Insights from an Online Survey: Examining Usage of Ultrasound in Maternal Care Facilities and Within Maternal Caregivers in Kenya

Baseline Survey Report

August 2024

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Acknowledgments

This report was created by Maitri Capital. The Ministry of Health Division of Reproductive Health and Maternal Care collaborated on data collection. The department analyzed the report alongside the Ministry of Health's Research Department. Dr. Gladys Mwango and the board of the Kenya Association of Radiologists (KAR) were essential in offering feedback and reviewing the report. The team gratefully acknowledges the Ministry of Health, Division of Reproductive Health and Maternal Care, County Research Directors, County Coordinators, and their teams for their assistance in encouraging replies from various public, private, and faith-based facilities. The team would like to recognize the participation of the Rural Private Hospitals Association of Kenya (RUPHA), Kenya Healthcare Federation (KHF), and Kenya Association of Radiologists.

Finally, we are deeply grateful to all the healthcare facilities and staff that took part in the survey and supplied vital data for the report. Their collaboration and readiness to share their knowledge and experience were critical to the success of this study. We believe that this research will help shape policy and practice in Kenya to improve maternal and prenatal care.

REPUBLIC OF KENYA
MINISTRY OF HEALTH

Kenya Healthcare Federation
The Health Sector Board of KEPSA

RURAL PRIVATE HOSPITALS ASSOCIATION OF KENYA

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Limitations of the Study

The findings and recommendations presented in this baseline survey report are based on the data collected through an online survey. While every effort has been made to ensure the accuracy and reliability of the information gathered, it is essential to acknowledge and consider the following limitations:

- The chosen methodology for this study predominantly utilized online surveys, introducing inherent limitations. Relying on self-reported data poses the risk of self-reporting bias, where participants may be influenced by social desirability or inadvertently provide inaccurate information. This potential bias may affect the reliability and validity of this study's conclusions.

- Furthermore, it is essential to note that this research does not fall under the category of clinical research. Consequently, it may lack the depth of clinical insights achievable through direct medical examinations or observations, limiting the study's comprehensive understanding of maternal caregiving. While the research proposal underwent scrutiny by Africa International University and NACOSTI, it's crucial to note that these organizations do not specialize in clinical research, and consequently, the oversight and feedback obtained may be constrained in addressing healthcare-specific nuances within the study.

- Additionally, the study offers a snapshot of the state of maternal caregivers at a specific moment in time. However, the dynamic nature of societal norms, healthcare policies, and other external factors implies that changes may occur over time. As a result, the study might not fully capture these dynamic shifts, potentially impacting the overall temporal relevance of its findings.

Interpretation of the findings and implementation of recommendations should be approached with caution, considering the aforementioned limitations. The results are meant to provide insights and inform discussions, rather than serve as conclusive evidence. This report does not claim to offer exhaustive solutions to the challenges identified but aims to contribute to the ongoing discourse on healthcare facilities and maternal caregiving in Kenya. Users of this report are encouraged to consult with relevant experts, conduct further research, and consider local contextual factors when making decisions based on the information presented herein.

Study Participants

The first questionnaire was exclusively administered to heads of medical facilities spanning across Level 3, 4, and 5. A total of 137 responses were gathered from this group. The second set of questionnaires targeted a diverse array of hospital staff, covering levels 2 to 6. The participants included a range of healthcare professionals, offering a multifaceted view of the maternal care landscape. The breakdown of roles among the participants is as follows:

PART 1: HOSPITAL MANAGEMENT SURVEY PROFILE

PROFESSION	TOTAL
Nursing Officer	25
Administrator	21
Medical Superintendent	18
Nurse	17
Clinical Officer	9
CEO	7
Director	6
Reproductive Health Coordinator	5
Health Administrative Officer	3
Procurement Office	3
Hospital Matron	2
Chief Medical Officer	1
Chief Nurse	1
Deputy Nursing Officer	1
Head Of Clinical Services	1
Others	17
TOTAL PARTICIPANTS	**137**

PART 2: MATERNAL CAREGIVERS SURVEY PROFILE

MEDICAL PROFESSION	TOTAL
Nurse	309
Clinical Officer	60
Medical Officers (Doctors)	9
Radiographer	4
Obstetrician	3
Anesthetist	1
TOTAL PARTICIPANTS	**386**

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PART A

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INTRODUCTION

Ultrasound technology has been widely adopted in the fields of obstetrics and gynecology including pregnancy management, across the globe and has been shown to significantly improve maternal outcomes. In Kenya, where the maternal mortality rate remains high, the use of ultrasound can play an important role in ensuring the health and safety of mothers and their newborns.

The use of ultrasound can play an important role in reducing maternal mortality rates by identifying and addressing potential complications early, such as detecting conditions like placenta previa or fetal distress, which can then be treated to prevent serious complications or death. The World Health Organization (WHO) prescribes at least one ultrasound before 24 weeks of gestation for all pregnant women, with high-income countries like the USA, UK, and Australia increasingly adopting early scans in the first trimester[1].

In pregnancies carrying high risks, the use of Doppler ultrasound has been shown to reduce the risk of perinatal death and prevent unnecessary obstetric interventions[1].

In the last ten years, the Kenyan government and various organizations have made significant efforts to improve maternal healthcare in the country. The government has implemented a free maternal healthcare policy and has been working to increase the number of trained healthcare workers and facilities. Additionally, organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) have been working to provide resources and support for maternal health programs in Kenya. However, despite these efforts, there is no evidence of declining maternal mortality.

Access to ultrasound services remains limited in many areas, with common barriers including the unavailability of electricity, the lack of technical support and care, and the lack of training for health professionals, particularly in rural and remote regions.

A retrospective facility-based study titled "Contribution of Portable Obstetric Ultrasound Service Innovation in Averting Maternal and Neonatal Morbidities and Mortalities at Semi-urban Health Centers in Ethiopia[2]" underscored the critical role of ultrasound technology in preventing maternal and neonatal mortalities. This research revealed that the introduction of ultrasound services had a significant impact, leading to the prevention of 1,970 maternal and 19.05 neonatal morbidities and mortalities per 100,000 and 1,000 live births, respectively. These findings emphasize the life-saving potential of accessible ultrasound services in safeguarding the health and well-being of expectant mothers and their newborns in semi-urban areas.

1. https://bmchealthservres.biomedcentral.com/counter/pdf/10.1186/s12913-021-06758-w.pdf
2. https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-022-04703-1

RESEARCH OBJECTIVE

- To identify the barriers to the utilization of ultrasound equipment and services, including the shortage of trained ultrasound providers, limited access to ultrasound equipment, and low utilization of ultrasound services in rural areas.
- To evaluate the quality of ultrasound services in Kenya, including the expertise of ultrasound providers and the integration of ultrasound into clinical practice.
- Assessing the effectiveness of current interventions aimed at improving ultrasound equipment access in the provision of maternal and antenatal care in Kenya.
- To recommend evidence-based interventions aimed at increasing access to and utilization of ultrasound equipment and services and improving the quality of care.

THE BASELINE SURVEY FOCUSED ON EXAMINING THE CURRENT UTILIZATION OF ULTRASOUND EQUIPMENT AND SERVICES IN KENYA AND ASSESSING ITS IMPACT ON MATERNAL AND FETAL OUTCOMES

RESEARCH METHODOLOGY

DATA COLLECTION

The research utilized both primary and secondary data. Primary data was obtained from custom-designed questionnaires administered both online and in-person. Two sets of questionnaires were administered to collect the data.

The first set of questionnaires was administered to the heads of medical facilities, and the second set to maternity staff. The questionnaires were designed to collect data on the availability and utilization of ultrasound equipment and services, the qualifications and training of healthcare providers operating the devices, and the impact of ultrasound utilization on maternal and fetal outcomes.

DATA SOURCES

The data collected from the questionnaires and qualitative interviews were analyzed using a mixed-methods approach. Quantitative data was analyzed using descriptive statistics and presented using tables, graphs, and narratives, while qualitative data was analyzed using thematic analysis.

Secondary data was obtained from the Kenya National Bureau of Statistics (KNBS) Survey 2022, World Bank, UNFPA, UNICEF and other publications on the health sector in Kenya. The research also includes a review of relevant literature and policy documents related to maternal and antenatal care in Kenya.

A convenience sample of healthcare facilities providing maternal and antenatal care in Kenya was selected for the survey. This included both public and private facilities located in urban, semi-urban, and rural areas.

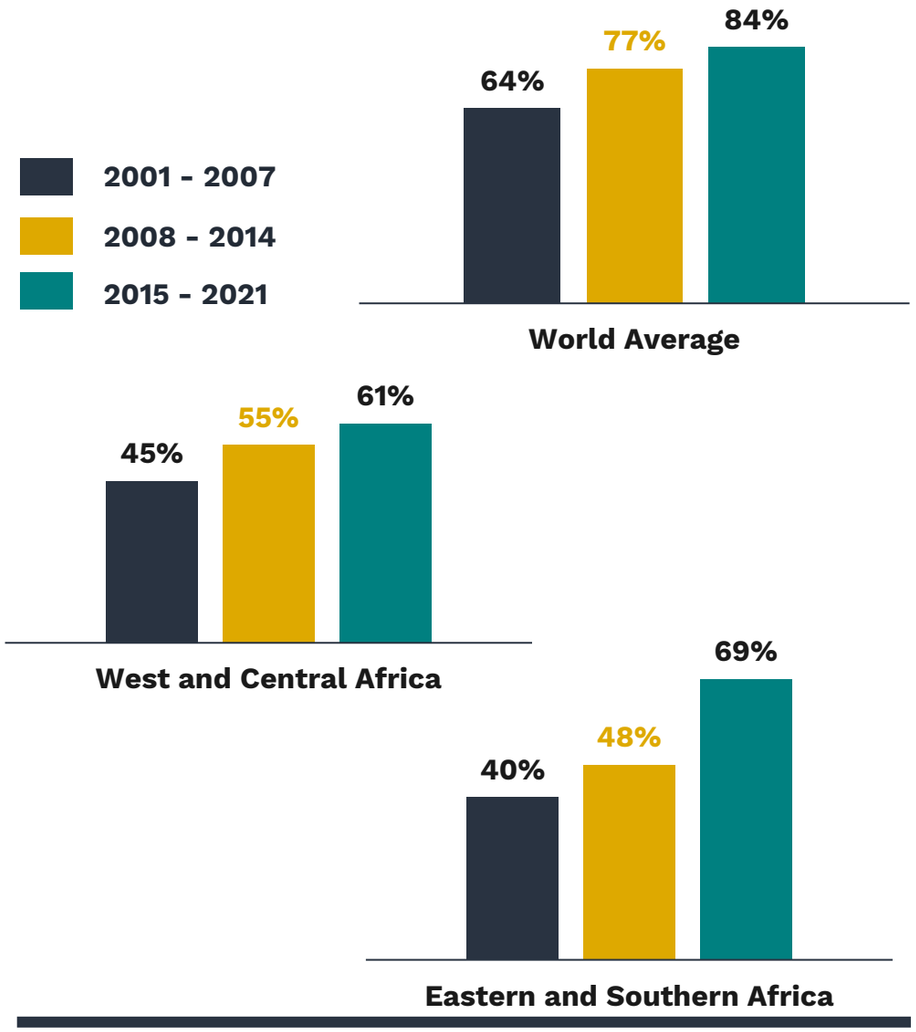
MATERNAL CARE: GLOBAL AND AFRICAN PERSPECTIVE

GLOBAL AND AFRICAN PERSPECTIVE

Global maternal deaths occurring each year declined by 35% between 2000 and 2017, from 451,000 in 2000 to 295,000 in 2017, with more than 800 women dying from complications of pregnancy and child-birth daily. Sub-Saharan Africa and Asia account for the largest proportion of maternal and neonatal mortality and stillbirths. The two regions account for over 64% of maternal deaths worldwide [1].

The two regions contributed to 45% of neonatal deaths in 2020[1]. On average, the two regions have the lowest coverage for key maternal health interventions, such as skilled delivery care. Between 2001 and 2007, the proportion of births attended by a skilled birth attendant increased by 20 percentage points, from 64% to 84% [1].

FIGURE 1: PERCENTAGE OF BIRTHS ATTENDED BY A SKILLED HEALTH PERSONNEL[1]



1. https://data.unicef.org/wp-content/uploads/2022/05/Delivering-for-women_brochure_8-May-2022.pdf

GAPS IN MATERNAL CARE IN AFRICA

Maternal and antenatal care play a critical role in ensuring the health and wellbeing of women and their unborn children. However, in Africa, significant gaps in maternal and antenatal care exist, leading to high rates of maternal and infant mortality. Some of the gaps and challenges are discussed in this section.

1. LACK OF ACCESS

One of the main factors contributing to the gaps in maternal and antenatal care in Africa is the lack of access to healthcare services. Many women in Africa live in rural areas where there is a shortage of healthcare facilities and trained healthcare workers.

According to the World Health Organization (WHO), only 50% of women in sub-Saharan Africa have access to skilled antenatal care, compared to 90% in developed regions [1].

2. POVERTY

Many women in Africa live in poverty, which makes it difficult for them to afford healthcare services, including antenatal care. In addition, poverty often means that women have poor nutrition and are more susceptible to infections, which can lead to complications during pregnancy and childbirth.

According to UNICEF, poverty is one of the main drivers of maternal and infant mortality in Africa, with 66% of maternal deaths in sub-Saharan Africa attributed to poverty [2].

3. CULTURAL PRACTICES

Cultural beliefs and practices also play a role in the gaps in maternal care in Africa. In some communities, women may not seek antenatal care due to cultural beliefs that view pregnancy as a natural process that does not require medical intervention. Cultural practices like female genital mutilation lead to complications during childbirth.

To address these gaps, several interventions are necessary, including the need to improve access to healthcare services, especially in rural areas. This can be achieved by building more healthcare facilities and training more healthcare workers to provide skilled antenatal care.

ONLY 50% OF WOMEN IN SUB-SAHARAN AFRICA HAVE ACCESS TO SKILLED ANTENATAL CARE, COMPARED TO 90% IN DEVELOPED REGIONS [1]

66%

OF MATERNAL DEATHS IN SUB-SAHARAN AFRICA ARE ATTRIBUTED TO POVERTY[2]

1. https://www.who.int/health-topics/maternal-health#tab=tab_1
2. https://data.unicef.org/topic/maternal-health/maternal-mortality/

IMPROVING MATERNAL CARE IN AFRICA THROUGH INITIATIVES – SOME EXAMPLES

There have been many initiatives put in place to improve maternal healthcare in Africa through the training of more skilled healthcare workers, including midwives and obstetricians. This has led to an increase in the number of safe deliveries and a reduction in maternal deaths.

Maternal and Child Health Integrated Program (MCHIP)

This program is focused on improving maternal and child health in 24 African countries, including Ethiopia, Kenya, and Tanzania. It aims to increase access to quality maternal and child health services, improve the capacity of health workers, and strengthen health systems.

Wellbeing Foundation Africa

This is an African-based organization that supports maternal, new-born, and child health. Its key programs include the MamaCare Antenatal and Postnatal Education Program, which provides education and support to pregnant and new mothers, and the MamaKit Safe Birth Initiative.

CARMMA

The African Union's Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA), was launched in 2009 with support from UNFPA to address the high rates of maternal mortality in Africa. It aims to improve access to quality maternal and child health services and reduce maternal deaths.

African Medical and Research Foundation (AMREF)

AMREF is an organization that works to improve the health of communities in Africa. One of its key programs is focused on maternal and child health, with a focus on providing training for health workers, increasing access to maternal health services, and improving community awareness about maternal health.

MamaYe!

This initiative is a campaign aimed at reducing maternal and new-born deaths in Africa. It works to increase awareness about the importance of maternal health and encourages communities to take action to improve access to quality healthcare for pregnant women.

KEY MATERNAL CARE STATISTICS IN KENYA

MATERNAL STATISTICS [1]

52
Under-five mortality rate, (above global average figure of 38)

36
Infant Mortality Rate

355
Maternal Mortality Rate (above global figure of 159)

3.4
Total Fertility Rate (above global figure of 2.3)

28
Crude Birth Rate (above global figure of 18)

Life expectancy at birth

♂ **60** (Below global figure of 68)

♀ **66** (Below global figure of 74)

HEALTH INSURANCE STATISTICS[1]

23.4M
Kenyans under National Health Insurance Fund

KES 60.8B
Total fund contribution to NHIF 2020/21, a 2.2% increase from 2019/20

SKILLED BIRTHS AND ANC VISITS[2]

66%
Of pregnant women had more than 4 ANC visits

89%
Of births were attended to by a skilled provider in 2022. A more than two-fold increase from 2003 (41%)

97%
Probability of a birth being attended to by a skilled provider in urban areas compared to 85% in rural areas

NUMBER OF MEDICAL PROFESSIONALS[1]

1. https://www.knbs.or.ke/wp-content/uploads/2022/05/2022-Economic-Survey1.pdf
2. https://dhsprogram.com/pubs/pdf/PR143/PR143.pdf

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PART B

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SURVEY PROFILE

Survey Mode Online

Country Kenya

Counties Covered 40

Total Responses 137

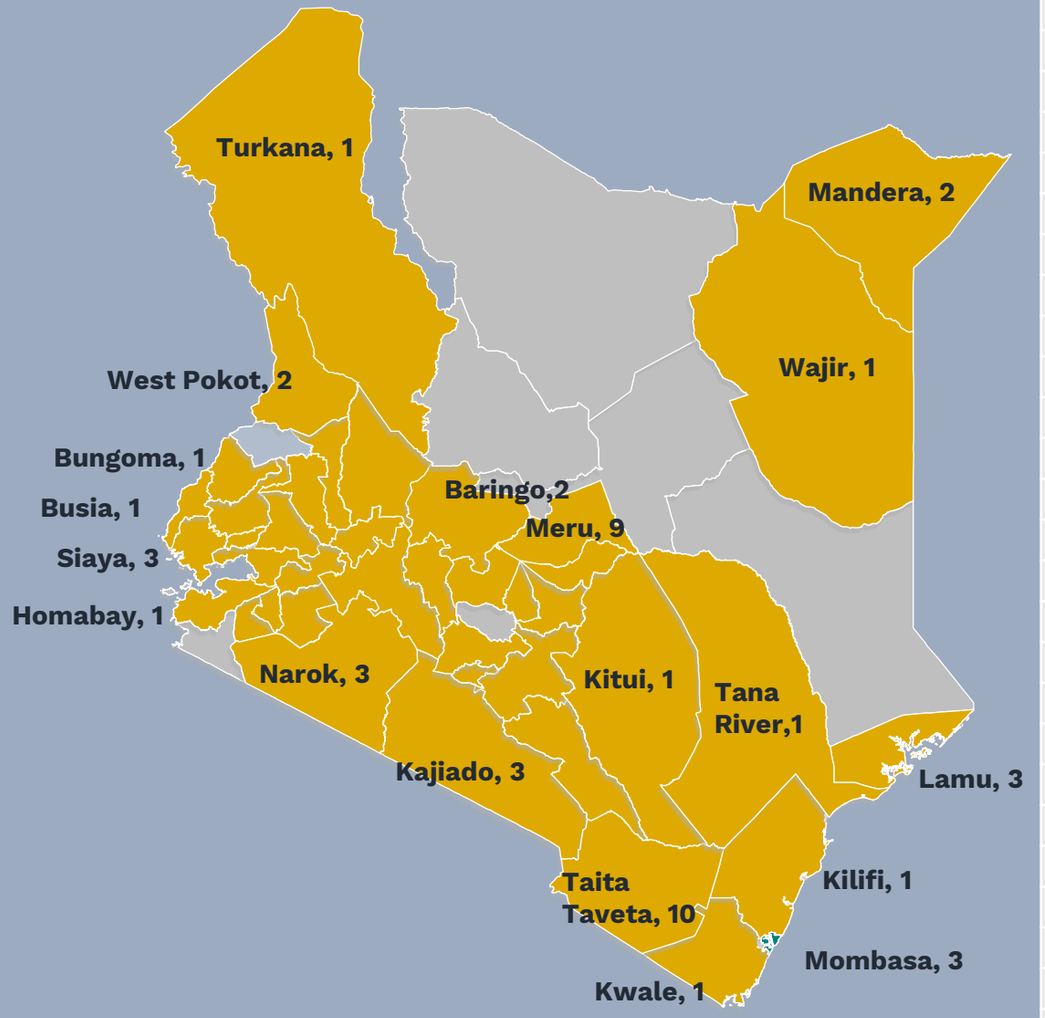
Facility Categorization	Percentage
Level 3	37%
Level 4	56%
Level 5	7%

Facility Setting	Facility setting
Rural	46%
Semi-urban	34%
Urban	20%

Facility Ownership	Count of Facility Ownership
Faith-based	5%
Private	17%
Public	78%

Facility Type	Percentage
Health Centre	30%
Hospital	66%
Maternity clinic	4%

COUNTY COVERAGE



Count	Respondents
Baringo	2
Bomet	7
Elgeyo Marakwet	1
Embu	1
Kakamega	1
Kericho	2
Kiambu	7
Kilifi	1
Kirinyaga	4
Kisii	20
Kisumu	11
Laikipia	1
Lamu	2
Machakos	1
Makueni	3
Mandera	2
Meru	9
Nairobi	8
Nakuru	3
Nandi	1
Nyamira	8
Nyandarua	2
Nyeri	3
Tharaka Nithi	2
Uasin Gishu	2
Vihiga	1
Wajir	1

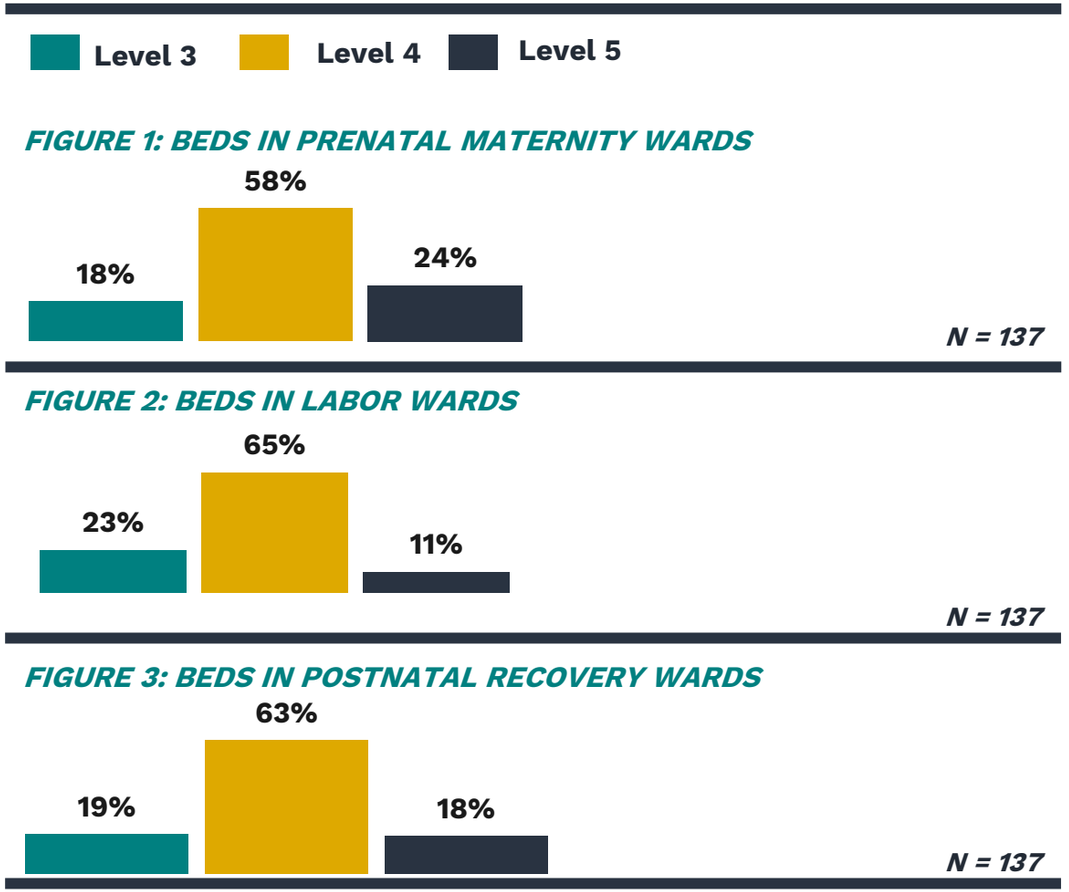
FACILITY PROFILE INFORMATION

NUMBER OF BEDS, STAFF SHORTAGE, YEARS OF OPERATION

65%

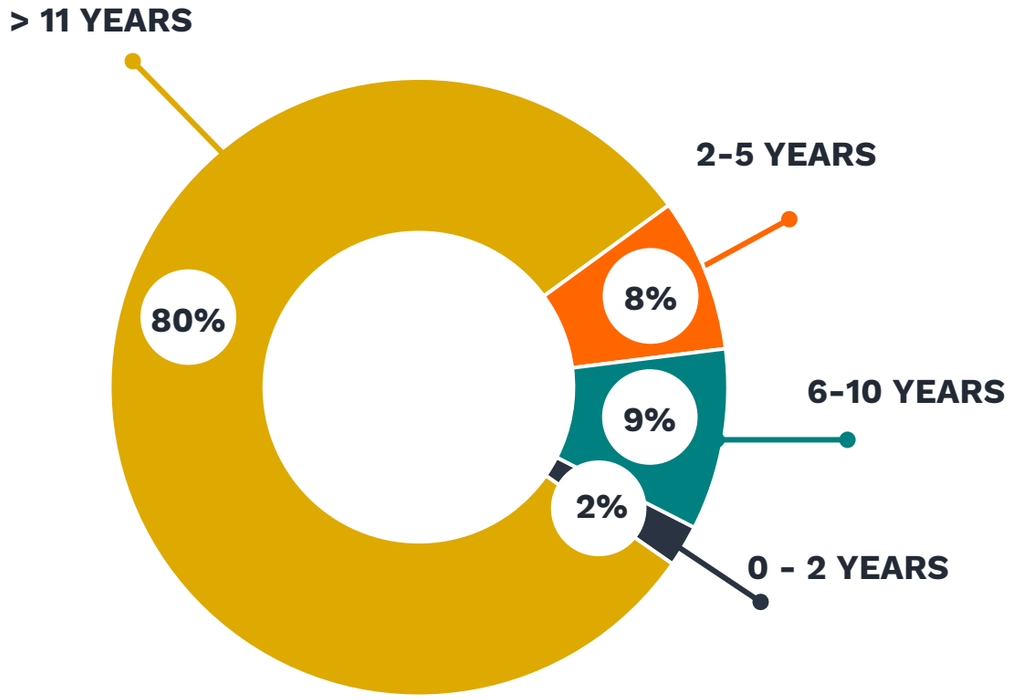
Of all beds in labor wards were within Level 4 facilities

LEVEL 4 FACILITIES HAD THE HIGHEST NUMBER OF BEDS IN ALL WARDS



NUMBER OF YEARS FACILITIES HAVE BEEN IN OPERATION

FIGURE 4: NUMBER OF YEARS FACILITY HAS BEEN IN OPERATION

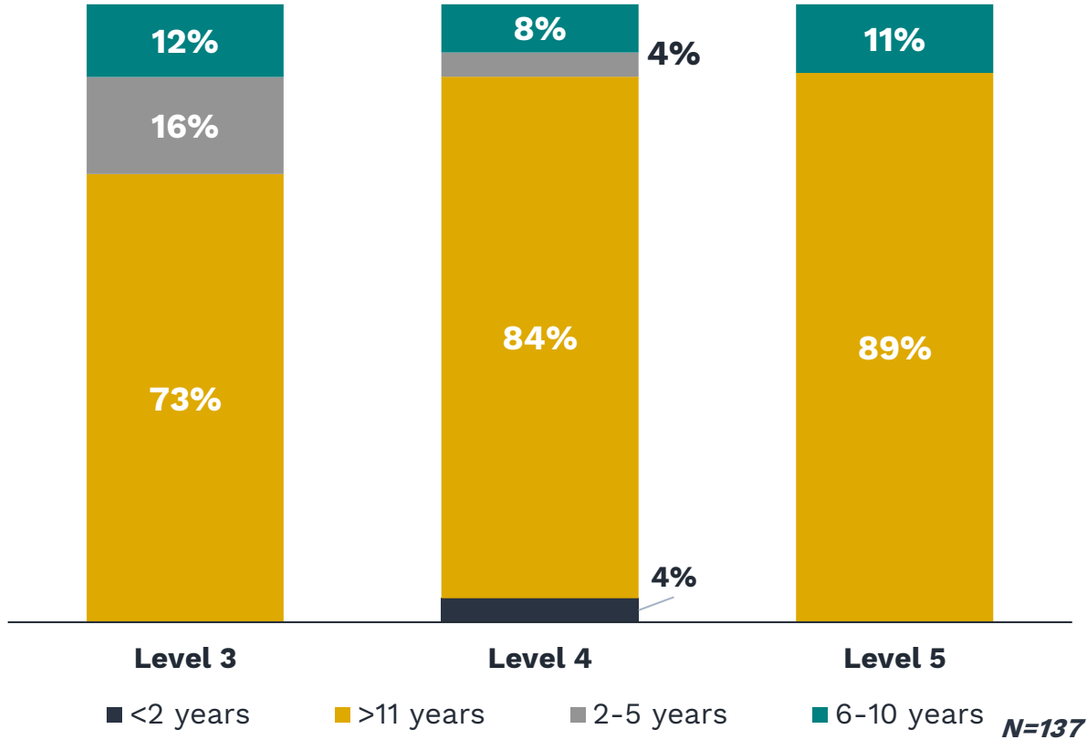


Most of the facilities have been in operation for the last 11 years

N=137

YEARS OF OPERATION BY FACILITY LEVEL

FIGURE 5: YEARS OF OPERATION BY FACILITY LEVEL



N=137

CROSS-CUTTING STAFF SHORTAGES WERE REPORTED ACROSS ALL PROFESSIONS

76%

of respondents cited nurse midwives as the most short-staffed

74%
CLINICAL OFFICERS

72%
MIDWIVES

N=137

WHICH OTHER PROFESSIONS HAD HIGH SHORTAGES?

Other than nurses, clinical officers, and midwives, higher shortages were reported in:

- Obstetricians, gynecologists, and medical officers (doctors) collectively (**72%** of facilities).
- Clinical midwives (**71%** of facilities).

ADEQUATE STAFFING IN SOME PROFESSIONS

Some professions had lower shortages:

- Matrons were the most well-staffed professionals across facilities.

PATIENTS PROFILE INFORMATION

DELIVERY PATIENTS, MATERNITY ADMISSIONS, MATERNAL COMPLICATIONS, MORTALITY RATES, PATIENT REFERRALS

Facilities served more than 2.6 million patients in 2022, according to the survey, averaging approximately 22,000 patients per facility. Level 5 facilities served the bulk of these patients (26,902 patients on average), while Level 3 facilities served the least number of patients.

MOST WOMEN IN RURAL FACILITIES DID NOT VISIT HOSPITALS TO ACCESS SERVICES

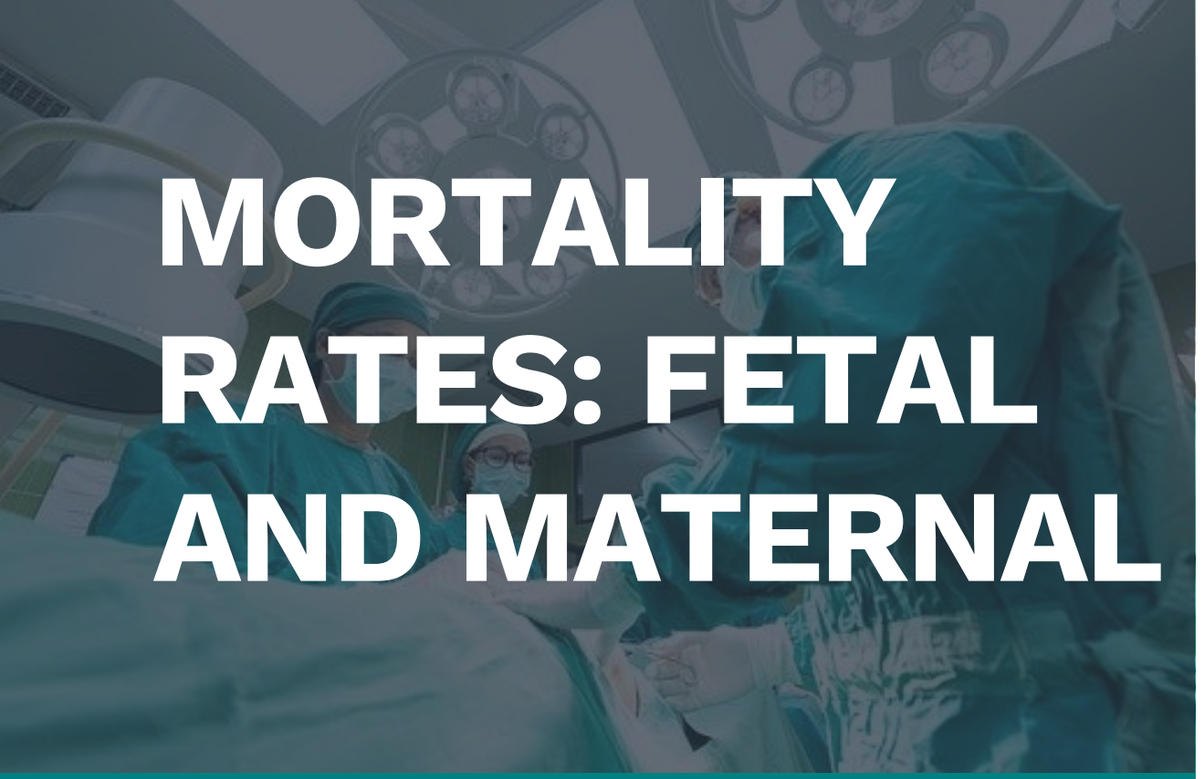
77% **of delivery patients were served in either urban or semi-urban facilities.**

Only 23% of all delivery patients received services in rural facilities.

FIGURE 6: PROPORTION OF DELIVERY PATIENTS SERVED BY FACILITY CATEGORY

Q: What proportion of delivery patients did each facility level serve?

N=137

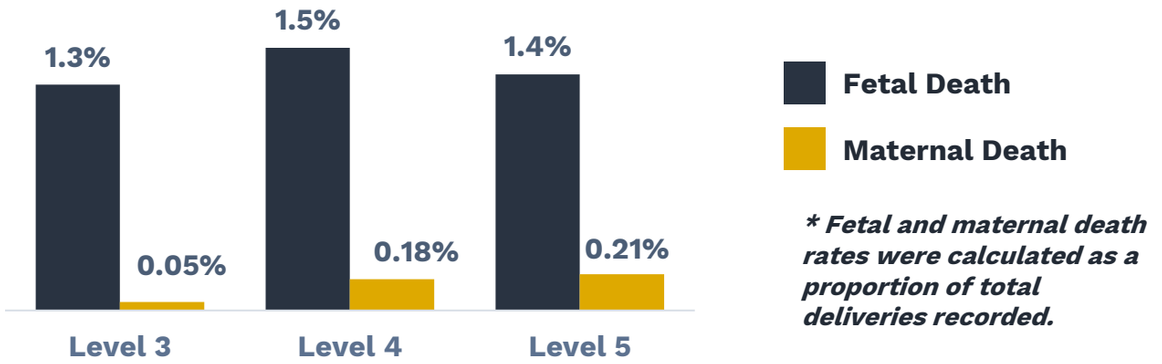


MORTALITY RATES: FETAL AND MATERNAL

The combined maternal and fetal mortality rates averaged 1.7% of the total facility deliveries in 2022. Fetal deaths accounted for the highest proportion, estimated at 1.5%, against 0.8% of maternal deaths.

LOW PERCENTAGES OF FETAL AND MATERNAL DEATHS WERE REPORTED ACROSS ALL LEVELS

FIGURE 7: FETAL AND MATERNAL DEATHS



** Fetal and maternal death rates were calculated as a proportion of total deliveries recorded.*

N=125

TABLE 1: NUMBER OF DELIVERIES, FETAL AND MATERNAL DEATHS

N=125

	Fetal Deaths	Maternal Deaths	Deliveries
Level 3	134	5	10,113
Level 4	1,252	149	81,303
Level 5	431	66	31,134

MATERNITY ADMISSIONS & DEATHS PER ADMISSIONS

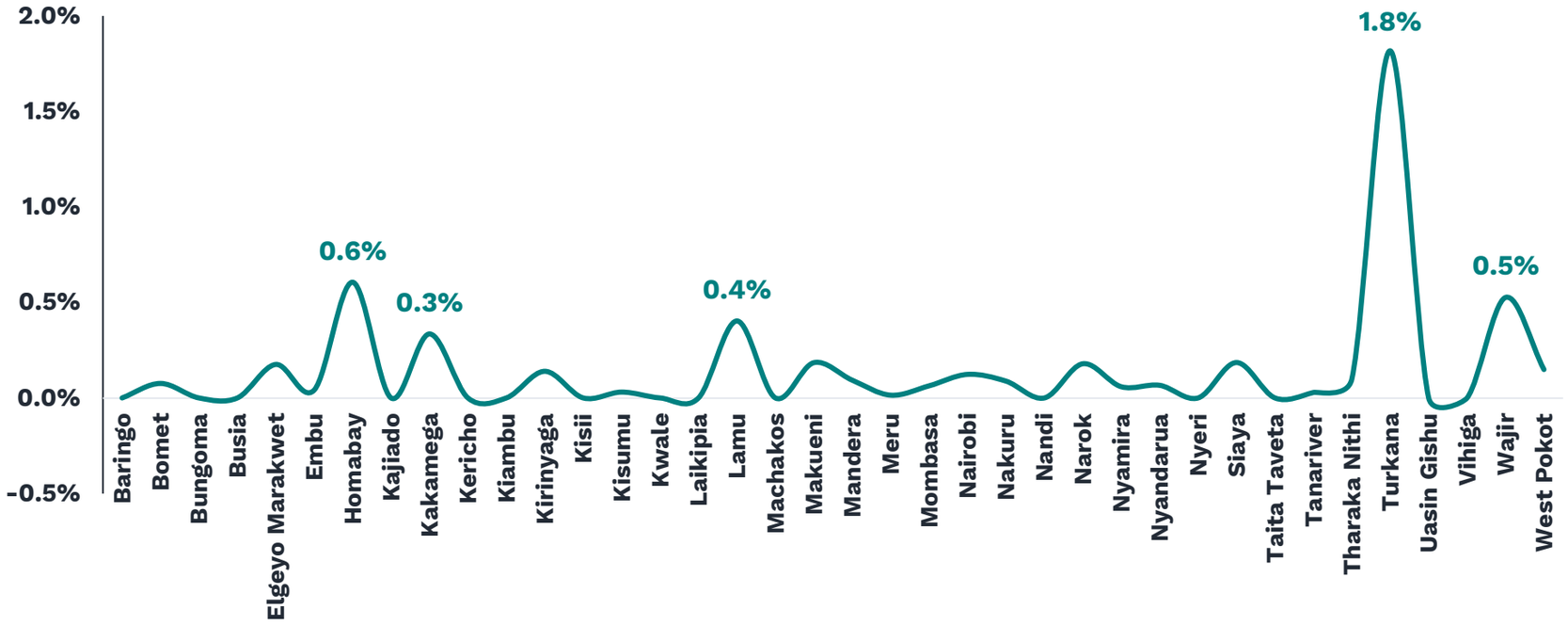
According to survey data of 125 healthcare facilities, a total of 194,531 maternity admissions were made in 2022, with 55.6% of these in semi-urban areas.

TURKANA COUNTY HAD A RELATIVELY HIGHER MATERNAL DEATHS PER ADMISSIONS RATIO

These high deaths could be attributed to poverty levels in the county. Turkana was considered the most marginalized county in the country, with high poverty rates [1].

FIGURE 8: MATERNAL DEATHS PER ADMISSION BY COUNTY

N=125



Maternity deaths are calculated as the number of deaths per maternity admission.
****These figures are based on survey results and could be subject to a skew based on the number of respondents by county.***

1. https://www.devolutionhub.or.ke/file/baba07911c2d298f01703d2ac33d7099.pdf

Top 5 counties with high fetal deaths:

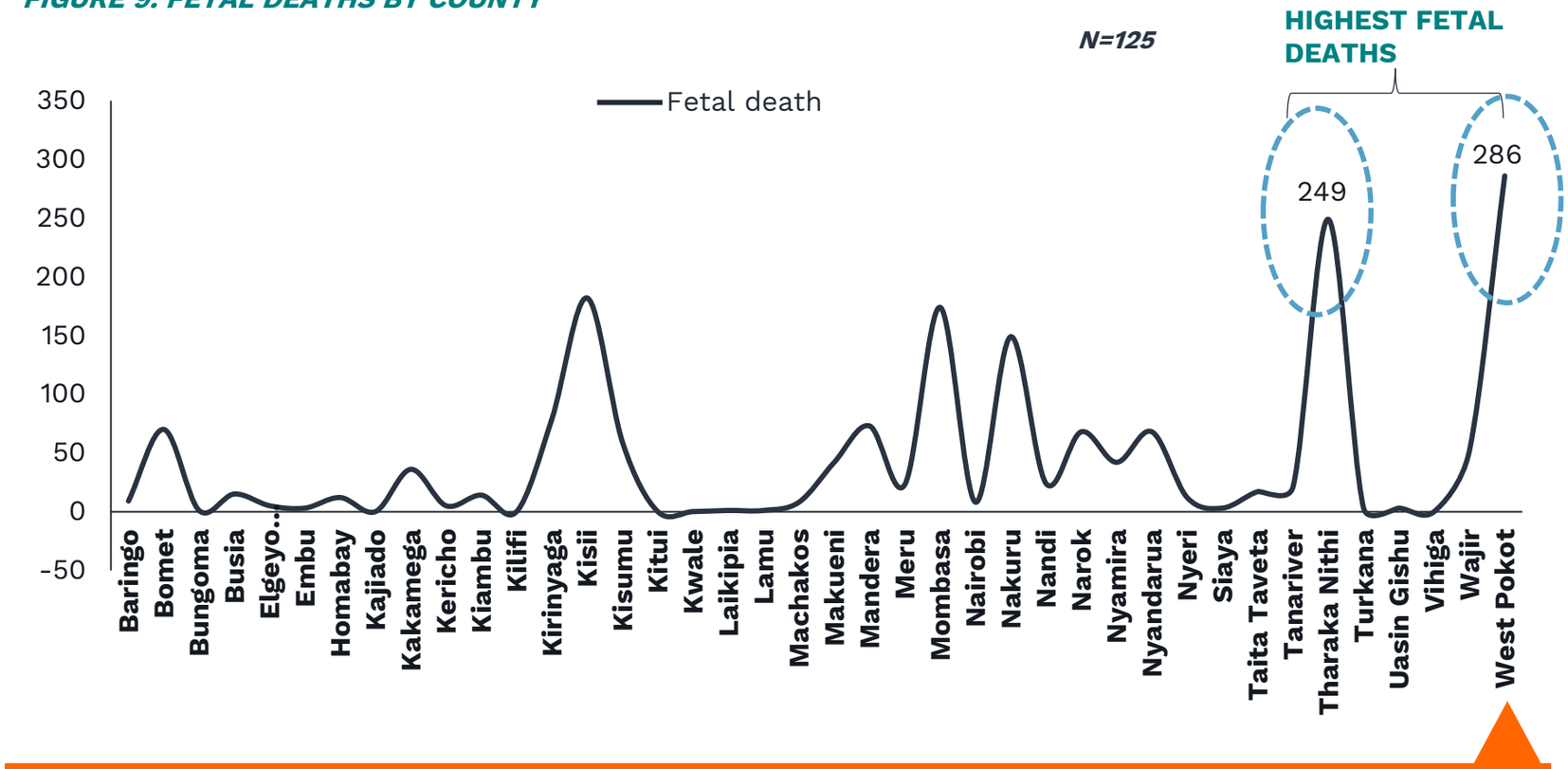
1. West Pokot, **286**
2. Tharaka Nithi, **249**
3. Kisii, **182**
4. Mombasa, **174**
5. Nakuru, **149**

West Pokot recorded the highest number of fetal deaths despite only having two facility respondents. The high levels of fetal deaths could be attributed to poverty in the county, given that West Pokot is among the top ten marginalized counties with a 68.7% poverty rate[1].

Additionally, West Pokot also reported low percentages for women with 4+ ANC visits (35%), according to the Kenya DHS report, and was among the counties where intermittent preventive treatment has not been implemented[2].

HIGHEST FETAL DEATHS IN WEST POKOT

FIGURE 9: FETAL DEATHS BY COUNTY



West Pokot has reported the highest number of fetal fatalities, despite having only two healthcare facilities as responses. Given that the county contains over 150 health institutions, this could indicate a data skew, but it also highlights the significance of doing a thorough and in-depth examination into what is causing these high fetal mortality rates in West Pokot.

1. https://participedia.net/case/4936#:~:text=West%20Pokot%20is%20amongst%20the,a%20poverty%20rate%20of%2068.7%25.
2. https://dhsprogram.com/pubs/pdf/PR143/PR143.pdf

MATERNAL COMPLICATIONS

Maternal complications affected 12% of delivery patients on average in facilities. Nevertheless, urban facilities faced a higher incidence, affecting 18% of their total delivery patients.

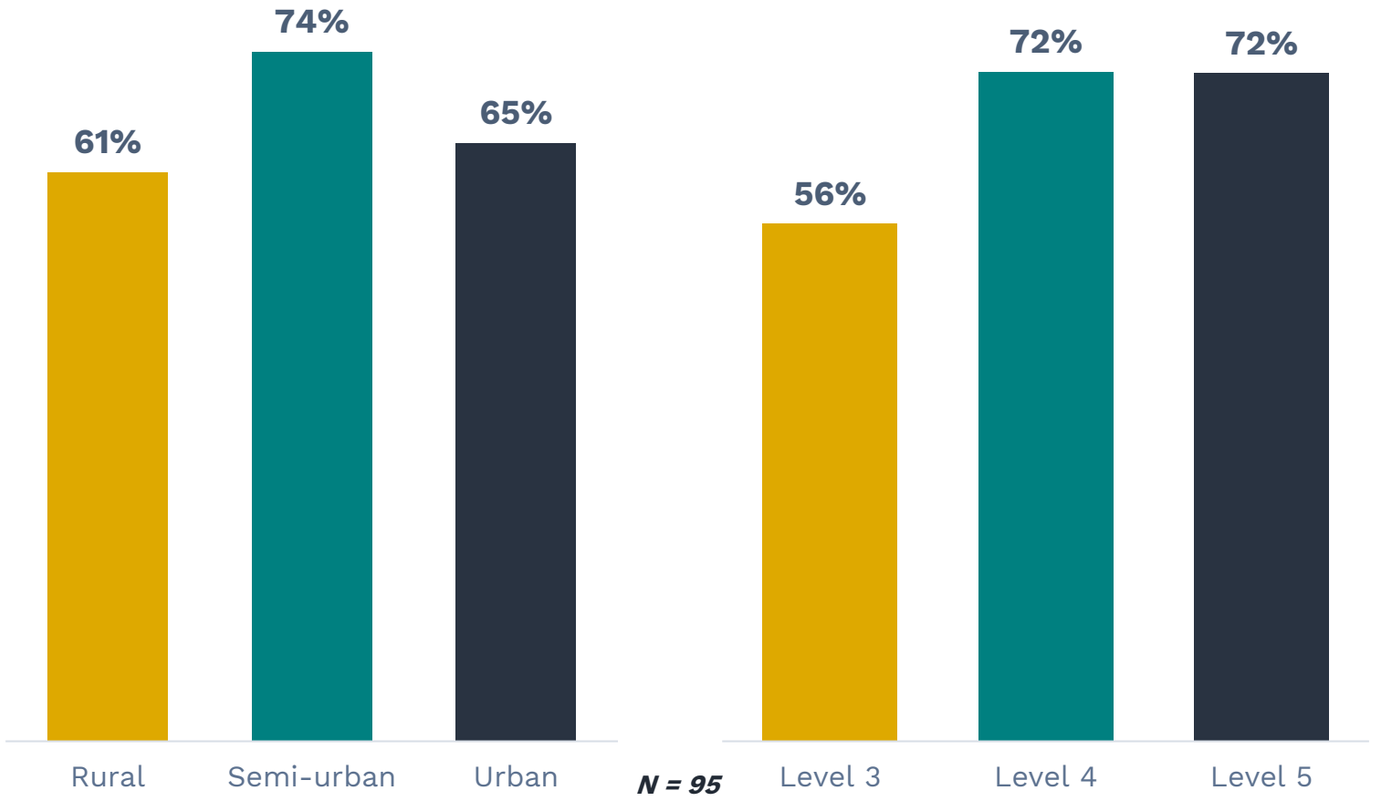
Despite these difficulties, the facilities achieved an average of 67% in terms of lives saved from maternal complications.

It's worth mentioning that semi-urban and urban facilities exhibited superior success rates, rescuing 74% and 65% of lives, respectively, among those who experienced maternal complications.

On average, the percentage of lives saved from maternal complications was 56% in Level 3 facilities and even higher in Level 4 and 5 facilities, reaching 72%. In comparison, rural healthcare facilities reported a lower rate of lives saved from complications when compared to urban and semi-urban facilities.

FIGURE 10: PERCENTAGE OF LIVES SAVED FROM COMPLICATIONS ON AVERAGE

Q: Out of the complications what % of lives were saved?



Lives saved from complications arising due to deliveries were mostly attributed to the high level of expertise of medical practitioners involved, as reflected by 71% of facilities.

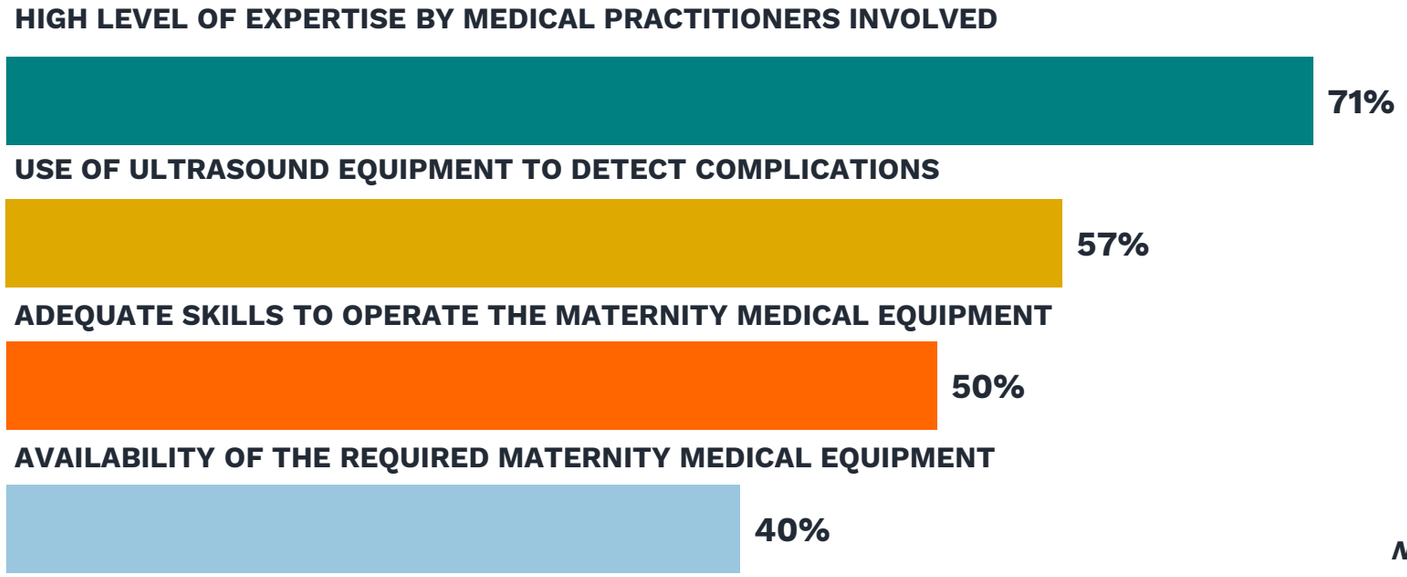
57% say that lives saved were due to the use of ultrasound equipment to detect complications, showing the increasing need to equip facilities with ultrasound devices.

The survey shows that there still isn't enough equipment to confidently attribute the lives saved from complications arising from birth to equipment availability. Only 40% of respondents attribute saved lives to the availability of required maternal medical equipment.

The subtle challenge of the lack of skilled personnel to operate medical equipment presents itself in this paradigm as well, with only 50% agreeing that lives saved were due to the availability of skilled personnel to operate equipment.

FIGURE 11: LIVES SAVED FROM MATERNAL COMPLICATIONS

Q: Lives saved from complication arising due to deliveries were mostly attributed to?



N=96

THE GROWING SIGNIFICANCE OF ULTRASOUND IN PREVENTING MATERNAL AND FETAL DEATHS...

is evident across various facilities. Most facilities concur that the utilization of ultrasound has played a crucial role in diminishing maternal and neonatal mortality rates within their establishment.

Q: How important has the use of ultrasound machines been in reducing maternal and neonatal mortality in your facility?

89% VERY IMPORTANT

7% MODERATELY IMPORTANT

3% SLIGHTLY IMPORTANT

1% NOT IMPORTANT

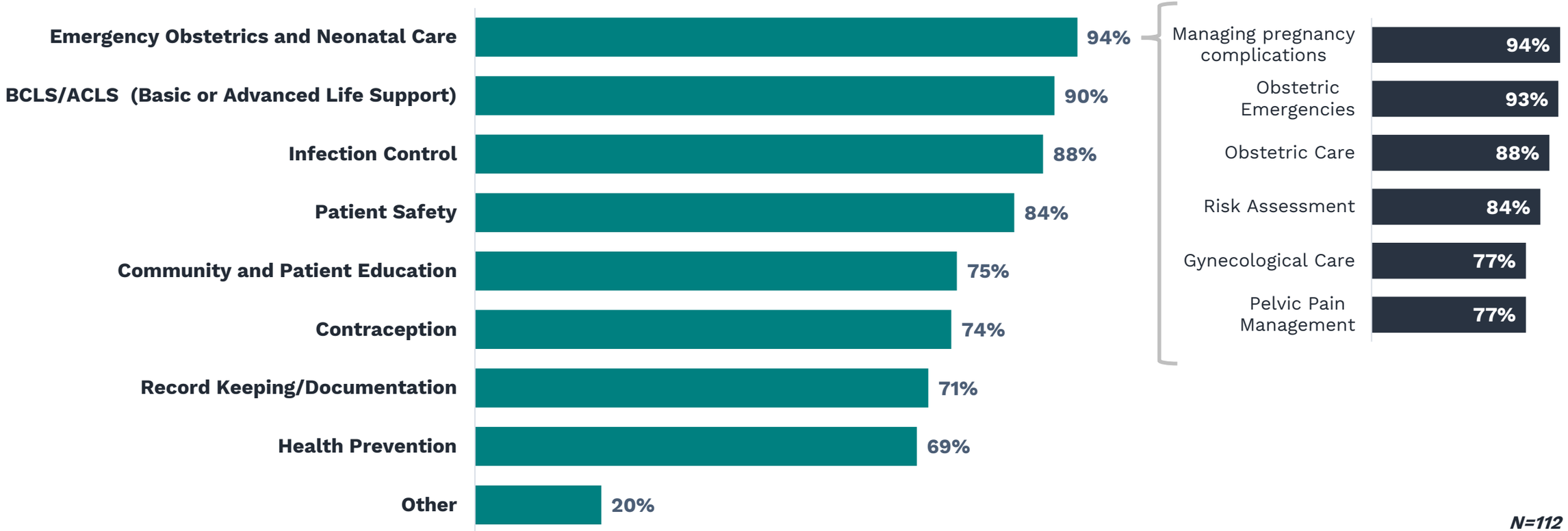
N=108

EMERGENCY OBSTETRIC AND NEONATAL CARE, TOP TRAINING NEED

Emergency obstetrics and neonatal care is the most pressing continuing education need for birthing, obstetric, and gynecology care departments within facilities.

FIGURE 12: TRAINING NEEDS

Q: Please identify the continuing education needs for your birthing, obstetric, gynecological care departments or within your facility.



N=112

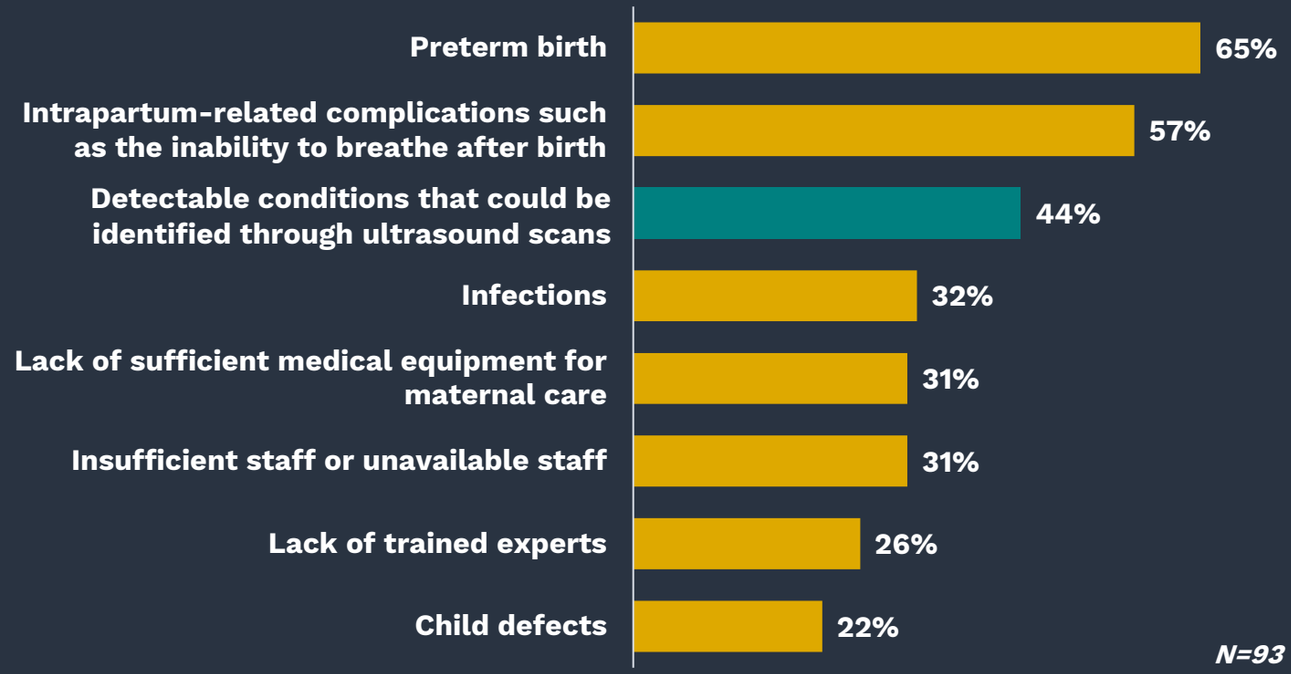
** This is as identified by heads and administrators of medical facilities*

CAUSES OF FETAL MORTALITIES

Among facilities that encountered fetal mortalities, the third most prevalent cause was conditions detectable through prenatal ultrasound scans, such as placental abnormalities, intrauterine growth restriction, multiple pregnancies, and hydrops fetalis. Preterm births accounted for the highest proportion of fatalities, as reported by 65% of respondents, while intrapartum-related complications ranked as the second leading cause.

FIGURE 13: CAUSES OF FETAL MORTALITIES

Q: What was the main cause of fetal mortalities encountered in 2022?



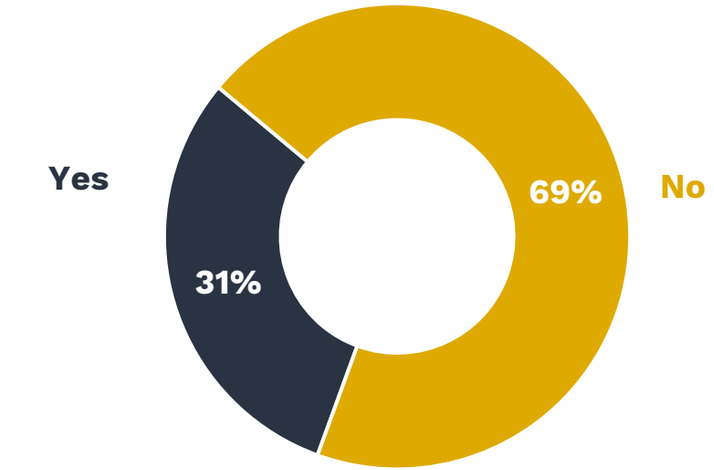
N=93

All facilities concur on two key points:

1. That the available medical equipment remains inadequate in preventing complications and fatalities among both mothers and fetuses.
2. That there is a shortage of skilled maternal caregivers, including midwives and obstetricians, which is hampering efforts to reduce maternal and fetal complications and fatalities.

FIGURE 14: MATERNAL MEDICAL EQUIPMENT

Q: Do you feel that there is sufficient maternal medical equipment in your facility to reduce maternal and fetal complications or mortalities?



N=116

CAUSES OF MATERNAL MORTALITIES

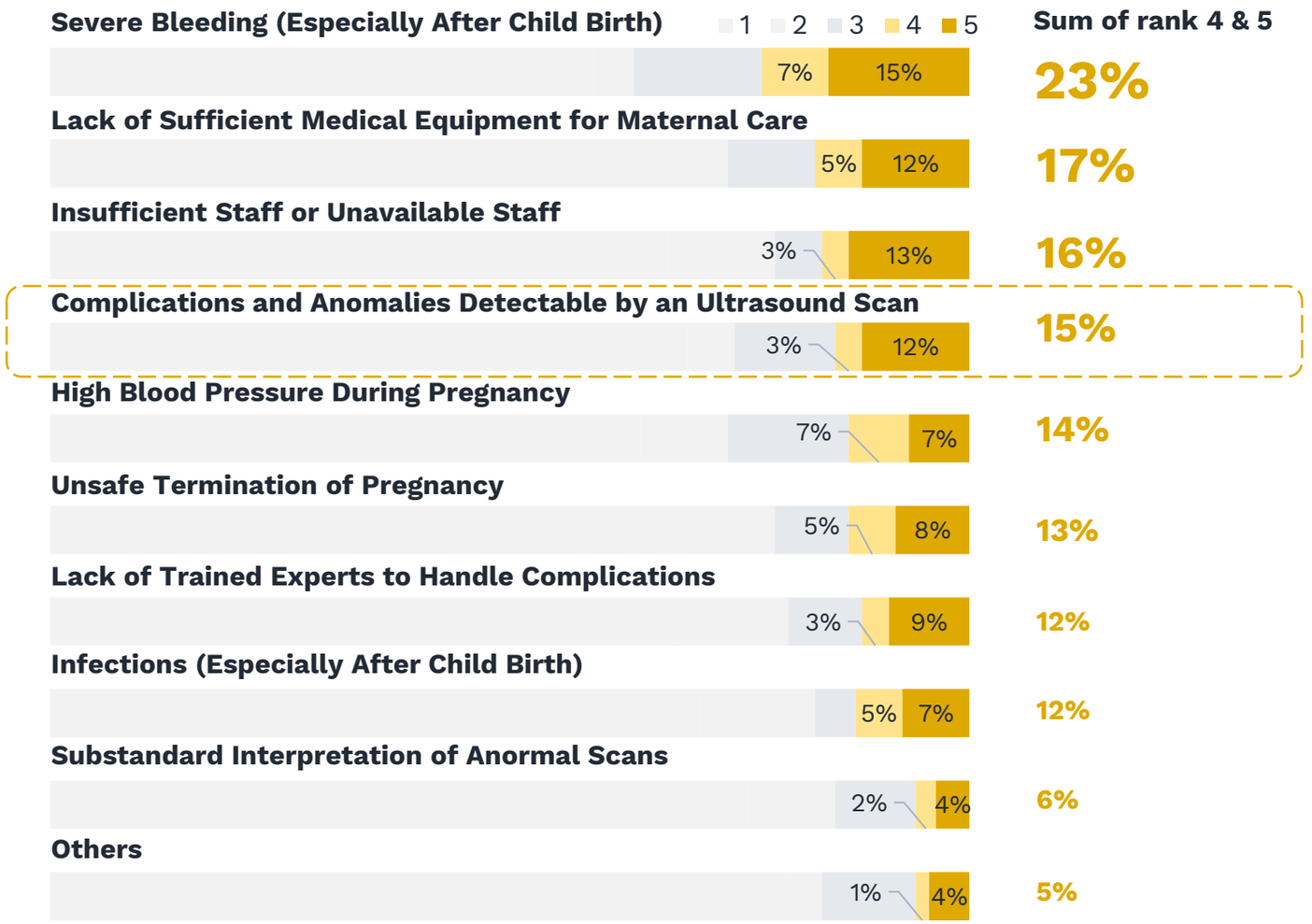
Maternal mortality within certain facilities has been notably attributed to severe postpartum bleeding as the primary cause, closely followed by a lack of adequate medical equipment for maternal care. The fourth leading factor contributing to maternal mortalities is complications or anomalies identifiable through ultrasound scans. This may include, but is not limited to, ectopic pregnancies, placenta previa and abruption, congenital disorders, and fetal growth restrictions.

Survey findings further highlight additional significant contributors to maternal mortalities, encompassing issues such as inadequate or unavailable staff, high blood pressure during pregnancy, and unsafe termination of pregnancies.

**The graph on the right presents the main causes of the maternal mortalities encountered on a scale of 1–5, with 1 being the least prevalent and 5 being the most prevalent. The most prevalent rankings (4 and 5) were summed to show which causes are the most prevalent.*

FIGURE 15: CAUSES OF MATERNAL MORTALITIES

Q: Main cause of the maternal mortalities encountered on a scale of 1-5, 1 being the least prevalent and 5 being the most prevalent. Rank is based on the sum of 4 and 5



WAIT TIME FOR MATERNITY PATIENTS

On average, maternity patients experience a waiting period of 47 minutes upon their arrival at healthcare facilities. Rural facilities displayed shorter waiting times, possibly due to lower patient volumes, with an average wait of 39 minutes.

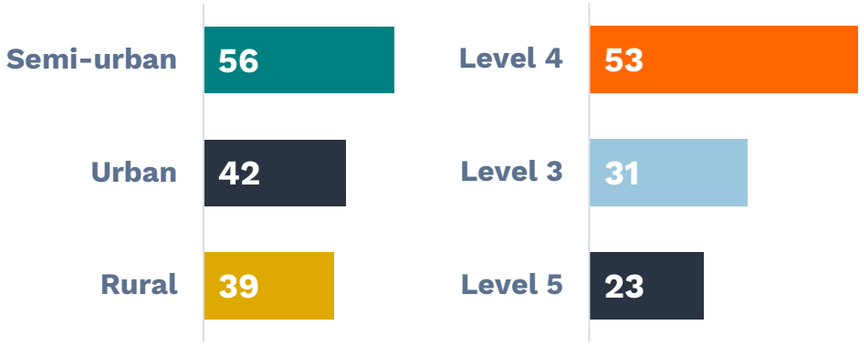
Conversely, patients visiting semi-urban facilities encountered the lengthiest wait times, averaging nearly an hour at 56 minutes, while those in urban facilities waited an average of 42 minutes. Regarding facility tiers, Level 4 facilities had the lengthiest wait times, standing at 53 minutes.

The extended waiting period at Level 4 facilities may be attributed to the substantial patient load they handle, compounded by the considerable number of referrals to these facilities. In contrast, Level 5 facilities boasted the briefest waiting times at just 23 minutes, while Level 3 facilities had an average wait of 31 minutes.

Among those who provided feedback on this matter, a majority, specifically 54%, expressed the belief that the wait times are lengthy.

AVERAGE WAIT TIME FOR MATERNITY PATIENTS IS 47 MINUTES

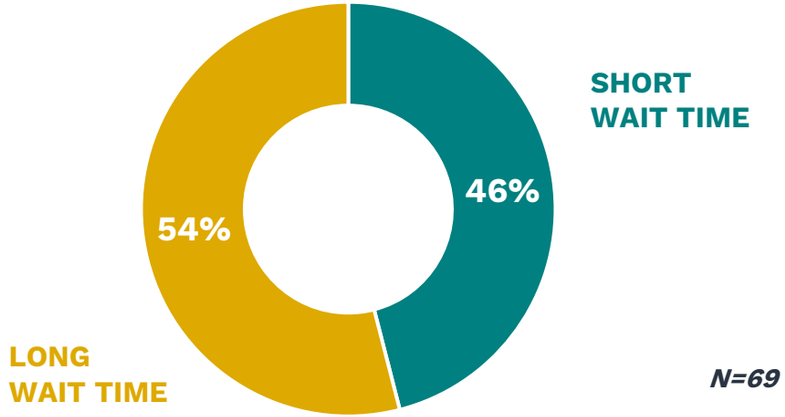
FIGURE 16: AVERAGE WAIT TIME IN MINUTES BY FACILITY SETTING AND LEVEL



N=69

FIGURE 17: WAIT TIME CLASSIFICATION

Q: Do you categorize the wait time for maternal patients mentioned as short or long?



N=69

PATIENT REFERRALS:

38%

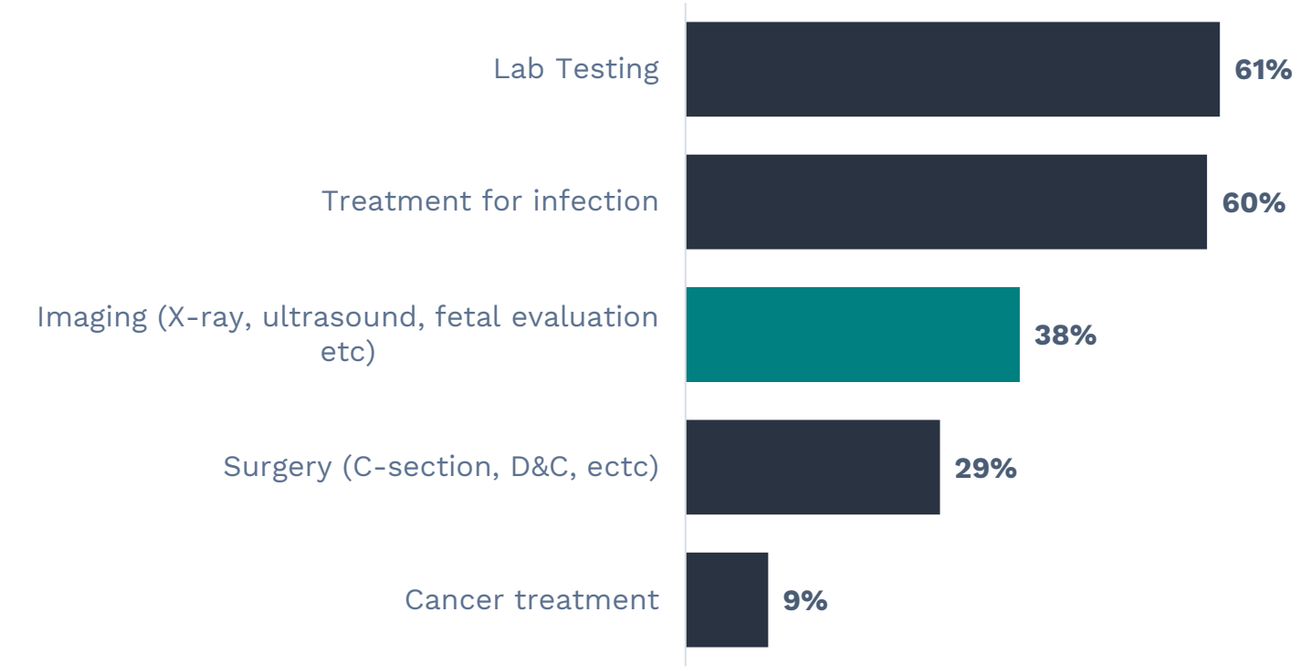
OF FEMALE PATIENTS ARE REFERRED TO FACILITIES TO SEEK IMAGING (ULTRASOUND, X-RAY, FETAL EVALUATION) SERVICES

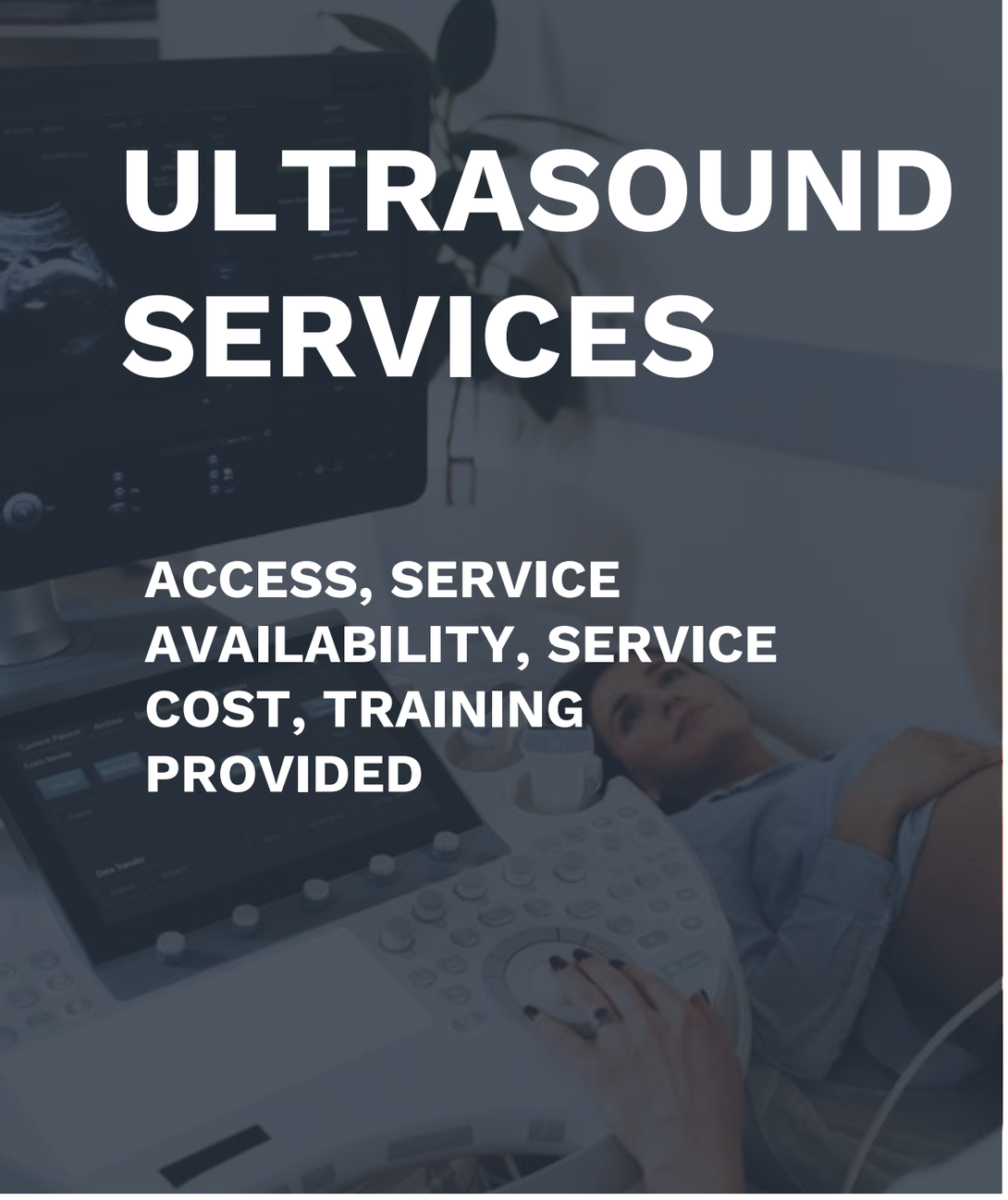
FACILITIES LARGELY REFER PATIENTS TO SEEK LAB TESTING SERVICES

This could be an indication of a possible lack of laboratory equipment. Treatment for infection was the second most referred service, with 60% of facilities saying that they frequently-to-always receive patients seeking this service.

FIGURE 18: FACILITY REFERRALS

Q: Indicate how often female patients are referred to your facility to undergo each of the following types of service





ULTRASOUND SERVICES

ACCESS, SERVICE AVAILABILITY, SERVICE COST, TRAINING PROVIDED

ULTRASOUND ACCESS STILL LIMITED

Ultrasound usage in Kenya has grown significantly in the past decade, with more healthcare providers incorporating the technology into their practices.

According to a study in 2015, approximately 70% of healthcare providers in Kenya had access to ultrasound equipment, and 45% of healthcare providers used ultrasound in their practice [1].

50%

Chance a woman visiting a rural facility will go through delivery without an ultrasound, 4x higher than a woman visiting an urban facility.

FIGURE 19: PROVISION OF OBSTETRIC ULTRASOUND

N=121

Q: What percentage of pregnant patients are provided with obstetric ultrasound?

60%

of the facilities provide ultrasound services to (0-50%) of women visiting the facilities

40%

of the facilities provide ultrasound services to (51-100%) of women visiting the facilities

Broken down as

31%

of the facilities provide the service to 51 – 75% of women

and only

9%

Of the facilities provide the service to 75 – 100% of women

1. https://www.sciencedirect.com/science/article/pii/S2211419X15000445

SERVICE AVAILABILITY

42%

OF FACILITIES HAD ONE ULTRASOUND MACHINE

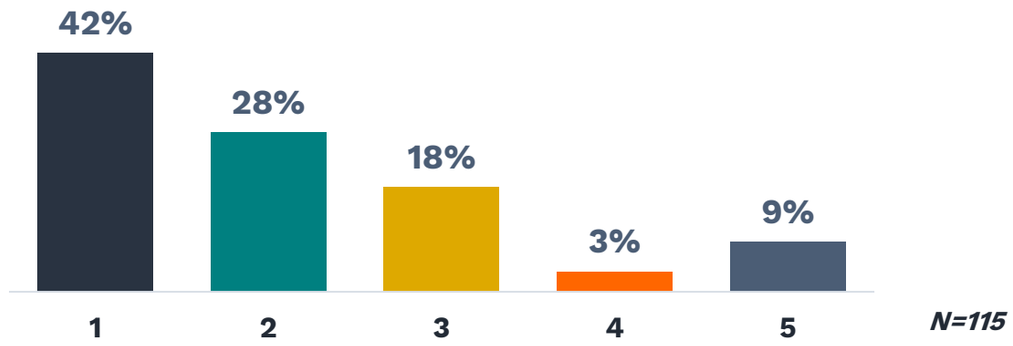
The survey sought to investigate the prevalence of different ultrasound equipment (cart-based ultrasound machines, desktop ultrasound, handheld ultrasound (probe and tablet devices), fetal monitors (CTG machines).

The survey underscores the ongoing challenges rural facilities encounter in procuring medical equipment. Interestingly, hand-held ultrasounds were most prevalent in rural regions.

The lack of high-quality medical equipment in rural facilities can be attributed to challenges such as limited access to electricity and a shortage of trained personnel capable of operating these devices.

FIGURE 20: NUMBER OF ULTRASOUND MACHINES

Q: How many ultrasound machines do you have at your facility?

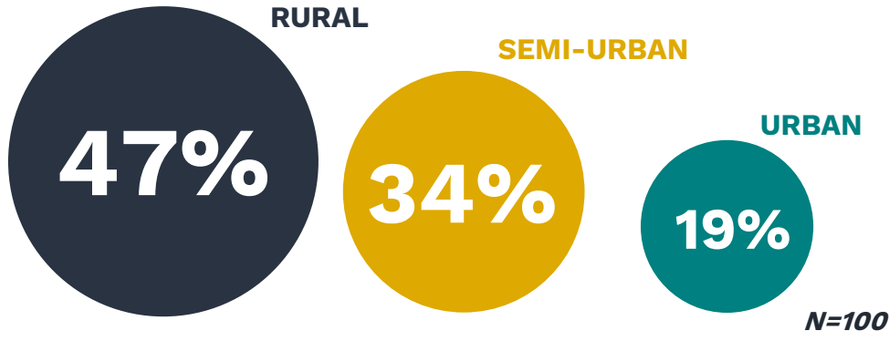


89% OF THE CART-BASED ULTRASOUND MACHINES WERE FOUND IN URBAN AND SEMI-URBAN FACILITIES.

Among all the cart-based ultrasound machines, rural facilities possessed only **11%**, while the majority were located in semi-urban and urban facilities, accounting for 47% and 42%, respectively.

Urban facilities had the fewest handheld ultrasounds machines.

FIGURE 21: HANDHELD ULTRASOUND MACHINES BY SETTING



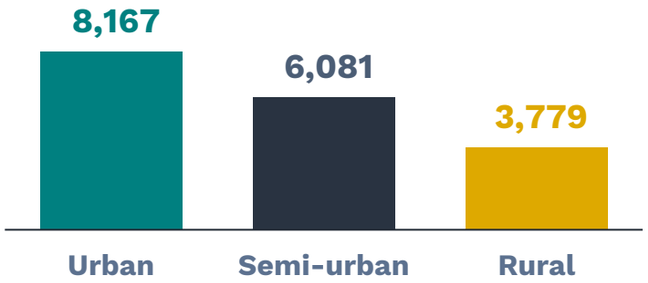
AVERAGE COST OF SERVICES IN KENYAN SHILLINGS

FIGURE 22: AVERAGE COST OF SERVICES (KES)

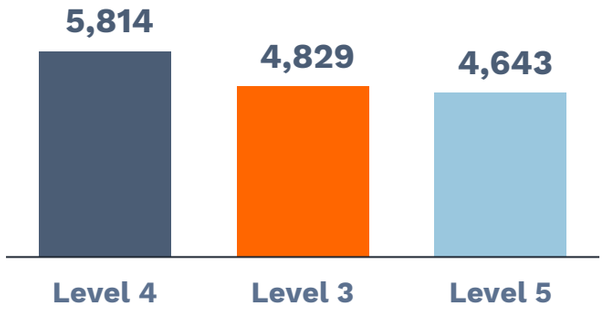
N=85

NORMAL DELIVERY

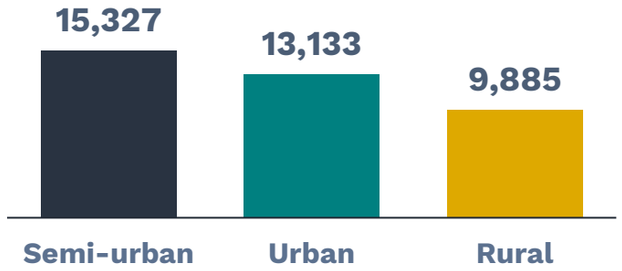
By Facility Setting

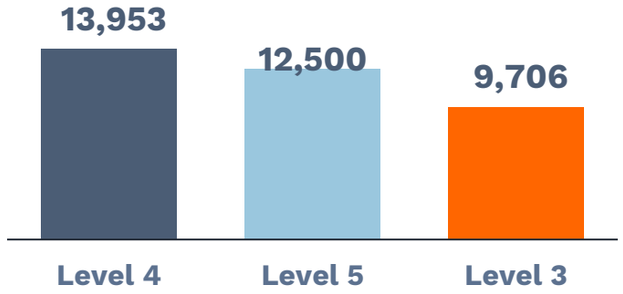


By Facility Level

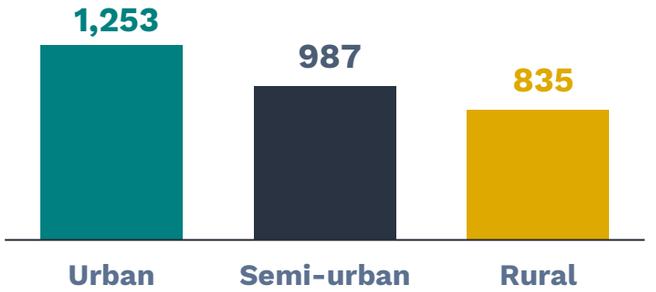


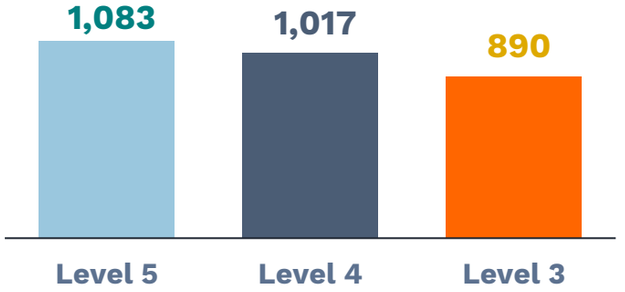
C-SECTION DELIVERY





ULTRASOUND SCAN





**** According to the survey respondents, Level 4 facilities had higher charges compared to Level 5 facilities. Ultrasound costs varied from 15% to 22% of regular delivery charges, but they were only about 8% of the cost of a C-section delivery. When women had to pay for ultrasounds themselves, their choice to undergo one would likely be influenced by the affordability versus necessity factor.***

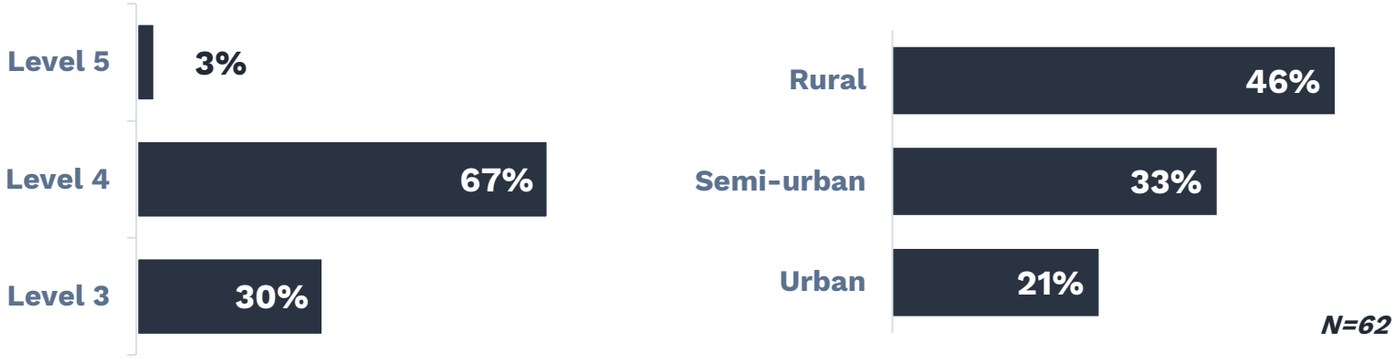
ULTRASOUND TRAINING

53% of facilities do not provide ultrasound training to staff. Rural facilities made up 46% of the total proportion of facilities that did not provide ultrasound training.

While universities may offer comprehensive education and training in ultrasound techniques, international accreditation for the recognition and validation of these skills within medical facilities is currently not present. Collaboration with international and local accreditation institutions like the Kenya Accreditation Service (KENAS) and national professional societies like the Kenya Association of Radiologists (KAR) and the Society of Radiography in Kenya (SORK) that actively engage with medical facilities could bridge this gap and promote the credibility and standardization of ultrasound practices.

53% OF FACILITIES DO NOT PROVIDE ULTRASOUND TRAINING TO STAFF

FIGURE 23: PROPORTION OF FACILITIES THAT DO NOT OFFER TRAINING ON ULTRASOUND



Q: Is the training provided in collaboration with a medical body (regulatory agencies and medical boards) or college?

44% *NO* **56%** *YES*

N=27

Collaboration with a medical body was highest in urban (semi-urban and urban) facilities (73%), and low in rural (27%).
Level 4 had the highest collaboration at 67%, and Level 3 had 33%. Level 5 had no collaboration (n = 15).
Among the bodies mentioned as collaborating to offer training were:

- Colleges (KMTC) and universities (JKUAT, Kenyatta University).
- International organizations (AMREF International, Global Ultrasound Institute).
- Government and regulatory bodies (MoH, Kenya Medical Practitioners and Dentists Council).
- National professional bodies (Society of Radiography in Kenya).

ULTRASOUND PERFORMERS AND INTERPRETERS

Sonographers were the primary professionals responsible for conducting ultrasound scans in healthcare facilities, as observed in 58% of these facilities, followed by doctors or radiologists, with nurses and midwives being the least common practitioners for this procedure.

Most individuals who conducted ultrasound scans were typically accessible only when needed, on an "as-needed" basis.

This situation could have potentially led to a risk of delayed diagnosis.

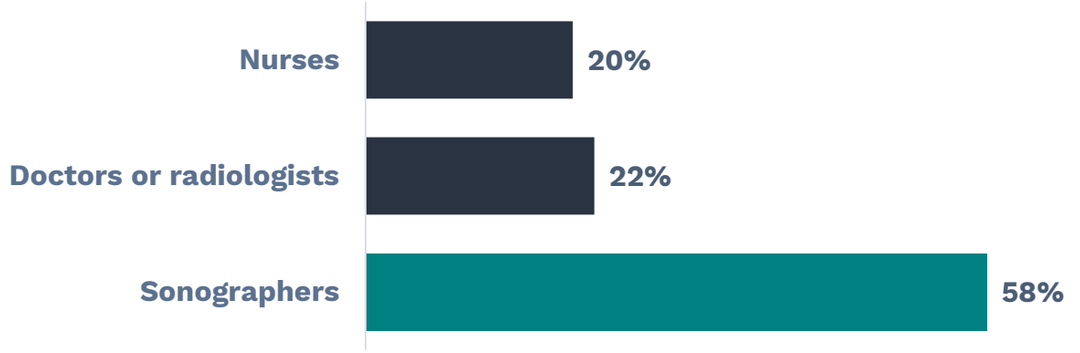
If sonographers are only available on demand, patients may have to wait longer for their imaging scans to be performed, potentially delaying the diagnosis of their medical conditions. It also raises the issue of missed opportunities for preventative care, as missed opportunities for early detection and preventative care for certain medical conditions could occur.

NURSES LEAST LIKELY TO PERFORM ULTRASOUNDS

Sonographers are responsible for reporting the majority of obstetric and gynecological ultrasound images (70%), followed by radiologists (36%), and nurses or midwives (34%). While the availability of medical staff to perform ultrasounds is on an on-demand basis, their availability for interpreting these reports is round-the-clock (24/7).

FIGURE 24: ULTRASOUND PERFORMERS

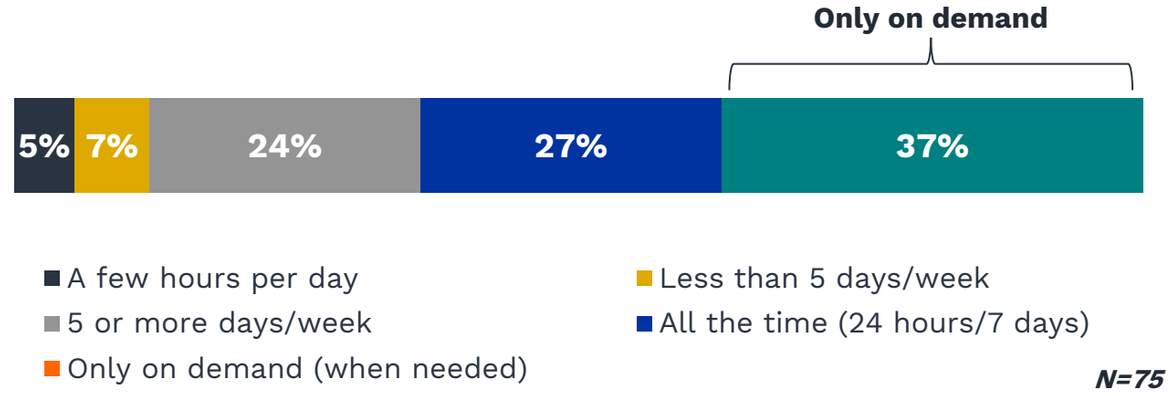
Q: Who performs ultrasound in your facility, % of total facilities?



N=104

FIGURE 25: AVAILABILITY TO PERFORM ULTRASOUND

Q: On average, how often are the healthcare personnel available to perform ultrasound scans?



N=75

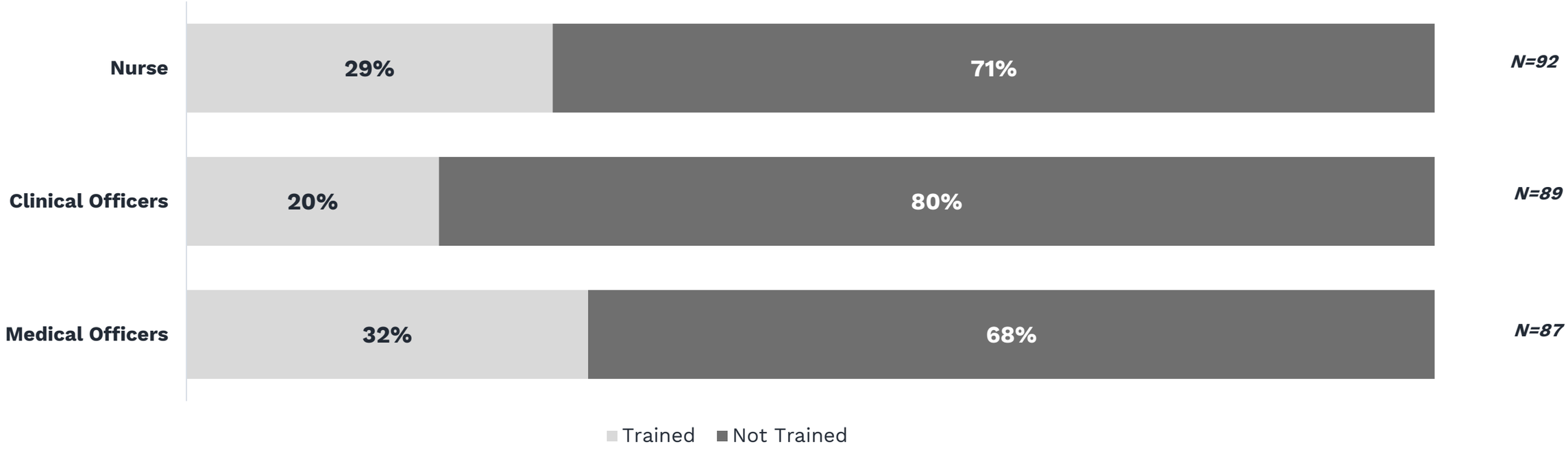
TRAINING IN ULTRASOUND AND DIAGNOSTIC EQUIPMENT

Survey data indicates that a significant proportion of facilities reported a lack of training in ultrasound among their staff. The highest percentage of untrained personnel in this regard was found among clinical officers and nurses, accounting for 80% and 71% of the facilities surveyed respectively.

These findings highlight the need for targeted interventions and training programs to address the gaps in ultrasound training among healthcare professionals in order to enhance the quality of healthcare delivery in these facilities.

FIGURE 26: LEVELS OF TRAINING AMONG HEALTH PROFESSIONALS

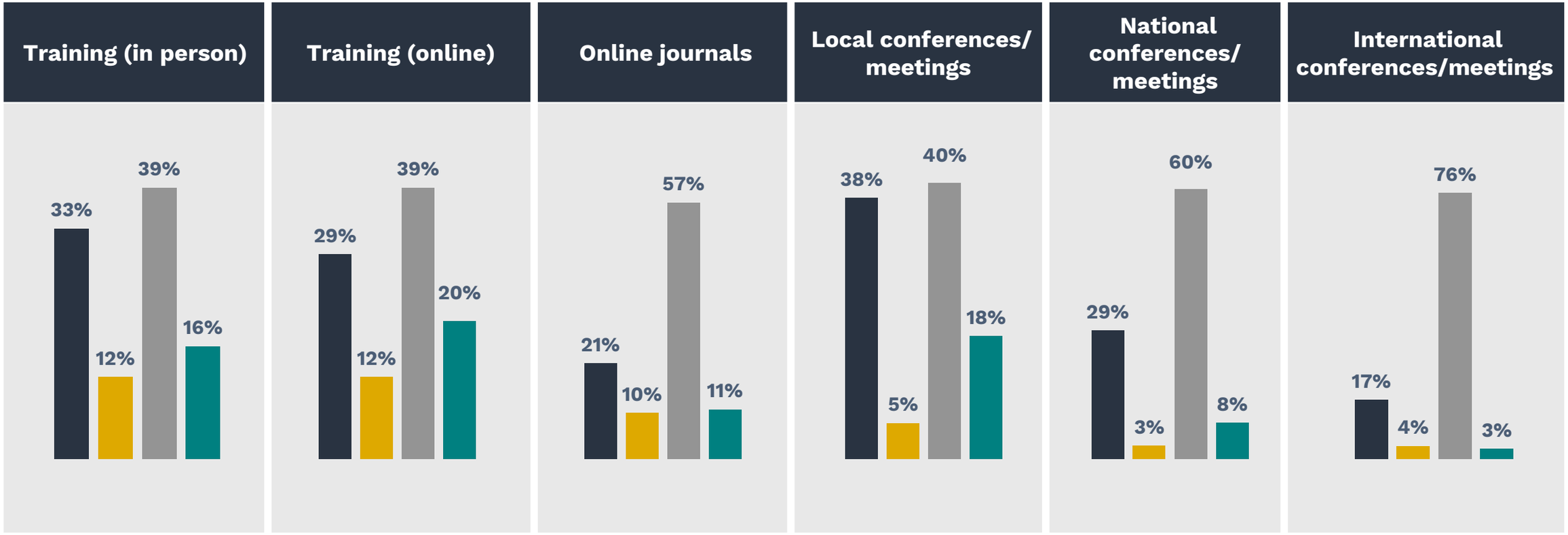
Q: What percentage of your maternity unit staff is trained in using ultrasound and diagnostic equipment?



FORMS OF CONTINUING MEDICAL EDUCATION ARE STILL INACCESSIBLE

FIGURE 27: ACCESS TO MEDICAL EDUCATION

Q: How accessible are the following forms of continuing medical education to nurses, sonographers, and other skilled healthcare professionals in ultrasound at your facility?



N=136

EQUIPMENT PURCHASES & REVENUE ANALYSIS

CASH PURCHASES: MAIN EQUIPMENT FINANCING METHOD

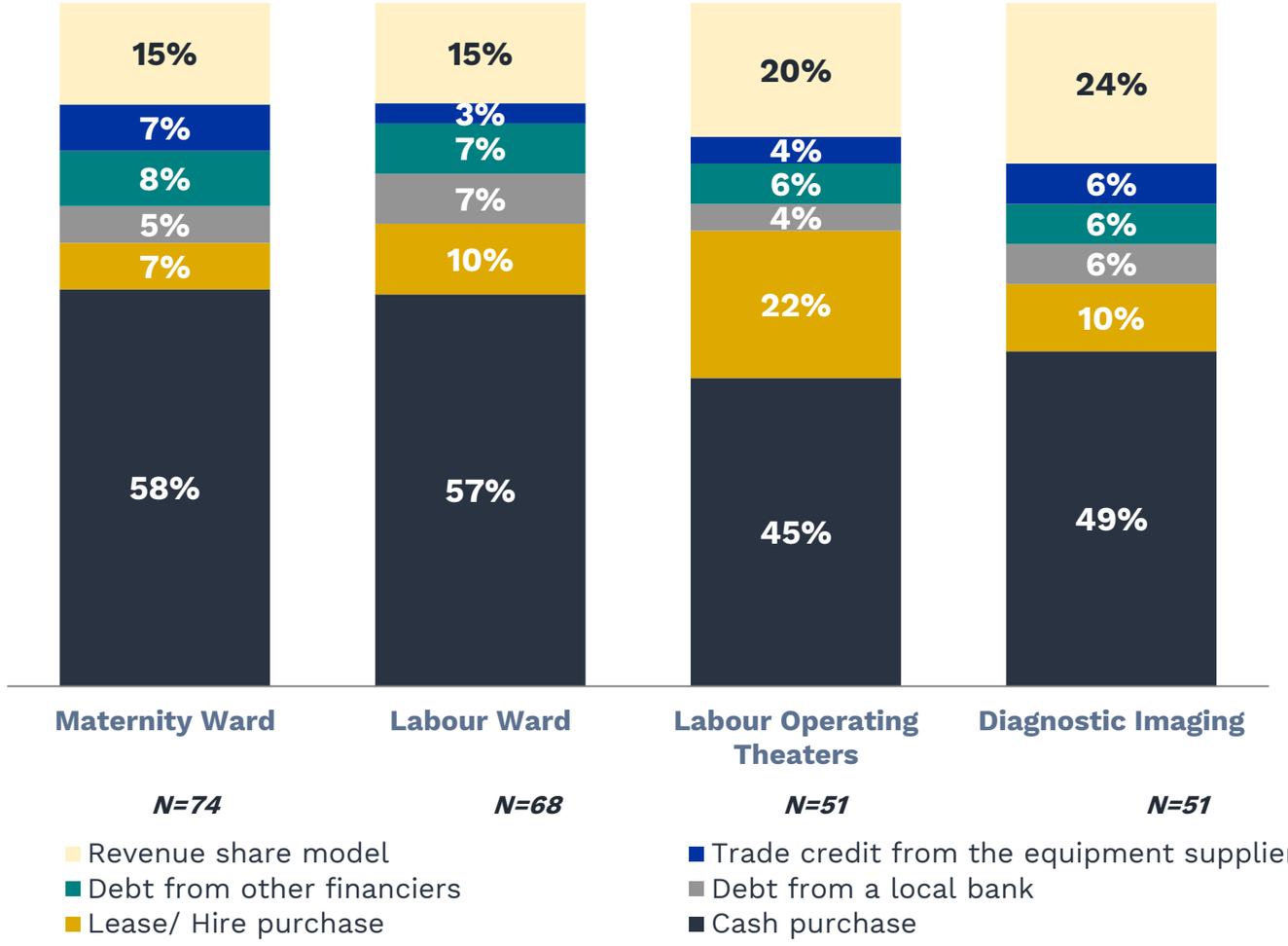
Cash was the main means used to purchase equipment and was largely used to purchase maternity ward equipment.

Usage of other financing means was low, likely due to the higher number of public facilities in the survey.

The use of lease or hire purchase was highly used after cash for the purchase of labor operating theater equipment due to the high cost of this equipment.

FIGURE 28: FINANCING METHOD FOR MEDICAL EQUIPMENT

Q: How did you finance equipment purchase?

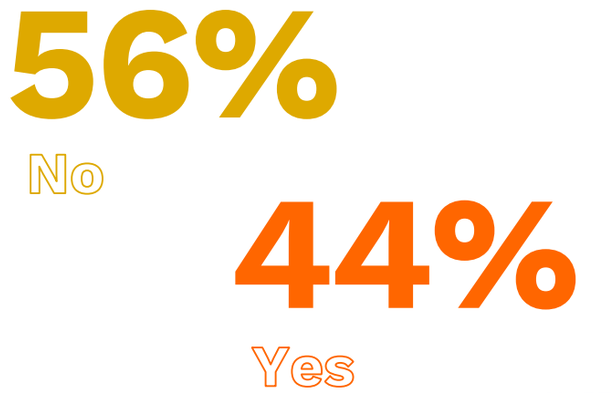


COST OF MEDICAL EQUIPMENT

Based on an examination of facility revenue and projected equipment acquisitions for the years 2023 to 2025, it has been determined that approximately 14% of facilities may encounter difficulties in procuring maternity equipment during their planned acquisition year due to potential budget limitations. Within this 14%, a substantial majority consists of semi-urban facilities (55%), while rural facilities are the least impacted (9%). This variation can be explained by the fact that rural facilities have planned purchases of more affordable medical equipment that do not necessitate substantial financial commitments, given their limited financial capacity for major investments.

Among facility managers who made equipment purchases in 2022, a significant majority (56%) expressed that the equipment was expensive for their respective facilities. On the other hand, only 44% of facility managers considered the purchases to be affordable.

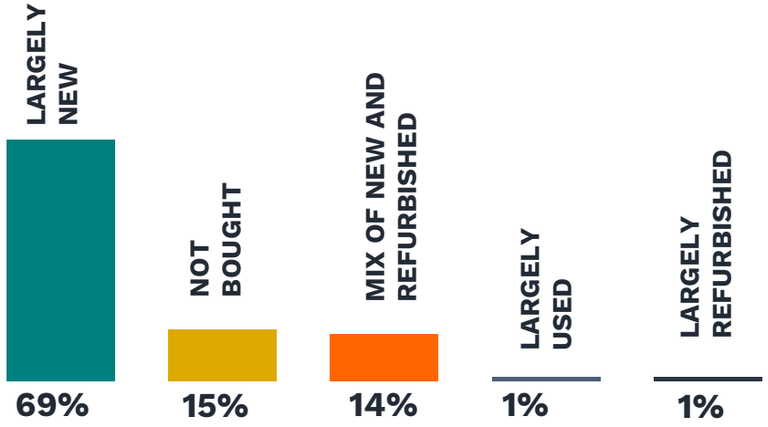
Q: Was medical equipment purchased in 2022 affordable?



N=57

FIGURE 29: TYPE OF EQUIPMENT PURCHASED

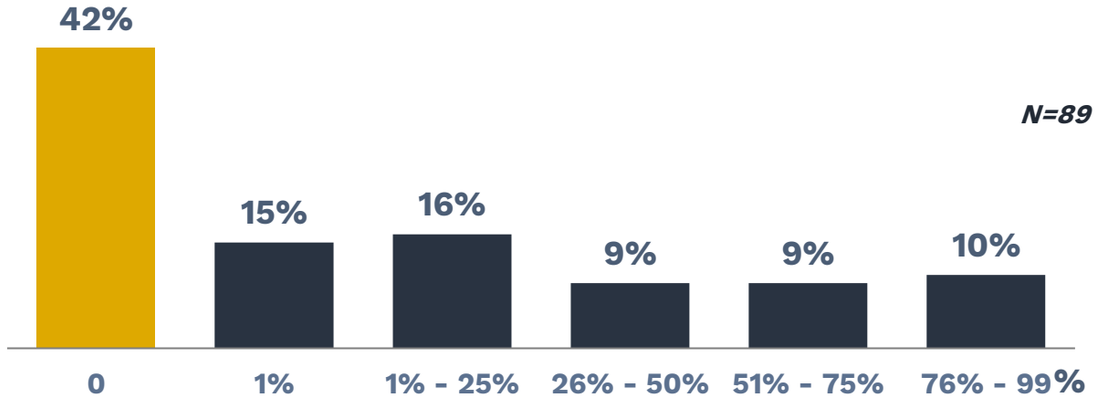
Q: Did you buy refurbished, new, or used maternity medical equipment?



N=88

FIGURE 30: EQUIPMENT WARRANTY OR SERVICE CONTRACT

Q: What percentage of your equipment has warranty or service contract?

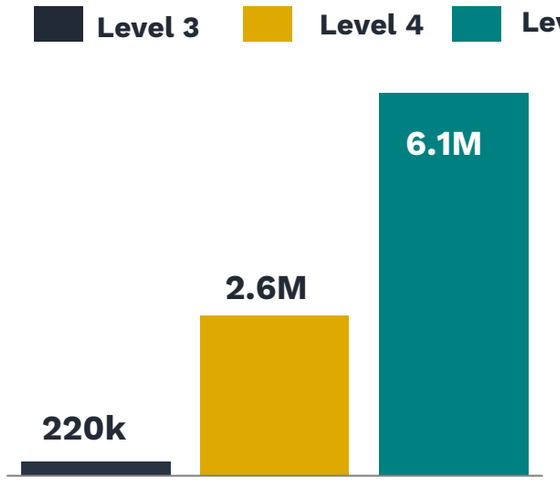


N=89

SPEND ON MATERNITY EQUIPMENT

LEVEL 4 HAVE **12x HIGHER** SPENDING ON MATERNITY EQUIPMENT THAN LEVEL 3 FACILITIES, LEVEL 5 HAVE **2x HIGHER** SPENDING THAN LEVEL 4

FIGURE 31: AVERAGE INVESTMENT BY LEVEL IN KENYAN SHILLINGS



1.8M

AVERAGE SPENDING/INVESTMENT IN MATERNITY EQUIPMENT BETWEEN 2020 - 2022

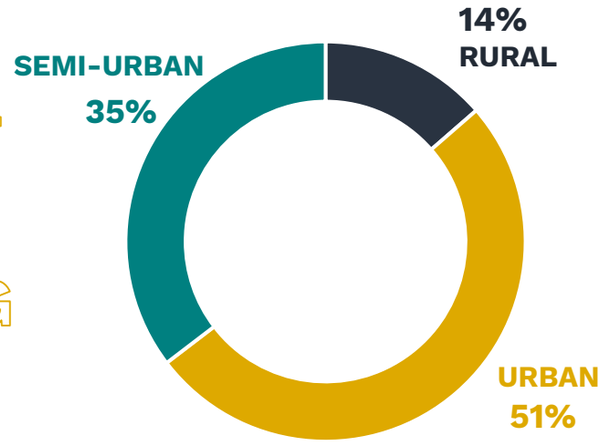
N=103

INVESTMENTS IN **RURAL FACILITIES REMAIN LOW AT** 14% SHARE, **WHILE...**

urban facilities spent the most on maternal equipment purchases between 2020 and 2022 at 51% of total investments, and the remaining 35% were by semi-urban facilities.

FIGURE 32: SHARE OF TOTAL INVESTMENT BY FACILITY SETTING

SHARE OF TOTAL SPENDING



N=103

MORE PLANNED PURCHASES EXPECTED IN LEVEL 5 FACILITIES WITH LABOR WARD EQUIPMENT BEING THE TOP PRIORITY PURCHASE

Investments planned for urban facilities in the years 2023, 2024, and 2025 are 10 times greater than those intended for rural facilities. On average, facilities are planning to invest KES 9.9 million during this period.

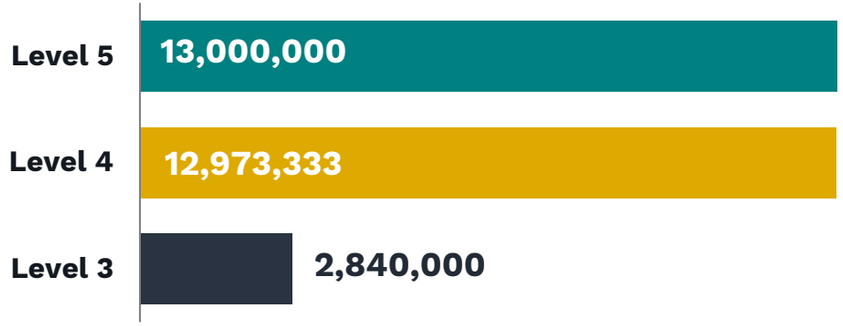
Specifically, urban facilities have allocated an average of KES 19.7 million for investments in these years, while rural facilities are planning to invest only KES 3.3 million over the same period.

Meanwhile, semi-urban facilities will be investing KES 13.6 million during this time frame.

In the context of all equipment types, including maternity ward equipment, labor ward equipment, operating theater equipment, and diagnostic equipment, over 60% of facilities indicated their intention to make equipment purchases. Among these, labor ward equipment emerged as the highest-priority purchase, with an 80% affirmative response rate.

FIGURE 33: AVERAGE PLANNED INVESTMENT IN KENYAN SHILLINGS

Q: How much do you plan to invest in 2023, 2024, 2025, on average (KES)?



N=68

Labor operating theater equipment was the least expected purchase, with only 68% of facilities saying they plan to purchase the equipment. This could be attributed to the high cost of equipment, which renders it unaffordable, especially for low-level facilities and facilities in rural settings.

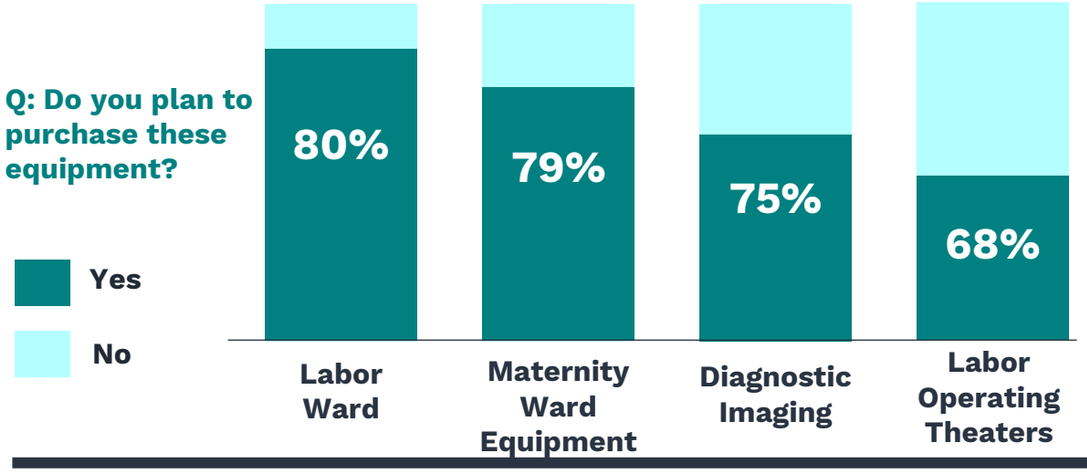
80%

OF FACILITIES SAY THEY INTEND TO PURCHASE LABOR WARD EQUIPMENT

FIGURE 34: PLANNED EQUIPMENT PURCHASE

N=68

Q: Do you plan to purchase these equipment?

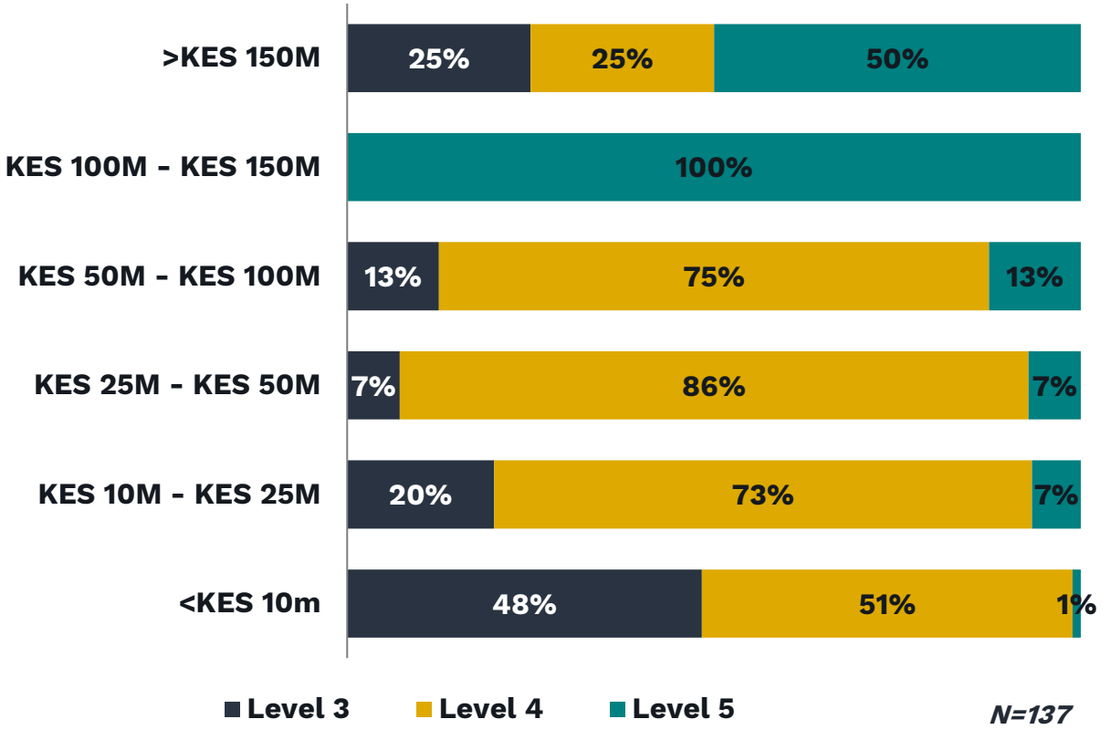


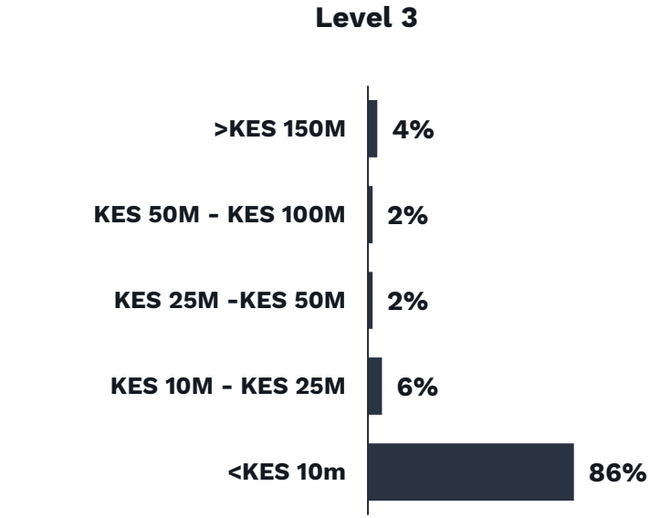
FACILITY REVENUES

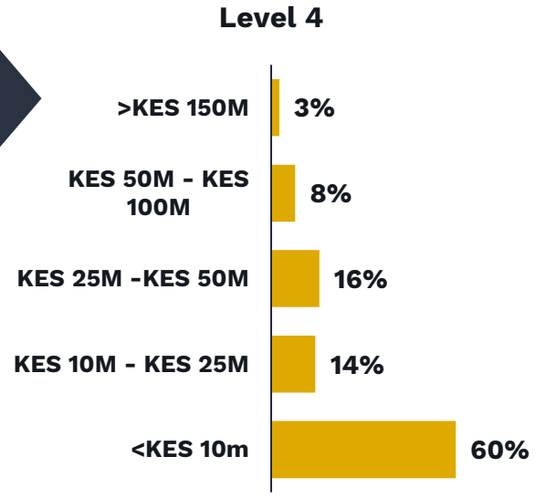
Higher revenue brackets were dominated by Level 5 facilities, with Level 3 and 4 facilities taking up much of the lower revenue brackets (less than KES 10M).

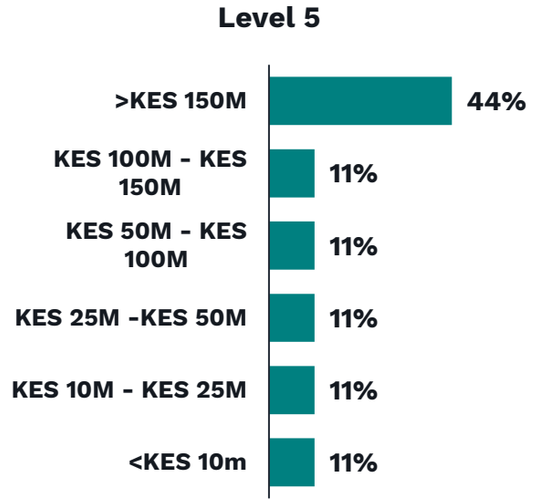
FIGURE 35: FACILITY REVENUE BY LEVELS

Q: What was the total revenue for the facility in 2022?









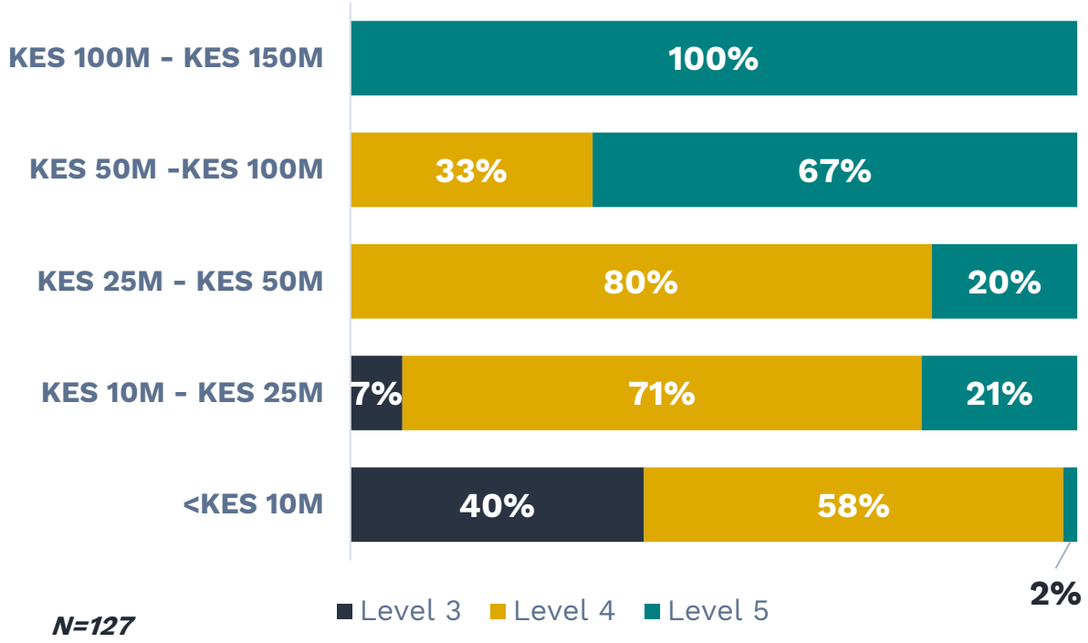
- More than **60%** of Level 3 and 4 facilities had revenues of less than **KES 10M**
- More than **50%** of Level 5 facilities had revenues of more than **KES 100M**

MATERNITY UNIT REVENUES:

Level 3 and Level 4 facilities continue to generate less revenue compared to Level 5 facilities. Revenues between KES 50M – KES 150M was dominated by Level 5 facilities. Level 4 facilities majorly generate revenues of between KES 25M – KES 50M.

FIGURE 36: MATERNITY UNIT REVENUE

Q: What was the revenue generated from the maternity unit in 2022?



N=127

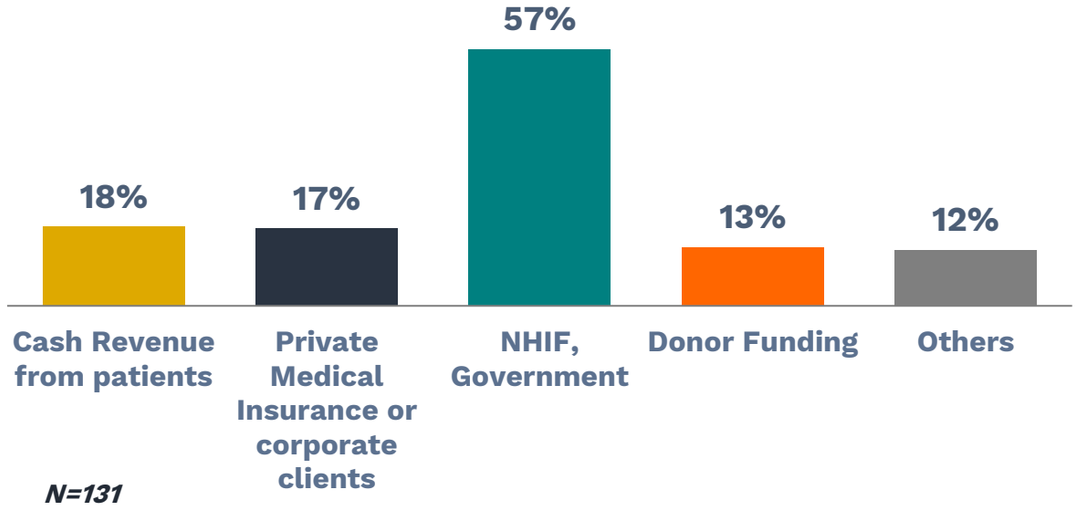
57% OF REVENUES WERE CONTRIBUTED TO BY NHIF SCHEME OR GOVERNMENT:

An analysis of maternity unit revenue split by the payor in 2022 shows that cash revenues from patients were the second highest revenue earners for facilities across the country.

The top three revenue sources for facilities are:

1. NHIF and government
2. Cash revenue from clients
3. Private medical insurance and corporate clients

FIGURE 37: REVENUE SPLIT BY PAYER



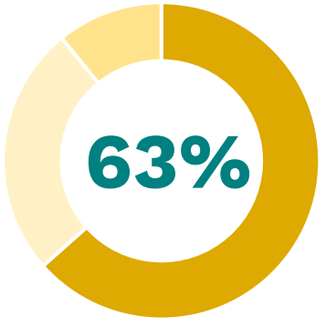
N=131

OOP PAYMENTS AND DONOR FUNDS HIGH IN RURAL FACILITIES

OOP (out-of-pocket) payments are individuals' direct payments to healthcare providers at the time of service use. In Kenya, like many other low- and middle-income countries, access to healthcare services in rural areas is often limited due to inadequate funding and resources. As a result, donor funding has become a crucial source of financial support for healthcare programs in these areas.

Survey results show a high concentration of donor funding, with more rural facilities reporting a larger percentage of their revenues to be from donors.

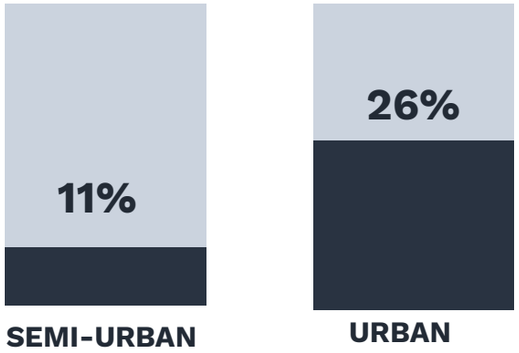
FIGURE 38: DONOR FUNDING ***N=130***



OF RURAL FACILITIES MATERNITY UNIT REVENUES WERE DONOR-FUNDED

The remaining **37%** was split between semiurban and urban facilities.

N=130



The country has been heavily reliant on donor support to finance a substantial part of its health budget, including funding for critical health programs such as maternal and child health, HIV/AIDS, malaria, and tuberculosis.

OOP payments in Kenya are prevalent, especially in rural areas. Despite the government's efforts to provide affordable and accessible healthcare services through the National Health Insurance Fund (NHIF), many Kenyans still face financial barriers to accessing healthcare services, which include high user fees, transportation costs, and other indirect costs such as lost wages due to time spent seeking care.

OOP payments were highest in rural facilities and lowest in urban facilities. This could be an indication of a lower prevalence of health insurance in rural areas.

EVERY YEAR, OOP HEALTH EXPENDITURE PUSHES MORE THAN 100 MILLION PEOPLE BELOW THE POVERTY LINE GLOBALLY [1]

1. https://www.brookings.edu/blog/future-development/2021/03/02/reducing-kenyas-health-system-dependence-on-donors/

EXTERNAL FINANCING

Only **36%** of non-public facilities applied for external financing to purchase maternal equipment in 2020-2022. Of the 18 private hospitals that responded to the question, 8 (44% of private facilities) applied for external financing, while 10 did not. For faith-based institutions, only one had applied for external financing, while the remaining six reported not applying for financing.

64%

OF FACILITIES DID NOT APPLY FOR EXTERNAL FINANCING *N=25*

Of the 8 private facilities that applied for financing, 7 (88%) managed to secure the funding. Overall, 89% of all facilities that applied for funding managed to attract the funding.

89%

OF THOSE WHO APPLIED RECEIVED FINANCING *N=9*

FIGURE 39: APPLICATION FOR EXTERNAL FINANCING

Q: Did you apply for external financing for the purchase of maternity equipment in 2020 – 2022?

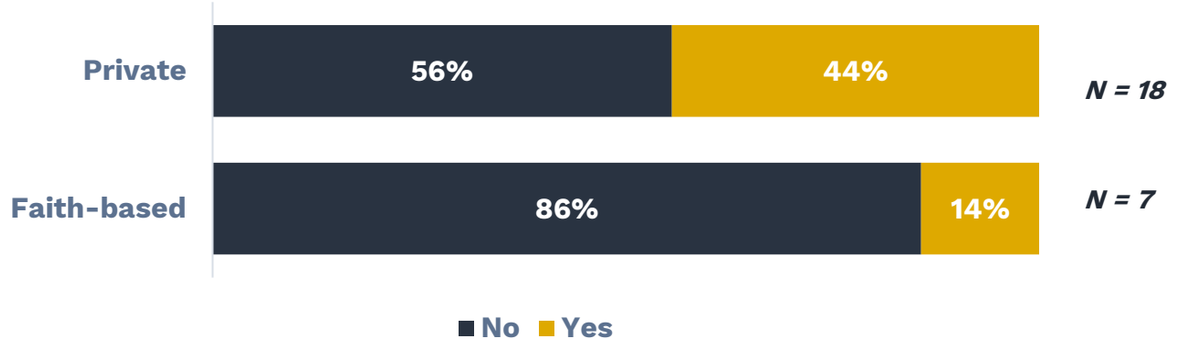
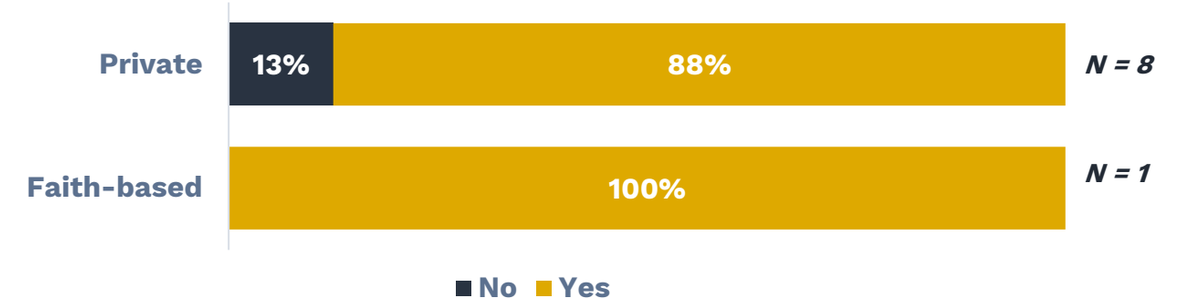


FIGURE 40: RECEIVING EXTERNAL FINANCING

Q: If you applied for external financing, did you receive it?



HIGH INTEREST RATES AND COLLATERAL REQUIREMENTS ARE THE MOST COMMON REASONS FOR NOT APPLYING FOR EXTERNAL FINANCING

Among the facilities that did not apply for external financing, the primary reason cited was the unappealing interest rates and high collateral requirements, with a quarter of respondents expressing this concern.

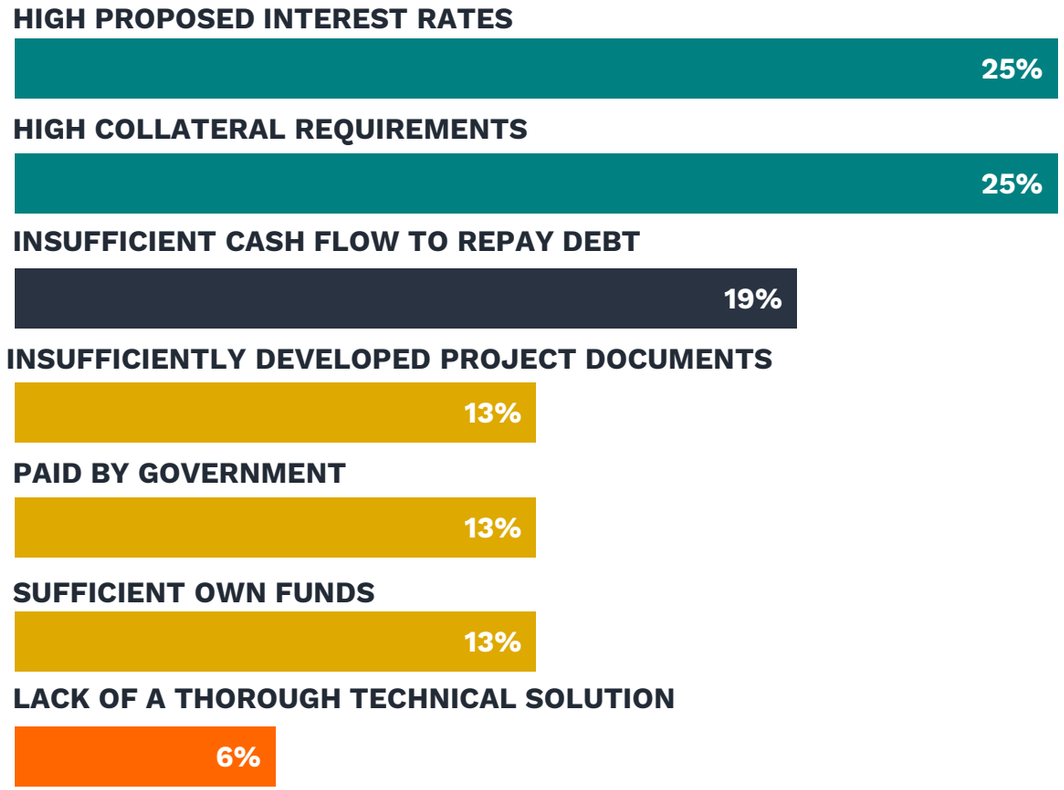
Insufficient cash flow to repay debt was the second most frequently cited reason, according to 19% of respondents.

The third most common reason cited by facilities for not applying for external financing was insufficiently developed project documents, followed by having sufficient own funds and being funded by the government. The least commonly cited reason was the lack of a thorough technical solution.

ONLY 13% OF FACILITIES HAVE SUFFICIENT OWN FUNDS TO PURCHASE EQUIPMENT

FIGURE 41: REASONS FOR NOT APPLYING FOR EXTERNAL FINANCING

Q: If your facility did not apply for external financing for the purchase of maternity equipment, then for what reason?



N = 16

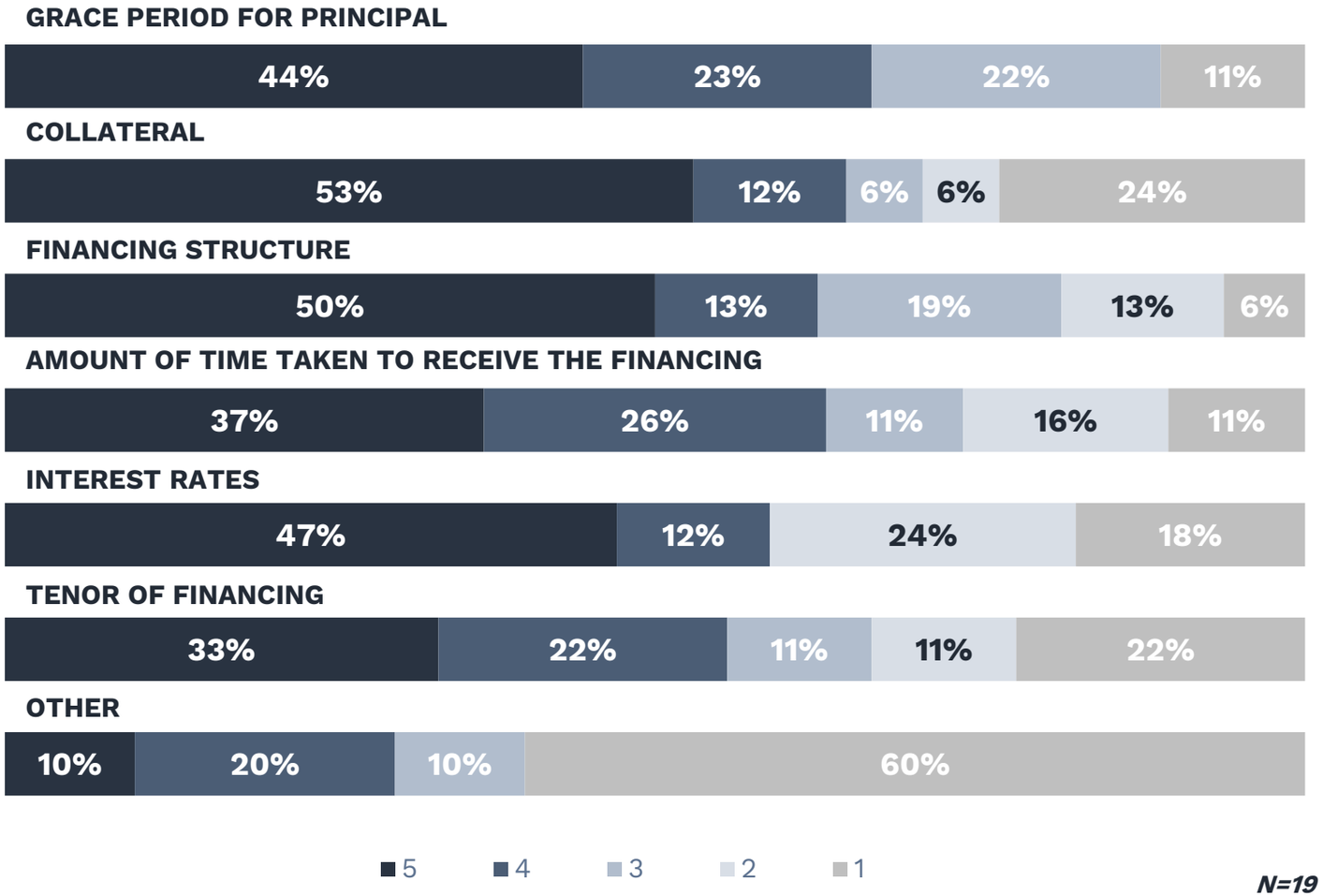
COLLATERAL AND FINANCE STRUCTURE: THE MOST IMPORTANT FEATURES OF EXTERNAL FINANCING

Grace period for principal was deemed the most crucial aspect of external financing by 67% of non-public facilities, closely followed by collateral, which was the choice of 65% of these facilities. Other significant factors included financing structure (63%), amount of time taken to receive the financing (63%), interest rates (59%), and tenor of financing (55%).

Many health facilities may not have the technical expertise to develop comprehensive project documents or understand how to structure financing in a way that makes sense for their operations. Providing technical assistance can help address this issue and enable health facilities to secure external financing more easily. Providing grants rather than loans can be a more appropriate way to support health facilities.

FIGURE 42: IMPORTANCE OF FEATURES OF EXTERNAL FINANCING

Q: Please rank the following terms/ features of external financing based on importance on a scale of 1-5.



N=19


PART C

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MATERNAL CAREGIVERS SURVEY PROFILE

Survey Mode	Online
Country	Kenya
Counties Covered	38
Total Responses	386

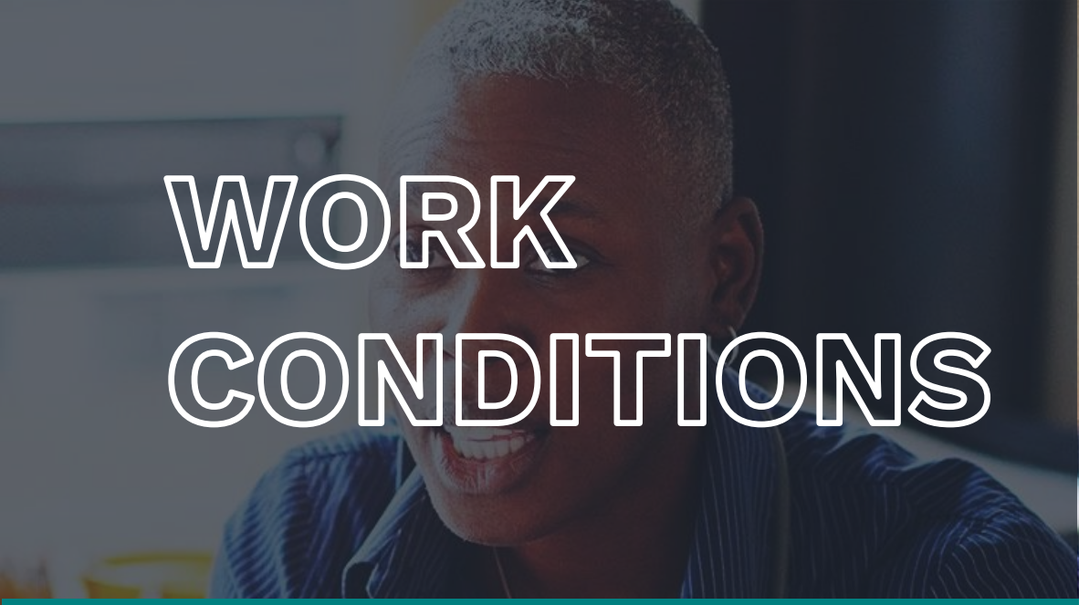
N represents the total number of respondents

	Total
Level 2	**9**
Level 3	**136**
Level 4	**188**
Level 5	**52**
Level 6	**1**

	% of Total
Faith-based	**3%**
Private	**8%**
Public	**89%**

	% Split
Female	**61%**
Male	**39%**

Medical Profession	Total
Anesthetist	**1**
Clinical Officer	**60**
Medical Officers (Doctors)	**9**
Nurse	**309**
Obstetrician	**3**
Radiographer	**4**



WORK CONDITIONS

The study revealed that healthcare professionals, irrespective of facility ownership model, their gender, or profession, typically put in approximately 40 hours of work per week. There were observable differences in average working hours across types of medical professions, with some, like medical officers (doctors), clocking up to 47 hours a week.

The average number of hours worked varies depending on factors like the type of facility and the specific job responsibilities of each maternal caregiver.

~40HRS

AVERAGE WEEKLY WORK HOURS

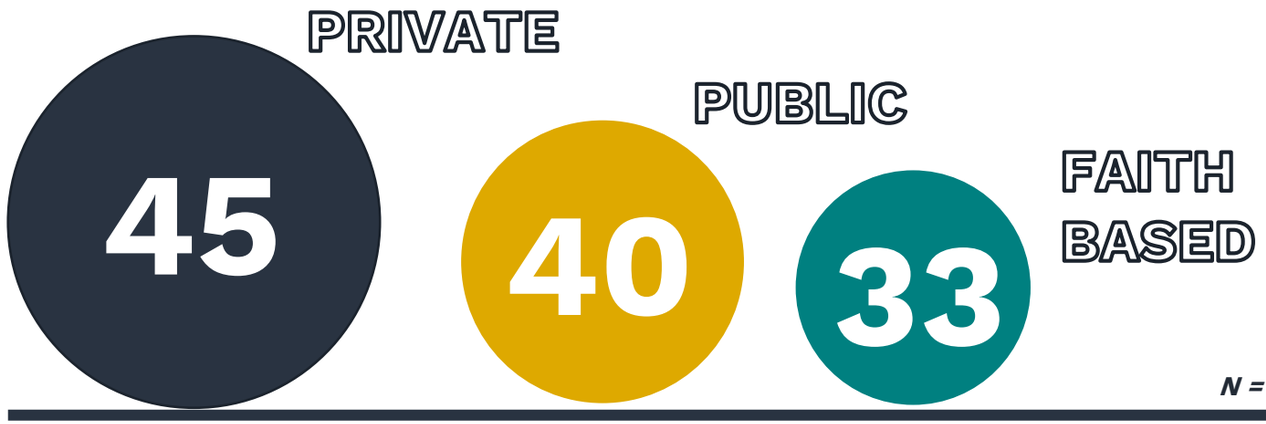
PROFESSIONALS IN PRIVATE FACILITIES WORK LONGEST HOURS

In terms of facility ownership, respondents from private facilities had higher average working hours per week **(45 hours)** compared to those from public facilities **(40 hours).** Faith-based medical professionals worked an average of 33 hours a week.

SURVEY RESULTS SHOW NO SIGNIFICANT GENDER-BASED DIFFERENCES IN AVERAGE WORKING HOURS IN FACILITIES

FIGURE 1: AVERAGE WORKING HOURS BY LEVEL

Q: How many hours a week do you work on average?

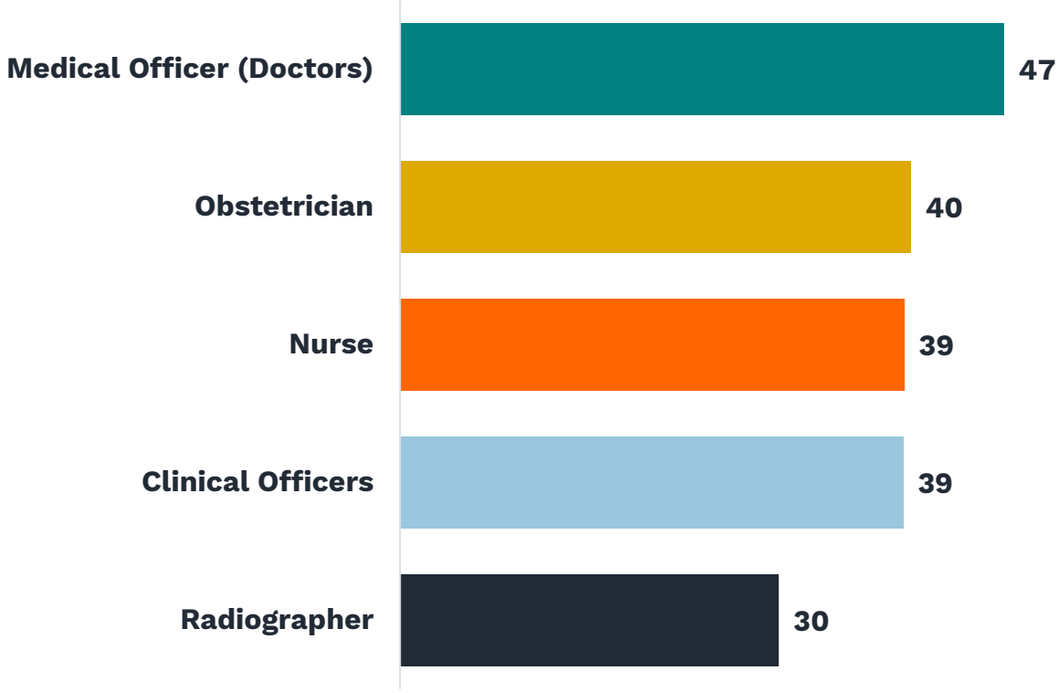


N = 366

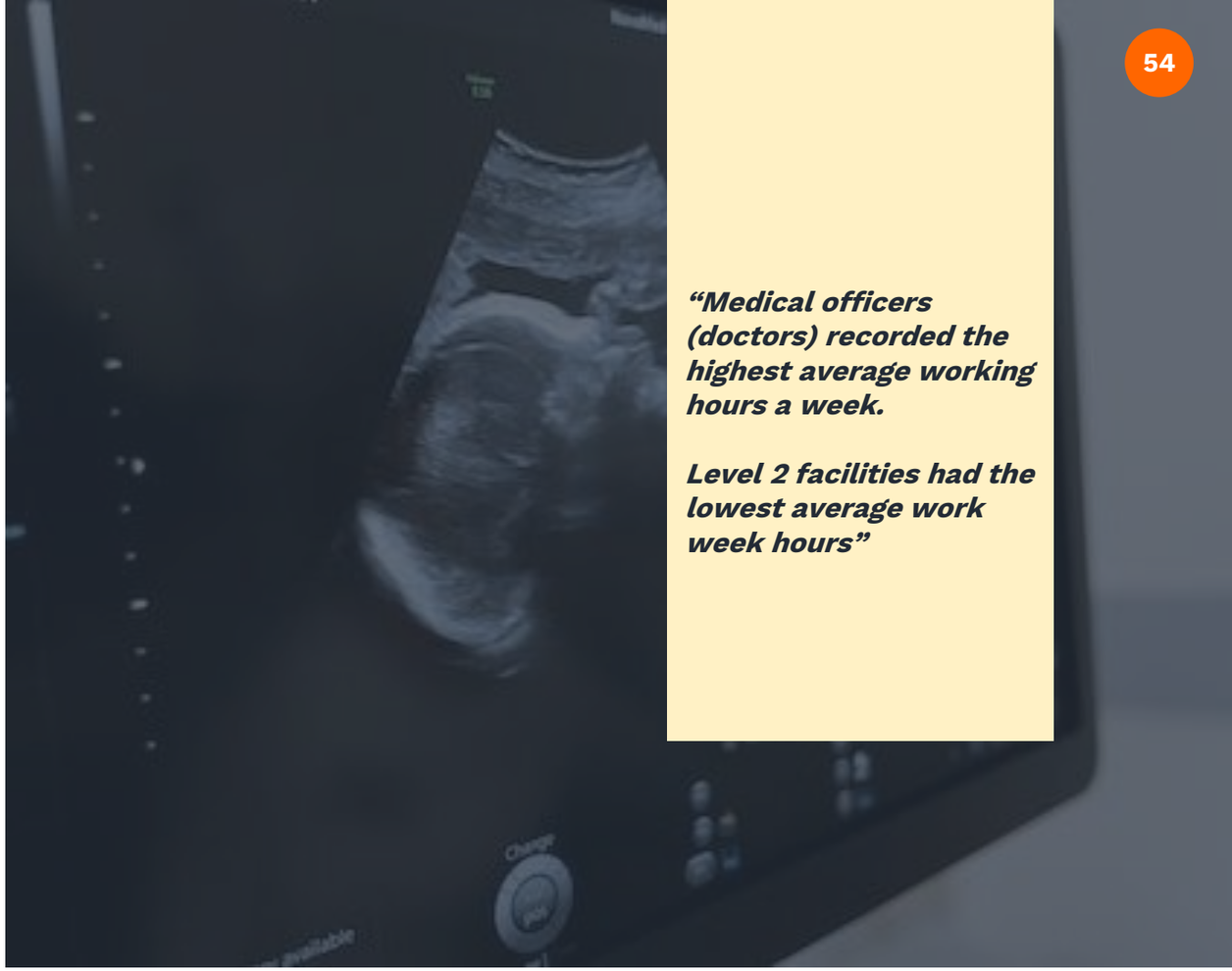
Medical officers (doctors) recorded the highest average working hours a week at 47 hours, 7 hours above the total average. Obstetricians had the second highest average work hours at 40 hours on average per week. Nurses and clinical officers recorded 39 hours on average, while radiographers recorded 30 hours on average.

FIGURE 2: AVERAGE WORKING HOURS BY PROFESSION

Q: How many hours a week do you work on average?



N = 384



"Medical officers (doctors) recorded the highest average working hours a week.

Level 2 facilities had the lowest average work week hours"

Level 2 facilities had the lowest average workweek hours (38) compared to other levels. Level 5 had 39 hours, while Levels 3, 4, and 6 both had 40 hours on average.

There exist very minimal differences in average working hours in facilities at both ownership type and categorization.

EARNING DISPARITIES ACROSS FACILITIES AND GENDER

KES 58,843

RESPONDENTS AVERAGE MONTHLY EARNINGS

HOW DOES EARNINGS VARY ACROSS FACILITIES?

Earnings comparison across facilities revealed the following:

- Public facilities had the highest average pay at KES 60,000.
- Faith-based institutions had the lowest at KES 38,000.
- Private facilities workers earned 48,000 on average monthly.

LEVEL 4 FACILITIES WORKERS WERE THE HIGHEST AVERAGE MONTHLY EARNERS (KES 68,393)

LEVEL 3 FACILITIES WORKERS WERE THE LOWEST AVERAGE MONTHLY EARNERS (KES 48,102)

GENDER-BASED EARNINGS DISPARITIES WERE FOUND TO BE MORE PREVALENT, WITH **MALE WORKERS EARNING UP TO KES 10,000 MORE** THAN FEMALES

TABLE 1: AVERAGE MONTHLY EARNINGS BY GENDER

Gender	Average monthly earnings (KES)
Female	55,173
Male	65,225

N = 315

Medical professionals who reported having undergone some form of ultrasound training recorded slightly higher earnings than those who hadn't done any training.

Average earnings comparison for those who have and haven't received training on ultrasound.

Not received training	**KES 58, 623**
Received training	**KES 60, 971**

N = 314

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EARNINGS COMPARISON ACROSS PROFESSIONS:

The pay of health professionals working the same job can be influenced by several factors, including location, experience, education, specialization, healthcare setting, unionization, market demand, additional skills, shifts, benefits, government regulations, performance, and economic conditions. Additionally, factors like shift differentials, union agreements, and government policies can further impact compensation.

WHAT RESEARCH SHOWS

N = 315

PROFESSIONALS IN PUBLIC FACILITIES EARN KES 20,000 MORE THAN PRIVATE FACILITIES AND KES 30,000 MORE THAN FAITH-BASED FACILITIES ON AVERAGE

Average earning for public facilities is around KES 60,000

MEDICAL OFFICERS (DOCTORS) ARE THE HIGHEST PAID PROFESSIONALS, WHILE COMMUNITY HEALTH VOLUNTEERS ARE THE LOWEST PAID

Medical doctors earn more than KES 140,000, while social workers earn KES 50,000 on average

MINOR DIFFERENCES IN EARNINGS OBSERVED FOR NURSES ACROSS THE VARIOUS TYPES OF FACILITIES

Nurses on average earn KES 53,500

CLINICAL OFFICERS IN PUBLIC FACILITIES EARN UP TO KES 40,000 MORE THAN THOSE IN FAITH-BASED FACILITIES

Clinical Officers in public facilities earn KES 72,000 while those in faith-based earn KES 31,000

ULTRASOUND TRAINING

The survey reveals a significant gap in the training of medical professionals across different facilities and professions with regards to the use of ultrasound equipment.

Private facilities had the highest proportion of respondents who had received training. Of the 42 private and faith based facilities, **31%** received training.

LACK OF ULTRASOUND TRAINING PROMINENT IN PUBLIC FACILITIES

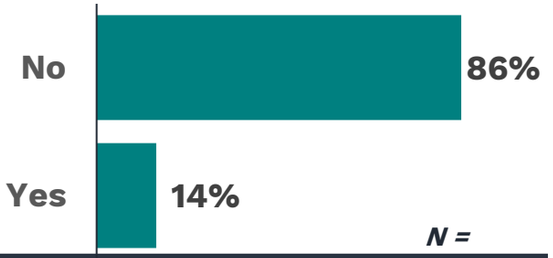
The lack of ultrasound training presented itself more prominently in public facilities. Of the 342 respondents from public facilities, only **12%** reported to have received ultrasound training.

86%

OF MEDICAL PROFESSIONALS HAVEN'T RECEIVED ULTRASOUND TRAINING FROM ALL FACILITIES

FIGURE 3: ULTRASOUND TRAINING AMONG MEDICAL PROFESSIONALS

Q: HAVE YOU BEEN TRAINED TO USE AN ULTRASOUND MACHINE



ULTRASOUND TRAINING BY YEARS OF EXPERIENCE

According to survey data, the majority of trained professionals in ultrasound have been in the healthcare profession for a duration ranging from 1 month to 10 years.

This group constitutes the largest proportion, accounting for 70% of the trained professionals in ultrasound. Additionally, 24% of the trained professionals in ultrasound had between 11 and 20 years of experience in maternal caregiving.

The data presented above illustrates the evolution in ultrasound training within educational institutions over the past decade. The limited ultrasound training observed among more experienced professionals may indicate that some seasoned experts have acquired their skills through practical experience rather than formal training, possibly due to a lack of opportunities or motivation for further education.

FIGURE 4: ULTRASOUND TRAINING BY YES, NO RESPONSES AND YEARS OF EXPERIENCE

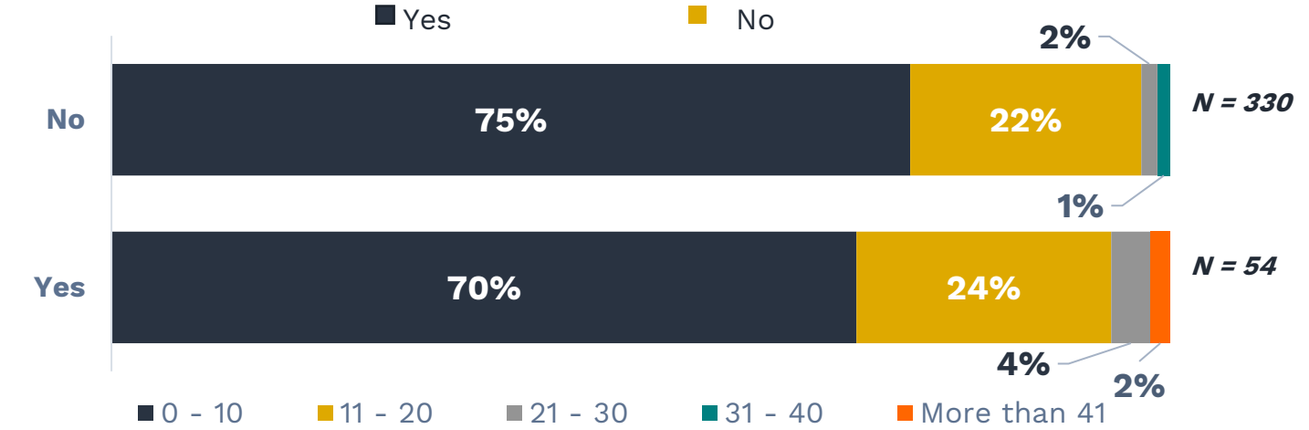
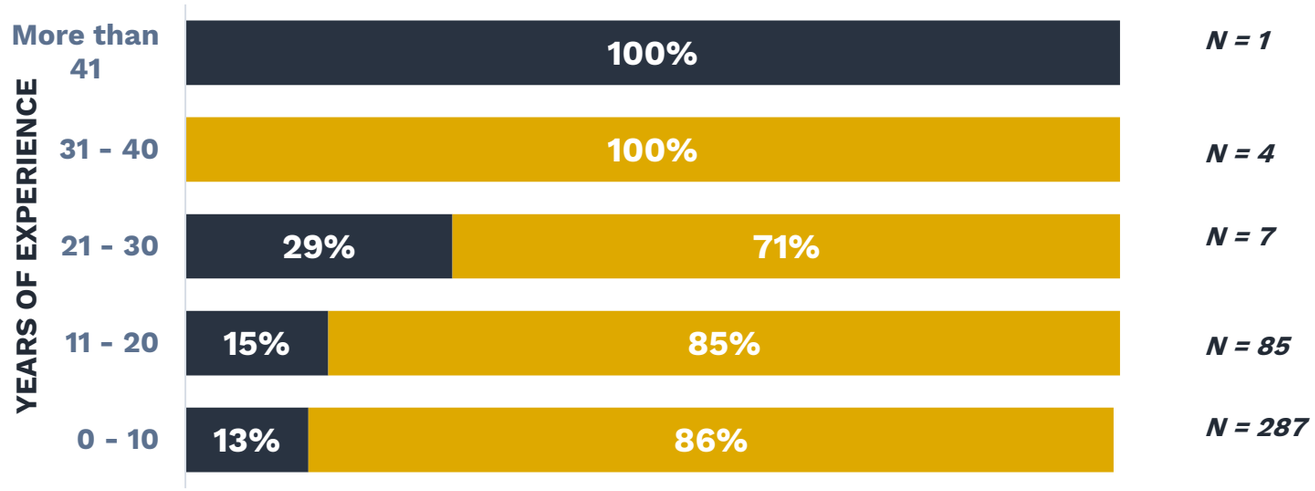


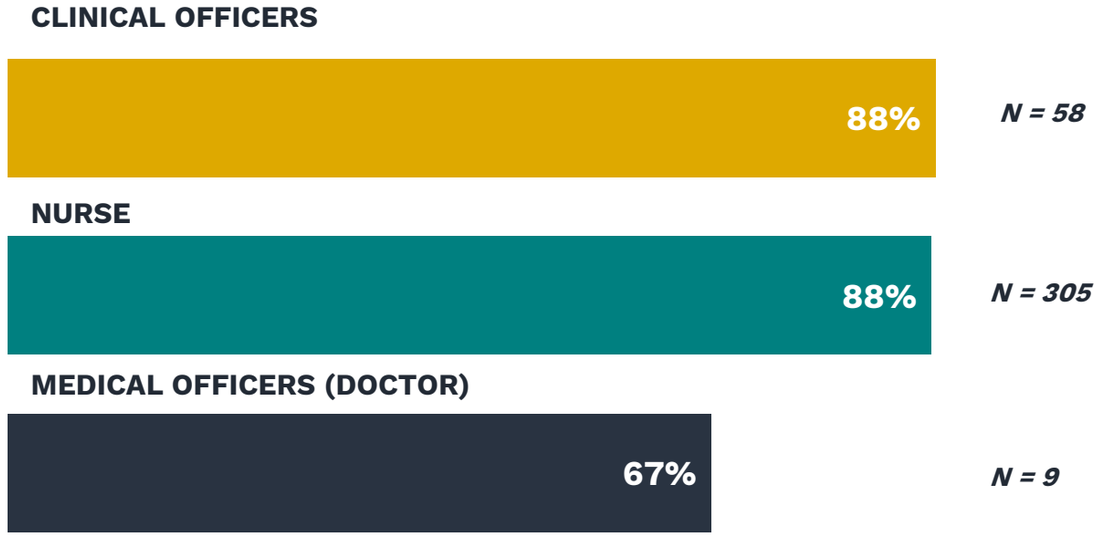
FIGURE 5: ULTRASOUND TRAINING AMONG PROFESSIONALS BY YEARS OF EXPERIENCE



Gender analysis reveals a more prominent lack of training in ultrasound among females compared to males**. Out of the 86% (330 respondents) of medical professionals with no ultrasound training, 68% (205 respondents) were female.**

Across professions, nurses and clinical officers had the highest proportion of untrained personnel in ultrasound, followed by medical officers (doctors).

FIGURE 6: PROPORTION OF MEDICAL PROFESSIONALS UNTRAINED ON ULTRASOUND, % OF EACH PROFESSION



Anecdotal data and the data represented above show that ultrasound training is not in the curricula of the vast majority of the respondents.

CERTIFICATION REMAINS LOW AMONG THOSE TRAINED

Only 14% of respondents (54 respondents) had received training in ultrasound. Of these, 44% have no certification (completion certificates) despite undergoing ultrasound training. Certification was higher in females (17 respondents) than in males (13 respondents).

Additionally, certification was high among staff in public facilities (25 respondents out of the total 54 who had received training). This indicates the need to channel certification towards both private and public facilities.

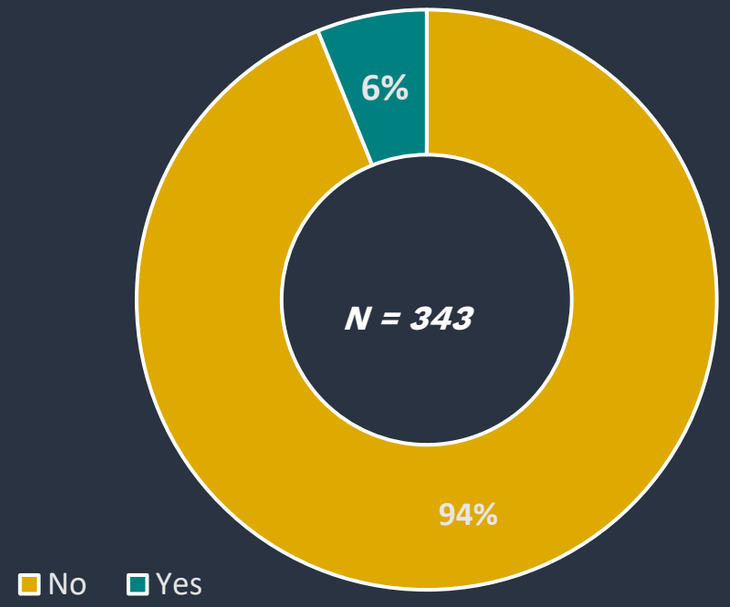
60%

OF MEDICAL PROFESSIONALS WHO RECEIVED ULTRASOUND TRAINING FEEL THEY STILL NEED MORE ULTRASOUND TRAINING TO BE PROFICIENT

THE DEMAND FOR ULTRASOUND TRAINING AMONG NON-IMAGING HEALTHCARE WORKERS

FIGURE 7: REGULAR ULTRASOUND TRAINING

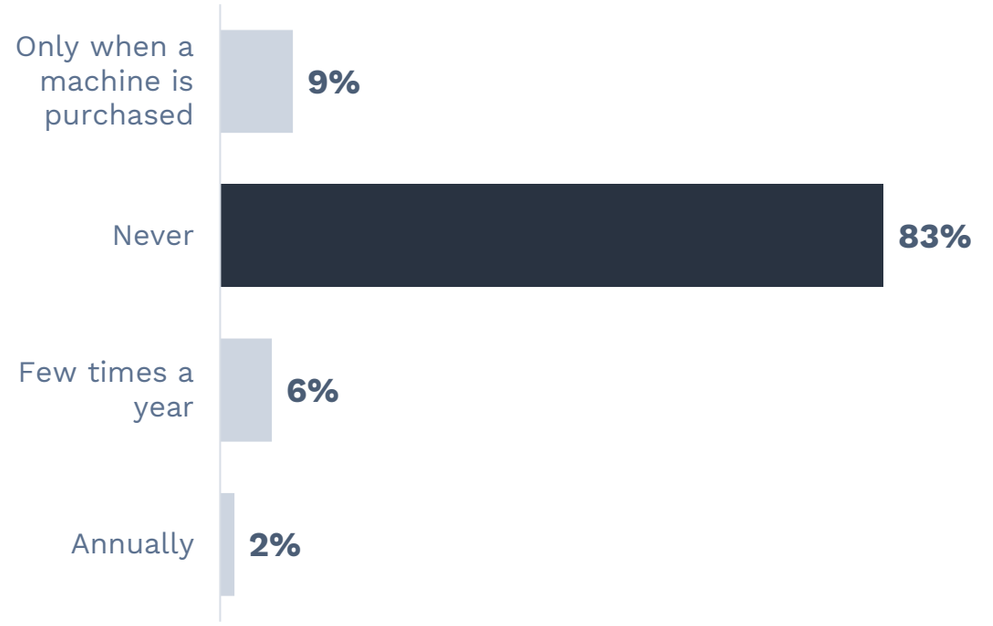
Q: Do you receive regular training on ultra sound usage and improvements in maternal care?



REGULAR TRAINING ON ULTRASOUND STILL AN ISSUE FOR THE HEALTH SECTOR

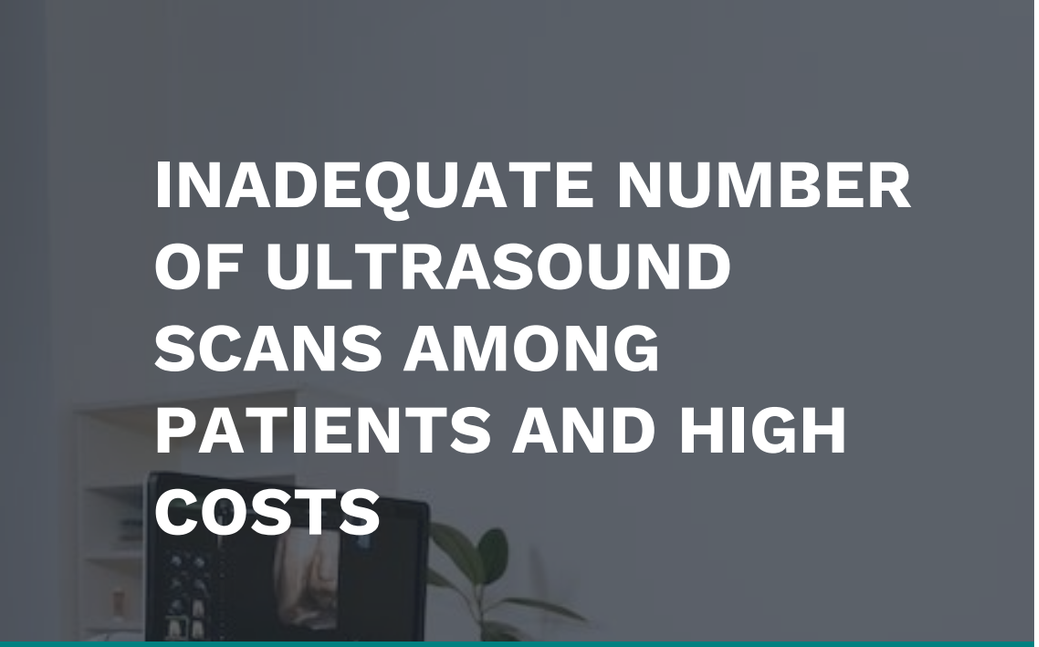
FIGURE 8: FREQUENCY OF ULTRASOUND TRAINING

Q: How often do healthcare professionals receive training updates on ultrasound usage?



N = 342

INADEQUATE NUMBER OF ULTRASOUND SCANS AMONG PATIENTS AND HIGH COSTS



KES 1000

AVERAGE PRICE FOR AN ULTRASOUND. PRIVATE FACILITIES CHARGE UP TO KES **2,350**

N = 185

ONLY 42% OF MATERNAL PATIENTS ON AVERAGE GO THROUGH AT LEAST ONE ULTRASOUND

The percentage of pregnant women who underwent at least one ultrasound scan during their pregnancy, as depicted above, falls short of the ideal level. This could be attributed to the prohibitively high cost, which is beyond the financial reach of many individuals.

The majority of hospitals charging for ultrasound were Level 4 (127 facilities), followed by Level 5 (34 facilities).

ULTRASOUND COST

On average, **the cost of an obstetric ultrasound was KES 1,000,** with private facilities charging up to KES 2,350, which is KES 1,000 more than public facilities. Faith-based facilities charge, on average, KES 1,750. Level 3 and Level 4 facilities charged approximately KES 900, below the total average, while Level 5 facilities on average charged **KES 1300** for similar services.

Approximately 7 in 10 facilities charge for an ultrasound service. This is despite the country's free maternity program which is meant to cover all pregnancy-related costs.

ADVOCATING FOR FREE ULTRASOUND

Greater efforts should be made to promote the availability of free ultrasound services for expectant mothers in public hospitals. This includes increasing awareness about the advantages of ultrasounds for both maternal and fetal health.

Furthermore, advocacy groups should collaborate with healthcare providers, community organizations, and policymakers to establish a united front in support of free ultrasounds. This collaborative approach can enhance the effectiveness of the message and generate a more influential call for change. Implementing incentives for healthcare providers can also serve as a motivating factor to encourage them to provide ultrasounds at no cost.

TOP TRAINING NEEDS IDENTIFIED BY MEDICAL PROFESSIONALS

The report identified some of the top training needs identified by medical professionals that would enable the better provision of quality care to patients (there were 324 responses)

1. Ultrasound training - 58% (187 responses)
2. Emergency care, including emergency obstetric care and emergency obstetric and neonatal care (EmOC and EmONC) - 55% (178 responses)
3. Neonatal and newborn care including resuscitation and Integrated Management of Childhood Illness (IMCI) - 30% (98 responses)
4. Family Planning, Reproductive health and infection prevention - 19% (61 responses)
5. Basic and Comprehensive Life Support, Advanced Cardiovascular Life Support (ACLS) - 14% (44 responses)
6. HIV and Prevention of Mother to Child Transmission (PMCT) - 8% (25 responses)
7. Post-Abortion Care - 7% (24 responses)
8. Antepartum Hemorrhage (APH) - 6% (21 responses)

TOP TRAINING NEEDS IDENTIFIED BY FACILITY ADMINISTRATORS

The report identified some of the top training needs identified by facility administrators and heads:

1. Emergency Obstetrics and Neonatal Care - 94%
2. BCLS/ACLS (Basic or Advanced Life Support) - 90%
3. Infection Control - 88%
4. Patient Safety - 84%
5. Community and Patient Education - 75%
6. Contraception - 74%
7. Record Keeping/Documentation - 71%
8. Disease prevention – 69%

** Training expectations between medical facility administrators and the surveyed medical professionals differ, highlighting the need for more advocacy in aligning the training needs.*

SUPPORT NETWORKS FOR MATERNITY STAFF

Many healthcare providers reported being part of a support network or community group to enhance their job skills. The majority of respondents who answered the question reported being part of such groups.

Some of these groups, such as the National Nurses Association of Kenya (NNAK) and Kenya Registered Nurse Anesthetists (KRNA), are professional associations that offer training and support to healthcare providers in their respective fields. Other groups, such as the Sub-County Health Management Team and Primary Health Care Networks, are government-led initiatives aimed at improving healthcare delivery in Kenya.

The respondents reported that these support networks and community groups helped them improve their skills and knowledge through training and mentorship opportunities, sharing of best practices, and networking with other healthcare providers. **Continuous Medical Education (CMEs), Group Antenatal Care (GANC), and Group Postnatal Care (GPNC) were some of the groups that were mentioned multiple times,** indicating their importance in providing ongoing education and support to healthcare providers.

In summary, the study underscored the significance of support networks and community organizations in enhancing the expertise and awareness of healthcare professionals in Kenya. Through the utilization of these groups, which have consistently offered education and assistance, healthcare providers have successfully enhanced the standard of maternal care and subsequently improved outcomes within the nation.

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KEY FINDINGS

Please note that the study did not differentiate between a general ultrasound and a point-of-care ultrasound (POCUS). Additionally, the type of ultrasound assessed in the study was not POCUS specifically.

POCUS - refers to portable ultrasound systems that allow the assessment of patients without requiring them to be physically present in a radiology department[1].

FOCUS AREA: ULTRASOUND USAGE

Key Finding #1: Detectable conditions that could be identified through an ultrasound scan are the third-highest cause of fetal mortalities – Detectable conditions (placental abnormalities, intrauterine growth restriction, multiple pregnancies, and hydrops fetalis) were the third highest cause of fetal mortality in the country (as indicated by 44% of facilities). This finding points to the need for at least one comprehensive obstetric ultrasound. This underscores the importance of accessing timely and comprehensive ultrasound services in prenatal care to identify and address potential complications that can impact fetal well-being.

Key Finding #2: Ultrasound access remains limited in rural areas – There is a 50% chance that a woman in a rural area will not receive an ultrasound during delivery demonstrating the significant access gap to ultrasound services despite the availability of handheld ultrasound equipment in those facilities.

This gap can be attributed to various factors, including transportation and geographical challenges, affordability and financial constraints, and the lack of awareness and education.

The cost of ultrasound scans, although comparatively lower in rural facilities, may still be prohibitively expensive for families residing in rural areas, particularly due to the high out-of-pocket payments.

Key Finding #3: Training on ultrasound is still a major challenge with no regulation of training or certification and no validation of professional competency - More than half (53%) of the facilities surveyed reported that they do not provide any form of ultrasound training to their staff, while 86% of medical professionals reported that they have not received any ultrasound-related training. The lack of training on ultrasound was more acute in public facilities, where 88% of respondents said they had no training on ultrasound. **Among facilities offering ultrasound training, 44% lack accreditation, raising quality and efficacy concerns that may impact patient outcomes. Additionally, 60% of trained medical professionals still feel the need for further training to use the technology effectively.**
The absence of standardized guidelines or certification requirements for ultrasound training poses the risk of inconsistent quality and competency among practitioners. There's therefore a need for accreditation of ultrasound-trained personnel with regular certification to maintain standards.

1. www.ncbi.nlm.nih.gov/pmc/articles/PMC6360013/

Key Finding #4: There is a need for skill transfer primarily from sonographers to other skilled, non-imaging healthcare workers who feel they require additional training for proficiency - Survey results suggest that while sonographers are the primary individuals likely to conduct and interpret ultrasounds, there is a growing demand for imaging services. To address this demand, there is potential for midwife nurses to perform the imaging, but the diagnosis should be carried out by radiologists. This approach ensures a broader distribution of imaging tasks, improving overall healthcare efficiency, reducing wait times, and facilitating the early identification and treatment of various maternal medical conditions. Additionally, it equips healthcare professionals with additional diagnostic tools, enabling them to offer more comprehensive care. There's a need to establish basic standards for training non-imaging healthcare workers especially those who feel they require additional training either due to a non-defined curriculum, training hours, or other reasons in ultrasound with regular certification.

Key Finding #5: Fetal evaluation (antenatal monitoring, profile assessments, and growth scans) and imaging services (X-ray and ultrasound) rank as the third and fourth most commonly referred services – The prevailing trend indicates that maternal patients are predominantly referred for fetal evaluation and imaging, primarily due to the limited accessibility of these services within healthcare facilities. This underscores the critical need to equip facilities with the necessary equipment. By addressing this shortage, the reliance on higher-level facilities is diminished, emphasizing the importance of enhancing local healthcare facilities' capacity to offer essential fetal evaluation and imaging services.

Key Finding #6: Severe bleeding especially after birth was the leading cause of maternal mortalities- Survey data underscores the critical impact of postpartum hemorrhage on maternal health outcomes. Instances of severe bleeding after birth were identified as the primary factor contributing to maternal deaths, highlighting the urgency for targeted interventions and heightened medical attention during the postpartum period. Furthermore, the survey also brought to light another significant contributor to maternal mortalities, namely detectable conditions identifiable through ultrasound scans. These conditions, when left unaddressed, contribute to maternal deaths and rank as the fourth leading cause. This dual revelation underscores the multifaceted nature of challenges faced in maternal healthcare

Key Finding #7: Emergency obstetrics and neonatal care was the top training need identified by facilities– Facilities have identified emergency obstetrics and neonatal care as the top training need for their birthing, obstetric, gynecological care departments (94% of facilities). The second top training need for these departments was Basic or Advanced Life Support (BCLS/ACLS).

FOCUS AREA: STAFF SHORTAGES

Key Finding #8: Nurses and midwives were the most short-staffed in facilities - While KNBS data shows a consistent annual increase in the number of nurses, the survey reveals persistent shortages in the field, with 76% of healthcare facilities reporting understaffing. The survey also underscores a nationwide shortage of medical professionals in all areas, leading to extended patient wait times, increased costs, and potential declines in health outcomes.

Additionally, this underscores the difficulty healthcare facilities encounter in recruiting additional staff, whether due to limited funds, perceived lack of necessity, or the unavailability of skilled medical professionals.

FOCUS AREA: MORTALITIES AND COMPLICATIONS

Key Finding #9: Higher mortality among marginalized communities – Marginalized counties have reported a higher than average number of maternal and fetal mortalities. The survey shows that the counties of Turkana and Wajir have recorded a higher than average number of maternal deaths per admission, while West Pokot reported a higher than average number of fetal deaths.

Even though the small sample size in these counties may have contributed to these findings, more research on the availability of maternal care and the use of ultrasound is necessary in these areas.

Key Finding #10: Maternal complications are still an issue within medical facilities – The incidence of maternal complication-related deaths was notably elevated in urban healthcare facilities, potentially attributed to the overwhelming patient load, insufficient medical staffing levels, and extended waiting times.

FOCUS AREA: REVENUES AND EQUIPMENT FINANCING

Key Finding #11: OOP and donor funding levels highest in rural facilities – While public insurance and government schemes constituted the primary revenue sources, rural facilities generated the second-largest share of their revenue from out-of-pocket expenses (OOP). This underscores the limited adoption of national health insurance in rural areas. OOP and donor funding played a more significant role in rural facilities, likely reflecting the lower number of women covered by national insurance in these regions.

The low coverage of national insurance in rural areas can be attributed to factors such as low income levels and insufficient awareness and education regarding the free maternity schemes and insurance.

63% of total donor funds went to rural facilities. Donor funding has been prevalent in the country to fund critical health programs such as maternal and child health, HIV/AIDS, malaria, and tuberculosis.

Key Finding #12: The cost of medical equipment is too high - Only 44% of facilities felt that medical equipment was affordable.

Key Finding #13: Investment in medical equipment remained low in Level 3 facilities and rural facilities – Urban and semi-urban facilities made up 86% of total investments in medical equipment in 2022. Level 3 facilities recorded the lowest average investment in maternity equipment. Level 5 had the highest investment and still had the highest expected investment.

Key Finding #14: Labor ward equipment is the top priority purchase for all facilities - Most facilities are planning to invest in labor ward equipment. However, labor operating theater equipment will be the least purchased by facilities (68% of facilities), possibly due to the high cost of these equipment.

Key Finding #15: Higher facility revenue brackets are dominated by Level 5 facilities – Over 50% of Level 5 facilities reported revenues exceeding KES 100M, whereas Level 3 and 4 facilities primarily fell within lower revenue brackets, with 75% of them earning less than KES 10M. Regarding maternity unit revenues, Level 4 facilities mainly generated incomes ranging from KES 25M to KES 50M, while those ranging from KES 50M to KES 150M were predominantly reported by Level 5 facilities.

RECOMMENDATIONS

SDG 3: Access to ultrasound services directly contributes to improving maternal and child health, which is a key target under Goal 3.

Please note that the study did not differentiate between a general ultrasound and a point-of-care ultrasound (POCUS). Additionally, the type of ultrasound assessed in the study was not POCUS specifically.

POCUS - refers to portable ultrasound systems that allow the assessment of patients without requiring them to be physically present in a radiology department[1].

Study based Recommendations

Theoretical Recommendations

Recommendation #1: Addressing the issue of ultrasound training, competency validation, and regulation of training and certification

1. **Develop a national policy for ultrasound training and certification:** We recommend creating a national policy for ultrasound training and certification with specific curriculum, training, and clinical standards. Additionally, establish collaboration among the Ministry of Health's Maternal Health and Reproduction unit, medical councils, training bodies, and external authorities. This collaborative effort would be instrumental in overseeing training programs, validating competency, managing certification processes, and regulating ultrasound practice, training, and professional development.

2. **Strengthen regulatory oversight:** Enhance regulatory bodies tasked with robustly overseeing and enforcing standards concerning competency validation, training, and certification within the field of ultrasound.

3. **Ensure ongoing professional development:** It is advisable to mandate and incentivize healthcare professionals with ultrasound training to actively engage in continuous professional development, aiming to enhance and sustain their skills. To ensure this, there may be a need for financial assistance for these programs, and healthcare facilities should be obliged to enable their staff's participation.

4. **Incorporate ultrasound training into healthcare professional education with emphasis on both technical and clinical applications:** The primary goal is to ensure that at least all medical professionals receive, as a minimum requirement, foundational training in ultrasound, enabling them to proficiently conduct basic scans and provide these for further diagnosis by radiologists, with further training provided on an ongoing basis.

Recommendation #2: Addressing the issue of short-staffed nurses and midwives in facilities:

1. **Increase funding for nursing and midwifery education programs** to attract and retain more qualified professionals in the field.

1. www.ncbi.nlm.nih.gov/pmc/articles/PMC6360013/

2. **Create policies that require healthcare facilities to maintain adequate staffing levels** of nurses and midwives and enforce these policies through regular inspections and penalties for non-compliance.

Recommendation #3: Addressing long wait times for maternal patients

The type of ultrasound used by facilities in the study was not POCUS but regular obstetric ultrasounds are performed by sonographers.

1. **Point-of-Care Ultrasound (POCUS):** POCUS refers to portable ultrasound systems that allow the assessment of patients without requiring them to be physically present in a radiology department. This can be achieved through:

    a) Developing and disseminating clinical guidelines and protocols for POCUS use in various medical specialties and ensuring that guidelines are evidence-based and regularly updated.

    b) Incorporation of POCUS training into medical and healthcare education curricula to prepare future professionals for its use and collaboration with medical schools to promote the inclusion of POCUS in their programs.

    c) Promoting collaboration between different medical specialties to share POCUS expertise and experiences and encouraging interdisciplinary training and case discussions.

    d) Educating patients about the benefits of POCUS in improving diagnostic accuracy and decision-making, as well as addressing patient concerns and providing information about the safety of POCUS.

    e) Ensuring radiologists provide oversight to the training and practice of ultrasound

    f) Foster a culture of continual improvement by encouraging healthcare organizations to regularly assess and refine their POCUS programs.

*A study titled "**Point of Care Obstetric Ultrasound Training for Midwives and Nurses**" revealed a highly positive experience among trainees. The overwhelmingly positive experience from trainees underscores the importance of point of care obstetric ultrasound in delivering imaging services[1].*

*Another pilot study, titled "**Point of Care Obstetric Ultrasound Knowledge Retention Among Midwives Following a Training Program: A Prospective Cohort Pilot Study**," concluded that training midwives in point-of-care obstetric ultrasound can lead to acceptable levels of knowledge retention. Training was done for six weeks, and assessments were done after six months. The mean exam score (out of 50) was 44.2 at the end of the training and 42.9 at the 6-month follow-up. This retention facilitates midwives in applying the acquired knowledge when making routine clinical decisions related to pregnant women[2].*

Recommendation #4: Improving regularity and accessibility of ultrasound training to maternal caregivers

1. **Establish continuing education programs and schedule regular training sessions:** Healthcare facilities should establish continuous and mandatory continuing education programs for professionals who use ultrasound including regular workshops, seminars, and online courses.

2. **Performance improvement teams:** Establish interdisciplinary teams focused on performance improvement in ultrasound.

*A pilot study in China, dubbed "**A National Quality Improvement Program on Ultrasound Departments in China**," observed an improvement in the outcome indicators of diagnostic accuracy and positive rate[3]*

1. https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-023-06569-8
2. https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-023-05429-4
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9819884/

Recommendation #5: Addressing constrained access to ultrasound services in rural areas and low service rates in rural facilities

1. **Public-private partnerships:** Collaborate with private healthcare providers or NGOs to expand ultrasound services in rural areas. Public-private partnerships can help bridge the gap and bring expertise and resources to rural communities.

2. **Subsidized equipment:** Provide subsidies or financial incentives for healthcare facilities in rural areas to acquire ultrasound equipment. This will make it easier for these facilities to invest in modern and portable ultrasound devices.

3. **Public awareness and education:** Launch public awareness campaigns to educate rural communities about the benefits of ultrasound services and the importance of prenatal and maternal care.

4. **Increase funding for rural healthcare:** Increase budget allocation to rural healthcare to improve infrastructure and attract qualified medical professionals to work in rural areas.

5. **Improve access to medical equipment** and technology, such as ultrasound machines and telemedicine, in rural facilities. This can help improve the quality of care provided and increase the number of patients served.

Recommendation #6: Addressing the issue of majority of individuals conducting ultrasound examinations being available on an 'on-demand' basis

1. **Cross-training:** Consider cross-training medical professionals working with maternal care patients, excluding community health workers, to perform ultrasound examinations. This can increase the pool of qualified personnel and reduce reliance on 'on-demand' availability. All the cross-training should be overseen by radiologists to avoid the risk of misdiagnosis.

2. **Task sharing:** This involves sharing certain aspects of ultrasound-related activities with medical professionals working with maternal care patients who may not be radiologists or sonographers but are under the supervision of radiologists who make the final diagnosis. While task sharing can be beneficial in expanding healthcare reach, it should be implemented carefully to ensure that the individuals taking on these tasks are adequately trained, supervised, and supported. The healthcare worker trained in ultrasound should have defined competencies and bear responsibility.

*A study titled "**The training of midwives to perform obstetric ultrasound scans in Africa for task shifting and extension of scope of practice: a scoping review**" showed the need to incorporate obstetric ultrasound scans as part of the scope of practice of midwives[1].*

3. **Telemedicine and tele-ultrasound:** Explore the use of telemedicine and tele-ultrasound services, which allow remote experts to assist with ultrasound examinations in real-time.

4. **Staffing models:** Review and adjust staffing models to ensure a more consistent and readily available ultrasound workforce. This may involve hiring additional qualified personnel or adjusting work schedules to meet demand.

Recommendation #7: Addressing the issue of detectable conditions that could be identified through ultrasound scans being the third leading cause of fetal mortalities and the fourth leading cause of maternal mortalities

1. **Lower cost of ultrasounds:** As the cost of ultrasounds is currently higher in rural facilities, policies should be developed to lower the cost of ultrasound machines in these areas. This could include subsidies or tax exemptions for facilities purchasing ultrasound machines or reducing tariffs on imported machines.

1. https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-023-04647-w

Recommendation #8: Addressing the issue of high OOP and donor funding in rural areas –

1. **Expansion of national health insurance coverage:** There is a need to increase the number of women covered by national insurance in rural areas. This can be achieved through the expansion of health insurance schemes, subsidies, and waivers.

2. **Incentives for private insurance providers:** The government should provide incentives for private insurance providers to expand their coverage to rural areas. This can be achieved through tax breaks or subsidies for insurance providers that offer affordable and comprehensive coverage to women in rural areas.

3. **Strengthening of public-private partnerships:** The government can collaborate with private sector partners to improve the availability and affordability of maternal health services in rural areas.

Recommendation #9: Addressing the high cost of equipment

1. **Group or shared purchasing:** Healthcare facilities can form partnerships to negotiate lower prices from suppliers by leveraging their collective buying power.

2. **Import duty waivers:** Import duties and taxes can significantly increase the cost of medical equipment. Governments can waive import duties and taxes on medical equipment to reduce costs for healthcare facilities.

3. **Technology transfer:** Governments can partner with medical equipment manufacturers to establish local manufacturing facilities or technology transfer agreements, which can reduce the cost of medical equipment.

4. **Rental programs:** Healthcare facilities can rent medical equipment instead of purchasing it outright, which can help spread out the cost and make it more affordable.

Recommendation #10: Addressing the pay gap between males and females

The pay of health professionals working the same job can be influenced by several factors, including location, experience, education, specialization, healthcare setting, unionization, market demand, etc.

1. **Conducting a gender pay gap analysis** to identify disparities in pay and bonuses based on gender. This analysis can be done within the healthcare system and across the public and private sectors to determine the extent of the issue.

2. **Implementing policies that ensure equal pay for equal work**, regardless of gender. This could include setting up a standardized pay scale, eliminating salary negotiations that can lead to bias, and mandating salary transparency.

3. **Providing professional development and mentorship opportunities for women in the medical profession** to help them advance their careers and increase their earning potential.

4. **Developing policies to address the underlying systemic issues** that contribute to gender disparities in pay, such as unconscious bias in hiring and promotion practices.

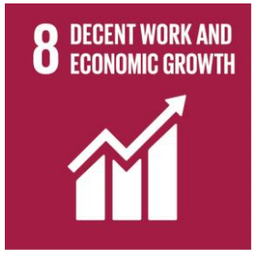
Recommendation #11: Addressing high mortalities among marginalized communities and handling of maternal complications

1. **Implement targeted health interventions by creating tailored healthcare programs:** These initiatives should deliver healthcare services directly to communities with limited access to facilities, ensuring on-call medical professionals are physically present with remote support.
2. **Strengthen referral systems:** Improve referral systems between health facilities to ensure patients receive appropriate care promptly, especially for high-risk pregnancies and maternal complications. This can include the development of transportation networks and communication systems between facilities.

SPECIFIC SDGs THAT APPLY TO THIS STUDY

SDG 1: Improved access to healthcare services, including ultrasound, can help reduce healthcare-related expenses for rural communities, contributing to the alleviation of poverty (Goal 1).

SDG 4: Training and workforce development initiatives align with Goal 4, as they aim to provide quality education and skills development to healthcare professionals, especially in rural areas.



SDG 8: Investments in training and workforce development can lead to the creation of job opportunities and economic growth in rural healthcare sectors.

SDG 9: Investment in telemedicine and tele-ultrasound contributes to the development of infrastructure and innovation in healthcare delivery.

SUSTAINABLE DEVELOPMENT GOALS THAT WILL BE MET THROUGH IMPLEMENTING THE RECOMMENDATIONS

CALL TO ACTION

The number of expectant mothers seeking maternal and neonatal health services has significantly increased under Linda Mama. As a result, there has been a notable improvement in maternal and neonatal indicators, leading to a reduction in maternal and infant deaths. Although the program has been successful in improving maternal and child health outcomes in Kenya, challenges still remain.

WHAT WILL SUCCESS LOOK LIKE FOR ENSURING ACCESS TO MATERNAL CARE IN KENYA?

1. **Improving vital statistics in key areas** like maternal mortality, under-5 and infant mortality, and increased proportion of births attended to by skilled attendants especially in rural areas. Additionally, an improvement of contraceptive prevalence rate indicating women have access to family planning services.
2. **Improving Antenatal Care Coverage (ANC) -** an increase in number of women who receive ANC at least once during their pregnancy.
3. **Clients satisfaction** – with pregnant women agreeing that the maternal care services offered meet their needs.

RECOMMENDATIONS

1. To The Ministry of Health...

- Work with the Government of Kenya to consider making amendments to the Public Finance Management Act to ensure that health facilities have the autonomy to spend the Linda Mama funds according to their priorities.
- Better communication of policies to facilities, including areas like service coverage and reimbursements.
- Work with NHIF to ensure timely disbursement of funds as well as timely reimbursements for better service delivery.
- Support research and innovation in the provision of maternal and neonatal health services. This can include funding research on best practices and innovative solutions, supporting the development of new technologies, and promoting collaboration with other stakeholders.

2. To NHIF...

- Consider setting up a stable and reliable e-platform system for lodging claims to allow efficiency when registering and lodging claims.
- As a strategic purchaser, consider the active use of Linda Mama data as well as monitoring the quality of care under the program.

3. To County Departments of Health...

- Work with facilities to ensure adequate hardware is available for user registration, patient admission, and claim reimbursement.
- Advocate for resources to support the provision of maternal and neonatal health services. This can include advocating for increased funding as well as working with other stakeholders to mobilize resources and support for the program.
- Monitoring and evaluation: The county departments of health can monitor and evaluate the performance of the free maternity services program in their respective counties. This can include collecting data on the number of women who access services, the types of services received, and the outcomes of care. This data can be used to identify areas for improvement and inform policy decisions.

4. To The National Government...

- Ensure **adequate funding for** free maternity services, including timely disbursement to necessary bodies.
- Ensure that **health facilities are equipped with the necessary equipment and supplies** to provide quality maternal and neonatal health services. This includes providing facilities with modern equipment such as ultrasound machines, delivery beds, and incubators.
- **Strengthen human resource capacity**: Ensure that there are enough skilled health workers, such as midwives, obstetricians, and nurses, who are trained to provide quality maternal and neonatal health services.
- **Improve data collection and analysis**: Ensure that there is a robust system for data collection and analysis to monitor the program's performance. This includes establishing a comprehensive database for tracking maternal and neonatal health indicators and using the data to inform policy and pragmatic decisions.
- **Address systemic barriers** that prevent women from accessing maternal and neonatal health services. This includes addressing gender inequality, ensuring that health facilities are accessible and geographically located close to where women live, and reducing financial barriers to care.

CALL TO ACTION TO THE MOH ON THE USE OF POCUS

PROBLEM #1: NO POLICIES OUTLINING POCUS FOR OBSTETRIC CARE FOR MEDICAL PROFESSIONALS

Call to Action #1: A National Policy Direction

Currently, there is a lack of policies regarding the use of POCUS (Point-of-Care Ultrasound) in obstetric care for medical officers (doctors), midwives, and clinical officers. As a result, there is a need to create a policy brief that outlines which health cadres should be responsible for screening and what specific areas need to be screened. It is essential that the MNCH (Maternal, Newborn, and Child Health) policy align with the POCUS policy brief to ensure proper implementation at the primary healthcare level.

While there is a referral system in place, it currently does not include clear referral pathways for POCUS. To address this issue, the policy should be updated to incorporate the scope of POCUS service delivery across different levels of the healthcare system, including referral structures. This will ensure that patients in need of POCUS services can be effectively and efficiently referred to the appropriate level of care.

This policy formulation will follow this path from formulation to approval:

- Define multi-stakeholders to be involved in the process and time frame.
- A policy brief anchored on an existing policy needs to be developed (RMNCAH, HRH) - Defining the scope of practice, outlining training requirements and oversight, outlining skills validation and certification, and defining clinical practice and referral pathways.
- Compilation of draft document.
- Third-party review (KHPOA, COG, MOH).
- Submission to MOH.
- Monitoring and Evaluation to measure the impact.

PROBLEM #2: NO STANDARDIZED APPROVED AND REGULATED CURRICULUM IN POCUS

Call to Action #1: Curriculum, Training, and Certification

To address this challenge, an action plan must be developed to establish a national curriculum for POCUS training and certification that is linked to national policy. This plan should be implemented across all public, private, and faith-based healthcare institutions. Currently, several training modules are being delivered by various stakeholders, but there is a need for cross-cadre alignment and national endorsement to expand the skills of healthcare providers.

By creating a standardized curriculum and certification process, healthcare providers will be better equipped to provide high-quality obstetric care using POCUS.
The following can be done:

- Conduct a training needs assessment among the target end users (medical officers, nurses, midwives, and clinical officers).
- Review existing results from baseline studies that have been conducted within our set or similar environments.
- Engage the regulatory bodies and professional associations to define the scope of practice and to inform syllabus and curriculum development.
- Design delivery methods i.e., short-term courses or electives and long-term inclusion in the overall syllabus; didactic and hands-on training augmented with virtual learning.
- Quality assurance by linking training to certification, professional development, and annual competency training through the issuance of CPD points.
- Support supervision to ensure alignment from the national level to the county level (M&E).
- Implement protocols and publish results.

These are based on the taskforce meeting on policy development at AMREF University on 28TH FEBRUARY 2023.

APPENDIX

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HEALTHCARE LANDSCAPE

In its broadest sense, Kenya's healthcare system comprises public and private healthcare and is administered at four levels: national, county, sub-county, and community level. Health is among the 14 devolved functions of county governments as provided for in the Constitution of 2010.

Kenya's health sector is comprised of three ownership systems: government owned, private-owned, and NGOs. Kenya's mission as a country is to achieve Universal Health Coverage (UHC) to ensure everyone has access to quality and affordable healthcare services.

The government provides public health insurance through the National Health Insurance Fund, which has 23.4 million members with member contributions of KES 60.8B (KNBS Survey)[1].

- Kenya's health sector is comprised of three ownership system; government owned, private-owned and NGOs.
- The government provides public health insurance through the National Health Insurance Fund which has 23.4 million members[1].
- The structure of the Kenyan healthcare system has changed over the years to what it is today.

- Kenya's healthcare system comprises public and private healthcare and is administered at four levels; national, county, sub-county and community level.

HEALTHCARE STRUCTURE CHANGES IN KENYA

FIGURE 1: HEALTHCARE SYSTEM STRUCTURE CHANGES

NHSSP 1994—2004

Level 1	Level 2	Level 3	Level 4
Health Centers and Dispensaries	District Hospitals	Provincial General Hospitals	National Referral Hospitals

Kenya Health Policy 2014—2030

Level 1	Level 2	Level 3	Level 4	Level 5
Community (village, households, families, individuals)	Dispensaries and Clinics	Health Centers, Maternities, Nursing homes	Primary Hospitals	Tertiary Hospitals

Current Health System Structure

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Community services	Dispensaries and clinics	Health centers, maternity and nursing homes	Sub county hospitals and medium sized private hospitals	County referral hospital and large private hospitals	National referral hospitals and large private teaching hospitals.

1. https://www.knbs.or.ke/wp-content/uploads/2022/05/2022-Economic-Survey1.pdf

HEALTHCARE PROFESSIONALS IN KENYA: THE RISING NUMBERS

Radiologists: Medical doctors who specialize in diagnosing and treating conditions using imaging equipment.

Radiographers: Test and operate radiographic, ultrasound and other medical imaging equipment to produce images of body structures for the diagnosis and treatment of injury, disease and other impairments. [1]

Sonographer: A person specializing in diagnostic medical procedure that uses high-frequency sound waves (ultrasound) to produce dynamic visual images of organs, tissues or blood flow inside the body *(Findlay)*

Nurse: A nurse is a person who has completed a basic, generalized nursing education program and is authorized by the appropriate regulatory authority to practice nursing in his or her country[2]

Midwife: A person who has successfully completed midwifery education programme based on the essential competences for basic midwifery practice according to global standards of midwifery education and is recognized and licensed in the country of origin [2]

Medical officer (doctor): Diagnose, treat and prevent illness, disease, injury, and other physical and mental impairments and maintain general health in humans through application of the principles and procedures of modern medicine[3]

- **Clinical Officer:** A person who, having successfully undergone a prescribed course of training in an approved training institution, is a holder of a certificate issued by that institution and is registered under the Clinical Officers Act[3]
- **Nurse Midwife:** A registered nurse who is also a registered midwife[2].
- **Clinical midwife:** This is a personal classification of a registered nurse or midwife recognising expert knowledge and practice in a particular clinical speciality *(Cabrini).*
- **Anesthetist:** Anesthesiology, or anesthesia is the medical specialty concerned with the total perioperative care of patients before, during, and after surgery.
- **Matron:** A senior nurse who is responsible for overseeing all of the nurses.
- **Skilled Birth Attendants:** An accredited health professional who has been educated and trained in the skills needed to manage normal pregnancies and childbirth.

THE NUMBERS

Kenya has been recording an increase in the number of healthcare professionals across all categories. This has also been the case for the proportion of registered professionals per 100,000 population in all cadres except for dentists. The total number of registered doctors and dentists has grown from 12,133 in 2017 to 14,772 in 2021. The number of registered nurses in 2021 stood at 76,878, while graduate nurses were 38,776 in the same year. Although the country registered an increase in these numbers, there is a shortage of health professionals, particularly in rural areas. The most significant shortage is of doctors, nurses, and midwives, which limits the ability of the health system to deliver quality health services.

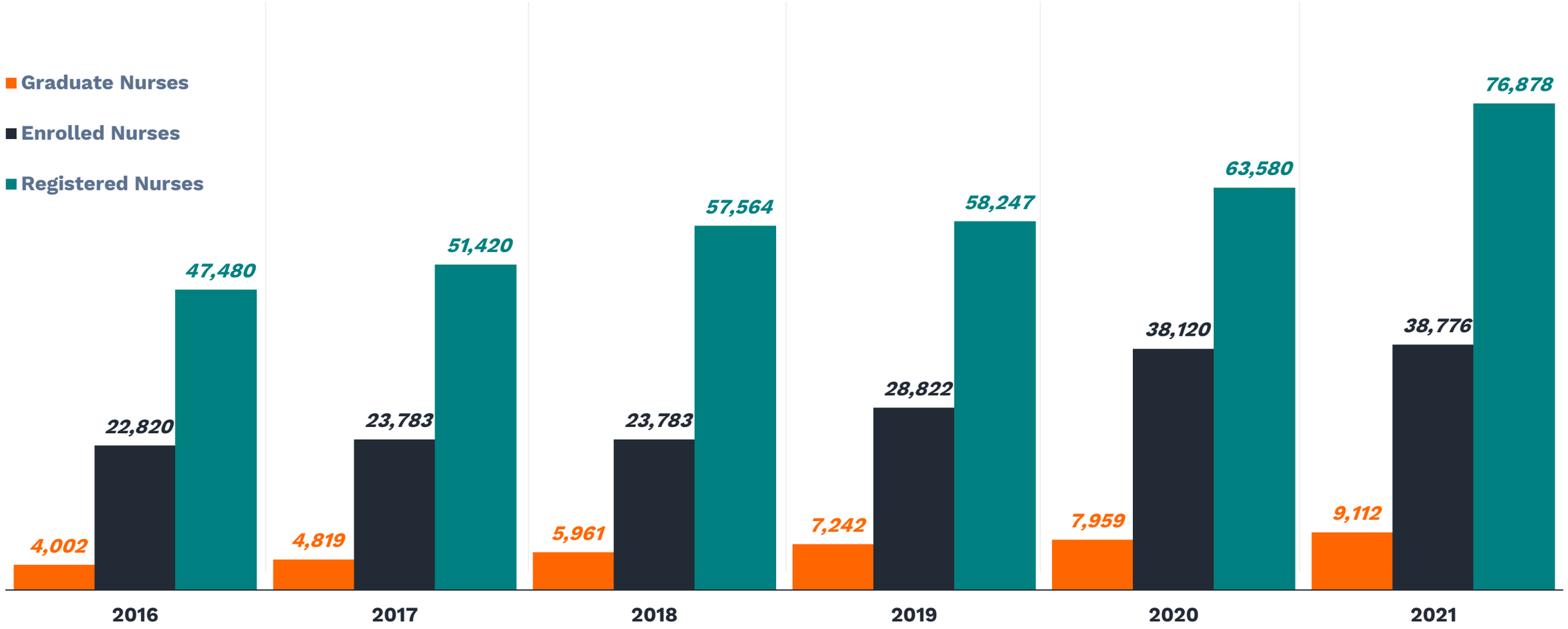
Kenya's medical professionals proportion per 100,000 population still remains below the recommended level by the WHO. Registered nurses had the highest ratio of 155.9 per 100,000 population, while physiotherapists had the lowest ratio at 0.7 per 100,000 population in 2021. Kenya has 27 medical officers per 100,000 population which is below the prescribed ratio of 100 per 100,000 population. Kenya has made efforts to address this shortage by increasing the number of health training institutions and providing incentives for health professionals to work in underserved areas.

Figures based on KNBS Survey 2022[1] and the KDHS 2022 Survey data[2]

1. WHO
2. http://kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=CAP.%20257
3. https://www.who.int/publications/m/item/classifying-health-workers
4. http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/ClinicalOfficers_Training_RegistrationandLicensing_No20ofAct__2017.pdf

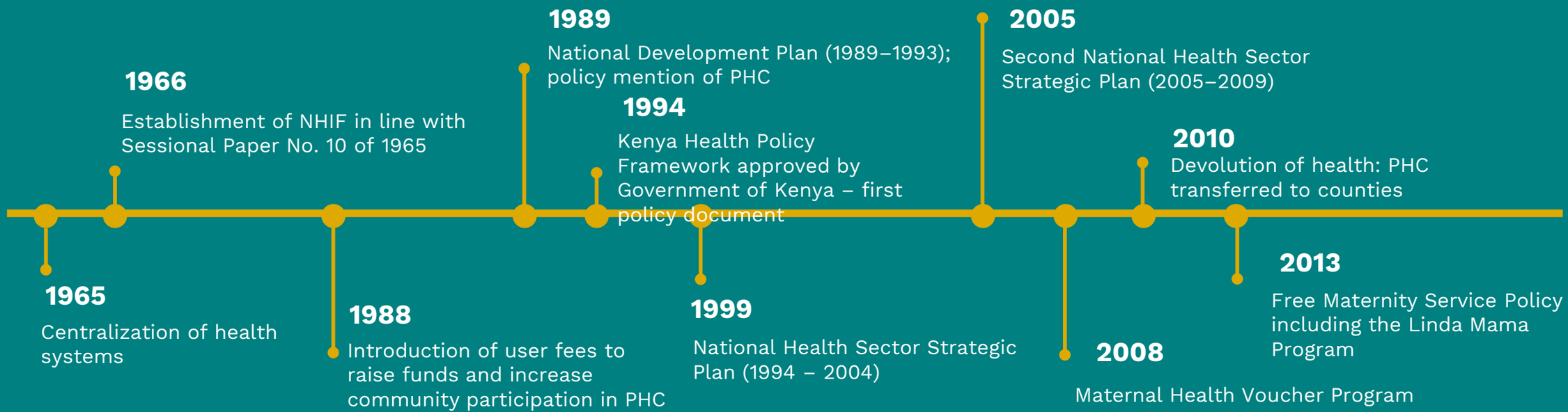
There has been a near twofold increase in the number of nurse graduates between 2016/17 and 2020/21, from 4,002 to 7,959. These graduates are spread across certificates, diplomas, and higher diplomas and degree programs. There has also been an increase in the number of enrolled nurses and registered nurses between 2016 and 2021.

FIGURE 2: NUMBER OF NURSES IN KENYA[1]



1. https://www.knbs.or.ke/wp-content/uploads/2022/05/2022-Economic-Survey1.pdf

THE KENYAN HEALTHCARE SYSTEM TIMELINE



Efforts to operationalize the Primary Healthcare in Kenya started soon after independence...

... but it wasn't until the 1980s that actionable strategies emerged, **emphasizing decentralization, intersectoral collaboration and community participation** in health.

The first Health Policy Framework wasn't established until 1994...

... after which many more policy documents were established and adopted. The devolution of health in 2010 saw the introduction of **free maternity services and the abolition of user fees in maternity.**

After 2013, ...

...the country came up with **several policy documents** to help strengthen provision of Healthcare and achieve UHC in the country.

HEALTH CARE POLICY LANDSCAPE

1. THE KENYAN CONSTITUTION

The 1969 Constitution of **Kenya made no provision for the right to health**. However, the Constitution did allow the state to limit or exclude the rights of individual citizens for public health reasons. It wasn't until the Kenyan Constitution of 2010 that the exclusive right to health was declared and recognized.

The **right to health is a foundational right that is guaranteed in the Kenyan Constitution of 2010** under Article 43 (1)(a). The article declares that "Every person has the right to the highest attainable standard of health, which includes the right to healthcare services, including reproductive healthcare." The article further explains that "A person shall not be denied emergency medical treatment."

"Every person has the right to the highest attainable standard of health, which includes the right to healthcare services, including reproductive healthcare. "

"A person shall not be denied emergency medical treatment."

2. KENYA COMMUNITY HEALTH STRATEGY (2014 – 2019)

This sought to streamline the implementation of community health services in the country. It serves as the backbone on which the Community Health Strategy (2020–2025) was built.

The policy provides a roadmap for improving health systems and the realization of the UHC.

3. KENYA HEALTH POLICY (2014 – 2030)

This policy provides guidelines for the formation of policies and the implementation of programs towards the realization of UHC by the government by 2030.

4. KENYA HEALTH SECTOR STRATEGIC PLAN 2018 – 2023

Dubbed the KHSSP, the plan provided a framework for investing in primary healthcare in line with the Astana Declaration on Primary Health Care [1]. Some of the key areas stressed are the increase in the number of community health extension workers and volunteers and the use of the KMTC curriculum to train health assistants.

5. KENYA PHC STRATEGIC FRAMEWORK (2019 – 2024)

Developed in line with the Constitution and the Kenya Health Policy Framework 2014–2030, the framework provides guidelines for the implementation and design of programs that seek to strengthen PHC.

1. https://www.who.int/docs/default-source/primary-health/declaration/gcphc-declaration.pdf

HEALTHCARE STATISTICS

WHAT ARE THE NUMBERS?

How does Kenya rank in Africa and the World?

3rd

Most improved Healthcare system in Africa in 2020 after South Africa (1st) and Tunisia (2nd)[1]

3rd

In Africa in the Global Health Security Index 2021 after South Africa and Mauritius[1]

84th

In the word in the Global Health Security Index 2021[1]

AFRICA		GLOBAL
5th	THE HOLOGIC GLOBAL WOMEN'S HEALTH INDEX[2]	72nd
33rd	GLOBAL RCG INDEX[3]	178th

1. https://www.ghsindex.org/wp-content/uploads/2021/12/2021_GHSindexFullReport_Final.pdf
2. https://hologic.womenshealthindex.com/sites/default/files/2022-09/Hologic_2021-Global-Women%27s-Health-Index_Full-Report.pdf
3. https://globalrcg.com/health-index-2021/#table

LINDA MAMA: KENYA'S INITIATIVE ON FREE MATERNAL CARE

35%

Immediate increase in the number of deliveries after the Linda Mama program

2,801,127

Cumulative number of deliveries in public health facilities with the introduction of Linda Mama (2012 – 2016)

10

Years since the launch of the Linda Mama program

KES 11.6B

Cumulative funds disbursed to the Linda Mama program as at 2020

LINDA MAMA BACKGROUND

The Linda Mama, Boresha Jamii program is a maternal and child health initiative in Kenya that was launched in 2013 by the Ministry of Health to achieve universal access to maternal and child health services and contribute to the country's progress towards Universal Health Care (UHC).

In June 2013, the government affirmed its commitment to the country by abolishing user fees for maternal services in all public health facilities country-wide. With the introduction of the free maternity program, health facilities were to be compensated for lost revenues, to this end a budget allocation of KES 3.8B was made in 2013/2014 and later increased to KES 4B and KES 4.3B in 2014/15 and 2015/16.

The introduction of Linda Mama saw a 35% increase in the number of deliveries from 461,995 in 2012/13 to 627,487 in 2013/2014.

These deliveries continued to increase and reached about 900,000 in 2015/16 [1]. As of 2020, the Kenyan government had cumulatively disbursed more than KES 11.6B for the program [2].

Health PS , 2020, Susan Mochache

"Linda Mama provides a package of basic health services accessed by all in the targeted population on the basis of need and not ability to pay, positioning Kenya on the pathway of UHC [2]."

1. http://guidelines.health.go.ke:8000/media/Implementation_Manual_for_Programme_Managers_-_December_2016.pdf
2. https://www.health.go.ke/linda-mama-programme-positioning-kenya-on-the-pathway-to-uhc-health-ps/

CURRENT STATE, WOMEN ELIGIBILITY, AND CHALLENGES

The program was initially funded by the government of Kenya and development partners, including the German government, the United States Agency for International Development (USAID), and the United Nations Population Fund (UNFPA).

Since its launch, the Linda Mama Program has expanded to cover all 47 counties in Kenya and has provided free maternal and child health services to millions of women and children. The program covers a wide range of services, including antenatal skilled delivery, postnatal care, family planning, and immunization. To access the Linda Mama services, eligible women (any woman who is a Kenyan citizen) and children are required to register with the National Health Insurance Fund (NHIF) or the Kenya Medical Insurance Fund (KMIF), which are the two health insurance providers participating in the program. After registration, beneficiaries receive a Linda Mama card which they then present at participating health facilities to access the free services.

CHALLENGES STILL PERSIST FOR THE PROGRAM

- Linda Mama **beneficiaries still can't access some services** that are part of the Linda Mama benefit package.
- Linda Mama **reimbursement rates are deemed insufficient** to cover the incurred costs.
- The **claims process** is faced with several challenges.
- There are **varying availability of essential medical supplies** in healthcare facilities.
- **Distance and associated transport costs** are a barrier to access.

65–70%

The number of deliveries that take place through the Linda Mama Program. More than 1.1M women register for the program yearly[1].

1. https://www.the-star.co.ke/health/2022-03-08-million-of-women-benefit-as-linda-mama-turns-nine/

SERVICES COVERED UNDER LINDA MAMA[1]

These services cover all pregnant women and newborns for a period of one year

ANTENATAL CARE (ANC)

- ANC profile including blood grouping, HIV counselling and testing, urinalysis and serology
- Preventive services including treatment for malaria, tetanus toxoid and folate supplements
- Prevention of Mother to Child Transmission (PMTCT) of HIV

DELIVERY

- Skilled delivery including caesarean section in public facilities and accredited for-profit and not-for-profit private health hospitals
- Neonatal care including costs related to pre-term births

POSTNATAL CARE (PNC)

- **Within 48 hrs;** analgesics, iron and folate supplements, long lasting mosquito nets, PMTCT for HIV positive mothers, and care for new-born
- **Within 1-2 weeks;** covers both mother and child including, cervical cancer screening, STIs and tuberculosis
- **Within 4 - 6 weeks**; family planning services, screening for cervical cancer, and immunization as per schedule and early infant diagnosis of HIV
- **Within 4-6 months**; family planning services, screening for cervical cancer, STI and TB, and immunization as per schedule

EMERGENCY SERVICES

- Ambulance services

COMPLICATION ARISING FROM PREGNANCY

- Treatment as outpatient or inpatient at any accredited facility (public, for-profit, not-for-profit)

CARE FOR INFANT

- Outpatient services (treatment in child welfare clinics) in accredited public faith-based and selected low-cost private for profit facilities
- Inpatient services in accredited public, faith-based and selected low cost private-for-profit facilities

Accredited institutions are all health facilities licensed to operate by the MoH either directly or by relevant regulatory bodies [1]

1. http://guidelines.health.go.ke:8000/media/Implementation_Manual_for_Programme_Managers_-_December_2016.pdf

IMPROVE THE QUALITY OF MATERNAL AND NEW-BORN CARE

Strategies for achieving this:

1. **Strengthen maternal and new-born health guidelines and protocols:**
    - **Develop and implement evidence-based guidelines and protocols for** maternal and newborn care that are tailored to the specific needs and contexts of different communities and are based on the latest scientific evidence
    - **Develop a national family planning, monitoring and evaluation system** to track the implementation and impact of the guidelines and protocols and identify areas for improvement

2. Develop and implement strategies to improve access to childbirth and postnatal care, including improving transportation systems, establishing referral systems, and integrating childbirth and postnatal care with other services, such as family planning and HIV services.

ACTION PLAN

Focus areas

Implement strategies to decrease maternal and fetal deaths

Strategies to increase use and access to quality maternity care

Strategies to increase training for maternity service providers

The primary aim is to eliminate preventable maternal mortality and inequities

Reduced maternal deaths
Increased number of pregnant women visiting facilities
Increased number of maternal experts

Improved birth care, early initiation of prenatal care, and healthy maternal care during every pregnancy

Decreased severe maternal morbidity

Decreased pre-natal complications

Decreased cost of services especially in rural areas

Increase access to post-natal maternal care for mother and child

Pregnancy → **Pre-natal** → **Delivery** → **Post-natal**

The primary aim is to reduce infant mortality and ensure quality services

Fewer deaths especially in marginalized areas

Increased immunization, breastfeeding and safer sleep

Healthier women at the start of possible subsequent pregnancy, early initiation of prenatal care

Labor and delivery → **Infancy** → **Delivery**

FUNDING HEALTHCARE IN KENYA

Kenya has witnessed significant improvements in budget allocation to health care and, in general, to the Ministry of Health, from KES 94B in FY 2012/2013 to KES 247B in 2020/2021.

Health as a proportion of the government budget in Kenya is still below the Abuja Declaration of 15%[1].

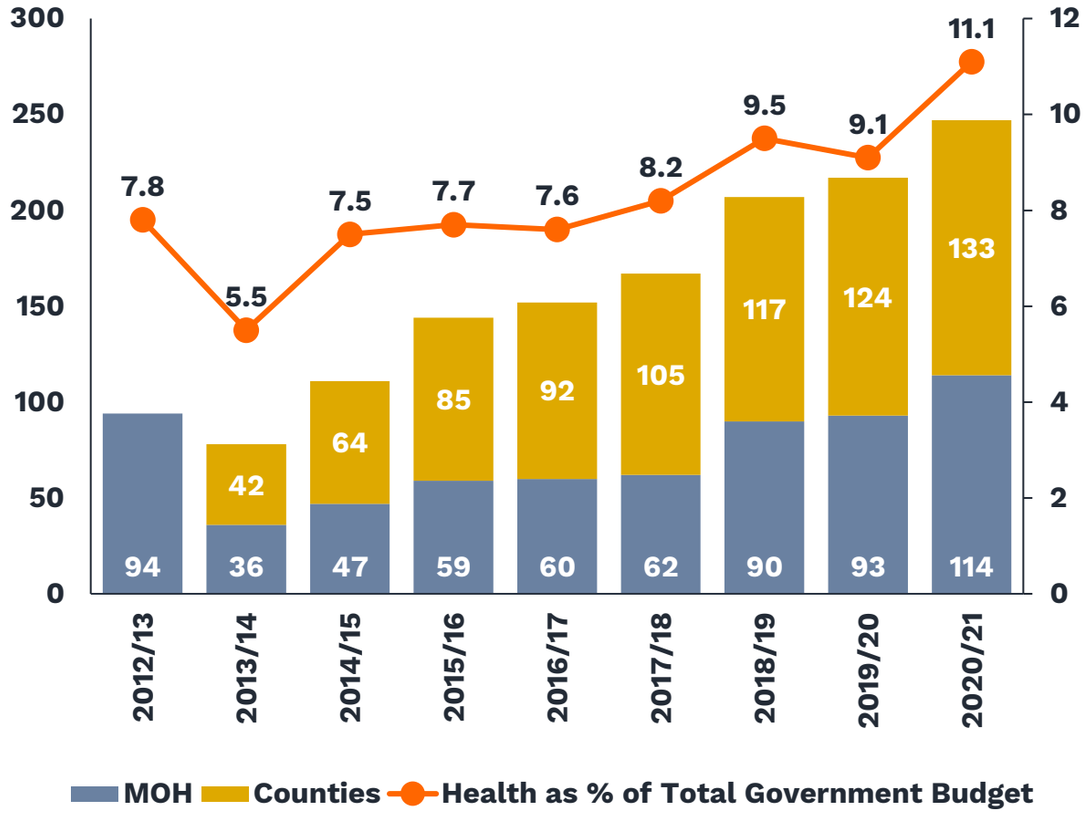
Despite this increase, the overall real allocation to health in the past three years has only increased by 7.5 percentage points and by 2.5% for per capita real health allocation. Health as a proportion of the government budget has increased to reach 11% in FY 2020/21[2].

The MOH, through its **Program-Based Budgeting (PBB),** has five designated programs through which all health services are delivered.

County governments continue to take up the largest share of allocations to health. In 2020/21, counties increased allocations to health to 29.2% of their total budgets[2].

The **reproductive, maternal, new-born, child, and adolescent health services program** saw a marginal increase in FY 2020/21 but received only 12% (KES 13.9 billion) of the MOH budget[2].

FIGURE 3: BUDGET ALLOCATIONS TO HEALTH (KES BILLIONS) [2]



1. https://www.un.org/africarenewal/magazine/october-2020/public-financing-health-africa-when-15-elephant-not-15-chicken
2. https://www.health.go.ke/wp-content/uploads/2022/06/National-and-County-Budget-Analysis-FY-2021-22.pdf

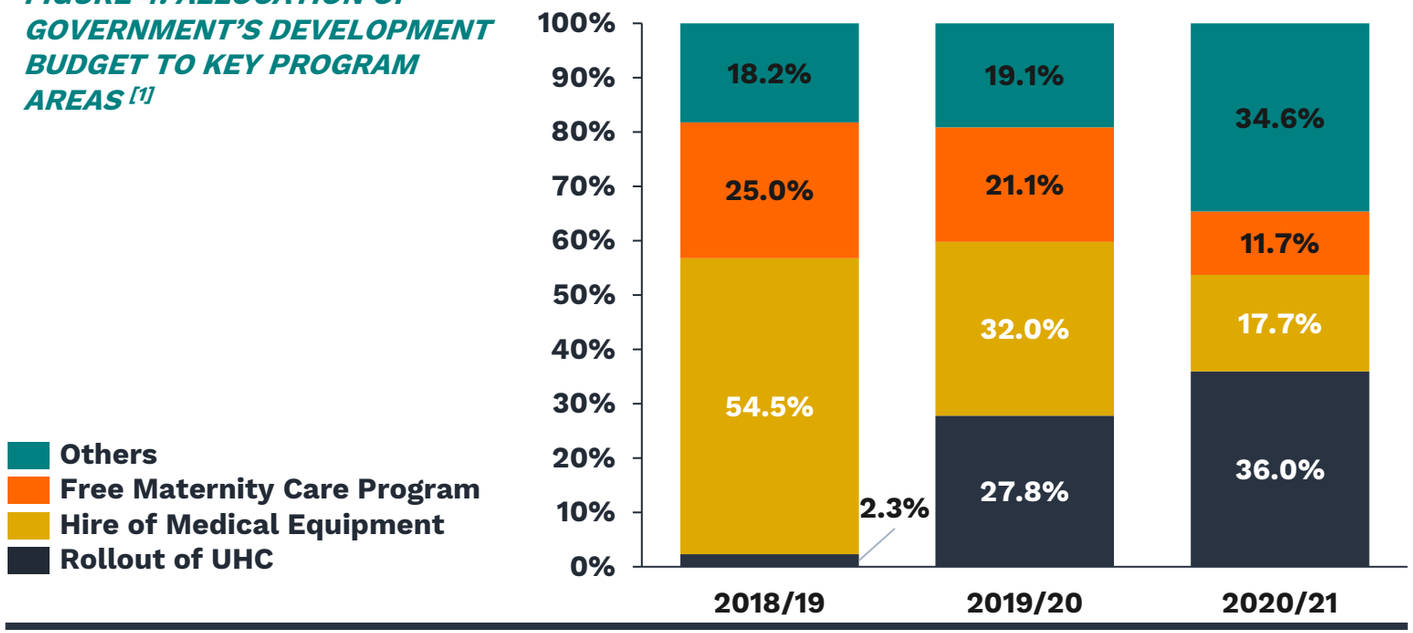
An analysis of the allocation of the country's development budget to key program areas shows a decreasing proportion of allocation to free maternity services.

IN 2020/21, BULK OF THE BUDGET WAS CONSUMED BY THE ROLLOUT OF UHC[1]

In 2018/19, free maternity services took up 25% of the country's development budget; this was reduced to 21.1% in 2019/20 and to 11.7% in 2020/21.

Allocations to "others" include capital grants to semi-autonomous government agencies (SGAs), other MOH headquarters projects and government of Kenya counterpart funding. The government's commitment to the Big Four Agenda has led to more funding for the achievement of UHC.

FIGURE 4: ALLOCATION OF GOVERNMENT'S DEVELOPMENT BUDGET TO KEY PROGRAM AREAS [1]



11.7%

Proportion of county budgets taken up by free maternity service in **2020/2021**

4.1B

Kenya's Allocation to Free maternity services in the FY **2021/2022**

1. https://www.health.go.ke/wp-content/uploads/2022/06/National-and-County-Budget-Analysis-FY-2021-22.pdf

TRAINING ON ULTRASOUND

TRAINING PROGRAMS FOR ULTRASOUND IN KENYA

These courses vary in duration and cost and are designed for medical professionals such as doctors, nurses, and midwives. These courses aim to equip healthcare professionals with the skills and knowledge to use ultrasound technology for diagnosing and treating patients in real-time without the need for additional diagnostic tests.

The courses range from short-term workshops to long-term programs, with varying costs and curriculums. They cover a range of topics, including basic ultrasound principles, image acquisition and interpretation, and clinical applications.

SOME INSTITUTIONS OFFERING TRAINING TO VARIOUS CADRES OF HEALTHCARE WORKERS IN KENYA

AMREF INTERNATIONAL UNIVERSITY

Duration: 3 years

Cost: KES 172K

AMREF trains nurse midwives for 3 years and are currently providing a proctored 2-month ultrasound in-service training. They also offer Continuing Professional Development (CPD) courses *(AMREF)*.

KENYA MEDICAL TRAINING COLLEGE

Duration: 2 years

Cost: KES 238K

KMTC offers various courses in ultrasound under the departments of radiography and imaging, including diplomas in radiography and imaging and diplomas in imaging sciences. For proficiency a 1-year higher diploma course is required *(KMTC)*

NORTH COAST MEDICAL TRAINING COLLEGE

Duration: 1 year

Offers POCUS training as a separate course. The POCUS training program is designed to provide healthcare professionals with the skills and knowledge needed to effectively use ultrasound in point-of-care settings *(NCMTC)*

UNIVERSITY OF NAIROBI

Duration: 4 years

Cost: KES 250K

Offers a 6-year medical undergraduate training program that includes rotations in radiology in levels 4-6; a 4-year postgraduate training in diagnostic radiology that includes all aspects of imaging, including MRIs, CTs, X-rays, and ultrasound, a higher diploma in medical imaging that includes ultrasound in obstetrics, pediatrics, abdomen, pelvis, chest, spine, and orbit; workshops on POCUS for emergency physicians and critical care specialists. *(UoN)*

KENYATTA UNIVERSITY

Duration: 4 years

Cost: KES 266K

Kenyatta University (KU) has a 6-year undergraduate medical school program with rotations in radiology. An additional radiology training for 4 years is required for proficiency. Kenyatta University has workshops on POCUS where they provide 1-week ultrasound training to midwives and nurses as part of on-going research. *(KU)*

PRESBYTERIAN UNIVERSITY OF EAST AFRICA

Duration: 4 years

Cost: KES 375K

The university's School of Medicine offers various undergraduate and postgraduate programs in health sciences, including diagnostic imaging, which includes ultrasound training as part of the curriculum.

KENYA METHODIST UNIVERSITY

Duration: 6 years

Cost: KES 315K

Offers a 6-year medical undergraduate training program that includes clinical rotations in radiology, and hands-on training where participants gain practical experience in using ultrasound in a variety of clinical settings. *(KeMU)*

AGA KHAN UNIVERSITY HOSPITAL

Duration: 4 years

Cost: KES 315K

Has a 4-year radiology residency training program. They currently have a post-basic ultrasound training for midwives as part of on-going research. *(Aga Khan).*

THE GLOBAL ULTRASOUND INSTITUTE (GUSI)

Duration: Various

Cost: Various

A non-profit organization that aims to improve patient care worldwide through ultrasound education and training. GUSI offers a variety of ultrasound training programs with varying durations and costs, including live courses, self-paced courses, online courses, and hands-on workshops. GUSI has a one-week POCUS training for healthcare workers. *(GUSI)*

TRAINING INSTITUTIONS

1. Kenya Medical Training College
2. Hospitals: Aga Khan University Hospital
3. International Institutions
    a) The Global Ultrasound Institute
4. Universities
    a) Kenyatta University
    b) University of Nairobi
    c) Kenya Methodist University

Cost and duration of these programs vary depending on the type of program a health care worker enrolls for

GLOBAL, LOCAL AND NGO SUPPLIERS OF ULTRASOUND EQUIPMENT

GLOBAL SUPPLIERS FOUND IN KENYA

PHILIPS

SAMSUNG
SAMSUNG MEDISON

Butterfly™
The New Image of Health

mindray

SIEMENS
Healthineers

FUJIFILM
Value from Innovation
SONOSITE

GE HealthCare

LOCAL SUPPLIERS

TODA
MEDICAL SUPPLIES

GM MEDICAL
Healthcare Excellence

PHOENIX
EQUIPMENT LIMITED

ACON
MEDICAL SUPPLIES

MEDISTUS
LIMITED

megascope Healthcare (K) Ltd
Your Medical Supplies Partner

OTHER SUPPLIERS

AFRICAN INSTITUTE FOR HEALTH & DEVELOPMENT
"Working with communities for better lives through evidence-based programming"

amref
health africa

KENYA MEDICAL RESEARCH INSTITUTE
KEMRI

EMERGENCY
MEDICINE KENYA FOUNDATION

TRENDS ON TRAINING FOR ULTRASOUND EQUIPMENT

1. SIMULATION & COLLABORATIVE TRAINING

Simulation technology has become an increasingly popular tool in ultrasound training, particularly for point-of-care ultrasound (POCUS) education. Simulators can provide a safe and controlled environment for learners to practice ultrasound scanning techniques, interpret images, and perform interventions without the potential risks associated with real-life patient encounters.

2. NEW & HYBRID CLINICAL CARE MODELS

This is particularly relevant in resource-limited settings, where access to traditional diagnostic tools may be limited. With POCUS training, clinicians can use ultrasound to rapidly diagnose and treat conditions such as pneumothorax, deep vein thrombosis, and fluid in the lungs, without the need for expensive imaging equipment or laboratory tests. In critical care, POCUS can be used to monitor patients in real-time and guide interventions such as fluid management and mechanical ventilation. In primary care, POCUS can be used to improve diagnostic accuracy and guide treatment decisions.

3. ARTIFICIAL INTELLIGENCE

AI is increasingly being used in POCUS ultrasound training to assist with image interpretation and analysis. AI can also provide personalized feedback to learners to enhance their training experience.

4. AUGMENTED REALITY

Augmented reality is emerging as a trend in POCUS ultrasound training, where learners can use a device to view a virtual image overlay on a real patient. This provides a new dimension to learning by allowing learners to visualize the internal anatomy of a patient in real-time.

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