to the rider who has to go far distance FGD, CHP, 03

The greatest challenge, when a champion ferries a client to the hospital, and for example they are referred to another hospital, they will not be added allowance. The SBA champions have been complaining a lot and this needs to be investigated because they will work double, and the pay is just the same. I wish there could be a system where they can sign twice in case of referral. They air these complaints to us, but I am tied because I don't know how to reply because we were told to tell them that transport is just once FGD, CHP, 02

Participants were concerned that the increased cost of fuel could render the program less profitable for those involved, thereby jeopardizing its sustainability. SBA champions were also said to incur losses due to the high cost of fuel, imposing the economic strain on those involved in the program.

...some other time I talked to them they were saying this job is good we are helping our people [pregnant women], but fuel prices have gone up. If there is something that can be done, because the economy is bad, like increasing the amount of money, we will be very happy KII, CHC, 01

Right now, the allowance is low regarding the current living conditions. When you calculate the cost of fuel, at the end of the day you are not getting anything and that explains why some people dropped FGD, SBA, 01

Infrastructure and connectivity challenges

Participants raised concerns about logistical challenges and operational hurdles within the SBA Champions model, especially relating to poor road networks. Bodaboda riders struggled to access some areas, thereby making it difficult to safely transport women to healthcare facilities. This was worsened by poor weather conditions, particularly during the rainy seasons.

The other thing is road network; some roads are poorly managed and sometimes you are afraid of getting an accident with a patient on board. The patients are normally accompanied by their birth companions, because of their conditions, you can't tell them to step down, so the companions must support them FGD, SBA, 02

We also have issues of poor road networks. During rainy seasons, most of our roads are impassable. When there is heavy downpour and labor starts, the mother will try to reach that champion and that champion will tell you that, I am not able to come and ferry you because a certain river has no bridge, so I am not able to use that route and you [the mother] will end up having home delivery KII, HCM, 03

Operational challenges related to network problems hindered effective communication with SBA champions in some areas.

...our area has a network problem. You may call someone, and they don't have network, but if you see a message maybe like 'I tried to call you' that means it's that network issue in this area. There are some areas with totally no network especially during night, during the day there is not much problem because during the day a bodaboda within five minutes, he will be in an area which has network, but at night when people are asleep you can call someone, and you fail to find them KII, CHC, 03

One is poor network coverage. When we get into the rural, you will realize that even these smartphones cannot access a network, even in 3G network. So, a mother will tell you that, I was willing to call that SBA champion, but we have network issues, so I tried to reach him until I delivered at home KII, HCM, 03

Administrative and logistical challenges

Further challenges included the non-reimbursement of SBA champions in cases where it was not true labor, highlighting potential financial losses for those engaged in the program. Women's failure to pay for transport costs in cases of false labor alerts upon reaching the facility, was problematic.

Okay, the only challenge some have reported is that when the mother comes, you know there are false labor and others, so she comes brought by the champion then she is inspected and found not ready for

birth, or the mother stays for two days and then goes back home. So maybe they won't pay claiming that they haven't delivered but the mother must pay KII, HCW, 06

...there are also a few challenges that they face in the process of delivering [transporting] these mothers. Some say that the mother might call but when they come to hospital you find this mother is not in labor. So, in such a scenario you find that they may not be compensated for their transport. So, it is also tricky for them to be able to know whether the mother is in labor or is not in labor KII, HCM, 04

When we were being sensitized, we were told, once you ferry someone to hospital and they don't deliver, you are not entitled to allowance, but the client should cater for the cost of transport. We have these challenges amongst ourselves because some women will not pay us FGD, SBA, 01

Participants expressed dissatisfaction with the one-way transport facilitation (from home to health facility), emphasizing the need for comprehensive support in both directions to address the challenges faced in reaching healthcare facilities.

As we say, all good things have a bad side. The women are transported to the facility but once they deliver, they cater for their transport back home. If it is possible, the plan should be they should be ferried to the hospital and back, that would be better. Because sometimes once they deliver, they call to ask how they will go back home. Because if they were ferried at night, it is usually costly and the champion cannot go and ferry the woman back but if it was possible, the voucher-based transport should be 2-way...We don't get complains from the women being transported. The only complaint we get is, we were transported to the facility, but we don't know how to go back home. For the women, they think the voucher-based transport system is two ways FGD, CHP, 01

The participants were also disgruntled about the flat-rate payment, which did not consider the distance to the facility, and this disadvantaged SBA champions.

This project pays 1000 shillings only, when I calculated the expense and the challenges we encounter on the way, sometimes we ferry them at night, they are in company of their companions, either one or two, sometimes, the nearest facility might not be operational and you can't leave her there, you have

to ensure she is in a facility where she can get help. So, when you go back home and look at the expenses, you start regretting why you let go of another better opportunity that you let go and this is a challenge. The 1000 is not enough, this is just the cost of fuel, they need to increase the amount so that we can also benefit in the process FGD, SBA, 03

There are some cases where a champion has gone for a mother, there are those that come from very far example those from [name of a place] and another from around, you find that for instance they are now paid a thousand shillings, the one from far will see that it is a bit unfair and they don't gain or lose anything from that because they are just in business. So, if there is a way, they could support them maybe those from a far distance there is a certain amount that they pay them that will encourage them not to see the burden KII, HCW, 05

Participants expressed concerns about the availability and reliability of SBA Champions, especially when they have to be woken up at night to transport a woman to a facility where at times, SBA Champions were not accessible when called, particularly at night.

Sometimes you are called at night, to me I consider that as my time to rest so that I can wake up refreshed. When you are called, you will have to go and ferry that client and you won't rest FGD, SBA, 02

Sometimes you can reach out to the champions, and you don't get them because their phones are off. Even if someone is called at any time, they should not give excuse that the motorbike doesn't have fuel. They should be always prepared and ready...when you call and they give excuse, they always refer you to the next champion because sometimes they get calls at 3am, they feel lazy to wake up FGD, CHP, 01

...the problem that has been there regarding the riders that carry pregnant women because I have been there, my labour might start, then I call that number and it is unavailable or I call and it goes through and he tells me he not nearby at that time, that is one challenge. Why is it a challenge, because I am depending on him, then he tells me he is not available FGD, BEN, 01

Discussion

The SBA Champions model has notably transformed transportation services for maternal healthcare. Participants consistently reported a significant reduction in home deliveries, indicating a positive shift towards facility-based childbirth. The model's provision of free or reduced cost of transport has alleviated financial burdens, making healthcare more accessible. Additionally, the efficient motorcycle transport system has helped navigate poor road networks, thereby ensuring timely and safe deliveries. Our findings are consistent with recent studies that have shown that voucher-based transport system can reduce delays in access to maternal and child health services by addressing transportation challenges [14, 16, 25, 26]. The use of transportation vouchers dubbed 'boda for mothers' in Uganda increased facility deliveries due to improved transport to access health facility [16]. These findings are also congruent with that of Bangladesh voucher program, which found an improved access to delivery services and reduced equity gap [27].

The SBA champion model has played a crucial role in reducing complications and mortality associated with childbirth. Participants in our study highlighted a decrease in maternal and neonatal deaths, indicating improved health outcomes. This is consistent with the findings of Independent Evaluation Group, which highlighted the positive impact of skilled birth attendance on maternal and child health outcomes [28]. However, Singh noted that the protective effect of SBAs against neonatal mortality varied by region, suggesting the need for further investigation into the model's effectiveness in different contexts [29]. Sibley and Canavan both emphasized the importance of training and competency assessments for SBAs, which are crucial components of the SBA champion model [30, 31]. These studies collectively underscore the potential of the SBA champion model in reducing complications and mortality in childbirth, while also highlighting the need for ongoing research and investment in training and infrastructure.

The SBA Champions model has created employment opportunities and provided a source of income for community members, contributing to local economic development. The positive economic impact extends to motorcycle riders offering transportation services, demonstrating broader community benefits. The reduction in the economic burden on families, allowing them to allocate funds for essential needs, further emphasizes the program's socio-economic benefits. Additionally, the model has enhanced awareness creation on skilled birth attendance within the community, highlighting the societal value of the SBA champion model. The findings of this study are in line with another study on benefits of a maternal and child health transport voucher program in Uganda [32]. The study found that transport voucher

increased maternal and child health awareness among women and transporters. In addition, the voucher program led to increased income among the transporters. Furthermore, a study conducted among community groups in Pallisa district in Eastern Uganda highlighted that about 26% of the transporters started income generating activities from the savings [32]. A study on maternal health voucher program aimed at increasing facility deliveries in informal settlement in Nairobi found that using voucher program was an effective mechanism targeting women of low socioeconomic status, thereby enabling them to overcome economic barriers to facility delivery [26].

Despite its successes, the SBA Champions program faces several challenges that threaten its sustainability and effectiveness. These include economic challenges, complex reimbursement and claim processes, poor infrastructure, and network connectivity issues. These findings concur with another study in Uganda on transport voucher scheme implementation challenges where community members shared their experiences. They complained of high inflation affecting fuel prices, while the transportation voucher charges remained constant, thus affecting the participation of some transporters who subsequently reduced transport availability [32]. Similarly, a study conducted in rural western Kenya found that use of motorcycle as a means of transport for women contended with rough terrain, odd hours of labor and harsh weather [25]. In another qualitative study on use of incentives for deliveries, nurses noted concerns on sustainability of the intervention when the program ends leading to seeking services from TBAs [33].

Strengths and limitations of the study

This study has several notable strengths. These include the provision of rich, context-specific insights by capturing the views of diverse stakeholders. The use of both FGDs and KIIs allowed for data triangulation, enhancing the credibility of the findings. The holistic approach to thematic analysis, combining inductive and deductive coding, ensured that the results were grounded in participants' experiences and views. Moreover, the study is embedded within a real-world intervention, making the findings directly applicable to ongoing maternal health programming. Its focus on transport-related barriers in rural Kenya addresses a critical gap in the literature and contributes meaningfully to efforts aimed at reducing maternal mortality in line with global targets.

However, the study also has limitations, including that of being conducted in only one sub-county (Kitui South). However, the findings may still have limited transferability given the rigour followed in conducting this study. The study may have been prone to social desirability bias, as participants may have been inclined to protecting

the relationship they have with the implementing organization.

Additionally, mixed methods study could have improved the utility of the findings. Gender dynamics were not deeply explored, despite the fact that all SBA champions were male, a factor that could influence women's comfort and willingness to use the service. Finally, the study does not assess long-term sustainability or outcomes beyond the project's active implementation period.

Conclusions

Overall, the SBA Champions model has made significant strides in improving access to maternal healthcare within the community. By addressing the identified challenges and building on the program strengths, the model can continue to provide invaluable support and contribute to better health outcomes for mothers and infants. Since this was a donor funded intervention, the issue of sustainability is crucial and needs prioritization for long term impact. Prioritization must come from both county government leadership and key stakeholders, including health development partners, community structures, and civil society organizations.

Abbreviations

AMREF	African Medical and Research Foundation
BEN	Beneficiary
CHAMPS	Children and Mothers Partnership Program
CHC	Community Health Committee
CHP	Community Health Promoter
CMMB	Catholic Medical Mission Board
ESRC	Ethics and Scientific Review Committee
FGD	Focus Group Discussion
HCM	Health Care Manager
HCW	Health Care Worker
KII	Key Informant Interview
KNBS	Kenya National Bureau of Standards
NACOSTI	National Commission for Science and Technology
SBA	Skilled Birth Attendance
SDG	Sustainable Development Goals
SSA	Sub Sahara Africa
UHC	Universal Health Coverage

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-13730-5>.

Supplementary Material 1

Supplementary Material 2

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Author contributions

K.J., M.Z., M.T., A. K., W.C., O.G., O.A., K.J., J.K., conceptualized the study design. H.K., J. M., O. J., M. Z., assisted in data collection, interpretation, data analysis and writing. M.Z., H.K., K.H., and G.T., assisted in writing and editing the manuscript. All authors contributed substantially to its revision and approval of the final version to be published.

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Data availability

Data is available within the CMMB repository. Data will be provided upon request via email to the corresponding author.

Declarations

Ethics approval and consent to participate

The protocol was approved by the AMREF Ethics and Scientific Review Committee (protocol No. ESRC-P1448/2023). A research permit was obtained from the National commission for Science and Technology (NACOSTI/P/23/29098). All study participants provided informed consent. The study adhered to the relevant ethical guidelines for research.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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