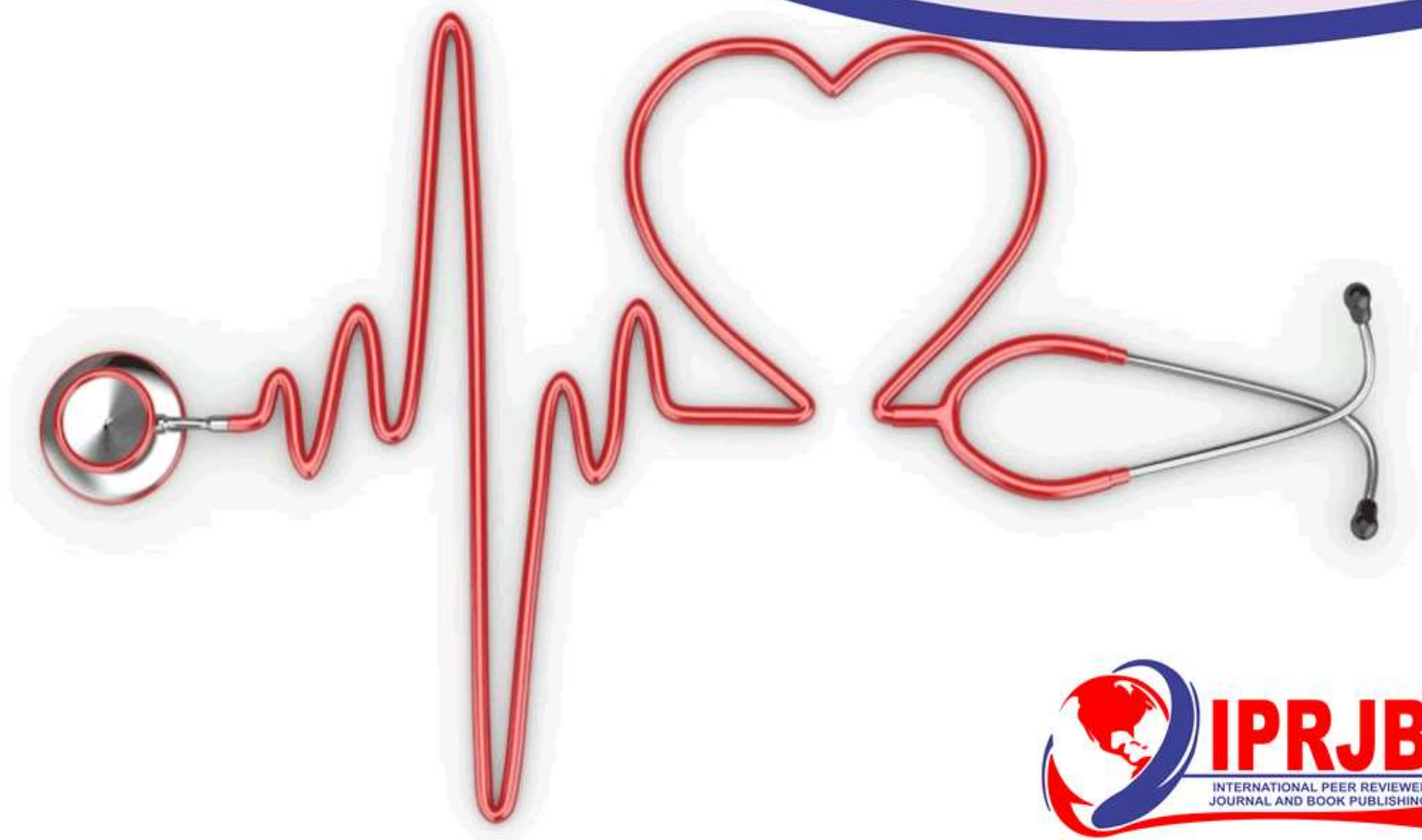


# Journal of Health, Medicine and Nursing (JHMN)

## Proportion of Reproductive Age Women Utilizing Mobile Maternal Health Services in Makueni County

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### Proportion of Reproductive Age Women Utilizing Mobile Maternal Health Services in Makueni County



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#### Article History

Received 28<sup>th</sup> May 2023

Received in Revised Form 10<sup>th</sup> June 2023

Accepted 20<sup>th</sup> June 2023



How to cite in APA format:

Mumo, J., Tai, S. ., & Kipkalom, R. (2023). Proportion of Reproductive Age Women Utilizing Mobile Maternal Health Services in Makueni County. *Journal of Health, Medicine and Nursing*, 9(2), 1–13. <https://doi.org/10.47604/jhmn.2076>

#### Abstract

**Purpose:** The aim of the study was to determine the proportion of reproductive age women utilizing mobile maternal health services in Makueni County.

**Methodology:** An analytical cross-sectional study was carried out in Makueni County. Kibwezi East and Kaiti Sub-Counties were purposively selected. Ukia ward from Kaiti sub-county and Nzambani ward from Kibwezi East sub-county were randomly selected using folded pieces of paper. Both qualitative and quantitative data were collected. Questionnaires were the tools used for quantitative data while guides for key informant were used to collect data qualitatively. The study systematically sampled 367 women of reproductive age as primary respondents from households at a sampling interval of 5. Twelve Key Informant Interviewees were purposively selected to provide additional qualitative data which were community health extension workers and healthcare providers. The research instruments were pretested at Kilome Sub County before actual data collection. Analytical correctional statistical analysis was done using the Statistical Package for Social Sciences software version 20.0. Pie-charts, frequency tables and graphs were used to present data. Triangulation of data collected qualitatively with quantitative data was done and presented as direct quotes.

**Findings:** The study found out that 40.6% of respondents utilized mobile maternal health services in Makueni County. The most common service sought was antenatal care. Distance from health facilities was the main reason for using mobile maternal health services. However, the main reason for non-use was preference for hospitals among respondents.

**Unique Contribution to Theory, Practice and Policy:** These results would inform policy makers to craft interventions seeking to advance mobile maternal health services utilization. Community Health Volunteers should conduct house to house campaigns on availability of mobile maternal health clinics and the designated days on their respective regions to increase awareness among women of reproductive age.

**Keywords:** *Mobile Maternal Health Services, Women, Reproductive Age, Makueni County*

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## INTRODUCTION

Maternal mortality is the death of mothers from sources related to pregnancy or within 42 days of pregnancy while Maternal Mortality Ratio (MMR) is sum of deaths of mothers per 100,000 live births (WHO, 2019). Globally, about 295,000 deaths of mothers were recorded in 2017 with developing countries accounting for 94% of the mortalities (WHO, 2019). Every day about 810 women succumb in the course of pregnancy and birthing. The biggest burden rests in Asia and Africa at 86%. In Sub-Saharan Africa (SSA) alone, approximately 196000 (two-thirds) maternal deaths were reported in 2017 (WHO, 2019).

Most causes of MMRs are preventable through avoiding delays of the 3Ds Model; decision on seeking care, accessing care and getting appropriate care (UNFPA, 2018). These delay effects are more significant especially among populations in remote and hard to reach areas. The main causes may include abortion, hemorrhage, obstructed labor, hypertensive disorders, sepsis and ectopic pregnancy (Tessema, 2017). The main risk factors maternal mortalities around the world include teenage pregnancy, short inter-birth intervals, home deliveries, unskilled birth attendance among others (Ntoimo *et al.*, 2018).

Despite significant improvement in reduction of MMR worldwide, SSA as a region shows slower rate compared to other developed regions. Worldwide, concerted efforts have been heightened with several interventions bearing fruits through ensuring existing health systems provide better access to quality maternal services (Girum *et al.*, 2017). United Nations through Millennium Development Goals (MDGs) tried bridge the gaps in maternal mortalities but some countries lagged behind in attaining the targets by 2015. This gave birth to Sustainable Development Goal 3 target 1 aiming at reduced deaths of mothers to lower than 70 per live births of 100,000 (UNDP, 2015). In Africa, some efforts especially from Africa Union (AU) have been directed at helping countries prevent and reduce maternal and child deaths. This includes interventions to increasing contraceptive uptake, antenatal care, hospital deliveries and postnatal care (Nannan *et al.*, 2019).

In Kenya, some strategies have been initiated to accelerate achievement of SDGs especially improvement of maternal and child health outcomes (Benjamin and Timothy, 2020). These initiatives include costless delivery of mothers using Linda Mama insurance, under-utilized maternal shelter, subsidized safe motherhood through Output Based Approach (OBA), Universal Health Coverage and Mobile Maternal Health Services to prevent and reduce death of mothers (Moindi *et al.*, 2016). Adoption of all these interventions would contribute to improved access and provision of quality maternal services thus lowering maternal and child mortalities (WHO, 2015).

Mobile Maternal Health Services (MMHS) is a well facilitated bus/van with the basic maternal health care services, operated by well-trained medical professionals who drop village by village at stipulated timings (Njuguna *et al.*, 2017). It involves using mobile devices that support delivery of services from distant places so as to check thus improving users' status of health (Akter *et al.*, 2013). The main difference between MMHS and traditional health services is that on adequate implementation they will ensure health services accessibility, individualized health solutions, timeliness of services, targeted information base and mobility (Kahn *et al.*, 2010). This makes MMHS cheaper, accessible, most convenient and faster delivery of services (Chatterjee *et al.*, 2009).

The Government of Kenya, in 2016 initiated the idea of mobile maternal health services to bring services closer to people especially in far to reach areas (MOH, 2016). This has been

adopted by county governments including Makueni. Currently there are three mobile maternal health clinics providing maternal services on a rotational basis at designated stations in the county. This addresses accessibility challenges especially in far to reach areas within the county.

Mobile maternal health services refer to a well facilitated bus/van with basic maternal health care services, operated by well-trained medical professionals dropping village by village at stipulated timings (Neke *et al.*, 2018). The services provided by mobile maternal health clinics include skilled birth attendance, family planning services, child growth monitoring and immunization are just but examples. Implementation of MMHS was an idea to bridge the gap on child and maternal healthcare utilization (Seebregts *et al.*, 2018). The main impediment to use of maternal services is mostly in remote and unreachable areas. These services are community-based hence factoring in cultural issues which may be a barrier in seeking services. This makes them appealing to community members from diverse cultural backgrounds (Attipoe-dorcoo, 2018).

Maternal health services are very critical in ensuring a healthy population prompting a lot of emphasis from governments across the world (Farah & Karim, 2016). Mobile healthcare facilities have emerged as one of the strategies aimed at ensuring accessibility and usage of healthcare services in the general population (Coleman *et al.*, 2020). In most interior parts in low income countries, socio-economic status affects maternal healthcare accessibility (Ali *et al.*, 2018). In the United States of America, mobile clinics have increased accessibility to services especially remote parts with less uninsured individuals (Malone *et al.*, 2020).

In Europe, mobile clinics were used to provide ANC services among the most vulnerable populations such as frequent migrants. In Italy, MMHS were used to ensure equity in access to essential healthcare services (Borsari *et al.*, 2018). Research findings from India shows that MMHS innovation has led to increased visits to ANC and giving birth in facilities where they had been implemented (Ilozumba *et al.*, 2018). A study conducted in rural India, patient-centered mobile maternal services promoted utilization of antenatal services even among those who could otherwise not have maternal services (Kojma *et al.*, 2017).

In other countries, MMHS have been integrated with m-health technologies to improve its effectiveness (Haddad *et al.*, 2019). This idea has also been adopted in some African countries. Studies from South Africa have indicated that MMHS have contributed to more than a half of ANC attendees (LeFevre *et al.*, 2018). Research findings from central Haiti, revealed that although mobile clinics were more efficient in serving larger number of pregnant women, they offered limited services and hence ineffective in offering comprehensive ANC services (Philips *et al.*, 2017). In rural Bangladesh, effective ANC services from mobile clinics improved service utilization among pregnant women from poor income areas and interior parts (Jo *et al.*, 2019).

The Kenyan Government through beyond zero campaigns in 2016, initiated the idea of mobile maternal health services bringing services closer to people especially in far to reach areas (MOH, 2016). Targeted patients are believed to be less educated, poorer and sicker compared to those using regional facilities. All the 47 counties grasped the idea with significant investments in MMHS, an alternative to using stationed health facilities which may be costly (MOH, 2017). Community health workers are at the forefront of this initiative informing the general public on its importance. To increase acceptance, traditional healers and leaders from religious institutions have also enhanced collaborations. These services are provided on a rotational basis at designated stations within the counties (Davies *et al.*, 2018).

## **Problem Statement**

In the County of Makueni, MMR stands at 452/100,000 live births (DOH Makueni County, 2021). This is more than the national average which is 362 out of 100,000 live births (KDHS, 2014) while death of neonates is 21/1000 live births (KDHS, 2022). Despite this, home deliveries have been witnessed averaging at 18% nationally with Makueni County accounting for 11.9% (KDHS, 2022). Women are preferring home deliveries under the care of unskilled birth attendants leading to complications during delivery hence poor maternal and child outcomes.

On average, the nearest health facility distance to households is six Kilometers which is more than nationally recommended of four kilometers (Makueni County, 2013). Majority of the hospitals are located far apart with impassable roads becoming an hindrance in case of instant labor pains. This contributes to delays in accessing and receiving healthcare services. The impoverished women are mainly affected by costs directly or indirectly. It is approximated that 50% of communities are surviving below one dollar per day (MOH, 2015). The unending issue of deliveries at home has called for measures to address these such as mobile maternal health services (Mulinge, 2017).

## **METHODOLOGY**

An analytical cross-sectional study design was applied. This analysed the individual factors, nature of attitude and health facility factors linked to MMHS utilization among reproductive age women in Makueni County, Kenya. The target population were reproductive age women (15 to 49 years) with at least 20 gestation weeks or have given birth at least 6 months post-delivery and had lived in the county for at least 6months. Questionnaires that were structured assisted in quantitative data collection. The variables covered include socio-demographic factors and MMHS utilization. Key Informant Interview (KII) guides helped in collecting additional data qualitatively from community health extension workers, healthcare providers and local administrators. For quantitative data, SPSS (22.0) software for analysis was adopted. The results were presented through graphs, percentages, charts and frequency tables. Qualitative data from KII were expressed as direct narrations.

## **RESULTS**

### **Demographic Characteristics**

#### **Distribution of Respondents' Socio-Demographic Traits**

The findings showed that 119 (34.3%) of the participants were aged between 20-29 years followed by 103 (29.7%) who were aged 30-39 years. 178 (51.3%) of the respondents had secondary level of education followed by 82 (23.6%) with tertiary level.

On marital status, results showed that 198 (57.1%) of them were married while 83 (23.9%) were single. Protestants were 171 (49.3%) followed by 154 (44.4%) Catholics. Results depicted that 149 (42.9%) were self-employed followed by 131 (37.8%) who were not employed. Result are as Table 1 below.

**Table 1: Distribution of Socio-Demographic Characteristics among Respondents (N=347)**

Variable	Respondent response	Frequency (N)	Percentage (%)
Age in years	≤19	51	14.7
	20-29	119	34.3
	30-39	103	29.7
	40-49	74	21.3
Highest level of education attained	No formal education	29	8.4
	Primary	58	16.7
	Secondary	178	51.3
	Tertiary	82	23.6
Marital status	Single	83	23.9
	Married	198	57.1
	Divorced/widowed/separated	66	19.0
Religion	Protestants	171	49.3
	Catholics	154	44.4
	Muslims	22	6.3
Occupation	Not employed	131	37.8
	Self-employed	149	42.9
	Employed	67	19.3

### Socio-demographic Factors Associated with Utilization of MMHS

The study results revealed that 91 (44.2%) of the respondents aged between 20-29 years did not utilize mobile maternal health services. There was a significant statistical association between age of respondents use of mobile maternal health services ( $p=0.001$ ). One of the Nurse who was in charge of a clinic in a KII session reported;

*“...most of the clients who come to these mobile clinics for services especially family planning are the young women. Most of them tell us that the mobile clinics are very convenient for them with their busy schedules of working and learning. They find these services also appealing in terms of saving time as compared to the hospitals where you will have to wait for longer to be served because of the high number of clients...” (KII Respondent)*

About 79 (56.0%) of respondents with secondary level of education had utilized mobile maternal health services. The results further showed that education was associated with utilization of mobile maternal health services ( $p=0.019$ ). Most 95 (67.4%) of those who were married had utilized mobile maternal health services. There was a significant statistical association between status of marital and mobile maternal health services utilization ( $p=0.007$ ). Results on religion, 78 (55.3%) of the respondents who were Protestants had used mobile maternal health services. However, religion did not influence utilization of mobile maternal health ( $p=0.583$ ).

Further 66 (46.8%) of the respondents who were not employed utilized mobile maternal health services. There was a significant statistical association between status of occupational and utilization of MMHS ( $p=0.026$ ) as shown in Table 2. The results were echoed by a hospital administrator who was part of a Key Informant Interview session as he reported;

*“...as much as we offer the services free of charge here some women cannot be able to afford the transport money to the facility. To reach the health facility they may be required to part*

*with at least Kshs.100 which is quite a lot for them since most are not employed. That's why the county embraced this idea of mobile clinics so that we can be able to take the services especially in the difficulty to reach areas. The uptake has really been encouraging and I hope we continue scaling up and increasing the number of service providers and the clinics... ” (KII Respondent).*

**Table 2: Association of Socio-Demographics and Utilization of MMHS (N=347)**

Independent variable	Response	Utilization of MMHS		Statistical significance
		Use (N= 141)	Non-use (N=206)	
Age in years	≤19	14(9.9%)	37(18.0%)	$\chi^2=23.366$ df=3 p=0.001
	20-29	28(19.9%)	91(44.2%)	
	30-39	56(39.7%)	47(22.8%)	
	40-49	43(30.5%)	31(15.0%)	
Highest level of education attained	No formal education	7(5.0%)	22(10.7%)	$\chi^2=56.665$ df=3 p=0.019
	Primary	12(8.5%)	46(22.3%)	
	Secondary	79(56.0%)	99(48.1%)	
	Tertiary	43(30.5%)	39(18.9%)	
Marital status	Single	31(22.0%)	52(25.2%)	$\chi^2=13.573$ df=2 p=0.007
	Married	95(67.4%)	103(50.0%)	
	Divorced, widowed or separated	15(10.6%)	51(24.8%)	
Religion	Protestants	78(55.3%)	93(45.1%)	$\chi^2=1.078$ df=2 p=0.583
	Catholics	55(39.0%)	99(48.1%)	
	Muslims	8(5.7%)	14(6.8%)	
Occupation	Not employed	66(46.8%)	65(31.5%)	$\chi^2=7.334$ df=2 p=0.026
	Self-employed	58(41.1%)	91(44.2%)	
	Employed	17(12.1%)	50(24.3%)	

### Utilization of MMHS

#### Ever Utilized Mobile Maternal Health Services

Results showed that 206 (59.4%) of the participants had never utilized mobile maternal health services while the rest 141 (40.6%) had utilized the mobile maternal health services. The results were as shown in the Figure 1 below.

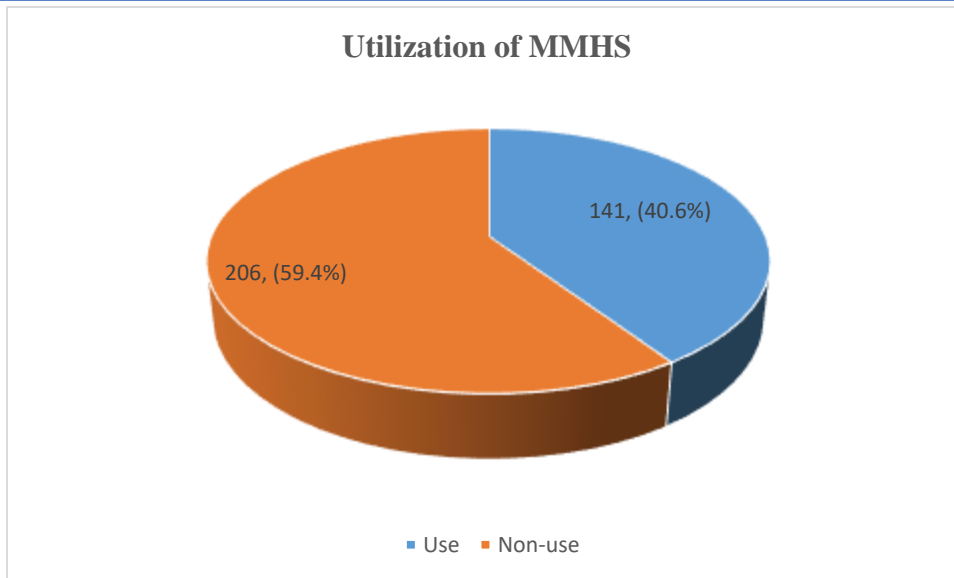


Figure 1: Ever Utilized Mobile Maternal Health Services

### Type of Services Sought in MMHS

Concerning the most recent type of service sought by the respondents, results revealed that 89 (29.3%) had sought for antenatal care services followed by 81 (26.6%) of those who had sought for family planning services. The results on most recent type of service sought was as presented in Table 3. In connection with this, a Nurse in a KII session claimed;

*“...we offer all the MCH services in the mobile clinics but when we compare the services utilized more, we find out that most women seek ANC services here. Initially they used to complain of distance as a key barrier to seeking for the ANC services. The mobile clinics have really increased the ANC service utilization since now most women are able to attend the clinics for the recommended 4 visits. Even the uptake of services like family planning has increased as well as we have had a great reduction of home deliveries which were common before the implementation of the mobile maternal health services...” (KII Respondent).*

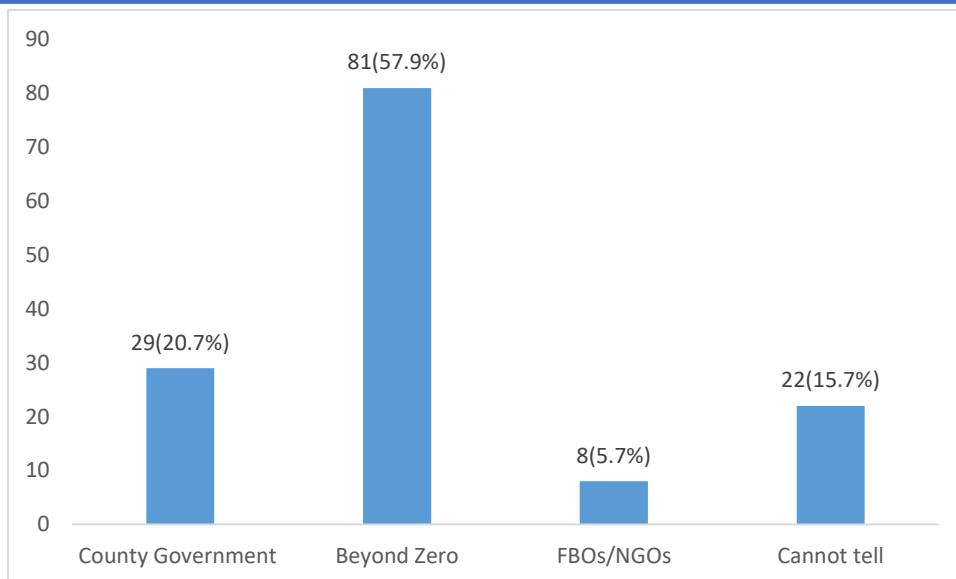
Table 3: Type of Service Sought in MMHS (N=304)

Variable	Response	Frequency (N)	Percentage (%)
Most recent type of service sought	Faming planning	81	26.6
	Antenatal care	89	29.3
	Preconception care	37	12.2
	Delivery	22	7.2
	Postnatal care	75	24.7

### Organization/Program Responsible for MMHS

On whether the respondents who had sought for the MMHS were aware of the organization/program responsible for the mobile maternal health services, results showed that more than half 81 (57.9%) reported that beyond zero provided van run by the county was responsible followed by 29 (20.7%) who reported that the county provided vans were responsible for the clinics. The results were as shown in Figure 2 below.

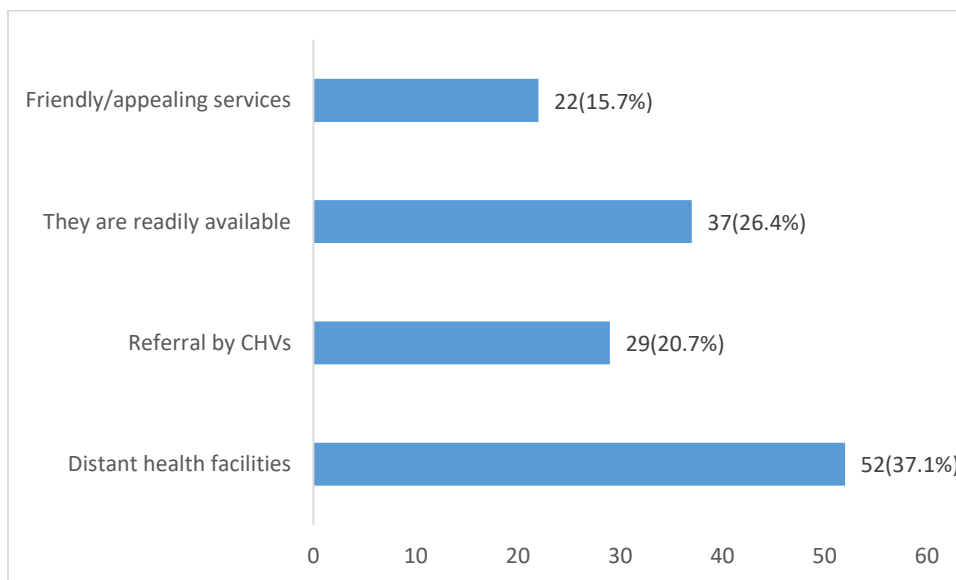




*Figure 2: Organization/Program Responsible for Running MMHS*

### Reasons for Seeking MMHS

Results revealed that 52 (37.1%) of the respondents sought for the services because the health facilities were distant followed by 37 (26.4%) who sought for services at the mobile clinics because they were readily available. The results were as shown in the Figure 3 below.



*Figure 3: Reasons for Seeking MMHS among Respondents*

### Reasons for Non-Use of MMHS

The researcher sought to find out reasons for the non-use of mobile maternal health services, results showed that 67 (32.45) did not seek for services at the mobile clinics because they had preference for hospitals followed by 59 (28.5%) of those who lacked information about mobile clinics. The results were as shown in the Figure 4 below.

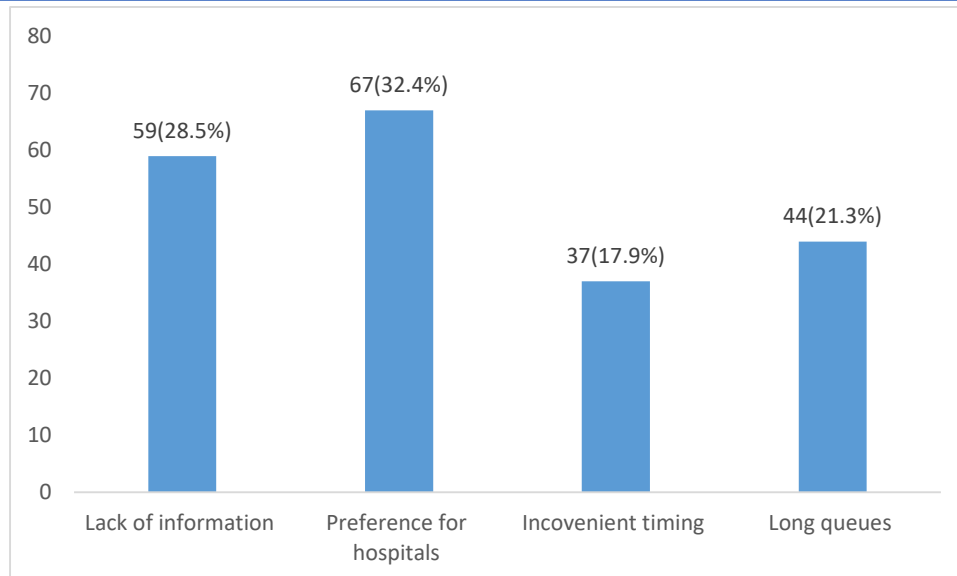


Figure 4: Reasons for Non-Use of MMHS among Respondents

## DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

### Socio-Demographic Factors

About a third of those interviewed had ages ranging between 20-29 years. This is a prime age for women to get into stable relationships thus pregnant or having a child. This agrees with a Gabon that found out that most of the mothers were 29 years and below (Yaya, 2020). The results further reported that age influenced utilization of MMHS. This is because majority of respondents were of younger ages who probably preferred healthcare facilities as a result of their inadequate maternal experience. Consistent results were reviewed from Ghana which showed that utilization of mobile maternal health services increased with age (Nuamah *et al.*, 2019). In another study from central Ethiopia, contrary findings were reported where the odds of utilizing mobile maternal services were higher among women aged 20-34 years (Ali *et al.*, 2018).

A good number had secondary education level. This may also be as a result of secondary education being regarded as basic education before people try to specialize in their relevant career paths. Findings concurred with a Nigerian study where most of the respondents who utilized mobile maternal health services had had a secondary level of education (Ajayi & Akpan, 2020). Education influenced utilization of MMHS among the respondents. Education empowers people in accessing information regarding sexual and reproductive health hence MMHS use. This agrees with a study from India which depicted that education was a key determinant for utilization of MMHS (Bangal *et al.*, 2018). Odetola *et al* (2018) published that education changes perception of women towards MMHS use.

Majority of those interviewed were married. This is because most were in their twenties and thirties, an age group in which majority of women in Kenya are settled in their marriages or are in stable relationships. This agrees with a Tiruaynet & Muchie, 2019 who argued that women reproductive age seeking maternal health services were married. Status of marriage influenced utilization of MMHS. This is supported by the findings as most of the married respondents had utilized MMHS. This could be probably due to support from their respective

spouses. In Kenya's Bungoma County and in rural Nigeria studies revealed a significant statistical association between marital status and MMHS utilization (Kisiangani *et al.*, 2021; Okonofua *et al.*, 2018).

Respondents' religion was majorly Protestants. This is a typical representation of the distribution of population in terms of religion in which majority of Kenyans are Protestants. Okonofua *et al.* (2018) noted that those who sought maternal health services were Christians. In Malawi 's rural set up majority of respondents seeking MMHS service were Muslims (Kim *et al.*, 2019). Despite this, religion did not influence use of MMHS. This is probably because irrespective of religion, women of reproductive age undergo pregnancy and delivery processes which attracts assistance from skilled attendants. Same findings were reported by study from Kwale County in Kenya where religion influenced utilization of maternal health services among women (Mochache *et al.*, 2020). In India, contrary results were reported where religion influenced MMHS utilization such as family planning among reproductive age women (Paul & Chouhan, 2020).

Finally, status of occupation of the respondents showed majority were self-employed. This is because the study location was in a rural set up with scarce employment opportunities were scarce thus forcing most of them to resort to looking for alternative ways of generating income. The results differed with Okonofua (2018), who reported that majority of women interviewed regarding utilization mobile maternal health services in Nigeria were employed. Occupational status influenced use of MMHS. Majority of the respondents who were not employed utilized these mobile maternal health services. This is because mobile maternal health services are free compared to seeking same services in health facilities. Inconsistent results from Eastern Ghana revealed that occupational status influenced utilization of maternal health services (Konlan *et al.*, 2020). Similarly, in Ethiopia ANC attendees showed that occupation status influenced utilization of such services (Tekelab *et al.*, 2019).

### **Conclusions**

In conclusion, four out of ten women utilized mobile maternal health services in Makueni County. The most common service sought was antenatal care. The main reason MMHS utilization was due to distant healthcare facilities in the study sites. However, the main reason for non-use was preference for hospitals among respondents.

### **Recommendations**

The county government of Makueni through the use of Community Health Volunteers should conduct house to house campaigns on availability of mobile maternal health clinics and the designated days on their respective regions to increase awareness among women of reproductive age.

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