



# Uptake of Antenatal Care Services among Women of Reproductive Age in Mandera County, Kenya

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## Summary

### BACKGROUND

Antenatal care is an opportunity for prevention and management of existing and potential causes of maternal and newborn mortality and morbidity. The new WHO antenatal care model, stipulates that, the first antenatal care visit takes place within the first trimester (gestational age of <12 weeks) and then, additional seven visits. Only 37% of women in Mandera County had utilized the recommended minimum four ANC visits.

### OBJECTIVES

There was need to assess the critical factors influencing the uptake of ANC in Mandera County Kenya, in order to enlighten stakeholders on the development of appropriate ANC Service Provision Program. This study took the initiative of bridging the gap.

### METHODOLOGY

The study adopted cross-sectional design using both quantitative and qualitative methods. Stratified and Sample random sampling were used to get a quantity of 348 respondents. Data was collected using questionnaire, FGDs and KIIs guides and Pearson's Chi-square test. Multivariate analysis using logistic regression was summarized to establish the strengths of the association. Odds Ratio (OR) and 95% Confidence Interval (CI) were used and threshold for statistical significance was set at  $p < 0.05$ . Qualitative data was transcribed and analyzed thematically.

### RESULTS

The proportion of women who utilized ANC was 83.0% and only 60.3% had attended recommended visits. Individual factors that influenced ANC uptake were; age, level of education, monthly income, gravida, parity and complications during pregnancy. Contextual factors that influenced ANC were; time taken to reach health facilities, source of maternal information and local discouragements. There was no significant relationship between Religion, marital status, age at first pregnancy with ANC uptake.

### CONCLUSION

The negative perception can change by; improving culturally sensitive ANC services accessibility by; increasing the number of female skilled health workers and reducing traveling time to the health facilities by conducting regular outreach services targeting villages with no close



facility to pastoral communities. It will be important to strengthen CHVs' capacity to emphasize primary health care and accelerate progress towards UHC in the County. Provide health education and promotion targeting older mothers with high parity, women inclined to harmful cultural practices and their partners. In spite of a wide range of literature on ANC topics in most parts of Kenya, it was limited pertaining Manderu County.

## RECOMMENDATIONS

**Meticulous understanding of local barriers and facilitating factors of ANC utilization is prerequisite for designing and implementing interventions that aim to improve ANC uptake. Well developed infrastructure is a basic need that falls in the category of basic wants for Manderu County.**

*Key words:* Antenatal care (ANC), Manderu, FGDs, immunization,  
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## Introduction

In 2017, approximately 810 women died daily from preventable causes related to pregnancy and childbirth. It was estimated that, 295,000 women died during and following pregnancy and childbirth complications that year alone [2].

The vast majority of these deaths (94%) occurred in low-resource settings. Sub-Saharan Africa and Southern Asia accounted for approximately 86% (254 000) of the estimated global maternal deaths. Sub-Saharan Africa alone accounted for roughly two-thirds (196,000) of those deaths. While Southern Asia accounted for nearly one-fifth (58,000) [2].

Kenya's maternal mortality rate was high at 362 deaths per 100,000 live births in 2017 [1]. A rate equal to or above 300 maternal deaths per 100 000 live births is considered high [3]. Manderu County is one of the 15 Counties that account for over 60% of maternal deaths in Kenya [4].

Antenatal care is an opportunity for prevention and management of existing and potential causes of maternal and newborn mortality and morbidity. Antenatal care can help women prepare for delivery and understand warning signs during pregnancy and childbirth. ANC can be a source of micronutrient supplementation, treatment of hypertension to prevent *eclampsia*, immunization against tetanus, preventing mother-to-child transmission of HIV [5].

The new WHO antenatal care model stipulates that, the first antenatal care visit takes place within the

first trimester (gestational age of <12 weeks) and an additional seven visits thereafter.

Globally, while 86 per cent of pregnant women access antenatal care with skilled health personnel at least once, only two in three (65 per cent) received at least four antenatal visits. In regions with the highest rates of maternal mortality, such as sub-Saharan Africa and South Asia, even fewer women received the minimum four antenatal visits (52 % and 49 % respectively) [6].

In Kenya, Ministry of Health (MOH) had designed new guidelines for FANC services placing emphasis on the four(4) ANC visits that focus on antenatal care, birth planning and emergency preparedness. The visits were entry point for a range of other reproductive health services, thus promoting comprehensive integrated service delivery [7].

Over 95 percent of all pregnant women in Kenya had received at least one ANC service from a skilled provider and only 58% received the stipulated four ANC visits. Approximately 89 % had received at least one TT injection. Approximately 20 % of the women had their first ANC visit in the first trimester and over 63% of all the respondents had, interacted with a skilled birth attendance for their most recent born child [1].

In Manderu County, only 37% of women of reproductive age had received ANC services at least 4 times during pregnancy. That was considerably lower than the national rate of 58 %, In addition, only 51%



received ANC services once compared to 96% of the national data. The reasons behind the low uptake of ANC in this area remain largely unknown. This calls for efforts to assess the critical factors influencing the uptake of ANC in this County in order to enlighten stakeholders on the development of appropriate ANC service provision programs [1].

Although there was a wide range of literature on ANC topics in most parts of Kenya, it was limited pertaining Mandera County. There was lack of adequate data on factors that led to low utilization of ANC in the County. Meticulous understanding of local barriers and facilitating factors of ANC utilization is a prerequisite for designing and implementing interventions that aim to improve uptake. The study has systematically assessed both individual and contextual factors associated with Uptake of ANC and all stakeholders need to act fast the best way possible both constraining and facilitating ANC factors to increase uptake.

## Methodology

The study-adopted community based cross-sectional design using both Quantitative and Qualitative methods. Study population consisted of 348 Women who gave birth one year prior to the study in Mandera County.

## Study Area

Mandera is an Arid county situated on the northern tip of Kenya's boundary with Somalia, Ethiopia and Wajiri County to the South West. Mandera South sub-County was randomly selected out of its Six - Sub-Counties. It was one of the Sub-Counties that are homogeneous in terms of Socio-economic, cultural/religious belief, access to and quality of health care.

The population of Mandera County was 2.7% of the Kenyan populations with 54.6% male and 45.4% female. Mandera Town was the largest urban population center with a population of 9%, Rhamu 3%, Elwak 2% and Takaba 2% of Mandera population ( CRA 2012 )

It has a population density of 988.2 which was 40.6% higher than the national population density of 401.1 per square kilometer. The average household size was 8.2, 53.7% larger than the national average household size of 4.4.

Population of children under 5years was 14.07% lower than national under 5years of 15.47.<sup>1</sup> 1.8% of the population is between the age of 0 – 5 months and 5.4% are between the age of 6 – 23 months.<sup>2</sup>

It was estimated that the county's deprived child population was 74.77%<sup>3</sup>. In 2011, the national birth rate per 1,000 was 37.6 and the annual population growth rate was 2.67% (World bank,2011- 2012)

The primary economic activity was livestock pastoral-ism with cross border trade in Mandera town. The county is hot with mean annual average temperatures of 30°C, maximum 37°C. Rainfall was scanty and unpredictable averaging at 255mm<sup>6</sup>. Majority of the population belongs to the Somali ethnic community and Islamic religion mainly dominates the county.

## Sampling Techniques

Stratified Sampling was done whereby the Sub-County was divided into its five Ward zones. Samples allocated equally in each of the Wards. The number of households allocated to each Village in the Wards was calculated proportionally to its population size. Random sampling was done to select the households that participated in the study. That was done prior to commencement of the data collection. FGDs participants were purposively selected from the survey component of the study.

## Data Collection and Analysis

Data was collected using Questionnaires, FGDs and KIIs. Quantitative data was coded, entered into access database and exported to *SPSS version 25* for analysis. The data was checked for completeness to ensure that all information was properly collected and recorded. Descriptive analysis was conducted on respondents' background characteristics and reported in frequencies and percentages. *Pearson's Chi-square test* was used to determine factors associated with the dependent variable.

All independent variables identified to significantly associate with ANC uptake were considered for Multivariate analysis using logistic regression to establish the strengths of the association. Odds Ratio (OR) and 95% Confidence Interval (CI) were used and threshold for statistical significance was set at  $p < 0.05$ . Qualitative data was transcribed and analyzed thematically. Major themes from the



discussions identified and corroborated with the results from quantitative data.

## Ethics

The study obtained approval from Kenyatta University, Ethics approval from Scientific Review Unit of KEMRI, research permit form NACOSTI and research authorization from County.

## Results

### Background Characteristics of Respondent

Out of 348 respondents, about 27% had no formal education. Almost all the respondents 99.7% were Muslims and majority of the respondents 72.1% were married. The spouse was reported as the main family breadwinner at 43.7%. Majority 29.0% earn Ksh. 15,000-25,000 (*Table 1*).

*Table 1: Association of obstetric factors and ANC uptake*

Variables	Category	Frequency (n=348)	Percentage (%)
	Percentage (%)		
Age	15-24	176	50.6
	25-34	124	35.6
	35-44	48	13.8
Education	No formal education	95	27.3
	Primary	58	16.7
	Secondary	94	27.0
	Tertiary	71	20.4
	Madrasa/Duksi	30	8.6
Religion	Muslim	347	99.7
	Christian	01	0.3
Marital Status	Single	10	2.9
	Married	251	72.1
	Widowed	36	10.3
	Divorced	51	14.7
Main source of income	Self	101	29.0
	Spouse	152	43.7
	Parent	51	14.7
	Relatives	44	12.6
Monthly Level of income	Below 15,000	98	28.2
	15,000-25,000	101	29.0
	25,000-35,000	83	23.9
	35,000 above	66	19.0



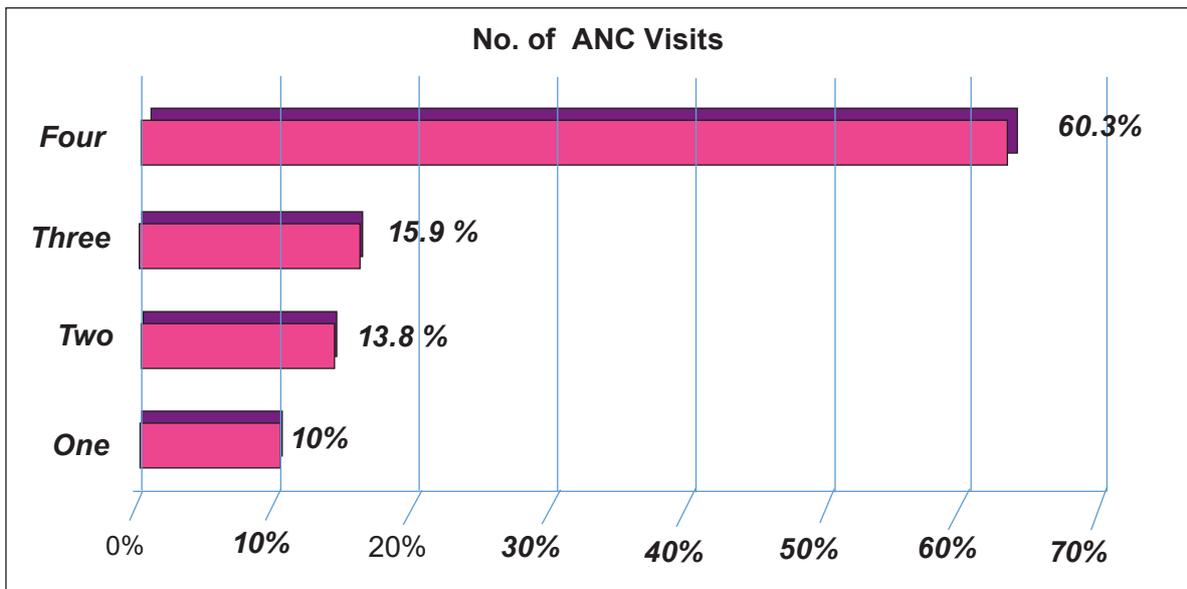
## Proportion of Women who Had Utilized ANC Services

More than two-thirds of the respondents 289 (83.0%) had utilized ANC services during their last pregnancy. Only, 59 (17.0%) of them had not utilized.

## Number of times mothers visited ANC Clinics for check-ups

More than half of the mothers who had utilized ANC, 175 (60.3%) had attended four or more antenatal visits during their last pregnancy, 46 (15.9%) attended thrice, 40 (13.8%) attended twice and 29 (100.0%) have attended once only (*Figure 1*)

*Figure 1 : Number Of Times Mothers Visited ANC Clinics For Check-Ups.*

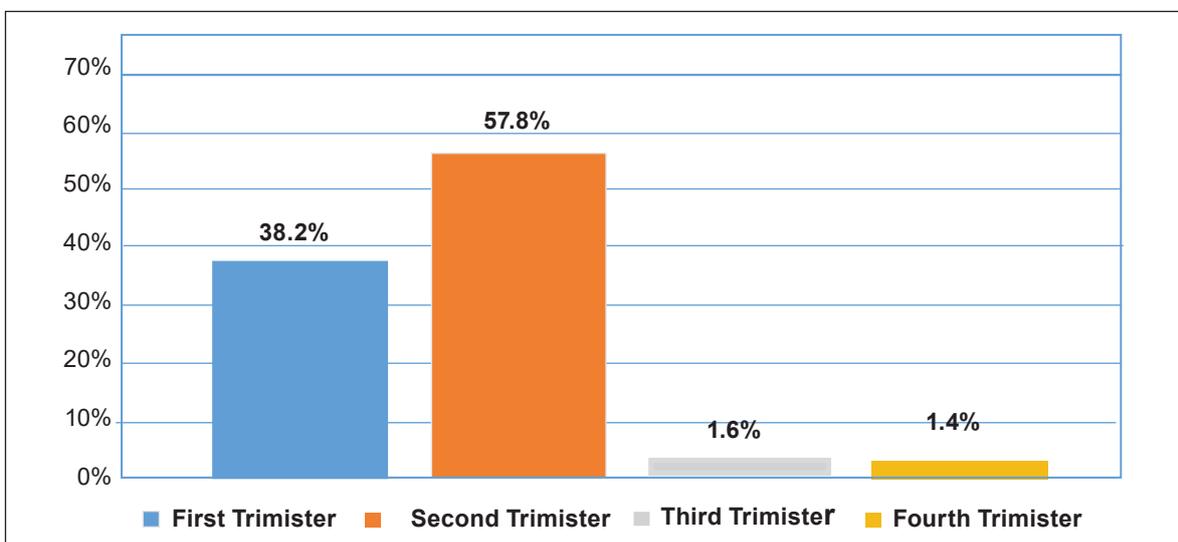


## Gestation period at the first visit for ANC service.

Majority of ANC user 147 (57.8%) had made first visit during second trimesters, Ninety-seven (38.2%) had

made first visit during first trimester, 4 (1.6%) had visited ANC during third trimester and 6 (2.4%) were not sure of the time of first visit (*Figure 2*).

**Gestation Period At The First Vist**



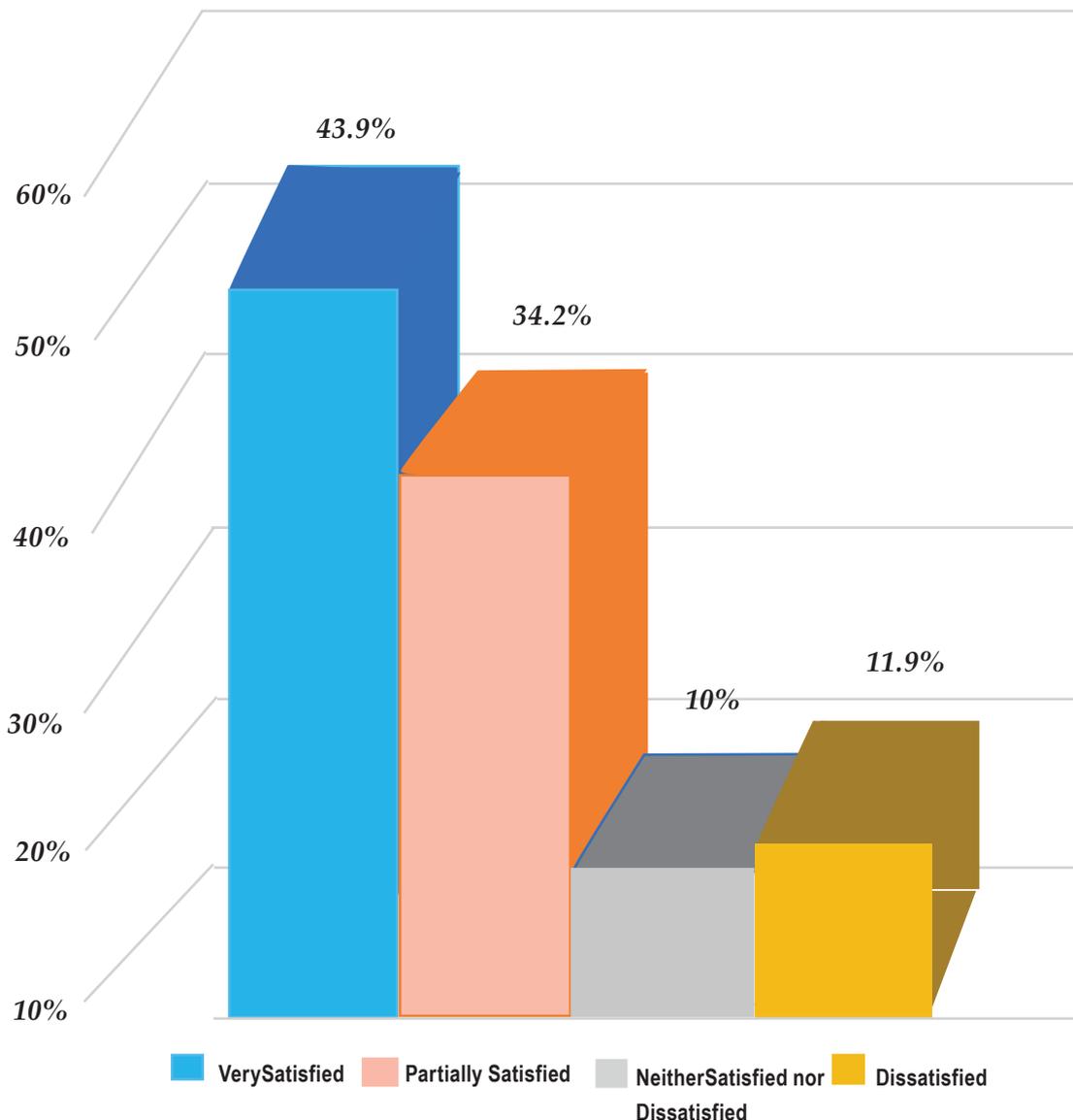


## Respondents' Satisfaction With The Quality Of ANC Service

The study established that less than half of ANC

user 122 (43.9%) were very satisfied with the service. 95 (34.2%) were partially satisfied, about 28 (10.1%) were neither satisfied nor dissatisfied and 33 (11.9%) were dissatisfied with ANC services (*Figure 3*)

**Satisfaction With ANC Service**



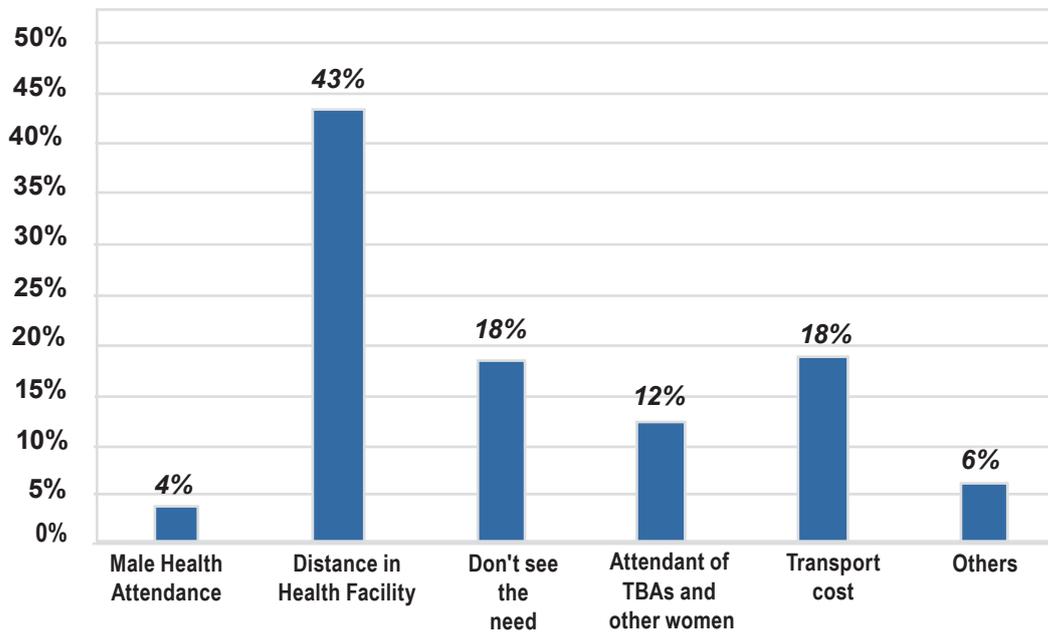
## Reasons for non-uptake of ANC services.

Most of the respondents who had not utilized ANC 22 (43.1%) cited long distance to health facilities as reason for non-uptake. Nine (17.6%) cited cost of

transport to the facility and same number do not see the need for ANC uptake. About six (11.8%) were attended by TBAs and other women. Two (3.9%) cited male health attendant and three (5.9%) cited other reasons for non-uptake.



## Reasons for non-uptake of ANC



Similar reasons cited by FGDs and KIIs respondents where they said:

*“Our village does not have any nearby hospital, we are forced to visit our neighbouring town that is Wargadud town for ANC services, you can imagine, pregnant women are forced to walk that long distance we hardly get a vehicle for transport. So! the government should consider building a small dispensary for us here. Even a Mobile clinic can work ”*  
FGDP5

*“My mother is a good TBA and she gives me good advice At times I may visit a hospital and find male attendants, better my mother since she also helps many pregnant women”*  
FGDP3

*“I have to look after my children and animals, I don't have time to visit hospitals every now and then except for major complications, God is great, I am fine”*  
FGDP7

## Association Between Socio-economic Factors and ANC Uptake

The study findings reported that, there was a significant relationship between age, level of education, monthly income and ANC uptake. **Table 2** shows logistic regression between selected socio-economic factors and ANC uptake.

Respondents who were aged between: 15-24 years were found to be almost nine times more likely to utilize ANC (OR = 8.956; 95% CI = 40.03, 200.036;  $p < .001$ ).

Those aged between 25-34 years were almost twice more likely to utilize ANC (OR = 2.692; 95% CI = 1.312, 7.15;  $p = 5.523$ ) compared to the respondents aged 34-44 years.

Respondents with Madrasa / Duksi that is Islamic form of education were more likely to utilize ANC compared to those with no formal education (OR= 0.157; 95% CI= 00.071, 0.347;  $p < .001$ ).

Those with a monthly income of below Ksh. 15,000/= were less likely to use ANC than those with income of Ksh. 15,000/= - Ksh. 25,000/= (OR= 3.137; 95%CI= 1.510, 6.517;  $p = .002$ ) and those with Ksh. 25,000-35,000 (OR= 11.340; 95%CI= 4.699, 27.365;  $p < .001$ ).



**Table 2:** Logistic Regression Between Selected Socio-economic Factors and ANC Uptake.

Variables	Never utilized ANC	Utilized ANC		Odd ratio (OR)	95% CI		p value*
	0 Visit (Non-Uptake) n (%)	<4 Visits (Inadequate) n (%)	≥4 visits (Recommended) n (%)		Lower	Upper	
<b>Age in years</b>							
15-24	12 (6.8%)	53 (30.1%)	111 (63.1%)	8.956	4.003	20.36	<b>&lt;0.001</b>
25-34	27 (21.8%)	47 (37.9%)	50(40.3%)	2.692	1.312	5.523	<b>0.007*</b>
35-44	20 (41.7%)	14 (29.2%)	14 (29.2%)	Reference			
<b>Level of Education</b>							
None	28 (48.3%)	10 (17.2%)	20 (34.5%)	0.571	0.071	0.347	<b>&lt;0.001*</b>
Primary	7 (7.4%)	26 (27.4%)	62 (65.3%)	1.840	0.691	4.899	0.223
Secondary	10 (14.1%)	26 (36.6%)	35 (49.3%)	0.798	0.330	1.931	0.617
Tertiary	1 (3.3%)	11 (36.7%)	8 (60.0%)	4.244	0.528	34,089	0.174
Madrasa / Duksi	13 (13.8%)	41 (43.6%)	40 (42.6%)	Reference			
<b>Marital Status</b>							
Married	45(18.0%)	71 (28.4%)	134 (53.6%)	1.147	0.746	1.763	0.532
Widowed	7 (19.4 %)	14 (38.8%)	15 (41.6%)	1.136	0.775	1.655	0.512
Divorced	11 (21.5%)	20 (39.2%)	20 (39.2%)	Reference			
<b>Monthly income ( Kenya shillings)</b>							
< 15,000	38 (45.8%)	27 (32.5%)	18 (21.7%)	Reference			
15000-25000	14 (21.2%)	32 (48.5%)	20 (30.3%)	3.137	1.510	0.662	<b>0.002*</b>
25000-35000	7 (6.9%)	48 (47.5%)	46 (45.5%)	11.340	4.699	0.213	<b>&lt;0.001*</b>

**Key:** OR = Odds Ratio; CI= Confidence Interval; \*Significant at  $p < 0.05$  bolded

## Association of Obstetric Factors and ANC Uptake.

The study showed that there was a significant relationship between gravida, parity, complication during pregnancy and ANC uptake. Respondents with four and above gravida (Number of Pregnancies) are

less likely to utilize than those with one gravida are (OR= 0.103; 95%CI= 0.35, 0.300;  $P<.001$ ), those with two gravida (OR= 0.51; 95%CI= 0.55, 0.411;  $P<.001$ ) and those with three gravida OR= 0.773; 95%CI= 0.601, 0.994;  $p=.044$ ).



Respondents with four and above parity (Number of children mothers had given birth to) are less likely to utilize than those with one parity are (OR= 0.071; 95%CI= 0.24, 0.208; P<.001) and two parities (OR= 0.218; 95%CI= 0.86, 0.549; P<.001). Respondent

who had complications during pregnancy were two times more likely to utilize ANC than those who had no complication (OR=2.136; 95%CI= 10.084, 4.210; p<.028) as shown in (**Table 3**) below.

Variables	Never utilized ANC	Utilized ANC		Odd ratio (OR)	95% CI		p value*
	0 Visit (Non-uptake) n (%)	<4 Visits (Inadequate) n (%)	≥4 visits (Recommended) n (%)		Lower	Upper	
<b>Gravida (Number of Pregnancies)</b>							
Once	4 (5.1%)	19(24.1%)	56 (70.9%)	0.103	0.035	0.30	<0.001*
Twice	1 (1.2%)	34 (39.5%)	51 (59.3%)	0.151	0.055	0.411	<0.001*
Thrice	10 (17.5%)	22 (38.6%)	25 (43.9%)	0.773	0.601	0.994	<b>0.044*</b>
≥ Four	44 (34.9%)	39 (31.0%)	43 (34.1%)	Reference			
<b>Parity (Number of children mothers have given birth)</b>							
One	4 (3.1%)	46 (35.4%)	80 (61.5%)	0.071	0.02	0.208	<0.001*
Two	6 (8.8%)	14 (20.6%)	48 (70.6%)	0.218	0.08	0.549	<0.001*
Three	12 (37.5%)	15 (46.9%)	5 (15.6%)	1.539	0.687	3.451	0.295
≥ Four	37 (31.6%)	38 (32.5%)	42 (35.9%)	Reference			
<b>Age at first pregnancy (years)</b>							
15- 18	25 (16.1%)	62 (40.0%)	68 (43.9%)	0.902	0.408	1.997	0.799
19-20	24 (18.8%)	35 (27.3%)	69 (53.9%)	0.830	0.369	1.868	0.653
21-25	10 (15.4%)	17 (26.2%)	38 (58.5%)	Reference			
<b>Complications during last pregnancy</b>							
Yes	13 (11.4%)	26 (22.8%)	75 (65.8%)	2.136	10.084	4.210	<b>0.028*</b>
No	46 (19.7%)	88 (37.6%)	100 (42.7%)	Reference			

Key: OR = Odds Ratio; CI= Confidence Interval; \*Significant at  $p < 0.05$  bolded



## Association of Contextual Factors Of Respondents and ANC Uptake.

A significant relationship between time taken to reach health facilities, sources of information, cultural beliefs and ANC uptake was reported. Respondents who took less than 30 minutes were more likely to utilize ANC than those who took one or one and half hour (OR= 0.207; 95% CI= 0.051, 0.840; p=.028) and those who took 2 hours and above to reach health facilities (OR= 0.063; 95%CI= 0.019, 0.210; p<.001).

Respondents who had no access to ANC information were less likely to utilize ANC services (OR= 0.057; 95%CI= 0.023, 0.147; p<.001). Those who got ANC information from Community Health Volunteers, disclosed cultural beliefs against ANC services and were less likely to utilize ANC services (OR= 0.219; 95%CI= 0.120, 0.401; p<.001).

Similarly, Respondents who utilized skilled delivery were fourteen times likely to have used ANC services more than those who had not utilized the service (OR= 14.135; 95%CI= 7.254, 27.544; p<.001) as shown in **Table 4** below.

Variables	Never utilized ANC	Utilized ANC		Odd ratio (OR)	95% CI		p value*
	0 Visit (Non-uptake) n (%)	<4 Visits (Inadequate) n (%)	≥4 visits (Recommended) n(%)		Lower	Upper	
<b>Time taken to access ANC services</b>							
< 30 minutes	3 (3.3%)	27 (39.7%)	40 (58.8%)	Reference			
30 min to 1 hour	1 (1.5%)	21 (22.8%)	68 (73.9%)	2.258	0.230	22.197	0.485
1 to 1 ½ hour	7 (14.0%)	15 (30.0%)	28 (56.0%)	0.207	0.051	0.840	<b>0.028</b>
2 hours above	48 (34.8%)	51 (37.0%)	39 (28.3%)	0.063	0.019	0.210	<b>&lt;.001*</b>
<b>Source of ANC information</b>							
CHVs	8 (7.8%)	14 (13.6%)	81 (78.6%)	Reference			
Health officer	4 (8.7%)	13 (28.3%)	29 (63.0%)	10.05	0.293	3.449	0.993
Radio/Television	7 (15.0%)	11 (23.9%)	28 (60.8%)	0.622	0.177	2.184	0.459
Friend	17 (13.2%)	75 (58.1%)	37 (28.7%)	0.631	0.269	1.481	0.290
None	25 (62.5%)	6 (15.0%)	9 (22.5%)	0.057	0.023	0.147	<b>&lt;.001*</b>
<b>Cultural / local discouragement</b>							
Yes	27 (37.0%)	22 (30.1%)	24 (32.9%)	0.219	0.120	0.401	<b>&lt;.001*</b>
No	31 (11.4%)	91 (33.5%)	150 (55.1%)	Reference			
<b>Skilled birth delivery</b>							
Yes	24 (8.5%)	96 (34.0%)	162 (57.4%)	14.135	7.254	27.544	<b>&lt;.001*</b>
No	34 (59.6%)	15 (26.3%)	8 (14.0%)	Reference			

**Key:** OR = Odds Ratio; CI= Confidence Interval; \*Significant at  $p < 0.05$  bolded



## Discussions

The purpose of this study was to systematically assess both individual and contextual factors associated with Uptake of ANC and inform all stakeholders on the best way to address both constraining and facilitating factors to increase ANC uptake.

World Health Organization had recently revised its recommendation of ANC. From previous four visits to a minimum of eight visits during the first trimester of pregnancy. This will reduce perinatal mortality and improve women's experience on pre-maternal care.

## Socio-Demographic of The Respondents

The study showed that, the proportion of reproductive women decrease with age. Half of the respondents were aged 15-24 years, this indicate most of the women had given birth in earlier life of their reproductive age. Almost a third had no formal education, while 9% had Islamic form of education and the rest with formal education. The region had high illiteracy level. Almost all the respondents practiced Islamic religion.

There was no association between religion and ANC uptake. Majority of the respondents 72 % were married with less than 3% being single. FGDs discussion established that, it was a taboo in this area to give birth without legal marriage.

## Utilization of ANC Services

It was established that 60.3% of women had visited ANC Four and above times as recommended by WHO. This was much higher than Kenya Demographic Health Survey (KDHS) conducted 2014, which showed only 37% of women in former North-eastern region where Mandera County is located received antenatal care at least 4 times during pregnancy. Seventeen percent of the mothers have not utilized ANC service, which was lower than 25.2% of KDHS 2014. This increase in uptake of ANC could be attributed to the devolution in Kenya, which started in 2013, whereby the health sector was devolved to specific Counties as opposed to National government prior to devolution.

Majority of ANC users (57.8%) had made their first ANC visit during their second trimesters. This finding was consistent with the results of the studies

whose majority of the ANC users about 68.0% begun clinic visits on their second trimester of pregnancy [7].

Utilization of ANC services during the second or third trimester contributed to poor compliance with the minimum four visits required for every expectant woman at term. Most of the respondents who had not utilized ANC were;

- 43.1% cited long distances to health facility,
- 17.6 % cost of transport,
- 11.8% didn't see the need of ANC
- 3.9% were attended to by TBAs and other women as reason for their non-uptake.

These findings corroborate with a study done in Ghana which showed long distance and cost of transport were leading reasons for non - ANC uptake [8].

Majority of the respondent 63.3% had not attended postnatal care as only 36.7% of the respondents sought postnatal care despite W.H.O recommendation that, if a birth is at home, the first postnatal contact should be as early as within 24 hours of birth. At least three additional postnatal contacts are recommended for all mothers and newborns that is on day 3 (48-72 hours), between 7<sup>th</sup> - 14<sup>th</sup> day after birth, and six weeks after birth.

## Factors that Influence Utilization of ANC Services among Women

### Socio - Demographic and Economic Factors

A significant relationship between age, level of education, monthly income and ANC uptake was evident. Younger respondents were more likely to utilize recommended four ANC visits than older ones. Respondents who were aged 15-24 years were more likely to utilize recommended ANC at 63% than those aged 25-34 and 35-44 years whom had utilization at 40.3 % and 29.2% respectively. This finding was similar to the study in Southern Ethiopia which showed that women aged 15-24 were more likely to utilize ANC than those aged 25-34 [9].

This might be due to women in the older age group were more likely to have many children to take care and had ingrained cultural practice like TBA as suggested in qualitative arm. Respondents with formal



education and those with Islamic form of education like Madrasa and Duksi were more likely to utilize ANC than those without. That concurred with the study done in Tharaka Nithi County [3].

The increased education might have brought improved knowledge and awareness of health services. Higher receptivity to new health-related information, better communication with their husbands, powerful decision-making, self-worth confidence, negotiating skills and ability to demand adequate services.

Respondents whose monthly income was below Kenya shilling 15,000 were less likely to utilize ANC than those with higher income. Some of the respondents especially those living far from the facilities at times failed to seek ANC services due to lack of transport money to commute to the health facilities as stated in FGDs. This consequently agrees with the findings of a study conducted in Shanghai which found that, pregnant women with adequate income were twice likely to seek ANC services compared to their counterparts with lower income [10].

There was no significant relationship between marital status and ANC uptake. That was contrary to the study in Meru County, Kenya whereby married women living with their husbands were more likely to seek ANC services especially if the husband had knowledge on the importance of ANC [11].

## Obstetric Factors

There was low uptake of ANC among respondents with high gravida and parity. Lower ANC utilization among women of higher gravida and parity can be due to increased confidence from previous pregnancy and childbirth experience, constraints of time and resources, poor prior experience with the health system and financial barriers to ANC utilization. High parity women might tend to rely on their experiences from previous pregnancies and not feel the need for antenatal care [12].

Participants who had complications during pregnancy were twice more likely to utilize ANC than those who had no complication. That was contrary to another study which stated that, there was no statistical significance between complications during previous pregnancies or births and antenatal care utilization. No significant relationship between age at first birth and ANC uptake was recorded [13].

## Contextual Factors

Distance to health facility was significantly associated with ANC uptake. Respondents who travel less than 30 minutes to access ANC service were more likely to utilize ANC than those who travel longer distances. Likewise, a previous study learned that, ANC was affected by time taken to access its services by availability of transportation [14].

Respondents who access ANC information from CHVs were more likely to utilize ANC than those who had no access to CHVs. This was supported by findings from other studies implemented in low-income countries which reported that, health officers and mass media can be an important platform to disseminate health information increasing maternal service utilization [15]

Respondents who cited disclosed cultural beliefs against ANC service were less likely to utilize than those who stated no discouragement. The issue of male birth attendants was considered a taboo by some respondents. The hiding of early pregnancy to avoid evil eye as stated in FGDs also resurfaced.

Significant relationship between ANC uptake and skilled delivery attendance was reported. similar to another study finding that mother's ANC attendance frequency, satisfaction with ANC services and possession of valid insurance card, significantly associated with utilization of skilled delivery services [16]

## Conclusion

There was an increased proportion of mothers having at least one ANC visit 83.0%. However; only 60.3% of them had at least four ANC visits as recommended by WHO. Majority of ANC users 57.8% started their visits on second trimester instead of first trimester. FGDs and KIIs as some respondents cited did not see the need of attending ANC early. Cultural beliefs of avoiding evil eyes in early pregnancy was another block.

Top five reasons for non-uptake of ANC include;

- i. Distance to health facility,
- ii. Cost of transport to the facility,
- iii. Do not see the need,
- iv. TBAs, other women attendance and aversion to male health attendants



- v. Individual factors that influence ANC uptake were age, level of education, monthly income, gravida, parity and complication during pregnancy.

Contextual factors that influenced ANC were time taken to reach health facility, source of maternal information and local discouragements. There was no significant relationship between Religion, marital status, age at first pregnancy and ANC uptake.

Lack of adequate data on factors that led to low utilization of ANC in the County was evident. Meticulous understanding of local barriers and facilitating factors of ANC utilization is prerequisite for designing and implementing interventions that aim to improve the uptake. The study has systematically assessed both individual and contextual factors associated with Uptake of ANC and inform all stakeholders on the best way to address both constraining and facilitating ANC factors to increase uptake.

## Recommendations

Demystify, sensitize ANC services, contrary to cultural beliefs and improve accessibility by increasing the number of female skilled health workers.

Reducing traveling time to the health facility by conducting regular outreach services targeting villages short of closer facilities and pastoral communities.

Exposing women to many sources of maternal information, as majority of respondents who utilized recommended ANC cited CHVs as their main source of maternal service information. There is need to strengthen CHVs capacity as it will strengthen primary health care and accelerate progress towards Universal Health Coverage in Mander County.

Health education and promotion on the importance of Antenatal care utilization to emphasis on advantages of early ANC attendance in the first trimester of pregnancy. Demystify danger signs, uptake of postnatal care targeting older mothers with high parity, women inclined to harmful cultural practices and their partners.

The government need to create ways of increasing

income generating activities by women. Empowering them economically increases their decision-making power to utilize maternal healthcare services. Livelihood programmes targeting mothers with low households' income to improve their wealth status.

Supporting Traditional Birth Attendants by attaching them to a specific health facilities so that they refer pregnant women in the community to ANC for antenatal care. Educate TBAs to act as community care givers with the supervision of skilled health provider. TBAs to take the initiative of distributing iron folate supplements.

Design effective maternal service delivery programmes with monitoring and evaluation methods that involve beneficiaries to improve the uptake of health services.

Further research to be carried on assessing CHVs capacity to accelerate maternal health care utilization towards achieving Universal Health Coverage in Mander County.

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