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Project Report
**End Term Evaluation of
The SonoMobile Project in Kenya.**



Amici Del Mondo - World Friends Onlus

Amici del Mondo - World Friends Onlus is an Italian Non- Governmental Organization working in collaboration with global partners to combat poverty and inequality and to guarantee fundamental rights to the local communities in Italy, Tanzania, Ethiopia, and Kenya. It continues to engage with and address the needs of the local communities through interventions in social-health and education.

This report is prepared by Dr. Caleb Mike Mulongo, on behalf of World Friends - Amici del Mondo - Onlus thus a copyright of World Friends- Amici del Mondo.

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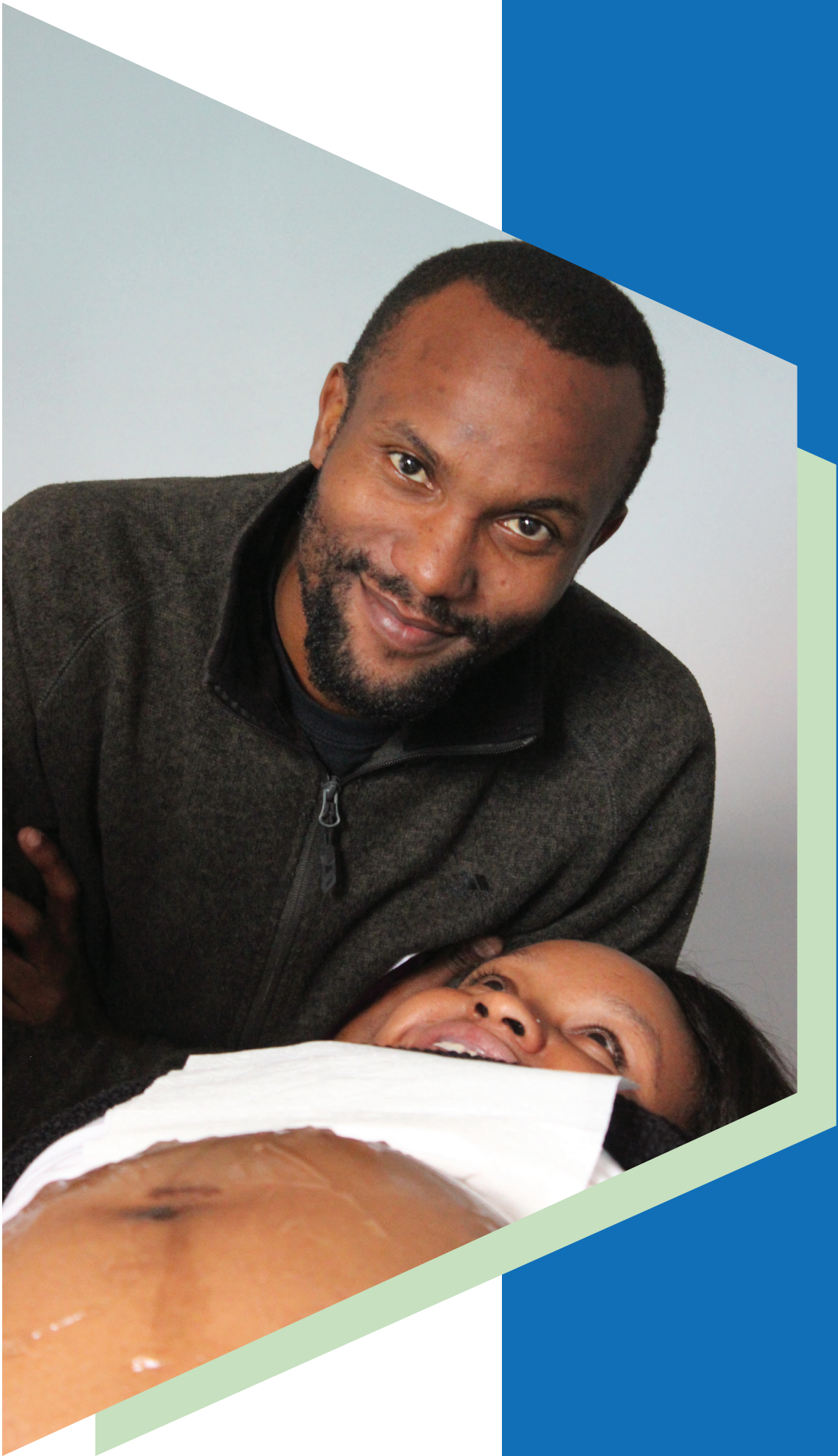


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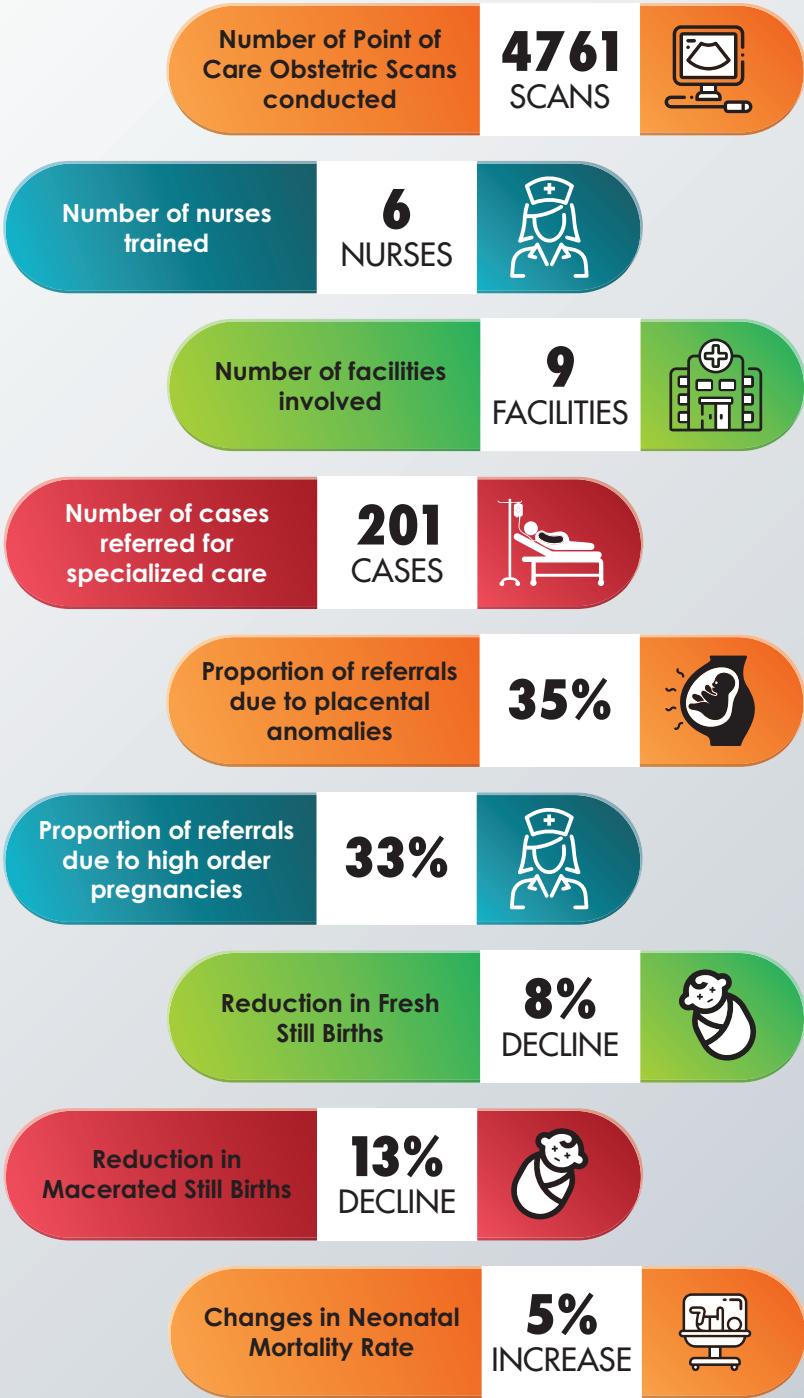


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Abbreviations

AICS	Italian Agency for Development Cooperation
APHRC	African Population and Health Research Centre Campus Università Campus Bio Medico di Roma– Ufficio Progetti di Cooperazione Universitaria allo Sviluppo
CSG	Centro di Salute Globale – Regione Toscana
KHPOA	Kenya Healthcare Professionals Oversight Authority
KIIs	Key Informant Interviews
KMCT	Kenya Medical Training College
KMPDC	Kenya Medical Practitioners' and Dentists' Council
NGO	Non-Governmental Organization
OECD DAC	The Organisation for Economic Co-operation and Development's Development Assistance Committee
PI	Principal Investigator
RUNH	Ruaraka Uhai Neema Hospital
SSA	Sub-Sahara Africa
SUERC	Strathmore University Ethics Review Committee
UniTO	Università degli studi di Torino- Scuola di Medicina
WF	Amici del Mondo-World Friends Onlus
WHO	World Health Organization

Project Highlights



Abstract

Background

The SonoMobile project was a three-year project being implemented in Nairobi's informal settlements with an aim of improving maternal and neonatal health while leveraging on new technologies. This would be tenable through; a) training of midwives in point of care ultrasonography, in collaboration with Kenya Medical Training College (KMTTC); b) remote reporting of ultrasound images by qualified sonographers hence provide a mobile ultrasound service in facilities that offer Primary Health Care, with priority given to the marginalized areas of the capital; c) quality control of the newly created mobile service, through the partnership with Italian universities. The project was implemented in Ruaraka Sub-County in Nairobi County, covering the informal settlements in Ruaraka.

This end term evaluation is aimed at establishing the impact of the SonoMobile project had in improving maternal and neonatal health outcomes among the population residing in the informal settlements in the North East area of Nairobi County.

Methodology

This evaluation adopted a mixed-methods approach, using both qualitative and quantitative methods to draw insights from the respective stakeholders and data repositories. Retrospective cohort analysis was applied for the quantitative part of the evaluation while key stakeholder insights on the impact of the project were sought through key informant interviews, semi-structured surveys and focused group discussions.

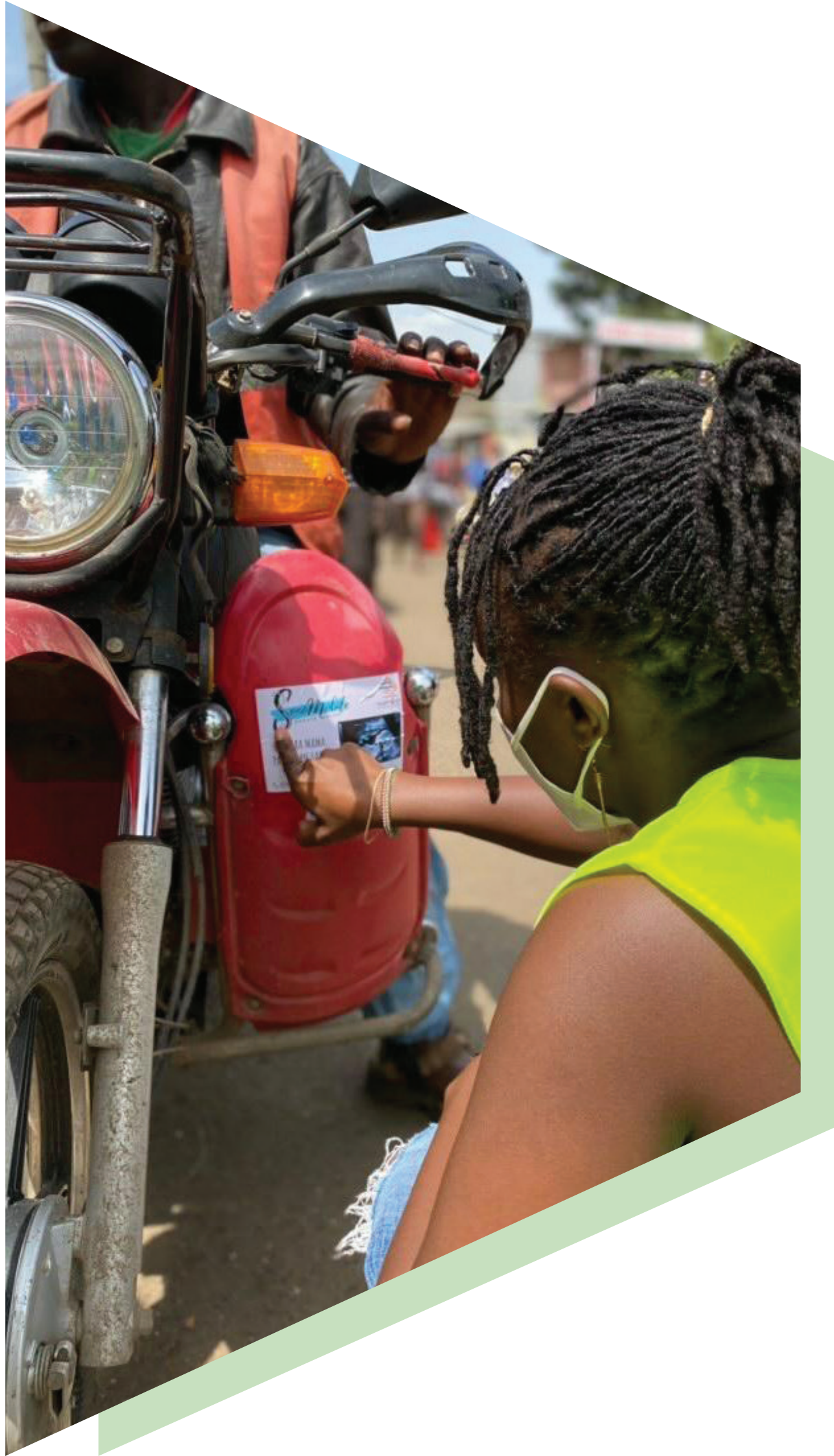
Purposive sampling was used to select respondents and facilities for inclusion into the evaluation. Thirty-six (36) key stakeholders involved in the project provided qualitative insights on their experience and the impact of the project.

The qualitative data collected was organised and analysed thematically in keeping with the Organisation for Economic Co-operation and Development's Development Assistance Committee (OECD DAC) Network on Development Evaluation (EvalNet) framework. The quantitative data was analysed using MS Excel and reported using descriptive statistics.

Outcomes

The evaluation yields the following outcomes; a) An elucidation of the impact of the project on access to and quality of maternal and neonatal care in the informal settlements in Ruaraka, Nairobi County; b) An understanding of the quality and impact of the training of nurse sonographers in Ruaraka, Nairobi County; c) An elucidation of lessons on healthcare project design, implementation, and scale up in informal settlements in urban settings. The findings are critical in guiding the design, implementation and scale-up of future projects; and provide policy relevant information pertaining to use of nurse led ultrasonography models in primary health care facilities.





Introduction

Background

High numbers of maternal and neonatal deaths continue to be a concern around the globe. In 2017, approximately 295,000 maternal deaths occurred, that is, about 810 women died every day. Sub-Saharan Africa (SSA) accounted for majority (196,000) of the maternal deaths¹. A systematic review in 2014, reported that about 73% of all maternal mortality were due to direct obstetric causes, the most common causes were haemorrhage (27%) with more than two thirds of the deaths classified as post partum haemorrhage, hypertensive disorders (14%), sepsis (10%), abortion (8%), and embolism (3.2%)². Abnormal placental implantation, retained products of conception and ectopic pregnancies are some of the causes of obstetric haemorrhage that can be diagnosed early by ultrasound^{3,4}.

Globally, about 6700 neonates died every day in 2019, accounting for largest share of deaths among children under the age of five. In SSA neonatal deaths account for 35% of all deaths among children under the age of five⁵. Most recently, a multisite retrospective study by Irimu et al (2021) demonstrates that neonatal deaths account for at least 66% of all deaths among children under the age of thirteen years in Kenya⁶. They further estimate that more than 95% of the deaths were preventable. Of these, intrapartum related complications such as those related to low birth weight and prematurity accounted for 30% of the deaths.

Notably, Kenya reported 21 neonatal deaths per 1000 live births in 2019⁵ and 342 maternal deaths per 100,000 live births in 2017¹, rates that are above the sustainable development goal 3 global targets of less than 70 maternal deaths per 100,000 live births and less than 12 neonatal deaths per 1000 live births⁷. Informal settings tend to be characterized by poverty, low coverage of maternal services and poorer quality services compared to the rest of urban areas, which may lead to poorer health indicators among slum dwellers⁸.

In Nairobi County, populations in informal settings have disproportionately high rates of both maternal and neonatal mortality rates, higher than the overall county and national averages^{9,10,11}.

Equitable access to health care services before, during and after pregnancy and childbirth, in informal settings is key in improving maternal and neonatal health outcomes in Nairobi County. Access to service is not only limited to clinical care, but also includes diagnostic medical imaging through ultrasounds, which has been demonstrated to contribute to reduction of maternal and neonatal mortality in primary care facilities¹².

The SonoMobile Project

Under the auspices of the Italian Agency for Development Cooperation (AICS), World Friends Onlus in partnership with Health E-net (a telemedicine support firm in Kenya keen on strengthening health equity through access to health) conceptualized the SonoMobile project.

The SonoMobile project was a three-year project implemented in Nairobi's informal settlements with an aim of improving maternal and neonatal health while leveraging on new technologies. This would be tenable through; a) training of midwives through implementation of a new curriculum for nurses specialized in point of care Ultrasonography, in collaboration with Kenya Medical Training College (KMTC) and be duly recognized; b) remote reporting of ultrasound images by qualified sonographers/ radiologists hence provide a mobile ultrasound service in facilities that offer Primary Health Care, with priority given to the marginalized areas of the capital; c) quality control of the newly created mobile service, through the partnership with Italian universities.

The project was implemented in Ruaraka Sub-County (the North East area of Nairobi County), covering the informal settlements in Ruaraka.

A formative assessment conducted by the World Friends Onlus in Ruaraka demonstrated low utilization of antenatal obstetric ultrasonography due to service unavailability and prohibitive costs¹³. Few pregnant women had antenatal ultrasounds done during their pregnancies, while a majority had one scan done predominantly in the first trimester.

During the course of implementing the project, World Friends Onlus conducted a mid-term evaluation which sought to establish the acceptability of the SonoMobile model of nurse-led sonography with remote report interpretation by trained sonographers¹⁴. The evaluation established that the model's value in improving access to affordable antenatal ultrasonography was well appreciated by all stakeholders who further recommended rigorous training, supervision, and regulation to improve the service delivery model. It also established a need for more capacity development among the nurse-sonographers on first trimester ultrasound assessments.

The end term evaluation is thus a culmination of the evaluation continuum, aimed at establishing the impact of the SonoMobile project had in improving maternal and neonatal health outcomes among the population residing in the informal settlements in Ruaraka.

Rationale and Justification

The end term evaluation is important to assess a) the impact of SonoMobile project interventions on the maternal and neonatal

health outcomes among the populations served by the project in Ruaraka Sub County; b) the impact of the project on the implementing partners and stakeholders; c) the nature and success of implementation of the project with a view to drawing lessons on project implementation, scale-up and sustainability. The findings are critical in guiding the design, implementation and scale-up of future projects; and will provide policy relevant information pertaining to use of nurse led ultrasonography models in primary health care facilities.

Main Objective

To evaluate the impact of the SonoMobile project on Maternal and Neonatal Care in Ruaraka, Nairobi.

Specific Objectives

- To examine the impact of SonoMobile program on access to quality maternal and neonatal care in the informal settlements in Ruaraka Sub County in Nairobi.
- To evaluate the training and use of nurses in nurse-led obstetric ultrasonography in Ruaraka in Nairobi.
- To explore lessons learnt from the implementation of the SonoMobile Project from all project stakeholders.





Methodology

Study Design

This evaluation was a mixed-methods approach, using both qualitative and quantitative methods to draw insights from the respective stakeholders and data repositories. Retrospective cohort analysis was applied for the quantitative part of the evaluation while key stakeholder insights on the impact of the project was sought through semi-structured interviews.

Study Site

The evaluation was conducted in Ruaraka Sub-County (the North East area of Nairobi County); and, specifically at all the nine SonoMobile project sites listed in appendix 2.

Population and Sampling

Non-Random sampling techniques, specifically purposive sampling, were employed in selection of the stakeholders given their respective roles in the implementation, utilization and regulation of the project interventions. Consequently, all health facilities involved in the project implementation in Ruaraka were sampled. All patients who received an ultrasound as part of the project had their records reviewed and pooled for analysis.

The evaluation used existing data sources for the quantitative data. Data collected during the project implementation as part of service delivery was retrospectively reviewed and used to determine progress with respect to the selected set of study outcomes.

The thirty six (36) key stakeholders involved in the project, from whom qualitative insights were drawn, included the following: hospital administrators and health workers in the project sites (n=6), nurse-sonographers trained in the project (n=3), line supervisors for the nurse sonographers (n=1), reference sonographers supporting the nurse

sonographers (n=2), trainers of the nurse sonographers (n=2), specialist physicians (consultant obstetricians/ gynaecologists) (n=1), the patient beneficiaries of the project (n=12), healthcare regulators- Kenya Medical Practitioners and Dentists' Council (n=1), SonoMobile Project implementation team (n=2) as well as external collaborators in the SonoMobile Project (n=6). A comprehensive list is provided in Appendix 3.

Data Collection

Qualitative data was collected from the relevant stakeholders through key informant interviews, semi-structured surveys and focused group discussions. Quantitative data was extracted from the project records. De-identified patient data was exported from the electronic medical record platform used for the project at the service delivery points. Patient data of interest that was extracted included the following: gestation of pregnancy at time of ultrasound scanning, and pregnancy type (whether single or multiple). Additionally, data on quality and volume of ultrasound services rendered was extracted from the project reports and repository.

Additional comparative data on key maternal and neonatal health indicators was extracted from existing Ministry of Health reporting platforms for the period of interest (DHIS 2) for Ruaraka Sub-County. These included neonatal and maternal mortalities at the sub-national level during the tenure of the project.

Table 1: Data Collection Strategy

Respondent/ Stakeholder	Data Collection Tool
Health Workers/ Health Facility Administrators	Key Informant Interviews
Nurses/ Midwives	Key Informant Interviews
Reference Sonographers	Key Informant Interviews
Specialist Physicians	Surveys
Patient Beneficiaries	Focus Group Discussions
Healthcare Regulators	Key Informant Interviews/ Surveys
County Government Health Representatives	Key Informant Interviews
SonoMobile Project Team	Key Informant Interviews/ Surveys
External Collaborators	Surveys

Data Management and Analysis

All interviews, upon obtaining informed consent, were audio recorded, transcribed and translated where necessary. Audio recordings were done using mobile phone-based recording applications. Similarly, upon obtaining consent, surveys were completed and stored in strict confidentiality.

The qualitative data collected was organised and analysed thematically in keeping with the OECD DAC Network on Development Evaluation (EvalNet) framework¹⁸.

Analytic Framework

Most often, project success has been evaluated in line with the three dimensions of the iron triangle (time, cost and quality). There is however growing evidence on the fact that project success transcends the three dimensions. For instance, Atkinson proposes considering other criteria in addition to the iron triangle such as benefits to the implementing organization, benefits to the stakeholders as well as information systems¹⁵. Additionally, evaluations of interventions must not only cover processes but also outcomes which could be behavioral, health, non-health and unintended outcomes.^{16,17}

In view of these, the end term evaluation adopted the OECD DAC Network on Development Evaluation (EvalNet) framework¹⁸ in the review of the processes and outcomes of the nurse-led antenatal ultrasonography (SonoMobile) program in the informal settlements of Ruaraka Sub-County, Nairobi.

The framework allows for a broad assessment of the project processes and outcomes in line with six dimensions namely; relevance, coherence, effectiveness, efficiency, impact and sustainability as depicted right.

Figure 1: OECD DAC Network on Development Evaluation (EvalNet) Framework



Source: OECD DAC

Appendix 1 outlines the dimensions in detail.

The review considered the possible project outcomes in two categories, proximal and distal, as proposed by Madan¹⁹. Proximal outcomes are those directly affected by an intervention, such as the number of staff who have received training. Distal outcomes are those where there is a multi-link causal chain linking the outcome to the intervention, such as the mortality rate for a given condition in a population of interest.

The quantitative data was analysed using MS Excel. We report the descriptive statistics including the number of ultrasound scans done; the scans by gestation age; pregnancy type as well as the number of high-risk pregnancies referred inter alia.

Validity and Reliability

Validation of the data collected was done through method triangulation of the responses from the surveys, and interviews and data triangulation from different sources (secondary data) and different respondents²⁰. Further, the insights drawn from the transcripts of the interviews and focus group discussions were reviewed with the participants for feedback hence bolstering credibility of the data collected. Quotes from the respondents have been included verbatim to support the research findings. The research team maintains an audit trail of the research process with transparent description of the research steps taken from the start of the project to the development and reporting of the findings²¹.



Ethical Considerations

Ethical Approval

Ethical approval was obtained from Strathmore University Ethics Review Committee (#SU-IERC0795/20). Additionally, approval was also obtained from the National Commission for Science, Technology & Innovation (#827569).

Risks and Benefits

There were no physical risks associated with participating in this study. Further, the team upheld confidentiality for all the research participants, particularly for the patient beneficiaries.

Limitations

Due to the restrictions of the pandemic, and the scheduling of patient reviews, constituting the focus group discussions to meet the minimum of six discussants per group for the patients on treatment was not entirely feasible. The evaluation was not able to draw direct attribution of some outcomes such as changes to maternal and neonatal mortalities in Ruaraka to the project in view of the multiple external health system factors that influence these indicators. They were however considered and documented as remote/ distal outcomes. Notably, the data on maternal mortality in Ruaraka was incomplete hence excluded in the assessment. The assessment did not capture outcomes of scanned mothers (referred or not referred) since these were beyond the scope of the project implementation.



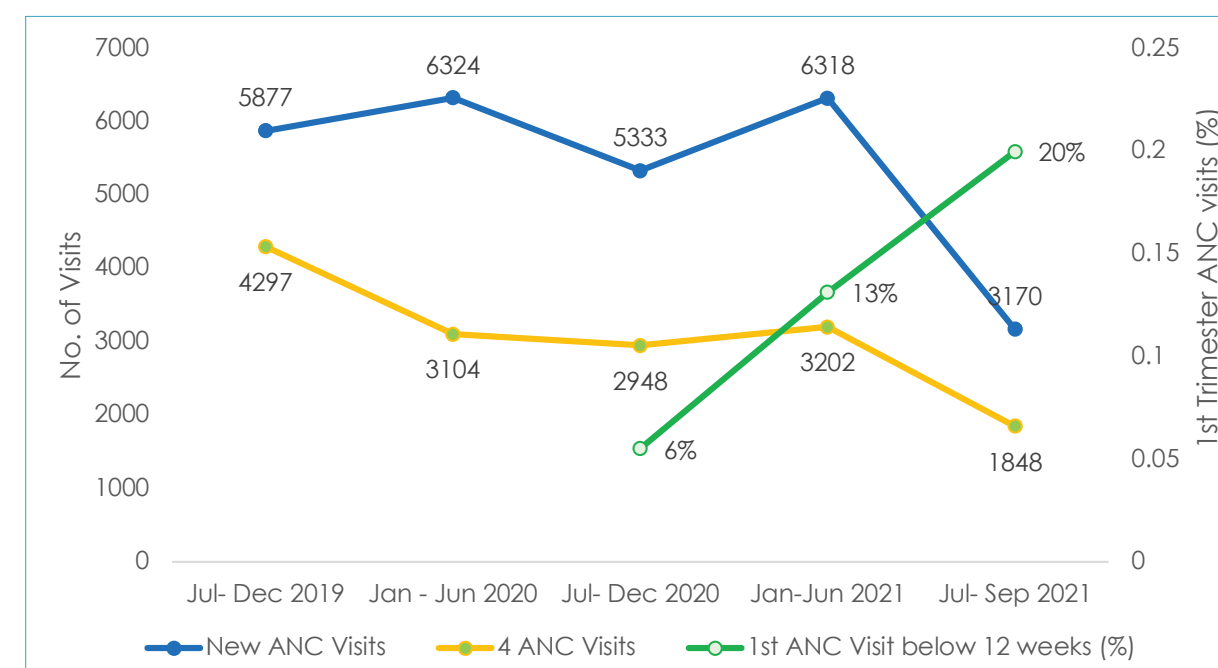
Findings and Analysis

3.1. Situation Analysis of ANC Utilization and Pregnancy Outcomes in Ruaraka Sub-County

3.1.1. ANC Utilization in Ruaraka

The number of new ANC visits progressively declined during the project period relative to the one year preceding the project largely due to the COVID 19 pandemic and related restrictions as shown in figure 2. Similarly, the proportion of mothers completing at least four (4) ANC visits declined from an average of 73% in June 2019 to 58% at the end of September 2021.

Figure 2: ANC Utilization in Ruaraka Sub-County



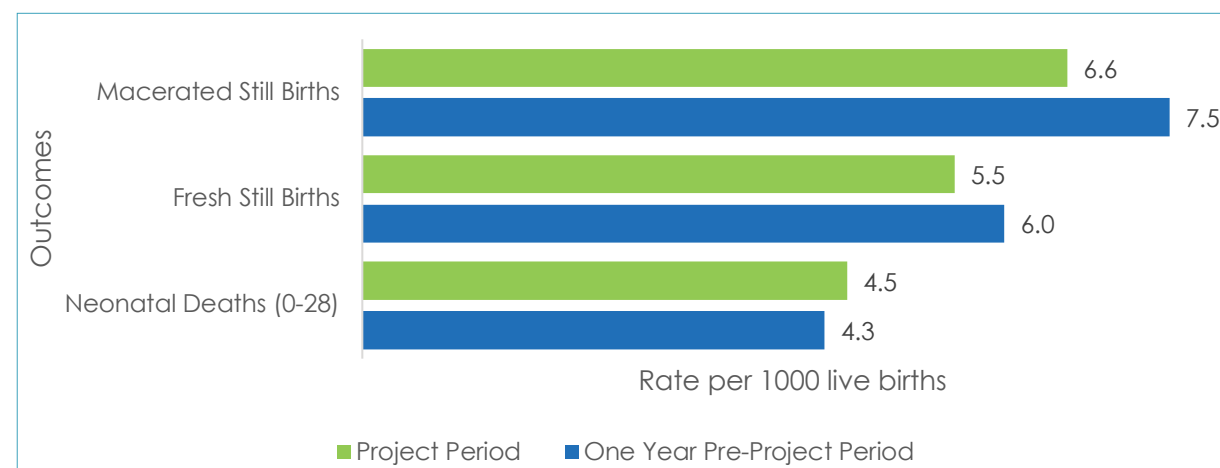
Source: DHIS 2

Notably, the proportion of ANC visits in the first trimester among the new visits were generally low but progressively increased from 6% (between July and December 2020) to 20% (between July and September 2021).

3.1.2. Pregnancy Outcomes in Ruaraka

While neonatal deaths marginally increased from 4.3 to 4.5 per 1000 live births during the project period, the proportion of fresh still births declined from 6 to 5.5 per 1000 live births while macerated still births declined from 7.5 to 6.6 per 1000 live births as shown in figure 3.

Figure 3: Pregnancy Outcomes in Ruaraka



Source: DHIS 2

The findings suggest the need for strengthening the entire continuum of maternal, neonatal and child care services to further reduce neonatal deaths in the first 28 days and beyond.

3.2. Project Evaluation

3.2.1. Effectiveness

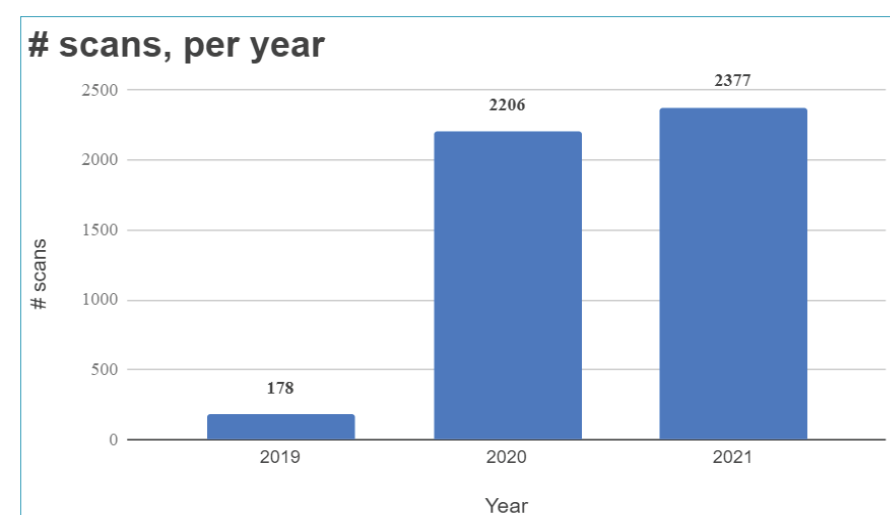
The extent to which the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups.

a. Improved access to point of care obstetric ultrasounds

A total of 4761 scans were conducted from the pilot in 2019, to project inception in July 2020 to conclusion in August 2021.

4% (178) of the scans were done in 2019; 46% (2206) in 2020; and the majority, 50% (2377) in 2021 as shown in figure 4.

Figure 4: Total Scans Conducted

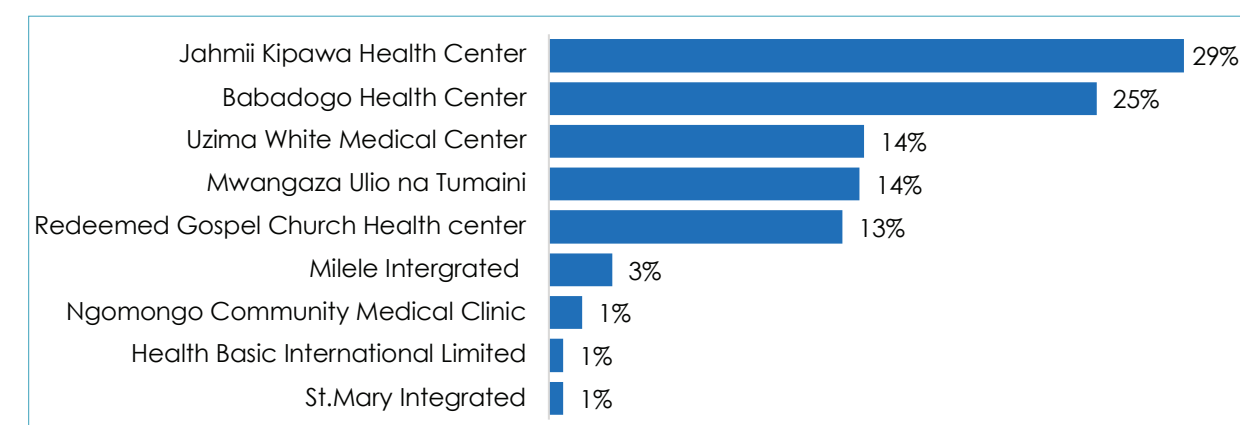


Source: Project Reports

Further, nine (9) facilities within Ruaraka were recruited as service points for the project during its tenure. These included Jamii Kipawa Health Center, Babadogo Health Center, Uzima White Medical Center, Mwangaza Ulio na Tumaini, Redeemed Gospel Church Health center, Milele Integrated, Ngomongo Community Medical Clinic, Health Basic International Limited and St. Mary Integrated. Notably, majority (29%) of the scans were done at Jamii Kipawa; 25% at Baba Dogo; 14% at Mwangaza; 14% at Uzima; and 13% at Redeemed as shown in figure 5.

These service delivery points, distributed within the informal settlements of Ruaraka, helped increase access to point of care obstetric ultrasounds delivered through the project.

Figure 5: Caseloads per facility involved in the SonoMobile Project

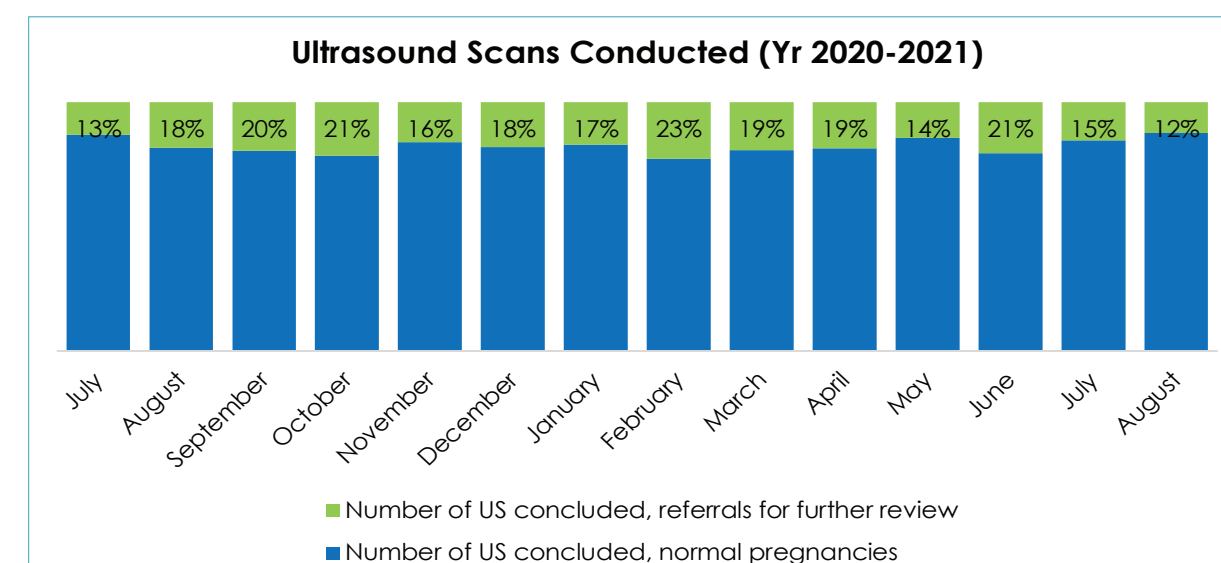


Source: Project Reports

b. Case Referrals

Majority of scans conducted were found to be normal with an average of **18%** referred for further review. Figure 6 shows the referral rates during the tenure of the project.

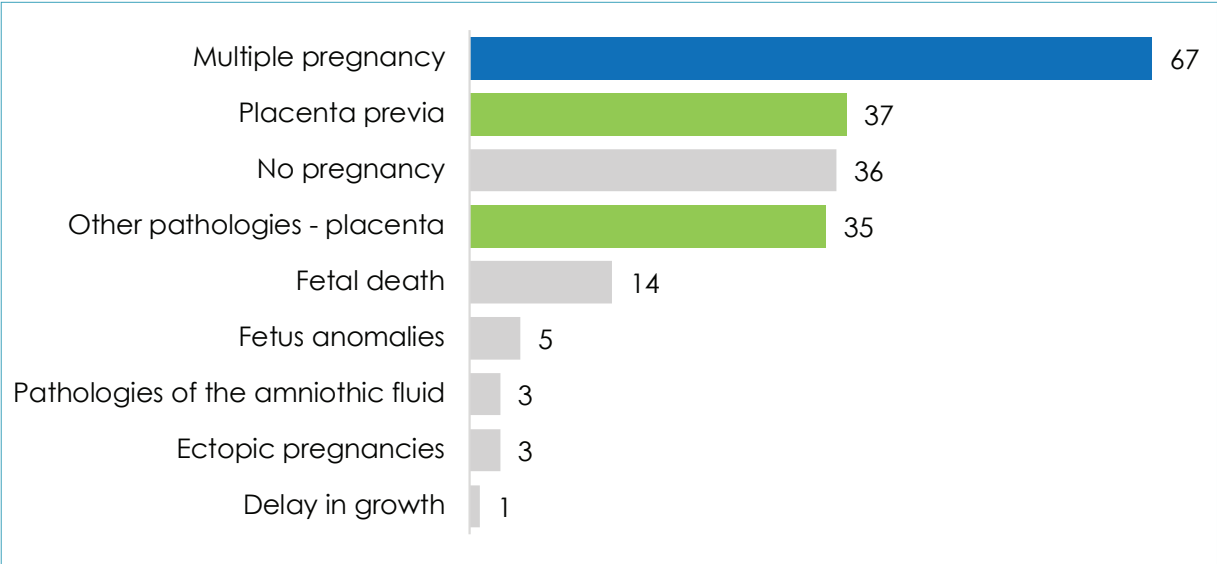
Figure 6: Ultrasound Scans Conducted and Referred during the Project Tenure



Source: Project reports

Most referrals were for multiple (High Order) pregnancies (33%) and Placental Disorders (35%) as captured in figure 7. Ectopic pregnancies accounted for 1% of all referred cases while fetal deaths accounted for 7% of the cases referred. Except for the reported 'No Pregnancy', the rest of the cases constitute high risk pregnancies and hence potentially averted maternal and neonatal deaths during the tenure of the project.

Figure 7: Reasons for Referrals

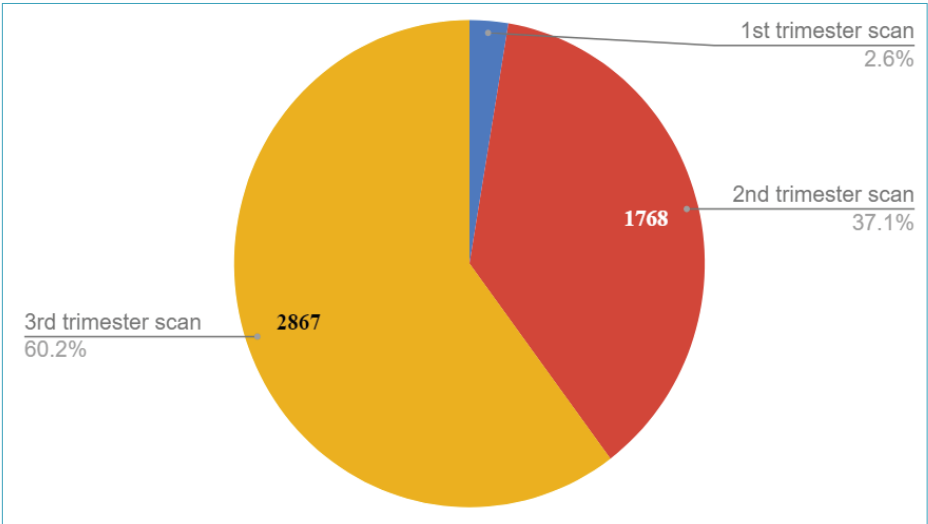


Source: Project reports

c. Timing of Scans

While 1st trimester scans are considered as most accurate for determining due date²², only 2.6% of the scans conducted in the project were done in the 1st trimester. Majority (more than 60%) were done in the 3rd trimester. This implies missed opportunities for early confirmation of dates, location of pregnancy (confirmation of intra or extra-uterine pregnancies), screening for anomalies through assessment of nuchal thickness and confirmation of viability of the pregnancy.

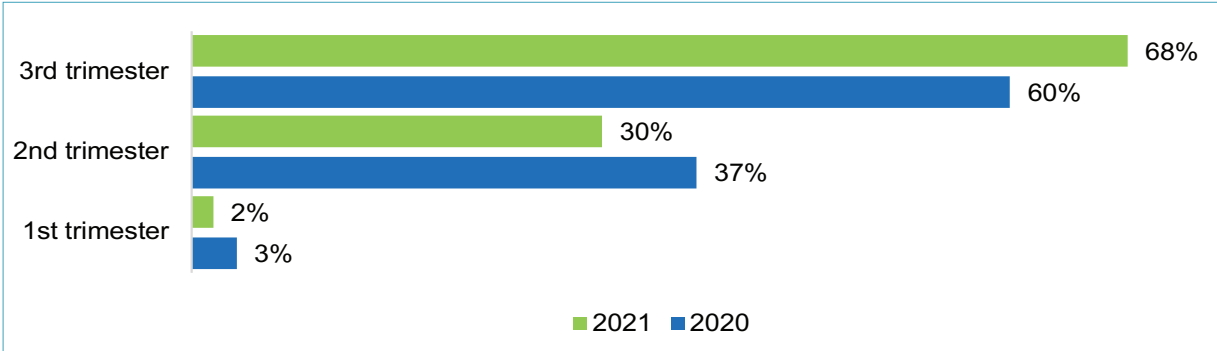
Figure 8: Total cans conducted by gestation age



Source: Project Reports

The trend was similar over the tenure of the projects as shown in figure 9

Figure 9: Scans conducted per year by gestation age



Source: Project Reports

The low uptake of 1st trimester scans is partly accounted for by limited awareness amongst the mothers, community and health workers on the value early obstetric ultrasound scans for both mother and child. This highlights the need for more aggressive community sensitization and mobilization.

I wasn't Interested since I had been told if I have one done, the baby will be born before they are mature. That the machines startle the child. Mother, FGD

I didn't have one done since I wasn't informed. Had the Nurse told me that I needed one I would have done a scan. Mother, FGD

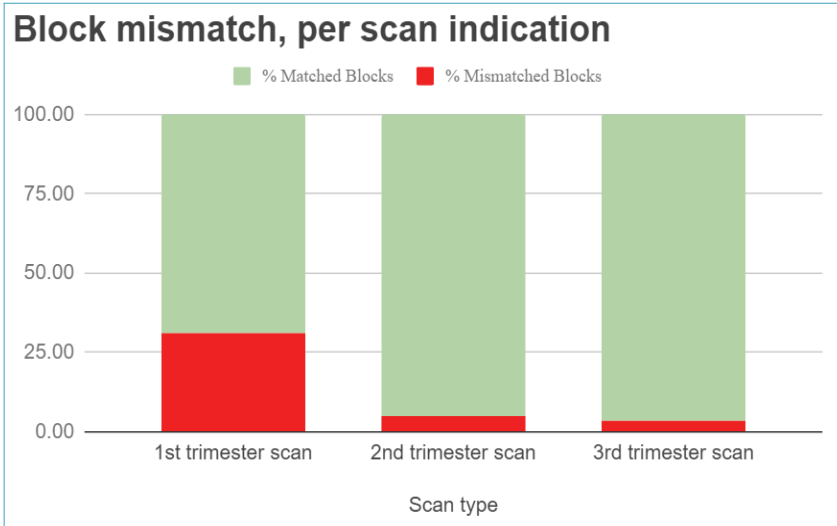
The major problem is finances. One considers meeting the daily needs first before they can get the scan. The distance to the facilities where a scan can be done is very long. Mother, FGD

Other factors cited include high cost of scans, distance to facilities with scans, fears and misconceptions on the effect of the scans on the mother and her pregnancy, fear of wrong reports on gender of the fetus among others.

d. Accuracy of Dating Scans

The highest variation in findings, between findings reported by the nurses and findings reported by the reviewing sonographers, was noted to be in the 1st trimester scans at 31% as shown in figure 10.

Figure 10: Variations in scan findings

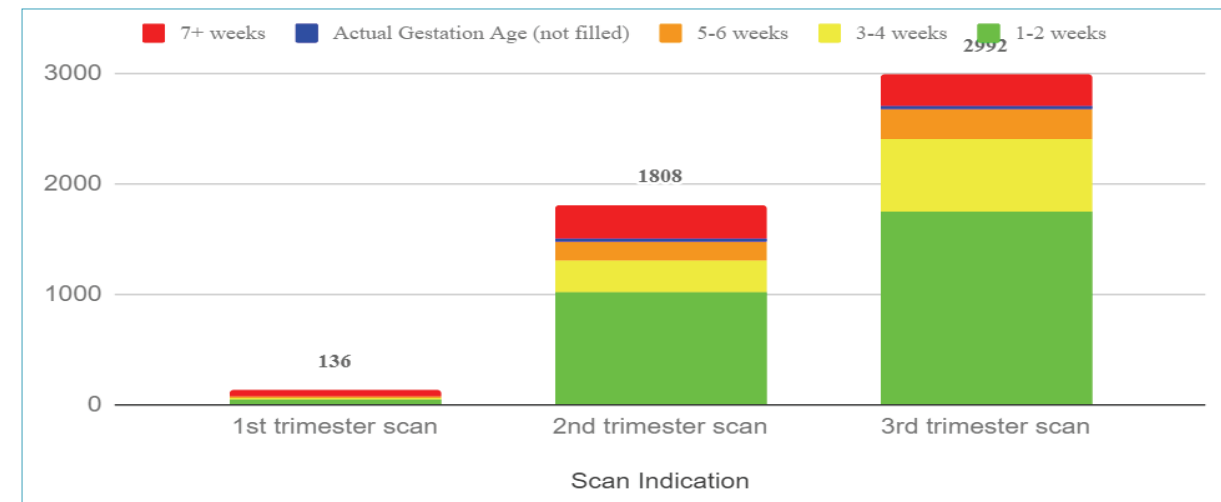


Source: Project Reports

Additionally, 62% of the 1st trimester scans had a due date mismatch greater than 2 weeks; 44% of 2nd trimester scans had a due date mismatch greater than 2 weeks; and 19% of 3rd trimester scans had a due date mismatch greater than 4 weeks as shown in figure 11.

The acceptable variation for 1st trimester scans is less than 1 week; less than 10 days for early 2nd trimester (14-22 weeks); less than 2 weeks for late 2nd trimester (22-28 weeks); and less than 3 to 4 weeks for 3rd trimester scans²². Consequently, the high proportions of due date mismatch in first and second trimester scans done in the project highlight the need for continued capacity development for the nurses to improve their proficiency.

Figure 11: Variation in gestation age



Source: Project Reports

e. Capacity Development

Through the project, six nurses were trained on Point of Care Obstetric Ultrasonography. The training was conducted in three cohorts in Nairobi.

The training covered basic concepts in obstetric imaging with a focus on the following:

- Device Features: Understanding the handheld devices, related functions and supporting technology.
- Fetal Heart and Movements: Identification of the fetal heart and calculation of the heart rate
- Amniotic Fluid Assessment: Assessment of the adequacy of the amniotic fluid (Amniotic Fluid Index)
- Placenta: Assessment of the placenta and the locations.
- Gestation Age: Estimation of the gestation age
- Limbs: Assessment of limbs
- Spine: Assessment of the spine
- Presentation: Assessment of presentation
- Cervical Length Assessment: Assessment of the Cervical length for cervical competency.

There was limited coverage of abnormalities in the training as all abnormalities were to be referred for specialist assessment.

The first cohort was trained for approximately one month, the second for about one and a half months and the last cohort for less than a month.

Notably, the trainers highlighted the need for longer trainings (at least six months of alternating theory and field work) coupled to robust field supervision to ensure better competency and grasp of the concepts by the nurses.

3.2.2. Relevance

The extent to which the intervention objectives and design respond to beneficiaries', global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change.

All stakeholders sampled were in agreement that the nurse led point of care obstetric ultrasounds were useful in improving maternal care particularly in the informal settlements.

The project improved access to point of care obstetric scans by reducing related costs and bringing the services closer to the pregnant mothers; increased sensitization of mothers on appropriate maternal and neonatal care; improved capacity of health workers to provide quality care to pregnant mothers; and improved skilled attendant deliveries. This was also well aligned to the national priority on universal access to quality maternity care.

You can monitor the growth of the baby. You can tell the gender of the baby. If you have complications, they will be detected. Mother, FGD

You are able to plan yourself financially. Since most results are accurate, you can procure baby items in advance based upon the gender. You will be informed of the referral Hospital to go to. Mother, FGD

It helps us in managing how we are going to deal with them. Because in our assessment we are going to see if this is going to be an easy delivery or a hard one. Nurse

The facility has been able to get more pregnant mothers who attend clinic and those who deliver in our facility due to these services. Facility Administrator

There is greater access to expectant mothers since there are more nurses but fewer Sonographers. Nurse.

3.2.3. Coherence

The compatibility of the intervention with other interventions in a country, sector or institution.

Majority of the respondents noted that the point of care obstetric ultrasounds done by nurses who were well trained and supervised were necessary in light of the shortage of sonographers and radiologists in the country.

Most respondents highlighted the value of a functional referral system and quality assurance system to support the midwives conducting the point of care obstetric scans.

"First Level Ob-Scans Can Be Performed By Trained Nurses And Offered To A Wider Group Of Patients. At The Same Time, During Reviewing And Reporting, The Sonographer Can Individuate Those Patients Who Are Actually In Need Of Second-Level Ob-Scans Thus Narrowing The Number Of Exams." QA Team

The respondents highlighted the fact that the midwives were well placed in this service given their proximity and constant contact with pregnant mothers during the antenatal period.

"It would go hand in hand with what they are currently doing but the outcomes of the report would be better as the nurses in maternal health have a clinical background on issues affecting the patients." Representative Obstetrician/Gynecologist

It does fit because these are the same people who assist women in delivery. They are the same people that take these mothers throughout their pregnancy journey. So, them getting a skill where they are not only able to touch but also use something that helps them to see...I feel it is sort of balanced. This is someone who is aware of what is going on in terms of pregnancy and the baby and then someone who is skilled in reporting on the images gives their own feedback on the same. Project Administrator

While qualifying the difference between the point of care scans and full abdomen and pelvis ultrasound scans, the trainers and quality assurance teams emphasized that the point of care scans were essential in identifying high risk pregnancies for referral for further care. It was reiterated that the point of care scans were not a replacement for or synonymous to the full abdomen and pelvis scans as the latter were beyond the scope of the nurses' training.

3.2.4. Efficiency

The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way.

Most respondents in the assessment reported that the nurse led point of care obstetric ultrasound scans were cheaper (at Ksh. 750; USD6.8) than those done in other facilities (range between Ksh.1500 to Ksh.2500; USD13.6 to USD22.6) hence fairly accessible and affordable to the populations in the informal settlements.

One of the differences is that these SonoMobile (scans) actually are cheap comparing to those others which are very expensive. Facility Owner

It made me happy because it is pocket friendly to the normal citizens and it showed me true results. Mother

It was noted that the use of the nurse led point of care obstetric scans as a filter for cases that are escalated for specialized care was critical in enhancing efficiency in the use of available resources within the health system. Only deserving cases would be referred to higher facilities where care is more expensive, and specialists would thus handle deserving cases. Consequently, this would reduce wastage of scarce resources within the health system.

Individuating first level and second level professionals that perform same exams with different insight levels can widen the number of patients offered the ob-scans but narrow the indications to the expert sonographer referral, ultimately leading to a more precise and better quality of care. QA Team

Majority of the respondents reported that the portability, availability, and versatility of the SonoMobile scans helped expedite decision making and service delivery to pregnant mothers in Ruaraka.

I believe it would improve due to the promptness in decision making that this would afford. Representative, Obstetrician/ Gynaecologist

You know they know that our scan is on Wednesday, so you find that they come within the week and are booked for Wednesday. Facility Owner

It was fast and they told me there was no problem and the baby is okay. Mother

3.2.5. Impact

The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects.

While the project sought to improve maternal and neonatal outcomes in Ruaraka, it also resulted in strategic collaborations between for profit, not for profit, government and teaching institutions involved in the implementation of the project. Further, it also helped improve patient knowledge on the value of obstetric ultrasounds and ultimately strengthened trust between the health workers and the mothers/ community members.

There are improvements because we now see mothers have knowledge about the scan. At least now the mothers are getting aware. Because they teach one another. Health Worker

3.2.6. Sustainability

The extent to which the net benefits of the intervention continue or are likely to continue.

a. Collaborations

The project fostered strong strategic collaborations with multiple stakeholders including the County and Sub-county health leadership, training institutions in Kenya and Italy, implementing partners, technology firms, public and private providers within Ruaraka. These partnerships ensured synergy hence anchor the intervention's sustainability beyond the project tenure.

b. Capacity Development

The knowledge and skills imparted through the training to the nurses are critical to

sustaining the impact of the project even beyond Ruaraka.

Capacity building has been met. We were able to train a good number of nurses; enough to cater to a wider range of patients. Project Administrator

c. Leveraging technology

The project's use of teleradiology (remote reporting by sonographers), remote quality assurance, real-time project monitoring, and use of portable handheld devices helped increase efficiency of the project implementation which hence likely to enhance sustainability of the project gains beyond the project tenure.

For the SonoMobile scans, we got a message with the results of the scan. The others don't send a message and don't give images. They just give a piece of handwritten paper and tell you that the doctor/nurse will come to explain the results. SonoMobile is better because they send you images on your phone and though one isn't trained in interpreting you believe what is written. Mother, FGD

d. Patient Trust

Mothers reported that they trusted the scans done by the nurses as the outcomes, mostly gender determination, were accurate. This reliability further strengthened the patients' confidence in the service, the health facilities and providers.

The sonographers conducting other scans hide some information from the mothers. For example the scan I had for my second child, they refused to tell me the gender since I had mentioned I had a boy. They thought I'd consider an abortion. In comparison to SonoMobile, they gave me all the information I needed and counselled me in addition to the scan. Mother. FGD

e. Patient Awareness

Mothers who had the scans done through the project were sensitized on the value of obstetric scans, danger signs during pregnancy and best practices during pregnancy. The heightened awareness on

these dimensions increase the likelihood of sustainability of the intended gains of the SonoMobile project.

Once they heard of it...the mothers that were attended to and had an experience with that (the project) and knew that it was important for them, they would go out in the community and spread the news. And other mothers would come telling us that, 'we heard this project from our friends who had experienced it.'" -Nurse

f. Affordability

Most respondents noted that the service was relatively affordable for the target population in the informal settlements with most mothers willing to pay for the service hence a potential anchor for sustainability.

"We are surprised and shocked by the number of women who were willing to pay for it as a service." Project Administrator

However, most facilities initially witnessed a significant decline in the number of mothers getting the scans upon introduction of the service charge of between five hundred and one thousand shillings.

Flow was very high. But right now, after charges were introduced, they are few but they have started to pick. They have started to understand because outside there, the scan goes for Ksh. 1500-2000...we told them the scan is Ksh. 1000 and at least they are now catching up like before. Health Worker, Partner Facility

"It affected the project in that now we had to get very few clients. Like in some facilities (previously) when we could go there in a day, we could get 10 – 12 clients. But after the introduction of payment, at times you could go there and get 1 or 2 clients. It was demotivating at the same time." -Nurse



Challenges

a. COVID 19 pandemic

The COVID 19 pandemic not only reduced healthcare service utilisation by community members, but also limited the level of project implementation and scope of engagement of collaborators in the project.

"It has reduced the number of patients since not everyone is comfortable coming to the facilities knowing well that they (expectant mothers being part of the vulnerable groups) risk getting into contact with an infected person." Nurse

b. Staff attrition and few staff

Transitions of trained nurses from the project limited realisation of the full value of investments in the training and delivery of the project.

Some of the trainee nurses quit their job making the effort made less valuable for the project-QA Team

The available workload outweighs the few staff conducting the scans and reporting the results resulting in service delays and limiting the potential number of beneficiaries served.

Getting the feedback immediately is tricky because maybe I'm also busy – Sonographer

c. Project costs

Direct costs related to implementation of the project, from training of nurses to operations and service delivery, were reported to be high, therefore a threat to sustainability of the project.

d. Cost of service

Introduction of user fees for the scans resulted in attrition in the number of patients scanned in the partner facilities as the fees were deemed high by some mothers.

"...some of them (mothers) cannot even manage the small amount that they (facilities)...charge." Facility Administrator

e. Limited and inaccurate knowledge on obstetric scans

Uptake of the point-of-care scans was limited by inadequate and inaccurate knowledge on the value of antenatal ultrasound scans among the mothers and some health workers.

f. Short duration of the training

The duration of the training of the nurses (4-6 weeks) What's considered inadequate for comprehensive and optimal competence in point-of-care obstetric ultrasound scans.

g. Acceptability

Some health workers disregarded ultrasound reports generated from the project questioning their legitimacy.

"I was told these mobile ones were not legitimate. Because even the place I started clinic at, they asked me why I had gone to the mobile scanning and not the scan she had sent me to." - Mother

h. Limited connectivity

Weak internet connectivity between the nurses and the sonographers resulted in delays in report generation and dissemination to respective mothers.

i. Low resolution of images

Low image resolution affected the quality of training and the quality of reports generated within the project.

j. Technical limitations

While the portable devices were deemed adequate for the evaluations, they had limited capabilities thus limiting the scope of the examinations.

“So depending on the settings for the machine, the knowledge on how to use them and...the machine I think is still limited with some app to adjust the setting, to adjust the images, measurements. So definitely they are still limited in a way.” -Sonographer

“The equipment kept on hanging. It could not support so many images, we had to delete some of them, we had to keep on upgrading the system” -Nurse

The software and the calibration of the software. Such that maybe sometimes you can have errors in measurement which might end up giving the wrong results. - Sonographer



Recommendations

a. Continued capacity development

Continued capacity development for the nurses to ensure proficiency. This should include standardization of the content and length of training; increasing the length of training from the current span to allow for more field and theoretical content exposure; increased practical sessions with field supervision.

Schedule retraining and refresher training sessions for the nurses to help reinforce skills and knowledge gained.

Repeated training sessions in time to keep up to changing standards and periodic external quality control in order to maintain a high proficiency of the nurses performing ob-scans. QA team

Improve on the resolution of images obtained in the project and those used in training of the nurses.

Send the mother a clear picture so that if it's written that it's a leg, the mother can see the leg. Mother, FGD

Some of the structures could be best evaluated with videos instead of images. QA Team

Consider real time linkage of trainers, QA team, Sonographers and the nurses for ease of monitoring and evaluation.

b. Supervision

Strengthen supervision of trained nurses during and after the training. Consider linkage to trainers during the field work for immediate feedback and mentorship.

Networking of devices used in the project and linkage to trainers, QA team and sonographers. Trainer

c. Regulation

There is need for clear guidelines on scope, quality assurance and regulation of the health workers conducting point of care ultrasonography. There is a likelihood that the radiography bill in parliament may provide some guidance on the scope and regulatory considerations.

Invest in and leverage better and reliable internet connectivity and software to minimize service disruption.

d. Leverage technology

Deploy simple user-friendly devices, platforms and interfaces for the users (nurses, sonographers, and mothers)

Give hardcopy results since some aren't able to access the results due to various challenges. Mother, FGD

...get a software that can be able to handle many clients. Or any upload that can stop the problem of the tablet hanging during the operation, it can be good. - Nurse

e. Targeted Advocacy and stakeholder engagement

Increase sensitization of mothers and the community on the value of obstetric ultrasounds.

More education to the mothers since some still believe that if they have an ultrasound the child will have an issue. Mother, FGD

More stakeholder involvement in curriculum design, delivery, regulation to enhance acceptability.

Incorporation of all stakeholders in the formulation of policies and the structure to enable acceptance when it is finally implemented and to be accorded the necessary support required. Specialist

Increase promotional marketing on availability of the services.

I think yes, with promotional marketing: radio advertisements, television advertisements, large billboard in the city, with health care education in slums facilities, leaflets and so on. QA Team

f. Staff retention and adequate staffing

Improve retention of staff trained to ensure invested value is realized.

Yes. Some of the trainee nurses quit their job making the effort made less valuable for the project. Trainer

Recruit more staff to ensure timely service delivery and to broaden the reach of the service.

g. Improve Post Natal Services

There is need for strengthening of the entire continuum of maternal, neonatal and childcare from the ANC phase to the Post-natal care phase to ensure healthy survival of the children.

h. Follow Up for Pregnant Mothers in the Project

Project participants, whether subsequently referred for further care or not, should be followed up and the outcomes of their pregnancies documented for completeness of the assessment.

...our follow-up system was not complete. Project Team

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Appendix

Appendix 1: OECD DAC Network on Development Evaluation (EvalNet) Framework

Dimension	Description
Relevance: Is the intervention doing the right things?	The extent to which the intervention objectives and design respond to beneficiaries', global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change.
Coherence: How well does the intervention fit?	The compatibility of the intervention with other interventions in a country, sector or institution.
Effectiveness: Is the intervention meeting its intended objectives.	The extent to which the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups.
Efficiency: How well are resources being used?	The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way.
Impact: What difference does the intervention make?	The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects.
Sustainability: Will the benefits last?	The extent to which the net benefits of the intervention continue or are likely to continue.

Appendix 2: SonoMobile Project Sites in Ruaraka, Nairobi County.

Facility	Level	Ownership Status
St. Mary Integrated	3A	Private
Health Basic International Limited	3A	Private
Ngomongo Community Medical Clinic	3A	Private
Milele Integrated Medical Services	3A	Private
Redeemed Gospel Church Health center	3B	Faith Based
Mwangaza Ulio na Tumaini	3B	Faith Based
Uzima White Medical Center	3A	Private
Babadogo Health Center	3B	Public
Jahmii Kipawa Health Center	3B	Private

Source: <http://kmhfl.health.go.ke/>

Appendix 3: List of Respondents

Respondents	Number	Mode
Sonographers	2	Key Informant Interview
Project Nurses	3	Key Informant Interview
Beneficiary Mothers- FGD (7 Mothers) & (5 Mothers)	12	Focus Group Discussions
Facility Administrators/ ANC Health Workers		
Health Basics	1	Key Informant Interview
Mwangaza Ulio na Tumaini	1	Key Informant Interview
Babadogo	1	Key Informant Interview
Redeemed	1	Key Informant Interview
Jamii Kipawa	1	Key Informant Interview
Uzima White	1	Key Informant Interview
Project Coordinator	1	Key Informant Interview
Specialists'/ Professional Association	1	Electronic Survey
Regulator- Kenya Medical Practitioners' and Dentists' Council	1	Key Informant Interview
Trainers	1	Key Informant Interview
Quality Assurance Team	2	Electronic Survey
Partners	7	Electronic Survey
Total	36	



Appendix 4: Data Collection Tools

a) FGD Guide- Beneficiary Mothers

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Number of Previous Pregnancies

Interview

- 1. Have you had another ultrasound scan done for you when pregnant before? Yes or No (If YES, then explain how many of them you did and eventually why)
- 2. If No, which kind of barriers did you find? (financial, social, cultural...)
- 3. If Yes, at which trimester of the pregnancy? Probe for reason
- 4. In your opinion, what is the value/ benefit of an ultrasound scan during pregnancy?
- 5. What problems or difficulties have you had in the past when trying to get a pregnancy ultrasound scan?
- 6. What are the benefits of having an early scan?
- 7. What challenges do mothers face in cases where a complication is detected by the scan?
- 8. From your experience, how would you compare the pregnancy ultrasound scans done by the SonoMobile team and those done elsewhere? (Probe on price, accessibility, availability, time, quality etc.)
- 9. What challenges have you experienced with the nurse led ultrasound service as currently offered by the program? Probe on price, accessibility, availability, time, quality, staff etc

- 10. Please rate the overall quality of the service you received under the SonoMobile project?

a) Excellent b) Good c) Average d) Fair e) Poor
- 11. Are you aware of any arrangements within your hospital for the referral of pregnant mothers to higher levels of care for ultrasound scans in cases where the SonoMobile nurse is unable to handle the case? (Probe for details where available on referral plans, destinations, communication etc.
- 12. What improvements would you suggest to ensure successful/ effective ultrasound service delivery by the nurse sonographers?

b) Trained Nurses

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Training

- 1. Briefly describe your role in the SonoMobile project?
- 2. How would you describe your overall experience with the SonoMobile project?
- 3. What in your words were the objectives of the training that you received?
- 4. Would you say the training met its objectives? And why?

- a. Probe: Were there any challenges that you faced?
- 5. What do you think changed for you as a nurse after receiving the training?

a. Probe for changes in knowledge of obstetric ultrasound: Do they have enough knowledge about USG to conduct the scan?

b. Probe for changes in skills in performing obstetric ultrasound for review by a remote sonographer: Are they able to generate good quality images for review by a sonographer?
- 6. Besides the initial training, what other support might be needed for nurses to conduct point of care obstetric ultrasound scans?
- 7. What challenges did you face with the training as it is currently designed?
- 8. How, if possible, would this training of nurses for remote obstetric ultrasound services be improved?
- 9. How has the COVID-19 pandemic affected the training and service delivery under the SonoMobile project?

Task Shifting

The SonoMobile project involves nurses who do the scans, and remote sonographers, who review the images and deliver a report.

Are your responsibilities as a trainee clear after the training? YES NO (Explain your response)

How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?

How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?

How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?

How does the provision of obstetric ultrasound scans by nurses fit into the wider context of maternal and newborn care in Kenya?

Scale Up

- 1. Do you imagine this new service being mainstreamed in the future? If yes, how do you imagine this happening?
- 2. What challenges do you see in scaling nurse-led obstetric ultrasound services?

a. Probe on technological challenges (probe, tablet, software)

b. Probe on operational challenges (training, scheduling, coordination)

c. Probe on policy/regulatory challenges (pricing, permissions)
- 3. What improvements would you suggest to the project as it currently exists?

c) Project Sonographers

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Training

- 1. Briefly describe your role in the sonomobile project?
- 2. How would you describe your overall experience with the sonomobile project?
- 3. What in your words were the objectives of the training of the nurses in this project?
- 4. Would you say the training and the project met their intended objectives? And why?

- a. Probe: Were there any challenges that you faced?
5. What do you think changed in the nurses with the training in the project?
- a. Probe for changes in knowledge of obstetric ultrasound: Do they have enough knowledge about USG to conduct the scan?
- b. Probe for changes in skills in performing obstetric ultrasound for review by a remote sonographer: Are they able to generate good quality images for review by a sonographer?
6. Besides the initial training, what other support might be needed for nurses to conduct quality point of care obstetric ultrasound scans?
7. How, if possible, would you improve the training of nurses for remote obstetric ultrasound services?
8. What aspects of the service would you recommend for improvement? Why? How?
9. How has the COVID-19 pandemic affected the service delivery under the SonoMobile project?

Task Shifting

The sonomobile project involves nurses who do the scans, and remote sonographers, who review the images and deliver a report.

- Are your responsibilities of the trainee nurses clear after the training? YES NO (Explain your response)
- How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?
- How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?
- How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?
- How does the provision of obstetric ultrasound scans by nurses fit into the

wider context of maternal and newborn care in Kenya?

Scale Up

- Do you imagine this new service being mainstreamed in the future? If yes, how do you imagine this happening?
- What challenges do you see in scaling nurse-led obstetric ultrasound services?
 - Probe on technological challenges (probe, tablet, software)
 - Probe on operational challenges (training, scheduling, coordination)
 - Probe on policy/regulatory challenges (pricing, permissions)
- What improvements would you suggest to the project as it currently exists?

d) Facility Administrators

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Interview

- Can you describe your role in the sonomobile project?
- How would you describe your overall experience with the services provided under the sonomobile project?
- In your opinion, what is the value/benefit of an ultrasound scan during pregnancy?

- What are the benefits of having an early scan?
- What factors do you think influence the time (of pregnancy) when patients get an ultrasound scan?

Why do you think fewer mothers get ultrasound scans in their first trimester?
- What problems or difficulties have pregnant mothers at your facility had in the past when trying to get a pregnancy ultrasound scan?
- What challenges do mothers face in cases where a complication is detected by the scan?
- From your experience, how would you compare the pregnancy ultrasound scans done by the SonoMobile team and those done elsewhere? (Probe on price, accessibility, availability, time, quality etc.)
- From your experience with the trainee nurse sonographers, would you say the training of nurses in obstetric ultrasonography met its objective of building capacity for obstetric ultrasonography? Briefly Explain
- Knowledge: Do you think the trainee nurses have adequate knowledge on obstetric ultrasonography?

Probe: Do they have enough knowledge about USG to conduct the scan?
- Skills: Do you think the nurse trainees have adequate skills to perform obstetric ultrasounds?

Probe: Are they able to generate good quality images for review by a sonographer?
- Are referral systems available and clear within your facility for pregnancy imaging cases beyond the trainee's capacity?
- What regulations/ policies guide the practice of nurse sonographers once trained?
- Which institution would be best placed to offer oversight and regulation for this new role/ cadre?
- During your partnership, did you observe any challenges with the nurses' training as it is currently designed?

- Do you have any suggestions on how to improve the training program? Explore for details
- What other challenges have you experienced with the nurse led ultrasound service as currently offered by the program? Probe on price, accessibility, availability, time, quality, staff etc
- What improvements would you suggest to ensure successful/ effective ultrasound service delivery by the nurse sonographers?

e) Project Administrator

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Training

- Briefly describe your role in the sonomobile project?
- How would you describe your overall experience with the sonomobile project?
- What in your words were the objectives of the training of the nurses in this project?
- Would you say the training and the project met their intended objectives? And why?

a. Probe: Were there any challenges that you faced?
- What do you think changed in the nurses with the training in the project?

- a. Probe for changes in knowledge of obstetric ultrasound: Do they have enough knowledge about USG to conduct the scan?
- b. Probe for changes in skills in performing obstetric ultrasound for review by a remote sonographer: Are they able to generate good quality images for review by a sonographer?
6. Besides the initial training, what other support might be needed for nurses to conduct quality point of care obstetric ultrasound scans?
7. How, if possible, would you improve the training of nurses for remote obstetric ultrasound services?
8. What aspects of the service would you recommend for improvement? Why? How?
9. How has the COVID-19 pandemic affected the service delivery under the SonoMobile project?

Task Shifting

The sonomobile project involves nurses who do the scans, and remote sonographers, who review the images and deliver a report.

1. Are the responsibilities of the trainee nurses clear after the training? YES NO (Explain your response)
2. How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?
3. How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?
4. How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?
5. How does the provision of obstetric ultrasound scans by nurses fit into the wider context of maternal and newborn care in Kenya?
6. How can they best integrate within the existing healthcare roles/ cadres in the Kenyan Context? (Probe for regulation, recognition, training, collaboration etc).

Scale Up

1. Do you imagine this new service being mainstreamed in the future? If yes, how do you imagine this happening?
2. What challenges do you see in scaling nurse-led obstetric ultrasound services?
 - a. Probe on technological challenges (probe, tablet, software)
 - b. Probe on operational challenges (training, scheduling, coordination)
 - c. Probe on policy/regulatory challenges (pricing, permissions)
3. What improvements would you suggest to the project as it currently exists?
 - a. Probe on technological opportunities (probe, tablet, software)
 - b. Probe on operational opportunities (training, scheduling, coordination)
 - c. Probe on policy/regulatory opportunities (pricing, permissions)

f) QA Team

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Training

1. Briefly describe your role in the sonomobile project?
2. How would you describe your overall experience with the sonomobile project?

3. What in your words were the objectives of the training of the nurses in this project?
4. Would you say the training and the project met their intended objectives
And why?
Probe: Were there any challenges that you faced?
5. What do you think changed in the nurses with the training in the project?
Probe for changes in knowledge of obstetric ultrasound: Do they have enough knowledge about Ultrasonography to conduct the scan?
Probe for changes in skills in performing obstetric ultrasound for review by a remote sonographer: Are they able to generate good quality images for review by a sonographer?
6. Besides the initial training, what other support might be needed for nurses to conduct quality point of care obstetric ultrasound scans?
7. How, if possible, would you improve the training of nurses for remote obstetric ultrasound services?
8. What aspects of the quality assurance of the service would you recommend for improvement? Why? How?
9. How has the COVID-19 pandemic affected the Quality Assurance and service delivery under the SonoMobile project?

Task Shifting

The sonomobile project involves nurses who do the scans, and remote sonographers, who review the images and deliver a report.

1. How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?
2. How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?

3. How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?

Scale Up

Do you imagine this new service being mainstreamed in the future? If yes, how do you imagine this happening?

What challenges do you see in scaling nurse-led obstetric ultrasound services?

Probe on technological challenges (probe, tablet, software)

Probe on operational challenges (training, scheduling, coordination, supervision, QA)

Probe on policy/regulatory challenges (pricing, permissions)

What improvements would you suggest to the project as it currently exists?

g) Specialists' Professional Associations

Briefly describe your role in delivery of obstetric care to the Kenyan patient.

Have you been involved in the management, delivery or evaluation of task shifting of health services? Yes / No (Please explain your response)

Would you consider a targeted point of care obstetric ultrasound training for nurse midwives to be adequate for them to offer quality obstetric scans? Yes, No (Probe for reasons e.g curriculum, qualification, etc)

What would you consider as essential for such a training to be adequate and legitimate in the Kenyan setting?

What value, if any, would you expect from nurse-led point of care obstetric ultrasound services?

What challenges, if any, would you expect from nurse-led point of care obstetric ultrasound services?

What challenges, if any, would you expect from large scale nurse-led point of care obstetric ultrasound services if they were coupled to remote reporting (teleradiology) by sonographers?

How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?

How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?

How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?

How can they best integrate within the existing healthcare roles/ cadres in the Kenyan Context? (Probe for regulation, recognition, training, collaboration etc).

Which institution would be best placed to offer oversight and regulation for:

- a. this new role/ cadre?
- b. Teleradiology/ telemedicine?

13. What policies/ regulations are in place for oversight of:

- a. this new role/ cadre?
- b. Teleradiology/ telemedicine?

14. What would you recommend to ensure successful implementation of nurse led obstetric ultrasonography in Kenya?

h) Trainer

Demographics

Age group

18-25

25-35

35-45

45-55

55 and above

Gender (M/F)

Years of professional experience

Professional qualifications

Training

Can you describe your role in the sonomobile project?

How would you describe your overall experience with the sonomobile project?

What in your words were the objectives of the training that you provided?

Would you say your training met its objectives? And why?

Probe: Were there any challenges that you faced?

What do you think changed in the nurses with the training?

Probe for changes in knowledge of obstetric ultrasound

Probe for changes in skills in performing obstetric ultrasound for review by a remote sonographer

Besides the initial training, what other support might be needed for nurses to conduct obstetric ultrasound scans?

How, if possible, would you improve the training or nurses for remote obstetric ultrasound services?

How has the COVID-19 pandemic affected the training and service delivery under the SonoMobile project?

Task Shifting

The sonomobile project involves nurses who do the scans, and remote sonographers, who review the images and deliver a report.

Are the responsibilities of the trainee clear after the training? YES NO (Explain your response)

How does this new role, in conducting ultrasound scans in pregnancy, fit with what nurses currently do in maternal health?

How does this new role, of reviewing and reporting ultrasound scans conducted by nurses, fit with what sonographers currently do in maternal health?

How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?

How does the provision of obstetric ultrasound scans by nurses fit into the wider context of maternal and newborn care in Kenya?

Scale Up

Do you imagine this new service being mainstreamed in the future? If yes, how do you imagine this happening?

What challenges do you see in scaling nurse-led obstetric ultrasound services?

Probe on technological challenges (probe, tablet, software)

Probe on operational challenges (training, scheduling, coordination)

Probe on policy/regulatory challenges (pricing, permissions)

What improvements would you suggest to the project as it currently exists?

i) Regulator: Kenya Medical Practitioners' and Dentists Council

Given your experience in regulating task shifting of healthcare services in Kenya:

Briefly describe your role in delivery of obstetric care to the Kenyan patient.

Have you been involved in the management, delivery or evaluation of task shifting of health services? Yes / No (Please explain your response)

Would you consider a targeted point of care obstetric ultrasound training for nurse midwives to be adequate for them to offer quality obstetric scans? Yes, No (Probe for reasons e.g curriculum, qualification, etc)

What would you consider as essential for such a training to be adequate and legitimate in the Kenyan setting?

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How does this split in roles affect the wider maternal health services (e.g. referral, specialist care) and how they are conducted?

How can they best integrate within the existing healthcare roles/ cadres in the Kenyan Context? (Probe for regulation, recognition, training, collaboration etc).

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- b. Teleradiology/ telemedicine?

What policies/ regulations are in place for oversight of:

- a. this new role/ cadre?
- b. Teleradiology/ telemedicine?

What would you recommend to ensure successful implementation of nurse led obstetric ultrasonography in Kenya?



Audio testimonials

Challenges faced (barriers)

Facility Nurse



SCAN ME!
TO LISTEN TO AUDIO

Facility Admin



SCAN ME!
TO LISTEN TO AUDIO

Beneficiary



SCAN ME!
TO LISTEN TO AUDIO

Facility Nurse



SCAN ME!
TO LISTEN TO AUDIO

Challenges related to the project

Facility Nurse



SCAN ME!
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Facility Nurse



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Sonographer



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Project benefits

Facility Nurse



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Beneficiary



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Beneficiary



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Facility Admin



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